# MEADOWBANK COMPLEX
# 2022 Annual Report
# 61-000-100-REP-005

**Prepared for:**
Nunavut Water Board
Nunavut Impact Review Board
Fisheries and Oceans Canada
Crown-Indigenous Relations and Northern Affairs Canada
Kivalliq Inuit Association

**Prepared by:**
Agnico Eagle Mines Limited – Meadowbank Complex

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# ABBREVIATION

| | |
|---|---|
| ABA | Acid base accounting |
| AANDC | Aboriginal Affairs and Northern Development Canada (now CIRNAC) |
| AEMP | Aquatic Ecosystem Monitoring Program |
| AP | Acid potential |
| ARD | Acid Rock Drainage |
| AWAR | All Weather Access Road |
| BACI | Before/after control/impact |
| BBS | Breeding Bird Survey |
| BL | Baker Lake |
| BLDAG | Baker Lake Dust Advisory Group |
| BV | Bureau Veritas |
| CAAQS | Canadian Ambient Air Quality Standards |
| CCBE | Cover with capillary barrier effects |
| CCME | Canadian Council of Ministers of the Environment |
| CD | Central Dike |
| CESCC | Canadian Endangered Species Conservation Council |
| CIRNAC | Crown-Indigenous Relations and Northern Affairs Canada |
| CLO | Community Liaison Officers |
| COPC | Contaminants of potential concern |
| COQ | Certificate of Qualification |
| COSEWIC | Committee on Status of Endangered Wildlife in Canada |
| CREMP | Core Receiving Environmental Monitoring Program |
| CRF | Cemented Rock Fill |
| CSM | Conceptual Site Model |
| CWS | Canada-Wide Standard |
| CWS | Canadian Wildlife Service |
| DFO | Fisheries and Oceans Canada |
| D/S | Downstream |
| ECC | Employment and Culture Committee |
| ECCC | Environment and Climate Changes Canada |
| EDF | Environmental design flood |
| EDI | Estimated daily intake |
| EEM | Environmental Effect Monitoring |
| El. | Elevation |
| EoR | Engineer of Record |
| ERP/CMP | Emergency Response Plan / Crisis Management Plan |
| ERT | Emergency Response Team |
| FCRP | Final Closure and Reclamation Plan |
| FDP | Final Discharge Point |
| FEIS | Final Environmental Impact Statement |
| FMEA | Failure Mode & Effect Analysis |
| FTE | Full-time equivalent |
| F/T | Freeze/Thaw |

| | |
|---|---|
| GHG | Greenhouse gas |
| GHGRP | Greenhouse Gas Reduction Plan |
| GN | Government of Nunavut |
| HCMP | Habitat Compensation Monitoring Plan |
| HHRA | Human Health Risk Assessment |
| HHS | Hunter Harvest Study |
| HPGR | High Pressure Grinding Rolls |
| HQ | Hazard quotient |
| HR | Human Resources |
| HTO | Hunter Trapping Organization |
| ICMC | International Cyanide Management Code |
| ICRP | Interim Closure and Reclamation Plan |
| ICS | Incident command system |
| IIBA | Inuit Impact and Benefit Agreement |
| INUG | Innuguguayalik Lake |
| IOL | Inuit owned land |
| IPC | Instantaneous pressure change |
| IPD | In-pit tailings deposition |
| IQ | Inuit Qaujimajatuqangit |
| ISV | Inuit Societal Values |
| IWBS | Inuit work barrier study |
| KIA / KivIA | Kivalliq Inuit Association |
| KLMA | Kivalliq Labour Market Analysis |
| KPI | Key Performance Indicator |
| KvSEMC | Kivalliq Socio-economic monitoring committee |
| LDL | Lower Detection Limit |
| LDMP | Landfarm Design and Management Plan |
| LMA | Labour market analysis |
| LSA | Local Study Area |
| LMS | Learning Management System |
| LOAELs | Lowest-observed adverse effect levels |
| LOM | Life of Mine |
| MAM | Mammoth Lake |
| Masl. | Meters above sea level |
| MBK | Meadowbank |
| MDL | Method Detection Limit |
| MDRB | Meadowbank Dike Review Board |
| MFRAG | Meadowbank Fisheries Research Advisory Group |
| ML | Metal Leaching |
| MMP | Mercury monitoring plan |
| MOU | Memorandum of Understanding |
| MPA | Maximum Potential Acidity |
| MDMER | Metal and Diamond Mining Effluent Regulations |
| NC | North Cell |
| NCA-D | North Cell Sumps A-D |
| NCIS | North Cell Internal Structure |
| NEM | Nemo Lake |

| | |
|---|---|
| NIRB | Nunavut Impact Review Board |
| NF | Near-Field |
| NML | Non metal leaching |
| NNLP | No Net Loss Plan |
| NP | Neutralization Potential |
| NPAG | Non-Potentially Acid Generating |
| NPC | Nunavut Planning Commission |
| NPR | Net Potential Ratio |
| NRCan | Natural Resources Canada |
| NSERC-UQAT | National Science and Engineering Research Council – University of Quebec in Abitibi-Temiscamingue |
| NWB | Nunavut Water Board |
| OHF | Oil Handling Facility |
| OMS | Operation, Maintenance and Surveillance |
| PAG | Potentially Acid Generating |
| PAHs | Polycyclic Aromatic Hydrocarbons |
| PEAMP | Post-Environmental Assessment Monitoring Program |
| PDL | Pipe Dream Lake |
| PHC | Petroleum Hydrocarbon |
| PMF | Probable maximum flood |
| PPE | Protective personnel equipment |
| PPL | Peak Pressure Level |
| PRISM | Program for Regional and International Shorebird Monitoring |
| PWRSF | Portage Waste Rock Storage Facility |
| PPV | Peak particle velocity |
| QAQC | Quality Assurance Quality Control |
| RCMP | Royal Canadian Mounted Police |
| RDP | Relative Percent Difference |
| RIME | Research Institute in Mine and Environment |
| RSA | Regional Study Area |
| S | Total Sulphur |
| SAO | Senior Administrative Officers |
| SC | South Cell |
| SD | Saddle Dam |
| SEMP | Socio-Economic Monitoring Program |
| SMP | Stormwater Management Pond |
| SEMR | Socio-economic monitoring report |
| SEMWG | Socio-economic monitoring working group |
| SNC | SNC-Lavalin |
| SPL, SP | Second Portage Lake |
| SPLE | Second Portage Lake Exposure |
| Sta. | Station |
| STD | Sexually Transmitted Diseases |
| STP | Sewage Treatment Plan |
| SWD | Stormwater dike |
| SWTC | South Whale Tail Channel |
| TAG | Terrestrial Advisory Group |

| | |
|---|---|
| TAP | Technical Advisory Panel |
| TARP | Trigger Action Response Plan |
| TCMSS | Transport Canada Marine Safety and Security |
| TDS | Total Dissolved Solids |
| TEMP | Terrestrial Ecosystem Management Plan |
| TK | Traditional Knowledge |
| TKN | Total Kjeldahl Nitrogen |
| TMS | Training Management System |
| TOC | Total Organic Carbon |
| TPL, TPN, TPE | Third Portage Lake |
| TRVs | Toxicity reference values |
| TS | Total Sulphur |
| TSM | Towards Sustainable Mining |
| TSF | Tailings Storage Facility |
| TSS | Total Suspended Solids |
| VECs | Valued Ecosystem Components |
| VWRSF | Vault Waste Rock Storage Facility |
| VSEC | Valued Socio-Economic Component |
| WAL | Wally Lake |
| WBS | W |
| WEP | Waste Extension Pool |
| WLE | Wally Lake Exposure |
| WRSF | Waste rock storage facility |
| WSLRA | Wildlife Screening Level Risk Assessment |
| WT | Whale Tail |
| WTD | Whale Tail Dike |
| WTHR | Whale Tail haul road |
| WTN | Whale Tail North |
| WTP | Water Treatment Plan |
| WTS | Whale Tail South |
| W/D | Wet/Dry |

# DOCUMENT CONTROL

| Version | Date (YMD) | Section | Page | Comment |
|---|---|---|---|---|
| 1 | 2023/03/31 | All | All | This has been reviewed by Environmental Staff and will be incorporated into training for all mine staff on behalf of the Mine Manager and Senior Management |

Prepared By: Meadowbank Environment Department

Approved By: 

*Eric Haley*
*Environmental and Critical Infrastructures Superintendent*

## SECTION 1. INTRODUCTION

The 100% owned Meadowbank Complex is located approximately 110 kilometres by road north of Baker Lake in the Kivalliq District of Nunavut, Canada. The complex consists of the Meadowbank mine and mill, and the Whale Tail mine, which is located 50 kilometres northwest of the Meadowbank mine.

Meadowbank Project, was first licensed by the NWB in 2008. The project involved the construction, operation, maintenance, reclamation, closure and monitoring of an open pit gold mine and milling facility at the Meadowbank mine site, and the processing plant achieved commercial production in March 2010. The original Water License was subsequently renewed by the Board in August 2015 and was amended in July 2018 to reflect changes to the Project associated with additional tailings deposition and ore processing at the Meadowbank mine site from Agnico Eagle's new mining undertaking at the Whale Tail mine site. On March 2019, the Water License was amended for the third time to allow for tailings disposal in the mined-out Goose and Portage pits. On May 2020, the fourth amendment was granted to allow the activities for the Whale Tail Mine Expansion, i.e. the term of the Water License was extended by 4 years, now expiring in March 2030. The Meadowbank Mine is governed by current Water License 2AM-MEA1530.

At present, the project components included in the scope of the Water License consist of the Meadowbank mine site and the Vault mine site, a Marshalling Facility in Baker Lake, and a 110 kilometre All-Weather Access Road between Baker Lake and the Meadowbank mine site. There are also water retention dikes constructed from mined waste rock to allow for the mining of ore beneath shallow dewatered lakes and a tailings storage facility (Second Portage Lake's northwest dewatered arm), where tailings have been deposited sub-aerially as slurry and water from the ponds reclaimed during operation. No mining at Meadowbank occurred in 2022 since the mineral reserves were exhausted in 2019. Whale Tail ore continued to be processed at Meadowbank mill in 2022. As approved by the Water License, in-pit tailings disposal began in Goose Pit on July 5$^{th}$, 2019 and in Portage Pit E on August 20$^{th}$, 2020.

The Meadowbank mine is also governed by the NIRB Project Certificate No. 004 first issued in December 2006. The Project Certificate was then amendment in November 2009 to reflect modification associated with the all-weather access road and Proponent Project name change, and in August 2016 to allow expansion of Vault Pit operations into Phaser Lake and to allow for the development of two additional pits, Phaser Pit and BB Phaser Pit. A final third amendment was approved in December 2018 to reflect modification of in-pit tailings disposal.

In 2016, Agnico Eagle proposed to develop the Whale Tail Project to continue mine operations and milling at the Meadowbank Mine and extend the Meadowbank Mine to include development of resources from Whale Tail. The Whale Tail mining operation uses the existing infrastructure at the Meadowbank mine (mining equipment, mill, tailings, camp and airstrip). Additional infrastructure has been built at the Whale Tail site (truck shop/warehouse, fuel storage and an additional camp facility). The deposit was mined as an open pit in 2019 and the commercial production was achieved on September 30$^{th}$, 2019. Whale Tail ore is transported using long haul off-road type trucks to the mill at the Meadowbank site for processing.

In 2018, Agnico Eagle proposed to increase gold production from the original Whale Tail Project by expanding mining activities at the Whale Tail mine site as proposed in the Expansion Proposal. The Expansion Proposal proposes further developing the Whale Tail Pit open mine in addition to the development of the IVR open pit and Underground operations. The Whale Tail expansion started in October 2018 with the application to NPC. The permitting process to amend the Whale Tail Project Certificate and Type A Water License to include the Whale Tail expansion was completed in early 2020. In a decision issued on October 18th, the NIRB concluded that if conducted in accordance with the NIRB's recommendations, this proposed amendment to the Whale Tail mine could proceed to the Type A Water License amendment phase with the NWB. The Minister of Northern Affairs approved the amended Project Certificate Report from the NIRB on January 20th, 2020, completing the NIRB process. The Project Certificate 008 amendment No. 1 was received on February 19th, 2020. The NWB Water License amendment process was completed on May 12th, 2020 and the Water License Amendment 2AM-WTP1830 was issued.

All ore at the Meadowbank Complex is now sourced from the Whale Tail mine. Mining at Whale Tail is by open pit and underground methods. The ore is extracted conventionally using drilling and blasting, then hauled by a long haul off-road truck fleet to the mill at the Meadowbank facilities for processing. Commercial production was achieved on September 30th, 2019 at the Whale Tail pit. The IVR pit began pre-stripping activities in the third quarter of 2020 and achieved commercial production on December 31st, 2020. Commercial production from the underground activities was achieved on August 1st, 2022.

These various components and activities associated with the project require a number of different authorizations, leases and permits from regulatory agencies including the Nunavut Water Board (NWB), Environment and Climate Changes Canada (ECCC) Metal and Diamond Mining Effluent Regulations (MDMER); Fisheries and Oceans Canada (DFO), Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC); the Kivalliq Inuit Association (KivIA) and the Nunavut Impact Review Board (NIRB).

This report is written to address all of the 2022 annual reporting requirements of the project under these authorizations:

Meadowbank

- NWB Type A Water License 2AM-MEA1530;
- NIRB Project Certificate No. 004;
- DFO HADD Authorization NU-03-190 AWAR;
- DFO HADD Authorization NU-03-191.3 and NU-03-191.4 Mine Site;
- DFO Authorization NU-14-1046 Phaser Lake;
- CIRNAC Land Leases 66A/8-71-3 (AWAR) and 66A/8-72-6 (AWAR Quarries);
- KivIA Production Lease KVPL08D280;
- KivIA Quarry Lease KVCA06Q11; and
- KivIA Right of Way KVRW06F04.

Whale Tail

- NWB Type A Water License 2AM-WTP1830;
- NIRB Project Certificate N0. 008;
- DFO HADD Authorization 16HCAA-00370;
- DFO HADD Authorization 20HCAA-00275;
- CIRNAC Land Leases 66H/8-02-1 (Whale Tail Haul Road) and 66H/8-01-4 (Whale Tail Haul Road Quarries);
- KivIA Production Lease KVPL17D01;
- KivIA Quarry Lease KVCA15Q01, KVCA15Q02, KVCA18Q01; and
- KivIA Right of Way KVRW15F01.

Reporting requirements for the MDMER have been submitted directly to Environment and Climate Changes Canada; results are presented herein to comply with the NWB Type A Water License.

Table 1-1 outlines each requirement by authorization and report section. Table 1-2 presents the status of each sampling stations stipulated in Part I, Schedule I of Water License 2AM-MEA15230 and 2AM-WTP1830. Appendix 1 provides a list of commitments completed by Agnico Eagle, following review by regulators of the 2021 Annual Report, to be incorporated in the 2022 Annual Report.

**Table 1-1 Meadowbank and Whale Tail List of Reporting Requirements**

| MEADOWBANK MINE | | |
|---|---|---|
| **Authorization Reference** | **Reporting Requirement** | **Report Section** |
| NIRB Project Certificate No.004 Condition 4 | Take prompt and appropriate action to remedy any noncompliance with environmental laws and regulations and/or regulatory instruments, and shall report any non compliance as required by law immediately and report the same to NIRB annually. | 11.6.1 |
| NIRB Project Certificate No.004 Condition 8 | Continue to undertake semi-annual groundwater samples and re-evaluate the groundwater quality after each sample collection; report the results of each re-evaluation to NIRB's Monitoring Officer, INAC and EC | 8.7.1 |
| NIRB Project Certificate No.004 Condition 15 | Within two (2) years of commencing operations re-evaluate the characterization of mine waste materials, including the Vault area, for acid generating potential, metal leaching and non-metal constituents to confirm FEIS predictions, and re-evaluate rock disposal practices by conducting systematic sampling of the waste rock and tailings in order to incorporate preventive and control measures into the Waste Management Plan to enhance tailing management during operations and closure; results of the re-evaluations shall be provided to the NWB and NIRB's Monitoring Officer | 5.1.1 |
| NIRB Project Certificate No.004, Condition 18 | Commit to a pro-active tailings management strategy through active monitoring, inspection, and mitigation. The tailings management strategy will include the review and evaluation of any future changes to the rate of global warming, compliance with regulatory changes, and the ongoing review and evaluation of relevant technology developments, and will respond to studies conducted during the mine operation | 5.3.1 |
| NIRB Project Certificate No.004, Condition 19 | Provide for a minimum of two (2) metres cover of tailings at closure, and shall install thermistor cables, temperature loggers, and core sampling technology as required to monitor tailing freezeback efficiency. Report to NIRB's Monitoring Officer for the annual reporting of freezeback effectiveness. | 5.4.1 |
| NIRB Project Certificate No.004, Condition 20 | Prior to construction, Cumberland shall identify mitigation measures that can be taken if groundwater monitoring around the tailings facility demonstrates that contamination from tailings has occurred through the fault. Upon drawdown of the North arm of Second Portage Lake, Cumberland shall conduct further tests to assess the permeability of any faults and provide the results to regulators. If doubt remains Cumberland shall seal the fault and conduct further permeability testing and monitoring. Following completion of the permitting process for the In-Pit Tailings Modification Proposal, the Proponent shall provide an update to the NIRB on any fault identified related to either Portage Pit A, Portage Pit E, and Goose Pit, any plans to address groundwater movement considering any fault, and how potential monitoring of tailings and groundwater movement would be undertaken to inform management plans. | 5.3.2 |
| NIRB Project Certificate No.004 Condition 21 | Shall fund and install a weather station at the mine site to collect atmospheric data, including air temperature and precipitation. | 8.21.1 |
| NIRB Project Certificate No.004 Condition 23 | Ensure that water quality monitoring performed at locations within receiving waters that allow for an assimilative capacity assessment of concern to regulators, be carried out by an independent contractor and submitted to an independent accredited lab for analysis, on a type and frequency basis as determined by the NWB; results of analysis shall be provided to the NWB and NIRB's Monitoring Officer | 8.5.7 |
| NIRB Project Certificate No.004, Condition 28 | Cumberland shall become a signatory to the International Cyanide Management Code, communicate this to shippers, and do so prior to Cumberland storing or handling cyanide for the Project. | 11.4 |
| NIRB Project | Report to NIRB if and when [Cumberland] develops plans for an expansion of the | 11.2 |

| MEADOWBANK MINE | | |
|---|---|---|
| **Authorization** | **Reporting Requirement** | **Report** |
| Certificate No.004 Condition 29 | Meadowbank Gold Mine, and in particular if those plans affect the selection of Second Portage Lake as the preferred alternative for tailings management | |
| NIRB Project Certificate No.004 Condition 32e | Prior to opening of the road, and annually thereafter, advertise and hold at least one community meeting in the Hamlet of Baker Lake to explain to the community that the road is a private road with non-mine use of the road limited to approved, safe and controlled use by all-terrain-vehicles for the purpose of carrying out traditional Inuit activities. | 11.7.2.1 |
| NIRB Project Certificate No.004 Condition 32f | Place notices at least quarterly on the radio and television to explain to the community that the road is a private road with non-mine use of road limited to authorized, safe and controlled use by all-terrain-vehicles for the purpose of carrying out traditional Inuit activities. | 11.7.2.1 |
| NIRB Project Certificate No.004 Condition 32g | Record all authorized non-mine use of the road, and require all mine personnel using the road to monitor and report unauthorized non-mine use of the road, and collect and report this data to NIRB one (1) year after the road is opened and annually thereafter. | 11.7.1.1 |
| NIRB Project Certificate No.004 Condition 32h | Report all accidents or other safety incidents on the road, to the GN, KivIA [KIA], and the Hamlet immediately, and to NIRB annually. | 11.7.2.1 |
| NIRB Project Certificate No.004 Condition 33 | Cumberland shall update the Access and Air Traffic Management Plan to:1. include an All-weather Private Access Road Management Plan, including aright-of-way policy developed in consultation with the KivIA, GN, INAC and theHamlet of Baker Lake, for the safe operation of the all-weather private accessroad; and to facilitate monitoring of the environmental and socio-economic impacts of theprivate road and undertake adaptive management practices as required,including responding to any concerns regarding the locked gates. | 11.7.1.1 |
| NIRB Project Certificate No.004 Condition 36 | Shall ensure the placement of local area marine mammal monitors onboard all vessels transporting fuel or materials for the Project through Chesterfield Inlet. | 11.8.2 |
| NIRB Project Certificate No.004 Condition 39 | Annually advertise and hold a community information meeting in Chesterfield Inlet to report on the Project and to hear from Chesterfield Inlet residents and respond to concerns; a consultation report shall be submitted to NIRB’s Monitoring Officer within one month of the meeting. | 11.9.1 |
| NIRB Project Certificate No.004 Condition 40 | Report to KIA and NIRB’s Monitoring Officer annually on the Traditional Knowledge gathered including any operational changes that resulted from concerns shared at the workshop. | 11.9.1<br>11.9.2 |
| NIRB Project Certificate No.004 Condition 41 | Subject to vessel and human safety considerations, Cumberland shall require shippers carrying cargo to the Project through Chesterfield Inlet to follow the following mitigation procedures in the event that marine mammals are in the vicinity of the shipping activities:<br>a. Wildlife will be given right of way;<br>b. Ships will maintain a straight course, constant speed, and will avoid erratic behaviour; and<br>c. When marine mammals appear to be trapped or disturbed by vessel movements, the vessel will stop until the mammals have moved away from the area. | 11.8.1 |
| NIRB Project Certificate No.004 Condition 45 | [Cumberland] shall carry, and require contracted shippers to carry adequate insurance to fully compensate losses arising from a spill or accident, including but not limited to the loss of resources arising from the spill or accident; any claims are to be reported to proper officials with a copy to NIRB’s Monitoring Officer | 11.8.5 |
| NIRB Project Certificate No.004 Condition 49 | Develop, implement and report on the fish-out programs for the dewatering of Second Portage Lake, Third Portage Lake, Vault Lake, and Phaser Lake. | 8.11.1 |
| NIRB Project Certificate No.004 Condition 51 | Engage the HTOs in the development, implementation and reporting of creel surveys within waterbodies affected by the Project to the GN, DFO and local HTO | 8.16 |
| NIRB Project Certificate No.004, Condition 52 | Cumberland shall enforce a no-fishing policy for employees while working on the job site. | 8.17 |
| NIRB Project Certificate No 004 Condition 53 | Agnico Eagle Mines Ltd. shall, in consultation with the HTOs and DFO, develop a Fish Habitat Monitoring Plan, including augmenting baseline fisheries data in the period prior to operation, with the clear objective of demonstrating the success of the No Net Loss Plan approved by the DFO. The Fish Habitat Monitoring Plan should include Phaser Lake. The updated plan should be provided to the NIRB for review at least 30 days prior to commencement of construction activities. Results from the fisheries baseline data to be provided in the annual report to the NIRB | 8.8.1 |

| MEADOWBANK MINE | | |
|---|---|---|
| **Authorization** | **Reporting Requirement** | **Report** |
| NIRB Project Certificate No.004 Condition 54 | a. Updated terrestrial ecosystem baseline data;<br>e. Details of a comprehensive hunter harvest survey to determine the effect on ungulate populations resulting from increased human access caused by the all-weather private access road, including establishing preconstruction baseline harvesting data, to be developed in consultation with local HTOs, the GN-DOE and the Nunavut Wildlife Management Board;<br>f. Details of annual aerial surveys to be conducted to assess waterfowl densities in the regional study area during the construction phase and for at least the first three (3) years of operation, with the data analyzed and compared to baseline data to determine if significant effects are occurring and require mitigation.<br>g. Details of an annual breeding bird plot surveys and transects along the all-weather road to be conducted during the construction phase and for at least the first three (3) years of operation.<br>h. Details of a monitoring program, including recording the locations and frequency of observing caribou and carnivores and any actions taken to avoid contact with or disturbance, and a specific mitigation plan for Shortearred owls and any other species of special concern pursuant to Schedule 3 of the Species at Risk Act located in the local study area or along the all-weather private access road, | 8.18.1.2 |
| NIRB Project Certificate No.004 Condition 55 | Annual Wildlife Summary Monitoring Report | 8.18.1.1 |
| NIRB Project Certificate No.004 Condition 56 | Maps of caribou migration corridors shall be developed in consultation with Elders and local HTOs, including Chesterfield Inlet and placed in site offices and upgraded as new information on corridors becomes available. Information on caribou migration corridors shall be reported to the GN, KIA and NIRB's Monitoring Officer annually. | 8.18.1.3 |
| NIRB Project Certificate No.004 Condition 57 | Participate in a caribou collaring program as directed by the GN-DOE. | 8.18.1.4 |
| NIRB Project Certificate No.004 Condition 58 | In consultation with Elders and the HTOs and subject to safety requirements, design the lighting and use of lights at the mine site to minimize the disturbance of lights on sensitive wildlife and birds | 11.9.2 |
| NIRB Project Certificate No.004 Condition 59 | In consultation with Elders and the HTOs, design and implement means of deterring caribou from the tailing ponds, such as temporary ribbon placement or Inukshuks, with such designs not to include the use of fencing | 11.9.2 |
| NIRB Project Certificate No.004 Condition 60 | Whenever practical, Cumberland shall implement a stop work policy when wildlife in the area may be endangered by the work being carried out. | 8.18.1.9 |
| NIRB Project Certificate No.004 Condition 62 | Develop and implement a noise abatement plan to protect wildlife from significant mine activity noise, including blasting, drilling, equipment, vehicles and aircraft; sound meters are to be set up immediately upon issuance of the Project Certificate for the purpose of obtaining baseline data, and monitoring during and after operations | 8.13.1 |
| NIRB Project Certificate No.004 Condition 63 | GN and INAC shall form a Meadowbank Gold Mine Socio-Economic Monitoring Committee ("Meadowbank SEMC") to monitor the socio-economic impacts of the Project and the effectiveness of the Project's mitigation strategies; the monitoring shall supplement, not duplicate, the monitoring required pursuant to the IIBA negotiated for the Project, and on the request of Government or NPC, could assist in the coordination of data collection and tracking data trends in a comparable form to facilitate the analysis of cumulative effects; the terms of reference shall focus on the Project, include a plan for ongoing consultation with KivIA and affected local governments and a funding formula jointly submitted by GN, INAC and [Cumberland]; the terms of reference shall be submitted to NIRB for review and subsequent direction within six (6) months of the issuance of a Project Certificate; [Cumberland] is entitled to be included in the Meadowbank SEMC | 11.10.1 |
| NIRB Project Certificate No.004 Condition 64 | [Cumberland] shall work with the GN and INAC to develop the terms of reference for a socio-economic monitoring program for the Meadowbank Project, including the carrying out of monitoring and research activities in a manner which will provide project specific data which will be useful in cumulative effects monitoring (upon request of Government or NPC) and consulting and cooperating with agencies undertaking such programs; [Cumberland] | 11.10.1 |

| MEADOWBANK MINE | | |
|---|---|---|
| **Authorization** | **Reporting Requirement** | **Report** |
| | shall submit draft terms of reference for the socio-economic monitoring program to the Meadowbank SEMC for review and comment within six (6) months of the issuance of a Project Certificate, with a copy to NIRB's Monitoring Officer | |
| NIRB Project Certificate No.004 Condition 65 | Cumberland shall include in its socio-economic monitoring program for the Meadowbank Project the collection and reporting of data of community of origin of hired Nunavummiut | 11.10.3 |
| NIRB Project Certificate No.004 Condition 67 | Develop and implement a program to monitor contaminant levels in country foods in consultation with HC; a copy of the plan shall be submitted to NIRB's Monitoring Officer | 8.19 |
| NIRB Project Certificate No.004, Condition 68 | Cumberland shall, in consultation with Elders, local HTOs and the Meadowbank Gold Mine SEMC, demonstrate that they are working toward incorporating Inuit societal values into mine operation policies." | 11.9.2 |
| NIRB Project Certificate No.004 Condition 69 | Carry out the Project to minimize the impacts on archeological sites, including conducting proper archeological surveys of the Project area (including the all-weather road and all quarry sites); [Cumberland] shall provide to the GN an updated baseline report for archeological sites in the Project area" | 8.20.1 |
| NIRB Project Certificate No.004 Condition 70 | Shall report any archeological site discovered during the course of construction, including a burial site, immediately and concurrently to the GN and KivIA. Upon discovering an archeological site, Cumberland shall take all reasonable precautions necessary to protect the site until further direction is received from the GN. In the event that it becomes necessary to disturb an archaeological site, Cumberland shall consult with Elders, GN and KivIA to establish a site specific mitigation plan, and obtain all necessary authorizations and comply with all applicable laws. | 8.20.1 |
| NIRB Project Certificate No.004 Condition 71 | In consultation with EC, install and fund an atmospheric monitoring station to focus on particulates of concern generated at the mine site. The results of air-quality monitoring are to be reported annually to NIRB. | 8.14.1 |
| NIRB Project Certificate No.004 Condition 72 | Conduct annual stack testing to demonstrate that the on-site incinerators are operating in compliance with these standards. The results of stack testing shall be contained in an annual monitoring report submitted to GN, EC and NIRB's Monitoring Officer. | 6.2.1 |
| NIRB Project Certificate No.004 Condition 73 | Cumberland shall undertake to conserve the Project's use of energy, monitor the Project's greenhouse gas emissions, and continuously review and, if possible, consider for adoption new technologies to ensure greenhouse gases meet the latest Canadian standards or criteria. | 8.15.1 |
| NIRB Project Certificate No.004 Condition 74 | Shall employ environmentally protective method to suppress any surface road dust. | 8.14.1 |
| NIRB Project Certificate No.004 Condition 75 | Provide a complete list of possible accidents and malfunctions for the Project; it must consider the all-weather road, shipping spills, cyanide and other hazardous material spills, and pitwall/dikes /dam failure, and include an assessment of the accident risk and mitigation developed in consultation with Elders and potentially affected communities | 7.3 |
| NIRB Project Certificate No.004 Condition 80 | File annually with NIRB's Monitoring Officer an updated report on progressive reclamation and the amount of security posted, as required by KivIA, INAC, and/or the NWB. | 9.2.1.1 |
| NIRB Project Certificate No.004 Condition 82 | Monitor the ingress/egress of ship cargo at Baker Lake and report any accidents or spills immediately to the regulatory agencies as required by law and to NIRB's Monitoring Officer annually. | 11.8.4 |
| NIRB Project Certificate No.004 Condition 85 | Develop a detailed blasting program to minimize the effects of blasting on fish and fish habitat, water quality, and wildlife and terrestrial VECs | 8.6.1 |
| NIRB Project Certificate No.004 Condition 87 | The Proponent shall, prior to the deposition of tailings into the Portage or Goose Pits, file with the Nunavut Water Board (NWB) a report containing updated hydrogeological modelling addressing information gaps as per the NIRB recommendation in the Reconsideration Report and Recommendations to the satisfaction of the NWB. The Proponent shall not deposit tailings into the Portage or Goose pits until the Water Board is satisfied that the modelling addresses the specific information gaps, and that the proponent can manage any identified risks with existing designs and feasible management strategies.<br><br>The Proponent shall file a report with the Nunavut Water Board, containing updated | 5.3.2 |

| MEADOWBANK MINE | | |
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| **Authorization** | **Reporting Requirement** | **Report** |
| | hydrogeological modelling addressing information gaps, prior to the deposition of tailings into the Portage or Goose pits. Confirmation of the report's filing, conclusions of this report, and any further updates to reporting requirements as determined under the water license, shall be provided to the NIRB in Agnico Eagle's Annual Report for the project. | |
| NIRB Project Certificate No.004, Commitment 18 | Observe, collect and maintain information on road-use to facilitate monitoring of the non-project uses of the road | 11.10.3 |
| NIRB Project Certificate No.004, Commitment 21 | Track the community of origin of hired Nunavimmiut to direct monitoring and follow up activities | 11.10.3 |
| NIRB Project Certificate No.004 Commitment 74 | Provide annual report of the quantity and type of waste generated at the mine site distinguishing landfilled, recycled and incinerated streams. | 6.1.1 |
| NIRB Project Certificate No.004, Commitment 95 | Inuit observation and encounter reports for on-board vessels transporting goods and fuel through Chesterfield Inlet. | 11.8.2 |
| NIRB Project Certificate No.004, Commitment 104 | Cumberland agrees with GN that labor force adjustments, any pressures on physical and social infrastructure (including by emergency response planning), socio-economic impacts of public use of the access road, and community physical and mental health are issues that should be included in socio-economic monitoring | 11.10.3 |
| NIRB Project Certificate No.004, Commitment 108 | Information made available by or to Cumberland under the terms of the IIBA in the areas of support to businesses in accessing project opportunities will be forwarded to the GN | 11.10.3 |
| NWB 2AM-MEA1530 Schedule B-1 | Construction Details for dikes and dams. | 3.1.1.1 |
| NWB 2AM-MEA1530 Schedule B-2 | Monthly and annual volume of fresh Water obtained from Third Portage Lake. | 4.1.1.1 |
| NWB 2AM-MEA1530 Schedule B-3 | Monthly and annual volume of fresh Water obtained from Wally Lake. | 4.1.1.2 |
| NWB 2AM-MEA1530 Schedule B-4 | Results of lake level monitoring conducted under the protocol developed as per Part D Item 5. | 4.2.1 |
| NWB 2AM-MEA1530 Schedule B-5 | Summary of reporting results for the Water Balance Water Quality model and any calibrations as required in Part E Items 7-9. | 4.4.2.1 |
| NWB 2AM-MEA1530 Schedule B-6 | The bathymetric survey(s) conducted prior to each year of shipping at the Baker Lake Marshalling Facility. | 4.3 |
| NWB 2AM-MEA1530 Schedule B-7 | Geochemical monitoring results. | 5.1.1 |
| NWB 2AM-MEA1530 Schedule B-8 | Volumes of waste rock used in construction and placed in the Rock Storage Facilities. | 5.2.1 |
| NWB 2AM-MEA1530 Schedule B-9 | An update on the remaining capacity of the Tailings Storage Facility. | 5.3.1 |
| NWB 2AM-MEA1530 Schedule B-10 | Summary of quantities and analysis of seepage and runoff monitoring from the Landfills, Waste Rock Storage facility and Central Dike. | 8.5.8.1 |
| NWB 2AM-MEA1530 Schedule B-11 | A summary report of all general waste disposal activities including monthly and annual quantities in cubic metres of waste generated and location of disposal. | 6.1.1 |
| NWB 2AM-MEA1530 Schedule B-12 | Report of Incinerator test results including the materials burned and the efficiency of the Incinerator as they relate to water and the deposit of waste into water. | 6.2.1 |
| NWB 2AM-MEA1530 Schedule B-13 | A list and description of all unauthorized discharges including volumes, spill report line identification number and summaries of follow-up action taken. | 7.1.1 |
| NWB 2AM-MEA1530 Schedule B-14 | A summary of modifications and/or major maintenance work carried out on all water and waste related structures and facilities. | 11.1.1 |
| NWB 2AM-MEA1530 Schedule B-15 | The results and interpretation of the Monitoring Program in accordance with Part I and Schedule I. | 8.5 |
| NWB 2AM-MEA1530 Schedule B-16 | The results of monitoring under the AEMP including Core Receiving Monitoring Program (CREMP), Metal Mining Effluent Regulation (MMER) Monitoring, Mine Site Water Quality and Flow Monitoring (and evaluation of NP-2), visual AWAR water quality monitoring, Blast Monitoring and Groundwater Monitoring. | SECTION 8 |
| NWB 2AM-MEA1530 | A summary of any progressive closure and reclamation work undertaken including | 9.1.1.1 |

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| **Authorization** | **Reporting Requirement** | **Report** |
| Schedule B-17 | photographic records of site conditions before and after completion of operations, and an outline of any work anticipated for the next year, including any changes to implementation and scheduling. | |
| NWB 2AM-MEA1530 Schedule B-18 | A summary of on-going field trials to determine effective capping thickness for the Tailings Storage Facility and Waste Rock Storage Facilities for the purpose of long term environmental protection. | 5.4.1 |
| NWB 2AM-MEA1530 Schedule B-19 | An updated estimate of the current restoration liability based on project development monitoring, results of restoration research and any changes or modifications to the Appurtenant Undertaking. | 9.2.1.1 |
| NWB 2AM-MEA1530 Schedule B-20 | A summary of any studies requested by the Board that relate to Water use, Waste disposal or Reclamation, and a brief description of any future studies planned. | 10.1.1 |
| NWB 2AM-MEA1530 Schedule B-21 | Where applicable, revisions as Addendums, with an indication of where changes have been made, for Plans, Reports, and Manuals. | 10.2.1 |
| NWB 2AM-MEA1530 Schedule B-22 | An executive summary in English, Inuktitut and French of all plans, reports, or studies conducted under this License. | 10.3.1 |
| NWB 2AM-MEA1530 Schedule B-23 | A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector. | 11.5.1 |
| NWB 2AM-MEA1530 Schedule B-24 | A summary of public consultation and participation with local organizations and the residents of the nearby communities, including a schedule of upcoming community events and information sessions. | 11.9 |
| NWB 2AM-MEA1530 Schedule B-25 | Any other details on Water use or Waste Disposal requested by the Board by November 1st of the year being reported. | 4.6.1/6.3.1 |
| NWB 2AM-MEA1530 Part B, Item 16 | The Licensee shall review the Plans or Manuals referred to in this License as required by changes in operation and/or technology and modify the Plans or Manuals accordingly. Revisions to the Plans or Manuals are to be submitted in the form of an Addendum to be included with the Annual Report required by Part B, Item 2, complete with a revisions list detailing where significant content changes are made. | 10.2.1 |
| NWB 2AM-MEA1530 Part E, Item 8 | The Licensee shall submit a Water Quality Model for pit re-flooding as part of the Water Management Plan which shall be re-calibrated as necessary and updated at a minimum of once every two (2) years following commencement of Operations. The results and implications of the predictive model shall be reported to the Board. | 4.4.2.1 |
| NWB 2AM-MEA1530 Part E Item 9 | The Licensee shall, on an annual basis during Operations, compare the predicted water quantity and quality within the pits, to the measured water quantity and quality. Should the difference between the predicted and measured values be 20% or greater, then the cause(s) of the difference(s) shall be identified and the implications of the difference shall be assessed and reported to the Board | 4.4.3.1 |
| NWB 2AM-MEA1530 Part E, Item 10 | The Licensee shall carry out weekly inspections of all water management structures during periods of flow and the records be kept for review upon request of an Inspector. More frequent inspections may be required at the request of an Inspector. This information is to be included in the annual Water Management Plan. | 4.4.1.1 |
| NWB 2AM-MEA1530 Part I, Item 11 | The Licensee shall submit to the Board as part of the Annual Report, the Geotechnical Engineer's Inspection Report. The Report shall include a cover letter from the Licensee outlining an implementation plan to address the recommendations of the Geotechnical Engineer. | 3.3.1 |
| NWB 2AM-MEA1530 Part I Item 12 | The Licensee shall submit to the Board as part of the Annual Report required under Part B Item 2, all reports and performance evaluations prepared by the Independent Geotechnical Expert Review Panel. | 3.2.1 |
| NWB 2AM-MEA1530 Part I Item 14 | The Licensee shall submit the results and interpretation of the Seepage Monitoring program required in Part I, Item 13 in the Annual Report required under Part B, Item 2. | 8.5.8.1 |
| NWB 2AM-MEA1530 Part I, Item 17 | The Licensee shall annually review the approved QA/QC Plan and modify the Plan as necessary. Proposed changes shall be submitted to an Accredited Laboratory for approval. | 8.5.7 |
| DFO Authorizations NU-03-0191.3 Condition 3.1, NU-03-0191.4 Condition 3.1; NU-03-0190 Condition 5, NU-14-1046 Condition 3 | Submit written report summarizing monitoring results and photographic record of works and undertakings. | 8.5 |

| MEADOWBANK MINE | | |
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| **Authorization** | **Reporting Requirement** | **Report** |
| DFO Authorization NU-03-0191.3 Condition 3.1 | The Proponent shall undertake monitoring and report to DFO annually, by March 31st, whether works, undertakings, activities or operations for the mitigation of potential impacts to fish and fish habitat were conducted according to the conditions of this Authorization. | 8.5.1.1 |
| DFO Authorization NU-03-0191.4 Condition 3.1 | The Proponent shall undertake monitoring and report to DFO annually, by December 31st, whether works, undertakings, activities or operations for the mitigation of potential impacts to fish and fish habitat were conducted according to the conditions of this Authorization. | 8.5.1.1 |
| DFO Authorization 14-HCAA-01046 Condition 3.1 | The Proponent shall monitor the implementation of avoidance and mitigation measures referred to in section 2 of this authorization and report to DFO, by March 31 annually and indicate whether the measures and standards to avoid and mitigate serious harm to fish were conducted according to the conditions of this authorization. | 8.5.1.1 |
| DFO Authorizations NU-03-0190 Condition 5.3 | A photographic record of before, during and after construction, during decommissioning and after restoration, showing that all works and undertakings have been completed according to the approved Plan and conditions of this authorization […] | 8.5.6.1 |
| DFO NU-03-0190 AWPAR Condition 5.2.4 | Creel survey results. | 8.16 |
| DFO Authorizations NU-03-0191.3 Condition 3 and 6 (Second and Third Portage Lakes), NU-03-0191.4 (Vault Lake) Condition 3 and 6; NU-03-0190 Condition 5 (AWPAR), NU-14-1046 (Phaser Lake) Condition 3 and 5 | Submit written report summarizing monitoring results and photographic record of works and undertakings. | 8.8.1 |
| | | |
| CIRNAC Land Lease 66A/8-71-3 Condition 23 | The Lessee shall submit to the Minister no later than November 1st, 2025, and every three (3) years thereafter, an updated Closure and Reclamation Plan and cost estimates thereof. | 9.2.1.2 |
| CIRNAC Land Lease 66A/8-71-3 Condition 35 | The Lessee shall file annually a progress report for the preceding year outlining the ongoing reclamation completed in conformance with the approved Closure and Reclamation Plan. | 9.1.1.2 |
| CIRNAC Land Lease 66A/8-72-6 Condition 8 | The lessee shall file a report, annually ...<br>i. Quantity of material removed and location of removal, for the immediately preceding calendar year<br>ii. Such other data as are reasonably required by the Minister from time to time. | 3.4.1.1 |
| CIRNAC Land Lease 66A/8-72-6 Condition 25 | The lessee shall file, annually, a report for the preceding year, outlining the ongoing borrow area operations completed in conformity with the approved Borrow Management Plan, as well as any variations from the Plan. | 3.4.1.1 |
| CIRNAC Quarry Lease 66A/8-72-6 Condition 33 | The lessee shall file annually a report for the preceding year, outlining ongoing restoration completed in conformity with C&R Plan, as well as any variations from the said Plan. | 9.1.1.3 |
| CIRNAC Land Lease 66A/8-72-6 Condition 37 | The lessee shall submit to the Minister every 2 years after the commencement date of this lease, a report describing cumulative variations from the C&R Plan with updated cost estimates. | 9.2.1.2 |
| | | |
| KIA ROW KVRW06F04 Condition 14 | Agnico Eagle shall submit to KIA on March 31, 2009, and no later than March 31st of every second year thereafter, a report describing any variations from the Closure and Reclamation Plan and updated cost estimates. | 9.2.1.2 |
| KIA ROW KVRW06F04 Condition 28 | Agnico Eagle shall file annually, no later than March 31st of each year, a progress report for the preceding year, outlining any ongoing restoration completed, in conformity with the Closure and Reclamation Plan. | 9.1.1.2 |
| KIA KVPL08D280 Condition 6.01 (9) | Plan detailing the activities taken in the last year and to be undertaken in the next year and planned for the balance of the Term, that includes, but is not limited to the proposed methods and procedures for progressive reclamation. | 9.1.1.1 |

| WHALE TAIL MINE | | |
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| **Authorization Reference** | **Reporting Requirement** | **Report Section** |
| NIRB Project Certificate No.008 Condition 1 | The Proponent shall:<br>a) Develop and implement an Air Quality Monitoring and Management Plan that includes clear objectives and that specifies air quality monitoring thresholds that will trigger adaptive management responses and actions;<br>b) In the implementation of the Plan, the Proponent shall demonstrate through active and passive monitoring of dustfall, for criteria air contaminant concentrations, incinerator stack testing, and vegetation, soil and snow chemistry sampling that dustfall and emissions of carbon monoxide (CO), nitrogen dioxide ($NO_2$), ozone ($O_3$), sulphur dioxide ($SO_2$), suspended particulate matter, mercury, dioxins and furans, and other chemicals remain within predicted levels and, where applicable, within levels or limits established by all applicable guidelines and regulations;<br>c) The Proponent shall ensure continuous $NO_2$ monitoring is undertaken downwind of mining activities to allow for comparison to relevant standards including the Canadian Ambient Air Quality Standards;<br>d)If exceedances occur, the Proponent shall provide an explanation for the exceedance, a description of planned mitigation, and shall conduct additional monitoring to evaluate the effectiveness of mitigative measures; and<br>e) The Proponent shall also develop, implement, and report on the quality assurance and quality control protocols used to ensure data reliability and proper functioning of equipment. | 8.14.2 |
| NIRB Project Certificate No.008 Condition 2 | Prior to commencing construction activities the Proponent shall update the existing Dust Management and Monitoring Plan for the Meadowbank Mine site to address and/or include the following additional items:<br>Align plan requirements with commitments made in the Final Environmental Impact Statement and during the Final Hearing to monitor dust along the existing all-weather access road, the Amaruq haul road and any other roads and trails associated with the Project.<br>· Verify commitments to the utilization of dust suppressants along the all-weather access road, the Amaruq haul road and any other roads and trails associated with the Project, including a description of the type of suppressant to be utilized and the frequency and timing of applications to be made throughout the various seasons of road use.<br>· Outline the specific triggers, thresholds, and adaptive management measures that will apply if monitoring indicates that dust deposition is higher than predicted. | 8.14.2 |
| NIRB Project Certificate No.008 Condition 3 | The Proponent shall maintain a Greenhouse Gas Emissions (GHG) Reduction Plan which includes:<br>· An estimate of the Project's GHG baseline emissions;<br>· A description of monitoring measures to be undertaken, including the methods, frequency, parameters, and a description the analysis that will be carried out on the monitoring data generated; and<br>· A description of mitigative and adaptive strategies planned, and taken, to reduce project-related greenhouse gas emissions over the Project lifecycle. | 8.15.2 |
| NIRB Project Certificate No.008 Condition 5 | Result of all noise monitoring undertaken by the Proponent shall be provided to the Nunavut Impact Review Board on an annual basis. The Proponent shall:<br>a) Conduct noise monitoring at least once during each phase of the Project at four (4) locations in the vicinity of the Whale Tail Pit Project and at two (2) locations along the haul road to demonstrate that noise levels remain within predicted levels for all Project areas; and<br>b) If monitoring identifies an exceedance, the Proponent shall provide an explanation for the exceedance, a description of planned mitigation, and shall conduct additional monitoring to evaluate the effectiveness of mitigative measures. | 8.13.2 |
| NIRB Project Certificate No.008 Condition 6 | The Proponent shall provide a summary of activities undertaken to address the requirements of this term and condition in annual report(s) to the NIRB. The Proponent shall:<br>a) Conduct detailed hydrodynamic modelling during operations and closure to evaluate the mixing of the Waste Rock Storage Facility seepage into Mammoth Lake post-closure; and<br>b) Based on the results of the modelling implement monitoring programs and adaptive management strategies that minimize the need for active intervention, including long-term treatment of mine contact water. | 4.4.4 |
| NIRB Project Certificate No.008 | Prior to commencement of mining of the Whale Tail deposit, and in consultation with applicable regulatory agencies, including Natural Resources Canada, the Proponent shall as part of a | 5.2.2.2 |

| WHALE TAIL MINE | | |
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| **Authorization** | **Reporting Requirement** | **Report** |
| Condition 7 | Mine Waste Rock and Tailings Management Plan that reflects site-specific geological and geochemical conditions. The Plan should be submitted to the NIRB at least 60 days prior to the start of construction of the Waste Rock Storage Facility, with subsequent updates or revisions to the Plan submitted annually thereafter or as may otherwise be required by the NIRB for the life of the Project. | |
| | a) Develop and implement monitoring programs for the Tailings Storage Facility and the Waste Rock Storage Facility at the Whale Tail Pit; | |
| | b) Establish thresholds that will trigger the requirement for the Proponent to implement adaptive management strategies to minimize the potential for impacts from these Facilities; and | |
| | c) Identify the adaptive management strategies that will be used by the Proponent to minimize the potential for impacts from these Facilities. | |
| NIRB Project Certificate No.008, Condition 8 | The Plan should be submitted to the NIRB at least 30 days prior to the start of construction, with subsequent updates or revisions to the Plan submitted annually thereafter or as may otherwise be required by the NIRB for the life of the Project. The Proponent shall submit a detailed Acid Rock Drainage and Metal Leaching Management Plan that includes the following items: | 5.1.2 |
| | · Waste rock segregation and testing; | |
| | · Thermal monitoring of waste rock; | |
| | · Seepage management and monitoring; | |
| | · A schedule for reporting of results and periodic updating of predictions for the WRSF pond quality; | |
| | · Planning for optimal cover conditions; | |
| | · Contingency measures that may be implemented if required; | |
| | · Plans for comparing monitoring results from receiving waters to model predictions; and | |
| | · The identification of thresholds that will trigger management actions if trends analysis indicates water quality objectives may be exceeded. | |
| NIRB Project Certificate No.008 Condition 9 | The Proponent shall undertake the additional site-specific geotechnical investigations required to identify sensitive land features and to inform final engineering design prior to the construction of project components such as the waste rock storage facility and quarries. Results from these studies should be submitted to the NIRB at least 30 days prior to the start of construction of these facilities, with results or updates submitted annually thereafter as applicable. | 5.2.2.3 |
| NIRB Project Certificate No.008 Condition 10 | Results of these studies should be submitted to the NIRB at least 30 days prior to the start of construction of these facilities, with subsequent updates submitted annually thereafter. In consultation with applicable regulatory agencies such as Indigenous and Northern Affairs Canada and Natural Resources Canada, the Proponent shall undertake additional site-specific permafrost monitoring, mapping and thermal analysis to:<br>▪ Document permafrost conditions, including seasonal thaw and amount of ground ice;<br>▪ Inform the detailed design of project infrastructure such as the Whale Tail pit, water management structures, mine site and haul roads, waste rock storage facility, tailings storage facility; and<br>▪ Ensure the integrity of such infrastructure is maintained after construction | 5.4.2 |
| NIRB Project Certificate No.008 Condition 11 | The Proponent shall develop and implement an Erosion Management Plan to prevent or minimize erosion and its resulting effects from project-related land disturbance. | 8.5.3.2.17 |
| NIRB Project Certificate 008 Condition 12 | The Proponent shall provide a summary of its progressive reclamation efforts and associated feedback received from communities with respect to aesthetic values solicited by the Proponent as part of its public engagement processes in its annual reporting to the NIRB. As part of the Closure and Reclamation Plan, the Proponent shall develop and implement a program to: | 9.1.2.1 |
| | a) Progressively reclaim disturbed areas within the project footprint, with an emphasis on restoring the natural aesthetics of the area through re-contouring to the extent practicable; and | |
| | b) In a manner that demonstrates that the Proponent has considered the aesthetic values of local communities (e.g. information regarding the acceptability of the topography and landscape of the project areas following progressive reclamation efforts). | |
| NIRB Project Certificate 008 | The Proponent shall explore the feasibility of topsoil/organic matter salvage as part of project development and provide updates to the Closure and Reclamation Plan based on this | 8.7.2 |

| WHALE TAIL MINE | | |
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| **Authorization** | **Reporting Requirement** | **Report** |
| Condition 13 | investigation. The Proponent shall provide a summary of its management of topsoil in annual reports to the NIRB. | |
| NIRB Project Certificate No.008 Condition 14 | The Proponent shall develop and implement a Thermal Monitoring Plan to identify potential changes in talik distribution and flow paths that may result from the development of project infrastructure, including the Whale Tail pit, dikes, and water impoundments. The Plan should be submitted to the NIRB at least 60 days prior to the start of construction of these facilities, with subsequent updates submitted annually thereafter or as may otherwise be required by the NIRB | 5.4.2 |
| NIRB Project Certificate No.008 Condition 15 | As required by NIRB Project Certificate No.008 Condition 15: The required Groundwater Monitoring Plan should be submitted to the NIRB at least 30 days prior to the start of construction, with subsequent plan revisions or updates submitted annually thereafter. Subject to the additional direction and requirements of the Nunavut Water Board, the Proponent shall prepare and implement a Groundwater Monitoring Plan that, at a minimum includes:<br>▪ The collection of additional site-specific hydraulic data (e.g., from new monitoring wells) in key areas during the pre-development, construction and operation phases;<br>▪ Definition of vertical and horizontal groundwater flows in the project development areas;<br>▪ Delineates monitoring plans for both vertical and horizontal ground water; and<br>▪ Thresholds that will trigger the implementation of adaptive management strategies that reflect site specific conditions encountered at the project site. | 8.7.2 |
| NIRB Project Certificate No.008 Condition 16 | As required by NIRB Project Certificate No.008 Condition 16: An updated Groundwater Monitoring Plan that outlines the Proponent's plans to fulfill this term and condition should be submitted to the NIRB at least 30 days prior to the start of construction, with subsequent plan revisions or updates submitted annually thereafter. Within two years of commencing operations, the Proponent shall:<br>a) Conduct additional analyses to determine the approximate fill time for the Whale Tail Pit at closure;<br>b) Undertake a hydrogeological characterization study to assess the potential for arsenic and phosphorous diffusion from submerged Whale Tail pit walls;<br>c) If the results of the characterization study indicate a moderate to high potential for arsenic and/or phosphorous diffusion, perform detailed hydrodynamic modelling of the flooded pit lake prior to closure to evaluate meromictic conditions and flooded pit water quality; and<br>d) Add these required activities to the site Groundwater Monitoring Plan. | 8.7.2 |
| NIRB Project Certificate No.008 Condition 17 | The plan should be submitted to the NIRB at least 30 days prior to the start of construction, with results submitted annually thereafter. The Proponent shall:<br>a) Monitor the effects of project activities and infrastructure on surface water quality conditions;<br>b) Ensure the monitoring data is sufficient to compare the impact predictions in the Environmental Impact Statement (EIS) for the Project with actual monitoring results;<br>c) Ensure that the sampling locations and frequency of monitoring is consistent with and reflects the requirements of the Water Quality and Flow Plan and the Core Receiving Environmental Monitoring Program; and<br>d) On an annual basis, the Proponent will compare monitoring results with the impact assessment predictions in the EIS and will identify any significant discrepancies between impact predictions and monitoring results | 8.1.2 |
| NIRB Project Certificate No 008 Condition 18 | The Proponent shall, reflecting any direction from the Nunavut Water Board, maintain a Site Water Monitoring and Management Plan designed to: Minimize the amount of water that contacts mine ore and wastes; Appropriately manage all contact water and discharges to protect local aquatic resources; and Implement water conservation and recycling to maximize water reuse and minimize the use of natural waters.<br>The Plan should include monitoring that demonstrates contact water (runoff and shallow groundwater) from the ore storage and waste rock storage areas is captured and managed, as per the Waste Rock Facility Management Plan. The plan should be submitted to the NIRB at least 60 days prior to the start of construction, with results submitted annually thereafter. | SECTION 8 |
| NIRB Project Certificate No.008, Condition 19 | The Proponent shall, reflecting any direction from responsible authorities such as the Nunavut Water Board, Fisheries and Oceans Canada and Environment and Climate Change Canada, maintain a Core Receiving Environment Monitoring Program (CREMP) designed to:<br>Determine the short and long-term effects in the aquatic environment resulting from the Project;<br>Evaluate the accuracy of Project effect predictions; | 8.1.2 |

| WHALE TAIL MINE | | |
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| **Authorization** | **Reporting Requirement** | **Report** |
| | Assess the effectiveness of mitigation and management measures on Project effects; | |
| | Identify additional mitigation measures to avert or reduce environmental effects due to Project activities; | |
| | Comply with Metal Mining Effluent Regulations requirements, should an Environmental Effects | |
| | Monitoring program be triggered; | |
| | Reflect site-specific water quality conditions; | |
| | Include details comparing the watershed features in the Whale Tail watershed to those watersheds used as reference lakes; and | |
| | Evaluate the mixing and non-mixing portion of the pit. | |
| NIRB Project Certificate No.008, Condition 20 | Unless otherwise authorized, the Proponent shall maintain an appropriate setback distance between project quarries and borrow pits from fish-bearing or permanent waterbodies as required to prevent acid rock drainage or metal leaching into such waterbodies. Throughout quarry development and operation, the Proponent shall, on an annual basis, provide information regarding quarry setback distances maintained and/or mitigation measures implemented by the Proponent in fulfillment of this term and condition in the Proponent's annual report to the NIRB. | 3.4.2.2 |
| NIRB Project Certificate No.008 Condition 22 | The Proponent shall engage with Fisheries and Oceans Canada to develop project specific thresholds, mitigation and monitoring for any blasting activities that would exceed the requirements of Fisheries and Oceans Canada's Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters. If project-specific thresholds, mitigation and monitoring requirements are developed, the Proponent shall identify these requirements in the annual report provided to the NIRB. | 8.6.2 |
| NIRB Project Certificate No.008 Condition 23 | The Proponent shall, reflecting any direction from Environment and Climate Change Canada and Fisheries and Oceans Canada: | 8.10 |
| | a) Conduct additional analysis to support the conclusions that a change in trophic status in Mammoth Lake would not impact fish productivity; | |
| | b) Undertake additional site-specific studies to assess the predicted trophic change on lake ecosystem productivity to monitor potential changes to downstream environments; and | |
| | c) Monitor actual loadings/concentrations in the receiving environment, identify trends in downstream chemistry and productivity, and track trophic status of Mammoth Lake | |
| NIRB Project Certificate No.008 Condition 24 | The Proponent shall engage Fisheries and Oceans Canada, and other interested parties to further assess: Whether the increased surface area of Whale Tail Lake is a viable offset to habitat losses resulting from development of the Project; and Whether Whale Tail end pit would support fish in the post closure scenario. | 8.8.2.1 |
| NIRB Project Certificate No.008 Condition 25 | At least 30 days prior to first shipment of equipment and supplies to the site, the Proponent's mitigation plans, protocols, monitoring and inspection program required in fulfillment of this term and condition shall be provided to the NIRB for review. Subsequently, information regarding inspections, monitoring results, and any reports as referenced above shall be included in the Proponent's annual report to the NIRB. The Proponent shall: | 8.18.7 |
| | a) Ensure that equipment and supplies brought to the project sites are clean and free of soils that could contain plant seeds or organic matter not naturally occurring in the area | |
| | b) Ensure that vehicle tires and treads are inspected prior to initial use in project areas; | |
| | c) Incorporate protocols for monitoring for the potential introduction of invasive vegetation species (e.g. surveys of plant populations in previously disturbed areas) into relevant monitoring and management plans for the terrestrial environment; and | |
| | d) Ensure any introductions of non-indigenous plant species must be promptly reported to the Government of Nunavut Department of Environment. | |
| NIRB Project Certificate No.008 Condition 26 | The Proponent shall include revegetation strategies within its Mine Closure and Reclamation Plan that support progressive reclamation, and promote natural revegetation and recovery of disturbed areas compatible with the surrounding natural environment. These strategies should include exploration of the feasibility and practicality of topsoil/organic matter salvage through Project development. Consideration for the results of similar reclamation efforts at other northern projects, including the Meadowbank Gold Mine Project, must be demonstrated. Within three (3) years from the commencement of construction, information regarding the revegetation strategies developed and implemented by the Proponent in fulfillment of this Term and Condition shall be included in the Proponent's annual report to the NIRB. Subsequently, information regarding the Proponent's progress in fulfillment of this Term and Condition shall be provided annually in the Proponent's annual report to the NIRB. | 9.3 |

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| NIRB Project Certificate No.008 Condition 27 | The Proponent shall participate in a Terrestrial Advisory Group with the Government of Nunavut, the Baker Lake Hunters and Trappers Organization, the Kivalliq Inuit Association, and other parties as appropriate to continually review and refine mitigation and monitoring details within the Terrestrial Ecosystem Management Plan. Additional caribou collar data, results from associated studies, Inuit Qaujimajatuqangit shared by knowledge holders, and other monitoring data as available should be considered for incorporation as appropriate. Finalized Terms of Reference for the Terrestrial Advisory Group shall be provided to the NIRB within six (6) months of issuance of the Project Certificate. A summary of outcomes from Terrestrial Advisory Group meetings shall be provided to the NIRB on an annual basis in the Proponent's Annual Report. | 8.18.2 |
| NIRB Project Certificate No.008, Condition 28 | The Proponent shall maintain a Terrestrial Ecosystem Management Plan (TEMP) throughout all phases of the Project. The Plan shall include detailed monitoring, mitigation, and adaptive management measures for wildlife, with consideration for each Project activity predicted to affect wildlife, and with inclusion of specific triggers for mitigation and adaptive management intervention. The TEMP shall demonstrate consideration for all relevant commitments made by the Proponent throughout the Nunavut Impact Review Board's review of the Project. Updates to the TEMP may be required when there are significant changes in project development plans, monitoring results indicating biologically-meaningful changes, significant updates to the scientific understanding of management methods relevant to wildlife at the project site, Inuit Qaujimajatuqangit, Traditional Knowledge, changes in climatic conditions that might subject wildlife to unexpected impacts, or as otherwise necessary.<br><br>The Proponent shall submit a revised TEMP to the Nunavut Impact Review Board (NIRB) within one (1) year of issuance of the Project Certificate, with subsequent versions provided as appropriate. Results of the TEMP shall be reported to the NIRB annually, including details of how Inuit Qaujimajatuqangit contributed by knowledge holders has been considered and utilized in associated activities and updates. | 8.18 |
| NIRB Project Certificate No.008 Condition 29 | The Proponent shall, in collaboration with the Government of Nunavut, collect additional caribou collar data and conduct analyses of this data to quantify the zone of influence and associated effects of project components on caribou movement for a study area that includes the Whale Tail mine site, the haul road, the Meadowbank Gold Mine and its All-Weather Access Road. A summary of the analyses and associated effects shall be provided annually in the Proponent's annual report to the Nunavut Impact Review Board. | 8.18.1.4 |
| NIRB Project Certificate No.008 Condition 30 | The Proponent shall work with the Government of Nunavut, the Baker Lake Hunters and Trappers Organization and the Kivalliq Inuit Association through the Terrestrial Advisory Group to develop and update thresholds to trigger implementation of mitigation measures on both the AWAR and Whale Tail Haul road, up to and including temporary road closures. The Proponent shall consider how these thresholds and mitigation measures reflect caribou life cycle sensitivities as well as demonstrate how Inuit Qaujimajatuqangit was incorporated throughout the development of these criteria and procedures. | 8.18.2 |
| NIRB Project Certificate No.008, Condition 31 | The Proponent shall develop and implement a Road Access Management Plan and maintain traffic monitoring logs along the haul road between the Whale Tail Pit project and the Meadowbank mine. Where traffic exceeds levels predicted within the Environmental Impact Statement, the Proponent shall develop and implement appropriate modifications to its wildlife protection measures. The Road Access Management Plan shall be provided to the Nunavut Impact Review Board (NIRB) 90 days prior to operations commencing. An annual summary of the monthly maximum, minimum and average traffic levels shall be provided to the NIRB in the Proponent's annual report. | 11.7.1.2 |
| NIRB Project Certificate No.008 Condition 32 | The Proponent shall engage with the Baker Lake Hunters and Trappers Organization and other relevant parties to ensure that safety barriers, berms, and designed crossings associated with project infrastructure, including the haul road, are constructed and operated as necessary to allow for the safe passage of caribou and other terrestrial wildlife. Summaries of engagement with the Baker Lake Hunters and Trappers Organization regarding implementation of this condition shall be provided to the Nunavut Impact Review Board along with details of the selected crossings in the Proponent's annual report to the Nunavut Impact Review Board. | 8.18.3 |
| NIRB Project Certificate No.008 Condition 33 | A summary regarding all wildlife incidents reported, including a reference to whether compensation was or will be provided by the Proponent for direct mortalities, as well as a description of any other steps taken in fulfillment of this term and condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board. The Proponent shall | 8.18.4 |

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| | provide wildlife incident reports to the appropriate authorities in a timely fashion. Wildlife incident reports should include the following information: | |
| | a) Locations (i.e., latitude and longitude), species, number of animals, a description of the animal activity, and a description of the gender and age of animals if possible; | |
| | b) Prior to conducting project activities, the Proponent should map the location of any sensitive wildlife sites such as denning sites, calving areas, caribou crossing sites, and raptor nests in the project area, and identify the timing of critical life history events (i.e., calving, mating, denning and nesting); and | |
| | c) Additionally, the Proponent should indicate potential impacts from the project, and ensure that operational activities are managed and modified to avoid impacts on wildlife and sensitive sites | |
| NIRB Project Certificate No.008 Condition 34 | The Proponent will maintain a Migratory Birds Protection Plan for the Project in consultation with Environment and Climate Change Canada and other interested parties. The plan should include and/or demonstrate that the Proponent give consideration to the following: | 8.18.5 |
| | · Information obtained from baseline characterization of migratory bird and vegetation communities within the predicted flood area; | |
| | · Results of field tests and/or the thorough literature review of the effectiveness of preferred deterrence prior to actual flooding; and | |
| | · Details regarding monitoring the effectiveness of mitigation measures during flooding. | |
| NIRB Project Certificate No.008 Condition 35 | The Proponent shall ensure that the mitigation and monitoring strategies developed for Species at Risk are updated as necessary to maintain consistency with any applicable status reports, recovery strategies, action plans, and management plans that may become available through the duration of the Project. Information regarding development, implementation and monitoring of the measures developed by the Proponent in fulfillment of this term and condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board. | 8.18.6 |
| NIRB Project Certificate No.008 Condition 36 | Prior to removal or deterrence of raptors, the Proponent will contact the Government of Nunavut – Department of Environment to discuss proposed mitigation options and, if required, will obtain the necessary permits. The Proponent shall include summaries of any mitigation measures implemented and permits obtained in fulfillment of this term and condition in the Proponent's annual report to the Nunavut Impact Review Board. | 8.18.1.11 |
| NIRB Project Certificate No.008, Condition 37 | The Proponent shall maintain a Shipping Management Plan in coordination and consultation with applicable regulatory authorities and the Kivalliq Inuit Association, and the Hunters and Trappers Organizations of the Kivalliq communities. The updated plan should be submitted to the Nunavut Impact Review Board at least 90 days prior to the start to commencement of shipping activities, with subsequent updates submitted annually thereafter in the Proponent's annual report or as may otherwise be required by the NIRB. | 11.8 |
| NIRB Project Certificate No.008 Condition 38 | The Proponent shall ensure that marine shipping activities avoid sensitive wildlife habitat and species along the shipping route and use a routing south of Coats Island as the primary shipping route, subject to vessel and human safety considerations. Confirmation that the requirements of this term and condition are being effectively implemented by shipping companies contracted by the Proponent should be submitted as part of annual reporting to the Nunavut Impact Review Board. | 11.8.1 |
| NIRB Project Certificate No.008 Condition 39 | The Proponent shall ensure that, subject to vessel safety requirements, a setback distance of at least 500 metres is maintained from colonies and aggregations of seabirds and marine mammals during Project shipping transiting through Hudson Strait, Hudson Bay, and Chesterfield Inlet. Confirmation that the requirements of this term and condition are being effectively implemented by shipping companies contracted by the Proponent should be submitted as part of annual reporting to the Nunavut Impact Review Board. | 11.8.1 |
| NIRB Project Certificate No.008 Condition 40 | The Proponent shall develop and implement a ship-based marine mammal monitoring program, as part of a Marine Mammal Management and Monitoring Plan, in consultation with Fisheries and Oceans Canada, communities, and other interested parties. The Proponent shall report any accidental contact by project vessels with marine mammals or seabird colonies to applicable responsible authorities including Fisheries and Oceans Canada and Environment and Climate Change Canada. The Plan should be submitted to the Nunavut Impact Review Board at least 90 days prior to commencement of shipping activities, with subsequent updates submitted annually thereafter. Confirmation that the requirements of the Plan are being effectively implemented by shipping companies contracted by the Proponent should be provided with annual reporting. | 11.8.2 |

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| NIRB Project Certificate No.008 Condition 41 | The Proponent shall provide notification to communities regarding scheduled ship transits throughout the regional study area, including Hudson Bay and Chesterfield Inlet. The Proponent shall provide a summary of public consultation undertaken to address this term and condition in its annual report to the Nunavut Impact Review Board. | 11.8.3 |
| NIRB Project Certificate No.008 Condition 42 | The Proponent shall design monitoring programs to ensure that local users of the marine area along the shipping route have the opportunity to provide feedback and input in relation to monitoring and evaluating potential project-induced impacts and changes in marine mammal distributions. The Proponent shall demonstrate how feedback received from community consultations has been incorporated into the most appropriate mitigation or management plans. The Proponent shall provide a summary of public consultation undertaken to address this term and condition in its annual report to the Nunavut Impact Review Board. | 11.9.1 |
| NIRB Project Certificate No.008 Condition 43 | The Proponent shall contract only certified vessels to carry cargo for the Project, and will ensure shippers are aware of the requirements of the Shipping Management Plan, the Risk Management and Emergency Response Plan, and the Oil Pollution Emergency Plan. Evidence of meeting the requirements of this term and condition should be submitted as part of annual reporting to the Nunavut Impact Review Board | 11.8.4 |
| NIRB Project Certificate No 008, Condition 44 | The Proponent is strongly encouraged to continue to participate in the work of the Kivalliq Socio-Economic Monitoring Committee along with other agencies and the communities of the Kivalliq region, and to identify areas of mutual interest and priority for inclusion into a collaborative monitoring framework that includes socio-economic priorities related to the Project, communities, and the Kivalliq region as a whole. | 11.10.1 |
| NIRB Project Certificate No.008, Condition 45 | The Proponent shall work in collaboration with other socio-economic stakeholders including, the Government of Nunavut, Indigenous and Northern Affairs Canada, the Kivalliq Inuit Association, and communities of the Kivalliq region, to establish a socio-economic working group for the Project to develop and oversee a Kivalliq Projects AEM Socio-Economic Monitoring Program. The working group will develop a Terms of Reference, which outlines each member's roles and responsibilities with regards to, where applicable, project specific socio-economic monitoring throughout the life of the projects. The Proponent shall work with the other parties to use the updated Kivalliq Projects Socio-Economic Monitoring Program to monitor the predicted impacts outlined in the projects' respective environmental impact statements as well as regional concerns identified by the Kivalliq Socio-Economic Monitoring Committee. The Proponent shall work in collaboration with all other socio-economic stakeholders such as the Government of Nunavut, Indigenous and Northern Affairs Canada, Kivalliq Inuit Association, and the communities of the Kivalliq region in developing this program, which should include a process for adaptive management and mitigation in the event unanticipated impacts are identified. The Terms of Reference for this multi-party, multi-project Working Group are to be provided to the Nunavut Impact Review Board (NIRB) upon completion, and within one (1) year of issuance of the Project Certificate. The Proponent shall produce annual joint "AEM Kivalliq Projects" Socio-Economic Monitoring reports throughout the life of the Projects that are submitted to the NIRB and discussed with the wider Kivalliq Socio-Economic Monitoring Committee. Details of the Kivalliq Projects Socio-Economic Monitoring Program are to be provided to the NIRB upon finalization, and within one (1) year of issuance of the Project Certificate. Information regarding the Proponent's efforts in fulfillment of this term and condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board. | 11.10.2 |
| NIRB Project Certificate No 008, Condition 46 | The Proponent should develop a Project-specific Whale Tail Pit Socio-Economic Monitoring Program designed to:<br>· Monitor for project-induced effects, including the impacts predicted in the Environmental Impact Statement through indicators presented in the Whale Tail Pit Socio-Economic Monitoring Plan;<br>· Reflect regional socio-economic concerns identified by the Kivalliq Socio-Economic Monitoring Committee (KivSEMC);<br>· Work in collaboration with all other socio-economic stakeholders such as the Kivalliq Inuit Association, the Government of Nunavut, and Indigenous and Northern Affairs Canada, and the communities of the Kivalliq region to develop the program; and<br>· Include a process for adaptive management and mitigation to respond if unanticipated impacts are identified.<br>- Monitor the success of existing and newly implemented gender-specific initiatives to determine their success and why they were considered successful or to identify any challenges | 11.10.2 |

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| | to their implementation.<br>Details of the Whale Tail Pit Socio-Economic Monitoring Program should be submitted to the Nunavut Impact Review Board (NIRB) within one (1) year of issuance of the Project Certificate. The Proponent should produce annual Whale Tail Pit socio-economic monitoring reports throughout the life of the Project that are submitted to the NIRB and shared with the wider KivSEMC. | |
| NIRB Project Certificate No.008 Condition 47 | The Proponent should undertake an analysis of the risk of temporary mine closure, giving particular consideration to how communities in the Kivalliq region may be affected by temporary closure of the mine, including consideration of the measures that can be taken to mitigate the potential for adverse effects (e.g. development of programs that provide transferable skills, identification of employment options that can include transfers amongst Agnico Eagle operations, etc.) This analysis is required to be updated as necessary to reflect significant changes to the Project or the socio-economic conditions in the region that may increase the risks and potential effects of temporary mine closures. This initial results of the Proponent's analysis should be provided to the Nunavut Impact Review Board (NIRB) within six (6) months of the issuance of the Project Certificate. Any updates to the analyses should be provided to the NIRB within three (3) months following completion of updated analyses by the Proponent. | 9.4 |
| NIRB Project Certificate No.008, Condition 48 | The Proponent is strongly encouraged to submit staff schedule forecasts that should, at a minimum, include the following:<br>- Title of positions required by department and division;<br>- Quantity of positions available by project phase and year;<br>- Transferable skills, both certified and uncertified which may be required for, or gained during, employment within each position;<br>- The National Occupational Classification code for each individual position.<br>The Proponent should also identify and register all trades occupations, journeypersons, and apprentices working with the Project and make this information available to the Government of Nunavut to assist in delivery of training initiatives and programs. The Staff Schedule should be submitted to the Nunavut Impact Review Board six (6) months prior to each phase of the Project (construction, operations, closure). | 11.10.3<br>11.11.1.1 |
| NIRB Project Certificate No.008, Condition 49 | The Proponent shall make best efforts to collaborate with the Government of Nunavut's Career Development Officer, Regional Manager of Career Development, and Director of Career Development. Semi-annual calls, at a minimum, should be initiated by the Proponent to address:<br>- Hiring procedures and policies<br>- Issues regarding employee recruitment and retention<br>- AEM policies regarding career pathways and opportunities for advancement<br>- Internal and/or partnered training and development of employees<br>- Long-term labour market plans to facilitate training in communities | 11.11.1.2 |
| NIRB Project Certificate No 008, Condition 50 | The Terms of Reference for this multi-party, multi-project Working Group are to be provided to the Nunavut Impact Review Board (NIRB) upon completion, and within one (1) year of issuance of the Project Certificate. Details of the Kivalliq Projects Socio-Economic Monitoring Program are to be provided to the NIRB upon finalization, and within one (1) year of issuance of the Project Certificate. The Proponent shall produce annual joint "AEM Kivalliq Projects" Socio-Economic Monitoring reports throughout the life of the Projects that are to be submitted as part of the Proponent's annual report to the NIRB. | 11.10.2 |
| NIRB Project Certificate No.008, Condition 50 | The Proponent will report the results of its Labour Market Analysis (LMA) and Inuit Work Barrier Study (WBS) to the Kivalliq Socio-Economic Monitoring Committee upon completion in 2018, which should integrate the findings into its ongoing work identifying gaps between the Kivalliq labour market and mining market needs, and how to activate latent labour pool in the Kivalliq region to maximize labour "capture" from mining for the region. The Proponent shall report the results and implications of the LMA and WBS within its first year's Annual Report to the Nunavut Impact Review Board (NIRB), and show how the results have been integrated into an updated Socio-Economic Monitoring Plan for the Whale Tail Pit Project. | 11.11.1.4 |
| NIRB Project Certificate 008 Condition 51 | The Proponent shall develop a conceptual Socio-economic Closure Plan that:<br>· Links the socio-economic closure plans for Meadowbank and Whale Tail;<br>· Identifies regular update and multi-party review requirements;<br>· Shows evidence of consideration of socio-economic lessons learned from other northern | 9.5 |

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| | mine closure experiences; | |
| | · Includes evidence of consultation with Kivalliq communities and governance bodies on socio-economic objectives/goals related to closure planning; | |
| | · Emphasizes plans, policies, and programs to increase transferable skills of Inuit workers, including into trades and other skilled positions; and | |
| | · Includes all plans, policies and programs related to socioeconomic factors in a temporary closure situation. | |
| | - Includes a Workforce Transition Plan between the Whale Tail Project and other production mines owned and operated by the Proponent in the Kivalliq region.<br><br>The Proponent shall advance the recommendations of the Conceptual Socio-economic Closure Plan through the development of a Final Socio-economic Closure Plan that will be part of the Whale Tail Pit Project Final Closure and Reclamation Plan. | |
| NIRB Project Certificate No.008, Condition 52 | The Proponent should develop and maintain an easily referenced listing of formal certificates and licenses that may be acquired via on-site training or training during project employment. The listing shall indicate which of these certifications and licenses would be transferable to a similar job site within Nunavut. The initial listing should be provided to the Nunavut Impact Review Board within six (6) months of the Project Certificate being issued. Updates to the list should be included in the Proponent's annual reports submitted to the Nunavut Impact Review Board and shared with the wider Kivalliq Socio-Economic Monitoring Committee throughout the life of the Project. | 11.11.1.3 |
| NIRB Project Certificate No.008, Condition 53 | Provided the collection and sharing of such information is consistent with and not limited by any Inuit Impact and Benefit Agreement with the Kivalliq Inuit Association and that employees are willing to voluntarily provide this information, the Proponent should collect and provide project-specific data concerning employee community of residence and number of employees that relocated from the year prior (where available, to and from, for Arviat, Baker Lake, Chesterfield Inlet, Coral Harbour, Naujaat, Rankin Inlet and Whale Cove). The details of this process will be captured in the terms of reference for the project specific Whale Tail Pit Socio-Economic Monitoring Committee. Summaries of this information should be included in the annual Whale Tail Pit socio-economic monitoring reports submitted to the Nunavut Impact Review Board and shared with the wider Kivalliq Socio-Economic Monitoring Committee throughout the life of the Project. | 11.10.3 |
| NIRB Project Certificate No.008, Condition 54 | Proponent should ensure that the development of all project monitoring plans and associated reporting and updates are undertaken with active engagement of Kivalliq communities, land users, and harvesters. The Proponent should work with the Kivalliq Inuit Association, the local Hunters and Trappers Organizations and the Kivalliq Socio-Economic Monitoring Committee to report on the collection and integration of Inuit Qaujimaningit through its monitoring programs for the Project. To the extent that the sharing of such information is consistent with, and not limited by, any confidentiality or other agreements, summaries addressing the Proponent's fulfillment of this term and condition should be included in the Proponent's annual report to the Nunavut Impact Review Board. | 11.10.1 |
| NIRB Project Certificate No.008 Condition 55 | The Proponent shall conduct archaeological surveys prior to land disturbance related to the Project and report survey results to applicable parties, including the Government of Nunavut – Department of Culture and Heritage. Evidence of meeting the requirements of this term and condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board. | 8.20.1 |
| NIRB Project Certificate No.008 Condition 56 | The Proponent shall report any archaeological site discovered during the construction, operation, and closure phases to the Government of Nunavut – Department of Culture and Heritage and the Kivalliq Inuit Association. Upon discovering an archeological site, the Proponent shall: | 8.20.1 |
| | a) Take all reasonable precautions necessary to protect the site until further direction is received from the Government of Nunavut – Department of Culture and Heritage; and | |
| | b) If it becomes necessary to disturb an archaeological site, the Proponent shall consult with the Government of Nunavut – Department of Culture and Heritage, the Kivalliq Inuit Association, and potential impacted communities to establish a site specific mitigation plan, and obtain all necessary authorizations and comply with all applicable laws. | |
| NIRB Project Certificate 008 Condition 57 | The Proponent shall update its Occupational Health and Safety Plan to include sexual health and well-being information in its employee orientation programming. In addition, the Proponent shall undertake an education program to inform workers of the range of health services | 10.2.2.1 |

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| | available onsite. The updated plan shall be provided to the Nunavut Impact Review Board (NIRB), once completed within six (6) months of issuance of the Project Certificate. Summaries of the education programs undertaken and any future updates or modifications to the Occupational Health and Safety Plan and the education program shall be included in the Proponent's annual report to the NIRB. | |
| NIRB Project Certificate No.008, Condition 58 | The Proponent is encouraged to form a subcommittee which includes Government of Nunavut representatives to reach consensus decisions on health related issues that the Proponent or the Government of Nunavut bring forward (e.g. programs and services to address sexually transmitted infections, a process for the treatment and transport of workers that may require medical services beyond that which the mine provides, monitoring and reporting on the impacts of the Project on health services within the potentially impacted communities and particularly, Baker Lake. etc.). Information regarding the Proponent's fulfillment of this term and condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board. | 11.11.1.5 |
| NIRB Project Certificate No.008, Condition 59 | The Proponent is encouraged to work with the Kivalliq Inuit Association to establish cross-cultural training initiatives, which promote respect and consideration for the importance of Inuit Qaujimajatuqangit to the Inuit identity and to make this training available to Project employees and on-site sub-contractors. The Proponent should actively monitor the implementation of these initiatives, including the following items: | 11.10.3.2.3 |
| | · Descriptions of the goals of each program offered; | |
| | · Language of instruction; | |
| | · Schedules and location(s) of when each program was offered; | |
| | · Uptake by employees and/or family members where relevant, noting Inuit and non-Inuit participation rates; and | |
| | · Completion rates for enrolled participants, noting Inuit and non-Inuit participation rates. | |
| | Summaries of the cross-cultural training initiatives implemented by the Proponent in fulfilment of this term and condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board. | |
| NIRB Project Certificate No.008, Condition 60 | The Proponent shall engage with the Government of Nunavut to develop a process to ensure that any conditions first treated at the mine site and requiring ongoing care is appropriately accommodated in a timely manner at community health centres as required. Evidence of meeting the requirements of this term and condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board. | 11.11.1.5 |
| NIRB Project Certificate No.008, Condition 61 | The Proponent, in collaboration with the Government of Nunavut and the Nunavut Housing Corporation, is encouraged to investigate measures and programs designed to assist Project employees with pursuing home ownership or accessing affordable housing options in the Kivalliq region. The Proponent should provide access to financial literacy, financial planning, and personal budgeting as part of the regular Life Skills Training and/or Career Path Program. Evidence of meeting the requirements of this term and condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board. | 11.10.3 |
| NIRB Project Certificate No.008, Condition 62 | The Proponent should work with the Government of Nunavut to develop an effects monitoring program that identifies Project-related pressures to community infrastructure such as airport and transportation infrastructure, policing, health and social services, in Baker Lake and all the point-of-hire communities of the Kivalliq Region. Evidence of meeting the requirements of this term and condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board | 11.10.3 |
| NIRB Project Certificate No.008, Condition 63 | The Proponent shall conduct additional studies as part of its freshwater aquatic effects analyses to ensure that methylmercury concentrations anticipated to increase during operations in the aquatic environment (including in fish tissue) do not exceed regulatory requirements. In addition, the Proponent shall consider assessing potential risks from consumption of fish containing methylmercury by using Health Canada's hazard quotients as a descriptive tool. A summary of the results of these additional studies, including the assessment of the potential risk to people from consumption of fish, shall be included in the Proponent's annual report to the Nunavut Impact Review Board. | 8.2 |
| NIRB Project Certificate No.008, Condition 64 | Within its annual reporting, the Proponent is encouraged to include detailed updates on the status of ongoing exploration programs associated with the Project and associated implications for future phase developments of the Amaruq property. Status updates in fulfillment of this Term and Condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board. | 11.3.1 |

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| NIRB Project Certificate No.008, Condition 65 | The Proponent shall, in consultation with the Terrestrial Advisory Group, develop a construction plan for the widening of the Whale Tail haul road which includes<br>- Design features of the Whale Tail haul road intended to facilitate caribou movement across the road;<br>▪ Identified sections of the roadside that will be constructed with slopes and top-dressing material appropriate for caribou crossing.<br>The plan must incorporate available Inuit Qaujimajatuqangit in the selection of caribou crossing locations.<br><br>The final construction plan shall be provided to the Nunavut Impact Review Board (NIRB) prior to widening the Whale Tail haul road. Within three months of completion of construction to widen the Whale Tail haul road, the Proponent shall file an 'as-built report' with the NIRB, which includes the backfill height, slope and top-dressing material specifications of designed wildlife crossing sections. | 3.5.2.3 |
| NIRB Project Certificate No.008, Condition 66 | The Proponent shall operate the Whale Tail haul road as a private access road, implement any reasonable measures to limit public access to the road, and develop strategies that account for unauthorized use. These measures must include, but are not limited to, the following:<br>a) The posting of signs in English and Inuktitut at the gate, each major bridge crossing, and each 10 kilometres of road, stating that public use of the road is prohibited;<br>b) Annually advertise and hold at least one community meeting in the Hamlet of Baker Lake to explain to the community that the road is restricted to mine use only;<br>c) Place local notices (e.g., radio, television, social media) at least quarterly to explain to the community that the road is restricted to mine use only;<br>d) Record all unauthorized non-mine use of the road, and require all mine personnel using the road to<br>e) Develop management strategies to ensure public and operator safety in the event of unauthorized public use.<br>Report unauthorized Whale Tail haul road use and accidents or other safety incidents on the road to the Government of Nunavut, the Kivalliq Inuit Association, Crown-Indigenous Relations and Northern Affairs Canada, the Baker Lake Hunters and Trappers Organization and the Hamlet of Baker Lake immediately, and to the Nunavut Impact Review Board annually. | 11.7.2.2 |
| NIRB Project Certificate No.008, Condition 67 | Subject to the additional direction and requirements of the Nunavut Water Board (NWB), the Proponent shall:<br>a) Conduct an evaluation of the potential aquatic effects to Lakes D1 and D5 and downstream that may result from the discharge of treated effluent. The evaluation will include:<br>▪ Additional water quality and phytoplankton baseline data in Lakes D1 and D5<br>▪ Updated water balance and water quality forecast<br>▪ Updated near field and far field effluent discharge modelling<br>▪ Updated Water Management Plan, Water Quality and Flow Monitoring Plan,<br>b) Provide adequate rationale for the need to use the alternative discharge contingency, based on the thresholds established as per the Whale Tail Pit Expansion Project water management decision tree.<br>c) In the event that discharge to Lakes D1 and/or D5 is not approved to proceed by the NWB, the Proponent will develop alternative effluent management plans as part of the Water Management Plan.<br>At least 90 days prior to any decision to use the effluent discharge alternatives, the Proponent shall submit the requested evaluation, and rationale for use of the effluent discharge alternatives to the Nunavut Water Board, the Nunavut Impact Review Board (NIRB) and relevant regulatory authorities, for approval to proceed with discharge to one or both of Lakes D1 and D5.<br><br>If the alternative discharge contingency is approved to proceed, the Proponent will submit the results of its monitoring annually to the NIRB. | 4.4.4 |
| NIRB Project Certificate No.008, Condition 68 | The Proponent shall maintain an up-to-date listing of the status of implementation for its commitments made during the Nunavut Impact Review Board's (NIRB) assessment of the Whale Tail Pit Project Proposal and the Whale Tail Pit Expansion Project Proposal through engagement of parties and active monitoring of associated implementation. | 11.12 |

| WHALE TAIL MINE | | |
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| **Authorization** | **Reporting Requirement** | **Report** |
| | The Proponent shall provide a status report on the implementation of all its commitments within three (3) months of issuance of the Project Certificate for the Whale Tail Pit Expansion Proposal and annually thereafter within its annual report to the NIRB. | |
| NIRB Project Certificate No.008 Item 6 | The Proponent shall take prompt and appropriate action to remedy any occasion of non-compliance with environmental laws and regulations and/or regulatory instruments, and shall report any non-compliance as required by law immediately. A description of all instances of non-compliance and associated follow up is to be reported annually to the NIRB. | 11.6.2 |
| NIRB Project Certificate No.008 Item 8 | All monitoring information collected pursuant to the Project Certificate and various regulatory requirements for the Project shall, if appropriate, given the type of monitoring conducted, contain the following information: | SECTION 8 |
| | a) The name of the person(s) who performed the sampling or took the measurements including any relevant accreditations; | |
| | b) The date, time and place of sampling or measurement, and weather conditions; | |
| | c) The date of analysis; | |
| | d) The name of the person(s) who performed the analysis including any relevant accreditations; | |
| | e) A description of the analytical methods or techniques used; and | |
| | f) A discussion of the results of any analysis. | |
| NIRB Project Certificate No.008, Item 9 | The Proponent shall make significant monitoring results and/or summaries of significant results available in English, Inuinnaqtun, and Inuktitut, to the extent feasible. | 10.3.2 |
| NIRB Project Certificate No.008, Item 12 | The Proponent shall establish a publically-accessible Project-specific web portal or web page to make available in a central location all significant non-confidential monitoring and reporting information submitted to regulatory authorities pursuant to the Project Certificate and other territorial or federal permits issued for the Project. For clarity, posting on the Project-specific site does not replace any reporting obligation of the Proponent pursuant to the Project Certificate or any territorial or federal permit. | 11.9.7 |
| NIRB Project Certificate No.008, Item 13 | The Proponent is encouraged to provide on-going opportunities for consultation and comment on any substantive revisions to the Project-specific monitoring program, modelling, studies, management plans, management measures, and reporting under the Project Certificate. | 10.2.2 |
| | | |
| NWB 2AM-WTP18230, Schedule B, Item 1 | For the dikes, dams and structures constructed to withhold water or waste:<br>a. An overview of methods and frequency used to monitor deformations, Seepage and geothermal responses; | 3.1.2.1 |
| | b. A comparison of measured versus predicted performance; | |
| | c. A discussion of any unanticipated observations including changes in risk and mitigation measures implemented to reduce risk; | |
| | d. As-built drawings of all mitigation works undertaken; | |
| | e. Any changes in the design and/or as-built condition and respective consequences of any changes to safety, water balance and water quality; | |
| | f. Data collected from instrumentation used to monitor earthworks and an interpretation of that data; | |
| | g. A summary of maintenance work undertaken as a result of settlement or deformation of dikes and dams; and | |
| | h. The monthly and annual quantities of Seepage from dikes and dams in cubic metres. | |
| NWB 2AM-WTP1830 Schedule B, Item 2 | Monthly and annual volume of fresh Water obtained from Nemo Lake. | 4.1.2.1 |
| NWB 2AM-WTP1830 Schedule B, Item 3 | Monthly and annual volume of fresh Water obtained from Mammoth Lake. | 4.1.2.4 |
| NWB 2AM-WTP1830 Schedule B, Item 4 | Monthly and annual volume of fresh Water obtained from Whale Tail Lake. | 4.1.2.2 |
| NWB 2AM-WTP1830 Schedule B, Item 5 | Monthly and annual volume of fresh Water obtained from Lakes A-P38, A46, A47, A49, A50, A51, A52, A53, A-P21, A-P10, A-P67, and A-P68. | 4.1.2.5 |

| WHALE TAIL MINE | | |
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| **Authorization** | **Reporting Requirement** | **Report** |
| NWB 2AM-WTP1830 Schedule B, Item 6 | Monthly and annual volume of fresh Water obtained for drilling from sources proximal to drilling sites. | 4.1.2.6 |
| NWB 2AM-WTP1830 Schedule B, Item 7 | Monthly and annual volume of fresh Water obtained from unnamed water bodies for Whale Tail Haul Road dust suppressant and for the Emulsion plant. | 4.1.2.3 |
| NWB 2AM-WTP1830 Schedule B, Item 8 | Monthly and annual volume of fresh Water obtained from Lake D1. | 4.1.2.7 |
| NWB 2AM-WTP1830 Schedule B, Item 9 | Summary of reporting results for the Water Balance and Water Quality model and any calibrations as required in Part E Items 5, 6, and 8. | 4.1.2.2 |
| NWB 2AM-WTP1830 Schedule B, Item 10 | Geochemical monitoring results | 5.1.2 |
| NWB 2AM-WTP1830 Schedule B, Item 11 | Volumes of Waste Rock used in construction and placed in the Waste Rock Storage Facility. | 5.2.2.1 |
| NWB 2AM-WTP1830 Schedule B, Item 12 | Volumes of ore stockpiled and overburden stored at Whale Tail Pit site. | 5.2.2.1 |
| NWB 2AM-WTP1830 Schedule B, Item 13 | Summary of quantities and analysis of Seepage and runoff monitoring from the Landfill, Waste Rock Storage Facility and associated dikes/berms | 8.5.8.2 |
| NWB 2AM-WTP1830 Schedule B, Item 14 | A summary report of all general waste disposal activities including monthly and annual quantities in cubic metres of waste generated and location of disposal | 6.1.2 |
| NWB 2AM-WTP1830 Schedule B, Item 15 | Reporting of Incinerator test results including the materials burned and the efficiency of the Incinerator in relation to effects on Water and the potential Deposit of Waste into Water | 6.2.2 |
| NWB 2AM-WTP1830 Schedule B, Item 16 | A list and description of all unauthorized discharges including volumes, spill report line identification number and summaries of follow-up action taken. | 7.1.2 |
| NWB 2AM-WTP1830 Schedule B, Item 17 | A summary of Modifications and/or major maintenance work carried out on all Water and Waste-related structures and facilities. | 11.1.2 |
| NWB 2AM-WTP1830 Schedule B, Item 18 | The results and interpretation of the Monitoring Program in accordance with Part I and Schedule I. | 8.5 |
| NWB 2AM-WTP1830 Schedule B, Item 19 | The results of monitoring related to the Aquatic Effects Monitoring Program (AEMP) including: Core Receiving Environment Monitoring Program (CREMP); Metal Mining Effluent Regulation (MMER) Monitoring; Water Quality and Flow Monitoring; Visual Whale Tail Haul Road water quality monitoring; Blast Monitoring; and Groundwater Monitoring. | SECTION 8 |
| NWB 2AM-WTP1830 Schedule B, Item 20 | A summary of any progressive Closure and Reclamation work undertaken, including photographic records of site conditions before and after completion of operations, and an outline of any work anticipated for the next year, including any changes to implementation and scheduling. | 9.1.2.1 |
| NWB 2AM-WTP1830 Schedule B, Item 21 | A summary of on-going field trials to determine effective capping thickness for the Waste Rock Storage Facility for the purpose of long term environmental protection. | 5.4.2 |
| NWB 2AM-WTP1830 Schedule B, Item 22 | An updated estimate of the current restoration liability based on Project development monitoring, results of restoration research and any changes or modifications to the Appurtenant Undertaking. | 9.2.2.1 |
| NWB 2AM-WTP1830 Schedule B, Item 23 | A summary of any studies requested by the Board that relate to Water use, Waste disposal or Reclamation, and a brief description of any future studies planned. | 10.1.2 |
| NWB 2AM-WTP1830 Schedule | Where applicable, revisions as Addenda, with an indication of where changes have been made, for Plans, Reports, and Manuals. | 10.2.2 |

| WHALE TAIL MINE | | |
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| **Authorization** | **Reporting Requirement** | **Report** |
| B, Item 24 | | |
| NWB 2AM-WTP1830 Schedule B, Item 25 | An executive summary in English, French and Inuktitut of all plans, reports, or studies conducted under this License. | 10.3.2 |
| NWB 2AM-WTP1830 Schedule B, Item 26 | A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector. | 11.5.1 |
| NWB 2AM-WTP1830 Schedule B, Item 28 | Any other details on Water use or Waste Disposal requested by the Board by November 1st of the year being reported. | 4.6.2/6.3.2 |
| NWB 2AM-WTP1830 Part B, Item 17 | The Licensee shall review the Plans or Manuals referred to in this License as required by changes in operation and/or technology and modify the Plans or Manuals accordingly. Revisions to the Plans or Manuals are to be submitted in the form of an Addendum to be included with the Annual Report required by Part B, Item 2, complete with a revisions list detailing where significant content changes are made. | 10.2.2 |
| NWB 2AM-WTP1830 Part C, Item 7 | The Licensee shall, within twelve (12) months following the commencement of Operations and when the Licensee files a Final Reclamation and Closure Plan as required under the License, submit to the Board for review an updated reclamation cost estimate, using the INAC RECLAIM Reclamation Cost Estimating Model (Version 7.0 or the most current version in use at the time the updated reclamation cost estimate is submitted to the Board). | 9.2.2.1 |
| NWB 2AM-WTP1830 Part D, Item 1 | The Licensee shall submit to the Board for review, at least sixty (60) days prior to Construction, final design and Construction drawings accompanied, with a detailed report, for the following:<br>a. Water works, including: Water Intake and causeway, Water control structures (dikes, berms, jetties, channels) and Water crossings (culverts, bridges);<br>b. Waste disposal facilities including: Wastewater Treatment Plant, Sewage Treatment Plant, Discharge Diffuser, Waste Rock Storage Facility, Overburden stockpiles, and Landfill; and<br>c. Whale Tail Bulk Fuel Storage Facility | 3.5.2.1 |
| NWB 2AM-WTP1830 Part D, Item 16 | The Licensee shall submit to the Board for review, within ninety (90) days of completion of each facility designed to contain, withhold, divert or retain Waters or Wastes during the construction phase, a Construction Summary Report prepared by a qualified Engineer(s) in accordance with Schedule D, Item 1. | 3.5.2.2 |
| NWB 2AM-WTP1830 Part E, Item 5 | The Licensee shall submit an updated Water Management Plan on an annual basis to the Board for review following the commencement of Operations. The Plan must include an updated Water Balance. The Water Management Plan shall include an action plan to be implemented if predicted re-flooded pit water quality indicates that treatment is necessary | 3.5.2.2 |
| NWB 2AM-WTP1830 Part E, Item 6 | The Licensee shall submit a Water Quality Model for pit re-flooding and for WRSF contact water mixing into Mammoth Lake post-Closure as part of the Water Management Plan which shall be re-calibrated as necessary and updated annually following commencement of Operations. The results and implications of the predictive model shall be reported to the Board. | 4.4.2.2 |
| NWB 2AM-WTP1830 Part E, Item 8 | The Licensee shall, on an annual basis during Closure, compare the predicted water quantity and quality within the pit and lake, to the measured water quantity and quality. Should the difference between the predicted base case values and measured values be 20% or greater, then the cause(s) of the difference(s) shall be identified and the implications of the difference shall be assessed and reported to the Board. | 4.4.3.2 |
| NWB 2AM-WTP1830 Part E, Item 10 | The Licensee shall carry out weekly inspections of all water management structures during periods of flow and the records of inspections shall be kept for review upon request of an Inspector. More frequent inspections may be required at the request of an Inspector. This information is to be included in the annual updated Water Management Plan. | 4.4.1.2 |
| NWB 2AM-WTP1830 Part I, Item 11 | The Licensee shall submit to the Board as part of the Annual Report, the Geotechnical Engineer’s Inspection Report. The Report shall include a cover letter from the Licensee outlining an implementation plan to address the recommendations of the Geotechnical Engineer. | 3.3.2 |
| NWB 2AM-WTP1830 Part I, Item 12 | The Licensee shall submit to the Board as part of the Annual Report required under Part B, Item 2, all reports and performance evaluations prepared by the Independent Geotechnical Expert Review Panel. | 3.2.2 |
| NWB 2AM-WTP1830 Part I, Item 14 | The Licensee shall submit the results and interpretation of the Seepage monitoring required in Part I Item 15 in the Annual Report required under Part B, Item 2 | 3.1.2.1 |

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| **Authorization** | **Reporting Requirement** | **Report** |
| NWB 2AM-WTP1830 Part I, Item 20 | The Licensee shall annually review the approved QA/QC Plan and modify the Plan as necessary. Proposed changes shall be submitted to an Accredited Laboratory for approval. | 8.5.7.2 |
| NWB 2AM-WTP1830 Part J, Item 2 | The Licensee shall submit to the Board for approval within twelve (12) months of Operations, an updated Interim Whale Tail Pit Closure and Reclamation Plan prepared in accordance with the "Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories", issued by the Mackenzie Valley Land and Water Board (MVLWB) and Aboriginal Affairs and Northern Development Canada (AANDC) in 2013 (MVLWB/AANDC 2013) and consistent with the INAC Mine Site Reclamation Policy for Nunavut, 2002. The Plan shall include all mine related facilities and Whale Tail Pit Haul Road. | 9.1.2.1 |
| | | |
| DFO Authorization 16-HCAA-00370 Condition 2.3.5 | As per the NIRB Project Certificate No. 008 Condition 21, the Proponent shall ensure that all project infrastructure in watercourses is designed and constructed in such a manner that it does not unduly prevent or limit the movement of water or fish species in fish streams and rivers, unless otherwise authorized by Fisheries and Oceans Canada. | 3.5.2.1 |
| DFO Authorization 16-HCAA-00370 Condition 2.3.3 20-HCAA-00275 Condition 2.3.8 | The proponent shall develop a blasting mitigation plan in consultation with DFO to ensure effects on fish and fish habitat are minimized, as per Nunavut Impact Review Board Project Certificate No. 008 Condition 22. The Blasting mitigations plan shall be submitted to DFO prior to construction for approval, and shall adhere to the guidance provided in the Monitoring Explosive-Based Winter Seismic Exploration in Waterbodies, NWT 2000-2002 | 8.6.2 |
| DFO Authorization 16-HCAA-00370 Condition 2.4 20-HCAA-00275 Clause 2.3.7 | The proponent shall provided a final fish-out plan to DFO at least three weeks prior to commencing the fish-out program to allow for review and approval | 8.11.2 |
| DFO Authorization 16-HCAA-00370, Condition 2.4.1 | The Proponent shall provide detailed engineering plans to DFO for review and approval, for construction works that have potential to impact fish and fish habitat, at least 3 months prior to commencement of the works. This includes dikes (e.g., Northeast dike), diversion/realignment channels, and freshwater jetty. | 3.5.2.1 |
| DFO Authorization 16-HCAA-00370 and 20-HCAA-00275 Condition 3.1 | The Proponent shall monitor the implementation of avoidance and mitigation measures referred to in section 2 of this authorization, and provide a stand-alone report to DFO, by March 31, annually and indicate whether the measures and standards to avoid and mitigate serious harm to fish were conducted according to the conditions of this authorization | 8.5.1.2 |
| DFO Authorization 16-HCAA-00370 Condition 3.1.1 | The report in addition to the above shall summarizes the monitoring results related to fish and fish habitat contained in the documents listed in section 2.3. The report shall include a description of the implementation as well as an evaluation of the effectiveness of those monitoring programs in validating the changes to fish and fish habitat predicted in the Proponent's Environmental Impact Statement | 8.5.1.2 |
| DFO Authorization 20-HCAA-00275 Condition 3.1.1 | Demonstration of effective implementation and functioning: Providing dated photographs and inspection reports to demonstrate effective implementation and functioning of mitigation measures and standards described above to limit the impacts to fish and fish habitat to what is covered by this authorization. | 8.5.1.2 |
| DFO Authorization 20-HCAA-00275 Condition 3.1.2 | Contingency measures: Providing details of any contingency measures that were followed, to prevent impacts greater than those covered by this authorization in the event that mitigation measures did not function as described. | 8.5.1.2 |
| DFO Authorization 16-HCAA-00370 Condition 3.1.2 20-HCAA-00275 Condition 3.2.1 | Each year, following the submission of the annual monitoring report to DFO, the Proponent shall arrange to meet with DFO and interested parties (e.g. Kivalliq Inuit Association) to review the results of the previous year's monitoring programs. The results of the meetings and any mutually agreed upon modifications aimed at improving the effectiveness of the monitoring programs shall be incorporated into the upcoming year of the monitoring programs. The Proponent shall update the monitoring programs/plans to reflect the changes, and the programs/plans shall be approved in writing by DFO prior to implementation. | 8.5.1.2 |
| DFO Authorization 16-HCAA-00370 Condition 3.1.3 | The annual monitoring report shall provide dated photographs with GPS coordinates and description of locations and inspection reports to demonstrate effective implementation and functioning of mitigation measures and standards described above to limit the serious harm to fish to what is covered by this authorization | 8.5.1.2 |
| DFO Authorization 16-HCAA-00370 | The annual monitoring report shall also provided details of any contingency measures that were followed to prevent impacts greater than those covered by this authorization in the event | 8.5.1.2 |

| WHALE TAIL MINE | | |
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| **Authorization** | **Reporting Requirement** | **Report** |
| Condition 3.1.4 | that mitigation measures did not function as described. | |
| DFO Authorization 16-HCAA-00370 Condition 3.2.1 | All fish-out results shall be provided to DFO in a fish-out monitoring report within 2 months of the completion of a fish-out program. In addition, the Proponent shall provide DFO with photocopies of all field data/notes, copies of photographs with GPS coordinates and an electronic database of data collected and result of all sample analyses. This condition shall be followed in accordance with the General Fish-out Protocol for Lakes and Impoundments in the Northwest Territories and Nunavut | 8.11.2 |
| DFO Authorization 16-HCAA-00370 Condition 4.2.1.2 | The Proponent shall provide updated research plans with detailed methodologies for projects listed under conditions 4.2.2.1a, b, c and d. Each updated plan shall be provided to DFO for approval on or before December 31, 2018 and at least 60 days prior to commencement of research. | 8.8.2.4 |
| DFO Authorization 16-HCAA-00370 Condition 4.2.1.3 and 20-HCAA-00275 Condition 5.3.3.5 | The proponent shall initiate a literature review no later than November 2018, and provide the results of this review to DFO no later that February 28, 2019. This shall include an outline of the proposed studies by February 28, 2019, and a complete detailed research plans by December 31, 2019 | 8.8.2.4 |
| DFO Authorization 16-HCAA-00370 Condition 4.2.1.4 | To serve as an advisory group for the complementary measures that shall be undertaken as listed under condition 4.2.2.1, the Proponent shall establish a Meadowbank Fisheries research Advisory Group (MFRAG). The MFRAG membership shall include DFO and the Proponent, an independent third party research advisor, any interested Inuit organizations within the Kivalliq Region, and other agencies or interested parties s considered appropriate by MFRAG members. The proponent shall develop a draft terms or reference and participant list for this advisory group which shall be provided to DFO by September 1, 2018. | 8.9 |
| DFO Authorization 16-HCAA-00370 Condition 4.2.1.6 | The proponent shall make all effort to ensure that the results from the research projects conducted for the complementary measures are published in peer-reviewed scientific journals | 8.8.2.4 |
| DFO Authorization 16-HCAA-00370 Condition 5.1.1.2 | The proponent shall provided an updated Whale Tail Pit Fish Habitat Offset Monitoring Plan, prepared by Agnico Eagle Mines Ltd. To DFO for review and approval on or before December 31, 2018. This update shall include, but is not limited to, details on the monitoring methods, frequency of monitoring, sampling location and criteria for success. | 8.8.2.2 |
| DFO Authorization 16-HCAA-00370 Condition 5.1.1.3 | The proponent shall develop a schedule for the implementation of the offsetting measures, and shall provide this schedule to DFO no later than December 31, 2019 | 8.8.2.2 |
| DFO Authorization 16-HCAA-00370 Condition 5.1.1.4: | The Proponent shall provide an annual Whale Tail Pit Fish Habitat Offset monitoring Report to DFO (and interested parties) following the construction of the offsetting habitat by March 31. The Proponent is required to provide the Whale Tail Pit Fish Habitat Monitoring Report until DFO indicates this requirement has been met | 8.8.2.2 |
| DFO Authorization 16-HCAA-00370 Condition 5.1.1.5 and 20-HCAA-00275 Condition 5.2.2 | As part of the annual Whale Tail fish Habitat Offset Monitoring Report, the Proponent shall include, but not limited to:<br>- a digital photographic record with GPS coordinates of pre-construction, during construction and post construction conditions shall be compiled using the same vantage points and direction to show that the approved works have been completed in accordance with the offsetting plan<br>-a summary of field observations for each respective year as well as as-built survey<br>-a detailed analysis report summarizing the effectiveness of the offsetting measures | 8.8.2.2 |
| DFO Authorization 16-HCAA-00370 Condition 5.1.1.6 | Each year, following the submission of the annual Whale Tail Pit Fish Habitat Offset Monitoring Report to DFO, the Proponent shall arrange to meet with DFO and interested parties (e.g., KIA) to review the results of the previous year of the monitoring program. The results of the meetings and any mutually agreed upon modifications aimed at improving the effectiveness of the offsetting monitoring program shall be incorporated into the upcoming year of the monitoring programs. The Proponent shall update the Whale Tail Pit Fish Habitat Offset Monitoring Plan, to reflect the changes, and the plans shall be approved in writing by DFO prior to implementation | 8.8.2.3 |
| DFO Authorization 16-HCAA-00370 Condition 5.2.1 | As required by DFO Authorization 16HCAA-00370 Condition 5.2.1: The Proponent shall monitor to validate Agnico Eagle Mines Ltd.'s Habitat Suitability Index (HSI). The monitoring shall be conducted to the satisfaction of DFO. Where appropriate, the HSI will incorporate additional knowledge generated by the complementary measures research projects under | 8.8.2.1 |

| WHALE TAIL MINE | | |
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| **Authorization** | **Reporting Requirement** | **Report** |
| | section 4.2.2, in particular research project 4.2.2.1c, and adjust the Habitat Evaluation Procedure (HEP) model according to the results generated. The HSI will be use to refine, as necessary, the performance end-points in habitat units for offsetting | |
| DFO Authorization 20-HCAA-00275 Condition 5.2.1 | The Proponent shall provide a Whale Tail Expansion Fish Habitat Offset Monitoring Report to DFO including geotechnical and biological and ecological monitoring as per section 5.1.1. The Proponent is required to provide the Report by March 31 of 2027 and update annually for 10 years or until DFO indicates requirements of this Authorization have been met | 8.8.2.2 |
| DFO Authorization 20-HCAA-00275 Condition 5.2.3 | The Proponent shall provide a summary report of all Whale Tail Expansion Fish Habitat Offset Monitoring Reports described in section 5.2.1 before March 31, 2036 to DFO (and interested parties) which shall analyse results from the offsetting measures of the Whale Tail Expansion Project following the construction of the offsetting habitat. DFO reserves the right to request additional Summary Report if annual reporting were to continue until requirement has been met. | 8.8.2.2 |
| DFO Authorization 20-HCAA-00275 Condition 5.3.2 | The Proponent shall monitor to validate Agnico Eagle Mines Ltd.'s Habitat Suitability Index (HSI). The monitoring shall be conducted to the satisfaction of DFO. Where appropriate, the HSI will incorporate additional knowledge generated by the monitoring plans and complementary measures research projects of the Approved Project (PATH No.: 16-HCAA-00370) and adjust the Habitat Evaluation Procedure (HEP) model according to the results generated. The HSI will be used to refine, as necessary, the performance end-points in habitat units for offsetting | 8.8.2.1 |
| | | |
| CIRNAC Land Lease 66H/8-1-4, Condition 9 | The lessee shall file, annually, with the Minister in the manner and format stipulated, no later than sixty (60) days following the anniversary date of the effective date of this lease. The report shall include: | 3.4.2.1 |
| | i. Quantity of material removed and location of removal, for the immediately preceding calendar year; and | |
| | ii. Such other data as are reasonably required by the Minister from time to time. | |
| CIRNAC Land Lease 66H/8-1-4, Condition 27 | The lessee shall file, annually, a report for the preceding year, outlining the ongoing borrow area operations completed in conformity with the approved Borrow Management Plan, as well as any variations from the Plan. | 3.4.2.1 |
| CIRNAC Land Lease 66H/8-1-4 Condition 66 | If an archaeological site is discovered with the Land, the lessee shall immediately advise the Minister and the Territorial Archaeologist in writing. | 8.20.1 |
| CIRNAC Land Lease 66H/8-1-4, Condition 35 | The lessee shall file annually a report for the preceding year, outlining ongoing restoration completed in conformity with the approved Abandonment and Restoration Plan, as well as any variations from the said Plan. | 9.1.2.3 |
| CIRNAC Land Lease 66H/8-2-1, Condition 25 | The lessee shall file annually a report for the preceding year, outlining ongoing restoration completed in conformity with the approved Abandonment and Restoration Plan, as well as any variations from the said Plan. | 11.7.1.2 |
| CIRNAC Road lease 66H/8-2-1 Condition 60 | The lease shall before the first (1st) day of September in each and every year during the term of the lease, provide to the Minister, a report of that years road activities. The report shall include, but not limited to: | 11.7.1.2 |
| | (a) total number of loads hauled in that year | |
| | (b) total road operating cost for that year | |
| CIRNAC Road lease 66H/8-2-1 Condition 63 | The lessee agrees to monitor and report unauthorized non-mine use of the road, and collect and report this data to the Minister, who shall make this report accessible to the Nunavut Impact Review board, one (1) year after the road is opened and annually thereafter. | 11.7.1.2 |
| CIRNAC Road lease 66H/8-2-1 Condition 64 | The lessee agrees to report any information received, including accidents or others safety incidents on the road, including the locked gates, to the minister, who shall make this information accessible to the GN, KIA a, the Hamlet of Baker Lake immediately. | 11.7.2.2 |
| CIRNAC Road lease 66H/8-2-1 Condition 65 | The lessee shall give notice of any closure of the road to the Minister and the reasons thereof, and post any notice of closure at the access point and along the road. | 11.7.2.2.1 |
| | | |
| KIA Production Lease KVPL17D01 Condition 6.01 (10) | Deliver to KIA, not later than March 31, 2022 and not later than March 31st every three (3) years thereafter, a Conceptual Reclamation and Closure Plan and Reclamation Estimate, detailing the reclamation and remediation activities taken in the last three (3) years and to be undertaken in the next three (3) years and planned for the balance of the Term. That includes, | 9.1.2.1 |

| WHALE TAIL MINE | | |
|---|---|---|
| **Authorization** | **Reporting Requirement** | **Report** |
| | but not is not limited to the proposed methods and procedure for the progressive […] | |
| KIA Quarry Lease KVCA15Q02, Condition 14 | AEM shall conduct reclamation activities until November 22, 2018, in accordance with the Reclamation Plan attached Schedule 3. AEM shall annually thereafter submit to KIA a Reclamation Plan detailing the proposed reclamation activities for the upcoming year. | 9.1.2.3 |
| KIA Quarry Lease KVCA18Q01, Condition 20 | The permittee shall conduct reclamation activities during the first twelve months of the term of this Permit in accordance with the Reclamation Plan attached as Schedule 3. The permittee shall annually thereafter submit to the Association an Reclamation Plan detailing the proposed reclamation activities for the upcoming year. | 9.1.2.3 |
| KIA Quarry Lease KVCA15Q01, Condition 13 | The permittee shall conduct reclamation activities during the first twelve months of the term of this Permit in accordance with the Reclamation Plan attached as Schedule 3. The permittee shall annually thereafter submit to the Association an Reclamation Plan detailing the proposed reclamation activities for the upcoming year. | 9.1.2.3 |

**Table 1-2 Meadowbank and Whale Tail Summary of Samples Stations**

| MEADOWBANK MINE | | | |
|---|---|---|---|
| **NWB Station** | **Description** | **Phase** | **2022 Reporting Status** |
| ST-DC-1 to TBD | Monitoring stations during Dike Construction as defined in Part D Item 5 | Construction | Not applicable in 2022 |
| ST-DD-1 to TBD | Monitoring stations during Dike Dewatering as defined in Part D Item 5 | Construction | Not applicable in 2022 |
| ST-1 | Water Intake for camp, mill and re-flooding | Water Intake for camp, mill and re-flooding | Section 4.1.1 |
| ST-1W | Water Intake for re-flooding | Water Intake for camp, mill and re-flooding | Not applicable in 2022 |
| ST-3 | Water Intake for Emulsion Plant | Late operation, closure | Section 4.1.1.3 |
| ST-4 | Water reclaimed from Tailings Storage Facility | Late operation, closure | Section 4.1.1 |
| ST-5 | Portage Area (east) diversion ditch | Late operation, closure | Section 8.5.3.1.2 |
| ST-6 | Portage Area (west) diversion ditch | Late operation, closure | Section 8.5.3.1.2 |
| ST-8 | East Dike Seepage Discharge | Late operation, closure | Section 8.5.3.1.3 |
| ST-9 | Portage Attenuation Pond prior to discharge through Third Portage Lake Outfall Diffuser | Early operation | Not applicable in 2022 |
| ST-10 | Vault Attenuation Pond prior to discharge through Wally Lake Outfall Diffuser | Late operation | Not applicable in 2022 |
| ST-11 | Tailings Storage Facility | Post closure | Not applicable in 2022 |
| ST-12 | Portage/ Goose Pit Lake | Post closure | Not applicable in 2022 |
| ST-13 | Vault Pit Lake | Post closure | Not applicable in 2022 |
| ST-14 | Discharge to the land from Landfarm sump at mine site | Late operation, closure | Section 8.5.3.1.22 |
| ST-16 | Portage Rock Storage Facility | Late operation, closure | Section 8.5.3.1.7 |
| ST-17 | North Portage Pit Sump | Operations | Section 8.5.3.1.8 |
| | Portage Pit Lake | Late operation, closure | Not applicable in 2022 |
| ST-19 | South Portage Pit Sump | Early operations | Section 8.5.3.1.9 |
| | Portage Pit Lake | Late operations | Not applicable in 2022 |
| ST-20 | Goose Island Pit Sump | Early operations | Section 8.5.3.1.10 |
| | Goose Island Pit Lake | Late operations, closure | Not applicable in 2022 |
| ST-21 | Tailings Storage Facility | Late operations | Section 8.5.3.1.11 |
| ST-22 | Tailings Storage Facility | Closure (drainage runoff) | Not Applicable in 2022 |
| ST-23 | Vault Pit Sump | Late operations | Not Applicable in 2022 |
| ST-24 | Vault Rock Storage Facility | Late operation, closure | Section 8.5.3.1.13 |
| ST-25 | Vault Attenuation Pond | Late operation | Section 8.5.3.1.14 |
| ST-26 | Vault Pit Lake | Closure | Section 8.5.3.1.12 |
| ST-30 | WEP 1 | Late operations, closure | Section 8.5.3.1.15 |
| ST-31 | WEP 2 | Late operations, closure | Section 8.5.3.1.15 |
| ST-32 | Saddle Dam 3 | Late operations, closure | Section 8.5.3.1.16 |
| ST-S-1 to TBD | Seeps (to be determined) | Late operations, closure | Sections 8.5.3.1.4, 8.5.3.1.17, 8.5.3.1.18 |

| MEADOWBANK MINE | | | |
|---|---|---|---|
| **NWB Station** | **Description** | **Phase** | **2022 Reporting Status** |
| ST-GW-1 to TBD | Groundwater wells (to be determined) | Late operations, closure | Section 8.7.1 |
| ST-AEMP-1 to TBD | Receiving AEMP | Late operations, closure | Section 8.12 |
| ST-MMER-1 to TBD | Vault, East dike and Portage effluent outfall | Late operations | Section 8.3.1 |
| ST-37 | Secondary containment sump at the Bulk Fuel Storage Facility at Meadowbank | Late operation, closure | Sections 8.5.5.1 |
| ST-38 | Secondary containment at the Bulk Fuel Storage Facility in Baker Lake - Jet-A containment | Late operation, closure | Sections 8.5.5.2 |
| ST-40.1 | Secondary containment sump at the Bulk Fuel Diesel Storage Facility in Baker Lake (Fuel tanks 5&6) | Late operation, closure | Sections 8.5.5.2 |
| ST-40.2 | Secondary containment sump at the Bulk Fuel Diesel Storage Facility in Baker Lake (Fuel tanks 1-4) | Late operation, closure | Sections 8.5.5.2 |
| ST-40.3 | Secondary containment sump at the Bulk Fuel Diesel Storage Facility in Baker Lake (Fuel tanks 7-8) | Late operation, closure | Sections 8.5.5.2 |
| ST-41 Lake | Phaser Pit Lake | Late operations | Section 8.5.3.1.19 |
| ST-42 Lake | BB Phaser Pit Lake | Late operations | Section 8.5.3.1.20 |
| ST-43 | Phaser Attenuation Pond | Late operations | Section 8.5.3.1.21 |

| WHALE TAIL MINE | | | |
|---|---|---|---|
| **NWB Station** | **Description** | **Phase** | **2022 Reporting Status** |
| ST-WT-DC-1 to TBD | Monitoring stations during Dike Construction as defined in Part D Item 5 | Construction | Section 8.12.4.1.2 |
| ST-WT-DD-1 to TBD | Monitoring stations during Dike Dewatering as defined in Part D Item 5 | Construction | Not Applicable in 2022 |
| ST-WT-S-1 to TBD | Seeps (to be determined) | Operations | Section 8.5.3.2.10 |
| | | Closure | Not applicable in 2022 |
| ST-WT-GW-1 to TBD | Groundwater wells (to be determined) as required under Groundwater Monitoring Plan | Operations | Section 8.7.2 |
| | | Closure | Not applicable in 2022 |
| ST-WT-1 | Attenuation Pond, pre-treatment | Operations | Section 8.5.3.2.1 |
| ST-WT-2 | Attenuation Pond, post-treatment; last point of control before discharge to Mammoth Lake via the West Diffuser | Operations | Not applicable in 2022 |
| ST-WT-2a | Attenuation Pond, post-treatment; last point of control before discharge to Mammoth Lake via the East Diffuser | Operations | Section 8.5.3.2.15.1 |
| ST-WT-2b | Attenuation Pond, post-treatment; last point of control before discharge to Mammoth Lake via the Winter Diffuser | Operations | Not applicable in 2022 |
| ST-WT-3 | Waste Rock Storage Facility (WRSF) Pond prior to pumping to Attenuation Pond | Operations Closure | Section 8.5.3.2.3 |
| | Waste Rock Storage Facility (WRSF) Pond prior to discharge to Mammoth Lake | Post-Closure | Not applicable in 2022 |
| ST-WT-4 | Whale Tail Pit or pit sump | Operations | Section 8.5.3.2.4 |
| ST-WT-5 | Water Intake from Nemo Lake | Construction Operations | Sections 4.1.2.1 |
| ST-WT-6 | Lake A47 | Construction Operations Closure | Section 8.5.3.2.6 |
| ST-WT-7 | East diversion channel | Operations | Not applicable in 2022 |
| ST-WT-8 | Water Intake from Whale Tail Lake | Closure | Not applicable in 2022 |
| ST-WT-9 | North Whale Tail Lake (as the basin fills and when it is connected to the south basin and prior to or when connected to the downstream environment) | Closure Post-Closure | Not applicable in 2022 |
| ST-WT-10 | Pit Lake (as the Pit fills) | Closure Post-Closure | Not applicable in 2022 |

| WHALE TAIL MINE | | | |
|---|---|---|---|
| **NWB Station** | **Description** | **Phase** | **2022 Reporting Status** |
| ST-WT-11 | Sewage Treatment Plant | Operations<br>Closure | Section 8.5.4.2 |
| ST-WT-12 | Secondary containment at Whale Tail Bulk Fuel Storage Facility | Operations<br>Closure | Section 8.5.5.3 |
| ST-WT-13 | Lake A45 | Operations<br>Closure | Section 8.5.3.2.7 |
| ST-WT-14 | Lake A16 outlet | Construction<br>Operations<br>Closure | Section 8.5.3.2.8 |
| ST-WT-15 | Lake A15 | Construction<br>Operations<br>Closure | Section 8.5.3.2.9 |
| ST-WT-16 | Secondary containment at Whale Tail Bulk Fuel Storage Facility Power Plant | Operations<br>Closure | Section 8.5.5.3 |
| ST-WT-17 | Whale Tail Dike Seepage | Operations<br>Closure | Section 8.5.3.2.10 |
| ST-WT-18 | IVR Pit or IVR Pit sump | Operations | Section 8.5.3.2.5 |
| ST-WT-19 | IVR Pit Lake (as the pit fills) | Closure and post-closure | Not applicable in 2022 |
| ST-WT-20 | Groundwater Storage Pond 1 (GSP-1) | Operations | Section 8.5.3.2.16 |
| ST-WT-21 | Groundwater Storage Pond 2 (GSP-2) | Operations | Not applicable in 2022 |
| ST-WT-22 | Groundwater Storage Pond 3 (GSP-3) | Operations | Not applicable in 2022 |
| ST-WT-23 | IVR Attenuation Pond, pre-treatment | Operations<br>Closure | Section 8.5.3.2.2 |
| ST-WT-24 | IVR Attenuation Pond, post-treatment; last point of control before discharge to Whale Tail South Basin via the Permanent Diffuser | Operations | Section 8.5.3.2.15.2 |
| ST-WT-24a | Whale Tail Attenuation Pond, post-treatment; last point of control before discharge to Whale Tail South Basin via the Temporary Diffuser | Operations | Not applicable in 2022 |
| ST-WT-25 | Whale Tail Pit Lake (North Wall) | Closure | Not applicable in 2022 |
| ST-WT-26 | Whale Tail South Water Transfer to Mammoth Lake Permanent Diffuser | Construction | Not applicable in 2022 |
| ST-WT-26a | Whale Tail South Water Transfer to Mammoth Lake Temporary Diffuser | Construction | Not applicable in 2022 |
| ST-WT-27 | Discharge from Landfarm | Operations<br>Closure | Section 7.2.2 |
| ST-WT-28 | IVR WRSF Pond prior to pumping to Attenuation Pond | Operations<br>Closure | Section 8.5.3.2.13 |
| ST-WT-29 | Water intake from Lake D1 | Closure | Not applicable in 2022 |
| ST-WT-30 | Water Ponding around Whale Tail WRSF | Operations<br>Closure<br>Post-closure | Section 8.5.3.2.12 |
| ST-WT-31 | Water Ponding around Whale Tail WRSF | Operations<br>Closure<br>Post-closure | Section 8.5.3.2.12 |
| ST-WT-32 | Water Ponding around Whale Tail WRSF | Operations<br>Closure<br>Post-closure | Section 8.5.3.2.12 |
| ST-WT-33 | Water Ponding around Whale Tail WRSF | Operations<br>Closure<br>Post-closure | Section 8.5.3.2.12 |
| ST-WT-34 | Water Ponding around IVR WRSF | Operations<br>Closure<br>Post-closure | Section 8.5.3.2.13 |
| ST-WT-35 | Water Ponding around IVR WRSF | Operations<br>Closure<br>Post-closure | Section 8.5.3.2.13 |

| WHALE TAIL MINE | | | |
|---|---|---|---|
| **NWB Station** | **Description** | **Phase** | **2022 Reporting Status** |
| ST-WT-36 | Water Ponding around IVR WRSF | Operations<br>Closure<br>Post-closure | Section 8.5.3.2.13 |
| ST-WT-37 | IVR Diversion Channel | Operations | Section 8.5.3.2.14 |

# SECTION 2. SUMMARY OF ACTIVITIES

## 2.1 2022 ACTIVITIES

Agnico Eagle's ability to consistently execute its business strategy has provided a solid foundation for growth. These three pillars – performance, pipeline and people – form the basis of Agnico Eagle's success and competitive advantage. By delivering on them, the Company strives to continue to build its production base and generate increased value for shareholders, while making meaningful contributions to its employees and communities.

In December 2021, as a result of the increase in COVID-19 cases at its Nunavut operations, the Company took the precautionary step to send home the Nunavummiut workforce and reduce site activities. All site activities ramped back to normal operating levels from mid-January into February 2022. The return of the Nunavummiut workforce started on March 14th, 2022, after consultation with the Nunavut Government and other local stakeholders. The reintegration was completed in early April 2022.

In the full year 2022, gold production increased when compared to the prior-year period primarily due to higher gold grades and higher tonnage resulting from a strong operating performance, including a full year of underground production and a higher than anticipated grade sequence in the Whale Tail and IVR open pits in the third quarter of 2022.

Production costs per tonne in the full year 2022 increased when compared to the prior year period primarily due to higher site services costs related to inflationary pressures on fuel and transportation, partially offset by the timing of unsold inventory and a higher deferred stripping adjustment. Production costs per ounce in the full year 2022 decreased when compared to the prior-year period due to higher gold grades, partially offset by higher production costs per tonne.

Minesite costs per tonne in the full year 2022 increased when compared to the prior-year period primarily due to the factors described above. Total cash costs per ounce in the full year 2022 increased when compared to the prior-year period as higher gold grades were offset by higher minesite costs per tonne.

A deep drilling campaign into extensions of known deposits at Whale Tail in 2022 resulted in several high-grade intersections over substantial widths that demonstrate the potential to extend underground mine life. Highlights of 2022 include hole AMQ22-2877A which intersected 10.3 g/t gold over 11.0 metres at 778 metres depth in the V2 Zone of the IVR deposit and hole AMQ22-2876A which intersected 7.4 g/t gold over 9.1 metres at 1,000 metres depth in the QZ03 Zone of the Whale Tail deposit.

At the Meadowbank Complex, the production forecast is higher in 2023 and 2024 when compared to Previous Guidance. In 2022, the Company completed an internal evaluation to optimize the open pit to underground crossover point. This evaluation resulted in the decision to raise the pit bottom by approximately 30 metres and to increase the open pit mining rate to 37.0 Mtpa, in line with 2022 open pit performance. With these changes, the open pit stripping ratio was reduced in 2023 and 2024 and gold production was brought forward.

Whale Tail underground is forecast to contribute approximately 100,000 ounces of gold in 2023, 2024 and 2025.

The 2022 highlights for the Meadowbank Complex include:

- Whale Tail achieved its record annual production in 2022, eclipsing prior year production by approximately 50,000 ounces of gold and increasing annual mill throughput by over 300,000 tonnes (including pre-commercial production), while achieving commercial production at the Whale Tail underground deposit on August 1st, 2022.

- In the fourth quarter of 2022, the open pit entered into a lower gold grade area at Whale Tail and IVR and a higher waste stripping period that is expected to last through 2023.

- In the fourth quarter of 2022, mill throughput was affected by high sulphur content ore and the ongoing ramp-up of the high pressure grinding roll system while gold recovery was affected by a leach tank that was down during the month of October. The Company continues to ramp up the use of the high pressure grinding rolls following the commissioning of the project in the second quarter of 2022.

- The underground mine continued to ramp up through the fourth quarter of 2022 experiencing some challenges with equipment availability as new equipment were being commissioned.

- The Company experienced below target results from the newly commissioned cemented rockfill plant and has been using a temporary mobile system during the ramp-up phase. An action plan to address the performance of the cemented rockfill plant is currently being prepared.

Every year, the caribou migration is factored into the Company's production plan. This migration can impact the ability to move materials on the road between Whale Tail and Meadowbank and between Meadowbank and Baker Lake. Wildlife management is an important priority and the Company is working with Nunavut stakeholders to find the best solutions to safeguard wildlife and minimize production disruptions.

Quarterly progress reports, providing further details of activities throughout the 2022 year, were prepared for the Kivalliq Inuit Association as required by Production Lease KVPL08D280 and KVPL17D01.

Agnico Eagle infrastructure locations can be found in Figure 1, 2, 3, 4, 5 and 6.

**Figure 1 Meadowbank Site 2022 Sampling Locations**

**Figure 2 EEM Receiving Environment 2022 Sampling Locations**

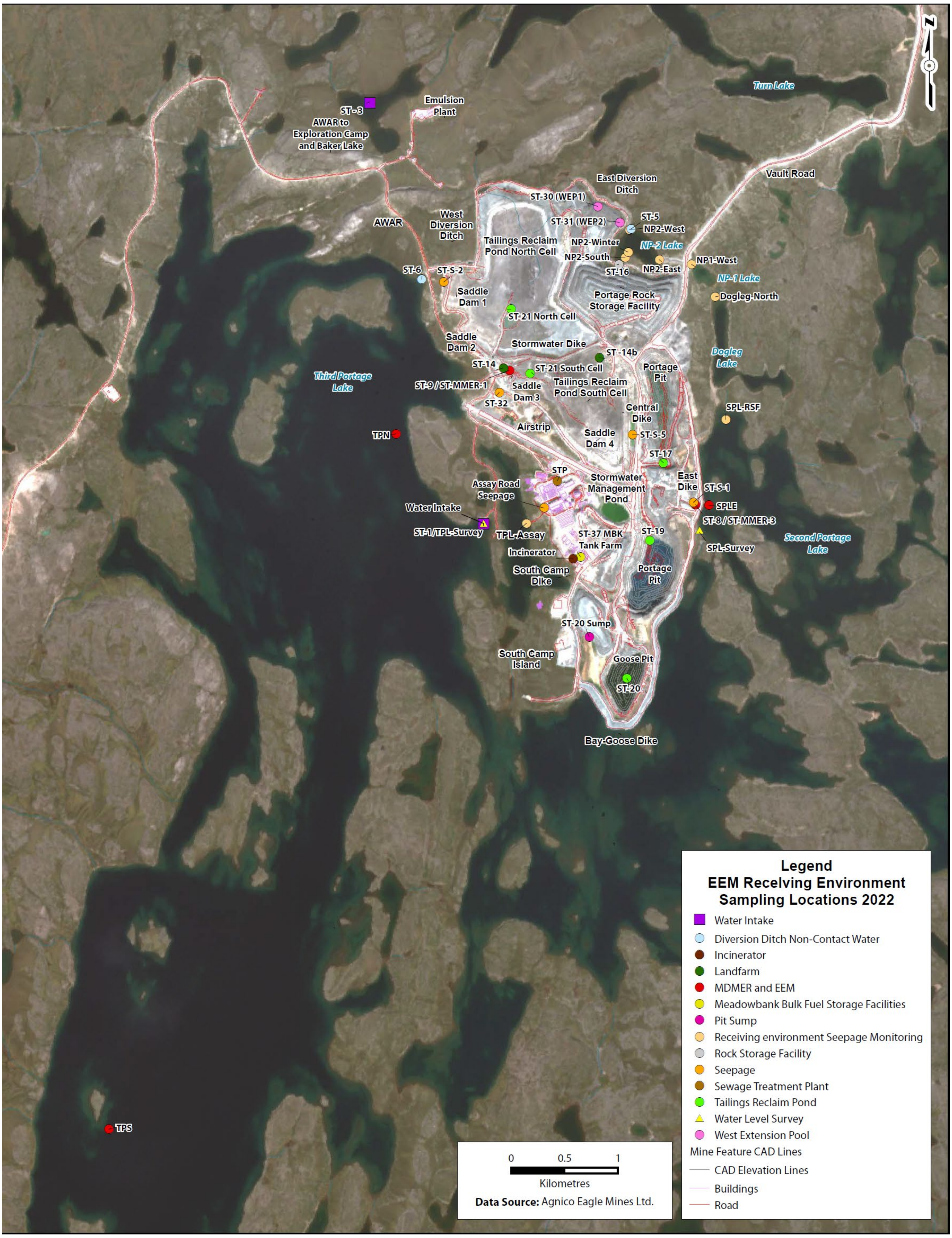


**Figure 3 Vault Area 2022 Sampling Locations**

**Figure 4 Whale Tail Site 2022 Sampling Locations**

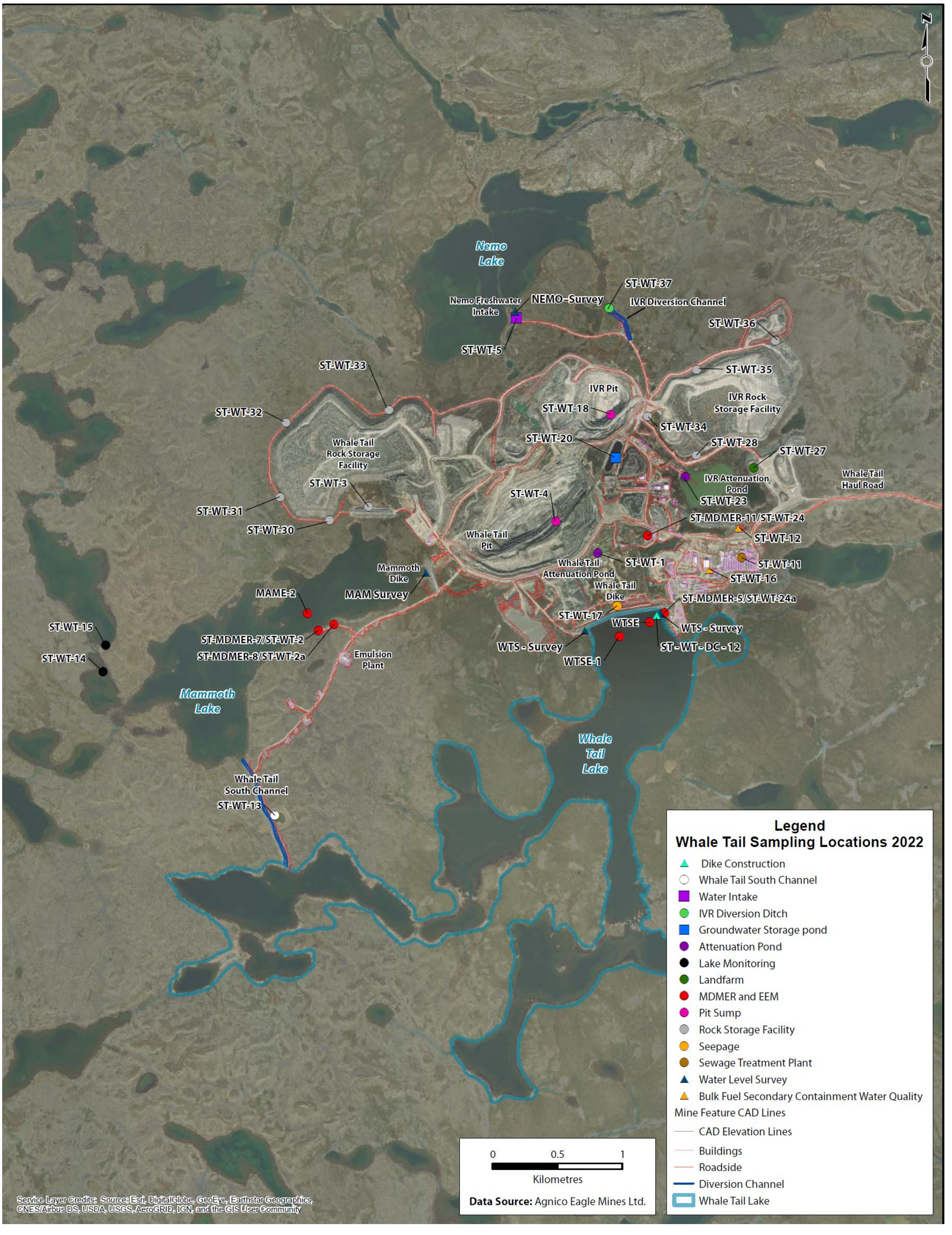


**Figure 5 General View from Baker Lake to Whale Tail Mine**

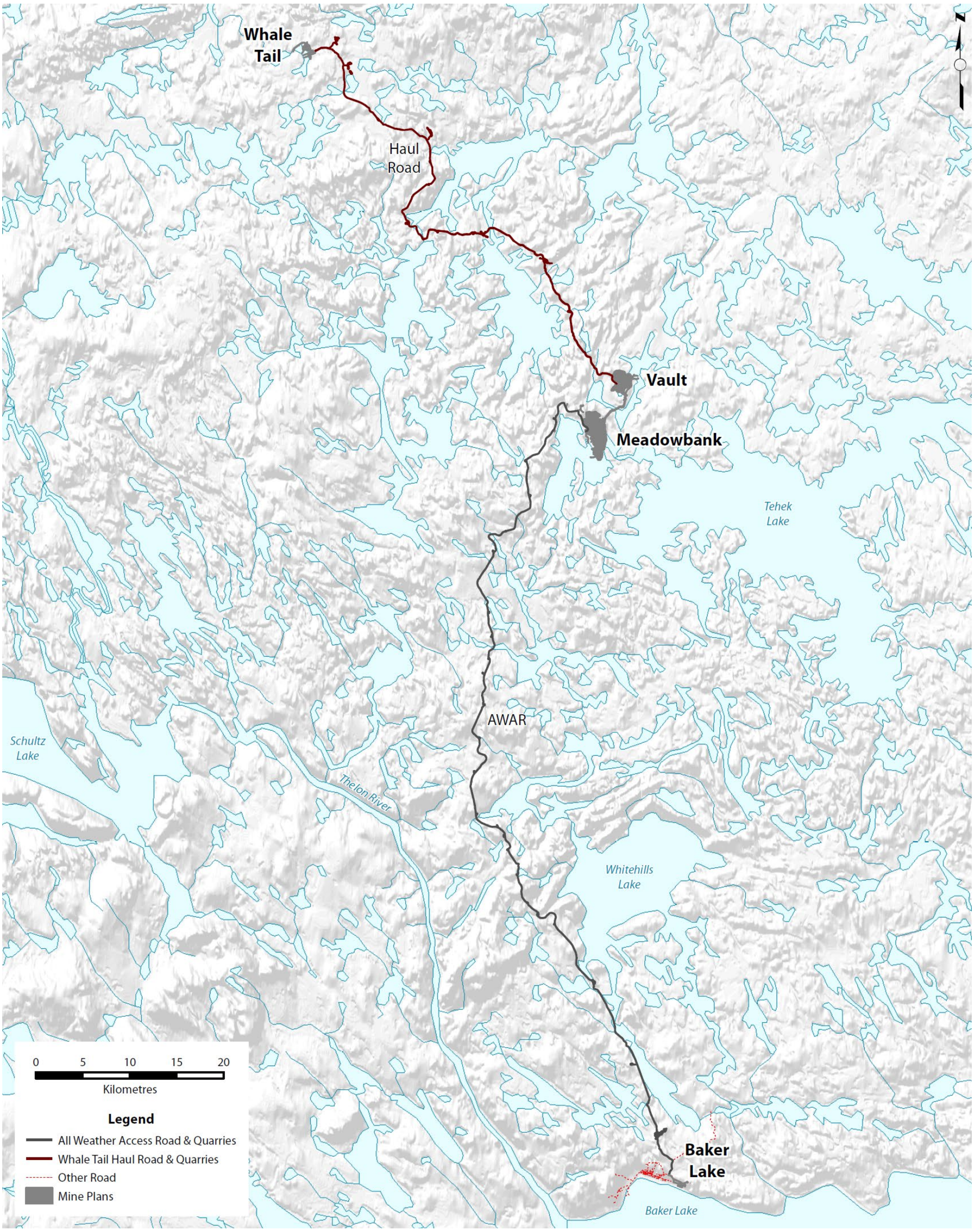


**Figure 6 Baker Lake Marshalling Area 2022 Sampling Locations**

## 2.2 2023 MINE PLAN / WORK PLAN

### 2.2.1 2023 Mine Plan Meadowbank Site

The 2023 Mine Plan for the Meadowbank Mine, prepared for the Kivalliq Inuit Association as required by Production Lease KVPL08D280 was submitted to the KivIA on December 21st, 2022, and outlines the activities planned for the project throughout the 2023 year.

The Meadowbank Mine began the operation phase of the project in February 2010, and thus, is entering its thirteenth year of operations. In addition to routine activities throughout the 2023 season, a number of secondary construction/modification projects will be undertaken near the main mine site area. Tailings will be mainly deposited in the Portage Pit E. If necessary, tailings deposition may occur in Portage Pit A, Goose Pit and in the Tailings Storage Facility North and South Cell to optimize the landform.

In 2023, under the current Life of Mine, no mining activity is planned to occur at Meadowbank as all the pit resources were exhausted in 2019. As no mining is planned, there is no waste rock planned to be managed.

Environmental monitoring (wildlife, aquatic effects, groundwater, noise and air) will continue through 2023 in support of all operational undertakings at the Meadowbank site as required by the NWB Type A Water License 2AM-MEA1530, NIRB Project Certificate No.004, DFO authorizations and MDMER regulation.

The Meadowbank All-Weather Access Road (AWAR) 2023 Work Plan, prepared for the KivIA as required by Lease KVRW06F04, was submitted to the KivIA on December 21st, 2022, and detailed planned road maintenance and operation activities along the All-Weather Access Road throughout the 2023 year. Environmental monitoring (wildlife, dust suppression, waste management, air and water quality) will continue through 2023.

On December 21st, 2022, Agnico Eagle submitted to KivIA the 2023 Work Plan for Quarry Permit KVCA06Q11. This Work Plan details planned activities for the quarries along the AWAR throughout the 2023 year. As per the Work Plan, Agnico Eagle is currently not planning to remove quarry material in 2023. Should planning change, Agnico Eagle will ensure that the material to be removed stay within the allowable volume prescribed in the authorized permit and will pay the associated material removal fees. Environmental monitoring will continue through 2023.

### 2.2.2 2023 Work Plan Whale Tail Site

The 2023 Mine Plan for the Whale Tail Mine, prepared for the Kivalliq Inuit Association as required by Production Lease KVPL17D01 was submitted to the KivIA on December 21st, 2022 and outlines the activities planned for the project throughout the 2023 year.

The Whale Tail Mine began the commercial production on September 2019, and thus, will be completing its fourth year of production in 2023. In addition to routine activities throughout the 2023 year, a number of secondary construction/modification projects will be undertaken near the main mine site. Ore will continued to be hauled to Meadowbank Mine for milling process.

The Whale Tail Haul Road 2023 Work Plan, prepared for the KivIA as required by Lease KVRW15F01, was submitted to the KivIA on December 21st, 2022, and detailed planned road maintenance and operation activities along the Whale Tail Haul Road throughout the 2023 year. Environmental monitoring (wildlife, dust suppression, waste management, air and water quality) will continue through 2023.

On February 14th, 2023, Agnico Eagle submitted to KivIA the 2023 Work Plans for Esker Permits KVCA15Q01 and KVCA15Q02. As these permits are currently in the renewal process, the Work Plans were submitted after the January 1st, 2023 deadline upon request from the KivIA. These Work Plans detail planned activities for the quarry/esker along the Whale Tail Haul Road throughout the 2023 year. As per the Work Plans, Agnico Eagle is currently not planning to remove esker and quarry material in 2023. Should this planning change, Agnico Eagle will ensure that the material to be removed stay within the allowable volume prescribed in the authorized permit and will pay the associated material removal fees. Environmental monitoring will continue through 2023.

On February 22nd, 2023, Agnico Eagle submitted to KivIA the 2023 Work Plan for Quarry Permit KVCA18Q01 as part of an amendment to include quarries at Km 8 and Km 2.5. As per the Work Plan, Agnico Eagle planning on removing quarry material from Quarry km 2.5 in 2023 once the permit amendment has been approved by the KivIA. Should this plan change, or if material is required from other quarries authorized under this permit, Agnico Eagle will ensure that the material to be removed stays within the allowable volume prescribed in the authorized permit and will pay the associated material removal fees Environmental monitoring will continue through 2023.

### 2.2.3 NIRB Screening Decision No. 11EN010

As requested by NIRB in the screening decision File No.11EN010, Agnico Eagle included within this annual report (Appendix 3), a comprehensive annual report of the activities associated with the project.

# SECTION 3. CONSTRUCTION / EARTHWORKS

The following sections discusses reporting requirements related to site construction and earthworks activities associated with dikes, dams and quarries.

## 3.1 DIKES AND DAMS

### 3.1.1 Meadowbank Site

#### 3.1.1.1 *Performance Evaluation*

**As required by NWB Water License 2AM-MEA1530, Schedule B, Item 1:**

***a. An overview of methods and frequency used to monitor deformations, seepage and geothermal responses;***

The surveillance program for the dewatering dikes and the tailings storage facility structures include site observation, inspection and instrument monitoring. Details of these surveillance programs and their frequencies are presented in the surveillance section of the Tailings Storage Facility (TSF) Operation Maintenance and Surveillance (OMS) Manual (Appendix 36) and in the Dewatering Dike OMS Manual (Appendix 35).

The main surveillance activities are:

- Site observation – conducted by personnel working near or on the structure and occur as part of their daily activities
- Routine visual inspection – conducted on a pre-defined schedule and targeting specific activities
- Instruments monitoring – includes the review of instrumentation data including thermistors, piezometers, inclinometers, blast monitoring, seepage flow monitoring, and settlement monitoring. Instruments data are checked on a pre-determined frequency and reported on a pre-determined frequency based on the structure performance
- Annual geotechnical inspection – comprehensive technical inspection integrating inspections and results of monitoring instruments. Done by an external geotechnical engineer on a yearly basis. Results are presented to the Independent reviewer (Meadowbank Dike Review Board)
- Independent Review Board Meeting (MDRB) - an annual MDRB meeting is held every year. The following topics are part of the annual MDRB scope of work:
    - Site visit of all infrastructure covered by the scope of the MDRB
    - Review of tailings management strategy
    - Review water management infrastructure designs and performance
    - Review of on-going construction works and monitoring data

- Provide opinions and guidance to the operation on the physical integrity, safety, behavior, and performance of the confinement systems for tailings and water retaining infrastructures

***b. A comparison of measured versus predicted performance;***

A detailed comparison and analysis of the measured versus predicted performance can be found in the 2022 Annual Geotechnical Inspection Report presented in Appendix 9. This assessment is based on visual inspection and analysis of instrumentation monitoring.

Table 3-1 presents the updated Trigger Action Response Plan (TARP) level of each dike at Meadowbank which is an indicator of measured versus predicted performance. A green level means that the performance of the structure is per normal operating condition while yellow means that performance has started to deviate from the normal operating condition. Surveillance will continue to assess the performance of the structures as per OMS practice and the surveillance data are used to evaluate the TARP level of each structure and the required action.

**Table 3-1 Operating Condition of Dikes at Meadowbank**

| Structure | Type | TARP Level | Comments |
|---|---|---|---|
| East Dike | Dewatering Dike | Green (normal operating condition) | Presence of seepage but still within normal operating condition |
| Bay-Goose Dike | Dewatering Dike | Green (normal operating condition) | Presence of seepage but still within normal operating condition |
| South Camp Dike | Dewatering Dike | Green (normal operating condition) | |
| Vault Dike | Dewatering Dike | Green (normal operating condition) | |
| Saddle Dam 1 | Tailings Dike North Cell Periphery | Green (normal operating condition) | |
| Saddle Dam 2 | Tailings Dike North Cell Periphery | Green (normal operating condition) | |
| RF1 | Tailings Dike North Cell Periphery | Green (normal operating condition) | |
| RF2 | Tailings Dike North Cell Periphery | Green (normal operating condition) | |
| North Cell Internal Structure | Tailings Dike North Cell Internal Structure | Green (normal operating condition) | Presence of small erosion feature on the upstream slope. Situation is stable |
| Stormwater Dike | Tailings Dike Internal Structure | Green (normal operating condition) | Presence of healed tension crack. Situation is stable |
| Saddle Dam 3 | Tailings Dike South Cell Periphery | Green (normal operating condition) | |
| Saddle Dam 4 | Tailings Dike South Cell Periphery | Green (normal operating condition) | |
| Saddle Dam 5 | Tailings Dike South Cell Periphery | Green (normal operating condition) | |
| Central Dike | Tailings Dike South Cell Periphery | Yellow (deviation from normal operating condition) | Due to historically high seepage rate through bedrock foundation |

At Central Dike, the performance of the structure is deviating from normal operating condition due to the presence of a high amount of seepage through the bedrock foundation. This condition started in 2014 but has stabilised in the past years to something predictable and manageable.

More details are available in the 2022 Annual Geotechnical Inspection available in Appendix 9 and in the 2022 Meadowbank Water Management Plan Version 11 (Appendix 12).

North Cell Internal Structure

During the freshet of 2020 some local signs of instability (sloughing and tension cracks) were observed in the fine filter layer of the NCIS structure on the Eastern side of the North Cell and were reported on in the 2020 Annual Report. A remediation plan was successfully implemented in 2021 to repair the damage observed and ensure that water stops channeling at the toe of the structure.

In 2022 additional erosion features and tension cracks (10-20 mm wide) were once again observed in the fine filter layer of the NCIS structure in the East Sector. The phenomena was located in similar area than in 2020 but at a lesser scale and is not impacting the performance of the structure. This situation is considered an on-going maintenance item. Agnico Eagle will closely monitor and repair these areas in 2023 and develop a strategy to alleviate these issues for the future.

***c. A discussion of any unanticipated observations including changes in risk and mitigation measures implemented to reduce risk;***

Central Dike

Seepage into the basin at the downstream toe of Central Dike was observed when tailings deposition was transferred from the North Cell of the TSF to the South Cell in 2014. The rate of seepage started to increase proportionally to the rise of the pond level of the South Cell and reached a peak of 946 $m^3$/hr in 2015. Desktop studies were undertaken by Golder in 2015 to estimate the seepage flows and pore water pressures, verify the dike stability, and attempt to predict the eventual flow volume that would report to the downstream toe for higher pond elevations. The main recommendation from this desktop study was to maintain beaches adjacent to Central Dike and to maintain a 'back pressure' on the downstream side of Central Dike in order to reduce the hydraulic gradient by holding the downstream pond at El. 115 m.

Willowstick was also hired to carry out geophysical soundings (electromagnetic survey) to detect seepage paths. The geophysical campaign led to additional recommendations and identified possible seepage path locations. Following the geophysical investigation, an investigation was conducted by SNC-Lavalin (SNC) and Agnico Eagle in December 2015 at station CD-595, and between CD-810 and CD-850. Highly altered and fractured bedrock was encountered and high hydraulic conductivity was measured from Packer testing. Instrumentation of the four boreholes with piezometers and thermistors was done at the same time. In 2016, the MDRB recommended that the seepage model and stability analyses be updated.

A study was completed in 2017 to update the seepage modelling and stability assessment with a seepage flow through the bedrock. In the summer of 2017 an investigation and instrumentation campaign was performed by Golder to confirm the results of the seepage modelling. The results from this investigation support the hypothesis that the seepage pathway occurs in the bedrock.

Historically the Central Dike seepage was pumped back into the South Cell. From September to October 2017 the seepage was transferred to Goose Pit as a mitigation measure. This measure, combined with an adapted tailings deposition plan was effective in reducing the seepage flow rate. As a result the average seepage rate at Central Dike decreased from 540 $m^3$/h in 2017 to 263 $m^3$/hr at the end of 2018.

In July 2019 tailings deposition was switched to Goose Pit and the Central Dike seepage was directed in Pit A. This had the impact of further decreasing the Central Dike seepage rate which reached 50 $m^3$/hr at the end of 2019. The yearly seepage rate trend has remained somewhat stable since then.

In the summer of 2017 the water in the downstream pond became orange and this was associated with rapid temperature variation. This event was investigated by chemical analysis and was found to be caused by the precipitation of iron oxide from bacterial process. As predicted this event re-occurred in the summer of 2018 through 2022.

***d. As-built drawings of all mitigation works undertaken;***

No mitigation work was performed on any dikes in 2022.

***e. Any changes in the design and/or as-built condition and respective consequences of any changes to safety, water balance and water quality;***

No change in design or as-built condition was done on any dikes in 2022.

***f. Data collected from instrumentation used to monitor earthworks and an interpretation of that data;***

Sections 3.0 and 5.0 of the 2022 Annual Geotechnical Inspection by WSP Golder, provided in Appendix 9, present the instrumentation data collected in 2022 and their interpretation.

***g. A summary of maintenance work undertaken as a result of settlement or deformation of dikes and dams; and***

In the summer of 2022, historic depression zones within the thermal capping on the crest of Bay-Goose Dike were filled to ease visual monitoring of the crest.

***h. The monthly and annual quantities of seepage from dikes and dams in cubic metres;***

Section 8.5.8.1 and Section 8.5.3.1 below presents the monthly quantities of seepage from dikes. More information can be found in the 2022 Meadowbank Water Management Plan Version 11 (Appendix 12).

### 3.1.2 Whale Tail Site

#### 3.1.2.1 *Performance Evaluation*

**As required by NWB Water License 2AM-WTP1830 Part I, Item 14:** ***The Licensee shall submit the results and interpretation of the Seepage monitoring required in Part I Item 13 in the Annual Report required under Part B, Item 2***

And

**As required by Water License 2AM-WTP1830, Schedule B, Item 1*:***

***a. An overview of methods and frequency used to monitor deformations, Seepage and geothermal responses;***

The surveillance program for the water management infrastructure includes site observation, inspection and instrument monitoring. Details of these surveillance programs and their frequencies are presented in the surveillance section of the Whale Tail Water Management Infrastructures Operation, Maintenance, and Surveillance (OMS) Manual (Appendix 37).

The main surveillance activities are:

- Site observation – conducted by personnel working near or on the structure and occur as part of their daily activities

- Routine visual inspection – conducted on a pre-defined schedule and targeting specific activities

- Instruments monitoring – includes the review of instrumentation data including thermistors, piezometers, inclinometers, blast monitoring, seepage flow monitoring, and settlement monitoring. Instruments data are checked on a pre-determined frequency and reported on a pre-determined frequency based on the structure performance

- Annual geotechnical inspection – comprehensive technical inspection integrating inspections and results of monitoring instruments. Done by an external geotechnical engineer on a yearly basis.

- Independent Review Board Meeting (MDRB) - An annual MDRB meeting will be held every year. The following topics are part of the annual MDRB scope of work:
    - Site visit of all infrastructure covered by the scope of the MDRB
    - Review water management infrastructure designs and performance
    - Review of on-going construction works and monitoring data
    - Provide opinions and guidance to the operation on the physical integrity, safety, behavior, and performance of the confinement systems for water retaining infrastructures.

***b. A comparison of measured versus predicted performance;***

A detailed comparison and analysis of the measured versus predicted performance can be found in the 2022 Annual Geotechnical Inspection report presented in Appendix 9. This assessment is based on visual inspection and analysis of instrumentation monitoring.

Table 3-2 presents the updated Trigger Action Response Plan (TARP) level of each dike at the Whale Tail Site which is an indicator of measured versus predicted performance. A green level means that the performance of the structure is per normal operating condition while yellow means that performance has started to deviate from the normal operating condition. Surveillance will continue to assess the performance of the structures as per OMS practice and the surveillance data are used to evaluate the TARP level of each structure and the required action.

**Table 3-2 Operating Condition of Dikes at Whale Tail**

| Structure | Type | TARP Level | Comments |
|---|---|---|---|
| Mammoth Dike | Dewatering Dike | Green (normal operating condition) | |
| Whale Tail Dike | Dewatering Dike | Yellow (deviation from normal operating condition) | Due to high seepage rate underneath the embankments in the foundation |
| WRSF Dike | Dewatering Dike | Green (normal operating condition) | TARP level was decreased from yellow to green in May 2020 following remediation work completion |
| IVR Dike D1 | Dewatering Dike | Green (normal operating condition) | Was raised to Yellow from September 9th, 2022 to November 24th, 2022 due to localised settlement observation |

At Whale Tail Dike, the performance of the structure is deviating from normal operating condition due to a high seepage rate underneath the embankments in the foundation. This condition started in May 2019. Further discussion on the risk and mitigation measures is included in Section c) below.

At WRSF Dike, the performance of the structure was deviating from normal operating condition due to seepage observed in August 2019. The TARP level was decreased to Green in May 2020 after the mitigation works were completed. Further discussion on the risk and mitigation measures is included in Section c) below.

At IVR D1 Dike, the performance of the structure was deviating from normal operation due to the observation of a bulk settlement zone 0.2-0.3 m in magnitude from Sta. 0+100 to Sta. 0+300. The settlement zone was 6-8 m wide and located in the esker material approximately 14m upstream of the centerline (i.e. upstream side of the key trench above the hinge point). The TARP level of the structure was increased to Yellow in September 2022 when this feature was discovered. The TARP level of the structure was decreased in November 2022 when the mechanism was understood in more detail and judged unlikely to impact the performance of the structure. Further discussion on the risk and mitigation measures is included in Section c) below.

More details are available in the 2022 Annual Geotechnical Inspection available in Appendix 9 and in the 2022 Whale Tail Water Management Plan Version 8 (Appendix 13).

***c. A discussion of any unanticipated observations including changes in risk and mitigation measures implemented to reduce risk;***

<u>Whale Tail Dike</u>

In May 2019 the TARP level of Whale Tail Dike was increased to yellow due to indications of a high seepage rate underneath the embankments in the foundation. As a result of the seepage the TARP level was increased and a remediation grouting campaign was conducted between November 2019 and March 2020 under the direction of the grout committee. The remediation works were successful in reducing the seepage rate to manageable levels (more than 50 %), thus preventing risks of flooding the Whale Tail Pit area.

In August 2022 it was observed that the natural soil on the Eastern abutment had settled allowing water to ingress further into the East abutment. This led to rapid thawing of the Eastern abutment foundation and the development of cracks on the crest and sloughing of the upstream dike slope in that area. A thermal berm plan was included in the design report of the structure as a mitigation plan for this mechanism and Agnico Eagle informed the NWB in September 2022 of their intention to go forward with the implementation of this measure. Construction of the Eastern abutment thermal berm was initiated by Agnico Eagle in September 2022 and is planned to be completed by April 2023. In addition, in order to further mitigate sloughing, a similar thermal berm was design for the Western abutment, and submitted to NWB and DFO in December 2022, for construction in 2023.

WRSF Dike

In August 2019 the TARP level of the WRSF Dike was increased to yellow due to seepage observed toward Mammoth Lake. Review of the thermistor data indicated that the most likely cause for the seepage observed was thawing of the foundation keytrench caused by water ponding over it for an extended period of time. The seepage at the downstream toe was estimated to be around 100 $m^3$/h. Tension cracks along the downstream crest of the dike were also observed. This event was disclosed to the relevant authorities and measures were taken to lower the WRSF pond level. Once the WRSF pond level was lowered the seepage was no longer observed.

Following the completion of mitigation measures (review operating level and construction of upstream thermal berm) the TARP level was decreased to Green. These mitigation measures were successful and no seepage was observed at WRSF Dike since 2019.

IVR-D1 Dike

In September 2022, the TARP level of IVR-D1 Dike was increased to yellow due to the observation of a bulk settlement zone 0.2-0.3 m in magnitude from Sta. 0+100 to Sta. 0+300. The settlement zone was 6-8 m wide and located in the esker material approximately 14m upstream of the centerline (i.e. upstream side of the key trench above the hinge point).

The settlement mechanism has been examined further and seems to be related to a surficial mechanism linked to the thawing of the esker material placed above the liner. Deformation of this esker zone will not impact the liner or the keytrench. This mechanism is supported by the thermistor data indicating that the keytrench and bedrock remained frozen in 2022 while only the esker material within the active layer thawed. The settlement zone has not progressed from September to October 2022 as indicated by the end of October drone scan data. Following these observations the TARP level of the structure was decreased in November 2022. The area will continue to be monitored in the summer of 2023. If the depression zone does not show further sign of settlement it will be levelled with material to prevent water ponding and ease the detection of any further deformation in the area.

***d. As-built drawings of all mitigation works undertaken;***

Construction of Whale Tail Dike Eastern abutment thermal berm was initiated by Agnico Eagle in September 2022 and is planned to be completed by April 2023. As-built drawings will be produced when the mitigation measure will be completed.

***e. Any changes in the design and/or as-built condition and respective consequences of any changes to safety, water balance and water quality;***

Please refer to Section 3.5.2 for the as-built construction report.

***f. Data collected from instrumentation used to monitor earthworks and an interpretation of that data;***

Section 4.0 of the 2022 Annual Geotechnical Inspection by WSP Golder provided in Appendix 9, presents the instrumentation data collected in 2022 and their interpretation.

***g. A summary of maintenance work undertaken as a result of settlement or deformation of dikes and dams; and***

The crest of Whale Tail Dike in the Eastern abutment zone was resurfaced in 2022 to fill tension cracks and compensate a localized settlement zone. This work was performed at the same time as the Eastern abutment thermal berm construction.

***h. The monthly and annual quantities of Seepage from dikes and dams in cubic metres.***

This information can be found in the Whale Tail Water Management Plan Version 10 (Appendix 13) and in Section 8.5.8.2 and 8.5.3.2 of this report.

## 3.2 MEADOWBANK DIKE REVIEW BOARD

### 3.2.1 Meadowbank Site

**As required by NWB Water License 2AM-MEA1530 Part I, Item 12:** ***The Licensee shall submit to the Board as part of the Annual Report required under Part B Item 2, all reports and performance evaluations prepared by the Independent Geotechnical Expert Review Panel.***

The annual meeting of the Meadowbank Dike Review Board (MDRB) was held in September 2022 (MDRB 30). The MDRB No.30 report, along with Agnico Eagle's response to the recommendations are included in Appendix 14. This Appendix includes a summary table of all recommendations and the Agnico Eagle implementation plan.

### 3.2.2 Whale Tail Site

**As required by NWB Water License 2AM-WTP1830 Part I, Item 12:** ***The Licensee shall submit to the Board as part of the Annual Report required under Part B, Item 2, all reports and performance evaluations prepared by the Independent Geotechnical Expert Review Panel.***

The annual meeting of the Meadowbank Dike Review Board (MDRB) was held in September 2022 (MDRB 30). The MDRB No.30 report, along with Agnico Eagle's response to the recommendations are included in Appendix 14. This Appendix includes a summary table of all recommendations and the Agnico Eagle implementation plan.

## 3.3 GEOTECHNICAL ENGINEER'S INSPECTION REPORT

### 3.3.1 Meadowbank Site

**As required by NWB Water License 2AM-MEA1530 Part I, Item 11:** ***The Licensee shall submit to the Board as part of the Annual Report, the Geotechnical Engineer's Inspection Report. The Report shall include a cover letter from the Licensee outlining an implementation plan to address the recommendations of the Geotechnical Engineer.***

The Meadowbank 2022 annual geotechnical inspection was performed by WSP Golder in July-August 2022. The report, along with Agnico Eagle's implementation plan are included in Appendices 9 and 15. In order to keep the whole interpretation and understanding of the recommendations and responses, Agnico Eagle will refer the reader to the Appendices which contains a summary table of all recommendations and the implementation strategy.

### 3.3.2 Whale Tail Site

**As required by NWB Water License 2AM-WTP1830 Part I, Item 11:** ***The Licensee shall submit to the Board as part of the Annual Report, the Geotechnical Engineer's Inspection Report. The Report shall include a cover letter from the Licensee outlining an implementation plan to address the recommendations of the Geotechnical Engineer.***

The Whale Tail 2022 annual geotechnical inspection was performed by WSP Golder in July-August 2022. The report, along with Agnico Eagle's implementation plan are included in Appendices 9 and 15. In order to keep the whole interpretation and understanding of the recommendations and responses, Agnico Eagle will refer the reader to the Appendices which contains a summary table of all recommendations and the implementation strategy.

## 3.4 QUARRIES

### 3.4.1 Meadowbank Site

#### 3.4.1.1 *Material Usage*

The annual reporting requirements listed in the following sections apply only to quarries located along the All Weather Access Road (AWAR).

**As required by CIRNAC Land Lease 66A/8 72-6, Condition 8:** ***The lessee shall file a report, annually, with the Minister in the manner and format stipulated by the Minister. The report shall include:***

> ***i. Quantity of material removed and location of removal, for the immediately preceding calendar year; and***
>
> ***ii. Such other data as are reasonably required by the Minister from time to time.***

And

**As required by CIRNAC Land Lease 66A/8 72-6, Condition 25:** ***The lessee shall file, annually, a report for the preceding year, outlining the ongoing borrow area operations completed in conformity with the approved Borrow Management Plan, as well as any variations from the Plan.***

In 2022, material was taken from the Quarry 2 (Parcel A) along the Meadowbank All-Weather Access Road on Crown Land. A total of 33,906 $m^3$ of bedrock was removed to complete road maintenance between Baker Lake and Meadowbank Mine. The 2022 Annual Quarry Report was sent to CIRNAC on February 13th, 2023.

In addition, 80,778 $m^3$ of material was removed from Quarry 22 along the All-Weather Access Road on KivIA leased land. Monthly reports were sent to KivIA in 2022 detailing the monthly consumption.

Regular inspections of the quarries were also performed during the year to ensure that runoff, if any, would be free of any visible sheen and would not impact the environment.  No issues with runoff water inside the quarries were noted in 2022.

### 3.4.1.2 *Quarry 22*

Quarry 22 was historically used as a temporary storage area for contaminated materials generated as a result of petroleum hydrocarbon (PHC) spill clean-up activities.

Following the AANDC inspection report in 2012, the Quarry 22 report has been prepared to provide information regarding the remediation method program of petroleum hydrocarbon, including but not limited to the contamination cause, the quantity of contaminated material transferred to the Meadowbank landfarm, results from soil sampling campaign and the decontamination further actions.

Since 2012, Agnico Eagle have submitted yearly updates by the Meadowbank Complex Annual Report. Agnico Eagle intended to scarify and sample on a year basic program. Some sampling campaign were however postponed due to peregrine falcon nesting activities in order to minimize mining disturbance on wildlife.

A bird deterrent cannon was deployed on May 24th, 2022 to prevent falcon activities in the quarry before scarification occurred. The bird cannon was set in the interval Random 10, meaning a shot series is randomly chosen by the control-unit between 1 and 10 minutes, blasting at 120dB. The bird cannon was removed once peregrine falcon activity was observed in the quarry on May 29th. All activity within the area, including scarification, were postponed minimizing the impact of potential nesting for this species and therefore ensure proper conditions for nesting activity.

A sampling campaign was however completed on September 5th, 2022, after the scarification of Quarry 22 occurred, to track the degradation of PHC with time.

The 2022 sampling results indicate the presence of contamination remnants in Q22. Results were compared to the Canadian Council of Ministers of the Environment (CCME) remediation criteria for Industrial use of Coarse material, which is determined to be aligned with the definition of industrial land detailed in the Government of Nunavut Environmental Guidelines for the Management of Contaminated Sites Remediation. The results indicated a concentration exceeding the PHC Fraction 3 limit (1,700 mg/kg) with a result of 3,300 mg/kg for both sampling areas Q22-1 and Q22-2.

For the fourth consecutive sampling campaign, analysis results were below the CCME Remediation criteria for the PHC Fraction 1, 2 and 4 in all sections and for PHC Fraction 3 in sections Q22-3 to Q22-8 since at least 2018.

Based on the degradation history of PHC's in the Meadowbank Landfarm and upon analysing results from the Q22 soil sampling campaign (2014, 2016, 2018, 2020, 2021 & 2022), Agnico Eagle is confident that the natural degradation of Petroleum Hydrocarbon (PHC) related products is an effective remediation method for Q22.

Another round of sampling is planned in 2023. Agnico Eagle is proposing to sample two (2) parcels (Q22-1 and Q22-2) and to stop the annual monitoring for parcel Q22-3 to Q22-8 as the results are below the contamination guideline since the last four (4) sampling campaigns. This new practice will be implemented in 2023.

Similar to 2022, falcon deterrence activities will take place in 2023 to prevent peregrine falcon nesting in the quarry to accelerate the remediation process. If recurrent peregrine falcon activities are not observed, Agnico Eagle proposes to continue scarifying the surface areas in Q22 during the summer of 2023. However, if any falcon activities are observed during the weekly quarry inspections, deterrence devices will be removed. Agnico Eagle will evaluate and if needed, the area could be limited to any activity to ensure adequate bird protection management. Agnico Eagle will then postpone the scarification until late September before the freeze up season in order to minimize mining disturbance on wildlife. Following the 2023 soil sampling results, Agnico Eagle will review the next steps to be taken. More details are provided in the Quarry 22 Report in Appendix 18.

### 3.4.2 Whale Tail Site

#### 3.4.2.1 *Material Usage*

The annual reporting requirements listed in the following sections apply only to quarries located along the Whale Tail Haul Road.

**As required by CIRNAC Land Lease 66H/8-1-4, Condition 9:** ***The lessee shall file, annually, with the Minister in the manner and format stipulated, no later than sixty (60) days following the anniversary date of the effective date of this lease. The report shall include:***

i. ***Quantity of material removed and location of removal, for the immediately preceding calendar year; and***

ii. ***Such other data as are reasonably required by the Minister from time to time.***

And

**As required by CIRNAC Land Lease 66H/8-1-4, Condition 27:** ***The lessee shall file, annually, a report for the preceding year, outlining the ongoing borrow area operations completed in conformity with the approved Borrow Management Plan, as well as any variations from the Plan.***

In 2022, material was taken from the Quarry 35 (Parcel H) along the Whale Tail Haul Road on Crown Land. A total of 56,687 m$^3$ of bedrock was removed to perform road maintenance. The 2022 Annual

Quarry Report was sent to CIRNAC on February 13th, 2023. No material was removed from eskers or quarries on KivIA leased land.

Pre-freshet and freshet inspections were conducted at crossings along the Whale Tail Haul Road, eskers and quarries in 2022. These inspections are performed to document the presence/absence of flow, erosional concerns, and turbidity plumes and to ensure that runoff, if any, would be free of any contaminant and would not impact the environment. No issues with runoff water inside the eskers/quarries to any waterbodies were noted in 2022 and no contingency mitigation measures were required to be installed.

#### 3.4.2.2 *Setback Distance*

**As required by NIRB Project Certificate 008, Condition 20:** ***Unless otherwise authorized, the Proponent shall maintain an appropriate setback distance between project quarries and borrow pits from fish-bearing or permanent waterbodies as required to prevent acid rock drainage or metal leaching into such waterbodies. Throughout quarry development and operation, the Proponent shall, on an annual basis, provide information regarding quarry setback distances maintained and/or mitigation measures implemented by the Proponent in fulfillment of this term and condition in the Proponent's annual report to the NIRB.***

The setback distance chosen was 31 metres from any waterbody high water mark. All quarries along the Whale Tail Haul Road were designed and excavated respecting this 31 metres setback distance.

## 3.5 2022 CONSTRUCTION

### 3.5.1 Meadowbank Site

In 2022, the In-Pit Tailings Deposition Project was completed (tailings deposition and reclaim water infrastructures in Portage Pit E). Also in 2022, Phase 4 of the Portage WRSF instrumentation for thermal monitoring was conducted with the installation of two thermistors in two trenches dug on the WRSF benches. Three new thermistors were installed to monitor the thermal behavior downstream of the South seepage station at East Dike.

In August 2022 construction was approved for the addition of a 3.3 million litre diesel fuel tank in a new containment pond at the Meadowbank Fuel Storage Facility. A modification to the Water License was submitted and approved by the NWB on August 10th, 2022. Refer to Section 11.2 for more information. As of December 2022, this project was in the final stages of construction with commissioning planned in early 2023.

Construction at the Mill facilities in 2022 included the addition of a tenth leach tank in existing containment pond and completion and start-up of the HPGR project.

### 3.5.2 Whale Tail Site

In 2022, the construction activities of the water management infrastructure at the Whale Tail Mine included the beginning of the construction of a thermal berm on the Eastern Abutment of Whale Tail Dike. Construction was done in accordance with the requirements of the Design and Technical Specifications developed for each structure. The data collected from the quality assurance (QA) and quality control (QC) program during the various construction activities were used to confirm that the construction of each structure was completed in compliance with the Drawings and Technical Specifications. This includes earthwork construction such as foundation preparation and fill placement as well as the installation of geosynthetics.

The Phase 1 IVR-WRSF instrumentation campaign consisted of two instrument sections installed in the WRSF, during September 2022. These instruments were installed to monitor the performance of the WRSF compared to the closure concept for the structure.

Other main construction projects completed in 2022 included: Whale Tail main camp pad extension, new crusher pad, tramp metal completion, CRF construction, underground Genset fuel farm installation, and mine ventilation work for underground.

### 3.5.2.1 *Design Report and Construction Drawings*

**As required by NWB Water License 2AM-WTP1830 Part D, Item 1:** ***The Licensee shall submit to the Board for review, at least sixty (60) days prior to Construction, final design and Construction drawings accompanied, with a detailed report, for the following:***

- ***Water works, including: Water Intake and causeway, Water control structures (dikes, berms, jetties, channels) and Water crossings (culverts, bridges);***
- ***Waste disposal facilities including: Wastewater Treatment Plant, Sewage Treatment Plant, Discharge Diffuser, Waste Rock Storage Facility, Overburden stockpiles, and Landfill; and***
- ***Whale Tail Bulk Fuel Storage Facility***

And

**As required by NWB Water License 2AM-WTP1830 Part D, Item 2:** ***The Licensee shall submit to the Board for review, at least thirty (30) days prior to Construction, final design and for-Construction drawings accompanied by a detailed report as described in Part D, Item 3 and stamped and signed by an Engineer for infrastructure (such as access roads, jetties, and conveyance systems) used for dewatering the following lakes, as authorized under the License: Lakes A47; A49; A-50; A-51; A-52; A53; and A-P21***

And

**As required by DFO Authorization 16-HCAA-00370 Condition 2.3.5 and 20-HCAA-00275 Condition 2.3.9:** ***As per the NIRB Project Certificate No. 008 Condition 21, the Proponent shall ensure that all project infrastructure in watercourses is designed and constructed in such a manner that it does not unduly prevent or limit the movement of water or fish species in fish streams and rivers, unless otherwise authorized by Fisheries and Oceans Canada.***

And

**As required by DFO Authorization 16-HCAA-00370, Condition 2.4.1 and 20-HCAA-00275 Condition 2.3.5:** ***The Proponent shall provide detailed engineering plans to DFO for review and approval, for construction works that have potential to impact fish and fish habitat, at least 3 months prior to commencement of the works. This includes dikes (e.g., Northeast dike), diversion/realignment channels, and freshwater jetty.***

Table 3-3 below provides a list of Design Reports submitted to NWB for approval before the construction began. All of the Design Reports along with regulator's comment and Agnico Eagle's response can be found on the NWB FTP site (ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-WTP1830%20Agnico/3%20TECH/D%20CONSTRUCTION/D1,%20D2/).

To address DFO Authorization 16-HCAA-00370 Condition 2.3.5 and 2.4.1 and 20-HCAA-00275 Condition 2.3.5 and 2.3.9, the designs were submitted to NWB and were available for DFO review. These reports, with the potential to impact waters frequented by fish, are also provided directly to DFO for review.

On September 22nd, 2022, Agnico Eagle advised DFO and the NWB of their intent to begin construction of a thermal berm located on the downstream side of the east abutment of the Whale Tail Dike. The thermal berm was a component of the previously approved Whale Tail Dike design, but construction of this portion was delayed until the present time since there was uncertainty as to its necessity. As a result, part of the berm is being constructed on top of a portion of the existing dike base that has become flooded as a result of dike construction. This area was terrestrial under baseline conditions, and water levels will ultimately be drawn down such that this area is returned to terrestrial habitat at closure.

On December 19th, 2022 Agnico Eagle submitted to DFO and the NWB the design report Whale Tail Dike West Abutment Thermal Berm. This report presents the design specifications for a thermal berm to be constructed on the downstream side of the west abutment of the Whale Tail Dike, similar to the east abutment which was partially constructed in 2022. A portion of the west abutment thermal berm overprints a portion of the dike foundation that has become recently flooded for water management purposes. This area will be drawn down post-closure and returned to terrestrial habitat.

Construction summary reports, including photographs, continue to be provided to NWB 90 days after the construction completion, as required according to the Water License 2AM-WTP1830 Part D Item 16. Agnico Eagle will continue to construct infrastructures in such a manner that it does not unduly prevent or limit the movement of water or fish species in fish streams and rivers.

**Table 3-3 Whale Tail 2022 List of Design Report Submitted**

| Design Report | 60 days notice Submission to NWB | NWB Design Report Approval |
|---|---|---|
| Whale Tail Emulsion Plant | December 14, 2021 | February 4, 2022 |
| Whale Tail SANA Crusher Pad | May 16, 2022 | June 6, 2022 |
| Whale Tail A-47 Sump | May 24, 2022 | July 13, 2022 |
| Whale Tail Camp Pad Extension | August 5, 2022 | September 2, 2022 |
| Whale Tail Dike East Abutment Remediation Work (Letter) | September 22, 2022 | October 14, 2022 |
| Whale Tail Dike West Abutment Thermal Berm | December 19, 2022 | February 13, 2023 |

### 3.5.2.2 *Construction Summary Report*

**As required by NWB Water License 2AM-WTP1830 Part D, Item 16:** ***The Licensee shall submit to the Board for review, within ninety (90) days of completion of each facility designed to contain, withhold, divert or retain Waters or Wastes during the construction phase, a Construction Summary Report prepared by a qualified Engineer(s) in accordance with Schedule D, Item 1.***

Table 3-4 below provided a list of the 2022 Construction Summary Report submitted to NWB following the completion of the facilities/infrastructures construction. All of the reports can be found on the NWB FTP site:(ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-WTP1826%20Agnico/3%20TECH/D%20CONSTRUCTION/D15/).

**Table 3-4 Whale Tail 2022 List of Construction Summary Report Submitted**

| Design Report | Submission Date to NWB |
|---|---|
| IVR WRSF Water Management System | March 4, 2022 |
| Whale Tail Emulsion Plant | August 18, 2022 |
| Whale Tail SANA Crusher Pad | November 21, 2022 |
| Whale Tail Camp Pad Extension | December 20, 2022 |

### 3.5.2.3 *Whale Tail Haul Road Construction Plan*

**As required by Project Certificate No. 008 Condition 65:** ***The Proponent shall, in consultation with the Terrestrial Advisory Group, develop a construction plan for the widening of the Whale Tail Haul Road which includes:***

- ***Design Features of the Whale Tail haul road intended to facilitate caribou movement across the road;***
- ***Identified sections of the roadside that will be constructed with slopes and top-dressing material appropriate for caribou crossing.***

***The plan must incorporate available Inuit Quajimajatuqangit in the selection of caribou crossing locations.***

***The final construction plan shall be provided to the Nunavut Impact Review Board (NIRB) prior to widening the Whale Tail haul road. Within three months of completion of construction to widen the Whale Tail haul road, the Proponent shall file an 'as-built report' with the NIRB, which includes the backfill height, slope and top-dressing material specifications of designed wildlife crossing sections.***

There was no widening to the permitted limit of the Whale Tail Haul Road in 2022.

## SECTION 4. WATER MANAGEMENT ACTIVITIES

The following section addresses reporting requirements related to water management activities.

## 4.1 FRESH WATER USAGE

### 4.1.1 Meadowbank Site

As per Type A Water License 2AM-MEA1530 Part E Item 4: "*The total volume of fresh water for all uses and from all sources, shall not exceed 2,350,000 m$^3$ per year from the License approval data to December 21, 2017 followed by 9,120,000 m$^3$ per year in 2018 through to the expiry of the License.*"

Section 4.1.1.1 to 4.1.1.3 and Table 4-1 below details the freshwater consumption per sources. The total volume of freshwater pumped from the surrounding lakes and used for the Meadowbank Mine in 2022 was 994,069 m$^3$.

The volume of reclaim water used in the mill in 2022 was 2,888,011 m$^3$. The volume of freshwater that was contained in the ore processed at the mill in 2022 was 42,484 m$^3$.

**Table 4-1 Meadowbank 2022 Freshwater Usage**

| Water Location | Source Lake | Jan | Feb | March | April | May | June |
|---|---|---|---|---|---|---|---|
| Camp | Third Portage Lake | 2,500 | 2,859 | 2,954 | 3,071 | 3,200 | 2,927 |
| Mill (freshwater tank) | Third Portage Lake | 47,333 | 207,923 | 134,271 | 53,791 | 49,616 | 70,567 |
| Emulsion plant | Unnamed Lake | 48 | 14 | 89 | 64 | 36 | 13 |
| **Total Freshwater Usage (m$^3$)** | | **49,881** | **210,796** | **137,314** | **56,926** | **52,852** | **73,507** |
| **Ore Water (m$^3$)** | Ore | 1,927 | 3,310 | 4,302 | 4,572 | 3,948 | 2,581 |
| **Reclaim Water Usage (m$^3$)** | Tailings Pond | 266,541 | 72,375 | 214,517 | 249,495 | 240,145 | 250,371 |

| Water Location | Source Lake | July | Aug | Sept | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|
| Camp | Third Portage Lake | 3,082 | 3,047 | 2,982 | 3,074 | 3,040 | 3,030 | 35,766 |
| Mill (freshwater tank) | Third Portage Lake | 67,521 | 74,928 | 75,403 | 58,088 | 60,567 | 58,031 | 958,039 |
| Emulsion plant | Unnamed Lake | 0 | 0 | 0 | 0 | 0 | 0 | 264 |
| **Total Freshwater Usage (m$^3$)** | | **70,603** | **77,975** | **78,385** | **61,162** | **63,607** | **61,061** | **994,069** |
| **Ore Water (m$^3$)** | Ore | 2,453 | 1,971 | 2,644 | 3,795 | 5,778 | 5,203 | **42,484** |
| **Reclaim Water Usage (m$^3$)** | Tailings Pond | 280,756 | 267,093 | 256,410 | 249,390 | 275,539 | 265,378 | **2,888,011** |

#### 4.1.1.1 *Third Portage Lake*

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 2: *Monthly and annual volume of fresh Water obtained from Third Portage Lake.***

A total volume of 993,805 m$^3$ of freshwater was used from Third Portage Lake for the site in 2022, which was in compliance with the Water License Freshwater maximum usage volume of 4,935,000 m$^3$ (Water License 2AM-MEA1530 Part E, Item 1). The monthly breakdown usage is provided in Table 4-1 above.

#### 4.1.1.2 *Wally Lake*

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 3: *Monthly and annual volume of fresh Water obtained from Wally Lake.***

As per Type A Water License 2AM-MEA1530 Part E Item 2, Agnico Eagle was authorized to withdraw from Wally Lake a total of 4,185,000 $m^3$ per year starting in 2018.

There was no freshwater obtained from Wally Lake for re-flooding activities and associated use in 2022.

#### 4.1.1.3 *Unnamed Lake*

Water used from unnamed lake was for explosive mixing. In 2022, the total of freshwater obtained from unnamed lake was 264 $m^3$. This was compliant with the Water License 2AM-MEA1530 Part E Item 3 which allows for a maximum usage of 2,400 $m^3$ per year. The monthly breakdown usage is provided in Table 4-1 above.

### 4.1.2 Whale Tail Site

Section 4.1.2.1 to 4.1.2.8 and Table 4-2 below details the freshwater consumption per source. The total volume of freshwater pumped from the surrounding lakes and used for the Whale Tail Mine in 2022, under Water License 2AM-WTP1830, was 84,278 $m^3$.

**Table 4-2 Whale Tail 2022 Freshwater Usage**

| Water Location | Source Lake | Jan | Feb | March | April | May | June |
|---|---|---|---|---|---|---|---|
| Camp | Nemo | 2,022 | 2,819 | 3,084 | 3,162 | 3,265 | 3,144 |
| Construction/Operation | Nemo | 739 | 1,978 | 2,101 | 3,191 | 4,532 | 3,574 |
| Dust Suppression | WTHR Pond | 0 | 0 | 0 | 0 | 1,100 | 2,510 |
| Explosive | Mammoth Lake | 0 | 0 | 0 | 0 | 0 | 0 |
| Drilling | Proximal Sources | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total Freshwater Usage ($m^3$)** | | **2,761** | **4,797** | **5,185** | **6,353** | **8,897** | **9,228** |

| Water Location | Source Lake | July | Aug | Sept | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|
| Camp | Nemo | 3,274 | 3,231 | 3,128 | 3,323 | 3,284 | 3,445 | **37,181** |
| Construction/Operation | Nemo | 3,873 | 3,424 | 4,354 | 3,419 | 4,097 | 2,945 | **38,227** |
| Dust Suppression | WTHR Pond | 4,350 | 775 | 135 | 0 | 0 | 0 | **8,870** |
| Explosive | Mammoth Lake | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| Drilling | Proximal Sources | 0 | 0 | 0 | 0 | 0 | 0 | **0** |
| **Total Freshwater Usage ($m^3$)** | | **11,497** | **7,430** | **7,617** | **6,742** | **7,381** | **6,390** | **84,278** |

#### 4.1.2.1 *Nemo Lake*

**As required by NWB Water License 2AM-WTP1830 Schedule B, Item 2: *Monthly and annual volume of fresh Water obtained from Nemo Lake.***

Agnico Eagle is authorized as per Part E Item 1 of the Water License 2AM-WTP1830 to take 209,544 $m^3$ of water per year from Nemo Lake during operations. Total freshwater consumption in 2022 from Nemo Lake was 75,408 $m^3$. The monthly breakdown usage is provided in Table 4-2 above.

#### 4.1.2.2 *Whale Tail Lake*

**As required by NWB Water License 2AM-WTP1830 Schedule B, Item 4: *Monthly and annual volume of fresh Water obtained from Whale Tail Lake.***

No freshwater obtained from Whale Tail Lake in 2022.

#### 4.1.2.3 *Unnamed Lake*

**As required by NWB Water License 2AM-WTP1830 Schedule B, Item 7: *Monthly and annual volume of fresh Water obtained from unnamed water bodies for Whale Tail Haul Road dust suppressant.***

Agnico Eagle is authorized as per Part E Item 1 of the Water License 2AM-WTP1830 to take 109,135 $m^3$ of water per year from sources proximal to the Whale Tail Haul Road for dust suppression.

In 2022, 8,870 $m^3$ of water was taken from pond along the Whale Tail Haul Road for dust suppression. The monthly breakdown usage is provided in Table 4-2 above.

#### 4.1.2.4 *Mammoth Lake*

**As required by NWB Water License 2AM-WTP1830 Schedule, B Item 3: Monthly and annual volume of fresh Water obtained from Mammoth Lake.**

Agnico Eagle is authorized as per Part E Item 1 of the Water License 2AM-WTP1830 Item 1 to take 2,500 $m^3$ from Mammoth Lake for explosives mixing and associated uses. In 2022 no water was taken from Mammoth Lake.

#### 4.1.2.5 *Lakes in the IVR Footprint*

**As required by NWB Water License 2AM-WTP1830 Schedule, B Item 5: *Monthly and annual volume of fresh Water obtained from Lakes A-P38, A46, A47, A49, A50, A51, A52, A53, A-P21, A-P10, A-P67, and A-P68.***

Dewatering of the IVR area waterbodies was completed in September 2020. Please refer to the Meadowbank Complex 2020 Annual Report Section 8.5.2.2.2 for more information.

#### 4.1.2.6 *Fresh Water For Drilling*

**As required by NWB Water License 2AM-WTP1830 Schedule, B Item 6:** ***Monthly and annual volume of fresh Water obtained for drilling from sources proximal to drilling sites.***

Agnico Eagle is authorized as per Part E Item 1 of the Water License 2AM-WTP1830 to use 109,135 $m^3$ from proximal sources for drilling activities. No water was taken from proximal sources in 2022 for drilling activities.

#### 4.1.2.7 *Lake D1*

**As required by NWB Water License 2AM-WTP1830 Schedule, B Item 8:** ***Monthly and annual volume of fresh Water obtained from Lake D1.***

In 2022, no water was withdrawn from Lake D1.

#### 4.1.2.8 *Underground Activities*

In 2022, a total volume of 2,550 $m^3$ was discharged from the underground to the GSP-1 Pond.

## 4.2 LAKE LEVEL MONITORING

### 4.2.1 Meadowbank Site

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 4:** ***Results of lake level monitoring conducted under the protocol developed as per Part D Item 5 (Water Quality Monitoring and Management Plan for Dike Construction and Dewatering).***

In 2022, as in previous years (2015 to 2021), water levels were similar to when monitoring began for Third Portage, Second Portage and Wally lakes. Refer to PEAMP Section 12.4.1.1 and Table 12-3 for a complete discussion of the impacts of discharge on water level in the receiving environment. Figure 44 - 47 in Section 12 presents historical trending up to 2022.

Overall, modeling predicted the natural range of water levels in Third Portage Lake to be 133.82 – 134.19 masl and the impact assessment indicated that this range would not be exceeded (Physical Environment Impact Assessment Report, 2005). Although these values accounted for 1-in-100 year precipitation or drought events, prior to operation, water levels were already below this range when monitoring began (prior to any significant freshwater consumption) in 2009 and continue to be as of now. Thus, in 2022, measured value ranged from 133.63 – 133.73 masl. Pumping rates of freshwater from Third Portage Lake have remained well within license limits, and water levels do not appear to have changed significantly since monitoring began (2009). No water was discharged in Third Portage Lake in 2022. The elevation, in metres above sea level (masl), of Third Portage Lake continued to be monitored in 2022. The location of the lake level survey monitoring is identified as TPL-survey on Figure 1. The lake level monitoring results are presented in Table 4-3 and Figure 7.

Water from the East Dike Seepage was discharged into Second Portage Lake in 2022. The elevation, in metres above sea level, of Second Portage Lake continued to be monitored in 2022. The location of the lake level survey monitoring is identified as SPL-survey on Figure 1. The lake level monitoring results are presented in Table 4-3 and Figure 7. In 2022, the water level ranged from 132.87 – 133.07 masl, similar to the baseline of 133.1 masl.

No water was discharged from the Vault Attenuation Pond in 2022. The elevation measurement, in metres above sea level, of Wally Lake was ongoing in 2022. The location of the lake level survey monitoring station is identified as WL-survey on Figure 3. The lake level monitoring results are presented in Table 4-3 and Figure 7; the lake level remained within the range of naturally occurring levels, with a level of 139.48 masl.

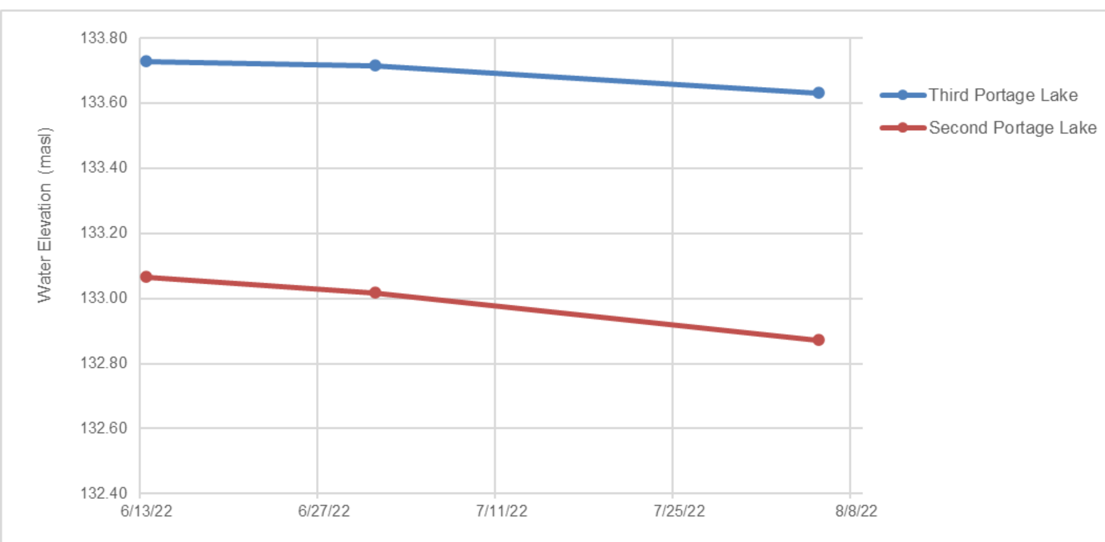
Following recommendation from CIRNAC regarding the 2018 Annual Report, starting 2019, Turn Lake water level monitoring during open water season was completed. The lake level monitoring results are presented in Table 4-3 and Figure 7. For Turn Lake, no baseline water levels were provided in the 2005 FEIS or 2015 FEIS Addendum for Turn Lake so 2019 was the first year for which measurements are available. Similar water levels were observed in 2020, 2021 and 2022.

Following this analysis, Agnico Eagle concluded the water level in Third Portage, Second Portage and Wally Lakes still remain within the range of naturally occurring levels. Natural seasonal variation comparison is not completed, as water elevation surveys are only taken during open water periods Table 4-4 below provide the 2013 -2022 water level monitoring average.

**Table 4-3 Meadowbank 2022 Lake Water Level Monitoring**

| Date | Third Portage Lake (masl) | Second Portage Lake (masl) | Turn Lake (masl) | Wally Lake (masl) |
|---|---|---|---|---|
| **Code Identification** | **TPL-Survey** | **SPL-Survey** | **TL-Survey** | **WL-Survey** |
| June 13, 2022 | 133.73 | 133.07 | N/A | N/A |
| June 23, 2022 | N/A | N/A | 139.20 | N/A |
| June 30, 2022 | N/A | N/A | N/A | 139.48 |
| July 1, 2022 | 133.72 | 133.02 | N/A | N/A |
| August 5, 2022 | 133.63 | 132.87 | N/A | N/A |

**Figure 7 Meadowbank 2022 Lake Water Level Monitoring**




* Turn Lake and Wally Lake Water Level Monitoring is not presented in this figure because of insufficient data.

**Table 4-4 Meadowbank 2013-2022 Lake Water Level Monitoring Average**

| Date | Third Portage Lake (masl) | Second Portage Lake (masl) | Turn Lake (masl) | Wally Lake (masl) |
|---|---|---|---|---|
| **Code Identification** | **TPL-Survey** | **SPL-Survey** | **Turn Lake-Survey** | **WL-Survey** |
| 2013 | 133.57 | 132.94 | NA | 139.38 |
| 2014 | 133.53 | 133.26 | NA | 139.42 |
| 2015 | 133.65 | 133.12 | NA | 139.47 |
| 2016 | 133.64 | 132.95 | NA | 139.47 |
| 2017 | 133.58 | 132.92 | NA | 139.52 |
| 2018 | 133.67 | 132.96 | NA | 139.41 |
| 2019 | 133.61 | 132.94 | 139.17 | 139.50 |
| 2020 | 133.68 | 132.97 | 139.13 | 139.48 |
| 2021 | 133.74 | 133.12 | 139.59 | 139.55 |
| 2022 | 133.69 | 132.99 | 139.20 | 139.48 |

### 4.2.2 Whale Tail Site

In 2022, the elevation, in metres above sea level, of Whale Tail Lake South Basin (range from 154.55 – 155.58 masl), Mammoth Lake (range from 152.11 – 152.50) were monitored daily and Nemo Lake (range from 155.74 – 156.07) was monitored on a monthly basis during open water season and, weather permitting, except for the month of March, October and December. Results are presented in Table 4-5 and Figure 8. The location of the lake level survey monitoring are provided on Figure 4. The lake level average results 2018-2022 are presented in Table 4-6. For a complete discussion and comparison to FEIS, please refer to Section 12.5.1.1.

**Table 4-5 Whale Tail 2022 Lake Water Level Monitoring**

| Date | Whale Tail South (masl) | Mammoth Lake (masl) | Nemo Lake (masl) | Date | Whale Tail South (masl) | Mammoth Lake (masl) | Nemo Lake (masl) | Date | Whale Tail South (masl) | Mammoth Lake (masl) | Nemo Lake (masl) | Date | Whale Tail South (masl) | Mammoth Lake (masl) | Nemo Lake (masl) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Code Identification** | **WTS-Survey** | **MAM-Survey** | **NEMO-Survey** | **Code Identification** | **WTS-Survey** | **MAM-Survey** | **NEMO-Survey** | **Code Identification** | **WTS-Survey** | **MAM-Survey** | **NEMO-Survey** | **Code Identification** | **WTS-Survey** | **MAM-Survey** | **NEMO-Survey** |
| 1/1/22 | 154.99 | 152.25 | | 4/2/22 | 154.68 | 152.23 | 156.00 | 7/2/22 | 155.47 | 152.39 | | 10/1/22 | 155.15 | 152.40 | |
| 1/2/22 | 154.99 | 152.25 | | 4/3/22 | 154.68 | 152.23 | | 7/3/22 | 155.47 | 152.37 | | 10/2/22 | 155.16 | 152.41 | |
| 1/3/22 | 154.99 | 152.25 | | 4/4/22 | 154.68 | 152.23 | | 7/4/22 | 155.46 | 152.35 | | 10/3/22 | 155.19 | 152.44 | |
| 1/4/22 | 154.98 | 152.25 | | 4/5/22 | 154.70 | 152.23 | | 7/5/22 | 155.45 | 152.34 | | 10/4/22 | 155.20 | 152.44 | |
| 1/5/22 | 154.97 | 152.25 | | 4/6/22 | 154.71 | 152.23 | | 7/6/22 | 155.45 | 152.32 | | 10/5/22 | 155.20 | 152.45 | |
| 1/6/22 | 154.97 | 152.25 | | 4/7/22 | 154.71 | 152.23 | | 7/7/22 | 155.45 | 152.31 | 155.96 | 10/6/22 | 155.21 | 152.45 | |
| 1/7/22 | 154.97 | 152.25 | | 4/8/22 | 154.71 | 152.23 | | 7/8/22 | 155.45 | 152.29 | | 10/7/22 | 155.22 | 152.45 | |
| 1/8/22 | 154.97 | 152.25 | 156.05 | 4/9/22 | 154.70 | 152.24 | | 7/9/22 | 155.44 | 152.28 | | 10/8/22 | 155.23 | 152.46 | |
| 1/9/22 | 154.98 | 152.25 | | 4/10/22 | 154.70 | 152.24 | | 7/10/22 | 155.44 | 152.26 | | 10/9/22 | 155.23 | 152.46 | |
| 1/10/22 | 154.99 | 152.25 | | 4/11/22 | 154.69 | 152.24 | | 7/11/22 | 155.43 | 152.25 | | 10/10/22 | 155.23 | 152.47 | |
| 1/11/22 | 155.00 | 152.25 | | 4/12/22 | 154.69 | 152.24 | | 7/12/22 | 155.42 | 152.23 | | 10/11/22 | 155.23 | 152.47 | |
| 1/12/22 | 155.01 | 152.25 | | 4/13/22 | 154.68 | 152.24 | | 7/13/22 | 155.41 | 152.22 | | 10/12/22 | 155.24 | 152.47 | |
| 1/13/22 | 155.02 | 152.25 | | 4/14/22 | 154.68 | 152.24 | | 7/14/22 | 155.38 | 152.20 | | 10/13/22 | 155.25 | 152.49 | |
| 1/14/22 | 155.02 | 152.25 | | 4/15/22 | 154.68 | 152.24 | | 7/15/22 | 155.43 | 152.20 | | 10/14/22 | 155.25 | 152.49 | |
| 1/15/22 | 155.02 | 152.25 | | 4/16/22 | 154.67 | 152.23 | | 7/16/22 | 155.44 | 152.20 | | 10/15/22 | 155.26 | 152.50 | |
| 1/16/22 | 155.01 | 152.25 | | 4/17/22 | 154.66 | 152.23 | | 7/17/22 | 155.43 | 152.18 | | 10/16/22 | 155.26 | 152.48 | |
| 1/17/22 | 155.01 | 152.25 | | 4/18/22 | 154.66 | 152.23 | | 7/18/22 | 155.42 | 152.18 | | 10/17/22 | 155.26 | 152.47 | |
| 1/18/22 | 155.00 | 152.25 | | 4/19/22 | 154.66 | 152.23 | | 7/19/22 | 155.41 | 152.17 | | 10/18/22 | 155.27 | 152.46 | |
| 1/19/22 | 155.00 | 152.25 | | 4/20/22 | 154.65 | 152.23 | | 7/20/22 | 155.41 | 152.16 | | 10/19/22 | 155.27 | 152.44 | |
| 1/20/22 | 154.99 | 152.25 | | 4/21/22 | 154.65 | 152.23 | | 7/21/22 | 155.41 | 152.15 | | 10/20/22 | 155.27 | 152.44 | |
| 1/21/22 | 154.99 | 152.25 | | 4/22/22 | 154.64 | 152.23 | | 7/22/22 | 155.40 | 152.14 | | 10/21/22 | 155.28 | 152.44 | |
| 1/22/22 | 154.98 | 152.25 | | 4/23/22 | 154.64 | 152.23 | | 7/23/22 | 155.39 | 152.13 | | 10/22/22 | 155.28 | 152.43 | |
| 1/23/22 | 154.98 | 152.25 | | 4/24/22 | 154.64 | 152.23 | | 7/24/22 | 155.39 | 152.12 | | 10/23/22 | 155.28 | 152.43 | |
| 1/24/22 | 154.97 | 152.25 | | 4/25/22 | 154.65 | 152.23 | | 7/25/22 | 155.38 | 152.11 | | 10/24/22 | 155.28 | 152.44 | |
| 1/25/22 | 154.97 | 152.25 | | 4/26/22 | 154.65 | 152.23 | | 7/26/22 | 155.38 | 152.11 | | 10/25/22 | 155.28 | 152.45 | |
| 1/26/22 | 154.96 | 152.25 | | 4/27/22 | 154.64 | 152.23 | | 7/27/22 | 155.37 | 152.11 | | 10/26/22 | 155.27 | 152.46 | |
| 1/27/22 | 154.96 | 152.25 | | 4/28/22 | 154.64 | 152.24 | | 7/28/22 | 155.36 | 152.11 | | 10/27/22 | 155.27 | 152.46 | |
| 1/28/22 | 154.95 | 152.25 | | 4/29/22 | 154.63 | 152.23 | | 7/29/22 | 155.36 | 152.11 | | 10/28/22 | 155.27 | 152.47 | |
| 1/29/22 | 154.95 | 152.25 | | 4/30/22 | 154.63 | 152.23 | | 7/30/22 | 155.36 | 152.12 | | 10/29/22 | 155.26 | 152.47 | |
| 1/30/22 | 154.95 | 152.25 | | 5/1/22 | 154.62 | 152.23 | | 7/31/22 | 155.36 | 152.12 | | 10/30/22 | 155.25 | 152.46 | |
| 1/31/22 | 154.94 | 152.25 | | 5/2/22 | 154.62 | 152.23 | | 8/1/22 | 155.36 | 152.13 | | 10/31/22 | 155.24 | 152.45 | |
| 2/1/22 | 154.94 | 152.25 | | 5/3/22 | 154.61 | 152.23 | | 8/2/22 | 155.36 | 152.13 | | 11/1/22 | 155.24 | 152.45 | |
| 2/2/22 | 154.93 | 152.25 | | 5/4/22 | 154.61 | 152.23 | | 8/3/22 | 155.35 | 152.14 | | 11/2/22 | 155.23 | 152.45 | |
| 2/3/22 | 154.93 | 152.25 | | 5/5/22 | 154.60 | 152.23 | | 8/4/22 | 155.35 | 152.13 | | 11/3/22 | 155.22 | 152.45 | |
| 2/4/22 | 154.92 | 152.25 | | 5/6/22 | 154.60 | 152.23 | | 8/5/22 | 155.35 | 152.13 | | 11/4/22 | 155.21 | 152.45 | |
| 2/5/22 | 154.92 | 152.25 | | 5/7/22 | 154.59 | 152.23 | | 8/6/22 | 155.35 | 152.13 | | 11/5/22 | 155.20 | 152.45 | |
| 2/6/22 | 154.91 | 152.25 | | 5/8/22 | 154.59 | 152.24 | | 8/7/22 | 155.35 | 152.14 | | 11/6/22 | 155.20 | 152.45 | |
| 2/7/22 | 154.91 | 152.25 | | 5/9/22 | 154.59 | 152.24 | | 8/8/22 | 155.34 | 152.13 | | 11/7/22 | 155.19 | 152.44 | |
| 2/8/22 | 154.91 | 152.25 | 156.01 | 5/10/22 | 154.59 | 152.24 | | 8/9/22 | 155.34 | 152.13 | | 11/8/22 | 155.18 | 152.43 | |
| 2/9/22 | 154.90 | 152.25 | | 5/11/22 | 154.58 | 152.24 | | 8/10/22 | 155.33 | 152.12 | | 11/9/22 | 155.18 | 152.43 | |
| 2/10/22 | 154.89 | 152.25 | | 5/12/22 | 154.58 | 152.24 | | 8/11/22 | 155.33 | 152.12 | | 11/10/22 | 155.17 | 152.43 | |
| 2/11/22 | 154.89 | 152.25 | | 5/13/22 | 154.57 | 152.23 | | 8/12/22 | 155.33 | 152.12 | | 11/11/22 | 155.17 | 152.42 | |
| 2/12/22 | 154.89 | 152.25 | | 5/14/22 | 154.57 | 152.23 | | 8/13/22 | 155.33 | 152.12 | | 11/12/22 | 155.16 | 152.43 | |
| 2/13/22 | 154.88 | 152.25 | | 5/15/22 | 154.57 | 152.23 | | 8/14/22 | 155.32 | 152.12 | | 11/13/22 | 155.16 | 152.43 | |
| 2/14/22 | 154.88 | 152.25 | | 5/16/22 | 154.56 | 152.24 | | 8/15/22 | 155.31 | 152.12 | | 11/14/22 | 155.16 | 152.43 | |
| 2/15/22 | 154.87 | 152.25 | | 5/17/22 | 154.56 | 152.24 | 156.04 | 8/16/22 | 155.31 | 152.11 | | 11/15/22 | 155.15 | 152.43 | |
| 2/16/22 | 154.87 | 152.24 | | 5/18/22 | 154.56 | 152.24 | | 8/17/22 | 155.31 | 152.11 | | 11/16/22 | 155.15 | 152.43 | |
| 2/17/22 | 154.86 | 152.24 | | 5/19/22 | 154.55 | 152.24 | | 8/18/22 | 155.30 | 152.11 | | 11/17/22 | 155.14 | 152.43 | |
| 2/18/22 | 154.86 | 152.24 | | 5/20/22 | 154.55 | 152.24 | | 8/19/22 | 155.30 | 152.11 | 155.79 | 11/18/22 | 155.14 | 152.43 | 155.89 |
| 2/19/22 | 154.85 | 152.24 | | 5/21/22 | 154.55 | 152.24 | | 8/20/22 | 155.30 | 152.11 | | 11/19/22 | 155.13 | 152.43 | |
| 2/20/22 | 154.85 | 152.24 | | 5/22/22 | 154.55 | 152.24 | | 8/21/22 | 155.30 | 152.12 | | 11/20/22 | 155.13 | 152.43 | |
| 2/21/22 | 154.85 | 152.24 | | 5/23/22 | 154.56 | 152.24 | | 8/22/22 | 155.30 | 152.12 | | 11/21/22 | 155.12 | 152.43 | |
| 2/22/22 | 154.84 | 152.24 | | 5/24/22 | 154.57 | 152.23 | | 8/23/22 | 155.30 | 152.12 | | 11/22/22 | 155.12 | 152.43 | |
| 2/23/22 | 154.83 | 152.24 | | 5/25/22 | 154.58 | 152.24 | | 8/24/22 | 155.29 | 152.13 | | 11/23/22 | 155.12 | 152.43 | |
| 2/24/22 | 154.83 | 152.24 | | 5/26/22 | 154.59 | 152.23 | | 8/25/22 | 155.29 | 152.13 | | 11/24/22 | 155.12 | 152.44 | |
| 2/25/22 | 154.83 | 152.24 | | 5/27/22 | 154.62 | 152.24 | | 8/26/22 | 155.19 | 152.18 | | 11/25/22 | 155.11 | 152.44 | |
| 2/26/22 | 154.82 | 152.24 | | 5/28/22 | 154.68 | 152.25 | | 8/27/22 | 155.02 | 152.32 | | 11/26/22 | 155.11 | 152.44 | |
| 2/27/22 | 154.84 | 152.24 | | 5/29/22 | 154.74 | 152.26 | | 8/28/22 | 155.02 | 152.32 | | 11/27/22 | 155.10 | 152.44 | |
| 2/28/22 | 154.85 | 152.24 | | 5/30/22 | 154.79 | 152.28 | | 8/29/22 | 155.01 | 152.31 | | 11/28/22 | 155.10 | 152.44 | |
| 3/1/22 | 154.84 | 152.24 | | 5/31/22 | 154.85 | 152.30 | | 8/30/22 | 155.01 | 152.31 | | 11/29/22 | 155.09 | 152.44 | |
| 3/2/22 | 154.83 | 152.24 | | 6/1/22 | 154.90 | 152.32 | | 8/31/22 | 155.01 | 152.31 | | 11/30/22 | 155.09 | 152.44 | |
| 3/3/22 | 154.84 | 152.25 | | 6/2/22 | 154.96 | 152.34 | | 9/1/22 | 155.01 | 152.31 | | 12/1/22 | 155.09 | 152.44 | |
| 3/4/22 | 154.83 | 152.24 | | 6/3/22 | 155.01 | 152.35 | | 9/2/22 | 155.00 | 152.31 | | 12/2/22 | 155.08 | 152.44 | |
| 3/5/22 | 154.81 | 152.24 | | 6/4/22 | 155.09 | 152.37 | | 9/3/22 | 155.00 | 152.31 | | 12/3/22 | 155.08 | 152.44 | |
| 3/6/22 | 154.80 | 152.24 | | 6/5/22 | 155.27 | 152.40 | | 9/4/22 | 154.99 | 152.31 | | 12/4/22 | 155.08 | 152.45 | |
| 3/7/22 | 154.80 | 152.24 | | 6/6/22 | 155.51 | 152.43 | | 9/5/22 | 155.00 | 152.31 | | 12/5/22 | 155.07 | 152.45 | |
| 3/8/22 | 154.80 | 152.24 | | 6/7/22 | 155.53 | 152.44 | 156.04 | 9/6/22 | 155.00 | 152.31 | | 12/6/22 | 155.07 | 152.45 | |
| 3/9/22 | 154.79 | 152.24 | | 6/8/22 | 155.54 | 152.45 | | 9/7/22 | 155.02 | 152.33 | | 12/7/22 | 155.07 | 152.45 | |
| 3/10/22 | 154.79 | 152.24 | | 6/9/22 | 155.56 | 152.45 | | 9/8/22 | 155.04 | 152.35 | 155.74 | 12/8/22 | 155.06 | 152.45 | |
| 3/11/22 | 154.78 | 152.24 | | 6/10/22 | 155.57 | 152.46 | | 9/9/22 | 155.04 | 152.36 | | 12/9/22 | 155.06 | 152.45 | |
| 3/12/22 | 154.78 | 152.24 | | 6/11/22 | 155.58 | 152.46 | | 9/10/22 | 155.06 | 152.37 | | 12/10/22 | 155.06 | 152.45 | |
| 3/13/22 | 154.77 | 152.23 | | 6/12/22 | 155.58 | 152.47 | | 9/11/22 | 155.08 | 152.38 | | 12/11/22 | 155.06 | 152.46 | |
| 3/14/22 | 154.77 | 152.23 | | 6/13/22 | 155.58 | 152.47 | | 9/12/22 | 155.08 | 152.39 | | 12/12/22 | 155.06 | 152.46 | |
| 3/15/22 | 154.76 | 152.23 | | 6/14/22 | 155.58 | 152.47 | | 9/13/22 | 155.09 | 152.40 | | 12/13/22 | 155.06 | 152.47 | |
| 3/16/22 | 154.76 | 152.23 | | 6/15/22 | 155.58 | 152.48 | | 9/14/22 | 155.10 | 152.40 | | 12/14/22 | 155.06 | 152.47 | |
| 3/17/22 | 154.75 | 152.23 | | 6/16/22 | 155.58 | 152.48 | | 9/15/22 | 155.10 | 152.41 | | 12/15/22 | 155.05 | 152.47 | |
| 3/18/22 | 154.75 | 152.23 | | 6/17/22 | 155.57 | 152.49 | | 9/16/22 | 155.10 | 152.41 | | 12/16/22 | 155.05 | 152.47 | |
| 3/19/22 | 154.74 | 152.23 | | 6/18/22 | 155.56 | 152.49 | | 9/17/22 | 155.11 | 152.41 | | 12/17/22 | 155.04 | 152.47 | |
| 3/20/22 | 154.74 | 152.23 | | 6/19/22 | 155.56 | 152.48 | | 9/18/22 | 155.12 | 152.42 | | 12/18/22 | 155.04 | 152.46 | |
| 3/21/22 | 154.74 | 152.23 | | 6/20/22 | 155.56 | 152.49 | | 9/19/22 | 155.11 | 152.42 | | 12/19/22 | 155.03 | 152.46 | |
| 3/22/22 | 154.74 | 152.23 | | 6/21/22 | 155.55 | 152.49 | | 9/20/22 | 155.12 | 152.42 | 155.80 | 12/20/22 | 155.03 | 152.46 | |
| 3/23/22 | 154.73 | 152.24 | | 6/22/22 | 155.54 | 152.49 | | 9/21/22 | 155.12 | 152.42 | | 12/21/22 | 155.02 | 152.46 | |
| 3/24/22 | 154.73 | 152.24 | | 6/23/22 | 155.54 | 152.48 | 156.07 | 9/22/22 | 155.12 | 152.41 | | 12/22/22 | 155.02 | 152.46 | |
| 3/25/22 | 154.72 | 152.24 | | 6/24/22 | 155.53 | 152.47 | | 9/23/22 | 155.13 | 152.41 | | 12/23/22 | 155.02 | 152.47 | |
| 3/26/22 | 154.71 | 152.24 | | 6/25/22 | 155.52 | 152.46 | | 9/24/22 | 155.13 | 152.41 | | 12/24/22 | 155.01 | 152.47 | |
| 3/27/22 | 154.71 | 152.24 | | 6/26/22 | 155.51 | 152.45 | | 9/25/22 | 155.14 | 152.41 | | 12/25/22 | 155.01 | 152.47 | |
| 3/28/22 | 154.71 | 152.24 | | 6/27/22 | 155.50 | 152.44 | | 9/26/22 | 155.13 | 152.40 | | 12/26/22 | 155.01 | 152.47 | |
| 3/29/22 | 154.70 | 152.24 | | 6/28/22 | 155.50 | 152.44 | | 9/27/22 | 155.14 | 152.40 | | 12/27/22 | 155.00 | 152.47 | |
| 3/30/22 | 154.70 | 152.23 | | 6/29/22 | 155.49 | 152.43 | | 9/28/22 | 155.14 | 152.40 | | 12/28/22 | 155.00 | 152.47 | |
| 3/31/22 | 154.69 | 152.23 | | 6/30/22 | 155.48 | 152.42 | | 9/29/22 | 155.14 | 152.40 | | 12/29/22 | 154.99 | 152.47 | |
| 4/1/22 | 154.69 | 152.24 | | 7/1/22 | 155.48 | 152.40 | | 9/30/22 | 155.14 | 152.40 | | 12/30/22 | 154.99 | 152.47 | |
| | | | | | | | | | | | | 12/31/22 | 154.99 | 152.47 | |

**Figure 8 Whale Tail 2022 Lake Water Level Monitoring**

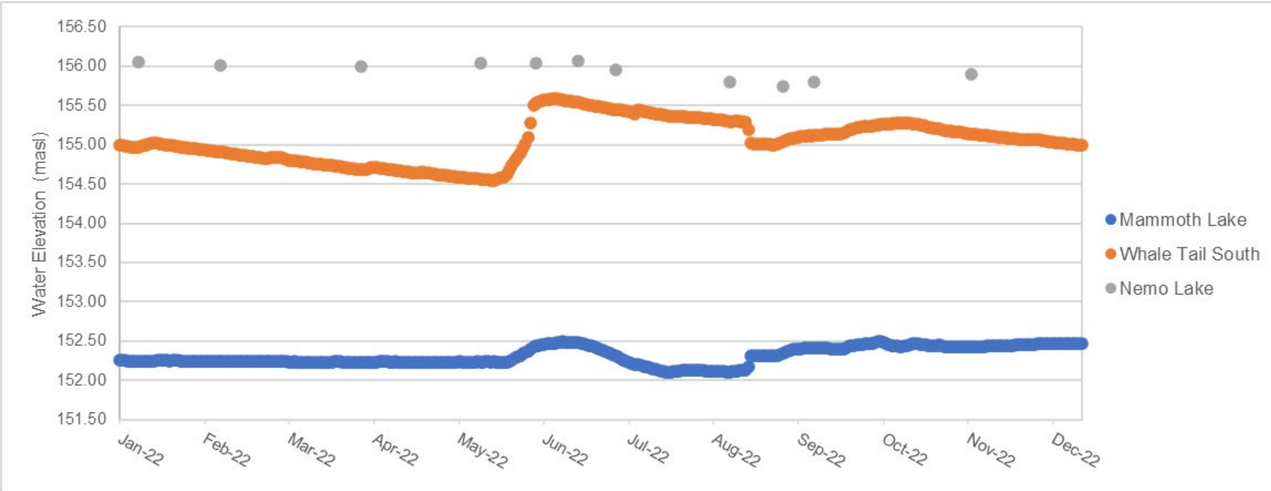



**Table 4-6 Whale Tail 2018-2022 Lake Water Level Average**

| Date | Whale Tail Lake South Basin (masl) | Mammoth Lake (masl) | Nemo Lake (masl) |
|---|---|---|---|
| Code Identification | WTS-Survey | MAM-Survey | NEMO-Survey |
| 2018 | 152.71 | 152.53 | - |
| 2019 | 154.85 | 152.49 | 156.16 |
| 2020 | 155.26 | 152.57 | 156.04 |
| 2021 | 155.21 | 152.33 | 155.74 |
| 2022 | 155.05 | 152.31 | 155.94 |

## 4.3 BATHYMETRIC SURVEYS BAKER LAKE MARSHALLING FACILITY

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 6:** ***The bathymetric survey(s) conducted prior to each year of shipping at the Baker Lake Marshalling Facility.***

The bathymetric survey in Baker Lake was completed on July 15th and 18th, 2022 and is included in Appendix 19. The survey was done before the shipping season.

## 4.4 WATER MANAGEMENT PLAN

### 4.4.1 Water Management Structure Inspection

#### 4.4.1.1 *Meadowbank Site*

**As required by NWB Water License 2AM-MEA1530 Part E, Item 10:** ***The Licensee shall carry out weekly inspections of all water management structures during periods of flow and the records be kept for review upon request of an Inspector. More frequent inspections may be required at the request of an Inspector. This information is to be included in the annual Water Management Plan.***

Agnico Eagle has an inspection program in place to inspect water management infrastructures. Site inspections on the dewatering dikes and tailings facility are performed every week and are documented during periods of flow or if changing conditions are observed as detailed in the Freshet Action Plan (Appendix D of the Meadowbank 2022 Water Management Plan Version 11 (Appendix 12)). Detailed visual inspections are performed and documented as per the OMS frequency (Appendix 35).

#### 4.4.1.2 *Whale Tail Site*

**As required by NWB Water License 2AM-WTP1830 Part E, Item 10:** ***The Licensee shall carry out weekly inspections of all water management structures during periods of flow and the records of inspections shall be kept for review upon request of an Inspector. More frequent inspections may be required at the request of an Inspector. This information is to be included in the annual updated Water Management Plan.***

Agnico Eagle has an inspection program in place to inspect water management infrastructures. Site inspections on the dewatering dikes are performed every week and are documented during periods of flow or if changing conditions are observed as detailed in the Freshet Action Plan (Appendix E of the Whale Tail 2022 Water Management Plan Version 8 (Appendix 13)). Detailed visual inspections are performed and documented as per the OMS frequency (Appendix 37).

### 4.4.2 Water Balance Water Quality Model Reporting Summary

#### 4.4.2.1 *Meadowbank Site*

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 5:** ***Summary of reporting results for the Water Balance Water Quality model and any calibrations as required in Part E Items 7-9.***

And

**As required by NWB Water License 2AM-MEA1530 Part E, Item 7:** ***The Licensee shall submit a Water Management Plan on an annual basis to the Board for review following the commencement of Operations. The Plan must include an updated Water Balance. The Water Management Plan shall include an action plan to be implemented if predicted re-flooded pit water quality indicates that treatment is necessary. The Licensee shall not breach dikes until the water quality in the re-flooded area meets CCME Water Quality Guidelines for the Protection of Aquatic Life, baseline concentrations, or appropriate site specific water quality objectives. Subject to the Board approval, if water quality parameters are above CCME Guidelines, a site specific risk assessment must be conducted to identify water quality objectives that are protective of the aquatic environment.***

And

**As required by NWB Water License 2AM-MEA1530 Part E, Item 8:** ***The Licensee shall submit a Water Quality Model for pit re-flooding as part of the Water Management Plan which shall be re-calibrated as necessary and updated at a minimum of once every two (2) years following commencement of Operations. The results and implications of the predictive model shall be reported to the Board.***

A water balance, water quality forecast, and water management plan update for 2022 was completed. This information is included in Appendix 12.

The water management objectives for the Meadowbank Site are:

- Keep the different water types (i.e. contact, non-contact, and freshwater) separated to the extent practical
- Control and minimize contact water through diversion and containment
- Minimize freshwater usage by reclaiming the contact water to the extent practical
- Meet discharge criteria before any site contact water is released to the downstream environment
- Reduction in freshwater intake per tonne mined
- No events of non-compliance
    - Regulatory/Water License water quality criteria (effluent loading limits)
    - Regulatory/Water License freshwater withdrawal criteria.

The water management targets and achieved data for 2022 is summarized in Table 4-7. In 2022 more freshwater was used than targeted mainly due to issues with winter operation of the reclaim system in Q1. However, as of the end of 2022 the winter reclaim strategy and operations have had great success and optimizations are ongoing in the mill in 2023 to further reduce freshwater needs. In 2022 less water was reclaimed than planned.

Targets for 2023 are also presented in Table 4-7. These targets are aligned with the water objectives of the Meadowbank Complex and go beyond the License limit. These targets strive to minimize risk, conserve freshwater, and minimize water usage. The 2023 targets assume continued improvements in the amount of reclaim water withdrawn from the pits to reuse in the Mill which will also decrease the amount of freshwater used per tonne processed and increase the amount of water in recirculation. Targets are set to ensure continuous effort is made to improve water management and to encourage all groups to find and pursue opportunities to reduce freshwater consumption. Higher production rates in 2023 will require slightly more fresh water withdrawn from Third Portage Lake.

**Table 4-7 Meadowbank Water Management Targets**

| Water Objective | Target 2022 | Achieved 2022 | Target 2023 |
|---|---|---|---|
| Fresh Water Withdrawn from Third Portage Lake (Mill and Camp) | 807,000 $m^3$ | 993,806 $m^3$ | 865,000 $m^3$ |
| Contact Water Withdrawn from Pit (reclaim water to Mill) | 3,508,822 $m^3$ | 2,888,010 $m^3$ | 3,465,000 $m^3$ |
| Freshwater per tonne processed | 0.20 $m^3$/t | 0.26 $m^3$/t | 0.20 $m^3$/t |
| Water discharge (treated) | 0 $m^3$ | 0 $m^3$ | 0 $m^3$ |
| Water discharge (fresh) | 70,000 $m^3$ (East Dike to Second Portage Lake) | 22,336 $m^3$ (East Dike to Second Portage Lake) | 61,000 $m^3$ (East Dike to Second Portage Lake) |
| Water in recirculation (water recycled / total water use) | 81.30% | 75.1% | 80.0% |

To avoid and minimize water related impacts and risks and to help achieve the water management targets above Agnico Eagle implemented several initiatives in 2022. These initiatives are summarized in Table 4-8.

**Table 4-8 Initiatives Taken to Decrease Water Management Risks**

| Initiative | Description |
|---|---|
| Reclaim System Improvement | Modification of reclaim pumping system in 2022 to increase reclaim flow to process plant (i.e. decrease freshwater usage) |
| Process Plant Freshwater Reduction | Implementation of an action plan in 2022 to understand and decrease freshwater consumption at process plant |
| Tailings dust suppression campaign | In the summer of 2022 a program was established to spray environmentally responsible product on the tailings surface with an helicopter to prevent wind blown tailings dust to reach the environment and surrounding waterbodies |
| East Dike seepage pumping system improvement | Modification of the seepage system at the East Dike station |

The life-of-mine (LOM) considered for the water balance reflects the mining plan summarized in the 2022 Water Management Plan, as it pertains to the activities within the current approved license for the Meadowbank mine. Revisions and modifications to the Water Balance and Water Quality Forecast are discussed in detail in the Meadowbank 2022 Water Management Plan Version 11 (Appendix 12).

In 2022 water transfers continued throughout the site to meet the water management objectives outlined above. Table 4-9 below outlines the various water transfer volumes in 2022.

**Table 4-9 2022 Meadowbank Water Transfers**

| Water Transfer Name | 2022 Transfer Volume ($m^3$) |
|---|---|
| North Cell to South Cell | 499,627 |
| SMP to South Cell | 0 |
| SMP to Pit A | 22,907 |
| South Cell to Pit A | 267,309 |
| South Cell to Goose | 0 |
| Goose to Pit A | 0 |
| Goose to Pit E | 0 |
| Pit A to Pit E | 0 |
| SD 3, 4 & 5 to South Cell | 16,528 |
| SD 1, 2, NCA-D, NCIS to North Cell | 73,000 |
| Interception sump to North Cell | 66,699 |
| ST-16 & WEP to North Cell | 61,579 |
| CD D/S pond to Pit A | 510,579 |
| CD D/S pond to SC | 13,852 |
| CD D/S pond to Pit E | 0 |
| Goose Pit Inflow | 253,500 |

#### 4.4.2.2 *Whale Tail Site*

**As required by NWB Water License 2AM-WTP1830 Schedule B, Item 9:** ***Summary of reporting results for the Water Balance and Water Quality model and any calibrations as required in Part E Items 5, 6, and 8.***

And

**As required by NWB Water License 2AM-WTP1830 Part E, Item 5:** ***The Licensee shall submit an updated Water Management Plan on an annual basis to the Board for review following the commencement of Operations. The Plan must include an updated Water Balance. The Water Management Plan shall include an action plan to be implemented if predicted re-flooded pit water quality indicates that treatment is necessary.***

And

**As required by NWB Water License 2AM-WTP1830 Part E, Item 6:** ***The Licensee shall submit a Water Quality Model for pit re-flooding and for WRSF contact water mixing into Mammoth Lake post-Closure as part of the Water Management Plan which shall be re-calibrated as necessary and updated annually following commencement of Operations. The results and implications of the predictive model shall be reported to the Board.***

A water balance, water quality forecast, and water management plan update for 2022 was completed. These can be found in Appendix 13.

The water management targets and achieved data for 2022 are summarized in Table 4-10. In 2022 all targets were achieved for freshwater and contact water. Much less water was discharged from site than planned.

Targets for 2023 are also presented in Table 4-10. These targets are aligned with the water objectives of the Meadowbank Complex (see the section above) and go beyond the License limit. These targets strive to minimize risk, conserve freshwater, and minimize water usage. The 2023 targets assume continued improvements in the amount of contact water withdrawn from the Pit. Higher production rates in 2023 will require slightly more fresh water withdrawn from Nemo Lake, more contact water withdrawn from Underground as the works expand, and more water discharged from site.

**Table 4-10 Whale Tail Water Management Targets**

| Water Objective | Target 2022 | Achieved 2022 | Target 2023 |
|---|---|---|---|
| Fresh Water Withdrawn from Nemo Lake (Mining and Camp) | 75,000 $m^3$ | 75,183 $m^3$ | 80,000 $m^3$ |
| Contact Water Withdrawn from Pit (pit inflow) | 910,827 $m^3$ Calculated taking an average year | 901,872 $m^3$ | 915,000 $m^3$ |
| Contact Water Withdrawn from Underground (inflow) | 3,000 $m^3$ | 2,550 $m^3$ | 16,000 $m^3$ |
| Water discharge from site (WTS / Mammoth Lake) | 2,488,068 $m^3$ | 1,988,076 $m^3$ | 2,500,000 $m^3$ |
| Water in recirculation (water recycled / total water use) | 0% | 0% | 0% |

The life-of-mine (LOM) considered for the water balance reflects the mining plan summarized in the 2022 Water Management Plan, as it pertains to the activities within the current approved license for the Whale Tail mine.

Revisions and modifications to the Water Balance and Water Quality Forecast are discussed in detail in the 2022 Water Management Plan Version 8 (Appendix 13).

As per comments received on the 2020 Annual Report, Agnico Eagle is providing the quantification use of explosive relative FEIS. In 2022, approximately 11.6k tonnes of explosives were used at the Whale Tail mine for open pit and underground. Water quality predictions outlined in the Appendix 6H of the FEIS Addendum for the Whale Tail Pit – Expansion Project (Agnico, 2018) related to explosive usage are specified for residual explosives in WRSF's, pit sumps, and underground sumps. Applied concentrations for nitrate and ammonia in operations for WRSF and pit sump runoff flows are 12 mg/L-N ($NO_3$) and 0.3 mg/L-N ($NH_4$) while applied concentrations for nitrate and ammonia in underground sumps are 321 mg/L-N ($NO_3$) and 321 mg/L-N ($NH_4$). The concentration of explosives by-products (ammonia and nitrate) in site contact water is sensitive to the management of blasting agents during their use. Given the proximity and similarity both in setting and operation of the Project to the Meadowbank Mine (similar mining rate, explosives type and explosives usage rate), it was assumed that similar nitrogen and ammonia contents would occur in the waste rock, and open pit drainages. Similarly, average ammonia and nitrate concentrations observed in the underground sumps at the Meliadine Mine were used as input chemistry to the model for underground sump concentrations.

Analysis of 2022 water chemistry results for the WT WRSF Pond (ST-WT-3), WT WRSF Pond (ST-WT-30, 31, 32, and 33), IVR WRSF Sump (ST-WT-28) and IVR WRSF Pond (ST-WT-34, 35, and 36) all exhibit average nitrate results less than the predicted 12 mg/L-N outlined in the FEIS with combined average nitrate values of 1.90 mg/L-N in 2022 Analysis of total ammonia-N results for these stations results in an average of 0.257 mg/L-N which is slightly lower than the concentrations outlined in the FEIS predictions, however the more toxic un-ionized ammonia concentration averages out to a result of 0.00044 mg/L-N.

Analysis of 2022 water chemistry results for both the Whale Tail Pit (ST-WT-4) and IVR Pit (ST-WT-18) Sumps exhibit nitrate results of 4.14 mg/L-N and 15.27 mg/L-N respectively, however average nitrate results are less than the predicted 12 mg/L-N as outlined in the FEIS with combined average nitrate values of 9.70 mg/L-N. Analysis of total ammonia-N results for these stations results in an average of 5.22 mg/L-N, which is higher than the FEIS predictions, however the more toxic un-ionized ammonia concentration averages out to a result 0.02 mg/L-N.

Analysis of 2022 water chemistry results for the Whale Tail Groundwater Storage Pond (GSP-1) (ST-WT-20) exhibit average nitrate results of 76.64 mg/L-N and average total ammonia-N results 26.9 mg/L-N, both of which are well below the average of 321 mg/L-N for both nitrate and ammonia concentrations outlined in the predictions.

All results for the aforementioned monitoring stations can be found in Section 8.5.3.2 of this report. It is important to note that none of the monitoring stations exhibited results for total ammonia-N exceeded the maximum authorized monthly mean or grab concentrations of 15 mg/L-N and 30 mg/L-N respectively, as included in the effluent quality limits found in the Whale Tail Water License (2AM-WTP1830).

Additionally, as mentioned in the FEIS predictions, if explosives waste management differs from that which is practiced at Meliadine, the sump concentrations at the Whale Tail mine may differ from the model predictions. Ammonia is expected to be attenuated through the FWTP. Agnico Eagle will continue to monitor the residual explosive concentrations and how they correlate to FEIS predictions in future annual reports.

### 4.4.3 Predicted Vs Measured Water Quality

#### 4.4.3.1 *Meadowbank Site*

**As required by NWB Water License 2AM-MEA1530 Part E, Item 9: *The Licensee shall, on an annual basis during Operations, compare the predicted water quantity and quality within the pits, to the measured water quantity and quality. Should the difference between the predicted and measured values be 20% or greater, then the cause(s) of the difference(s) shall be identified and the implications of the difference shall be assessed and reported to the Board. The comparison of predicted water quality in reflooded pits also addresses Water License 2AM-MEA1530 Part E, Item 7.***

As per NIRB Comments to 2014 Annual Report: *"(…) provides comparisons between originally predicted and measured water quantity and quality in 2014. This comparison only uses the current year, but a year over year comparison would help identify trends*." In the 2015 and 2016 Annual Report, the predicted water quantity and quality within the pits was compared to the measured water quantity and quality. This comparison used a year over year comparison. Since 2017, the predicted water quantity and quality within the pits will be compared to the measured water quantity and quality values that were sampled in the same year.

The comparison between the predicted water quantity and quality within the pits will be compared to the measured water quantity and quality done from 2012 to 2022. Because the Portage Pit was not deep enough to collect sufficient data from the sumps in 2011, this comparison used 2012 as a start point.

Appendix 20 provides a comparison between predicted (originally predicted in support of the NWB license) and measured water quantity and quality within Portage, Goose and Vault Pits from 2012 to 2022. The Life of Mine (LOM) at Meadowbank has been updated since the 2007 application for the NWB license and includes the Whale Tail mine (past 2018). Consequently, the prediction model year originally presented in 2007 are no longer in sync with the current LOM. In order to account for this discrepancy, Table 4-11 presents the predicted model year used for comparison of the measured data collected in the current LOM calendar year.

Percent difference between the predicted and measured values for water quantity and quality was calculated using the following formula:

*% difference = ((A-B) / B)*100;*
*where: A = measured value and B = predicted*

**Table 4-11 Water Quality Predicted Model Year used for Comparison against Current Life of Mine Calendar Year**

| Calendar Year | Current Life of Mine Year | Predicted Model Year Used for Comparison | | | | |
|---|---|---|---|---|---|---|
| | | Third Portage Open Pit (Pit E) | North Portage Pit Sump (Pit A) | Goose Island Pit | Vault Pit Sump | Phaser Pit Sump |
| **2012** | **3** | 3 | not in operation | 3 | not in operation | not in operation |
| **2013** | **4** | 4 | | 3 | | |
| **2014** | **5** | 4 | 4 | 3 | 5 | |
| **2015** | **6** | 4 | 4 | 3 | 6 | |
| **2016** | **7** | 4 | 4 | 3 | 7 | |
| **2017** | **8** | 4 | 4 | 3 | 7 | |
| **2018** | **9** | 4 | 4 | 3 | 7 | 7 |
| **2019** | **10** | 4** | 4** | 3** | 8 | 8 |
| **2020** | **11** | 4** | 4** | 3** | 9 | 9 |
| **2021** | **12** | 4** | 4** | 3** | 10 | 10 |
| **2022** | **13** | 4** | 4** | 3** | 11 | 11 |
| **2023** | **14** | 4** | 4** | 3** | 12 | 12 |
| **2024** | **15** | 4** | 4** | 3** | 13 | 13 |
| **2025** | **16** | 4** | 4** | 3** | 13 | 13 |
| **2026** | **17** | 4** | 4** | 3** | 13 | 13 |
| **2027-2038** | **Closure** | 5 to 13 | 5 to 13 | 5 to 13 | 13 | 13 |

Note:
** As of 2019, measured data are compared against the predicted model year presented in 2007 and the predicted values presented in the Meadowbank Interim Closure and Reclamation Plan, updated in 2019 which include in-pit deposition.

*Water Quantity*

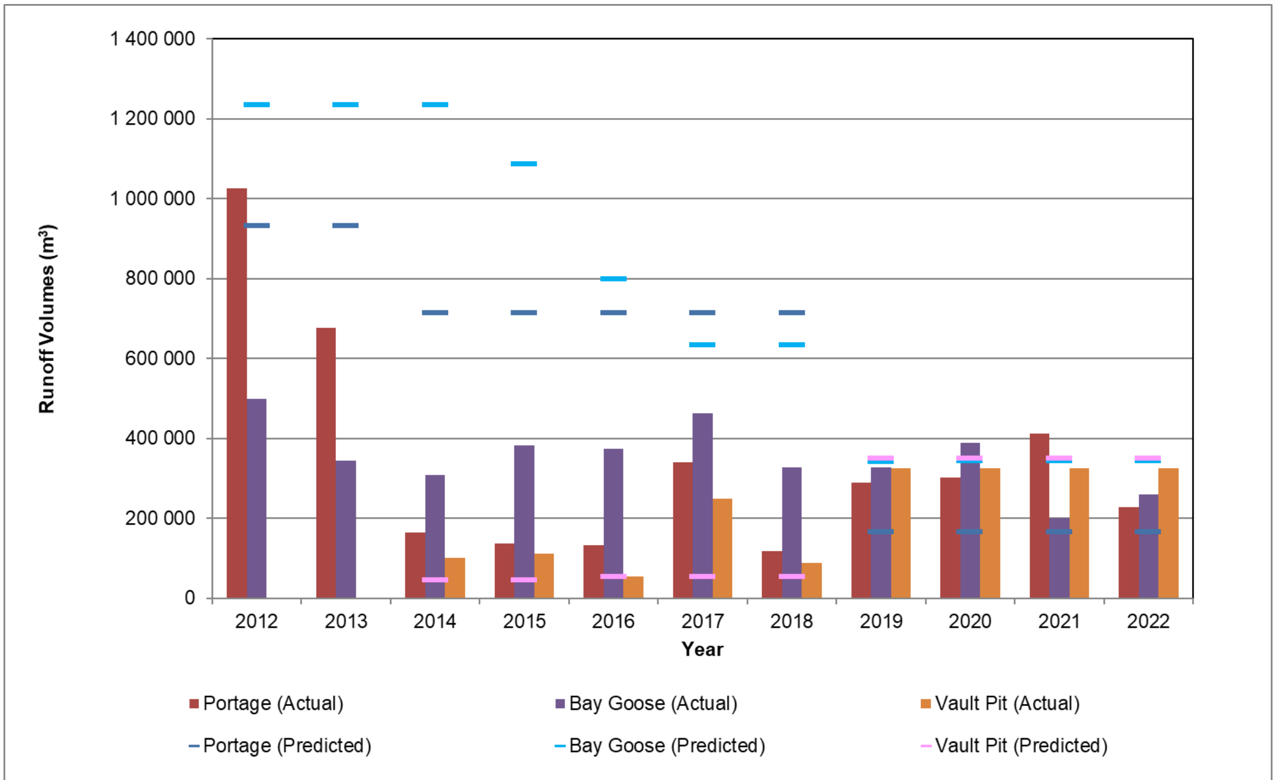
The tables presented in Appendix 20 provides a comparison between predicted (originally predicted in support of the NWB license) and measured water quantity within Portage, Goose and Vault Pits from 2012 to 2022.

Table 4-12 summarizes the key differences between the predicted water quantity in Golder (2007) against the measured estimated volumes in Portage Pit, Goose Pit and Vault Pit and provides also general comments and explanations for these discrepancies. Figure 9 summarizes the runoff to the different pits measured from 2012 to 2022 and compares them against the forecasted values.

**Table 4-12 Summary of Key Differences Between Predicted and Measured Water Quantity**

| Pits | Difference between Predicted Water Quantity and Measured Water Quantity | Comments/Explanation |
|---|---|---|
| Portage | • In 2012, the measured water quantity was higher than the predicted water quantity by only 10%.<br>• From 2013 to 2018, the measured water quantity was lower than the predicted water quantity by more than 20%.<br>• From 2019 to 2022, the measured water quantity was higher than the predicted water quantity by more than 20%. | • From 2013 to 2018, the quantities of seepage and groundwater sources and volumes that collectively make up the water in the pit, were less than what was originally predicted.<br>• Furthermore, between 2014 and 2018, water from the East Dike Seepage was pumped back to Second Portage Lake which contributes to significantly decrease the water quantity in Portage Pit<br>• As of 2019, operations continued in Portage Pit with in-pit deposition activities. The site did not go into closure as originally planned and thus any clean water diversion structure required at closure were not put in place. |
| Goose | • The % difference between the predicted water quantity and the measured quantity were lower by more than 20% from 2012 to 2018, 2021 and 2022.<br>• In 2019, the % difference between the predicted water quantity and the measured quantity was not significant (i.e. -5%).<br>• In 2020, the % difference between the predicted water quantity and the measured quantity was higher by 13%.<br>• In 2022, the % difference between the predicted water quantity and the measured quantity was lower by 24%. | • Since 2012, the quantities of seepage and groundwater sources and volumes that collectively report to Goose Pit were less than what was originally predicted.<br>• Differences in measured quantities can also be attributed to either lower or higher runoff and infiltration rates reporting to this area. |
| Vault | • The % differences were significantly higher than 20% in 2014 (commencement of mining operations), 2015, 2017 and 2018 between the predicted water quantity and the measured quantity<br>• In 2016, and 2019 to 2022, there was no significant difference between the predicted and measured volume (i.e. less than -10%).<br>• In 2018, the estimated runoff volume reporting to Vault and Phaser Pits was 64% above the predicted value.<br>• In 2022, the estimated value runoff volume reporting to Vault is the same of 2019. the % difference between the predicted water quantity and the measured quantity was higher by 7%. | • The higher differences in measured quantities can be attributed to higher freshet and rainfall volumes reporting to this specific area.<br>• In 2018, a large ice wall was formed in the Vault pit over the winter months. This phenomenon indicates a higher seepage flow rate entering the pit that was not accounted for in the original water balance. The main implication of the higher volumes of water to manage at the Vault Pit area is the requirement for longer pumping period than anticipated<br>• Since 2019, no activity is occurring at the Vault site. The Vault Pit is allowed to naturally reflood over time. |

**Figure 9 Meadowbank Summary of Runoff Volumes to the Pits**




*Water Quality*

According to the original NWB application documents (Golder, 2007- Water Quality Predictions), a Probable scenario and a Possible Poor End scenario for predicted water quality results were evaluated. These models were developed to anticipate a representative range of water quality that would be used for management and mitigative decisions. The Probable scenario used input values that simulate predicted observed field conditions and added realistic scaling factors related to explosives management and pit operations. The Possible Poor End scenario input values simulated probable variance on observed field characteristics and selected input parameters to capture possible, conservative variance. The predicted values in the Probable scenario and the Possible Poor End scenario represented the summer averages.

The measured values for 2012 to 2022 (LOM year 3 to 13) are summarized in tables presented in Appendix 20. Each table includes the following information:

- The yearly mean and lower 25$^{th}$ percentile of all the data available throughout the year at Portage Pit (ST-17 and ST-19), Goose Pit (ST-20), Vault Pit (ST-23 and ST-26) and Phaser Pits (ST-41 and ST-42) were compared to the predicted values where data were available.
- The lower 25$^{th}$ percentile values were calculated and compared to the predicted values when three or more samples were taken during the year.
- For year 2012 to 2018, the predicted values were evaluated in the water quality prediction model developed in 2007 (refer to Table 4-11 for predicted model year used for comparison).

- As of 2019, the predicted values for Portage and Goose pits were based on the water quality forecast considered in the Meadowbank Interim Closure and Reclamation Plan, updated in 2020 since in-pit deposition has started in Goose Pit.
- In addition, as of 2019, the measured values were also compared to the predicted values obtained in the water quality prediction model developed in 2007 to ensure continuity with previous years analysis (refer to Table 4-11 for predicted model year used for comparison).
- The measured data was also compared to the Water License discharge criteria to Third Portage Lake and Wally Lake, the Metal and Diamond Mining Effluent Regulations (MDMER) and the CCME water quality guidelines for the protection of aquatic life.
    - With regard to the MDMER, the discharge criteria were updated as of June 2021 and thus, the measured data was compared to these updated values.
    - Sulphate concentrations were compared to a guideline value based on a threshold value from BC Environment guideline for the protection of aquatic life for very soft water (0-30 mg/L) (April 2013).
    - It is understood that the Water License, MDMER and CCME criteria apply to mining effluents discharged to the environment and are as such not applicable to the pit water since it is managed within the site and undergoes a treatment step if required prior to discharge to the environment. These criteria are used as a guide to identify potential parameters of concern.

The laboratory services selected by Agnico Eagle are conducted by accredited facilities and reach the analysis lower detection limits (LDL) where the results can be compared to the CCME guidelines. Agnico Eagle will continue to ensure that the accredited laboratory can reach the required detection limits.

Table 4-13 summarizes the key differences between the predicted and the measured water quality data at the Third Portage Open Pit Sump (i.e. Portage Pit E), Goose Island Open Pit Sump (i.e. Goose Pit), North Portage Pit Sumps, Vault Pit Sumps and Phaser Pit Sumps presented in Appendix 20. Comparison to the guidelines (CCME Guidelines, MDMER and Water License criteria) to be used as a guide only to identify potential parameters of concern.

Figures 10 to 13 on the following pages illustrate the measured annual mean concentrations (represented by the vertical bars) and the probable and possible poor scenario, for the last five years (2018 to 2022), or annual average and lower 25$^{th}$ percentile scenarios for year 2022 (represented by horizontal lines). Graphics for the 25$^{th}$ percentile data were not plotted since there are years where not enough samples were taken to statistically evaluate this value.

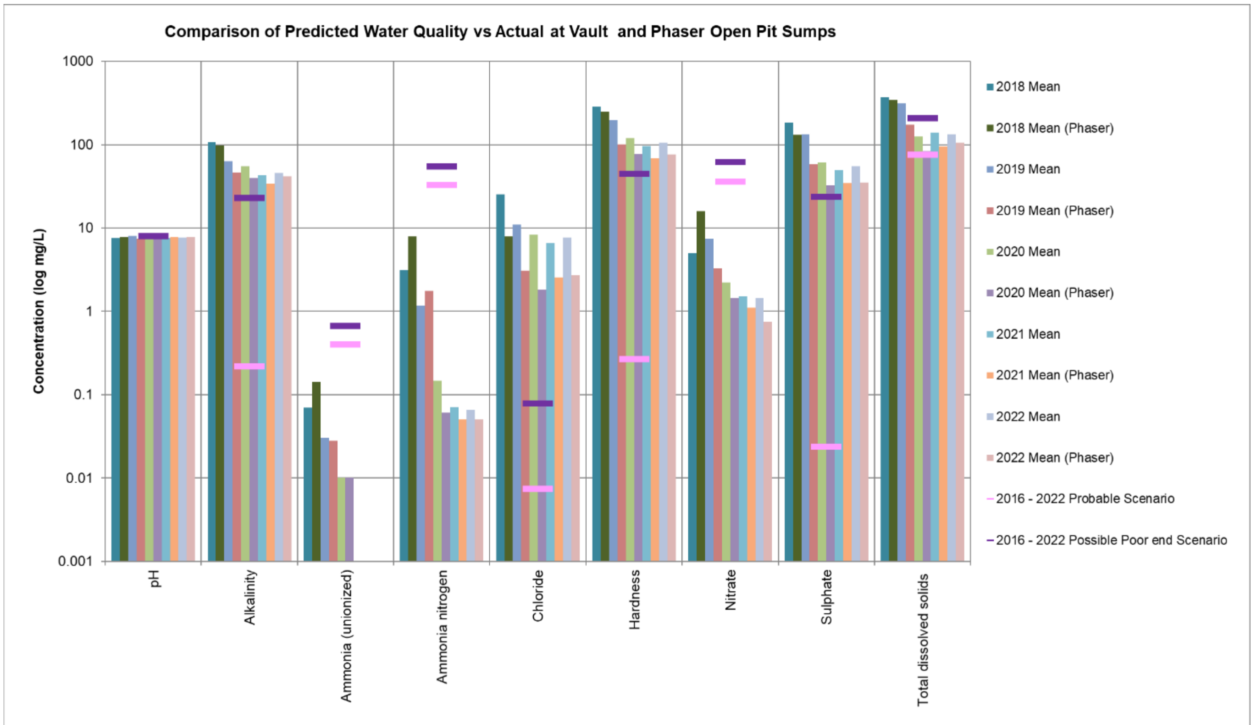
**Table 4-13 Summary of Key Differences Between Predicted and Measured Water Quality**

| Pits | Difference between Predicted Water Quantity and Measured Water Quantity | Comparison to CCME Guidelines, MDMER and Water License |
|---|---|---|
| Third Portage Pit Sump (Pit E) | • From 2012 to 2018 the difference between the measured and predicted values were generally greater than +/- 20% for many parameters, for both probable and possible poor scenarios assessed in 2007.<br>• The parameters with difference much greater than 20% vary from year to year. Notable parameters include unionized ammonia, copper, arsenic cadmium, selenium and thallium.<br>• From 2019, the difference between the measured and predicted values continue to be generally greater than +/- 20% for many parameters, for both probable and possible poor scenarios assessed in 2007.<br>• However, when comparing the measured data to the 2019 annual average water quality forecasted values, the % difference are generally lower when comparing to the 2007 predicated values. This is expected since the 2007 predicated values did not consider in-pit deposition.<br>• In 2022, for many parameters the measured values were higher by 9% than the same values in 2021. | • From 2012 to 2022, the following recurring parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, fluoride and nitrate.<br>• Sulphate were found to be higher than the threshold value as of 2015.<br>• From 2020 (i.e. start of in-pit deposition), most of the metals were found to be higher than the CCME guidelines, except for lead, barium, iron, manganese and thallium.<br>• Generally, no parameters exceeded the Water License and MDMER criteria prior to the start of in - pit deposition.<br>• From 2020, certain parameters exceeded the Water License criteria: ammonia nitrogen (as of 2021) arsenic (only in 2020), copper and nickel (as of 2021).<br>• From 2020, the following parameters exceeded the MDMER criteria: copper and nickel (as of 2022).<br>• In 2022: certain parameters exceeded the Water License criteria: ammonia nitrogen, copper and nickel (as of 2021). |
| North Portage Pit Sump (Pit A) | • The difference between the measured and predicted values were generally greater than 20% for all parameters, for both probable and possible poor scenarios assessed in 2007.<br>• The parameters with difference much greater than 20% vary from year to year. Notable parameters include unionized ammonia, chloride, fluoride, molybdenum, and sulphate.<br>• When comparing the measured data to the 2019 annual average water quality forecasted values, the % difference are generally lower when comparing to the 2007 predicated values. This is expected since the 2007 predicated values did not consider in-pit deposition.<br>• Note that no tailings were deposited in Pit A. Pit A was used since 2019/2020 as a storage basin for Reclaim Water.<br>• In general, measured values in 2022 were higher by +/-30% than the measured values in 2021. Moreover, in 2022, predicted values exceeded the measured values by +/- 50%. | • From 2015 to 2022, the following recurring parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, arsenic, fluoride, and nickel.<br>• Sulphate were found to be higher than the threshold value as of 2015.<br>• From 2020 (i.e. start of in-pit deposition in Pit E), the following additional parameters were found to be higher than CCME guidelines: copper, manganese, molybdenum and selenium.<br>• Generally, no parameters exceeded the Water License and MDMER criteria prior to the start of in - pit deposition.<br>• From 2020, certain parameters exceeded the Water License criteria: ammonia (as of 2021) arsenic (only in 2020), copper and nickel (only of 2021).<br>• From 2020, the following parameters exceeded the MDMER criteria: copper (2020 and 2021).<br>• In 2022, no parameters exceeded the MDMER criteria. However, ammonia nitrogen and copper exceeded the Water License criteria. |

| Pits | Difference between Predicted Water Quantity and Measured Water Quantity | Comparison to CCME Guidelines, MDMER and Water License |
|---|---|---|
| Goose Island Pit Lake (Goose Pit) | • From 2012 to 2018 the difference between the measured and predicted values were generally greater than +/- 20% for many parameters, for both probable and possible poor scenarios assessed in 2007.<br>• From 2019, the difference between the measured and predicted values continues to be generally greater than +/- 20% for many parameters, for both probable and possible poor scenarios assessed in 2007. This is to be expected since in-pit deposition took place in Goose Pit in 2019.<br>• However, when comparing the measured data to the 2019 annual average water quality forecasted values, the % difference are generally lower when comparing to the 2007 predicated values. This is to be expected since the 2019 model considered in-pit deposition.<br>• Note that no tailings were deposited in Goose Pit other than in 2019. As of 2020, only natural runoff are reporting to the pit, with occasional transfer to Pit A<br>• For 2022, predicted values were lower than the measured values by +/- 30%. | • From 2015 to 2022, the following recurring parameters were found to be higher than the CCME guidelines: fluoride and nitrate (up to 2020).<br>• Sulphate were found to be higher than the threshold value as of 2015.<br>• In 2019, tailings were deposited in Goose Pit. From that moment, the following additional parameters were found to be higher than CCME guidelines: unionized ammonia, ammonia , arsenic, copper, nickel and selenium.<br>• Generally, no parameters exceeded the Water License and MDMER criteria prior to the start of in - pit deposition in 2019, except for cadmium and mercury in 2012 and nitrate in 2013.<br>• From 2019, certain parameters exceeded the Water License criteria: ammonia (as of 2020), arsenic (as of 2020) and copper (2019 to 2020).<br>• From 2020, the following parameters exceeded the MDMER criteria: copper (2019 to 2020) and arsenic (as of 2020).<br>• In 2022, ammonia nitrogen and arsenic exceeded the water License criteria (as 2020). Compared to 2020, only arsenic exceeded the MDMER criteria. |
| Vault Pit | • From 2014 to 2018, the difference between the measured and predicted values where generally greater than +/- 20% for many parameters, for both probable and possible poor scenarios assessed in 2007.<br>• The parameters with difference much greater than 20% vary from year to year. Notable parameters include alkalinity, fluoride, iron, manganese and sulphate<br>• From 2019, once the mining activity has stopped in the area, the difference between the measured and predicted values continued to be generally greater than +/- 20% for many parameters for both probable and possible poor scenarios assessed in 2007, but to a lesser extent.<br>• For 2022, the difference between the measured and predicted values continued to be generally greater than +/- 20% for many parameters (except ammonia nitrogen and nitrate) for both probable and possible poor scenarios assessed between 2016-2022. | • From 2014 to 2019 the following recurring parameters were found to be higher than the CCME guidelines: unionized ammonia, ammonia, fluoride and nitrate.<br>• Sulphate were found to be higher than the threshold value from 2014 to 2019.<br>• Once operation ceased in 2019 and the pit was allowed to naturally reflood, most parameters were below the CCME guidelines as of 2020, except for selenium in 2020 that was slightly higher than the guideline.<br>• No parameters exceeded the Water License, except for ammonia in 2015.<br>• No parameters exceeded the MDMER criteria.<br>• In 2022, no parameters exceeded all criteria guidelines |

| Pits | Difference between Predicted Water Quantity and Measured Water Quantity | Comparison to CCME Guidelines, MDMER and Water License |
|---|---|---|
| Phaser Pit | • In 2018, the difference between the measured and predicted values were generally greater than +/- 20% for many parameters, for both probable and possible poor scenarios assessed in 2007.<br><br>• The parameters with difference much greater than 20% vary from year to year. Notable parameters include fluoride, manganese and sulphate<br><br>• From 2019, once the mining activity has stopped in the area, the difference between the measured and predicted values continued to be generally greater than +/- 20% for many parameters for both probable and possible poor scenarios assessed in 2007, but to a lesser extent. The difference between the measured and predicted values continued to be generally greater than +/- 20% for many parameters (except ammonia nitrogen and nitrate) for both probable and possible poor scenarios assessed between 2016-2022. | • From 2018 to 2019 the following recurring parameters were found to be higher than the CCME guidelines: unionized ammonia, ammonia, copper, fluoride and nitrate.<br><br>• Sulphate were found to be higher than the threshold value from 2018 to 2019.<br><br>• Once operation ceased in 2019 and the pit was allowed to naturally reflood, most parameters were below the CCME guidelines as of 2020, except for copper in 2021 and 2022 that was slightly higher than the guideline.<br><br>• In 2022, no parameters exceeded the Water License and MDMER criteria. |

**Figure 10 Meadowbank Mean Annual Water Quality - Vault and Phaser Open Pit Sumps**



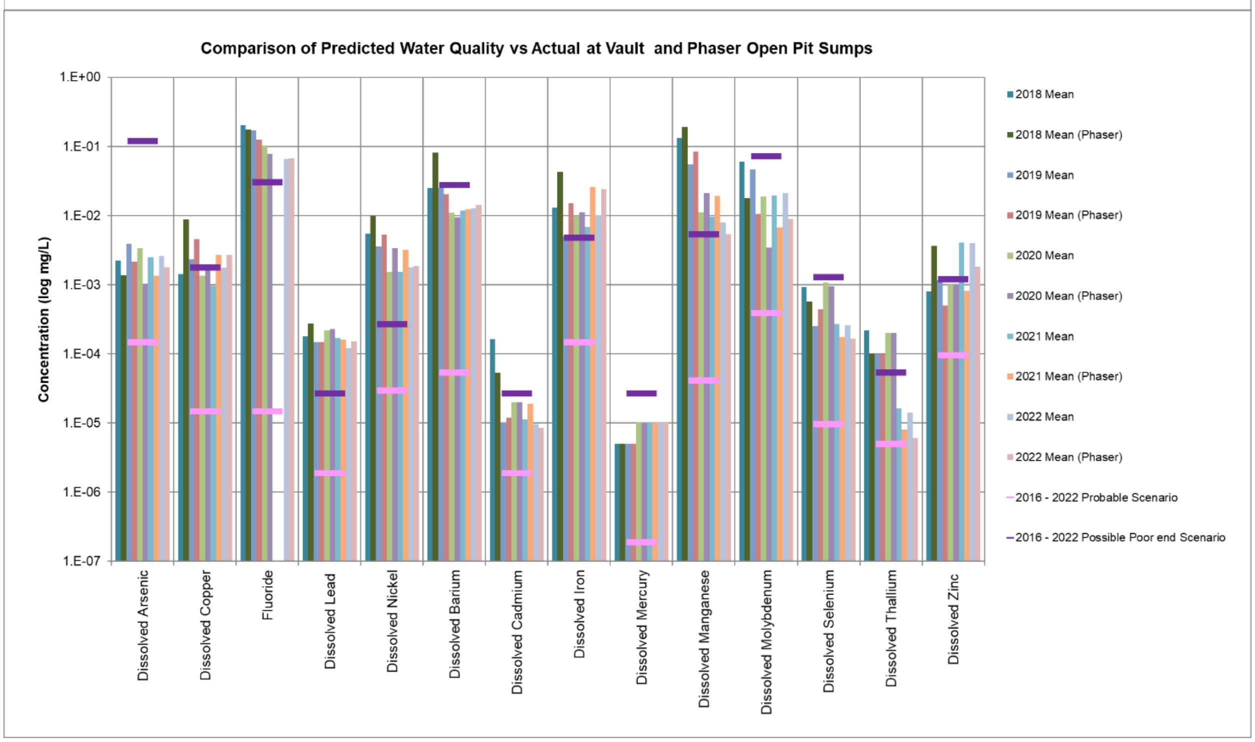
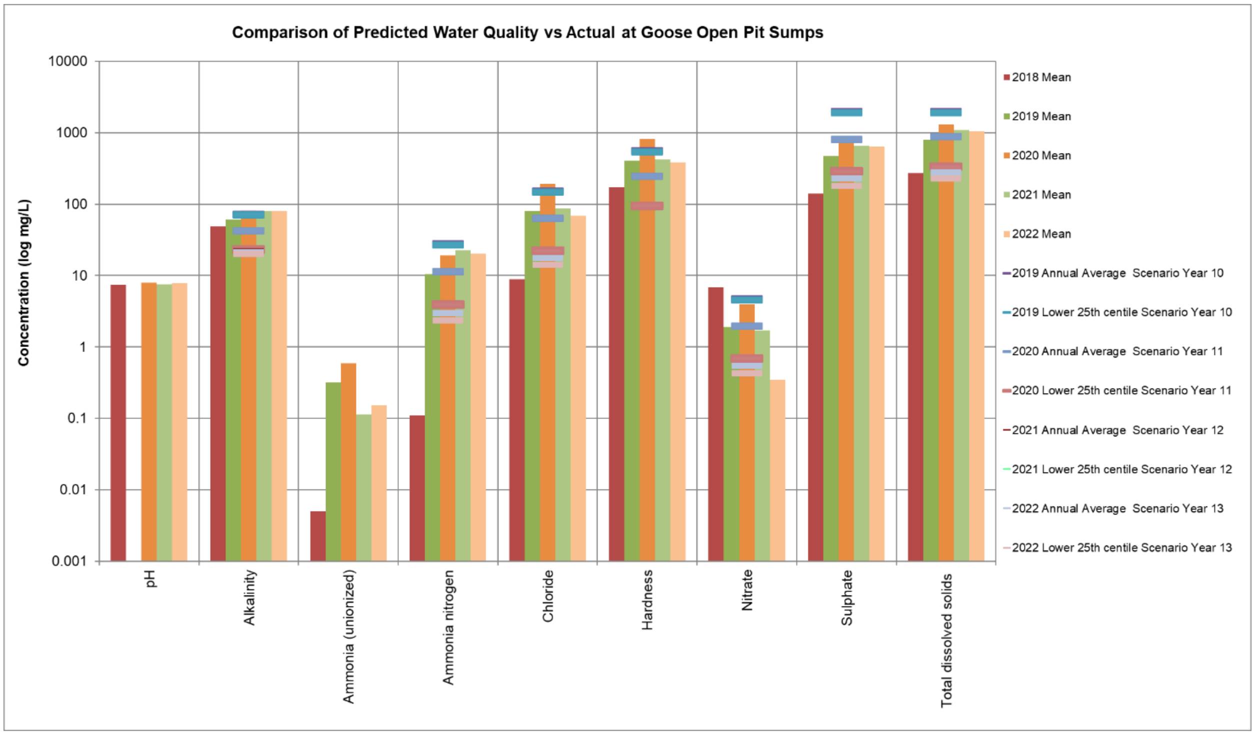



**Figure 11 Meadowbank Mean Annual Water Quality – Goose Open Pit Sumps**



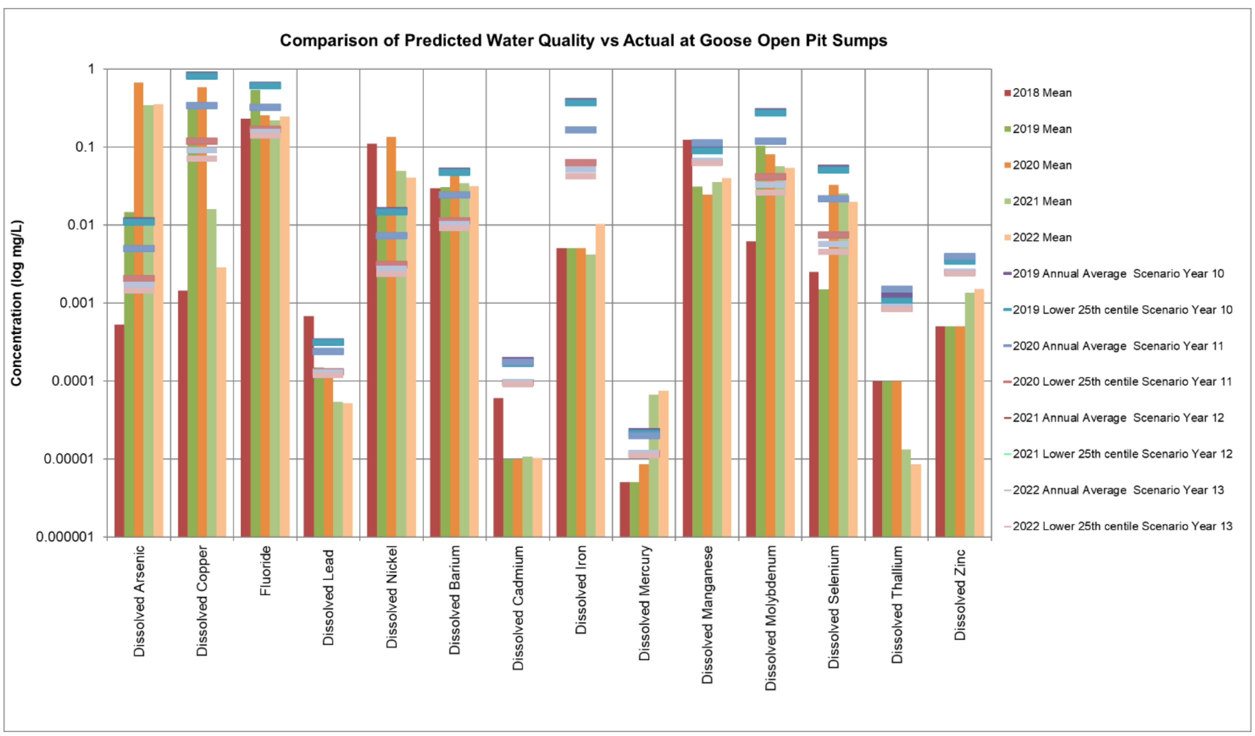
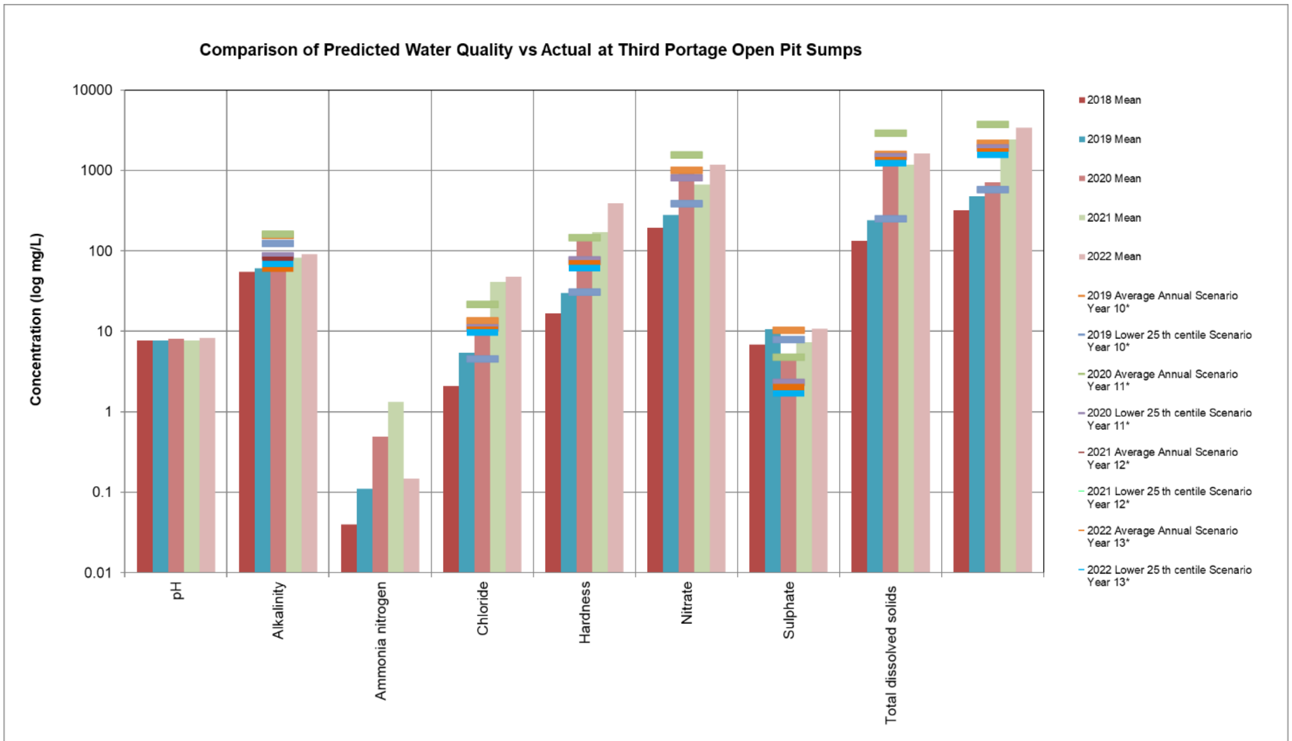



**Figure 12 Meadowbank Mean Annual Water Quality – Third Portage Pit (Pit E) Sumps**



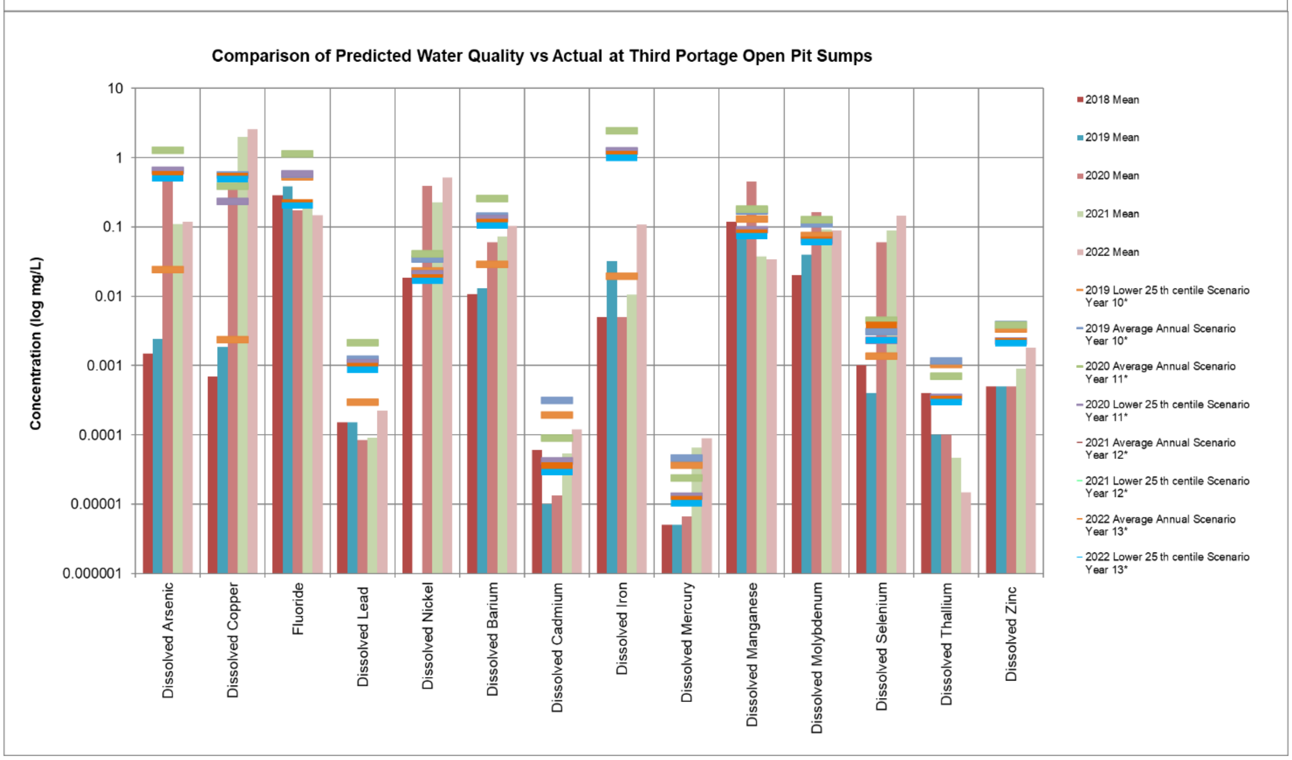
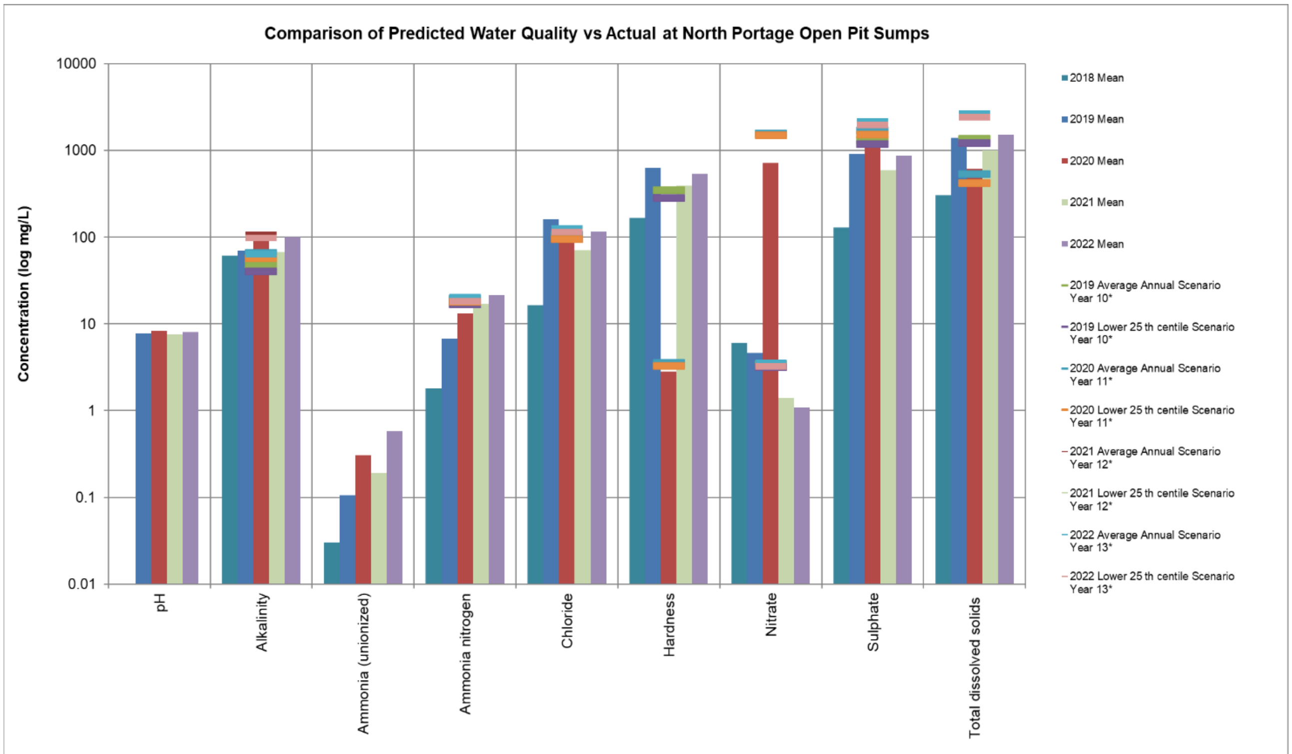
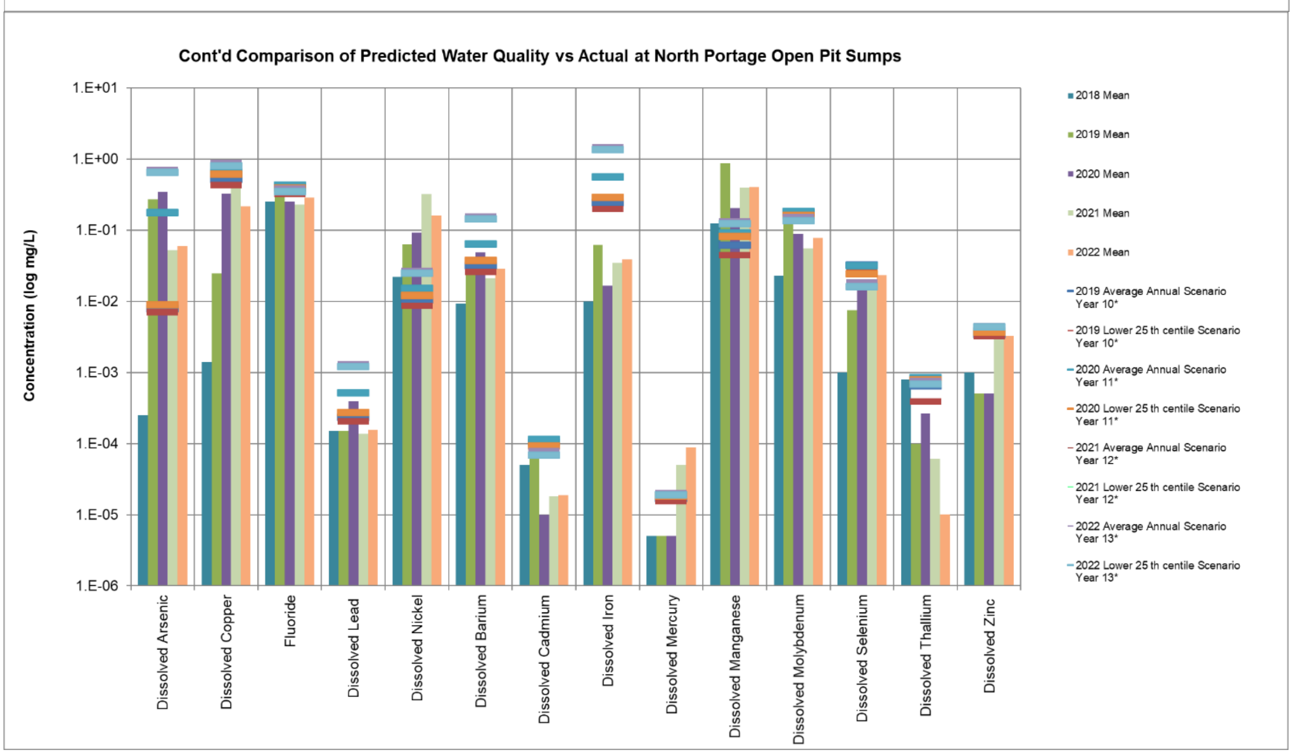



**Figure 13 Meadowbank Mean Annual Water Quality – North Portage Pit (Pit A) Sumps**



Based on this analysis, many of the predicted values for water quality and quantity for the Probable and Probable Poor End scenarios and Annual Average and 25% Percentile Water Quality Forecast have differences greater than +/- 20% when compared to the measured values. There are several potential causes that could contribute to these differences:

- For Portage and Goose Pits, the measured water volumes were significantly less than what was originally predicted, specifically from 2012 to 2018. This reflects the fact that seepage, ground water and local runoff volumes were being managed and less water than what was originally predicted was reporting to the pit sumps.
- For Portage Pit, the measured water volumes of 2019 to 2022 were higher than what was originally predicted. This can be explained by the higher observed precipitation at the site and more runoff being directed toward Portage Pit and possibly a higher infiltration rate.
- Higher contaminant loads observed in Portage Pit could be the result from additional transfer of reclaim water from the Central Dike Downstream Pond.
- Higher contaminant loads of arsenic and nickel could also be the results of processing ore from Whale Tail mine. This ore was shown to leach out higher concentration for certain metals, such as arsenic.
- Since 2019, in-pit deposition activities in Goose and Portage Pit contribute the main contaminant loading to the pit water.
- For North Portage Pit, the higher load could originate from water transfer from South Cell TSF, Downstream Pond and Goose Pit and transfer from Third Portage Pit.
- Higher observed load in the seepages flowing into the pits also contribute in part to the contaminant loads observed in Goose and Portage pits.
- The contaminant loads measured in Vault and Phaser Pits water were generally higher than the prediction. However, there has been a continued improvement in pit water quality year after year since the end of mining at Vault and natural re-flooding was allowed to take place in the pits.
- Some accredited laboratory water quality measurements have detection limits that are higher than the predicted values. This is particularly true for dissolved metal analysis, such as cadmium, iron, lead, nickel, molybdenum, selenium, thallium and zinc.
- The pH measured in Portage and Goose pits is generally higher than the predicted values. A possible cause for this phenomenon is that the groundwater infiltrating into the pits have a higher alkalinity concentration and pH when compared against the background water quality of the surrounding Third Portage Lake.
- Un-ionized ammonia concentration in water is greatly influenced by the pH. The higher the pH, the higher the fraction of un-ionized ammonia in the water. The predicted pH of the Portage and Goose pit water is between 6.1 and 6.3, while the measured values are generally between 7.0 and 8.3.

Furthermore, there are many parameters in the pit water from Goose Pit, Third Portage Pit and North Portage Pit that are higher than the CCME water quality guidelines for the protection of aquatic life. Some parameters, such as ammonia and nitrate, are present in the pit water from the use of explosive during the pit development and from natural degradation of cyanate, the by-product produced from the cyanide destruction process. Other parameters found in the pit water could originate from the natural groundwater seepage into the pit (i.e. fluoride, sulphates, etc.), from contact of runoff water and seepage water with potentially acid generating (PAG) rock surfaces of the pit wall and/or from loads coming from the reclaim water that is deposited with the tailings in the pits.

However, it is important to note that the water from all the pits is extensively monitored and is not discharged directly into the environment:

- For Portage and Goose Pit sump water, no water was discharged to the environment from these pits. Up until November 2014, the pit water was transferred to the former Attenuation Pond. The water accumulated in the Attenuation Pond was sent to the Tailings Storage Facility or treated by the Water Treatment Plant (WTP) before being discharged in the Third Portage Lake. It should also be noted that since the South Cell Tailings Storage Facility was put into operation (November, 2014), no additional water from the former Portage Attenuation Pond has been discharged into the receiving environment during mining operations. Since mining activities are completed in Goose, all water inflows will remain in Goose Pit and form part of the natural re-flooding volume (since July 2015). In-pit tailings deposition in Goose Pit was started in July 2019 and finished in August 2020. It continued in Third Portage Pit as of August 2020. Reclaim water from the South Cell TSF Reclaim Pond and Central Downstream Pond was also transferred to North Portage Pit in 2020, 2021 and 2022.
- For Vault and Phaser Pits sump water, the pit water reports to the Vault Attenuation Pond. The water accumulated in the Vault Attenuation Pond could have been treated by the WTP, if required, until the end of 2017 for Total Suspended Solids (TSS) removal before discharge into the receiving environment (Wally Lake). From 2018 to 2022, there was no discharge to the environment.

The sample results from Portage, Goose, Vault and Phaser Pits will continue to be monitored in the future and the results will be considered in the water quality modelling, revised yearly, to assist in informing management of water quality in the pits during closure. All factors including the proportional volume of pit water and reclaim water in the TSF, as well as possible implementation of mitigative measures during operation and closure, will be considered when deciding if water treatment will be required at closure. All of this information including the applicable parameters are integrated into the water quality model and is discussed in the subsequent section.

Water Quality Forecast model - Pit Water Quality

Based on the updated Interim Closure and Reclamation Plan 2020, reclaim Water stored in Goose Pit, Third Portage Pit and North Portage Pit shall be treated and discharged to Third Portage Lake following the end of in-pit deposition. Once treatment is completed, aggregate cover construction over the tailings in the pits will begin, if feasible, followed by re-flooding of the pits with natural runoff and water transfer from Third Portage Lake. For this study, parameters of concern were identified using the current Water License limits, however, final site-specific treated effluent discharge limits for closure will be developed through review of the final closure plan by regulatory agencies.

The Water Quality Forecast model is completed yearly with the updated, measured data from site, as well as the water balance used on site. Review of the water quality predictions at the end of in-pit deposition is in this forecast. Table 4-1 of the Meadowbank Water Quality Forecasting Update for the 2022 Water Management Plan found in Appendix C of the 2022 Water Management Plan Version 11 (Appendix 12) summarizes the forecasted concentrations of applicable parameters in Portage and Goose Pits (based on measured water quality from the TSF) predicted in the pits at the end of in-pit deposition.

Based on the results of the water quality mass balance presented in Section 4.2 of the Meadowbank Water Quality Forecasting Update for the 2022 Water Management Plan, treatment of the reclaim water at the end of in-pit deposition may be required for metals removal (such as for arsenic, copper, iron and nickel) and TSS removal. Ammonia removal may also be needed, as well as Total Dissolved Solids reduction.

For the Vault pit, no treatment would likely be required after the pit has been re-flooded prior to dike reconnection. This is largely due to the fact that there is no interaction of contact water with a tailings disposal facility at the Vault site and all parameters are expected to meet the CCME guidelines or other site specific criteria developed during the closure process and/or baseline criteria per the Water License. Table 5-1 of the Meadowbank Water Quality Forecasting Update for the 2022 Water Management Plan presents the average concentrations of water quality from samples taken in the Vault area in 2022.

Potential treatment options for the removal of the metals in reclaim water prior to discharge to Third Portage Lake is caustic or lime precipitation, while aeration, biological treatment or zeolite exchange are recommended for total nitrogen reduction . Coagulation with ferric sulfate could be used to co-precipitate the arsenic as a ferric arsenate precipitate. Additional treatment steps could be considered once the actual nature of the water to treat is known, such as additional polishing steps, like multimedia or membrane filtration.

For the Vault area, ammonia and nitrate are the parameters of concern identified by Environment and Climate Change Canada, but no actual or forecasted concentration exceeds the Type A Water License discharge requirements for this area. Current concentrations for these two parameters are also below the CCME guidelines.

It is important to note that the water quality in the pits will be subject to CCME guidelines or site-specific criteria and/or baseline criteria per the Water License at closure once the water level in the Goose and Portage Pits are equal to the water level in the Third Portage Lake, following reclaim water treatment and natural and active pit reflooding. The dikes will only be breached once the water quality in the pits meets CCME guidelines or site specific criteria and/or baseline criteria per the Water License developed during the closure plan approval process. This applies also for the Vault area.

#### 4.4.3.2 *Whale Tail Site*

**As required by NWB Water License 2AM-WTP1830 Part E, Item 8:** ***The Licensee shall, on an annual basis during Closure, compare the predicted water quantity and quality within the pit and lake, to the measured water quantity and quality. Should the difference between the predicted base case values and measured values be 20% or greater, then the cause(s) of the difference(s) shall be identified and the implications of the difference shall be assessed and reported to the Board.***

As per the NWB requirement, this comparison will be provided once in closure.

### 4.4.4 Alternative Effluent Discharge Locations

**As required by Project Certificate No. 008 Condition 67:** ***Subject to the additional direction and requirements of the Nunavut Water Board (NWB), the Proponent shall:***

***a)Conduct an evaluation of the potential aquatic effects to Lakes D1 and D5 and downstream that may result from the discharge of treated effluent. The evaluation will include:***

- ***Additional water quality and phytoplankton baseline data in Lakes D1 and D5***
- ***Updated water balance and water quality forecast***
- ***Updated near field and far field effluent discharge modelling***
- ***Updated Water management Plan, Water Quality and Flow Monitoring, and Core-receiving Environment Monitoring Plan***

***b) Provide adequate rationale for the need to use the alternative discharge contingency, based on the thresholds established as per the Whale Tail Pit Expansion Project water management decision tree.***

***c) In the event that discharge to Lakes D1 and/or D5 is not approved to proceed by the NWB, the Proponent will develop alternative effluent management plans as part of the Water Management Plan.***

As discharge to Lakes D1 and D5 is not planned at this point, no information is required to be provided under this Term and Condition.

## 4.5 HYDRODYMANIC STUDIES WHALE TAIL SITE

**As required by NIRB Project Certificate No.008 Condition 6:** ***The Proponent shall provide a summary of activities undertaken to address the requirements of this term and condition in annual report(s) to the NIRB. The Proponent shall:***

> ***a) Conduct detailed hydrodynamic modelling during operations and closure to evaluate the mixing of the Waste Rock Storage Facility seepage into Mammoth Lake post-closure; and***
>
> ***b) Based on the results of the modelling implement monitoring programs and adaptive management strategies that minimize the need for active intervention, including long-term treatment of mine contact water.***

This condition was fulfilled with the submission of the Hydrodynamic Modelling of Mammoth Lake report found in Appendix 16 of the 2018 Annual Report. Agnico Eagle will review the hydrodynamic model during operation, if needed, and during closure.

## 4.6 ADDITIONAL INFORMATION

### 4.6.1 Meadowbank Site

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 25:** ***Any other details on Water use or Waste Disposal requested by the Board by November 1st of the year being reported.***

No additional information was requested in 2022.

### 4.6.2 Whale Tail Site

**As required by Water License 2AM-WTP1830 Schedule B, Item 28:** ***Any other details on Water use or Waste Disposal requested by the Board by November 1st of the year being reported.***

No additional information was requested in 2022.

# SECTION 5. WASTE ROCK MANAGEMENT ACTIVITIES

## 5.1 GEOCHEMICAL MONITORING

### 5.1.1 Meadowbank Site

**As required by NIRB Project Certificate No.004 Condition 15:** ***Within two (2) years of commencing operations re-evaluate the characterization of mine waste materials, including the Vault area, for acid generating potential, metal leaching and non-metal constituents to confirm FEIS predictions, and re-evaluate rock disposal practices by conducting systematic sampling of the waste rock and tailings in order to incorporate preventive and control measures into the Waste Management Plan to enhance tailing management during operations and closure; results of the re-evaluations shall be provided to the NWB and NIRB's Monitoring Officer.***

And

**In accordance with NWB Water License 2AM-MEA1530 Schedule B, Item 7:** ***Geochemical monitoring results including:***

***a. Operational acid/base accounting and paste pH test work used for waste rock designation (PAG and NPAG rock);***

As no mining occurred at Meadowbank mine in 2022, no blast holes were analyzed for sulphur and carbon. Agnico Eagle will refer to previous annual reports for historical information.

***b. As-built volumes of waste rock used in construction and sent to the Waste Rock Storage Facilities with estimated balance of acid generation to acid neutralization capacity in a given sample as well as metal toxicity;***

Refer to the Section 5.2.1 of this report.

***c. All monitoring data with respect to geochemical analyses on site and related to roads, quarries, and the All Weather Access Road;***

Surface water quality monitoring has not been completed since 2012. Previous water sampling results showed no evidence of geochemical issues in the quarries. Agnico Eagle will refer to the 2012 and previous Annual Reports. The water chemistry in quarries remains consistent between years and due to the isolated nature of the pool, the water collected in the quarry does not likely pose a risk to the aquatic environment. It was recommended that unless turbidity issues are visually observed, surface water quality sampling is not deemed necessary at non-HADD crossings or contact pools. In 2022, no turbidity issues were visually observed so surface water quality sampling was not deemed necessary at quarry contact water pool. Similar to previous years, Quarry 4, 13 and 14 were flooded, as noted in the 2022 Annual Geotechnical Inspection (Appendix 9). The water ponding at freshet or during the summer period in the quarries does not drain to any nearby watercourse. The quarry reclamation along the AWAR will form part of the Meadowbank Final Closure Plan. Reclamation activities for some quarries may occur during operations. The remaining reclamation activities for the quarries will occur during the closure period.

Pre-freshet and freshet inspections were conducted at crossings along the AWAR and quarries in 2022. These inspections are conducted to document the presence/absence of flow, erosional concerns and turbidity plumes and to ensure that runoff, if any, would be free of any contaminant and would not impact the environment. No turbidity issues were visually observed so surface water quality sampling was not deemed necessary at non-HADD crossings or quarry contact water pools. Agnico Eagle considers the planned monitoring approach sufficient. As described in the 2012 Annual Report: *'HADD crossings R02, R06, R09 and R15 water quality monitoring results continue to suggest an improvement from post AWAR construction (complete March 2008) as mine related road activity did not cause any observable effects on the receiving environment from the field observations and water chemistry data collected in 2012. Consistent with 2011, the AWAR surface water quality results did not present concerns to the receiving environment as none of the parameters exceeded CCME (2007) in 2012. Based on the monitoring results, the road construction material appears to be stable; therefore Agnico did not conduct any surface water chemistry sampling in 2013 unless visual turbidity observed. If in the future, an erosion issue occurs, detailed monitoring will be conducted in response to the event.'*

***d. Leaching observations and tests on pit slope and dike exposure;***

No leaching was observed on the pit slope or dike faces in 2022.

***e. Any geochemical outcomes or observations that could imply or lead to environmental impact;***

In 2022, Agnico Eagle continued to conducts inspections around the Waste Rock Storage Facilities (WRSF) to determine if there is seepage at the base of the WRSF. In 2022, as in previous years, seepage has been observed. Samples are taken in accordance with the NWB Water License 2AM-MEA1530 and reported in the annual report.

The waste rock storage facility at Portage includes a sector with only NPAG material, and a sector for PAG material, capped with NPAG material during operations. Inspection and monitoring around the Portage waste rock storage facility report minimal water accumulation around the facility, mostly related to melt and runoff water in the spring. Thermistors installed in the Portage WRSF also indicate that freeze back is occurring within the rock pile; freeze back of the pile and the 4.0 m layer of NPAG rock will provide geochemical stability and to act as a thermal barrier to control acid rock drainage potential. The station ST-16 collects ponding water along the Portage WRSF. It is important to be noted that the seepage reported at ST-16 in 2013 is not related with acid rock drainage from the waste rock contained in the Portage WRSF, but rather from infiltration of reclaim water from the TSF through the WRSF. Several mitigation measures were implemented in since 2013 to effectively control this seepage. Refer to Section 8.5.3.1.7 regarding the seepage event; mitigation and monitoring that occurred in NP-2 Lake and other downstream lakes (i.e. NP-1, Dogleg, and SPL).

The waste rock mined at Vault is largely NPAG. As a mitigative measure any PAG or uncertain waste rock material were placed in the middle of the Vault Waste Rock Storage Facility while NPAG material is placed on the perimeter to encapsulate the PAG material. Runoff or seepage water monitoring analysis confirms the effectiveness of this abatement measure. To date water monitoring analysis from runoff indicates no concerns related to ARD. The water seepage from the Vault WRSF area is expected to be of suitable quality to allow discharge to the environment without treatment and capping of this facility is therefore not proposed. Agnico Eagle initiated water quality monitoring at Vault in 2014 and results confirm the prediction. An adaptive management plan will include continued monitoring of water quality during operations to confirm modelling predictions, and to allow adjustments to the closure plan as required. As discussed in Section 8.5.3.1.13, in 2022, ponded water was observed at the base of the WRSF (sampling station ST-24) and was sampled in June, July, August, September and October. As per

NWB Water License, samples were collected to assess water quality and the results are presented in Table 8-29. No water was pumped from this location as it is mainly a ponding area without flow.

***f. Geochemical data associated with tailings solids, tailings supernatant, cyanide leach residue, and bleed from the cyanide destruction process including an interpretation of the data;***

Agnico Eagle takes throughout the year monthly samples of tailings (as per the Pore Water Quality Monitoring Program – Section 5.1.1.1 below) that are sent to an accredited laboratory to analyse for ABA and Metal Leaching. Table 5-1 below presents the results of tailings solids. These sample results are also integrated in the Water Quality Forecast updated yearly.

**Table 5-1 Meadowbank 2022 Tailings Solids Monitoring**

| Analysis | Date | 2022 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Units | 23-Jan | 10-Feb | 15-Mar | 11-Apr | 9-May | 6-Jun | 5-Jul | 2-Aug | 5-Sep | 3-Oct | 8-Nov | 6-Dec |
| NP | t CaCO3 /1000 t | 119.0 | 70.5 | 99.1 | 75.8 | 83.2 | 84.7 | 90.9 | 89.5 | 84.2 | 76.9 | 93.2 | 74.9 |
| AP | t CaCO3 /1000 t | 20.3 | 46.9 | 28.4 | 66.6 | 41.6 | 45.0 | 49.4 | 45.0 | 49.4 | 75.6 | 30.0 | 59.7 |
| Net NP | t CaCO3 /1000 t | 98.6 | 23.6 | 70.7 | 9.2 | 41.6 | 39.7 | 41.5 | 44.5 | 34.8 | 1.3 | 63.2 | 15.2 |
| NP/AP | ratio | 5.85 | 1.50 | 3.48 | 1.14 | 2.00 | 1.88 | 1.84 | 1.99 | 1.71 | 1.02 | 3.11 | 1.25 |
| Sulphur | % | 0.88 | 1.72 | 1.02 | 2.35 | 1.62 | 1.82 | 1.70 | 1.84 | 1.74 | 2.53 | 1.30 | 2.08 |
| Acid Leachable $SO_4$-S | % | 0.23 | 0.22 | 0.11 | 0.22 | 0.29 | 0.38 | 0.12 | 0.40 | 0.16 | 0.11 | 0.34 | 0.18 |
| Sulphide | % | 0.65 | 1.50 | 0.91 | 2.13 | 1.33 | 1.44 | 1.58 | 1.44 | 1.58 | 2.42 | 0.96 | 1.91 |
| C | % | 1.48 | 0.83 | 1.14 | 0.91 | 0.99 | 0.99 | 1.18 | 1.00 | 0.90 | 1.00 | 1.09 | 0.97 |
| $CO_3$ | % | 6.82 | 3.01 | 5.30 | 3.83 | 4.33 | 3.98 | 4.88 | 4.31 | 3.59 | 4.03 | 4.68 | 3.96 |
| Final pH | units | 1.89 | 1.79 | 1.79 | 1.55 | 1.70 | 1.57 | 1.93 | 1.59 | 1.59 | 1.61 | 1.57 | 1.66 |
| As | mg/L | 1.00 | 1.40 | 1.00 | 1.30 | 1.20 | 1.40 | 1.09 | 1.80 | 1.30 | 2.40 | 0.92 | 1.20 |
| Cu | mg/L | 0.11 | 0.11 | 0.11 | 0.12 | 0.08 | 0.13 | 0.09 | 0.12 | 0.11 | 0.06 | 0.11 | 0.12 |
| Ni | mg/L | 0.84 | 0.75 | 1.00 | 0.76 | 0.74 | 0.57 | 0.48 | 0.63 | 0.64 | 0.51 | 0.70 | 0.43 |
| Zn | mg/L | 0.091 | 0.093 | 0.086 | 0.110 | 0.091 | 0.093 | 0.070 | 0.100 | 0.083 | 0.089 | 0.074 | 0.072 |

***g. Results related to the road quarries and the All Weather Private Access Road.***

As mentioned in Section 5.1.1c, no geochemical water analysis was performed in 2022.

### 5.1.1.1 *Pore Water Quality*

Agnico Eagle received on May 24th, 2019 from NWB the Ministers Approval regarding the Amendment No.3 to Water License 2AM-MEA1526 to authorize Water Uses and Waste Deposits associated with the In-Pit Tailings Disposal Proposal. Tailings generated from the Whale Tail Mine will be deposited in the mined-out Goose and Portage pits. As part of their decisions, Agnico Eagle was required to submit a

Tailings Pore Water Quality Monitoring Program for the Board review and approval (Section IV, Part B: General Conditions). The approved Pore Water Quality Monitoring Program is attached in Appendix 23 of the 2019 Annual Report.

The chemical composition of the mill effluent process water has significant influence on the quality of supernatant water above the tailings surface (i.e. reclaim water) as well as the exfiltration from the tailings. The chemical composition of the tailings pore water is expected to be controlled by the chemical composition of the mill effluent and the reclaim water, which is a mixture of mill effluent process water and any other direct inputs to the pit (i.e. precipitation, runoff, etc.). Geochemical reactions within the tailings solids themselves are not expected to influence pore water chemistry.

In-Pit disposal in Goose Pits started on July 5$^{th}$, 2019 and stopped on August 19$^{th}$, 2020. In-pit disposal in Portage Pit E started on August 20$^{th}$, 2020 and is ongoing. As part of this program, Agnico Eagle collected on a monthly basis one sample of plant effluent slurry representative of the end of pipe prior to tailings disposal in Goose/Portage pits (collected in the mill). Tailings samples were taken each month in 2022. Samples of reclaim water from the Pits where tailings are actively being deposited were also taken, if possible to be done safely, and the result are provided in Section 8.5.3.1 below.

Agnico Eagle is planning to complete sampling for in-pit tailings and porewater for two (2) subsequent years. A sampling program was conducted in August 2022 to characterize the tailings and porewater in Goose Pit. Additional sampling is planned to be completed in 2023, if the site conditions allow the program to be conducted safely. If year two is within 20% or lower of year one, and within the prediction, then no further sampling in-situ will be performed. Monitoring pore water quality from Goose Pit will provide insights on the behavior of the pore water quality over time as the tailings self-consolidate. The data collected from Goose Pit should be representative of the behavior within Portage Pits since similar tailings are deposited in these pits. These data will also be included in the closure studies to be presented in the Final Closure and Reclamation Plan.

### 5.1.2 Whale Tail Site

**As required by NIRB Project Certificate No.008, Condition 8:** ***The Plan should be submitted to the NIRB at least 30 days prior to the start of construction, with subsequent updates or revisions to the Plan submitted annually thereafter or as may otherwise be required by the NIRB for the life of the Project. The Proponent shall submit a detailed Acid Rock Drainage and Metal Leaching Management Plan that includes the following items:***

- ***Waste rock segregation and testing;***
- ***Thermal monitoring of waste rock;***
- ***Seepage management and monitoring;***
- ***A schedule for reporting of results and periodic updating of predictions for the WRSF pond quality;***
- ***Planning for optimal cover conditions;***
- ***Contingency measures that may be implemented if required;***
- ***Plans for comparing monitoring results from receiving waters to model predictions; and***
- ***The identification of thresholds that will trigger management actions if trends analysis indicates water quality objectives may be exceeded.***

And

**As required by NWB Water License 2AM-WTP1830 Schedule B, Item 10:** ***Geochemical monitoring results including:***

After one year of mining activity in Whale Tail Pit and after accumulating substantial information and knowledge of the Whale Tail deposit, in 2020 Agnico Eagle reviewed the waste sampling default ratios defined by the Operational ARD-ML Sampling and Testing. An updated Operational ARD-ML Sampling Testing and Plan (Appendix 21 of the 2020 Annual Report) which included new sampling frequency in Whale Tail Pit was provided to and approved by the NWB on January 22nd, 2021. A subsequent update to the plan which included new sampling frequency in IVR Phase 1 Pit was provided to and approved by the NWB on March 8th, 2023. This version of the Plan can be found in Appendix 31.

The objectives of the Plan are to define the sampling, analysis, and testing procedures that are to be implemented to define the acid generating and metal leaching potential of waste rock for the Mine. This characterization is to be used by mine staff to ensure that waste rock, overburden (till), and lake sediments are identified, managed, segregated and disposed of in an environmentally appropriate manner, as designated in the Plan. The Plan also defines if waste rock, overburden, and lake sediment can be used as construction/closure material. This Plan does not discuss thermal monitoring of waste rock, which is covered in the Thermal Monitoring Plan (Appendix 25 of the 2021 Annual Report).

***a. Operational acid/base accounting and paste pH test work used for Waste Rock designation (PAG and NPAG rock);***

In 2022, Agnico Eagle sampled approximately 25% of the blast holes and analyzed the percentages of sulphur and carbon. The results from these analyses are used to differentiate Non-Potentially Acid Generating (NPAG) from Potentially Acid Generating (PAG) materials. For detailed process regarding the ARD-ML for Whale Tail waste rock and overburden classification, please refer to the Operational ARD-ML Sampling and Testing Plan Section 3.2 of Appendix 31. See Table 5-2 below for a summary of Acid Rock Drainage (ARD) Guidelines used to classify Whale Tail waste rock. The plan also described the frequency of sampling. Once characterized by the geology team, the waste rock material is segregated and placed in appropriate location.

**Table 5-2 Summary of ARD Guidelines used to classify Waste**

| Initial Screening Criteria | ARD Potential |
|---|---|
| NPR< 1 | Potentially Acid Generating (PAG) |
| 1 < NPR < 2 | Uncertain or low acid generating |
| 2 < NPR, As < 75 ppm | Non Potentially Acid Generating (NPAG) |
| 2 < NPR, As > 75 ppm | Potentially Acid Generating (PAG) |

The mine geology staff uses the derived NPR and arsenic (As) values to characterize the rock in the blast pattern. Mine surveyors and grade control technicians use this information to delineate and place the dig limits within the blasted rock to guide the shovel and loader operators in directing where the rock is to be mined. See Section 5.2.2 and Table 5-4 for a discussion of the use and location of waste rock.

Segregation of ore, waste rock as potentially acid generating (PAG) or non-potentially acid generating (NPAG) material based on operational testing during mining activity to differentiate waste rock type is part of the Whale Tail Waste Rock Management Plan. Sampling and testing of waste materials for acid rock drainage (ARD) is conducted during mine operations in order to segregate PAG waste from NPAG waste rock material, so that waste material can be assigned to specific locations or use. This practice has been ongoing since the beginning of the mining operations at Meadowbank, and continue to be applied at the Whale Tail Mine. Operational sampling and analysis is completed on site during mining activities in order to identify and delineate the material type in the pits during mining.

The geochemical properties of all mining wastes have been confirmed with duplicates samples sent to a certified laboratory, through both static and kinetic testing on numerous representative samples, by various test methods and through multiple project development stages. In 2022, to validate the method used by Agnico Eagle, approximately 355 samples from Whale Tail and IVR Pits were sent to an accredited commercial lab (external lab) for acid base accounting (ABA) analysis using the Modified Sobek Method for determination of NP/AP, metal leaching using the Shake Flask Method, bulk metals analysis and for whole rock analysis. The results from the external laboratory confirmed Agnico Eagle's methodology and results to differentiate PAG/NPAG rock. In 2022, on the basis of NAG/PAG determination using ABA based on sulphur and NPR content, 92% of samples analyzed at the Meadowbank and SGS laboratories were classified as the same material (NPAG or PAG). Of the 8% that did not result in the same classification, the Meadowbank lab provides a more conservative result and classifies the sample as PAG, where SGS classifies the sample as NPAG in 71% of the analyses.

The results of the NPAG-PAG classification confirmation are logged in the Meadowbank LIMS database and also stored as models in MineTrust. Due to the large volume of data, the results are not included in this annual report. These results can be provided upon request.

Information regarding the waste rock characterization is also managed and recorded by the mine dispatch in Wenco system, tracking in real time load of material, including waste rock, and their respective destination. The system and the dispatcher in charge, guides the operators and ensures the ore and waste rock material is transported to the appropriate destination. The system displays in real time information about equipment location and destination, as well as pit development information. All production data, including all waste rock haulage to the PAG and NPAG waste rock storage facilities, as well as construction use are recorded into a database.

In 2022, Agnico Eagle analyzed 14,111 samples from blast holes at Whale Tail Pit and 18,548 samples from IVR Pit at its on-site laboratory. Refer to Table 5-3 below for the percentage of PAG, uncertain and NPAG per pits.

**Table 5-3 Whale Tail Site Geochemical ARD determination 2018-2022 (including all waste types)**

| Year | Whale Tail Pit | | | IVR Pit | | |
|---|---|---|---|---|---|---|
| | PAG (%) | Uncertain (%) | NPAG (%) | PAG (%) | Uncertain (%) | NPAG (%) |
| 2018 | 28 | 11 | 61 | NA | NA | NA |
| 2019 | 42 | 11 | 47 | NA | NA | NA |
| 2020 | 30 | 11 | 58 | 2 | 1 | 93 |
| 2021 | 30 | 13 | 57 | 2 | 2 | 96 |
| 2022 | 20 | 13 | 66 | 82 | 8 | 9 |

The Whale Tail and IVR WRSF's will be constructed to encapsulate potentially acid generating (PAG) and metal leaching (ML) waste rock inside a layer of NPAG material as a control measure for ARD and ML. The NPAG rock that is placed on the top and sides of the storage pile is needed in the long term to host the thawed layer and prevent liquids from contacting the centre of the pile that contains PAG and ML waste rock. Presently, it is anticipated that the cover design will be similar to the Meadowbank Portage WRSF. The cover will consist of a 4.7 m thick NPAG/NML waste rock layer on the top and edges of the facility. The cover is expected to maintain freezing conditions in the pile in the long-term. This rationale is based on results to date on thermal modelling that considers thermistor readings at the Portage WRSF. Rock oxidation can still occur in frozen material but will proceed at a slower rate than predicted by laboratory testing because of the cold temperatures prevalent for much of the year. Permafrost will retain water as ice, so it was predicted that contaminants will not be transported away from the core of the WRSF in the long-term. Further information of the Whale Tail and IVR WRSF are provided in the Whale Tail Pit – Waste Rock Management Plan (Appendix 23).

Sampling and testing of waste materials for ARD and ML are conducted during mine operation in order to segregate suitable waste for use in construction and for closure from that which will report directly to the Whale Tail and IVR WRSF.

If ponding water is found at the base of the Whale Tail WRSF (ST-WT-30, ST-WT-31, ST-WT-32, and ST-WT-33) this water reports to the WRSF Pond (ST-WT-3), and ponding water at the base of the IVR WRSF (ST-WT-28, ST-WT-34, ST-WT-35, and ST-WT-36) reports to the IVR Attenuation Pond. As per NWB Water License, samples are to be collected to assess water quality. Refer to Sections 8.5.3.2.12 and 8.5.3.2.13 for a complete discussion of the results. An adaptive management plan will include continued monitoring of water quality during operations to confirm modelling predictions, and to allow adjustments to the closure plan as required.

***b. As-built volumes of Waste Rock used in construction and sent to the Waste Rock Storage Facility with estimated balance of acid generation to acid neutralization capacity in a given sample as well as metal toxicity;***

Refer to the Section 5.2.2 of this report.

***c. All monitoring data with respect to geochemical analyses on site and related to roads, quarries, and the Whale Tail Haul Road;***

There are no issues to report for 2022.

Pre-freshet and freshet inspections were conducted at crossings along the Whale Tail Haul Road, eskers and quarries in 2022. These inspections are conducted to document the presence/absence of flow, erosional concerns and turbidity plumes and to ensure that runoff, if any, would be free of any contaminant and would not impact the environment. Refer to Section 8.5.3.2.17 for more information.

***d. Leaching observations and tests on pit slope and dike exposure; and***

No leaching was observed on the pit slope or dike faces in 2022.

***e. Any geochemical outcomes or observations that could imply or lead to environmental impact.***

There are no geochemical outcomes or observations that could lead to an environmental impact in 2022.

## 5.2 WASTE ROCK AND ORE VOLUME

### 5.2.1 Meadowbank Site

**In accordance with NWB Water License 2AM-MEA1530 Schedule B, Item 8: *Volumes of waste rock used in construction and placed in the Rock Storage Facilities.***

There is no more mining at Meadowbank so no more waste rock was generated in 2022.

The Mine Waste Rock and Tailings Management Plan (Version 13) was revised in March 2023 and can be found in Appendix 22. Details of all waste rock deposition and tailings management are contained in the revised plan.

### 5.2.2 Whale Tail Site

#### 5.2.2.1 *Waste and Ore Stockpile Volume*

**In accordance with NWB Water License 2AM-WTP1830 Schedule B, Item 11 *Volumes of Waste Rock used in construction and placed in the Waste Rock Storage Facility.***

And

**In accordance with NWB Water License 2AM-WTP1830 Schedule B, Item 12: *Volumes of ore stockpiled and overburden stored at Whale Tail Pit site.***

The total volume of waste rock generated by Whale Tail and IVR Pits in 2022 was 33,570,767 tonnes. The use and location of all of the rock, by volume, is presented in Table 5-4 and is identified by the following categories:

- Roads – used for road construction and maintenance;
- WRSF – stored in the Waste Rock Storage Facilities;
- Stockpiles – stored in stockpile for later usage for construction purposes;
- Construction;
    - Crushers – taken to the mobile crusher and used for construction or maintenance purposes;
    - Miscellaneous uses;
    - Pads construction.

The Whale Tail Waste Rock Management Plan (Version 10) was revised in March 2023 and can be found in Appendix 23. Details of all waste rock deposition and tailings management are contained in the plan.

**Table 5-4 Whale Tail 2022 Rock Volume**

| Month | Whale Tail and IVR Pits | | | | | | | | Ore Processed in Mill (tonnes)[5] |
|---|---|---|---|---|---|---|---|---|---|
| | Ore[1] (tonnes) | Waste Rock (tonnes) | | | | | | Overburden (tonnes) | |
| | | Dikes | Roads[2] | WRSF[3] | Stockpiles | Construction[4] | Total | | |
| January | 100,535 | - | 164,699 | 1,356,381 | 59,093 | 62,737 | 1,642,910 | 2,185 | 199,263 |
| February | 212,628 | - | 142,724 | 1,801,048 | 197,049 | 44,048 | 2,184,869 | - | 294,647 |
| March | 354,008 | - | 16,699 | 2,541,184 | 110,532 | 2,312 | 2,670,727 | - | 361,517 |
| April | 415,139 | - | 171,251 | 2,259,219 | 507,071 | 4,568 | 2,942,109 | 129,866 | 294,409 |
| May | 519,369 | - | 58,151 | 2,388,906 | 433,394 | - | 2,880,451 | 24,727 | 307,005 |
| June | 438,347 | - | 10,579 | 2,063,847 | 199,551 | 69,946 | 2,343,923 | 17,842 | 328,165 |
| July | 616,992 | - | 8,803 | 2,262,233 | 323,792 | 6,207 | 2,601,035 | 58 | 363,141 |
| August | 414,999 | - | 26,514 | 2,555,465 | 128,266 | 131,778 | 2,842,023 | 124 | 352,064 |
| September | 371,621 | - | 25,129 | 2,055,203 | 776,509 | 87 | 2,856,928 | 10,308 | 315,765 |
| October | 331,560 | - | 24,637 | 2,664,225 | 568,471 | 1,202 | 3,258,535 | 30,775 | 266,496 |
| November | 228,519 | - | 51,134 | 2,318,271 | 1,462,183 | 35,273 | 3,866,861 | 25,950 | 334,002 |
| December | 215,487 | - | 136 | 2,994,101 | 486,160 | - | 3,480,397 | 13,876 | 322,946 |
| **TOTAL** | **4,219,203** | **-** | **700,456** | **27,260,082** | **5,252,071** | **358,158** | **33,570,767** | **255,710** | **3,739,420** |

1 *All ore mined is stockpiled before it's long hauled to the Mill;*
2 *Includes road construction and maintenance; excludes Whale Tail Haul Road*
3 *Includes the waste rock that is stored in temporary locations*
4 *Earthworks excluding road and Dike construction*
5 *Includes underground ore processed*

#### 5.2.2.2 *Monitoring Program*

**In accordance with NIRB Project Certificate No.008 Condition 7:** ***Prior to commencement of mining of the Whale Tail deposit, and in consultation with applicable regulatory agencies, including Natural Resources Canada, the Proponent shall as part of a Mine Waste Rock and Tailings Management Plan that reflects site-specific geological and geochemical conditions. The Plan should be submitted to the NIRB at least 60 days prior to the start of construction of the Waste Rock Storage Facility, with subsequent updates or revisions to the Plan submitted annually thereafter or as may otherwise be required by the NIRB for the life of the Project.***

> ***a) Develop and implement monitoring programs for the Tailings Storage Facility and the Waste Rock Storage Facility at the Whale Tail Pit;***
>
> ***b) Establish thresholds that will trigger the requirement for the Proponent to implement adaptive management strategies to minimize the potential for impacts from these Facilities; and***
>
> ***c) Identify the adaptive management strategies that will be used by the Proponent to minimize the potential for impacts from these Facilities.***

The Whale Tail Mine – Waste Rock Management Plan was initially submitted in January 2017 (Version 1) with subsequent updates. The last Version 10 (March 2023) (Appendix 23) was updated to align with the current operation. Agnico Eagle will continue to update the plan on an annual basis during the operation phase of the Whale Tail Mine.

#### 5.2.2.3 *Site-specific geotechnical investigations*

**In accordance with NIRB Project Certificate No.008 Condition 9:** ***The Proponent shall undertake the additional site-specific geotechnical investigations required to identify sensitive land features and to inform final engineering design prior to the construction of project components such as the waste rock storage facility and quarries. Results from these studies should be submitted to the NIRB at least 30 days prior to the start of construction of these facilities, with results or updates submitted annually thereafter as applicable.***

Agnico Eagle have submitted to NIRB on June 4$^{th}$, 2018 the memorandum Site Specific Geotechnical Studies (Appendix 18 of the 2018 Annual Report) as required by Condition 9. Please refer to this document in for a complete overview of the investigations completed.

Geotechnical investigations (test pits and boreholes) were conducted in 2019 and 2020 in the area of the projected IVR D-1 Dike, which will form part of the IVR attenuation pond. The information available indicates that the bedrock depth varies between 2.1 m and 6.7 m below ground surface, hence no major sensitive land features have been identified at these locations. The design report of the IVR D-1 Dike contains all the required information on the field investigations carried out at the IVR D-1 Dike, and should be referred to for all the implications of geotechnical investigations for construction (SNC, 2020).

## 5.3 TAILINGS STORAGE FACILITY MEADOWBANK SITE

### 5.3.1 Tailings Storage Facility Capacity

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 9:** ***An update on the remaining capacity of the Tailings Storage Facility.***

And

**As required by NIRB Project Certificate No.004, Condition 18:** ***commit to a pro-active tailings management strategy through active monitoring, inspection, and mitigation. The tailings management strategy will include the review and evaluation of any future changes to the rate of global warming, compliance with regulatory changes, and the ongoing review and evaluation of relevant technology developments, and will respond to studies conducted during the mine operation.***

From 2010 to 2022 a total of 44.3 Mt of dry tailings slurry from the mill had been deposited in the Tailings Storage Facilities (TSF) and the In-Pit Tailings Deposition sites as indicated in Table 5-5. In 2022, a total of 3.8 Mt of dry tailings slurry was deposited in the In-Pit Tailings Deposition sites. A monthly summary of the tailings produced in 2022 is provided in Table 5-6.

Agnico Eagle revised the tailings deposition plan (available in the 2022 Mine Waste Rock and Tailing Management Plan Version 13 presented in Appendix 22). The deposition model completed is valid until the end of milling operations in 2026. The model is based on the data collected during previous years of operation. The filling scheme for the two cells of the tailings storage facility and the In-Pit Tailings Deposition sites is designed for end of pipe discharge.

Table 5-7 presents the summary of the tailings management strategy for 2022-2026. More information on the tailings deposition modeling is presented in the Waste Rock and Tailings Management Plan.

The main conclusions from the modeling results are:

- The total maximum capacity of the In-Pit Tailings Deposition sites up to 134 masl is estimated at 48.1 $Mm^3$;
- All tailings deposition for the remainder of the LOM is to be done in Portage Pit E.

**Table 5-5 Meadowbank Deposition location (realized)**

| Date | Deposition location | Tailings deposited (dried tonnes) |
|---|---|---|
| February 2010 to November 2014 | North Cell | 16.0M tonnes |
| November 2014 to July 2015 | South Cell | 2.7M tonnes |
| July 2015 to October 2015 | North Cell | 1.0M tonnes |
| October 2015 to August 2018 | South Cell | 10.8M tonnes |
| August 2018 to October 2018 | North Cell | 0.5M tonnes |
| October 2018 to April 2019 | South Cell | 1.4M tonnes |
| April 2019 to July 2019 | North Cell | 0.6M tonnes |
| July 2019 to December 2019 | Goose Pit | 1.4M tonnes |
| January 2020 to August 2020 | Goose Pit | 1.4M tonnes |
| August 2020 to July 2021 | Pit E | 3.1M tonnes |
| July 2021 to August 2021 | North Cell | 0.4M tonnes |
| August 2021 to December 2022 | Pit E | 5.0M tonnes |

**Table 5-6 Meadowbank 2022 Processed Tailings Volume**

| Month | Total Dry Tailings (tonnes) |
|---|---|
| January | 207,804 |
| February | 307,276 |
| March | 377,012 |
| April | 307,028 |
| May | 307,005 |
| June | 328,165 |
| July | 363,141 |
| August | 352,064 |
| September | 315,765 |
| October | 266,496 |
| November | 334,002 |
| December | 322,946 |
| **TOTAL** | **3,788,703** |

**Table 5-7 Meadowbank Deposition plan and infrastructure construction – summary**

| Date | Discharge location | Dry tonnes deposited | Comments |
|---|---|---|---|
| January 2023 - December 2026 | Pit E | 15.0 Mt | • Reclaim water from Pit E and Pit A<br>• Transfer water from Pit E to Pit A<br>• No Goose Pit transfers planned |

### 5.3.2 Tailings In-Pit Disposal Meadowbank Site

**As required by NIRB Project Certificate No.004, Condition 87:** ***The Proponent shall, prior to the deposition of tailings into the Portage or Goose Pits, file with the Nunavut Water Board (NWB) a report containing updated hydrogeological modelling addressing information gaps as per the NIRB recommendation in the Reconsideration Report and Recommendations to the satisfaction of the NWB. The Proponent shall not deposit tailings into the Portage or Goose pits until the Water Board is satisfied that the modelling addresses the specific information gaps, and that the proponent can manage any identified risks with existing designs and feasible management strategies. The Proponent shall file a report with the Nunavut Water Board, containing updated hydrogeological modelling addressing information gaps, prior to the deposition of tailings into the Portage or Goose pits. Confirmation of the report's filing, conclusions of this report, and any further updates to reporting requirements as determined under the water license, shall be provided to the NIRB in Agnico Eagle's Annual Report for the project.***

And

**As required by NIRB Project Certificate No.004, Condition 20:** ***Prior to construction, Cumberland shall identify mitigation measures that can be taken if groundwater monitoring around the tailings facility***

***demonstrates that contamination from tailings has occurred through the fault. Upon drawdown of the North arm of Second Portage Lake, Cumberland shall conduct further tests to assess the permeability of any faults and provide the results to regulators. If doubt remains Cumberland shall seal the fault and conduct further permeability testing and monitoring. Following completion of the permitting process for the In-Pit Tailings Modification Proposal, the Proponent shall provide an update to the NIRB on any fault identified related to either Portage Pit A, Portage Pit E, and Goose Pit, any plans to address groundwater movement considering any fault, and how potential monitoring of tailings and groundwater movement would be undertaken to inform management plans.***

As per Condition 87 (Project Certificate 008), Agnico Eagle has submitted the requested study in advance of the Meadowbank In-pit disposal. Thermal modeling was carried out in early 2018 for the in-pit tailings deposition detailed engineering study at the Goose Pit, Portage Pit A and Portage Pit E up to a 100-year period after closure. The modeling details and results were presented in the "In Pit Tailings Deposition Thermal Modeling Report", dated April 16th, 2018 (Appendix 19 of the 2018 Annual Report). To address NRCan's outstanding comments from the meeting on September 25th, 2018, additional long term thermal modeling beyond 100 years and up to 20,000 years after closure was carried out to evaluate the long term thermal regime/permafrost conditions for the three pits. Modeling summary of this work is presented in the report 'Meadowbank In-Pit Tailings Disposal - Thermal and Hydrogeological Modeling Update to Address NRCan's Comments' and can be found in Appendix 20 of the 2018 Annual Report. Agnico Eagle have received the Minister approval for the NWB Water License 2AM-MEA1526 Amendment no.3 on May 24th, 2019.

To ensure the environment protection and evaluate potential risks for tailing migration into groundwater, a feasibility study was conducted by SNC-Lavalin professionals in 2016-2017. The feasibility study included a complementary characterization of the geological structures and permafrost extent on site and the development of a detailed hydrogeological numerical 3D model. Main geological structures (Bay Fault, Second Portage Lake Fault and geological contact with quartzite formation) were identified and implemented in the 3D model with defined hydraulic conductivity and porosity to simulate potential reclaim water seepages out from in-pit tailings pore water. The numerical simulations were designed to represent the worst-case scenarios in terms of contaminant transport within the aquifers. Therefore, a groundwater monitoring program was designed in relation to the groundwater flow and contaminant transport simulation results. The hydrogeological model and solute transport simulations were updated to version 4 during the detailed engineering study completed by SNC-Lavalin and following Natural Resources Canada (NRCan) recommendations addressed during In-Pit Tailings Deposition Project approval process.

In 2018, the latest version of the groundwater numerical model was used to forecast the post closure evolution of chloride concentrations at existing wells, including the four new wells installed in 2018. Breakthrough chloride concentration curves (predicted concentrations of chloride over time at a specific point of the 3D model) were extracted from the model at each monitoring well. Concentration increases over time showed that monitoring wells could intercept the contaminant plume from Pit A, Pit E and Goose Pit after closure over different period and at different concentrations.

As the in-pit deposition project will continue, updates of the hydrogeological model will be performed at closure period using the gathered site data such as ground temperature, hydraulics heads, in-pit tailings pore water quality, etc. Breakthrough curves will be reviewed at this time to adapt the Groundwater Monitoring Plan.

As Goose Pit, Portage Pit A and Portage Pit E are mined out, faults mapping and (location, azimuth, dip, aperture) could be carried out in each of the current final pit shells. Other former and new structural information can be revisited such as existing televiewer surveys performed in a few geotechnical boreholes, specifically in IPD boreholes and in the Central Dike area. Other available investigation results such the pit wall stability analysis or any rock core logging database could be also reviewed to identify main fracture zones or lithology contacts. Relevant information will be integrated to the revised 3D model, at closure period.

The Groundwater Management Plan (Version 11, March 2020 – Appendix 60 of the 2019 Annual Report) is considered to be compliant with the term and condition.

## 5.4 FREEZEBACK, PERMAFROST, THERMAL MONITORING AND CAPPING THICKNESS

### 5.4.1 Meadowbank Site

**As required by NIRB Project Certificate No.004, Condition 19:** ***Provide for a minimum of two (2) metres cover of tailings at closure, and shall install thermistor cables, temperature loggers, and core sampling technology as required to monitor tailing freezeback efficiency. Report to NIRB's Monitoring Officer for the annual reporting of freezeback effectiveness.***

And

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 18:** ***A summary of on-going field trials to determine effective capping thickness for the Tailings Storage Facility and Waste Rock Storage Facilities for the purpose of long term environmental protection.***

The current concept for the TSF landform at closure includes a cover system comprised of a minimum 2 m thick layer of NAG rockfill. Since 2015, progressive capping has been ongoing in the TSF North Cell. Agnico Eagle initiated in 2022 a study to confirm the design of the TSF landform. The objective of that study was to re-affirm the applicability of the technology retained for the cover design, clarify the geometry of the landform, and define if new structures are required and when they should be put in place. The scope of this ongoing study includes reviewing the closure concept, updating the concept design based on information gathered through operation, updating the landform surface water management system, and updating the monitoring plan. This study is expected to continue in 2023 and more details will be shared in the next update of the ICRP or in the Final Closure and Reclamation Plan (FCRP).

The current concept for the WRSF landform is to place 4 m of NAG cover to maintain geochemical stability of the facility. Agnico Eagle has initiated in 2022 a study to confirm the design of the Portage WRSF landform. The scope of this study included: reviewing the closure concept, updating the concept design based on information gathered through operation, updating the landform water balance and updating the monitoring plan. This report can be found in Appendix 21 and the information contained within will be integrated in the next update of the ICRP and the FCRP. The conclusions from this study reinforce the confidence in the current design of the Portage WRSF landform. The report puts in context the available monitoring data and models the predicted behaviour of the landform while explaining the mechanisms that will ensure that the closure objectives are met. The updated adaptive monitoring plan included in this report provides additional tools to measure the performance of the current cover and feed the final design report of the landform that will be submitted as part of the FCRP.

Thermistors are installed within the tailings of the TSF and the waste rock of the Portage WRSF. These instruments are used to obtain thermal data within the operation of these structures. Additional instruments will be installed as required to support the design of these landforms and to monitor their performance. In 2022, additional near surface monitoring instruments were installed at Portage WRSF to further increase understanding of mechanisms that could impact the performance of the closure landform.

The thermistors installed within the tailings of the North Cell indicate that tailings freezeback is occurring as most of the tailings are frozen except for a seasonal active layer. The thermistors are indicating that freezeback is occurring within the North Cell TSF. Instruments located near the pond of water of the North Cell are showing a portion of unfrozen tailings at depth with frozen tailings at surface and a progression of the freezing front advancing at depth. Instruments installed in the capping or rockfill structures above tailings show that the active layer remained confined in the waste rock showing the effectiveness of the capping concept.

The thermal prediction of the tailings freezeback made by Golder in 2008 indicated for the conservative scenario the entire tailings body would be completely frozen within a period of about 40 years after the end of operations with the freezing front advancing into the foundation beneath the tailings in the long term. The results are aligned with this modelling with most data showing a quicker freezeback than anticipated. As part of the study to update the TSF landform design, supplemental modelling is ongoing to demonstrate the effectiveness of the final design and to develop monitoring triggers to ease the evaluation of cover performance against the design intent.

Thermistors installed within the Portage WRSF indicate that freezeback is occurring within the Portage WRSF structures. However, the long term performance of the structure can not only be measured as a function of whether the structure is frozen or not but will also depend on the water mobility through the structure. Refer to the Meadowbank Thermal Report (Appendix 24) for more information on the review of the available thermistor data. As part of the study to update the Portage WRSF landform design, supplemental modelling was performed to demonstrate the effectiveness of the final design and to develop monitoring triggers to ease the evaluation of cover performance against the design intent. Refer to Appendix 21 for the report including the modelling update.

**Update on Field Trials**

A research project in collaboration with the Research Institute of Mines and Environment (RIME) was initiated in 2014 at Meadowbank. The Research Institute on Mines and Environment, through the NSERC-UQAT Chair on Mine Site Reclamation, is mandated to evaluate the performance of three field experimental cells constructed in 2014 and 2015 on Meadowbank's North Cell TSF. The three experimental cells that were built on Meadowbank's TSF are two insulation covers and one thermal cover with capillary barrier effects (CCBE).

The tested experimental cells are a 2m and a 4m thick insulation cover as well as a 2m thick cover with capillary barrier effects. The cells were built with coarse and fine non-potentially acid generating (NAG) ultramafic waste rock (soapstone) and are instrumented in order to follow their thermal and hydrogeological behaviors.

Also in collaboration with the RIME, in 2016 a laboratory testing program was developed to obtain a good overview of the effects of freeze/thaw (F/T) and wet/dry (W/D) cycles on the soapstone. The developed experimental program is primarily focused towards the evaluation of the resistance to F/T and W/D of the soapstone to be used as cover materials for the TSF and WRSF. Testing was completed to evaluate the effects of F/T and W/D on rock cores and rock slabs, the effects of F/T on various soapstone grain size fractions, and the effects of F/T on the permeability of a compacted soapstone layer.

In 2019 the RIME finished collecting and analysing the data on the cover field trial and on the long term performance of ultramafic rockfill as a cover material. Research papers on this subject were published in 2020 and 2021.

The memorandum made by O'Kane on the Meadowbank Portage WRSF landform closure strategy (948-228-002) attached to the Thermal Report (Appendix 24) has a section that summarizes the study made by the RIME and how the information will be useful to re-affirm or update the design of the WRSF landform. A similar literature review exercise is ongoing as part of the project to update the TSF cover concept.

The full list of all publications produced by the RIME related to the TSF and WRSF covers is listed below.

***RIME Publication List***

*Conference papers and abstracts*

Awoh, A.S., Bruno, B., Batzenschlager, C., Boulanger-Martel, V., Lépine, T. & Voyer, É. 2016. Design, construction and preliminary results of two insulation covers at the Meadowbank mine. Geo-Chicago 2016: Sustainability, Energy, and the Geoenvironment. American Society of Civil Engineers, Chicago, IL, 12. (TSF)

Boulanger-Martel, V., Bussière, B., Côté, J. & Gagnon, P. 2017. Design, construction, and preliminary performance of an insulation cover with capillary barrier effects at Meadowbank mine, Nunavut. 70th Canadian Geotechnical Conference, Ottawa, Ontario, Canada. (TSF)

Boulanger-Martel, V., Bussière, B. & Côte, J. 2018. Évaluation de modes de restauration pour le parc à résidus miniers de la mine Meadowbank. Rouyn-Noranda 2018 Symposium on mines and the environment. Canadian Institut of Mining, Metallurgy and Petroleum, Rouyn-Noranda, Québec, Canada. (TSF)

Boulanger-Martel, V., Poirier, A., Côté, J. & Bussière, B. 2018. Thermal conductivity of Meadowbank's mine waste rocks and tailings. 71$^{th}$ Canadian Geotechnical Conference, Edmonton, Alberta, Canada. (TSF + WRSF)

Boulanger-Martel, V., Bussière, B. & Rossit, M. 2020. Determination of the water retention curve of large particle sizes–high water retention capacities materials. 73th Canadian Geotechnical Conference, Calgary, Alberta, Canada. Abstract no. 300 (TSF)

*Special presentations*

Boulanger-Martel, V. 2019. Thermal performance of two insulation covers to control sulfide oxidation at Meadowbank mine, Nunavut. Canadian Geotechnical Society graduate presentation award, 72th

Canadian Geotechnical Conference, St- John's, Newfoundland and Labrador, Canada. October 1st, 2019. (TSF)

*Journal papers*

Poirier, A., Bussière, B., Côte, J., & Boulanger-Martel, V. 2019. Thermal behaviour of a waste rock pile located in the Arctic: case study of Meadowbank mine, Nunavut. Paper to be resubmitted to the Canadian Geotechnical Journal in 2021. (WRSF)

Boulanger-Martel, V., Bussière, B. & Côte, J. 2021. Resistance of a waste rock unit to freeze-thaw and wet-dry cycles: implications for use in a reclamation cover in the Canadian Arctic. Bulletin of Engineering Geology and the Environment, 80: 41-54. (TSF + WRSF)

Boulanger-Martel, V., Bussière, B. & Côte, J. 2021. Thermal behaviour and performance of two field experimental insulation covers to control sulfide oxidation at Meadowbank mine, Nunavut. Canadian Geotechnical Journal. 58(3): 427–440. doi:10.1139/cgj-2019-0616. (TSF)

Boulanger-Martel, V., Bussière, B. & Côte, J. 2021. Insulation covers with capillary barrier effects to control sulfide oxidation in the Arctic. Canadian Geotechnical Journal. doi:10.1139/cgj-2019-0684. (TSF)

*Thesis*

Boulanger-Martel, V. 2019. Évaluation de la performance de recouvrements miniers pour contrôler le drainage minier acide en climat nordique. Ph. D. thesis, Département des génies civil, géologique et des mines, Polytechnique Montréal. 446 pp. (TSF)

Poirier, A. 2019. Étude du comportement thermique d'une halde à stérile située en conditions nordiques. M.S.A. thesis, Département des génies civil, géologique et des mines, Polytechnique Montréal. 196 pp. (WRSF)

*Published dataset*

Boulanger-Martel, V. 2019. Evolution of the physical and mechanical properties of NPAG waste rock cores with respect to freeze-thaw and wet-dry cycles. Mendeley data, v1, http://dx.doi.org/10.17632/2kzf6grgvb.1 (TSF and WRSF)

### 5.4.2 Whale Tail Site

**As required by Water License 2AM-WTP1830 Schedule B, Item 21:** ***A summary of on-going field trials to determine effective capping thickness for the Waste Rock Storage Facility for the purpose of long term environmental protection.***

And

**As required by NIRB Project Certificate No.008 Condition 10:** ***Results of these studies should be submitted to the NIRB at least 30 days prior to the start of construction of these facilities, with subsequent updates submitted annually thereafter. In consultation with applicable regulatory agencies such as Indigenous and Northern***

***Affairs Canada and Natural Resources Canada, the Proponent shall undertake additional site-specific permafrost monitoring, mapping and thermal analysis to:***

- ***Document permafrost conditions, including seasonal thaw and amount of ground ice;***
- ***Inform the detailed design of project infrastructure such as the Whale Tail pit, water management structures, mine site and haul roads, waste rock storage facility, tailings storage facility; and***
- ***Ensure the integrity of such infrastructure is maintained after construction.***

And

**As required by NIRB Project Certificate No.008 Condition 14:** ***The Proponent shall develop and implement a Thermal Monitoring Plan to identify potential changes in talik distribution and flow paths that may result from the development of project infrastructure, including the Whale Tail pit, dikes, and water impoundments. The Plan should be submitted to the NIRB at least 60 days prior to the start of construction of these facilities, with subsequent updates submitted annually thereafter or as may otherwise be required by the NIRB.***

In 2018, studies were initiated with a consultant (O'Kane) to develop the detailed engineering design for the capping of the Whale Tail WRSF. This mandate included thermal modelling to re-assess the capping thickness. This information was also used to inform the instrumentation program to ensure that the WRSF cover performs according to its design intent. These studies were completed in 2019 and provided to the authorities (Landform Water Balance Modelling of Whale Tail and IVR WRSF under RCP8.5., O'Kane Reference No. 948-011-015 rev4 and Amaruq Waste Rock Storage Facility Thermal Cover System Design Basis. O'Kane Reference No. 948-011-M-007 Rev3).

The study "Landform Water Balance Modelling of Whale Tail and IVR WRSF under RCP8.5" completed a landform water balance including estimates of runoff, interflow, and basal seepage rates for different slopes and aspects of the WRSF under the Representative Concentration Pathway 8.5 (RCP8.5) climate change condition. The results of the study provided effective precipitation for the 150-year climate database, provided a surface water balance, concluded that basal seepage will be negligible, determined the interflow distribution by month, and forecasted trends in pore space temperature. Results of the surface water balance support the conceptual model that the hydraulic regimes are expected to be different based on the North and South aspect. Generally, higher net radiation results in greater evaporation and soil heating. With more evaporation, less water is available to runoff and/or infiltrate. Higher net radiation will also result in more sublimation, as more energy is available to convert snow into water vapour.

The study "Amaruq Waste Rock Storage Facility Thermal Cover System Design Basis" goes over the cover system design, the surface water management design, design drawings, construction specifications, and the Operations, Maintenance and Surveillance Manual for the WRSF cover systems.

Agnico Eagle has documented permafrost conditions on site with thermistors placed at strategic locations recommended by the different designers and consultants involved in the project. The Thermal Monitoring Report (Appendix 25) presents a summary of the thermal monitoring program at Whale Tail Mine from the period of 2016 to 2022 along with interpretation of the thermistor results.

Agnico Eagle updated the Whale Tail Thermal Monitoring Plan (Version 4) in March 2022 and it is presented in Appendix 39 of the 2021 Annual Report.

The data presented in Appendix A of the Thermal Monitoring Report (Appendix 25) informed and will continue to inform the detailed design of the project infrastructure such as the Whale Tail and IVR pits, water management structures, mine site and haul roads, and the waste rock storage facility.

At the WRSF, thermistors are showing thermal behaviour along the expected trend (permafrost aggradation) and the instruments are now covered by waste rock. The analysis of this data against adaptive monitoring triggers indicate that the current thermal performance of the WRSF is as expected.

Refer to the 2022 Whale Tail Thermal Monitoring Report (Appendix 25) for a discussion and interpretation of the thermal data for the dike and pit areas.

The detailed analysis of the thermal monitoring of the dikes is presented in the 2022 Annual Geotechnical Inspection Report (Appendix 9). Table 5-8 below presents the sections of this report associated with each structure. Agnico Eagle will refer the reader to the 2022 Annual Geotechnical Inspection Report for a complete review of the results.

**Table 5-8 Whale Tail Thermal Data Interpretation Sections in the 2022 Annual Geotechnical Inspection**

| Structure | Section in the 2022 Annual Geotechnical inspection |
|---|---|
| Whale Tail Dike | 4.1.2.2 |
| WRSF Dike | 4.2.2 |
| Mammoth Dike | 4.4.2 |
| IVR Dike D1 | 4.3.2 |

# SECTION 6. WASTE MANAGEMENT ACTIVITIES

## 6.1 GENERAL WASTE DISPOSAL ACTIVITY

### 6.1.1 Meadowbank Site

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 11:** ***A summary report of general waste disposal activities including monthly and annual quantities in cubic metres of waste generated and location of disposal.***

And

**NIRB Project Certificate No.004 Commitment 74*****: Provide annual report of the quantity and type of waste generated at the mine site distinguishing landfilled, recycled and incinerated streams.***

#### 6.1.1.1 Incinerator

A monthly summary of the amount of waste transferred to the incinerator in 2022 is included in Table 6-1. A total of 4,346.9 m$^3$ were incinerated. More details regarding quantities incinerated can be found in Section 6.2.1.

**Table 6-1 Meadowbank 2022 volume of waste transferred to incinerator**

| Month | Volume of waste send to incinerator (m³) * |
|---|---|
| January | 298.6 |
| February | 310.1 |
| March | 855.0 |
| April | 855.0 |
| May | 883.5 |
| June | 481.1 |
| July | 154.8 |
| August | 188.0 |
| September | 199.1 |
| October | 33.2 |
| November | 88.5 |
| December | 0.0 |
| **TOTAL** | **4,346.9** |

**Volume included waste from Whale Tail Mine*

#### 6.1.1.2 Landfill

Agnico Eagle estimated from the engineering surveys that approximately 5,528 m$^3$ of waste was landfilled at Meadowbank in 2022. Landfill #11 is currently in use. Table 6-2 below indicates the volume of waste in cubic meter (m$^3$) disposed of in each sub-landfill from 2012 to 2022 and Figure 14 indicates the location of each sub-landfill used to date. The volume of waste landfilled from the start of the project is approximately 124,316 $m^3$. This is based on the engineering surveys done at each sub-landfill. It should be noted that this amount is overestimated as some of the surveys were completed once the landfill capping were done. The waste was not always compacted in the landfill when surveyed causing volumes to be overestimated.

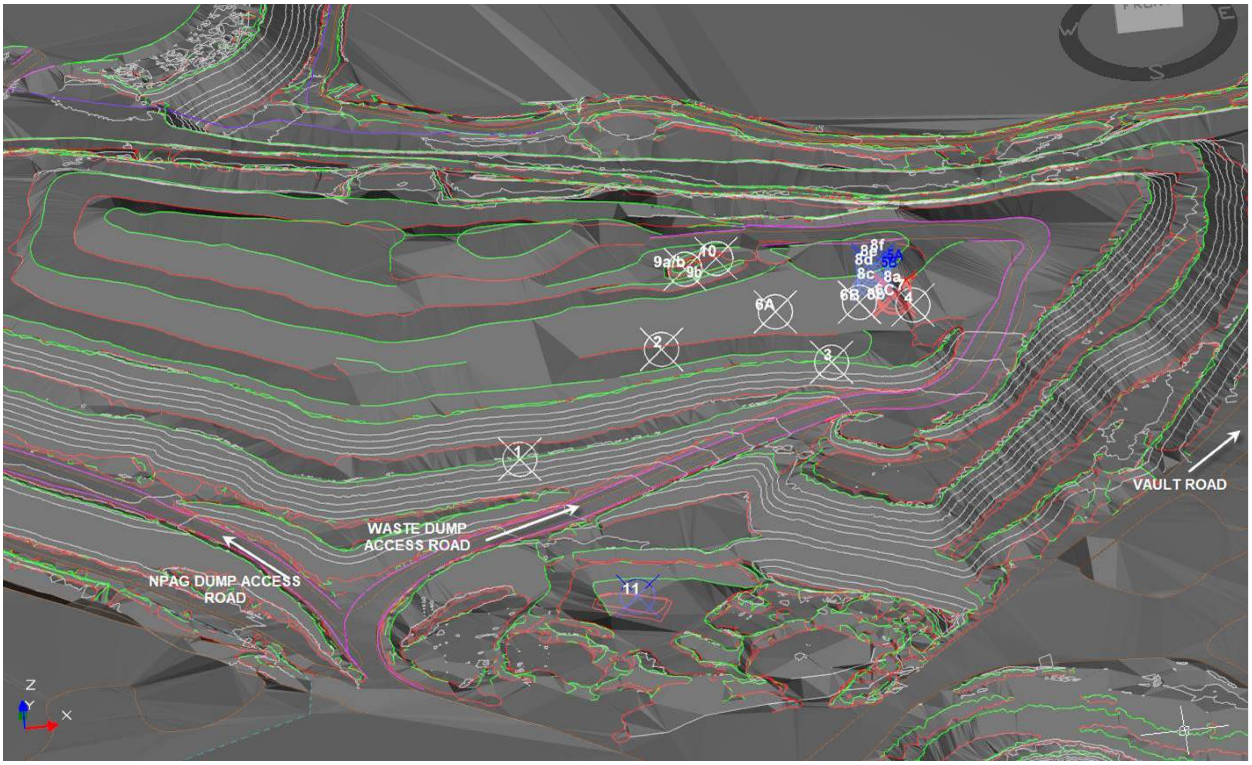
In December 2021, the Meadowbank landfill burned from an undetermined cause. The volume of waste from landfill #11 at the end of 2020 (1,691 $m^3$) and 2021 (4,905 $m^3$) were added to the table below as indicative purpose to obtain the total volume disposed over the years, as those volumes no longer exist due to the fire event. A volume of 308 $m^3$ was remaining in the landfill #11 at the end of 2021.

**Table 6-2 Meadowbank volume of waste disposed in each sub-landfill (from survey)**

| Landfill | Coordinates (UTM) | | | Volume ($m^3$) | Date covered |
|---|---|---|---|---|---|
| | Northing | Easting | Elevation | | |
| #1 | 7215715.6 | 638601.6 | 160 | 3,650 | December 12, 2012 |
| #2 | 7215795.8 | 638711.4 | 186 | 840 | February 27, 2013 |
| #3 | 7215743.1 | 638827.8 | 195 | 1,656 | May 14, 2013 |
| #4 | 7215796.5 | 638890.9 | 200 | 9,507 | January 19, 2014 |
| #5A | 7206586.1 | 643115.9 | 210 | 3,870 | November 30, 2014 |
| #5B | 7206586.1 | 643115.9 | 210 | 2,768 | March 13, 2015 |
| #6A | 7215788.8 | 638793.3 | 212 | 278 | March 21, 2015 |
| #6B | 7215789.3 | 638853.1 | 212 | 3,260 | September 5, 2015 |
| #6C | 7215790.8 | 638878.1 | 212 | 9,290 | May 20, 2016 |
| #7 | 7215790.8 | 638878.1 | 214 | 4,560 | December 20, 2016 |
| #8a | 7215790.1 | 638878.1 | 217 | 17,864 | November 30, 2017 |
| #8b | 7215790.1 | 638878.4 | 217 | 2,709 | January 27, 2018 |
| #8b | 7215790.1 | 638878.4 | 217 | 13,019 | June 1, 2018 |
| #8c | 7215800.7 | 638865.4 | 221 | 2,800 | October 1,2018 |
| #8d | 7215800.7 | 638865.4 | 227 | 9,377 | April 4, 2019 |
| #8e | 7215800.7 | 638865.4 | 232 | 8,482 | August 1, 2019 |
| #8f | 7215800.7 | 638865.4 | 235 | 12,175 | September 2, 2019 |
| #9a | 7215823.5 | 638733.9 | 233 | 350 | March 28, 2020 |
| #9b | 7215823.5 | 638733.9 | 235 | 4,079 | March 28, 2020 |
| #10 | 7215829.7 | 638756.6 | 235 | 1,350 | November 17, 2020 |
| *#11* | *7215539.9* | *638667.78* | *150* | *1,691** | *Burned in 2021* |
| *#11* | *7215539.9* | *638667.78* | *150* | *4,905** | *Burned in 2021* |
| #11 | 7215539.9 | 638667.78 | 150 | 5,836 | Active |
| | | | **Total** | **124,316** | |

**Volume added to the volume of waste disposed to the landfill. See text above for more information.*

**Figure 14 Meadowbank sub-landfill location**




### 6.1.1.3 *Hazardous and non-hazardous waste*

In 2022, approximately 720 sea cans comprising hazardous waste, used tires, scrap metal, domestic waste, and construction debris were transported to registered companies or disposal facilities located in the Province of Quebec.

The sea cans were shipped from the spud barge at Agnico Eagle's Baker Lake marshalling facilities to Bécancour (Quebec) by sealift. These materials were transported under Waste Manifest #'s ES71248-9 (Appendix 26) , in accordance with the GN Guidelines for the shipment of such waste.

A description of the types of waste, packaging and volume is provided in Table 6-3. Table 6-4 provided a summary of waste generated per type along with their disposal/recycling location. The volume of hazardous and non-hazardous waste disposed by sealift in 2022 are for the Meadowbank and Whale Tail sites. The waste to be disposed off-site from Whale Tail site is transported to Meadowbank during the year, there is no possibility to make a distinction between the two sites.

In 2022, Agnico Eagle generated approximately 13,530 tonnes of waste for Meadowbank and Whale Tail sites. This represents 58.8% of general waste disposed in the landfill, 10.1% of domestic waste disposed in the incinerator/composter or off-site, 6.3 % of industrial/hazardous waste sent to an approval facility off-site, 3.6 % of waste (waste oil, batteries and tires) recycled on site and off-site and 21.1% of steel recycled off site. As shown in Table 6-4 below the percentage of waste recycled, disposed on site or off-site are in the same range as previous years except for steel that is 9% more than last year.

**Table 6-3 Meadowbank and Whale Tail 2022 waste shipped to licensed hazardous waste companies**

| Description | UN | Class | P. G.[1] | Regulated under T.D.G.A.[2] | Quantity | Container Type and Capacity | Unit Capacity | Volume (L) | Weight (kg) | Disposal Method |
|---|---|---|---|---|---|---|---|---|---|---|
| Waste, Batteries, Dry, containing potassium hydroxyde | UN 3028 | 8 | - | yes | 2 | Quatrex | 400 L | 800 | 461 | Recycling |
| Waste, Batteries, Wet - Lead Batteries | UN 2794 | 8 | - | yes | 59 | Quatrex | 400 L | 23,600 | 28,474 | Neutralization and metal recycling |
| Waste, Diesel Fuel | UN 1202 | 3 | III | yes | 4 | Drum | 205 L | 820 | 667 | Energy recovery |
| Waste, Diesel Fuel | UN 1202 | 3 | III | yes | 15 | tote | 1,000 L | 15,000 | 9,295 | Energy recovery |
| Empty drum, last residue cont, Nitric acid | UN 2031 | 8 | II | yes | 57 | Drum | 205 L | 11,685 | 2,013 | Cleaning and drum recycling |
| Environmentally Hazardous Substances, solid (LEAD) - Lab sample | UN 3077 | 9 | III | yes | 28 | Quatrex | 765 L | 21,420 | 1,818 | Secure landfill |
| Waste, empty paint cans with residue | UN 3509 | 9 | - | yes | 17 | Quatrex | 765 L | 13,005 | 2,349 | Secure landfill |
| Waste, Flammable liquid, Toluene | UN 1993 | 3 | II | yes | 2 | Drum | 205 L | 410 | 259 | Energy recovery |
| Waste, Fuel, Aviation, Turbine Engine | UN 1863 | 3 | III | yes | 1 | Drum | 205 L | 205 | 130 | Energy recovery |
| Labpack caustic alkaline solid - unused laboratory chemical reagents | UN 3262 | 8 | II | yes | 1 | Drum | 205 l | 205 | 54 | Neutralization and incineration |
| Labpack oxydizing liquid - Perchloric acid bottle | UN 1873 | 5.1 (8) | I | yes | 1 | Drum | 205 L | 205 | 58 | Neutralization and incineration |
| Waste, Toxic liquid, organic, Methylene Diisocyante MDI | UN 2810 | 6.1 | II | yes | 1 | Drum | 205 L | 205 | 65 | Incineration |
| Waste, Antifreeze - concentration less than 30% | N/R[3] | N/R | - | no | 20 | tote | 1,000 L | 20,000 | 22,638 | Incineration |
| Waste, Antifreeze - concentration more than 30% | N/R | N/R | - | no | 3 | Drum | 205 L | 615 | 432 | Antifreeze recycling |
| Waste, Antifreeze - concentration more than 30% | N/R | N/R | - | no | 37 | tote | 1,000 L | 37,000 | 37,167 | Antifreeze recycling |
| Waste, Contaminated Hydrated lime | N/R | N/R | - | no | 8 | Quatrex | 765 L | 6,120 | 5,350 | Secure landfill |
| Empty drum, last residue cont, oil/grease | N/R | N/R | - | no | 537 | Drum | 205 L | 110,085 | 10,677 | Cleaning, reconditioning or metal recycling |
| Empty plastic pails, last residue cont. Oil/grease | N/R | N/R | - | no | 8,370 | Pail (20 L) | 20 L | 167,400 | 8,370 | Cleaning and plastic recycling |
| Empty tote-tank, Residu last contained Oil/Grease | N/R | N/R | - | no | 116 | tote | 1,000 L | 116,000 | 15,696 | Cleaning, reconditioning or metal recycling |
| Waste, Grease | N/R | N/R | - | no | 51 | Drum (60L) | 60 L | 3,060 | 3,169 | Solidification and secure landfill |
| Waste, Grease | N/R | N/R | - | no | 156 | Drum | 205 L | 31,980 | 20,322 | Solidification and secure landfill |
| Hydrocarbon contaminated soil non-treatable at landfarm site | N/R | N/R | - | no | 11 | Drum | 205 L | 2,255 | 2,015 | Secure landfill |
| Hydrocarbon contaminated soil non-treatable at landfarm site | N/R | N/R | - | no | 21 | Quatrex | 765 L | 16,065 | 21,829 | Secure landfill |
| Waste, Hydrocarbon contaminated water | N/R | N/R | - | no | 2 | tote | 1,000 L | 2,000 | 1,285 | Water treatment and oil recycling |
| Waste, Kitchen grease | N/R | N/R | - | no | 97 | Drum | 205 L | 19,885 | 14,682 | Energy recovery |
| Mixed waste labpack (Labpack of miscellaneous chemicals) | N/R | N/R | - | no | 1 | Quatrex | 765 L | 765 | 322 | Solidification and secure landfill |
| Waste Oil | *Used Oil acceptable for recycling or energy recovery*[4] | | | | 97<br>345 | Drum<br>Tote | 205 L<br>1,000 L | 304,054 | 270,608 | Oil recycling or energy recovery |
| | *Oily water mixed with waste oil* | | | | | | | 6,381 | 6,381 | Water treatment |
| | *Antifreeze < 30 % + water mixed with waste oil* | | | | | | | 23,546 | 23,546 | Incineration |
| | *Used Oil containing chlorine > 2000 ppm* | | | | | | | 13,111 | 13,111 | Energy recovery |
| Oily contaminated solid | N/R | N/R | - | no | 612 | Quatrex | 765 L | 468,180 | 126,056 | Energy recovery |
| Oily contaminated solid | N/R | N/R | - | no | 1 | tote | 1,000 L | 1,000 | 225 | Energy recovery |

| Description | UN | Class | P. G.[1] | Regulated under T.D.G.A.[2] | Quantity | Container Type and Capacity | Unit Capacity | Volume (L) | Weight (kg) | Disposal Method |
|---|---|---|---|---|---|---|---|---|---|---|
| Waste, Oil Filters | N/R | N/R | - | no | 9 | Drum | 205 L | 1,845 | 1,337 | Energy recovery and metal recycling |
| Waste, Oil Filters | N/R | N/R | - | no | 44 | Quatrex | 765 L | 33,660 | 14,410 | Energy recovery and metal recycling |
| Waste, Oil Filters | N/R | N/R | - | no | 17 | tote | 1,000 L | 17,000 | 6,130 | Energy recovery and metal recycling |
| Waste, Oily water | N/R | N/R | - | no | 10 | Drum | 205 L | 2,050 | 752 | Water treatment and oil recycling |
| Waste, Oily water | N/R | N/R | - | no | 93 | Tote | 1,000 L | 93,000 | 88,362 | Water treatment and oil recycling |
| Waste, Paint | N/R | N/R | - | no | 2 | Drum | 205 L | 410 | 259 | Energy recovery |
| Waste, Polyol - Part A of urethane mix | N/R | N/R | - | no | 2 | Drum | 205 L | 410 | 130 | Energy recovery |
| Waste, Sulfite Salt | N/R | N/R | - | no | 3 | Quatrex | 765 L | 2,295 | 2,287 | Neutralization and secure landfill |
| | | | | | | | **Total** | **1,587,732** | **763,191** | |

1. Packaging Group as per TDGA
2. Transportation of Dangerous Good Act, Canada 1992, S.C. 1992, c. 34
3. Not regulated under TDGA
4. As per Schedule 6 of Regulation Respecting Hazardous Materials (CQLR, Q-2, r. 32)

**Table 6-4 Percentage of waste disposed from 2015-2022**

| Waste | 2015 Weight (Tonnes) | 2016 Weight (Tonnes) | 2017 Weight (Tonnes) | 2018 Weight (Tonnes) | 2019 Weight (Tonnes) | 2020 Weight (Tonnes) | 2021 Weight (Tonnes) | 2022 Weight (Tonnes) | 2015 Total waste (%) | 2016 Total waste (%) | 2017 Total waste (%) | 2018 Total waste (%) | 2019 Total waste (%) | 2020 Total waste (%) | 2021 Total waste (%) | 2022 Total waste (%) | Disposal / Recycling location |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| General[1] | 8,561 | 8,672 | 8,403 | 11,073 | 24,339[4] | 7,505 | 6,325 | 7,960 | 74.9 | 76.5 | 78.7 | 75.7 | 87.8 | 69.4 | 67.5 | 58.8 | Landfill On-site disposal |
| Domestic[2] | 545 | 541 | 557 | 924 | 810 | 700 | 796 | 1,367 | 4.8 | 4.8 | 5.2 | 6.3 | 2.9 | 6.5 | 8.5 | 10.1 | Incinerator or on-site/off-site disposal |
| Industrial/ Hazardous[3] | 289 | 161 | 243 | 483 | 470 | 622 | 600 | 856 | 2.5 | 1.4 | 2.3 | 3.3 | 1.7 | 5.8 | 6.4 | 6.3 | Off-site disposal and recycling |
| Waste oil | 358 | 280 | 280 | 337 | 210 | 162 | 263 | 152 | 3.1 | 2.5 | 2.6 | 2.3 | 0.8 | 1.5 | 2.8 | 1.1 | On-site recycling |
| Steel | 1,449 | 1,550 | 1,097 | 1,690 | 1,813 | 1,657 | 1,132 | 2,858 | 12.7 | 13.6 | 10.3 | 11.5 | 6.5 | 15.3 | 12.1 | 21.1 | Off-site recycling |
| Wood | 88 | 55 | 0 | 0 | 0 | 0 | 0 | 0 | 0.8 | 0.5 | 0 | 0 | 0 | 0 | 0 | 0 | Baker Lake recycling |
| Batteries | 38 | 17 | 17 | 19 | 19 | 31 | 11 | 29 | 0.3 | 0.1 | 0.2 | 0.1 | 0.1 | 0.3 | 0.1 | 0.2 | Off-site recycling |
| Tire | 97 | 67 | 81 | 110 | 63 | 136 | 243 | 309 | 0.9 | 0.6 | 0.8 | 0.8 | 0.2 | 1.3 | 2.6 | 2.3 | Off-site recycling |
| **TOTAL** | **11,425** | **11,343** | **10,678** | **14,636** | **27,724** | **10,813** | **9,370** | **13,530** | **100** | **100** | **100** | **100** | **100** | **100** | **100** | **100** | |

1. *2022 - Volume of general waste sent to Meadowbank Landfill is 4,090 tonnes and to Whale Tail Landfill is 3,870 tonnes*
2. *2022 - Volume of domestic waste sent to the Meadowbank Site incinerator (622 tonnes), composter (291 tonnes) and to a registered down south company (454 tonnes).*
3. *Industrial/ Hazardous waste does not include batteries weight. Including waste oil sent off-site.*
4. *Higher volume of general waste disposed of in 2019 compared to previous are mainly due to the construction and development of the Whale Tail Mine and to the fact the that volume reported is from October 2018 to January 2020.*

Several projects for waste reduction/recycling were undertaken or were ongoing in 2022 at the Meadowbank Complex:

- Recycling of used protective personnel equipment (PPE)
    - The objective of the Used PPE Project is to provide a second life to reusable PPE. With the collaboration of all departments, Agnico Eagle collected used PPE around the Meadowbank Complex to create a used PPE inventory. This used PPE is now reused instead of ordering new equipment and disposing of reusable materials in the landfill. This initiative has been successful in reducing waste sent to landfill and as an overall cost saving measure.
- Waste oil recycling plan
    - Agnico Eagle has an existing waste oil reuse plan. In 2022, Agnico Eagle reused approximately 172.62 $m^3$ of waste oil as a fuel source in the on-site incinerator (32.12 $m^3$) and in waste oil heaters (140.50 $m^3$). Table 6-10 provides a breakdown of the volume of waste oil incinerated by month. Agnico Eagle is planning on continuing to reuse waste oil produced in 2023.
- Steel Recycling
    - A total of 2,858 tonnes of steel was packaged and transported south for recycling. This material was removed from our solid waste stream and not landfilled on site.
- Aluminum Recycling
    - In 2022, aluminum pop cans were not donated to local groups. It is anticipated that these will be donated in 2023 to a local charity or shipped south for recycling.
- Battery recycling
    - In 2022, 29 tonnes of batteries were shipped south and recycled in an accredited facility.
- Tire recycling
    - In 2022, 308.73 tonnes of scrap tires were shipped south and recycled in an accredited facility.

#### 6.1.1.4 *Composter*

The Meadowbank composter was in operation in 2022 and continues to contribute to optimizing waste management by reducing the amount of waste going to the incinerator.

In 2022, 126,349 kg of cardboard and 165,058 kg of food waste was loaded into composter. A total of 112 totes of compost (Table 6-5) were produced and transferred to the Meadowbank landfill as per the approved Incinerator Waste Management Plan.

**Table 6-5 2022 Compost totes produced**

| Month | Quantity of totes produced |
|---|---|
| January | 6 |
| February | 5 |
| March | 8 |
| April | 7 |
| May | 12 |
| June | 10 |
| July | 11 |
| August | 11 |
| September | 9 |
| October | 12 |
| November | 8 |
| December | 13 |
| **Total** | **112** |

### 6.1.2 Whale Tail Site

**As required by NWB Water License 2AM-WTP1830 Schedule B, Item 14:** ***A summary report of all general waste disposal activities including monthly and annual quantities in cubic metres of waste generated and location of disposal***

As detailed in Section 6.1.1 above, all hazardous and non-hazardous waste that required an off-site disposal to an accredited facilities for recycling or disposal according to regulations are sent to Meadowbank site by the Whale Tail Haul Road. From there, the hazardous and non-hazardous waste are segregated along with the waste generated by the Meadowbank site. There is no distinction possible between the site provenance of the waste. A description of the types of waste, packaging and volume is provided in Table 6-3.

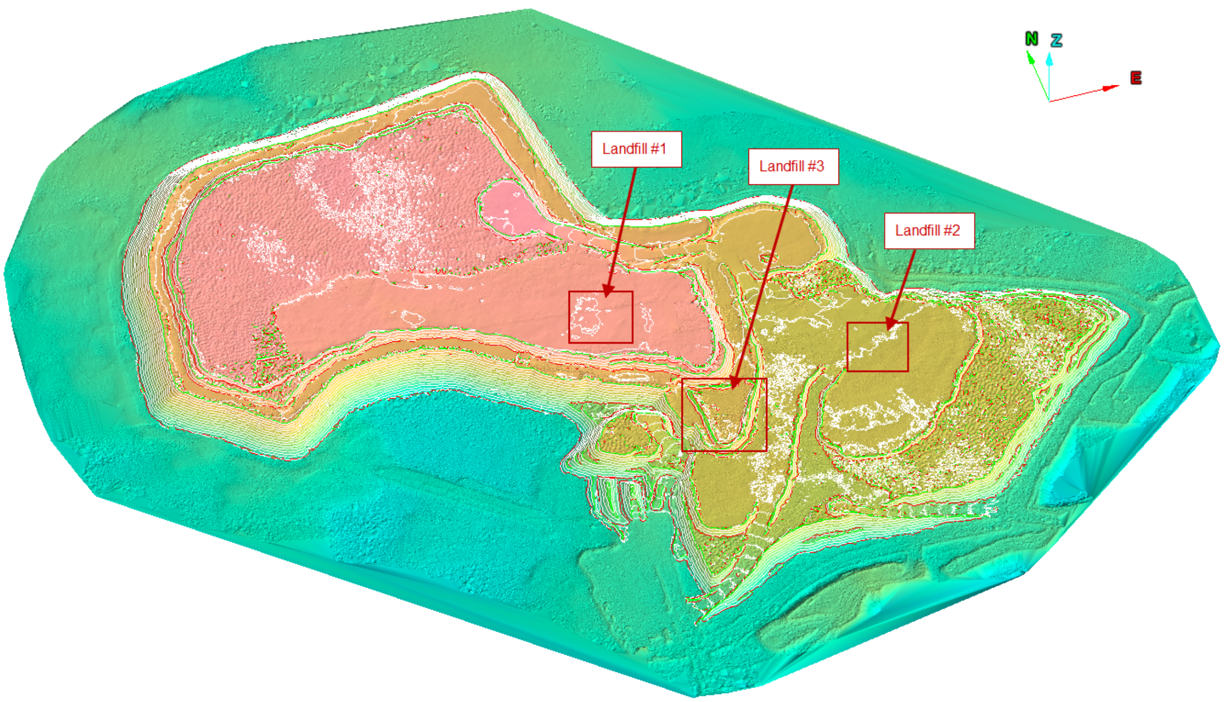
All inert waste that can be landfilled consist primarily of plastics, fiberglass, wood, cardboard, rubber, clothing and some metal that was not recycled. Landfillable waste were transported via the Whale Tail Haul Road to the Meadowbank Landfill up to October 2019. After October 2019 and following the approval from the NWB to operate a landfill at Whale Tail, waste was no longer sent to Meadowbank but were disposed of directly on site.

Table 6-6 below indicates the volume of waste in cubic meter ($m^3$) disposed in the Whale Tail Landfill starting in October 2019 and Figure 15 indicates the location used to date. The volume of waste landfilled since 2019 is 17,959 $m^3$. This is based on the engineering survey done at each landfill. From that amount, Agnico Eagle landfilled 5,843 $m^3$ in 2022. Landfill #3 is currently in use.

**Table 6-6 Whale Tail Volume of waste disposed in landfill (from survey)**

| Landfill | Coordinates (UTM) | | | Volume ($m^3$) | Date Covered |
|---|---|---|---|---|---|
| | Northing | Easting | Elevation | | |
| #1 | 7256069.069 | 605637.584 | 168 | 6,151 | December 6, 2020 |
| #2 | 7256087.459 | 606021.081 | 171 | 8,553 | October 2, 2022 |
| #3 | 7255858.089 | 605863.835 | 197 | 3,255 | Active |
| | | | **Total** | **17,959** | |

**Figure 15 Whale Tail landfill location**




There was no incinerator at Whale Tail in 2022 and thus all domestic wastes were sent to the Meadowbank incinerator/composter or shipped down south, as previously described. There is no distinction possible between the volume site provenance of domestic waste in 2022.

## 6.2 INCINERATOR

### 6.2.1 Meadowbank Site

**As per NWB Water License 2AM-MEA1530 Schedule B, Item 12:** ***Report of Incinerator test results including the materials burned and the efficiency of the Incinerator as they relate to water and the deposit of waste into water.***

And

**NIRB Project Certificate No.004 Condition 72:** ***On-site incinerators shall comply with Canadian Council of Ministers of Environment and Canada-Wide Standards for dioxins and furan emissions, and Canada-wide***

***Standards for mercury emissions, and AEM shall conduct annual stack testing to demonstrate that the on-site incinerators are operating in compliance with these standards. The results of stack testing shall be contained in an annual monitoring report submitted to GN, EC and NIRB's Monitoring Officer.***

The incinerator was in operation throughout 2022. Based on the data recorded, approximately 13% of the material incinerated was food waste; the other 87% was dry waste comprised of food containers, cardboard boxes and paper. In 2022, a total of 4,346.9 $m^3$ of waste was burned in the incinerator. The location of the incinerator is highlighted in Figure 1.

In 2022, the incinerator was in operation for 218 days and 12 consecutive events, from February 21st to March 5th, excluding February 24th, did not reach the 1,000°C in the secondary chamber. This represents 5.5% of the total burn which can be considered as minor under the actual operating conditions at site. From the 12 events where the temperature did not reach 1,000°C, 50% (6/12) were for temperatures between 900°C and 999°C, 42% (5/12) for temperatures between 800°C and 899°C and 8% (1/12) for a temperature of 794°C. The burns that occurred from March 7th till the end of 2022 reached the minimum 1,000°C for every completed burn cycle.

In 2020, two events did not reach the 1,000°C, representing 0.68 % of the total burn. In 2021, the average temperature in the secondary chamber reached the minimum 1,000°C for every completed burn cycle. The underperformance of the incinerator in 2022 was linked to a damaged thermocouple wire and the degradation of the insulation in the secondary chamber. Both of these components were replaced after the events. According to the incinerator fuel consumption, it is possible to assume that the average temperature in the secondary chamber was above 1,000°C from February 21st to March 5th, excluding February 24th, and therefore that the temperature probe was malfunctioning.

Continued actions in 2022:

- Average temperature readings are automatically recorded from the HMI into the daily reports instead of manual instantaneous readings from operators. Thus, reducing the risk of human error and providing a more accurate account of the temperature in the secondary chamber during the burn cycle;
- The temperature in the secondary chamber continued to be set at 1,050°C to ensure the temperature does not fall below the recommended 1,000°C at any point in the burn cycle;
- The HMI is providing the temperature trends throughout the burn cycle.
- Programing does not allow the primary burn to start before the temperature in the secondary chamber reaches 1,000°C. An alarm was added to inform the incinerator operator if the temperature falls under 1,000°C after the burning cycle has started.

In 2022, Agnico Eagle continued to conduct weekly regular inspections at the incinerator. During the inspection, workers were reminded regularly of the importance of maintaining a proper and detailed log of the incinerator. Staff on site are also reminded regularly on proper waste segregation through departmental toolbox meetings and site wide communications.

#### 6.2.1.1 *Stack testing*

In 2014, stack testing results indicated that mercury level average exceeded the Environment Canada guideline (refer to 2014 and 2015 Annual Reports for more information). An investigation was performed to determine the potential sources of this exceedance. Although Agnico Eagle had an alkaline battery recycling program, the investigation revealed the possibility of a significant volume of batteries disposed of along with regular solid waste destined for the onsite incinerator. As a result, this implemented a comprehensive site wide communication program to reinforce the requirements of the battery recycling program and proper waste segregation.  No more mercury exceedances have since been observed.

The number of Quatrex bags of batteries backhauled in 2022 (Table 6-7) confirms the ongoing segregation efforts are effective at reducing the number of batteries accidently burnt in the incinerator.

Toolbox meetings on waste management still continue to be held with different departments to continue education and improve awareness of employees and contractors.

**Table 6-7 Number of Quatrex bags of batteries backhauled 2013-2022**

| Year | Quantity (unit) |
|---|---|
| 2013 | 29 |
| 2014 | 12 |
| 2015 | 34 |
| 2016 | 20 |
| 2017 | 20 |
| 2018 | 47 |
| 2019 | 36 |
| 2020 | 69 |
| 2021 | 24 |
| 2022 | 61 |

Annual stack testing is performed as per the Incinerator Waste Management Plan (Version 10, June 2022 provided in Appendix 51). In 2022, a stack testing program was completed from September 2nd to 4th. The Meadowbank 2022 Incinerator Air Emission Testing Report completed by Consulair - Air & Environment Global Management is provided in Appendix 52. Mercury and dioxins and furans guidelines are referenced from the Government of Nunavut Environmental Guideline for the Burning and Incineration of Solid Waste and the Canadian Council of Ministers of Environment Canada-Wide Standards for mercury emissions. Results from the 2022 test indicated that the applicable mercury guideline was met for all of the tests. However, the application standards for dioxins and furans were exceeded for all three tests and for the overall average. Following receipt of the dioxins and furans exceedance, Agnico Eagle notified the NIRB on December 21st , 2022 of the non-compliance.

Table 6-8 below provide the summary results for the stack testing from 2014 to 2022.

**Table 6-8 Meadowbank 2014- 2022 Stack Testing Results**

| Year | Mercury ($\mu g/Rm^3$ @ 11% v/v $O_2$) | | Dioxins and Furans ($ng/Rm^3$ @ 11% v/v $O_2$) | |
|---|---|---|---|---|
| | GN Standard | Stack Testing Results (Average) | GN Standard | Stack Testing Results (Average) |
| 2014 | | 64.09 | | 0.054 |
| 2015 | | <0.22 | | 0.021 |
| 2016 | | <0.46 | | 0.033 |
| 2017 | | 3.8 | | 0.022 |
| 2018 | 20 | <0.19 | 0.08 | 0.01 |
| 2019 | | 0.45 | | 0.027 |
| 2020 | | No stack testing program completed | | No stack testing program completed |
| 2021 | | 1.33 | | 0.286 |
| | | 0.25 | | 0.570 |

*R: Reference conditions 25 °C and 101.3 kPa on a dry basis*
*Grey cells represent exceedances*

Following the 2021 and 2022 exceedances, Agnico Eagle retained the services of a consultant to conduct an investigation to determine causation of theses exceedances. The investigation included discussions with the stack test contractor to confirm test results, review of incinerator logs, discussion with the operator to confirm normal operating conditions, and literature review to identify specific potential causal factors for further assessment.

Based on the investigation described above, low stack gas temperature was identified as the most likely cause of elevated PCDD/F emission during stack testing in 2021 and 2022. Pending resolution of this issue, operation of the incinerator ceased on November 27th, 2022.

If the incinerator is operational in 2023, Agnico Eagle will conduct stack testing requirements as per the approved plan.

#### 6.2.1.2 *Ash Monitoring*

In 2022, Agnico Eagle monitored the ash quality on a monthly basis. The results from April 7th, 2022 indicated a concentration of chromium exceeding the Guideline for Industrial Waste Discharge (5 mg/L) with a result of 14 mg/L. As the ash results were below the regulatory guideline for the last seven months of 2022 (Table 6-9) and because the chromium exceedance is considered to be an isolated event, if the incinerator is operational in 2023, Agnico Eagle will reduce the testing frequency and will return to a frequency more aligned with the Incinerator Waste Management Plan, which stipulates twice per year. There are no results for the month of December since the incinerator was not operational during that month.

**Table 6-9 Meadowbank 2022 incinerator ash monitoring**

| Parameters | Guideline for Industrial Waste Discharge* | Sample Date / Unit | 1/11/2022 | 2/7/2022 | 3/10/2022 | 4/7/2022 | 5/5/2022 | 6/2/2022 |
|---|---|---|---|---|---|---|---|---|
| Arsenic | 2.5 | mg/L | 0.65 | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Barium | 100 | mg/L | 0.41 | 1.90 | 0.80 | < 0.2 | 1.20 | < 0.2 |
| Cadmium | 0.5 | mg/L | 0.02 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Chromium | 5 | mg/L | 0.01 | 0.70 | 1.60 | 14.00 | 2.70 | 0.30 |
| Lead | 5 | mg/L | 0.01 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Mercury | 0.1 | mg/L | < 0.00002 | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Selenium | 1 | mg/L | 0.004 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Silver | 5 | mg/L | < 0.0005 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Zinc | 500 | mg/L | 7.79 | 0.40 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |

| Parameters | Guideline for Industrial Waste Discharge* | Sample Date / Unit | 7/2/2022 | 8/1/2022 | 9/3/2022 | 10/22/2022 | 11/16/2022 |
|---|---|---|---|---|---|---|---|
| Arsenic | 2.5 | mg/L | < 0.2 | < 0.2 | < 0.2 | < 0.2 | 2.10 |
| Barium | 100 | mg/L | 0.70 | 1.00 | < 0.2 | < 0.2 | < 0.2 |
| Cadmium | 0.5 | mg/L | < 0.05 | < 0.05 | < 0.05 | < 0.3 | < 0.05 |
| Chromium | 5 | mg/L | 1.30 | < 0.1 | 0.20 | 0.40 | < 0.1 |
| Lead | 5 | mg/L | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Mercury | 0.1 | mg/L | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| Selenium | 1 | mg/L | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Silver | 5 | mg/L | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Zinc | 500 | mg/L | < 0.1 | 0.20 | < 0.1 | < 0.1 | 1.10 |

** Government of Nunavut Environmental Guideline for Industrial Waste Discharges (D of SD, 2011).*

Grey shaded values are above the Guideline for Industrial Waste Discharge.

### 6.2.1.3 *Waste Oil Monitoring*

In 2022, a total of approximately 172.62 m$^3$ of waste oil was burned in the incinerator and/or in furnaces. Volumes of waste oil reused as fuel in 2022 are presented in Table 6-10.

**Table 6-10 Meadowbank 2022 volume of waste oil incinerated and consumed**

| Month | At the incinerator (m³) | In the furnace at Cat Dome, Blue coverall and SS Coverall) (m³) |
|---|---|---|
| January | 4.45 | 0.00 |
| February | 2.63 | 0.00 |
| March | 3.90 | 4.00 |
| April | 4.63 | 32.00 |
| May | 4.00 | 8.50 |
| June | 3.55 | 0.00 |
| July | 3.73 | 0.00 |
| August | 3.60 | 0.00 |
| September | 1.25 | 2.00 |
| October | 0.40 | 21.00 |
| November | 0.00 | 21.00 |
| December | 0.00 | 52.00 |
| **Total** | **32.12** | **140.50** |

There are no sampling frequency for waste oil specified in the GN Environmental Guideline for Used Oil and Waste Fuel (2012). To ensure compliance with the Guideline parameters, Agnico Eagle will sample the waste oil feedstock twice a year. This data is presented in Table 6-11.

In 2022, Agnico Eagle collected one waste oil sample per month. All metals and PCB parameters have meet the GN Environmental Guideline. It should be noted that for the sample of January 2022, the detection limit for Polychlorinated Biphenyls was above the maximum allowable concentration.

**Table 6-11 Meadowbank 2022 Waste Oil monitoring**

| Parameters | Maximum Allowable Concentration* | Unit | 1/23/2022 | 2/7/2022 | 3/10/2022 | 4/7/2022 | 5/14/2022 | 6/2/2022 |
|---|---|---|---|---|---|---|---|---|
| Flash Point | ≥ 37.7 | C° | 152 | >80 | >80 | >80 | >80 | 70 |
| Total Halogen | 1,000 | mg/kg | 23 | 141 | 56 | 107 | 87 | < 1 |
| Cadmium | 2 | mg/kg | 0.014 | < 1 | < 1 | < 1 | < 1 | < 1 |
| Chromium | 10 | mg/kg | 0.32 | < 1 | < 1 | < 1 | < 1 | < 1 |
| Lead | 100 | mg/kg | 0.488 | < 5 | < 5 | < 5 | < 5 | < 5 |
| Polychlorinated Biphenyls | 2 | mg/kg | < 20 | < 1 | < 1 | < 1 | < 1 | < 1 |

| Parameters | Maximum Allowable Concentration* | Unit | 6/30/2022 | 8/1/2022 | 9/3/2022 | 10/2/2022 | 11/5/2022 | 12/19/2022 |
|---|---|---|---|---|---|---|---|---|
| Flash Point | ≥ 37.7 | C° | >80 | 63 | >80 | >80 | >80 | 76 |
| Total Halogen | 1,000 | mg/kg | 54 | 244 | 57 | 73 | 71 | 100 |
| Cadmium | 2 | mg/kg | < 1 | < 1 | < 1 | < 1 | < 1 | <1 |
| Chromium | 10 | mg/kg | < 1 | < 1 | < 1 | < 1 | < 1 | <1 |
| Lead | 100 | mg/kg | < 5 | < 5 | < 5 | < 5 | < 5 | <5 |
| Polychlorinated Biphenyls | 2 | mg/kg | < 1 | < 1 | < 1 | < 1 | < 1 | <1 |

** GN Environmental Guideline for Used Oil and Waste Fuel (GN, 2012)*

### 6.2.2 Whale Tail Site

**As per Water License 2AM-WTP1830 Schedule B, Item 15:** ***Reporting of Incinerator test results including the materials burned and the efficiency of the Incinerator in relation to effects on Water and the potential Deposit of Waste into Water***

There is currently no incinerator associated with the Water License 2AM-WTP1830. In 2022, waste that needed to be incinerated were hauled to the Meadowbank Site to be burned/composted or shipped down south for disposal, as previously described.

## 6.3 ADDITIONAL INFORMATION

### 6.3.1 Meadowbank Site

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 25:** ***Any other details on Water use or Waste Disposal requested by the Board by November 1st of the year being reported.***

The Board did not request any additional details on waste disposal in 2022.

### 6.3.2 Whale Tail Site

**As required by NWB Water License 2AM-WTP1830 Schedule B, Item 28:** ***Any other details on Water use or Waste Disposal requested by the Board by November 1st of the year being reported.***

The Board did not request any additional details on waste disposal in 2022.

# SECTION 7. SPILL MANAGEMENT

## 7.1 SPILL SUMMARY

The number of spills in 2022 for both Meadowbank and Whale Tail sites are summarized in Table 7-1 below. The construction of the Whale Tail Mine started in 2016 with the construction of the Amaruq Exploration Access Road (Whale Tail Haul Road). For this reason, there are no spills to report from the Whale Tail site prior to 2016. Spills that occurred along the Amaruq Exploration Access Road were reported in 2016 and 2017 in the report submitted as part of the NWB Water License 8BC-AEA1525, which was cancelled as of November 2018 and are reported in the Table 7-1 below.

To be consistent with previous years, Agnico Eagle will continue to present spills for the Meadowbank Mine site, AWAR and Bake Laker infrastructures (Section 7.1.1) and the ones for Whale Tail Mine site and Whale Tail Haul Road (Section 7.1.2) separately.

**Table 7-1 Total reportable and non-reportable spills for the Meadowbank and Whale Tail Sites from 2011 to 2022**

| Year | Meadowbank Site | | | Whale Tail Site | | | Total both site |
|---|---|---|---|---|---|---|---|
| | Number Reportable Spills | Number Non-Reportable Spills | Total | Number Reportable Spills | Number Non-Reportable Spills | Total | |
| 2011 | 12 | 68 | **80** | NA | NA | **NA** | **80** |
| 2012 | 16 | 82 | **98** | NA | NA | **NA** | **98** |
| 2013 | 7 | 85 | **92** | NA | NA | **NA** | **92** |
| 2014 | 9 | 63 | **72** | NA | NA | **NA** | **72** |
| 2015 | 18 | 148 | **166** | NA | NA | **NA** | **166** |
| 2016 | 34 | 374 | **408** | 0 | 14 | **14** | **422** |
| 2017 | 28 | 383 | **411** | 0 | 34 | **34** | **445** |
| 2018 | 26 | 217 | **243** | 15 | 114 | **129** | **372** |
| 2019 | 22 | 97 | **119** | 43 | 177 | **220** | **339** |
| 2020 | 11 | 38 | **49** | 21 | 204 | **225** | **274** |
| 2021 | 20 | 48 | **68** | 14 | 148 | **162** | **230** |
| 2022 | 14 | 45 | **59** | 20 | 134 | **154** | **213** |

With the main mining operations shifted from Meadowbank to Whale Tail mine in 2019, it was expected to observe a significant decrease in spills internally and externally reported at Meadowbank and an increase at the Whale Tail site.

In 2016, due to the observed increase in spills occurring on site, an action plan was initiated. Key Performance Indicators (KPIs) were developed and tracked regularly. Since 2018, the total site spills have continued to decrease as a result of these efforts. Similarly, in 2022, in order to address rising significant environmental incidents, a new action plan was developed, with the intent of identifying and addressing root causes of spills, as well as raising environmental awareness across the site. As part of the action plan, a thorough review of the spills which occurred in 2021 and the first half of 2022 was performed to identify common causes. The maintenance department launched an equipment spill root cause analysis, which included a failure mode & effect analysis (FMEA) on the equipment models with the highest spill frequency. The identification of causes and rectifying actions will be completed in 2023. Furthermore, to identify and better address incident root causes, an investigation process was designed and launched in 2022. Corrective measures are tracked for completeness, with the help of the Intelex database. As part of the continual improvement initiatives, the investigation process will be solidified in 2023. Additionally, an environmental awareness training program was developed at the end of 2022, and will be implemented in 2023. The training will be mandatory for all supervisors on site, and open to all site personnel. The training includes a refresher of spill management, and reporting requirements, in addition to many other environmental topics.

An analysis of non-reportable spills in 2022 for both Meadowbank and Whale Tail sites continues to highlight that the majority of spills (80%) are caused by equipment failure / malfunction and that they occur primarily in high production areas: Pits and WRSF (37%), Pads, Parking Areas, and Laydowns (25%), and Mine Haul Roads (15%). This information will be provided to the maintenance department to aid in their efforts, as described above, to improve spill prevention and management.

Agnico Eagle operates Meadowbank and Whale Tail under extreme cold condition during winter, and thus creates extra pressure on equipment that can lead to more frequent equipment failure even if good inspections and maintenance are conducted. In 2022, as per previous years, particular attention was paid to operating practices on sites. The stand down of equipment during extreme cold temperatures was fully integrated within mining operations and reduced overall pressures on hydraulic systems.

Mandatory spill training is included in the Meadowbank and Whale Tail sites induction and the Environmental Department is working in a collaborative approach to ensure field personnel are reminded consistently on best practices in spill management. Refresher training was developed to be specifically focused on key departments, operators and supervisors. By continuing education and awareness within our sites, Agnico Eagle is confident that the overall environmental impacts are limited. Measures put in place were found to be effective as a decrease in spill overall was observed in 2022.

All internal reported spills and spills reported to regulators are managed according to the spill contingency plan. Spills are contained and cleaned, contaminated material is disposed to the appropriate area and the clean-up actions are monitored by the Environment team.

To prevent and ensure all spills are reported internally, spill prevention training was provided to employees in 2022. Training activities include the following:

- All employees and contractors must participate in an induction session online prior to the arrival at the mine site, which includes a training section on spill management (prevention, reporting and cleaning);
- Every employee and contractor who operates a vehicle on site must participate in training on vehicle operation. Spill management is a component of this training session;
- Frequent toolbox meetings were given in 2022 by the Environmental Department to different departments at Meadowbank and Whale Tail. Topics during the meetings included spill reporting and spill response;

- A mock spill exercise was completed on July 14th, 2022 at the Baker Lake Marshalling Facility. The scenario was: while working near the diesel fuel line pipe at the Baker Lake Marshalling facility, an employee struck the pipe with a loader, creating a major spill flowing towards the shoreline of Baker Lake. The exercise was used to gain experience on spill intervention and awareness of spill management gear. Overall, the reaction of participants was satisfactory and lessons learned from the event will ensure a more efficient future response, if needed. The mock spill exercise report can be found in Appendix K of the Spill Contingency Plan, Version 18 (Appendix 27).

- A Spill Response Training was given by SWAT Consulting Inc. to the Environment Department and Emergency Response Team on July 24th and August 7th. The training, that was over two days, covered both sites and took place at Whale Tail Mine. It allowed the participants to gain experience on spill intervention and awareness of spill management gear.

- A table top exercise was performed on December 7th, 2022. The scenario involved a loaded tanker that tipped over and the tank was pierced, releasing 29,000 L of diesel fuel onto the ground below, referencing to the incident that occurred November 28th, 2022 on the AWAR at KM 87. The Alternate Worst Case Scenario exercise for Meadowbank, involving E2 regulated substance, allowed to review the spill management procedure, gain experience on spill intervention and awareness of spill management gear. The simulation exercise report can be found in Appendix K of the Spill Contingency Plan, Version 18 (Appendix 27).

In 2022, Agnico Eagle continued to raise worker awareness to the importance of including full details in spill report regarding contaminated material disposal. It should be noted that the contaminated material has always been disposed of as per the Spill Contingency Plan. Agnico Eagle intends in 2023 to solidify the spill investigation process, complete the equipment spill root cause analysis, keep updating and improving the spill reporting procedure and will continue to conduct individual toolbox meetings with all departments.

### 7.1.1 Meadowbank Site

**As per NWB Water License 2AM-MEA1530 Schedule B, Item 13** ***A list and description of all unauthorized discharges including volumes, spill report line identification number and summaries of follow-up action taken.***

A summary of all unauthorized discharges that were reported to the GN Spill hotline in 2022 are presented in Table 7-2. A summary of all non-reportable spills can be found in Table 7-3. This data was also included in monthly monitoring reports submitted to the NWB 2AM-MEA1530 and quarterly via the KivIA Production Lease Report. GN Spill Reporting Forms and the follow up reports as requested by the Water License 2AM-MEA1530 Part H, Item 8 for reported spills are included in Appendix 28. The spills presented in Table 7-2 and Table 7-3 below include spill events related to the Meadowbank Site, AWAR and Baker Lake infrastructures.

In 2022, fourteen (14) spills were reported to the GN Spill hotline. The decrease observed in 2018 in the significantly lower number of non-reportable spills reported continued to be observed in 2022. This decrease is mainly due to the fact that the construction/operation activities at Meadowbank were reduced in previous years, i.e. mining activities ceased in October 2019 and construction/operation activities continued to be shifted towards the Whale Tail Mine since 2019.

In 2022, one (1) non-compliance related to the MDMER and Meadowbank Water License 2AM-MEA1530 and one (1) non-compliance related to the Meadowbank Water License 2AM-MEA1530 limits occurred:

- On April 9th, the level of Total Suspended Solids (TSS) from the East Dike Discharge (ST-MMER-3/ST-8) to Second Portage Lake exceeded the limits, set out in Water License Part F Item 7 and MDMER Schedule 4, of 30 mg/L for the maximum authorized concentration in a grab sample. This event was reported to the ECCC and CIRNAC inspector on April 25th and a follow-up report was submitted to the inspector on May 24th. The monthly TSS average did not exceed the maximum monthly average concentration permitted by the Water License and MDMER of 15 mg/L. More information on this exceedance can be found in Appendix 28.

- In June, the level of Total Suspended Solids (TSS) associated with Portage Area East Diversion Ditch (ST-5) monthly sample exceeded the maximum monthly average concentration (15 mg/L) permitted by the Water License. This event was not reported through to the GN Spill hotline but was reported to CIRNAC and NWB as part of the monthly monitoring summaries. More information on this exceedance can be found in Section 8.5.3.1.2.

**Table 7-2 Meadowbank 2022 spills reported to the GN 24Hr spill HotLine**

| Date of Spill | Hazardous Material | Quantity | Units | Site | Location | Cause of spill | Clean-up action taken | Spill Number |
|---|---|---|---|---|---|---|---|---|
| February 27, 2022 | Diesel Fuel | 700 | L | Meadowbank | Pit E Reclaim Station | Damaged fuel tank | The spilled contaminant was fully contained within the tailing storage facilities. To prevent the incident from occurring in the future the technique used to transfer the pump into its shell was re-evaluated and changed. Furthermore, a reminder was communicated to workers to complete a visual inspection of all work area as part of the inspection phase prior to starting a task. | 2022-060 |
| March 28, 2022 | Diesel Fuel | 250 | L | Meadowbank | Meadowbank Fuel Farm | Overflow during fueling | Spill pads were immediately placed on the ground and a grader was called to scrape the area clean. Approximately $10m^3$ of contaminated snow and material was collected and brought to the Meadowbank Landfarm. | 2022-101 |
| April 9, 2022 | Total Suspended Solids | 10.78 | Kg | Meadowbank | East Dike ST-MMER-3/ST-8 | The effluent of ST-MMER-3 East dike discharge was sampled on April 9, 2022 as required by the Water License 2AM-MEA1530 and MDMER. The results of the internal TSS analysis revealed a concentration of 2.8 mg/L, however the external laboratory results revealed a concentration of 49 mg/L | Discharged was stopped. | 2022-145 |
| April 23, 2022 | Diesel Fuel | 100 | L | Meadowbank | Fuel Farm | Human error. After offloading the driver failed to disconnect the loading arm. | Spill pads were placed on the ground and an excavator was immediately brought at the tank farm to scrape the contaminated snow and material. Approximately $5m^3$ was collected into a roll off and was brought to the Meadowbank landfarm. | 2022-141 |
| April 25, 2022 | Sewage | 30 | L | Meadowbank | Under Wing 6 | Damaged sewage line due to thermal expansion/contraction. | Hand shovels and equipment were used to manually excavate the contaminated area under the wing. The contaminated material was disposed of appropriately at the Hazmat area. | 2022-146 |
| May 18, 2022 | Hydraulic Oil | 525 | L | Meadowbank | Warehouse Storage Pad | Broken hydraulic hose | A combination of absorbent booms and peat moss were placed around the equipment to capture as much oil as possible. The used spill response material was disposed appropriately at the Hazmat facility and approximately $8m^3$ of contaminated soil was brought to the Meadowbank landfarm. | 2022-192 |
| June 7, 2022 | Total Suspended Solids | Unknown | Kg | Meadowbank | Baker Lake | Turbid Runoff | Upon observation of the runoff into the lake, the environmental personnel deployed maritime curtains, woodchip-log or straw-log booms and silt fence in the flow path of the runoff, to control the transportation of sediments. | 2022-236 |

| Date of Spill | Hazardous Material | Quantity | Units | Site | Location | Cause of spill | Clean-up action taken | Spill Number |
|---|---|---|---|---|---|---|---|---|
| June 25, 2022 | Diesel Exhaust Fluid | 200 | L | Meadowbank | Outside Warehouse counter | Punctured/Damaged Tote | Spill pads were placed on the ground and a loader was immediately brought at the maintenance shop area to scrape the contaminated material. Approximately 1m$^3$ was collected into a roll off and was brought to the Meadowbank landfarm. | 2022-342 |
| August 29, 2022 | Hydraulic Oil | 200 | L | Meadowbank | Transit Laydown 4 | Hydraulic Hose Failure | The equipment was parked by the operator and absorbent pads were immediately placed under the hose to capture as much oil as possible. The environment department was called to assess the spill and mechanics to repair the equipment. Approximately 2 cubic meters of contaminated material was collected and brought to the landfarm. | 2022-440 |
| October 5, 2022 | Waste Oil | 750 | L | Meadowbank | Oil Trailer | Punctured waste oil tote due to improper method and attachment used to move the tote. | The tote was flipped over to prevent additional oil from leaking out of the container and a berm was built to halt the spill from going further. Absorbent material was used to collect as much oil as possible before removing approximately 10 cubic meters of contaminated soil with an excavator. The contaminated material was brought to the Meadowbank landfarm | 2022-490 |
| October 23, 2022 | Diesel Fuel | 250 | L | Meadowbank | Meadowbank Fuel Farm | Fueling procedure not followed | Spill pads were immediately placed on the ground and the contaminated snow and material was scraped up. Approximately 6m$^3$ was collected and brought to the Meadowbank landfarm. | 2022-508 |
| November 26, 2022 | Contaminated Water | 140 | L | Meadowbank | Underneath Main Camp | Sewage line failure | The connection was repaired immediately and a re-inspection of all sewage lines on site was completed. The spill occurred in a confined space under the building. Skirting around the camp will be removed to access the spill in spring once accessible and free of snow buildup. A combination of steaming machine and vacuum truck will be used in the confined space to clean up the frozen sewage (estimated removal date – May 2023). | 2022-543 |
| November 28, 2022 | Diesel Fuel | 29000 | L | Meadowbank | AWAR KM 87 | Equipment rollover | Trenches were excavated to contain the spill. Slush and liquid picked up will be disposed in totes. Contaminated solids will be disposed at the at MBK site as per approved protocol. Contaminated snow will be placed at the stormwater management pond. Contaminated area was delineated, to ensure remediation work will cover entire potential contamination zone. Remaining fuel in the tanker was transferred into another tanker. | 2022-544 |

| Date of Spill | Hazardous Material | Quantity | Units | Site | Location | Cause of spill | Clean-up action taken | Spill Number |
|---|---|---|---|---|---|---|---|---|
| December 23, 2022 | Glycol | 1,000 | L | Meadowbank | Warehouse Dome | Damaged Pipe | A plan of the warehouse was designed, illustrating where material such as batteries were stored to ease the waste sorting throughout the dismantling phase. Excave all contaminated material in the surrounding area. The debris sorting and contaminated material excavation will be executed under the supervision of the environment department to ensure they are disposed as per Agnico Eagle management plans (e.g., snow/ice containing glycol will be brought to the tailing storage facility). | 2022-561 |

**Table 7-3 Meadowbank 2022 non-reportable spills**

| Date of Spill | Hazardous Material | Quantity | Units | Site | Location | Cause of spill | Clean-up action taken |
|---|---|---|---|---|---|---|---|
| January 27, 2022 | Hydraulic Oil | 10 | L | Meadowbank | AWAR KM 68 | Broken hydraulic hose | The machine was immediately stopped and the contaminated snow was collected and adequately disposed of in the Meadowbank tailings. |
| January 28, 2022 | Diesel Fuel | 80 | L | Meadowbank | Meadowbank Tank Farm | Procedure not followed | Contaminated material was removed and brought to yellow bin for disposal. |
| January 30, 2022 | Coolant | 2 | L | Meadowbank | Exploration parking | Equipment failure | Coolant was recovered and disposed of at the tailing facility. |
| February 17, 2022 | Coolant | 5 | L | Meadowbank | Meadowbank Transit Laydown | Equipment failure | Contaminated snow was picked up and properly disposed of in the landfarm. |
| February 22, 2022 | Hydraulic Oil | 25 | L | Meadowbank | Primary Crusher | Equipment failure | Material was brought to the contaminated soil pile for disposal |
| February 24, 2022 | Diesel Fuel | 20 | L | Meadowbank | Baker Lake Fuel Farm | Equipment malfunction | Spill was contained, and contaminated soil and was snow picked up and disposed of appropriately. Contaminated soil will be shipped to Meadowbank. |
| March 1, 2022 | Diesel Fuel | 85 | L | Meadowbank | Environment Parking | Equipment failure | The equipment engine was shut down and spill pads were placed under the vehicle. Contaminated snow was brought to the yellow bin for disposal. |
| March 1, 2022 | Coolant | 2 | L | Meadowbank | Environment Parking | Equipment failure | Contaminated snow picked up and disposed of adequately in a yellow bin. |
| March 17, 2022 | Glycol | 2 | L | Meadowbank | Between Pebble Crusher and HPGR | Hose failure | Immediate shutoff off pump. Contaminated material collected and brought to yellow bin for disposal. |
| March 30, 2022 | Diesel Fuel | 40 | L | Meadowbank | Pushback Parking | Unknown | Contaminated soil was collected and brought to a yellow bin for disposal. |
| March 31, 2022 | Hydraulic Oil | 5 | L | Meadowbank | Environment Office | Broken hydraulic hose | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 1, 2022 | Diesel Fuel | 5 | L | Meadowbank | Fuel Farm | Equipment malfunction | Absorbent pads used. Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 2, 2022 | Coolant | 2 | L | Meadowbank | Baker Lake Tank Farm | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 5, 2022 | Diesel Fuel | 30 | L | Meadowbank | LHT Refueling Area | Unknown | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 13, 2022 | Glycol | 1 | L | Meadowbank | Inside of pebble crusher | Hose failure | Contaminated rags brought to hazmat for adequate disposal. |
| April 19, 2022 | Transmission Oil | 5 | L | Meadowbank | AWAR KM 58 | Broken transmission | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 23, 2022 | Antifreeze | 8 | L | Meadowbank | AWAR KM 69 | Equipment failure | Spill was contained, and contaminated soil was picked up and disposed of appropriately in a yellow bin |
| April 23, 2022 | Diesel Fuel | 6 | L | Meadowbank | Baker Lake Barge Dock | Equipment failure | Spill was contained, and contaminated soil was picked up and disposed of appropriately in a yellow bin |
| April 29, 2022 | Diesel fuel | 5 | L | Meadowbank | Fuel Farm | Unknown | Contaminated soil was collected and brought to a yellow bin for disposal. |

| Date of Spill | Hazardous Material | Quantity | Units | Site | Location | Cause of spill | Clean-up action taken |
|---|---|---|---|---|---|---|---|
| April 30, 2022 | Hydraulic Oil | 5 | L | Meadowbank | Pit E | Unknown | Contaminated soil was collected and brought to a yellow bin for disposal. |
| May 4, 2022 | Unknown | 20 | L | Meadowbank | HPGR Building | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| May 6, 2022 | Brake Cleaner | 20 | L | Meadowbank | Outside Assay lab | Equipment failure | Contaminated soil was collected and brought to the south cell tailings for disposal. |
| May 7, 2022 | Hydraulic Oil | 20 | L | Meadowbank | Fountain Tire | Broken hydraulic hose | Contaminated soil was collected and brought to the landfarm for disposal. |
| May 29, 2022 | Coolant | 4 | L | Meadowbank | AWAR KM 23 | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| June 4, 2022 | Transmission Fluid | 15 | L | Meadowbank | Environment Office | Equipment failure | Absorbent pads used and adequately disposed of at the Hazmat disposal area. |
| June 9, 2022 | Transformer Oil | 30 | L | Meadowbank | Iron Pad | Punctured Tank | Contaminated soil was collected and brought to a yellow bin for disposal. |
| June 12, 2022 | Oil | 2 | L | Meadowbank | Incinerator | Cracked Tote | Contaminated soil was collected and brought to a yellow bin for disposal. |
| June 13, 2022 | Differential Oil | 7 | L | Meadowbank | Main Truck Shop | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| June 30, 2022 | Hydraulic Oil | 60 | L | Meadowbank | Old Sana Crusher | Procedure not followed | Contaminated soil was collected and brought to a yellow bin for disposal. |
| July 2, 2022 | Hydraulic Oil | 20 | L | Meadowbank | Truck Shop | Broken Hydraulic Hose | Contaminated soil was collected and brought to a yellow bin for disposal. |
| July 8, 2022 | Coolant | 15 | L | Meadowbank | AWAR KM 72 | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| July 10, 2022 | Hydraulic Oil | 10 | L | Meadowbank | Winter Parking | Equipment Failure | Absorbent pads were used and contaminated soil was collected and brought to a yellow bin for disposal. |
| July 19, 2022 | Diesel Fuel | 4 | L | Meadowbank | Baker Lake Tank #1 | Pipe Leakage | Secondary containment was placed under the leak. Contaminated soil was collected and brought to a yellow bin for disposal. |
| July 29, 2022 | Hydraulic Oil | 4 | L | Meadowbank | Vault Parking | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| August 2, 2022 | Hydraulic Oil | 8 | L | Meadowbank | Vault Parking | Equipment failure | Contaminated material was adequately cleaned up brought to the landfarm. |
| August 6, 2022 | Transmission Fluid | 25 | L | Meadowbank | South Ramp of Primary Crusher | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| August 16, 2022 | Oil | 15 | L | Meadowbank | Road Behind Dome 2 | Punctured tote | Absorbent pads were used and contaminated soil was collected and brought to a yellow bin for disposal. Remaining oil was transferred into a new, undamaged tote. |
| September 1, 2022 | Diesel Fuel | 27 | L | Meadowbank | Fuel Farm Baker Lake | Tanker Valve Malfunction | Contaminated soil was collected and brought to a yellow bin for disposal. |
| November 9, 2022 | Engine Oil | 1 | L | Meadowbank | Baker Lake | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |

| Date of Spill | Hazardous Material | Quantity | Units | Site | Location | Cause of spill | Clean-up action taken |
|---|---|---|---|---|---|---|---|
| November 13, 2022 | Diesel Fuel | 0 | L | Meadowbank | Fuel Farm | Leaking tank | Before product went to the ground installed spills pads and had containment barrel ready. Disposed rags in the bin in SS coverall. |
| November 21, 2022 | Hydraulic Oil | 80 | L | Meadowbank | Warehouse Laydown | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| November 25, 2022 | Diesel Fuel | 40 | L | Meadowbank | Tanker Farm | Human error | Contaminated soil was collected and brought to a yellow bin for disposal. |
| December 4, 2022 | Hydraulic Oil | 75 | L | Meadowbank | AWAR Quarry 22 | Equipment failure | Contaminated soil was collected and brought to the landfarm for disposal. |
| December 8, 2022 | Hydraulic Oil | 15 | L | Meadowbank | AWAR KM 95 | Equipment failure | Contaminated soil was collected and brought to the tailings storage facility for disposal. |
| December 10, 2022 | Waste Oil | 20 | L | Meadowbank | Site Services Coverall | Punctured tote | Oil rags and contaminated gravel was brought to landfarm for disposal. |

### 7.1.2 Whale Tail Site

**As per NWB Water License 2AM-WTP1830 Schedule B, Item 16:** ***A list and description of all unauthorized discharges including volumes, spill report line identification number and summaries of follow-up action taken.***

A summary of all unauthorized discharges that were reported to the GN Spill hotline in 2022 is presented in Table 7-4. A summary of all non-reportable spills can be found in Table 7-5. This data was included in monthly monitoring reports submitted to the NWB 2AM-WTP1830 and also reported quarterly via the KivIA Production Lease Report. GN Spill Reporting Forms and the follow up report as requested by the Water License 2AM-WTP1830 Part H, Item 8 for reported spills are included in Appendix 29. The spills presented in Table 7-4 and Table 7-5 below only include spills related to the Whale Tail Site and Whale Tail Haul Road.

In 2022, twenty (20) spills were reported to the GN Spill hotline and 134 non-reportable spills occurred on site which represents a total spill decrease compare to 2021. Table 7-1 above provides a summary of the reportable and non-reportable spills from 2016 -2022.

In 2022, one (1) non-compliance related to the MDMER and Whale Tail Water License 2AM-WTP1830 regulation occurred:

- During the month of April, the level of Total arsenic (As) concentrations from the treated discharge into Whale Tail South Lake (ST-MDMER-11/ST-WT-24) exceeded the maximum limits set out in 2AM-WTP1830 Part F Item 5 for maximum authorized concentration in a grab sample (0.20mg/L) and maximum authorized monthly mean concentration (0.10mg/L), and MDMER Schedule 4, Table 2, for the maximum authorized monthly mean concentration (0.30mg/L). More information on this exceedance can be found in Appendix 29.

As per the Spill Contingency Plan, spills are contained and cleaned, contaminated material is disposed to the appropriate area and the clean-up actions are monitored by the Environment team. In 2022, the majority of hydrocarbon contaminated soil from Whale Tail site were shipped to Meadowbank Landfarm for adequate disposal until the Whale Tail Landfarm was commissioned in late fall 2022. Non-hydrocarbon contaminated material was shipped to Meadowbank for adequate disposal.

**Table 7-4 Whale Tail 2022 spills reported to the GN 24Hr spill HotLine**

| Date of Spill | Hazardous Material | Quantity | Units | Site | Location | Cause of spill | Clean-up action taken | Spill Number |
|---|---|---|---|---|---|---|---|---|
| January 6, 2022 | Sewage | 10 | L | Whale Tail | Dyno Emulsion Offices | Operator error | The environment department notified the operator supervisor which immediately dispatched workers to chip away the ice and excavate the remaining material. Contaminated material was disposed of at the Meadowbank tailings area. Procedures in place for operating the equipment were reviewed with the vacuum truck operators and environmental awareness regarding reportable substances was reinforced. | 2022-006 |
| January 12, 2022 | Sewage | 40 | L | Whale Tail | Sewage Treatment Plant | Operator error | Worker advised the STP operator to stop the pump. E&I supervisor and environment department were notified. Hand shovels and equipment was used to clean the spill area. Approximately 2m$^3$ of contaminated snow and material was disposed of at the Meadowbank tailings area. A shut off valve was installed on the pipe to prevent sewage from spilling. Environmental awareness regarding reportable substances was reinforced. | 2022-009 |
| February 3, 2022 | Grease | 4 | m$^3$ | Whale Tail | Sewage Treatment Plant | Broken pipe | Workers immediately used the sucker truck to remove ~1,000L of grease from the ground. Hand shovels and equipment was used to clean the spill area. Approximately 1.5 m$^3$ of contaminated snow and material was disposed of at the Meadowbank tailings area. Due to the location, time and nature of the spill additional remediation work will occur in the spring when the ground has thawed to allow for better recovery of contaminated material. Two additional backflow valves were installed inside the plant to eliminate this spill from reoccurring. | 2022-058 |
| February 11, 2022 | Activated Sludge | 5 | L | Whale Tail | Sewage Treatment Plant | Procedure not followed | The contaminated snow and sludge was immediately picked up with shovels and placed into a mega bag with the STP screeners. Approximately 1 m$^3$ of contaminated snow and material was placed into the mega bag for shipment south with our HazMat. | 2022-059 |

| Date of Spill | Hazardous Material | Quantity | Units | Site | Location | Cause of spill | Clean-up action taken | Spill Number |
|---|---|---|---|---|---|---|---|---|
| March 5, 2022 | Hydraulic Oil | 20 | L | Whale Tail | SH92 Drill on Mammoth Lake | Broken hydraulic hose | Spill pads were immediately placed around the spill area under the drill. The mechanic replaced all hydraulic lines were as a precaution measure. The area was scraped clean and additional spill pads were placed on the ice to collect any residue. Additional spill pads were placed on the ice over the following days and brought to the hazmat area. Approximately 0.5m$^3$ of contaminated snow and ice were collected and placed into an empty 45g drum. The drum was brought to the yellow roll off bin for disposal at the MBK landfarm. | 2022-066 |
| March 17, 2022 | Sewage | 30 | L | Whale Tail | Sana Shop | Human error | Approximately 1m$^3$ of contaminated snow and sewage was collected and brought to the Meadowbank tailings area for disposal. | 2022-085 |
| March 18, 2022 | Hydraulic Oil | 1 | L | Whale Tail | Drill 4 on Mammoth Lake | Failed seal on Dozer winch | The dozer operator fixed spill pads to the winch to contain the slow leak of oil and moved the dozer off the Lake. The area was scraped clean and additional spill pads were placed on the ice to collect any residue. Spill pads were brought to the Hazmat storage area. | 2022-087 |
| March 19, 2022 | Diesel Fuel | 250 | L | Whale Tail | IVR Pit Ramp | Ruptured fuel tank | Approximately 6m$^3$ of contaminated material was excavated from the area and brought to the Meadowbank Landfarm. | 2022-088 |
| April 1, 2022 | Hydraulic Oil/Fuel | 43 | L | Whale Tail | Drill 8 on Mammoth Lake | The diesel fuel spill was occurred due to the fuel cell being too full and fuel escaping the cell via the breather valve during transportation.<br><br>Due to a loose hydraulic fitting on the foot clamp of the drill and failure of secondary containment under the drill hydraulic oil leaked out onto the ice and was not visible until the drill move was complete. | Spill pads were immediately placed around the spill area to collect the accessible hydraulic oil. Ice chippers and shovels were utilized to break ice that was contaminated with hydraulic oil. The spill was regularly inspected for ~one week to ensure contaminates was completely collected. A quatrex bag and four 45-gallon drums were filled with contaminated spill matting and ice/snow respectively. The drums & quatrex were brought to the AMQ Hazmat disposal area. A five-gallon pail was used to collected contaminated snow from the diesel fuel. This snow was sent to the yellow contaminated soil bin to be sent to the MBK Landfarm. | 2022-137 |

| Date of Spill | Hazardous Material | Quantity | Units | Site | Location | Cause of spill | Clean-up action taken | Spill Number |
|---|---|---|---|---|---|---|---|---|
| April 3, 2022 | Arsenic | 23.38 | Kg | Whale Tail | Whale Tail South ST-MDMER-11/ST-WT-24 | The treated discharge from IVR Attenuation Pond was discharged into Whale Tail South Lake from April 3rd, 3:00PM Central, through April 6th, 7:10PM Central, for a total of 44,474$m^3$, and from April 24th, 1:00AM Central, through April 25th, 11:50AM Central, for a total of 19,323$m^3$. An exceedance of the maximum authorized concentration in a grab sample outlined in 2AM-WTP1830 occurred on April 3rd, leading to an exceedance of the maximum authorized monthly mean concentration outlined in 2AM-WTP1830 and in the MDMER Schedule 4, Table 2.<br><br>Following the internal investigation, the elevated source of arsenic is believed to have originated from a new pit sump in Whale Tail Pit. Water reporting into this sump is ultimately transferred into the IVR Attenuation Pond for storage prior to treatment in the water treatment plan, for final discharge in Whale Tail South Lake through the permanent diffusor. | Due to the delay in receiving sample analysis from the accredited laboratories, a new process was integrated to be able to perform analysis of arsenic content in water to the precision of 0.01mg/L on site. This process will provide high precision, quality information to the water treatment plant operator to improve treatment efficiency, as opposed to the color scale paper strip method previously used in the plant. | 2022-156 |
| April 19, 2022 | Hydraulic Oil | 150 | L | Whale Tail | IVR Pit | Broken hydraulic hose. | The operator immediately shut down the equipment, called the mechanics to have the equipment fix and the environment department to assess the spill. Contaminated material was excavated and brought to the contaminated soil bin, to then be disposed of at the Meadowbank landfarm. | 2022-137 |
| May 1, 2022 | Hydraulic Oil | 300 | L | Whale Tail | IVR Pit Maintenance Pad | Damaged tote | The mechanics immediately stopped draining the hydraulic oil and placed down spill absorbent pads. The environment department was called to assess the spill. Approximately 12$m^3$ of contaminated material was excavated and brought to the contaminated soil bin to be disposed of at the Meadowbank Landfarm. | 2022-158 |
| May 17, 2022 | Hydraulic Oil | 400 | L | Whale Tail | Road 3 | Broken hydraulic hose | The mechanics immediately placed a secondary containment under the truck and placed down spill absorbent pads. Approximately 10$m^3$ of contaminated material was excavated and brought to the contaminated soil bin to be disposed of at the Meadowbank Landfarm | 2022-185 |
| May 17, 2022 | Diesel Fuel | 1100 | L | Whale Tail | Whale Tail Pit | Punctured fuel tank | A 45g drum under the fuel tank to capture as much of the leaking fuel as possible. The environment department was then called to assess the spill. The spill occurred inside the pit footprint in an active mining area. Approximately 15$m^3$ of contaminated material was excavated and brought to the contaminated soil bin to be disposed of at the Meadowbank Landfarm. | 2022-186 |

| Date of Spill | Hazardous Material | Quantity | Units | Site | Location | Cause of spill | Clean-up action taken | Spill Number |
|---|---|---|---|---|---|---|---|---|
| June 16, 2022 | Engine Oil | 800 | L | Whale Tail | Warehouse | Damaged Tote | The equipment was immediately removed from the area by the operator and absorbent pads/booms were placed around the seacan to contain the leak. Additionally, granular absorbent and a small pump were used to collect as much oil as possible. The seacan was then removed by the container handler to allow the decontamination of the area, approximately 12m$^3$ of contaminated soil was collected and brought to the Meadowbank landfarm. | 2022-282 |
| August 3, 2022 | Sewage Sludge | 50 | L | Whale Tail | Sewage Treatment Plant | Sewage overflow due to malfunction after power outage | The vacuum truck was used to collect any sewage sludge that had pooled on the surface. A small excavator and hand shovels were used to scrape the ground. Approximately 2m$^3$ of contaminated material was collected and adequately disposed of. Sewage Treatment Plant Operators will complete a walk through and check of working areas after electrical shutdowns or power failures. | 2022-396 |
| November 7, 2022 | Hydraulic Oil | 220 | L | Whale Tail | Whale Tail Pit | Failed drive shaft | The equipment was immediately shut off by the operator and mechanics were called to have the equipment fixed. Approximately 4 m$^3$ of contaminated materials has been collected and will be brought to the Meadowbank Landfarm. | 2022-522 |
| November 23, 2022 | Sewage Water | 20 | L | Whale Tail | FGL Office | Human error | Approximately 1m$^3$ of contaminated snow and sewage was collected and brought to the Meadowbank tailings area for disposal. | 2022-537 |
| November 24, 2022 | Diesel Fuel | 150 | L | Whale Tail | Whale Tail Pit | Equipment malfunction | The lube truck was brought to pump as much products as possible from the equipment reservoirs to minimize the quantity of liquid leaking onto the ground of the pit floor. Approximately 3 m$^3$ of contaminated materials has been collected and will be brought to the Meadowbank Landfarm. | 2022-539 |
| December 13, 2022 | Sewage | 100 | L | Whale Tail | Main Camp | Mechanical failure and damage to the secondary containment under the sewage tank. | Approximately 4m$^3$ of contaminated snow and sewage was collected and brought to the Meadowbank tailings area for disposal. | 2022-551 |

**Table 7-5 Whale Tail 2022 non-reportable spills**

| Date of Spill | Hazardous Material | Quantity | Units | Site | Location | Cause of spill | Clean-up action taken |
|---|---|---|---|---|---|---|---|
| January 6, 2022 | Grey Water | 80 | L | Whale Tail | Kitchen | Broken pipe | Worker noticed water rising in the Grease Trap Lift Station Shack and called for the Sewage truck. Supervisor asked worker to try to see underneath camp with camera by the kitchen floor and by opening up the wooden insulated box protecting the piping but no presence of water was seen in these 2 areas. |
| January 8, 2022 | Engine Oil | 5 | L | Whale Tail | Truck Shop | Equipment failure | Machine was shut off. Spill was cleaned up and properly disposed of in the contaminated soil bin behind the truck shop. |
| January 13, 2022 | Hydraulic Oil | 30 | L | Whale Tail | Washroom parking | Equipment failure | A bucket was immediately placed under the truck to contain the spill. Contaminated soil was cleaned up and properly disposed of in the yellow bins. |
| January 19, 2022 | Hydraulic Oil | 85 | L | Whale Tail | Camp parking | Equipment failure | Absorbent pads and the lube truck were used to soak up as much oil as possible. Contaminated material was brought to a yellow bin for adequate disposal. |
| January 24, 2022 | Diesel Fuel | 20 | L | Whale Tail | WTHR KM 148 | Overturned long haul truck | Spill kit was used and contaminated material was disposed of in a yellow bin. |
| January 28, 2022 | Coolant | 15 | L | Whale Tail | Beside Truck Shop | Equipment failure | Contaminated material was removed and brought to yellow bin for disposal. |
| February 4, 2022 | Motor Oil | 20 | L | Whale Tail | Amaruq Sana laydown | Equipment failure | Spill was contained and contaminated soil picked up and disposed appropriately in a yellow bin. |
| February 5, 2022 | Coolant | 40 | L | Whale Tail | WTHR KM 115 | Equipment failure | Absorbent pads were used to soak up spill. Contaminated soil was brought to the contaminated soil pile for adequate disposal. |
| February 6, 2022 | Coolant | 20 | L | Whale Tail | Whale Tail Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| February 6, 2022 | Coolant | 30 | L | Whale Tail | Washroom parking | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| February 12, 2022 | Anti-Freeze | 40 | L | Whale Tail | Whale Tail Pit | Equipment failure | A bucket was immediately placed to collect the leak. Contaminated soil was cleaned up and properly disposed of in the yellow bins. |
| February 24, 2022 | Anti-Freeze | 15 | L | Whale Tail | IVR WRSF | Equipment failure | Contaminated snow was picked up and properly disposed of a yellow bin. |
| February 25, 2022 | Glycol, Diesel Fuel, and, Engine Oil | 80 | L | Whale Tail | WTHR KM 154 | Overturned long haul truck | 10-20 L of Diesel, 40 L of Coolant, and 20 L Engine Oil. Spill kit was used and contaminated material was disposed of in a yellow bin. |
| March 2, 2022 | Hydraulic Oil | 20 | L | Whale Tail | Road beside shovel pad | Equipment failure | Buckets were placed to collect spill and absorbent pads were used. Contaminated material was adequately disposed of in the yellow bins. |

| Date of Spill | Hazardous Material | Quantity | Units | Site | Location | Cause of spill | Clean-up action taken |
|---|---|---|---|---|---|---|---|
| March 4, 2022 | Hydraulic Oil | 20 | L | Whale Tail | IVR Pit | Broken O-ring | Contaminated soil was collected and brought to a yellow bin for disposal. |
| March 5, 2022 | Motor Oil | 40 | L | Whale Tail | IVR WRSF | Broken oil pan | Loader was used to collect contaminated soil which was brought to the yellow bin for proper disposal. |
| March 5, 2022 | Hydraulic Oil | 20 | L | Whale Tail | WT Pit - Phase 1 | Broken hydraulic hose | Contaminated soil was collected and brought to a yellow bin for disposal. |
| March 6, 2022 | Coolant | 90 | L | Whale Tail | Pad K | Broken coolant hose | Spill was contained and contaminated soil was collected and brought to a yellow bin for disposal. |
| March 7, 2022 | Coolant | 50 | L | Whale Tail | WT Pit - Phase 2 | Broken coolant hose | Contaminated soil was collected and brought to a yellow bin for disposal. |
| March 11, 2022 | Hydraulic Oil | 50 | L | Whale Tail | IVR Pit | Broken hydraulic hose | Contaminated soil was collected and brought to a yellow bin for disposal. |
| March 14, 2022 | Hydraulic Oil | 50 | L | Whale Tail | IVR Pit | Broken hydraulic hose | Contaminated soil was collected and brought to a yellow bin for disposal. |
| March 18, 2022 | Coolant | 10 | L | Whale Tail | Washroom parking | Broken coolant hose | Spill was contained, and contaminated soil picked up and disposed of appropriately in a yellow bin. |
| March 19, 2022 | Hydraulic Oil | 30 | L | Whale Tail | WT Pit | Equipment failure | Absorbent pads were used and contaminated soil was adequately disposed of in a yellow bin. |
| March 20, 2022 | Coolant | 30 | L | Whale Tail | IVR Pit | Broken O-ring | Contaminated soil was collected and brought to a yellow bin for disposal. |
| March 20, 2022 | Hydraulic Oil | 10 | L | Whale Tail | IVR Pit | Broken O-ring | Contaminated soil was collected and brought to a yellow bin for disposal. |
| March 22, 2022 | Hydraulic Oil | 35 | L | Whale Tail | IVR Pit | Broken hydraulic hose | Contaminated soil was collected and brought to a yellow bin for disposal. |
| March 27, 2022 | Hydraulic Oil | 88 | L | Whale Tail | Pad K | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 1, 2022 | Glycol | 5 | L | Whale Tail | WTHR KM 159 | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 1, 2022 | Hydraulic Oil | 35 | L | Whale Tail | Whale Tail Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 2, 2022 | Hydraulic Oil | 20 | L | Whale Tail | EMR Road | Broken hydraulic line | Absorbent pads used. Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 3, 2022 | Antifreeze | 80 | L | Whale Tail | Whale Tail Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 3, 2022 | Hydraulic Oil | 80 | L | Whale Tail | IVR Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 5, 2022 | Hydraulic Oil | 30 | L | Whale Tail | Whale Tail Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 6, 2022 | Hydraulic Oil | 50 | L | Whale Tail | Whale Tail Pit | Broken hydraulic line | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 6, 2022 | Coolant | 10 | L | Whale Tail | Whale Tail Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |

| Date of Spill | Hazardous Material | Quantity | Units | Site | Location | Cause of spill | Clean-up action taken |
|---|---|---|---|---|---|---|---|
| April 7, 2022 | Hydraulic Oil | 40 | L | Whale Tail | WT WRSF | Broken hydraulic line | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 7, 2022 | Hydraulic Oil | 20 | L | Whale Tail | WT WRSF | Broken hydraulic line | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 7, 2022 | Hydraulic Oil | 30 | L | Whale Tail | WT WRSF | Broken hydraulic line | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 8, 2022 | Coolant | 5 | L | Whale Tail | WTHR KM 163 | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 11, 2022 | Hydraulic Oil | 25 | L | Whale Tail | IVR Pit | Broken hydraulic line | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 12, 2022 | Hydraulic Oil | 45 | L | Whale Tail | Whale Tail Pit | O-ring failure | Contaminated soil was picked up and disposed in the yellow bin. |
| April 18, 2022 | Hydraulic Oil | 4 | L | Whale Tail | Underground Office | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 19, 2022 | Hydraulic Oil | 75 | L | Whale Tail | Pad C | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 19, 2022 | Hydraulic Oil | 20 | L | Whale Tail | IVR Pit | Equipment failure | Absorbent pads were used. Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 19, 2022 | Hydraulic Oil | 20 | L | Whale Tail | Camp Parking | Broken hydraulic line | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 21, 2022 | Hydraulic Oil | 50 | L | Whale Tail | IVR Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 24, 2022 | Hydraulic Oil | 40 | L | Whale Tail | Whale Tail Pit | Equipment failure | Absorbent pads were used. Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 25, 2022 | Diesel Fuel | 80 | L | Whale Tail | Fuel Farm | Overflow during fuelling | Spill was contained, and contaminated soil and snow picked up and disposed of appropriately in a yellow bin. Spill pads and bin were used. |
| April 26, 2022 | Diesel Fuel | 10 | L | Whale Tail | Whale Tail Pit | Equipment malfunction | Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 27, 2022 | Hydraulic Oil | 20 | L | Whale Tail | Sana Shop | Broken hydraulic line | Spill pads were used to collect the oil and contaminated soil was brought to the yellow bin for disposal. |
| April 29, 2022 | Hydraulic Oil | 60 | L | Whale Tail | WT View Point | Equipment failure | Absorbent pads were used. Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 29, 2022 | Engine coolant | 20 | L | Whale Tail | WTHR KM 131 | Equipment failure | Absorbent pads were used. Contaminated soil was collected and brought to a yellow bin for disposal. |
| April 30, 2022 | Oil | 40 | L | Whale Tail | WTHR KM 161 | Unknown | Contaminated soil was collected and brought to a yellow bin for disposal. |
| May 1, 2022 | Diesel Fuel | 15 | L | Whale Tail | Underground Tank Farm | Equipment failure | Absorbent pads were used. Contaminated soil was collected and brought to a yellow bin for disposal. |
| May 2, 2022 | Coolant | 10 | L | Whale Tail | WTHR KM 150 Quarry | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| May 4, 2022 | Diesel Fuel | 25 | L | Whale Tail | Fuel Farm | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |

| Date of Spill | Hazardous Material | Quantity | Units | Site | Location | Cause of spill | Clean-up action taken |
|---|---|---|---|---|---|---|---|
| May 6, 2022 | Hydraulic Oil | 90 | L | Whale Tail | Road 7 | Broken hydraulic hose | Contaminated soil was collected and brought to a yellow bin for disposal. |
| May 8, 2022 | Coolant | 25 | L | Whale Tail | IVR Pit | Broken hydraulic hose | Contaminated soil was collected and brought to a yellow bin for disposal. |
| May 9, 2022 | Hydraulic Oil | 40 | L | Whale Tail | Whale Tail Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| May 9, 2022 | Engine Coolant | 12 | L | Whale Tail | WTHR KM 134.5 | Equipment failure | Absorbent pads were used. Contaminated soil was collected and brought to a yellow bin for disposal. |
| May 10, 2022 | Coolant | 45 | L | Whale Tail | Pad K | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| May 15, 2022 | Hydraulic Oil | 55 | L | Whale Tail | Underground 380 Level | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| May 15, 2022 | Hydraulic Oil | 45 | L | Whale Tail | Whale Tail Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| May 17, 2022 | Hydraulic Oil | 90 | L | Whale Tail | Whale Tail Pit | Broken hydraulic hose | Contaminated soil was collected and brought to a yellow bin for disposal. |
| May 18, 2022 | Hydraulic Oil | 50 | L | Whale Tail | Pad K | Broken hydraulic hose | Contaminated soil was collected and brought to a yellow bin for disposal. |
| May 21, 2022 | Hydraulic Oil | 50 | L | Whale Tail | Whale Tail Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| May 23, 2022 | Hydraulic Oil | 10 | L | Whale Tail | Drill 4 on Pad | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| June 5, 2022 | Diesel Fuel | 80 | L | Whale Tail | Orbit Garage pad | Improper Storage | Absorbent matting was put on the spill. The contaminated soil was removed by small excavator (3 buckets) Soil was loaded into a yellow bin and hauled to MBK landfarm. |
| June 6, 2022 | Hydraulic Oil | 55 | L | Whale Tail | IVR Pit | Equipment Failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| June 13, 2022 | Coolant | 10 | L | Whale Tail | WTHR KM 122 | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| June 15, 2022 | Hydraulic Oil | 90 | L | Whale Tail | Whale Tail Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| June 23, 2022 | Transmission Fluid | 25 | L | Whale Tail | Whale Tail Pit | Damaged Oil Pan | Contaminated soil was collected and brought to a yellow bin for disposal. |
| June 23, 2022 | Hydraulic Oil | 10 | L | Whale Tail | Warehouse | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| June 23, 2022 | Diesel Fuel | 20 | L | Whale Tail | Near Peanut Lake | Equipment Malfunction | Contaminated soil was collected and brought to a yellow bin for disposal. |
| June 23, 2022 | Diesel Fuel | 10 | L | Whale Tail | IVR Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| June 24, 2022 | Coolant | 25 | L | Whale Tail | IVR Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| June 24, 2022 | Hydraulic Oil | 10 | L | Whale Tail | Whale Tail WRSF | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |

| Date of Spill | Hazardous Material | Quantity | Units | Site | Location | Cause of spill | Clean-up action taken |
|---|---|---|---|---|---|---|---|
| June 25, 2022 | Hydraulic Oil | 10 | L | Whale Tail | Washroom Parking | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| July 1, 2022 | Diesel Fuel | 5 | L | Whale Tail | Underground Genset | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| July 10, 2022 | Diesel Fuel | 90 | L | Whale Tail | Whale Tail Pit | Punctured Fuel Tank | Contaminated soil was collected and brought to a yellow bin for disposal. |
| July 12, 2022 | Coolant | 40 | L | Whale Tail | Whale Tail Pit | Equipment Failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| July 21, 2022 | Diesel Fuel | 40 | L | Whale Tail | IVR Pit | Equipment malfunction | Absorbent pads were used and contaminated soil was collected and brought to a yellow bin for disposal. |
| July 23, 2022 | Coolant | 10 | L | Whale Tail | Whale Tail Pit | Spill outside of containment unit | Absorbent pads were used and contaminated soil was collected and brought to a yellow bin for disposal. |
| July 23, 2022 | Diesel Fuel | 1 | L | Whale Tail | WTHR KM 179 | Overturned long haul truck | Contaminated soil was collected and brought to a yellow bin for disposal. |
| July 27, 2022 | Engine Oil | 40 | L | Whale Tail | WTHR KM 119 | Equipment failure | Absorbent pads were used and contaminated soil was collected and brought to a yellow bin for disposal. |
| July 29, 2022 | Coolant | 20 | L | Whale Tail | IVR WRSF | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| July 29, 2022 | Glycol | 40 | L | Whale Tail | Camp Genset | Equipment failure | Absorbent pads were used and contaminated soil was collected and brought to a yellow bin for disposal. |
| July 31, 2022 | Coolant | 5 | L | Whale Tail | WTHR KM 138 | Equipment failure | Absorbent pads were used and contaminated soil was collected and brought to a yellow bin for disposal. |
| August 2, 2022 | Hydraulic Oil | 20 | L | Whale Tail | Whale Tail Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| August 4, 2022 | Engine Coolant | 2 | L | Whale Tail | WTHR KM 141 | Equipment failure | Absorbent pads were used and contaminated soil was collected and brought to a Quatrex bag for disposal. |
| August 5, 2022 | Engine Coolant | 6 | L | Whale Tail | WTHR KM 138 | Equipment failure | Absorbent pads were used and contaminated soil was collected and brought to a yellow bin for disposal. |
| August 5, 2022 | Windshield Washer Fluid | 80 | L | Whale Tail | Washer Fluid Station | Valve left open | The valve was closed and the nozzle set into the secondary containment container. Absorbent pads were used and contaminated soil was collected and brought to a yellow bin for disposal. |
| August 11, 2022 | Transmission Fluid | 4 | L | Whale Tail | Underground Shop Yard | Spilled fluid while towing to shop | Contaminated soil was collected and brought to a yellow bin for disposal. |
| August 17, 2022 | Greywater | 90 | L | Whale Tail | Kitchen | Unknown | Vacuum truck removed greywater and it was adequately disposed of. Leak will be fixed once floor is replaced in the dish pit. |
| August 26, 2022 | Hydraulic Oil | 10 | L | Whale Tail | IVR Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| August 30, 2022 | Coolant | 5 | L | Whale Tail | WTHR KM 175 | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| August 30, 2022 | Hydraulic Oil | 40 | L | Whale Tail | IVR WRSF | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |

| Date of Spill | Hazardous Material | Quantity | Units | Site | Location | Cause of spill | Clean-up action taken |
|---|---|---|---|---|---|---|---|
| September 2, 2022 | Transmission Oil | 30 | L | Whale Tail | Haul Road in front of Fountain Tire Garage | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| September 5, 2022 | Diesel Fuel | 20 | L | Whale Tail | Whale Tail Pit | Punctured fuel tank | Contaminated soil was collected and brought to a yellow bin for disposal. |
| September 11, 2022 | Transmission Oil | 90 | L | Whale Tail | Whale Tail Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| September 11, 2022 | Engine Oil | 10 | L | Whale Tail | Whale Tail Pit | Punctured engine oil pan | Contaminated soil was collected and brought to a yellow bin for disposal. |
| September 15, 2022 | Hydraulic Oil | 60 | L | Whale Tail | IVR Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| September 18, 2022 | Hydraulic Oil | 25 | L | Whale Tail | Whale Tail Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| September 20, 2022 | Diesel Fuel | 30 | L | Whale Tail | Washroom Parking | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| September 27, 2022 | Engine Coolant | 12 | L | Whale Tail | WTHR KM 158 | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| October 2, 2022 | Hydraulic Oil | 30 | L | Whale Tail | Pad E NAG Stockpile | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| October 4, 2022 | Diesel Fuel | 30 | L | Whale Tail | Whale Tail Fuel Farm | Fuelling procedure not followed | Contaminated soil was collected and brought to a yellow bin for disposal. |
| October 6, 2022 | Hydraulic Oil | 30 | L | Whale Tail | Underground Shop Yard | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| October 7, 2022 | Hydraulic Oil | 20 | L | Whale Tail | IVR Pit | Damaged equipment | Contaminated soil was collected and brought to a yellow bin for disposal. |
| October 9, 2022 | Hydraulic Oil | 75 | L | Whale Tail | IVR Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| October 11, 2022 | Diesel Fuel | 50 | L | Whale Tail | Underground Generator | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| October 12, 2022 | Hydraulic Oil | 15 | L | Whale Tail | Warehouse | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| October 17, 2022 | Diesel Fuel | 10 | L | Whale Tail | Underground Maintenance Parking | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| October 21, 2022 | Motor Oil | 12 | L | Whale Tail | IVR Pit | Damaged oil filter | Contaminated soil was collected and brought to a yellow bin for disposal. |
| October 22, 2022 | Coolant | 5 | L | Whale Tail | WTHR KM 172 | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| October 25, 2022 | Hydraulic Oil | 15 | L | Whale Tail | Washroom Parking | Equipment Failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| October 25, 2022 | Hydraulic Oil | 35 | L | Whale Tail | Whale Tail Pit | Equipment Failure | Contaminated soil was collected and brought to a yellow bin for disposal. |

| Date of Spill | Hazardous Material | Quantity | Units | Site | Location | Cause of spill | Clean-up action taken |
|---|---|---|---|---|---|---|---|
| November 3, 2022 | Glycol | 30 | L | Whale Tail | WTHR KM 141 | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| November 8, 2022 | Diesel Fuel | 20 | L | Whale Tail | Main Camp Parking | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| November 8, 2022 | Hydraulic Oil | 10 | L | Whale Tail | Main Camp Parking | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| November 9, 2022 | Coolant | 20 | L | Whale Tail | Sana Yard | Human error | Contaminated soil was collected and brought to a yellow bin for disposal. |
| November 19, 2022 | Hydraulic Oil | 80 | L | Whale Tail | Whale Tail Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| December 3, 2022 | Hydraulic Oil | 30 | L | Whale Tail | Whale Tail Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| December 6, 2022 | Transmission Oil | 4 | L | Whale Tail | Core Shack Parking | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| December 8, 2022 | Coolant | 45 | L | Whale Tail | Whale Tail WRSF | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| December 9, 2022 | Hydraulic Oil | 80 | L | Whale Tail | Whale Tail Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| December 10, 2022 | Waste Oil | 50 | L | Whale Tail | Main Truck Shop | Damaged tote | Contaminated snow mixture was collected in a 45 gallon drum. |
| December 15, 2022 | Hydraulic Oil | 70 | L | Whale Tail | E&I Parking | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| December 15, 2022 | Diesel Fuel | 20 | L | Whale Tail | Pad C | Overfilled fuel tank | Contaminated soil was collected and brought to a yellow bin for disposal. |
| December 16, 2022 | Hydraulic Oil | 15 | L | Whale Tail | WTHR KM 177 | Punctured oil pan | Contaminated soil was collected and brought to a yellow bin for disposal. |
| December 17, 2022 | Hydraulic Oil | 15 | L | Whale Tail | Whale Tail Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| December 17, 2022 | Diesel Fuel | 10 | L | Whale Tail | IVR WRSF | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| December 18, 2022 | Hydraulic Oil | 40 | L | Whale Tail | Whale Tail Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |
| December 30, 2022 | Compressor Oil | 60 | L | Whale Tail | IVR2 Pit | Equipment failure | Contaminated soil was collected and brought to a yellow bin for disposal. |

## 7.2 LANDFARM ACTIVITIES

The 2022 Landfarm Report is provided in Appendix 30. As per the Meadowbank Landfarm Design and Management Plan (LDMP; March, 2017), and Whale Tail Landfarm Design and Management Plan (LDMP ; August, 2021), the document presents the 2022 landfarm activities at the Meadowbank and Whale Tail sites. The report indicates the volume of material added to the facilities, amount of material removed and disposal or re-use location, all analysis results, volume and type of nutrient addition, visual inspections and volume of contact water pumped. A summary of activities is provided here.

### 7.2.1 Meadowbank Site

Meadowbank's first landfarm (Landfarm 1) was constructed in 2012 and located on the north-west side of the South Tailings Cell within the Tailings Storage Facility. Since this area was planned to eventually become flooded with reclaim water, Agnico Eagle constructed a new landfarm (Landfarm 2) in 2016, in order to continue the treatment of contaminated soil. In 2019, the Landfarm 1 area became flooded with reclaim water, and it is thus no longer in operation.

Based on surveys conducted by Meadowbank's Engineering Department the volume of the landfarm 2 in December 2022 was 5,534 $m^3$. In 2022, 453 $m^3$ of soil were added to landfarm 2 from material collected from spill events around the Meadowbank and Whale Tail sites. The remaining capacity of the landfarm 2 is estimated at 5,911 $m^3$.

No landfarm soil sampling was conducted in 2022 in Meadowbank, and no material was removed from the landfarm.

Nutrient additions in the form of sewage sludge occurred in September, as detailed in the LDMP. Total volume of sludge added to the Meadowbank landfarm is 1 $m^3$. No aeration of the material by the construction of windrow was performed due to a mechanical failure of the Extec screener. Some material was displaced by an excavator within the landfarm to aerate and reorganize usage of the landfarm.

Surface runoff, due to snow melt and rain, was identified from the landfarm and sampled on June 12th, 2022, as per the Water License requirements. Water was naturally flowing towards the adjacent Tailing Storage Facilities. No other runoff water outside the landfarm was observed. Visual inspections (49) indicated that the landfarm berm and pad appear to be structurally intact, and no maintenance was required.

### 7.2.2 Whale Tail Site

The construction of the landfarm at Whale Tail Mine was approved by the NWB on October 27th, 2021. The landfarm at Whale Tail Mine was built in fall 2022 but has not been operational for most of this year. The majority of petroleum-contaminated material was sent to the Meadowbank landfarm, except 15 $m^3$ that was brought to the Whale Tail Landfarm. In 2023, most contaminated material from Whale Tail operations should be placed in the Whale Tail Landfarm.

## 7.3 POSSIBLE ACCIDENT AND MALFUCTIONS AT MEADOWBANK SITE

**As required by NIRB Project Certificate No.004 Condition 75:** ***provide a complete list of possible accidents and malfunctions for the Project; it must consider the all-weather road, shipping spills, cyanide and other hazardous material spills, and pitwall/dikes /dam failure, and include an assessment of the accident risk and mitigation developed in consultation with Elders and potentially affected communities***

A list of possible accidents and malfunctions are included in the following Meadowbank Complex management plans:

- Hazardous Materials Management Plan, Version 7, March 2022 (Appendix 55 of the 2021 Annual Report);
- Spill Contingency Plan, Version 16, March 2023 (Appendix 27);
- Emergency Response Plan, Version 17, October 2021 (Appendix 31 of the 2021 Annual Report);
- Oil Pollution Emergency Plan and Oil Pollution Prevention, Version 15, March 2023 (Appendix 32);
- Meadowbank OMS Manual for Tailings Management, Version 11, December 2022 (Appendix 36);
- Meadowbank OMS Manual for the dewatering dikes, Version 10; December 2022 (Appendix 35);
- Whale Tail OMS Manual for Water Management Infrastructure, Version 3, December 2022 (Appendix 37).

Agnico Eagle complied with this condition, including the provision of a list of possible accidents and malfunctions. These Plans were originally reviewed as part of the NIRB and NWB License application process. As such there was extensive public review which included elders' participation at the associated hearings.

Road Spills

Table 7-2 to 7-4 show all spills related to the Meadowbank Complex, including the AWAR/WTHR, and other spills related to mine activities.

International Cyanide Management Code (ICMC)

As part of the International Cyanide Management Code, Agnico Eagle discussed with the community the cyanide shipping and transportation along the AWAR. On May 3rd, 2022, during the Chesterfield Inlet shipping consultation the presentation covered transportation of dangerous goods. Participants were referred to the Agnico Eagle Nunavut website where they can find Cyanide Transportation and Management pamphlet. During the transportation, the community of Chesterfield Inlet were kept informed about the Cyanide transportation through the Meadowbank Complex Facebook page. Furthermore, community members and first responders engagements were held on August 16th, 2022 in Baker Lake and on August 4th, 2022 in Rankin Inlet to present the 2022 Cyanide Transportation program. Participation was both in-person and via teleconference with community representatives – HTOs, Royal Canadian Mounted Police (RCMP), Health Centers, Fire Departments, Hamlets, KivIA, Agnico Eagle

Health and Safety and Community Relations personnel. During the teleconference, the 2022 Cyanide Transportation safety and monitoring procedures were presented as well as the communication plans for communities.

COVID-19

In 2022, the no-contact procedure was removed, although, there was still a restricted policy in place between on-site employees and community members to limit interactions only to work-related tasks. The information was communicated through a Facebook post, Nunavut website photo banner and through various communications with the mayors and Senior Administrative Officers (SAO).

Community information meetings

On May 3rd, 2022, an engagement session was held with Chesterfield Inlet hamlet representatives and on August 17th, 2022 a teleconference was held with Baker Lake Hamlet and Fisheries and Oceans Canada representatives. Both of these meetings were to present the 2022 Sealift Season schedule. During the session, the following topics were presented:

- Vessel routing from Quebec to Nunavut and routing to Baker Lake and Rankin Inlet;
- Monitoring of marine mammals and seabirds;
- All Weather Access Road (AWAR) closure process;
- Caribou Monitoring;
- Process to find live information about the vessel routing
- Process to ask questions and raise concerns via Tusaajugut 'We are Listening'

In 2023, Agnico Eagle will continue in-person Sealift Season consultations with affected communities and other stakeholders such as DFO. In an event where an in-person consultation or information session cannot be held the Community Liaison Officers (CLOs) will provide support and arrange a teleconference.

Accidents and malfunctions

To prevent and ensure accidents and malfunctions are dealt appropriately the following activities were held in 2022:

- Emergency Plans and crisis management training to superintendents;
- Implemented in 2021, any personal on a role of "Acting Manager" will need to complete the Emergency Response Plan / Crisis Management Plan (ERP/CMP) management induction training, followed by the training management system;
- Underground evacuation mock scenario was held in December;
- Various training to the rescue teams member combined with active scenarios: Incident command system (ICS), confine space, explosive risk, etc.;

- Debriefing were held after each emergency calls to learn from every events;
- Cyanide awareness and scenarios were held with all our Emergency response team members;
- An Environmental Incident Reduction Action Plan was developed in 2022 and includes different items such as Environmental Awareness, an Environmental Incident Investigation Process, a Mechanical Performance Review and Improvement Plan, as mentioned in Section 7.1;
- A mock spill exercise was completed on July 14th, 2022 at the Baker Lake Marshalling Facility. The scenario was that while working near the diesel fuel line pipe at the Baker Lake Marshalling facility, an employee struck the pipe with a loader, creating a major spill flowing towards the shoreline of Baker Lake. The mock spill exercise report can be found in Appendix K of the Spill Contingency Plan, Version 18 (Appendix 27);
- A Spill Response Training was given by SWAT Consulting Inc. to the Environment Department and Emergency Response Team on July 24th and August 7th. The training, that was over two days, covered both sites and took place at Whale Tail Mine. It allowed the participants to gain experience on spill intervention and awareness of spill management gear; and
- A table top exercise was performed on December 7th, 2022. The scenario involved a loaded tanker that tipped over and the tank was pierced, releasing 29,000 L of diesel fuel onto the ground below, referencing to the incident that occurred November 28th, 2022 on the AWAR at KM 87. The Alternate Worst Case Scenario exercise for Meadowbank, involving E2 regulated substance, allowed to review the spill management procedure, gain experience on spill intervention and awareness of spill management gear. The table top exercise report can be found in Appendix K of the Spill Contingency Plan, Version 18 (Appendix 27);

## SECTION 8. MONITORING

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 16:** ***The results of monitoring under the Aquatic Effects Management Plan (AEMP) including:***

- ***Core Receiving Monitoring Program (CREMP);***
- ***Metal Mining Effluent Regulation (MMER) Monitoring;***
- ***Mine Site Water Quality and Flow Monitoring (and evaluation of NP-2);***
- ***Visual AWAR water quality monitoring;***
- ***Blast Monitoring;***
- ***Groundwater Monitoring.***

And

**As required by NWB Water License 2AM-WTP1830 Schedule B, Item 19:** ***The results of monitoring related to the Aquatic Effects Monitoring Program (AEMP) including:***

- ***Core Receiving Environment Monitoring Program (CREMP);***
- ***Metal Mining Effluent Regulation (MMER) Monitoring;***
- ***Water Quality and Flow Monitoring;***
- ***Visual Whale Tail Haul Road water quality monitoring;***
- ***Blast Monitoring; and***
- ***Groundwater Monitoring.***

And

**As required by NIRB Project Certificate No.008 Item 8:** ***All monitoring information collected pursuant to the Project Certificate and various regulatory requirements for the Project shall, if appropriate, given the type of monitoring conducted, contain the following information:***

a) ***The name of the person(s) who performed the sampling or took the measurements including any relevant accreditations;***
b) ***The date, time and place of sampling or measurement, and weather conditions;***
c) ***The date of analysis;***
d) ***The name of the person(s) who performed the analysis including any relevant accreditations;***
e) ***A description of the analytical methods or techniques used; and***
f) ***A discussion of the results of any analysis.***

And

**As required by NIRB Project Certificate No 008 Condition 18:** ***The Proponent shall, reflecting any direction from the Nunavut Water Board, maintain a Site Water Monitoring and Management Plan designed to:***

- ***Minimize the amount of water that contacts mine ore and wastes;***
- ***Appropriately manage all contact water and discharges to protect local aquatic resources; and***
- ***Implement water conservation and recycling to maximize water reuse and minimize the use of natural waters.***

- ***The Plan should include monitoring that demonstrates contact water (runoff and shallow groundwater) from the ore storage and waste rock storage areas is captured and managed, as per the Waste Rock Facility Management Plan. The plan should be submitted to the NIRB at least 60 days prior to the start of construction, with results submitted annually thereafter.***

Following sections describe the water monitoring as required by the Meadowbank and Whale Tail Water Quality and Flow Monitoring Plan and AEMP. These plans were both approved by the NWB.

Given the elevated number of certificates of analysis related to both Meadowbank and Whale Tail sites in 2022, Agnico Eagle will provide them on request. The certificates of analysis is detailed as follow:

- name of the person(s) who performed the sampling;
- date, time and place of sampling or measurement;
- date of analysis;
- name of the person(s) who performed the analysis including any relevant accreditations;
- description of the analytical methods or techniques used; and.
- sample and QAQC results.

For all samples collected under the Meadowbank Water Quality and Flow Monitoring Plan, trending is presented for 2017 up to 2022. The same is also compiled for Whale Tail starting in 2018 up to 2022.

## 8.1 CORE RECEIVING ENVIRONMENT MONITORING PROGRAM (CREMP)

### 8.1.1 Meadowbank Site*

The Core Receiving Environment Monitoring Program (CREMP) was updated and approved by NWB in 2022 and can be found in Appendix 33. Please take note that the following is just a summary of the CREMP report and Agnico Eagle will refer the reader to the whole report in Appendix 33 for an exhaustive comprehension of the program and results for 2022. Agnico Eagle will also refer the reader to Table ES-1 of the 2022 CREMP report for a summary of key findings with temporal and spatial trend assessment and annual CREMP results compared to FEIS prediction.

The Core Receiving Environment Monitoring Program (CREMP) for the Meadowbank Complex focuses on identifying changes in water quality, sediment chemistry, and aquatic communities—both primary producers (phytoplankton) and secondary producers (benthic invertebrate community)—that may be associated with mining activities. Changes are identified using a temporal/spatial trend assessment that detects changes or differences in key measures over time and/or among locations. The trend assessment includes the use of early warning triggers and action thresholds to support management decisions within the Aquatic Effects Management Program (AEMP). The AEMP is the overarching ‘umbrella’ program that integrates results of individual, but related, monitoring programs for the purpose of implementing management actions before unacceptable adverse impacts occur to aquatic life.

* TSM- Biodiversity Conservation

The 2022 CREMP summarized results for the Meadowbank and Baker Lake study areas are presented below.

**Meadowbank Study Area**

There are nine sampling areas included in the Meadowbank CREMP. Third Portage Lake East Basin and North Basin (TPE and TPN), Second Portage Lake (SP), and Wally Lake (WAL) are the NF areas monitored annually for changes related to operations at the Meadowbank mine and mill. Starting in 2023, MF areas Tehek Lake (TE), the South Basin of Third Portage Lake (TPS), and FF area Tehek Lake far-field (TEFF) are monitored only if moderate changes are detected upstream at the NF locations consistent with the strategy outline in Section 2.2.3 of the report in Appendix 33. Two reference areas are shared for the Meadowbank and Whale Tail programs: Inuggugayualik Lake (INUG) and Tasirjuaraajuk Lake (aka Pipedream Lake [PDL]). INUG has been the core reference area since formal monitoring began in 2006. PDL was added to was added to the Meadowbank CREMP in 2009. Refer to the map provided in the 2022 CREMP Report for locations.

*Water Quality (Limnology & Water Chemistry)*

Water quality monitoring for limnology and chemistry was completed in March, May, July, August, and September 2022 according to the CREMP study design. Limnology profiles were taken at the Near-Field (NF) areas—Third Portage Lake (TPN, TPE), Second Portage Lake (SP), and Wally Lake (WAL)—in the winter months when ice conditions were safe (January, February, April, November, and December), to verify the absence of anomalous changes in water quality (e.g., conductivity) attributable to site-related activities.

The NF areas close to the mine have higher concentrations of dissolved solids and constituent major ions such as calcium and magnesium compared to baseline/reference conditions. This observation is consistent with previous findings. While these changes to water quality are mine-related, the observed concentrations are still relatively low and there is no evidence to suggest concentrations are increasing year-over-year or that the observed concentrations would result in adverse ecological effects. Consistent with previous reporting cycles, there were no trigger exceedances in 2022 for any water quality parameters with CCME water quality guidelines (WQG), including metals. In the context of the assessment framework outlined in the Final Environmental Impact Statement (FEIS), the magnitude of potential effect on water quality in each of the near-field lakes in 2022 was considered low (i.e., less than 1X the CCME WQGs) and consistent with the original predictions. Routine water quality monitoring is recommended for 2023.

Long-term Trend Analysis – In addition to the routine water quality assessment summarized above, a more detailed assessment of temporal changes for a subset of parameters in NF areas was completed for the first time in 2021 using the long-term Meadowbank water quality dataset. The analysis used a mixed-effects model approach focusing on physical/ionic parameters that have consistently increased over time relative to control and exceeded triggers and/or FEIS predictions. These parameters included conductivity, water hardness, calcium, magnesium, total alkalinity, and total dissolved solids (TDS). The routine Before-After-Control-Impact (BACI) analysis is designed to test for changes in parameters for a particular year relative to baseline/reference conditions, however, it is not designed to test for longer-term trends in key parameters over time. The mixed-effects trend analysis was developed in 2021 to provide a statistically supported understanding of long-term trends in key water chemistry parameters.

The 2021 trend analysis results showed that there is strong evidence that differences in physical/ionic parameters relative to INUG have been stable since 2014 at TPN, TPE and SP, though there was more variability in year-to-year differences at SP between 2014 and 2021. Since this analysis focused on long-term trends, it is not intended to be repeated annually. Rather, the BACI will continue to be used routinely to test for changes in a particular year relative to baseline/reference conditions.

*Phytoplankton Community*

Phytoplankton community sampling was completed at the same time as the water chemistry sampling program in 2022, though May samples were archived as per the 2022 CREMP Plan Update. The phytoplankton community showed no significant changes relative to baseline for biomass or richness in 2022, though the effect sizes for total biomass at TPN, SP, and WAL were above the 20% trigger. The apparent increase in biomass is not associated with higher nutrient concentrations, which implies the increase observed in 2022 may be natural variability. Ultimately, the long-term phytoplankton monitoring data demonstrates that mining operations have not contributed to pervasive changes in primary productivity among the NF areas. The trends in phytoplankton biomass and richness will be reviewed again in 2023.

*Sediment Chemistry*

Sediment grab sampling was conducted at the NF and reference areas to support the benthic invertebrate community monitoring component of the CREMP. Sediment was analyzed for grain size and total organic carbon. The remaining sediment was archived for chemistry. The samples collected from INUG and PDL had high moisture content, resulting in not enough sediment remaining for determining grain size after sediment chemistry analysis. While historically there have been no changes in grain size in these areas, additional sediment will be collected for each sample in 2023 to mitigate this from happening in the future. The next sediment coring program will be conducted in August 2023 to review trends in chemistry. In addition, grab samples will be collected to support the benthic invertebrate community sampling program.

*Benthos Community*

There were no statistically significant changes to the benthic invertebrate community at Meadowbank relative to baseline/reference conditions identified by the 2022 BACI assessment, except for an increase in taxa richness at SP during the 2019-2022 time period. The number of taxa at SP were within the range of reference area INUG in 2022. The trends in benthos abundance and richness will be reviewed again in 2023.

**Baker Lake Study Area**

CREMP monitoring at Baker Lake started in 2008. Important mine-related activities in Baker Lake include barge/shipping traffic and general land-based activities associated with the tank farm area. The number of barge shipments in 2022 were slightly less than 2021 which reported the highest shipments since monitoring began in 2008. In 2022, there was turbid water runoff flowing from the Marshalling Facilities that reached the shore of Baker Lake. Silt fences and wood-chip booms were utilized to intercept flows. There were no elevated TSS concentrations observed in the Baker Lake sampling areas in subsequent sampling events.

*Water Quality*

Water quality sampling was conducted at two NF areas (BBD, BPJ) and one FF area (BAP) in Baker Lake in July, August, and September 2022. The mean concentrations for total and dissolved organic carbon water exceeded their respective triggers in 2022 at all three areas. The BACI showed no statistically significant increase above baseline/reference for BBD or BPJ. There was no evidence of any barge-related impacts to water quality at impact areas in Baker Lake.

Concentrations measured in water at Baker Lake in 2022 were comparable to results reported in previous annual monitoring reports. Monitoring in 2023 will follow the scope and schedule of the CREMP Plan.

*Phytoplankton Community*

There was an apparent increase in total biomass at impact areas BPJ and BBD, however this may be attributed to the decrease observed at reference area BAP. Overall, the phytoplankton community in Baker Lake was similar to previous years and has not exhibited any changes attributable to Agnico Eagle's activities in Baker Lake. Monitoring in 2023 will follow the scope and schedule of the CREMP Plan.

*Sediment Chemistry and Benthic Community*

Sediment chemistry and benthos sampling at Baker Lake was not completed in 2022 as per the revised CREMP Plan Update (Appendix 34). Sediment and benthos sampling will now occur on a three-year cycle beginning in August 2023 which coincides with the CREMP sediment coring program and EEM cycle. Changes in sediment chemistry data and the benthic community will be evaluated in 2023. Sediment chemistry and benthos community monitoring in 2023 will follow the CREMP Plan.

### 8.1.2 Whale Tail Site*

**As required by NIRB Project Certificate No.008, Condition 19*: The Proponent shall, reflecting any direction from responsible authorities such as the Nunavut Water Board, Fisheries and Oceans Canada and Environment and Climate Change Canada, maintain a Core Receiving Environment Monitoring Program (CREMP) designed to:***

- ***Determine the short and long-term effects in the aquatic environment resulting from the Project;***
- ***Evaluate the accuracy of Project effect predictions;***
- ***Assess the effectiveness of mitigation and management measures on Project effects;***
- ***Identify additional mitigation measures to avert or reduce environmental effects due to Project activities;***
- ***Comply with Metal Mining Effluent Regulations requirements, should an Environmental Effects***
- ***Monitoring program be triggered;***
- ***Reflect site-specific water quality conditions;***
- ***Include details comparing the watershed features in the Whale Tail watershed to those watersheds used as reference lakes; and***
- ***Evaluate the mixing and non-mixing portion of the pit.***

***The CREMP should include sufficient sampling and monitoring programs to appropriately characterize the receiving environment to ensure that adequate data is available to assess impact predictions made within the***

* TSM- Biodiversity Conservation

***Environmental Impact Statement for the Whale Tail Pit Project. The updated plan should be submitted to the NIRB at least 60 days prior to the start of construction, with results submitted annually thereafter.***

And

**As required by NIRB Project Certificate No.008 Condition 17:** ***The plan should be submitted to the NIRB at least 30 days prior to the start of construction, with results submitted annually thereafter. The Proponent shall:***

- ***a) Monitor the effects of project activities and infrastructure on surface water quality conditions;***
- ***b) Ensure the monitoring data is sufficient to compare the impact predictions in the Environmental Impact Statement (EIS) for the Project with actual monitoring results;***
- ***c) Ensure that the sampling locations and frequency of monitoring is consistent with and reflects the requirements of the Water Quality and Flow Plan and the Core Receiving Environmental Monitoring Program; and***
- ***d) On an annual basis, the Proponent will compare monitoring results with the impact assessment predictions in the EIS and will identify any significant discrepancies between impact predictions and monitoring results.***

The Core Receiving Environment Monitoring Program (CREMP) was updated and approved by the NWB in 2022 and can be found in Appendix 34. Please take note that the following is just a summary of the CREMP report and Agnico Eagle will refer the reader to the whole report in Appendix 33 for an exhaustive comprehension of the program and results for 2022. Agnico Eagle will also refer the reader to Table ES-2 of the 2022 CREMP report for a summary of key finding with temporal and spatial trend assessment and annual CREMP results compared to FEIS prediction.

Data analysis for Whale Tail study areas follows the same methods and framework as Meadowbank. 2022 was the fourth full year where most Whale Tail study area lakes were classified as impact. Whale Tail South (WTS) and Mammoth Lake (MAM) switched from control to impact in 2018 coinciding with construction of the Whale Tail Dike. The status of Lake A20, Lake A76, and Lake DS1 switched to impact in January 2019. Nemo Lake (NEM) transitioned after July 2019.

The Core Receiving Environment Monitoring Program (CREMP) for the Meadowbank Complex focuses on identifying changes in water quality, sediment chemistry, and aquatic communities—both primary producers (phytoplankton) and secondary producers (benthic invertebrate community)—that may be associated with mining activities. Changes are identified using a temporal/spatial trend assessment that detects changes or differences in key measures over time and/or among locations. The trend assessment includes the use of early warning triggers and action thresholds to support management decisions within the Aquatic Effects Management Program (AEMP). The AEMP is the overarching ‘umbrella’ program that integrates results of individual, but related, monitoring programs for the purpose of implementing management actions before unacceptable adverse impacts occur to aquatic life.

The 2022 CREMP summarized results for the Whale Tail study area are presented below.

**<u>Whale Tail Study Area</u>**

There are six lakes currently included in the Whale Tail CREMP study design. Whale Tail Lake South Basin (WTS) and Mammoth Lake (MAM) are NF areas designed to detect changes related to dike construction in Whale Tail Lake and Mammoth Lake and discharge of treated water during operations. Nemo Lake (NEM) is also considered a NF area because of its proximity to the site, even though it is situated in a different watershed. MF areas are Lake A20 (upstream from WTS, but joined to WTS after flooding) and Lake A76 located downstream from MAM. Lake A76 is situated at the junction of the two flow paths leading to Lake DS1. Given its morphology and location, it represents an ideal MF exposure area for both flow paths. Lake DS1 is the FF location to provide additional context for characterizing spatial extent of effects. Refer to the map provided in the 2022 CREMP Report for locations.

Water Quality

Surface water monitoring for limnology and water chemistry were completed in March, May, July, August, and September according to the CREMP study design for the Whale Tail study area. Supplemental limnology profiles were taken at Whale Tail South (WTS), Mammoth Lake (MAM), Nemo Lake (NEM), and Lake A20 in select winter months to verify that water quality is broadly within the range of expected values, particularly for conductivity and dissolved oxygen.

Changes in water quality in lakes downstream from the mine were predicted to occur during construction and operations. Water quality within the Whale Tail study area lakes exhibited fairly stable conditions during the baseline period. Consequently, when interpreting time series plots to examine spatial-temporal trends in water quality, the signal of development-related inputs was expected to be easily observed relative to the low noise levels of the baseline period. The following parameters have increased relative to baseline/reference conditions:

- Ionic Compounds – total dissolved solids and constituent ions such as calcium, magnesium, potassium, and sodium were elevated in the NF lakes and downstream of MAM to Lake A76.

- Nutrients – total Kjeldahl nitrogen, total phosphorus, total organic carbon, and dissolved organic carbon were elevated at NF areas WTS, MAM, and A20. The elevated parameters are likely the result of inputs from flooded terrestrial habitats following impoundment, dewatering inputs from WTN, and the joining of WTS to A20.

- Metals/metalloids – total and dissolved lithium was elevated at MAM and total titanium was elevated at WTS. These parameters do not have an effects-based guideline for protection of freshwater aquatic life.

Of the parameters with trigger exceedances, FEIS predictions were exceeded for total phosphorus at WTS and total alkalinity, TDS, total lithium, and several ionic compounds at WTS and MAM in one or more sampling events. Importantly, the absolute concentrations of these parameters remain low. Total phosphorus and arsenic at WTS and MAM are within the normal operating ranges and Level 0 water management strategy is in effect in 2023 as per the Adaptive Management Plan. Routine water quality monitoring will continue in 2023 to track emerging spatial and temporal trends.

Phytoplankton Community

Phytoplankton community sampling was completed at the same time as the water chemistry sampling program in 2022. Phytoplankton communities vary naturally throughout the year in total biomass (and density) and community composition (taxa richness). The primary stressors for the phytoplankton community include nutrients and metals in surface contact water discharged to MAM and WTS. Nutrient loading can manifest as an increase in total biomass or a change in community structure, while increasing metals concentrations would be expected to cause lower biomass and taxa diversity.

Increased total biomass was reported at WTS (77%), MAM (32%), A20 (128%), A76 (73%), and NEM (43%) relative to control/baseline conditions. None of the changes in total biomass were statistically significant ($p > 0.1$). No significant changes in the taxonomic richness of the phytoplankton community were observed in 2022. Phytoplankton community monitoring is scheduled for 2023 according to the CREMP Plan.

<u>Sediment Chemistry</u>

Concentrations of metals were similar to results from the baseline period and early operations. The sediment samples collected at Lake A76 in August 2022 had high water content and therefore grain size analysis could not be completed. A larger sediment sample will be collected in 2023 to mitigate this from happening again. The next sediment coring program will be conducted in August 2023 to review trends in chemistry. In addition, grab samples will be collected to support the benthic invertebrate community sampling program.

<u>Benthos Community</u>

Benthic invertebrate (benthos) community structure (taxa richness) and function (abundance) in the Whale Tail study area lakes is typical of northern headwaters lakes in the region (i.e., relatively low abundance and few taxa). Although total abundance tends to be low, within-area variability can be substantial. Taxa richness, unlike abundance, is considerably less variable, both temporally (i.e., inter-annually) and spatially (i.e., among the different lakes). There was an apparent increase in taxa richness and total biomass at MAM and NEM, but not at other NF and MF area lakes in 2022, suggesting the increases may be due to natural variability rather than mining influence. All other study areas were comparable with baseline/reference conditions. Benthos community monitoring will be conducted in 2023 according to the CREMP Plan.

## 8.2 METHYLMERCURY STUDIES WHALE TAIL SITE*

**As required by NIRB Project Certificate No.008, Condition 63*: The Proponent shall conduct additional studies as part of its freshwater aquatic effects analyses to ensure that methylmercury concentrations anticipated to increase during operations in the aquatic environment (including in fish tissue) do not exceed regulatory requirements. In addition, the Proponent shall consider assessing potential risks from consumption of fish containing methylmercury by using Health Canada's hazard quotients as a descriptive tool. A summary of the results of these additional studies, including the assessment of the potential risk to people from consumption of fish, shall be included in the Proponent's annual report to the Nunavut Impact Review Board.***

The 2022 Mercury Monitoring Program (MMP) was completed according to the study design outlined in the Mercury Monitoring Plan (Version 3, April 2019). The purpose of the MMP is to assess changes in mercury concentrations caused by the creation of the Whale Tail Impoundment ("Impoundment") following completion of the in-water construction of the Whale Tail Dike in September 2018. Construction of the dike raised the elevation of the south basin of Whale Tail Lake (WTS) and connected WTS with Lake A20, Lake A65, and other small waterbodies adjacent to WTS. One of the effects of newly formed reservoirs is an increase in the production of methylmercury. Methylmercury bioaccumulates in aquatic food webs with the highest concentrations of methylmercury typically observed in large-bodied fish species like Lake Trout. In anticipation of this situation, predictions were made for the magnitude of increase expected in Lake Trout for the Final Environmental Impact Statement (FEIS; Azimuth, 2019).

* TSM- Biodiversity Conservation

Mercury concentrations in Lake Trout are predicted to increase between 2-3 times above baseline concentrations. Total mercury concentrations in surface water are predicted to peak at 50-100 ng/L (Golder, 2019c). No predictions were made for methylmercury in surface water or sediment.

The MMP was designed to monitor mercury dynamics in key components of the ecosystem to verify the FEIS predictions and manage methylmercury-related risks should those predictions be exceeded. The scope of the 2022 program included water and sediment sampling at various locations within the Impoundment, downstream of the mine, and at local reference lakes. The 2022 Mercury Monitoring Program report also includes the 2021 small-bodied fish tissue chemistry data, which were not available in time to include in the 2021 MMP report submitted in March 2022.

The 2022 Mercury Monitoring Program Report key findings are presented below. Complete review and results interpretation can be found in (Appendix 53).

Water

Mercury concentrations in surface water in the Impoundment were between 1-2 ng/L for total mercury and between 0.1-0.7 ng/L for methylmercury. Current concentrations are well below predictions in the FEIS and below the CCME water quality guidelines for the protection of aquatic life (26 ng/L for total mercury and 4 ng/L for methylmercury). Concentrations of total mercury and methylmercury increased during the early post-flooding years, but since 2020, concentrations have been fairly stable. There are some signs of downstream transport of methylmercury to Mammoth Lake, but the magnitude of change is hard to distinguish compared to baseline/reference conditions. Mercury concentrations in surface water will continue to be monitored in 2023 as proposed in the Mercury Monitoring Plan Update (Version 4, March 2023).

Sediment

In 2022, sediment samples were collected from the depositional areas in the MMP lakes and inundated areas within the Impoundment. Flooded terrestrial soils are known to drive increased methylmercury production in reservoirs. Therefore, methylmercury concentrations are expected to be higher within the inundation zone sediment (formerly soils) compared to the depositional areas in the Impoundment.

Total mercury concentrations were below the CCME sediment quality guidelines at all areas for depositional and inundation zone samples. Total mercury concentrations in the depositional zones of the Impoundment as well as downstream exposure areas in 2022 were similar to baseline/reference conditions.

Methylmercury concentrations in some deposition zone samples in the Impoundment in 2022 were higher than previous results. As anticipated, the inundation zone sediment samples had the highest methylmercury concentrations, as conditions in these areas are known to stimulate mercury methylation. Despite the lack of clear changes in either surface water or fish tissue, there was an increase in methylmercury concentrations in depositional zone sediments in MAM. One possible explanation for this increase is mercury methylation by sulphate-reducing microbes. Sulphate concentrations in surface water in MAM, while well below the CREMP trigger value (i.e., not a concern for aquatic life), were higher than baseline/reference conditions and exceeded the FEIS prediction. A comprehensive sediment coring program is planned for 2023. These results should help verify whether the increase in methylmercury concentrations at MAM is mining-related or not. Furthermore, sediment sampling within the inundation zone will be repeated to identify whether methylmercury concentrations have peaked and to allow comparison between flooded and depositional substrates within the Impoundment.

Lake Trout

Lake Trout (*Salvelinus namaycush*) is the target species to monitor mercury bioaccumulation in the food web because piscivorous fish such as Lake Trout typically have the highest concentrations of mercury in high-latitude lakes. Lake Trout were collected from the Impoundment in 2020 and mercury concentrations were found to be similar compared to baseline/reference concentrations. Lake Trout mercury concentrations in the Impoundment were also below the predicted peak mercury concentration for Lake Trout in the Impoundment. The next sampling event is scheduled for August 2023. The MMP has committed to implementing further risk-based analyses if fish tissue mercury concentrations in the Impoundment exceed the predicted peak mercury concentration for Lake Trout (Azimuth, 2019). This approach is reasonable considering the low rates of fishing by local residents in the Project area and a non-fishing policy for workers while onsite.

Small-bodied Fish

Small-bodied fish (Slimy Sculpin [*Cottus cognatus*] and Ninespine Stickleback [*Pungitius pungitius*]) were collected from areas in the Impoundment and other lakes close to the Whale Tail mine from 2018–2021 as part of a research study looking at changes in lake productivity caused by flooding. To supplement tissue chemistry results from the Lake Trout study, mercury analysis was opportunistically completed on a subset of the small-bodied fish collected in 2018–2021 to understand temporal and spatial patterns of mercury bioaccumulation lower in the food web during the first few years of flooding. This report presents results from the most recent sampling event in 2021 along with results from 2018–2020. Both small-bodied fish species in the Impoundment showed marked increases in tissue mercury concentrations in 2020 that persisted in 2021. The temporal patterns seen to date for both species suggest that conditions may have stabilized somewhat as tissue mercury concentrations neither continued to rise sharply nor showed clear signs of decreasing back to baseline levels.

Mercury concentrations in small-bodied fish from MAM were similar in 2021 compared to concentrations in MAM from 2018–2020 and compared to the reference lakes. These results are consistent with the relatively low and stable concentrations of methylmercury in water from MAM.

The supplemental small-bodied fish mercury study will be completed for one more year in 2023 to verify that mercury concentrations have peaked in fish from the Impoundment.

Mercury Monitoring Program 2023 Update

The MMP is implemented with the Core Receiving Environment Monitoring Program (CREMP) as a requirement of Water License 2AM-WTP1830. There is considerable overlap between the two programs and the two programs have been implemented in parallel during the baseline pre-flooding period (pre-2018) and in the early flooding years (2018-2022). Sampling for the MMP has also been completed under the mandate of the Environmental Effects Monitoring program (EEM) and the productivity study led by researchers at the University of Waterloo. Given that certain components of the MMP have been sampled under the EEM (3-year cycle) and productivity study (completed in 2021), there was a need to revisit the study design to ensure the scope of the MMP is clearly defined for the next phase of the project. Agnico Eagle commissioned Azimuth Consulting Group Inc. to prepare an update to Version 3 of the Mercury

Monitoring Plan (April 2019) that outlines the monitoring strategy for the next four years (2023-2026) based on findings from the early post-flooding phase (2018-2022).

The 2023 MMP is intended to be completed as per the scope and schedule outlined in the update Mercury Monitoring Plan (Version 4, March 2023) and presented in Appendix 54 of this report.

## 8.3 MDMER AND EEM SAMPLING

### 8.3.1 Meadowbank Site

This section includes the results of the monitoring programs conducted under the Metal and Diamond Mining Effluent Regulations (MDMER) and its Schedule 5 Environmental Effects Monitoring (EEM) Studies. Figures 1, 2, and 3 illustrate the location of sampling stations at the Meadowbank mine site, EEM receiving environment monitoring program and the Vault Site.

#### 8.3.1.1 *Portage Attenuation Pond Discharge*

On November 19$^{th}$, 2014 tailings deposition commenced in the South Cell (Portage Attenuation Pond) and this represented the end of use of the Portage Attenuation Pond. There has been no further effluent discharge to Third Portage Lake since July 5$^{th}$, 2014. In 2019, Agnico Eagle have officially informed ECCC that the final discharge point Water Treatment Plant (ST-MMER-1 / ST-9) will no longer be used and is permanently dismantled. For this reason, Agnico Eagle is not reporting MDMER and EEM results since 2019.

#### 8.3.1.2 *Vault Attenuation Pond Discharge*

The Vault final discharge point became subject to the MDMER Regulation on June 27$^{th}$, 2013, at the commencement of the dewatering of Vault Lake. In 2022, no water was discharged from the final effluent Vault Discharge (ST-MMER-2) into the receiving environment Wally Lake. There are no further plans to discharge water from this location in 2023. This discharge is however still active in the MERS system.

#### 8.3.1.3 *East Dike Discharge*

The East Dike Seepage Discharge became subject to the MDMER on January 6$^{th}$, 2014. In 2022, Agnico Eagle continued to pump water from the two collection points, South and North seepage and discharged through a common header through a diffuser into Second Portage Lake. The seepage water was released into the environment, prior to contact with mining activity, without treatment as it is compliant with section 4 (1) of the regulation.

Agnico Eagle sent a request to ECCC in February 2016 to reduce the testing frequency of the Ra226 to once per quarter. On March 15$^{th}$, 2016, the request was approved by ECCC. Agnico Eagle sent a second request in August 2016 to ECCC to reduce the sampling frequency of Item 1 to 6 in column 1 of the Schedule 4 and to reduce acute lethality and Daphnia magna testing to not less than once per quarter. On September 15$^{th}$, 2016, ECCC approved the Agnico Eagle's request. The reduced frequency has started on October 1$^{st}$, 2016. Starting July 1$^{st}$, 2021, when the MDMER amendment came in force, Daphnia magna return to a normal monthly frequency and un-ionized ammonia started to be tested on a weekly basis. Discharge monitoring samples are provided in Table 8-1.

East Dike Seepage (sampling station ST-8, also named ST-MMER-3) was discharged into the receiving environment, Second Portage Lake (SPL), January 1$^{st}$ to January 25$^{th}$, April 7$^{th}$ to April 30$^{th}$, and

November 20th to December 31st, 2022. Due to increased TSS levels in April, the discharge to Second Portage Lake was stopped. All water was diverted to the pits, as done in the past. Agnico Eagle continued to monitor TSS and restarted the discharge to Second Portage Lake on November 20th. The total volume discharged in 2022 was 22,336 $m^3$. There was one (1) exceedance of the TSS MDMER/Water License limits in 2022:

- On April 9th, the level of Total Suspended Solids (TSS) from the East Dike Discharge (ST-MMER-3) to Second Portage Lake exceeded the limits set out in MDMER Schedule 4, Table 2, for the maximum authorized concentration in a grab sample (30 mg/L), at 49 mg/L. This event was reported to the ECCC inspector on April 25th and a follow-up report was submitted to the inspector on May 24th. The monthly TSS average did not exceed the maximum monthly average concentration of 15 mg/L.

The volume of water discharged to the environment was reported on a weekly basis pursuant to the MDMER monitoring program requirements. Table 8-2 provides a daily breakdown of volumes of water pumped.

Sublethal toxicity samples are collected directly after the effluent characterization samples, from the same location (ST-MMER-3-EEM, East Dike Discharge). In 2022, there was only one discharge to the receiving environment. For this reason, the East Dike discharge (ST-MMER-3-EEM) is the mine's final discharge point that has potentially the most adverse environmental impact on the environment as per Schedule 5 Section 5. In 2022, three (3) sub-lethal toxicity samples were collected from the East Dike Discharge in compliance with Schedule 5 Section 6. The sub-lethal toxicity samples were collected on January 17th, April 18th, and November 21st. The water quality samples were taken from the discharge location (ST-MMER-3), the receiving environment exposure area (SPLE or ST-MMER-3-EEM-SPLE) and reference area (TPS or ST-MMER-1-EEM-TPS). These sampling locations are highlighted on Figures 1 and 2. Results of the EEM water quality monitoring program are presented in Tables 8-3. This data was previously reported to Environment Canada via the MERS electronic database reporting system.

**Table 8-1 Meadowbank 2022 East Dike MDMER Monitoring**

| Month | As | Cu | CN | Pb | Ni | $NH_3$ | Zn | TSS | Ra 226 | pH | Results for Rainbow Trout Acute Lethality Tests | Results for Daphnia magna Monitoring Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | | (mean percentage mortality in 100% effluent test concentration) | (mean percentage mortality in 100% effluent test concentration) |
| **January** | | | | | | | | | | | | |
| 4-Jan-22 | 0.000970 | 0.00145 | < 0.0005 | < 0.0002 | < 0.001 | 0.00200 | < 0.0050 | 10 | < 0.005 | 8.65 | 0 | 0 |
| 10-Jan-22 | NMR | NMR | NMR | NMR | NMR | 0.0011 | NMR | 11 | NMR | 8.43 | NMR | NMR |
| 17-Jan-22 | 0.000988 | 0.00142 | < 0.0005 | 0.000156 | 0.000585 | 0.0011 | 0.0017 | 11 | < 0.005 | 7.33 | NMR | NMR |
| 24-Jan-22 | NMR | NMR | NMR | NMR | NMR | 0.0023 | NMR | 2 | NMR | 8.48 | NMR | NMR |
| **February** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **March** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **April** | | | | | | | | | | | | |
| 9-Apr-22 | NMR | NMR | NMR | NMR | NMR | 0.00086 | NMR | 49 | NMR | 8.28 | NMR | NMR |
| 10-Apr-22 | NMR | NMR | NMR | NMR | NMR | 0.00056 | NMR | 2 | NMR | 8.10 | NMR | NMR |
| 11-Apr-22 | 0.00136 | 0.00119 | < 0.0005 | < 0.0002 | < 0.001 | 0.00022 | < 0.0050 | 2 | < 0.005 | 7.69 | 0 | 0 |
| 18-Apr-22 | NMR | NMR | NMR | NMR | NMR | 0.00171 | NMR | 2 | NMR | 8.62 | NMR | NMR |
| 25-Apr-22 | NMR | NMR | NMR | NMR | NMR | 0.00096 | NMR | 2 | NMR | 7.86 | NMR | NMR |
| 26-Apr-22 | 0.00079 | 0.00172 | < 0.0005 | < 0.0002 | < 0.001 | 0.00045 | 0.0068 | 2 | < 0.005 | 8.04 | 0 | 30 |
| **May** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **June** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **July** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **August** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **September** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **October** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **November** | | | | | | | | | | | | |
| 21-Nov-22 | 0.00123 | 0.00126 | < 0.0005 | < 0.0002 | < 0.001 | < 0.00049 | < 0.0050 | < 1 | < 0.005 | 8.05 | NMR | 0 |
| 28-Nov-22 | NMR | NMR | NMR | NMR | NMR | < 0.00040 | NMR | < 1 | NMR | 7.71 | NMR | NMR |
| **December** | | | | | | | | | | | | |
| 6-Dec-22 | 0.0012 | 0.00165 | < 0.0005 | < 0.0002 | < 0.001 | < 0.00040 | < 0.0050 | 4 | < 0.005 | 7.49 | NMR | NMR |
| 12-Dec-22 | 0.00112 | 0.00115 | 0.0006 | < 0.0002 | < 0.001 | < 0.00074 | < 0.0050 | 3 | 0.009 | 8.24 | 0 | 0 |
| 19-Dec-22 | NMR | NMR | NMR | NMR | NMR | 0.00124 | NMR | 5 | NMR | 9.22 | NMR | NMR |
| 27-Dec-22 | NMR | NMR | NMR | NMR | NMR | < 0.01 | NMR | 7 | NMR | 6.65 | NMR | NMR |

*NDEP: No Deposit*
*NMR: No Measurement Required*

**Table 8-2 Meadowbank 2022 East Dike MDMER Volume**

| Date | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | YTD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 266 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 286 | |
| 2 | 241 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 286 | |
| 3 | 283 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 285 | |
| 4 | 231 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 276 | |
| 5 | 264 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 254 | |
| 6 | 284 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 282 | |
| 7 | 282 | 0 | 0 | 105 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 283 | |
| 8 | 283 | 0 | 0 | 218 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 291 | |
| 9 | 282 | 0 | 0 | 213 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 356 | |
| 10 | 282 | 0 | 0 | 210 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 281 | |
| 11 | 282 | 0 | 0 | 197 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 284 | |
| 12 | 276 | 0 | 0 | 199 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 284 | |
| 13 | 277 | 0 | 0 | 206 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 291 | |
| 14 | 278 | 0 | 0 | 206 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 286 | |
| 15 | 279 | 0 | 0 | 203 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 286 | |
| 16 | 238 | 0 | 0 | 205 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 293 | |
| 17 | 218 | 0 | 0 | 205 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 285 | |
| 18 | 268 | 0 | 0 | 199 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 284 | |
| 19 | 262 | 0 | 0 | 211 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 283 | |
| 20 | 272 | 0 | 0 | 210 | 0 | 0 | 0 | 0 | 0 | 0 | 93 | 285 | |
| 21 | 279 | 0 | 0 | 209 | 0 | 0 | 0 | 0 | 0 | 0 | 281 | 285 | |
| 22 | 230 | 0 | 0 | 206 | 0 | 0 | 0 | 0 | 0 | 0 | 293 | 285 | |
| 23 | 16 | 0 | 0 | 201 | 0 | 0 | 0 | 0 | 0 | 0 | 292 | 279 | |
| 24 | 15 | 0 | 0 | 200 | 0 | 0 | 0 | 0 | 0 | 0 | 292 | 294 | |
| 25 | 7 | 0 | 0 | 203 | 0 | 0 | 0 | 0 | 0 | 0 | 291 | 229 | |
| 26 | 0 | 0 | 0 | 206 | 0 | 0 | 0 | 0 | 0 | 0 | 289 | 228 | |
| 27 | 0 | 0 | 0 | 207 | 0 | 0 | 0 | 0 | 0 | 0 | 289 | 273 | |
| 28 | 0 | 0 | 0 | 208 | 0 | 0 | 0 | 0 | 0 | 0 | 281 | 284 | |
| 29 | 0 | 0 | 0 | 156 | 0 | 0 | 0 | 0 | 0 | 0 | 286 | 284 | |
| 30 | 0 | 0 | 0 | 130 | 0 | 0 | 0 | 0 | 0 | 0 | 287 | 285 | |
| 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 285 | |
| **Total ($m^3$)** | **5,896** | **0** | **0** | **4,713** | **0** | **0** | **0** | **0** | **0** | **0** | **2,974** | **8,753** | **22,336** |

**Table 8-3 Meadowbank 2022 East Dike EEM Monitoring (ST-MMER-3)**

| | Alkalinity | Aluminum | Cadmium | Chloride | Chromium | Cobalt | Hardness | Iron | Manganese | Mercury | Molybdenum | Nitrate | Phosphorus | Selenium | Sulphate | Thallium | Uranium | Conductivity | T° | Sub-Lethal Toxicity | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mg $CaCO_3$/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg $CaCO_3$/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg P/L | mg/L | mg/L | mg/L | mg/L | µS/cm | °C | *Ceriodaphia dubia* | *Fathead minnow* | *Lemna minor* | *Pseudokirchneriella subcapitata* |
| **Effluent characterization (65°01'11.21"N 96°02'32.00" W) (ST-MMER-3-EEM)** | | | | | | | | | | | | | | | | | | | | | | | |
| 17-Jan-22 | 27 | 0.150 | < 0.000010 | < 1 | < 0.001 | < 0.0002 | 28.9 | 0.227 | 0.0048 | < 0.00001 | < 0.001 | 0.11 | 0.0070 | < 0.0001 | 6.3 | < 0.000010 | 0.0004 | 62.9 | -0.40 | without SE or AL | without SE or AL | without SE | without SE |
| 11-Apr-22 | 33 | 0.055 | 0.000032 | < 1 | < 0.001 | < 0.0002 | 37.2 | 0.08 | 0.0032 | < 0.00001 | < 0.001 | < 0.10 | 0.0017 | < 0.0001 | 6.8 | 0.000011 | 0.0005 | 83.5 | 1.20 | NMR | NMR | NMR | NMR |
| 18-Apr-22 | 34 | 0.036 | < 0.000010 | < 1 | < 0.001 | < 0.0002 | 35.7 | 0.047 | 0.0017 | < 0.00001 | < 0.001 | < 0.10 | 0.0021 | < 0.0001 | 6.9 | < 0.000010 | 0.0005 | 85.1 | 0.40 | without SE or AL | without SE or AL | without SE | without SE |
| 26-Apr-22 | 32 | 0.053 | < 0.000010 | < 1 | < 0.001 | < 0.0002 | 36.3 | 0.085 | 0.0020 | < 0.00001 | < 0.001 | < 0.10 | 0.0019 | < 0.0001 | 7.5 | < 0.000010 | 0.0004 | 81.7 | 0.10 | NMR | NMR | NMR | NMR |
| 21-Nov-22 | 27 | 0.025 | 0.000018 | < 1 | < 0.001 | < 0.0002 | 27.8 | 0.020 | < 0.0010 | < 0.00001 | < 0.001 | < 0.10 | 0.0016 | 0.0001 | 7.5 | < 0.000010 | 0.0005 | 131.8 | 0.90 | without SE or AL | without SE or AL | without SE | without SE |
| ***Annual Average** | | | | | | | | | | ***0.000005*** | | | | ***0.00006*** | | | | | | | | | |

**Annual average calculated using half the detection limit*
*SE: Sub-Lethal effects*
*AL: Acute Lethality*
*NMR: No measure requirement*
*NA: No measurement recorded*

| | Unionized Ammonia | Alkalinity | Aluminum | Cadmium | Chloride | Chromium | Cobalt | Hardness | Iron | Manganese | Mercury | Molybdenum | Nitrate | Phosphorus | Selenium | Sulphate | Thallium | Uranium | Conductivity | T° | pH | $O_2$ | $O_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mg N/L | mg $CaCO_3$/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg $CaCO_3$/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg P/L | mg/L | mg/L | mg/L | mg/L | µS/cm | °C | | % | mg/L |
| **Water Quality Monitoring Exposure Area (65°01'10.81" N 96°02'22.64"W) (ST-MMER-3-EEM-SPLE)** | | | | | | | | | | | | | | | | | | | | | | | |
| 10-Apr-22 | < 0.0004 | 12 | 0.00375 | < 0.000005 | < 1.0 | < 0.0001 | 0.000009 | 17.3 | 0.0043 | 0.000545 | < 0.00001 | 0.000156 | < 0.1 | < 0.001 | < 0.00004 | 5.8 | < 0.000002 | 0.000057 | 43.0 | 1.19 | 6.30 | 121.60 | 16.72 |
| 27-Nov-22 | < 0.0008 | 9.8 | 0.00464 | < 0.000005 | 1.1 | < 0.0001 | 0.000011 | 13.9 | 0.0091 | 0.000721 | < 0.00001 | 0.000114 | < 0.1 | < 0.001 | < 0.00004 | 5.1 | < 0.000002 | 0.000039 | 91.3 | 0.50 | 8.28 | 108.77 | 10.65 |
| 27-Dec-22 | < 0.00001 | 12 | 0.01 | < 0.00002 | 0.9 | < 0.0006 | < 0.0005 | 16.0 | 0.01 | 0.0008 | < 0.00001 | < 0.0005 | 0.01 | 0.03 | < 0.0005 | 5.5 | < 0.0002 | < 0.001 | 41.7 | 0.20 | 6.97 | 110.00 | 15.42 |
| **Water Quality Monitoring Reference Area (64°58'10.90" N 96°09'51.37" W) (ST-MMER-1-EEM-TPS)** | | | | | | | | | | | | | | | | | | | | | | | |
| 10-Apr-22 | < 0.0004 | 10 | 0.00318 | < 0.000005 | < 1.0 | < 0.0001 | 0.000007 | 10.0 | 0.0017 | 0.000332 | < 0.00001 | 0.000103 | < 0.1 | < 0.001 | < 0.00004 | 4.7 | < 0.000002 | 0.000042 | 29.2 | 1.12 | 5.93 | 110.10 | 15.19 |
| 27-Nov-22 | < 0.00041 | 8.1 | 0.00323 | < 0.000005 | < 1.0 | < 0.0001 | 0.000008 | 9.5 | 0.0032 | 0.000674 | < 0.00001 | 0.000094 | < 0.1 | < 0.001 | < 0.00004 | 4.6 | < 0.000002 | 0.000037 | 66.2 | 0.50 | 7.98 | 103.60 | 12.41 |
| 27-Dec-22 | < 0.00002 | 9.0 | < 0.005 | < 0.00002 | 0.9 | < 0.0006 | < 0.0005 | 12.0 | 0.01 | 0.0009 | 0.00002 | < 0.0005 | 0.02 | 0.03 | 0.0008 | 4.7 | < 0.0002 | < 0.001 | 37.7 | 0.18 | 7.04 | 106.80 | 14.89 |

| | Arsenic | Copper | Cyanide | Lead | Nickel | Ra226 | TSS | Zinc |
|---|---|---|---|---|---|---|---|---|
| | mg/L | mg/L | mg/L | mg/L | mg/L | Bq/L | mg/L | mg/L |
| **Water Quality Monitoring Exposure Area (65°01'10.81" N 96°02'22.64"W) (ST-MMER-3-EEM-SPLE)** | | | | | | | | |
| 10-Apr-22 | 0.000301 | 0.000892 | < 0.0005 | 0.000010 | 0.000530 | < 0.005 | < 1 | 0.0005 |
| 27-Nov-22 | 0.000310 | 0.000916 | < 0.0005 | 0.000012 | 0.000379 | < 0.005 | < 1 | 0.0006 |
| 27-Dec-22 | < 0.0005 | < 0.0005 | 0.001 | < 0.00017 | < 0.0005 | < 0.01 | < 1 | < 0.001 |
| **Water Quality Monitoring Reference Area (64°58'10.90" N 96°09'51.37" W) (ST-MMER-1-EEM-TPS)** | | | | | | | | |
| 10-Apr-22 | 0.000175 | 0.000440 | < 0.0005 | < 0.000005 | 0.00044 | < 0.005 | < 1 | 0.00068 |
| 27-Nov-22 | 0.000194 | 0.000425 | < 0.0005 | 0.000008 | 0.00043 | < 0.005 | < 1 | 0.00057 |
| 27-Dec-22 | < 0.0005 | < 0.0005 | 0.002 | < 0.00017 | < 0.0005 | < 0.010 | < 1 | < 0.001 |

### 8.3.2 Whale Tail Site

#### 8.3.2.1 *ST-MDMER-4*

During the in-water portion of the Whale Tail Dike Construction, Agnico Eagle had discharged an effluent from the construction dewatering activities. The Whale Tail Site became subject to the MDMER on July 27th, 2018. The sample was taken from the Water Treatment Plant prior to the release on the tundra, which flowed onto a natural boulder field at the edge of the Whale Tail Lake North Basin (receiving environment). In 2019, Agnico Eagle has officially informed ECCC that the final discharge point Whale Tail North Basin (ST-MDMER-4) will no longer be used and was permanently dismantled.

#### 8.3.2.2 *ST-MDMER-5*

During the dewatering of the Whale Tail North Basin, a FDP was created in 2019 - ST-MDMER-5 WT North Basin Dewatering Phase 1. This FDP is still active on the MERS system. This FDP was not used in 2022.

#### 8.3.2.3 *ST-MDMER-6*

During the Phase 2 dewatering of the Whale Tail North Basin, the ST-MDMER-6 FDP was created in 2019. This FDP was subject to MDMER on June 17th, 2019. When water from the Whale Tail North Basin dewatering required treatment for TSS, the water was pumped and treated via the Water Treatment Plant and discharged back in Mammoth Lake via a submerged diffuser to control erosion and disturbance to bottom sediments. This final discharge point was not used in 2022 but remains active on MERS.

#### 8.3.2.4 *ST-MDMER-7*

The third FDP was the Attenuation Ponds water discharged to Mammoth Lake via a submerged diffuser to control erosion and disturbance to bottom sediments – ST MDMER-7. This FDP is still active on the MERS system. This FDP was not used in 2022.

#### 8.3.2.5 *ST-MDMER-8*

The fourth FDP is the Whale Tail Attenuation Pond discharged to Mammoth Lake via the submerged East Diffuser to control erosion and disturbance to bottom sediments – ST-MDMER-8. ST-MDMER-8 intake is in the Attenuation pond and the FPD is at the shore of Mammoth Lake. This FDP was in operation from June 16th to June 30th and July 24th to September 20th. There were no non compliance associated with this discharge in 2022. The total volume of water discharge via this diffuser in 2022 was 872,789 $m^3$. Table 8-5 presents the daily discharge volumes.

Sublethal toxicity samples are collected directly after the effluent characterization samples, from the same location (ST-MDMER-8-EEM, Mammoth Lake Discharge). ST-MDMER-8 has been determined to be the mine's final discharge point that has potentially the most adverse environmental impact on the environment as per Schedule 5 Section 5. In 2022, two (2) sub-lethal toxicity samples were collected from the ST-MDMER-8-EEM in compliance with Schedule 5 Section 6. The sub-lethal toxicity samples were collected on July 25th and August 29th. The water quality samples were taken from the discharge location (ST-MDMER-8), the receiving environment exposure area (EEM-7-MAME-2) and reference area (TPS or ST-MMER-1-EEM-TPS). These sampling locations are highlighted on Figures 2 and 4. Results of the EEM water quality monitoring program are presented in Tables 8-6. This data was previously reported to Environment Canada via the MERS electronic database reporting system

#### 8.3.2.6 *ST-MDMER-10*

No effluent was discharged in 2022 from this FDP. This FDP is still active on MERS.

#### 8.3.2.7 *ST-MDMER-11*

The seventh FDP is ST-MDMER-11 which represents the discharge from the Whale Tail Attenuation Pond to Whale Tail South via the permanent diffuser to control erosion and disturbance to bottom sediments. The sampling point for this FDP is at the header after the WTP. Discharge from this FDP occurred from January 7$^{th}$ to 13$^{th}$, February 26$^{th}$ to 28$^{th}$, April 3$^{rd}$ to 6$^{th}$, April 24$^{th}$ to 25$^{th}$, May 22$^{nd}$ to June 16$^{th}$, and October 3$^{rd}$ to 29$^{th}$. The results are presented in Table 8-7. The total volume of water discharge from the FDP in 2022 was 1,115,285 m$^3$, the daily discharge volumes are presented in Table 8-8. Two non-compliances were observed in 2022 for this FDP:

- During April, the level of total arsenic (As) concentrations from the treated discharge into Whale Tail South Lake (ST-MDMER-11) exceeded the maximum limits set out in MDMER Schedule 4, Table 2, for the maximum authorized monthly mean concentration (0.30mg/L) at 0.3145 mg/L. This event was reported to ECCC Inspector on April 29$^{th}$ and a follow-up report was submitted to the inspector on May 27$^{th}$. There was no exceedance of the maximum authorized concentration in a grab sample (0.6 mg/L).

- The monthly acute toxicity test collected on May 23$^{rd}$ for rainbow trout as required by MDMER Section 14.1 was deemed invalid due to the mortality in the blank of the test exceeding the acceptable percentage (10% or less), thus invalidating the test according to the criteria of the reference method. The results for the Daphnia magna acute lethality test are valid and show that the effluent is not acutely lethal, while the results for Rainbow Trout show that the issue is related to the control sample and is not linked to the effluent. This event was reported to ECCC on June 2$^{nd}$ and a follow-up report was submitted to the inspector on June 23$^{rd}$. A call between ECCC, CIRNAC, and Agnico Eagle was conducted on July 6$^{th}$ to discuss this event.

The water quality samples were taken from the discharge location (ST-MDMER-11), the receiving environment exposure area (WTSE-1) and reference area (TPS or ST-MMER-1-EEM-TPS). These sampling locations are highlighted on Figures 2 and 4. Results of the EEM water quality monitoring program are presented in Tables 8-9. This data was previously reported to Environment Canada via the MERS electronic database reporting system.

**Table 8-4 ST-MDMER-8 2022 MDMER Monitoring**

| Month | As | Cu | CN | Pb | Ni | $NH_3$ | Zn | TSS | Ra 226 | pH | Results for Rainbow Trout Acute Lethality Tests | Results for Daphnia magna Monitoring Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | | (mean percentage mortality in 100% effluent test concentration) | (mean percentage mortality in 100% effluent test concentration) |
| **January** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **February** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **March** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **April** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **May** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **June** | | | | | | | | | | | | |
| 18-Jun-22 | 0.00505 | 0.00101 | 0.00607 | < 0.0002 | 0.0164 | < 0.0004 | < 0.005 | < 1 | < 0.005 | 6.91 | NMR | NMR |
| 20-Jun-22 | 0.00234 | 0.00083 | 0.00501 | < 0.0002 | 0.0124 | < 0.0004 | < 0.005 | 1 | < 0.005 | 6.89 | 0 | 40 |
| 27-Jun-22 | 0.00120 | 0.00083 | 0.00182 | < 0.0002 | 0.0120 | 0.0006 | < 0.005 | 1 | < 0.005 | 6.66 | NMR | NMR |
| **July** | | | | | | | | | | | | |
| 25-Jul-22 | 0.00317 | 0.00102 | 0.00398 | < 0.0002 | 0.0122 | 0.0007 | < 0.005 | 1 | 0.012 | 7.05 | 0 | 10 |
| **August** | | | | | | | | | | | | |
| 1-Aug-22 | 0.00573 | 0.00087 | 0.00098 | < 0.0002 | 0.0155 | < 0.0004 | < 0.005 | 2 | < 0.005 | 6.83 | 0 | 0 |
| 8-Aug-22 | 0.01380 | 0.00104 | 0.00081 | < 0.0002 | 0.0256 | 0.0017 | 0.0074 | 4 | < 0.005 | 7.39 | 0 | 0 |
| 15-Aug-22 | 0.00785 | 0.00112 | 0.0112 | < 0.0002 | 0.0173 | 0.0009 | 0.0062 | 3 | < 0.005 | 6.89 | NMR | NMR |
| 22-Aug-22 | 0.00558 | 0.00104 | 0.00093 | < 0.0002 | 0.015 | 0.0006 | 0.0061 | 2 | < 0.005 | 7.18 | NMR | NMR |
| 29-Aug-22 | 0.00458 | 0.00093 | 0.00405 | < 0.0002 | 0.0136 | < 0.0004 | < 0.0050 | 1 | 0.010 | 6.60 | NMR | NMR |
| **September** | | | | | | | | | | | | |
| 5-Sep-22 | 0.00571 | 0.00092 | 0.0134 | < 0.0002 | 0.0298 | 0.0018 | < 0.0050 | < 1 | < 0.005 | 7.20 | 0 | 0 |
| 12-Sep-22 | 0.02370 | 0.00102 | 0.0142 | < 0.0002 | 0.0526 | 0.0012 | 0.0067 | 1 | 0.008 | 6.98 | NMR | NMR |
| 19-Sep-22 | 0.04070 | 0.00125 | 0.0032 | < 0.0002 | 0.0349 | 0.0005 | 0.0074 | 2 | 0.015 | 6.91 | NMR | NMR |
| **October** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **November** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **December** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |

*NDEP: No Deposit*
*NMR: No Measurement Required*

**Table 8-5 ST-MDMER-8 2022 Volume**

| Date | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | YTD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16,075 | 11,095 | 0 | 0 | 0 | |
| 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16,735 | 8,451 | 0 | 0 | 0 | |
| 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3,761 | 11,830 | 0 | 0 | 0 | |
| 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,676 | 11,803 | 0 | 0 | 0 | |
| 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14,296 | 11,777 | 0 | 0 | 0 | |
| 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14,775 | 12,471 | 0 | 0 | 0 | |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13,343 | 7,831 | 0 | 0 | 0 | |
| 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8,135 | 13,036 | 0 | 0 | 0 | |
| 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10,795 | 8,793 | 0 | 0 | 0 | |
| 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10,867 | 11,633 | 0 | 0 | 0 | |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5,190 | 8,283 | 0 | 0 | 0 | |
| 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13,559 | 16,288 | 0 | 0 | 0 | |
| 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13,574 | 7,203 | 0 | 0 | 0 | |
| 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13,571 | 11,936 | 0 | 0 | 0 | |
| 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13,538 | 13,550 | 0 | 0 | 0 | |
| 16 | 0 | 0 | 0 | 0 | 0 | 3,387 | 0 | 11,113 | 14,276 | 0 | 0 | 0 | |
| 17 | 0 | 0 | 0 | 0 | 0 | 13,075 | 0 | 13,569 | 16,031 | 0 | 0 | 0 | |
| 18 | 0 | 0 | 0 | 0 | 0 | 5,211 | 0 | 13,596 | 16,042 | 0 | 0 | 0 | |
| 19 | 0 | 0 | 0 | 0 | 0 | 2,011 | 0 | 13,580 | 16,046 | 0 | 0 | 0 | |
| 20 | 0 | 0 | 0 | 0 | 0 | 13,439 | 0 | 13,565 | 10,933 | 0 | 0 | 0 | |
| 21 | 0 | 0 | 0 | 0 | 0 | 13,270 | 0 | 13,464 | 0 | 0 | 0 | 0 | |
| 22 | 0 | 0 | 0 | 0 | 0 | 13,547 | 0 | 13,470 | 0 | 0 | 0 | 0 | |
| 23 | 0 | 0 | 0 | 0 | 0 | 13,479 | 0 | 13,461 | 0 | 0 | 0 | 0 | |
| 24 | 0 | 0 | 0 | 0 | 0 | 13,533 | 237 | 13,444 | 0 | 0 | 0 | 0 | |
| 25 | 0 | 0 | 0 | 0 | 0 | 13,486 | 11,403 | 13,480 | 0 | 0 | 0 | 0 | |
| 26 | 0 | 0 | 0 | 0 | 0 | 13,504 | 10,163 | 10,631 | 0 | 0 | 0 | 0 | |
| 27 | 0 | 0 | 0 | 0 | 0 | 13,245 | 15,060 | 11,965 | 0 | 0 | 0 | 0 | |
| 28 | 0 | 0 | 0 | 0 | 0 | 13,476 | 18,360 | 11,940 | 0 | 0 | 0 | 0 | |
| 29 | 0 | 0 | 0 | 0 | 0 | 11,919 | 17,790 | 11,899 | 0 | 0 | 0 | 0 | |
| 30 | 0 | 0 | 0 | 0 | 0 | 7,734 | 16,932 | 2,983 | 0 | 0 | 0 | 0 | |
| 31 | 0 | 0 | 0 | 0 | 0 | 0 | 14,978 | 12,197 | 0 | 0 | 0 | 0 | |
| **Total ($m^3$)** | **0** | **0** | **0** | **0** | **0** | **164,317** | **104,923** | **364,244** | **239,305** | **0** | **0** | **0** | **872,789** |

**Table 8-6 ST-MDMER-8 2022 EEM Monitoring**

| | Alkalinity | Aluminum | Cadmium | Chloride | Chromium | Cobalt | Hardness | Iron | Manganese | Mercury | Molybdenum | Nitrate | Phosphorus | Selenium | Sulphate | Thallium | Uranium | Conductivity | T° | Sub-Lethal Toxicity | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mg $CaCO_3$/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg $CaCO_3$/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg P/L | mg/L | mg/L | mg/L | mg/L | µS/cm | °C | *Ceriodaphia dubia* | *Fathead minnow* | *Lemna minor* | *Pseudokirchneriella subcapitata* |
| **Effluent characterization (65°23'51.44" N 96°44'06.13" W) (ST-MDMER-8-EEM)** | | | | | | | | | | | | | | | | | | | | | | | |
| 20-Jun-22 | 31 | 0.199 | < 0.000010 | 17 | < 0.0010 | < 0.0002 | 36.4 | 0.247 | 0.0254 | < 0.00001 | < 0.0010 | 0.74 | 0.0018 | < 0.0001 | 31 | < 0.000010 | < 0.00010 | 183.8 | 3.50 | NA | NA | NA | NA |
| 25-Jul-22 | 48 | 0.008 | < 0.000010 | 43 | 0.0075 | 0.00078 | 128 | 0.135 | 0.163 | < 0.00001 | 0.0042 | 4.24 | < 0.0010 | 0.0002 | 53 | 0.000028 | 0.00150 | 380 | 12.70 | without SE or AL | without SE or AL | without SE | without SE |
| 29-Aug-22 | 43 | 0.007 | 0.000011 | 41 | < 0.0010 | 0.00093 | 153 | 0.227 | 0.0963 | < 0.00001 | 0.0084 | 5.31 | < 0.0010 | 0.0002 | 73 | 0.000021 | 0.00151 | 422 | 6.90 | with SE without AL | without SE or AL | without SE | without SE |
| ***Annual Average** | | | | | | | | | | ***0.000005*** | | | | ***0.00016*** | | | | | | | | | |

*Annual average calculated using half the detection limit
*SE: Sub-Lethal effects*
*AL: Acute Lethality*
*NMR: No measure requirement*
*NA: No measurement recorded*

| | Unionized Ammonia | Alkalinity | Aluminum | Cadmium | Chloride | Chromium | Cobalt | Hardness | Iron | Manganese | Mercury | Molybdenum | Nitrate | Phosphorus | Selenium | Sulphate | Thallium | Uranium | Conductivity | T° | pH | $O_2$ | $O_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mg N/L | mg $CaCO_3$/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg $CaCO_3$/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg P/L | mg/L | mg/L | mg/L | mg/L | µS/cm | °C | | % | mg/L |
| **Water Quality Monitoring Exposure Area (65°23'54.4" N 96°44'21.6"W) (EEM-7-MAME-2)** | | | | | | | | | | | | | | | | | | | | | | | |
| 26-Jul-22 | < 0.0004 | 15 | 0.0167 | < 0.000025 | 14 | 0.0007 | 0.000078 | 1630 | 0.0499 | 0.0106 | < 0.00001 | 0.0006 | 0.22 | < 0.0010 | < 0.00020 | 14 | 0.000023 | 0.000136 | 240.0 | 15.20 | 7.06 | 104.6 | 9.32 |
| 28-Aug-22 | < 0.0004 | 20 | 0.00487 | < 0.000005 | 19 | < 0.0001 | 0.000123 | 53.9 | 0.0297 | 0.0124 | < 0.00001 | 0.00128 | 0.74 | 0.0016 | 0.000088 | 21 | < 0.000002 | 0.000202 | 155.5 | 7.00 | 7.11 | 102.4 | 10.6 |
| **Water Quality Monitoring Reference Area (64°58'10.90" N 96°09'51.37" W) (ST-MMER-1-EEM-TPS)** | | | | | | | | | | | | | | | | | | | | | | | |
| 25-Jul-22 | < 0.0004 | 8.5 | 0.0048 | < 0.000010 | < 1.0 | < 0.0010 | < 0.00020 | 9.67 | 0.030 | 0.001300 | < 0.00001 | < 0.0010 | < 0.10 | < 0.005 | < 0.00010 | 4.3 | < 0.000010 | < 0.00010 | 27.7 | 13.30 | 7.53 | NA | NA |
| 28-Aug-22 | < 0.0004 | 6.1 | 0.0046 | < 0.000005 | < 1.0 | 0.0001 | 0.000008 | 9.54 | 0.0074 | 0.000959 | < 0.00001 | 0.000093 | < 0.10 | 0.003 | < 0.00004 | 4.2 | < 0.000002 | 0.000035 | 126.7 | 9.96 | 6.12 | 100.4 | 11.34 |

| | Arsenic | Copper | Cyanide | Lead | Nickel | Ra226 | TSS | Zinc |
|---|---|---|---|---|---|---|---|---|
| | mg/L | mg/L | mg/L | mg/L | mg/L | Bq/L | mg/L | mg/L |
| **Water Quality Monitoring Exposure Area (65°23'54.4" N 96°44'21.6"W) (EEM-7-MAME-2)** | | | | | | | | |
| 26-Jul-22 | 0.00150 | 0.00163 | 0.00063 | 0.000097 | 0.00202 | < 0.005 | 1 | 0.00277 |
| 28-Aug-22 | 0.00128 | 0.00055 | 0.00083 | 0.000007 | 0.00230 | < 0.005 | 1 | 0.00075 |
| **Water Quality Monitoring Reference Area (64°58'10.90" N 96°09'51.37" W) (ST-MMER-1-EEM-TPS)** | | | | | | | | |
| 25-Jul-22 | 0.00021 | 0.00051 | < 0.00050 | < 0.00020 | < 0.0010 | < 0.005 | < 1 | < 0.0050 |
| 28-Aug-22 | 0.000184 | 0.000326 | 0.00132 | 0.000006 | 0.00037 | < 0.005 | < 1 | 0.00078 |

**Table 8-7 ST-MDMER-11 2022 MDMER Monitoring**

| Month | As | Cu | CN | Pb | Ni | $NH_3$ | Zn | TSS | Ra 226 | pH | Results for Rainbow Trout Acute Lethality Tests | Results for Daphnia magna Monitoring Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg/L | | (mean percentage mortality in 100% effluent test concentration) | (mean percentage mortality in 100% effluent test concentration) |
| **January** | | | | | | | | | | | | |
| 8-Jan-22 | 0.01130 | 0.00196 | 0.01750 | < 0.0002 | 0.0332 | 0.00012 | 0.0086 | 6 | 0.006 | 6.67 | NMR | NMR |
| 10-Jan-22 | 0.00129 | 0.00115 | 0.00968 | < 0.0002 | 0.0059 | 0.00010 | 0.0070 | 2 | < 0.005 | 7.03 | 0 | 0 |
| **February** | | | | | | | | | | | | |
| 26-Feb-22 | 0.00682 | 0.00168 | 0.00344 | < 0.0002 | 0.0234 | 0.00032 | 0.0127 | 4 | 0.024 | 7.04 | NMR | NMR |
| 28-Feb-22 | 0.06200 | 0.00123 | 0.02360 | < 0.0002 | 0.0746 | 0.00058 | 0.0151 | 7 | 0.027 | 6.65 | 0 | 0 |
| **March** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **April** | | | | | | | | | | | | |
| 3-Apr-22 | 0.442 | 0.00292 | 0.0330 | 0.0002 | 0.221 | 0.00522 | 0.0106 | 1 | 0.023 | 7.30 | 0 | 0 |
| 25-Apr-22 | 0.187 | 0.00188 | 0.0245 | < 0.0002 | 0.189 | 0.00262 | 0.0098 | < 3 | < 0.005 | 7.15 | NMR | NMR |
| **May** | | | | | | | | | | | | |
| 23-May-22 | 0.00574 | 0.00092 | 0.00881 | < 0.0002 | 0.0243 | < 0.0004 | 0.0077 | 1 | < 0.005 | 6.87 | NA | 0 |
| 30-May-22 | 0.00525 | 0.00092 | 0.00254 | < 0.0002 | 0.0241 | < 0.0004 | 0.0066 | 1 | 0.008 | 6.73 | NMR | NMR |
| **June** | | | | | | | | | | | | |
| 6-Jun-22 | 0.00880 | 0.00118 | 0.01150 | < 0.0002 | 0.0165 | 0.0006 | 0.0055 | 2 | < 0.005 | 6.86 | 0 | 0 |
| 13-Jun-22 | 0.00496 | 0.00131 | 0.00708 | < 0.0002 | 0.0129 | 0.0006 | < 0.0050 | 2 | < 0.005 | 7.11 | NMR | NMR |
| **July** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **August** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **September** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **October** | | | | | | | | | | | | |
| 3-Oct-22 | 0.0129 | 0.00082 | 0.00402 | < 0.0002 | 0.0243 | 0.0008 | < 0.005 | 1 | 0.009 | 7.19 | 0 | 10 |
| 10-Oct-22 | 0.0134 | 0.00143 | 0.01210 | < 0.0002 | 0.0383 | 0.0008 | < 0.005 | 3 | < 0.005 | 7.01 | NMR | NMR |
| 17-Oct-22 | 0.0130 | 0.00099 | 0.00914 | < 0.0002 | 0.0370 | 0.0023 | < 0.005 | 1 | 0.008 | 7.57 | NMR | NMR |
| 24-Oct-22 | 0.0149 | 0.00161 | 0.02850 | < 0.0002 | 0.0374 | 0.0044 | < 0.005 | 2 | 0.011 | 7.36 | NMR | NMR |
| **November** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **December** | | | | | | | | | | | | |
| NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |

*NDEP: No Deposit*
*NMR: No Measurement Required*

**Table 8-8 ST-MDMER-11 2022 Volume**

| Date | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | YTD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 0 | 0 | 17,563 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 2 | 0 | 0 | 0 | 0 | 0 | 34,750 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 3 | 0 | 0 | 0 | 4,772 | 0 | 36,926 | 0 | 0 | 0 | 6,034 | 0 | 0 | |
| 4 | 0 | 0 | 0 | 14,007 | 0 | 36,734 | 0 | 0 | 0 | 445 | 0 | 0 | |
| 5 | 0 | 0 | 0 | 14,780 | 0 | 35,913 | 0 | 0 | 0 | 10,192 | 0 | 0 | |
| 6 | 0 | 0 | 0 | 10,915 | 0 | 35,945 | 0 | 0 | 0 | 17,607 | 0 | 0 | |
| 7 | 4,455 | 0 | 0 | 0 | 0 | 36,386 | 0 | 0 | 0 | 18,266 | 0 | 0 | |
| 8 | 15,472 | 0 | 0 | 0 | 0 | 37,305 | 0 | 0 | 0 | 15,862 | 0 | 0 | |
| 9 | 16,507 | 0 | 0 | 0 | 0 | 37,157 | 0 | 0 | 0 | 9,839 | 0 | 0 | |
| 10 | 15,396 | 0 | 0 | 0 | 0 | 24,463 | 0 | 0 | 0 | 10,296 | 0 | 0 | |
| 11 | 16,724 | 0 | 0 | 0 | 0 | 12,941 | 0 | 0 | 0 | 14,222 | 0 | 0 | |
| 12 | 14,767 | 0 | 0 | 0 | 0 | 13,495 | 0 | 0 | 0 | 16,033 | 0 | 0 | |
| 13 | 12,746 | 0 | 0 | 0 | 0 | 13,515 | 0 | 0 | 0 | 16,011 | 0 | 0 | |
| 14 | 0 | 0 | 0 | 0 | 0 | 13,492 | 0 | 0 | 0 | 16,556 | 0 | 0 | |
| 15 | 0 | 0 | 0 | 0 | 0 | 13,461 | 0 | 0 | 0 | 16,885 | 0 | 0 | |
| 16 | 0 | 0 | 0 | 0 | 0 | 10,107 | 0 | 0 | 0 | 15,560 | 0 | 0 | |
| 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13,444 | 0 | 0 | |
| 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 13,812 | 0 | 0 | |
| 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14,567 | 0 | 0 | |
| 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 15,912 | 0 | 0 | |
| 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14,031 | 0 | 0 | |
| 22 | 0 | 0 | 0 | 0 | 5,460 | 0 | 0 | 0 | 0 | 14,641 | 0 | 0 | |
| 23 | 0 | 0 | 0 | 0 | 15,451 | 0 | 0 | 0 | 0 | 15,763 | 0 | 0 | |
| 24 | 0 | 0 | 0 | 12,889 | 14,615 | 0 | 0 | 0 | 0 | 16,826 | 0 | 0 | |
| 25 | 0 | 0 | 0 | 6,434 | 14,964 | 0 | 0 | 0 | 0 | 13,774 | 0 | 0 | |
| 26 | 0 | 5,997 | 0 | 0 | 13,295 | 0 | 0 | 0 | 0 | 13,156 | 0 | 0 | |
| 27 | 0 | 12,674 | 0 | 0 | 14,488 | 0 | 0 | 0 | 0 | 13,131 | 0 | 0 | |
| 28 | 0 | 3,702 | 0 | 0 | 18,598 | 0 | 0 | 0 | 0 | 13,014 | 0 | 0 | |
| 29 | 0 | 0 | 0 | 0 | 9,448 | 0 | 0 | 0 | 0 | 11,802 | 0 | 0 | |
| 30 | 0 | 0 | 0 | 0 | 24,446 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 31 | 0 | 0 | 0 | 0 | 24,453 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| **Total ($m^3$)** | **96,067** | **22,373** | **0** | **63,796** | **155,217** | **410,152** | **0** | **0** | **0** | **367,681** | **0** | **0** | **1,115,285** |

**Table 8-9 ST-MDMER-11 2022 EEM Monitoring**

| | Alkalinity | Aluminum | Cadmium | Chloride | Chromium | Cobalt | Hardness | Iron | Manganese | Mercury | Molybdenum | Nitrate | Phosphorus | Selenium | Sulphate | Thallium | Uranium | Conductivity | T° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mg $CaCO_3$/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg $CaCO_3$/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg P/L | mg/L | mg/L | mg/L | mg/L | µS/cm | °C |
| **Effluent characterization (65°23'51.30"N 96°40'49.00" W) (ST-MDMER-11-EEM)** | | | | | | | | | | | | | | | | | | | |
| 10-Jan-22 | 41 | 0.0088 | < 0.000010 | 23 | < 0.0010 | 0.00103 | 96.2 | 0.349 | 0.307 | < 0.00001 | 0.0021 | 0.59 | < 0.0010 | < 0.00010 | 39 | < 0.000010 | 0.00063 | 239.0 | -0.30 |
| 3-Apr-22 | 83 | 0.0092 | 0.000013 | 62 | < 0.0010 | 0.00508 | 185 | 0.103 | 0.352 | < 0.00001 | 0.0108 | 3.68 | 0.0057 | 0.00016 | 69 | 0.000023 | 0.00233 | 540.0 | 0.70 |
| 6-Jun-22 | 37 | 0.0225 | < 0.000010 | 27 | < 0.0010 | 0.00129 | 79.9 | 0.197 | 0.227 | < 0.00001 | 0.0029 | 1.28 | 0.0049 | 0.00012 | 33 | < 0.000010 | 0.00078 | 248.0 | 3.40 |
| 3-Oct-22 | 38 | 0.0130 | 0.000011 | 80 | < 0.0010 | 0.00146 | 221 | 0.222 | 0.164 | < 0.00001 | 0.0085 | 4.33 | < 0.0010 | 0.00047 | 99 | 0.000016 | 0.00338 | 545.0 | 2.10 |
| ***Annual Average** | | | | | | | | | | ***0.000005*** | | | | ***0.00020*** | | | | | |

**Annual average calculated using half the detection limit*
*SE: Sub-Lethal effects*
*AL: Acute Lethality*
*NMR: No measure requirement*
*NA: No measurement recorded*

| | Unionized Ammonia | Alkalinity | Aluminum | Cadmium | Chloride | Chromium | Cobalt | Hardness | Iron | Manganese | Mercury | Molybdenum | Nitrate | Phosphorus | Selenium | Sulphate | Thallium | Uranium | Conductivity | T° | pH | $O_2$ | $O_2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mg N/L | mg $CaCO_3$/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg $CaCO_3$/L | mg/L | mg/L | mg/L | mg/L | mg/L | mg P/L | mg/L | mg/L | mg/L | mg/L | µS/cm | °C | | % | mg/L |
| **Water Quality Monitoring Exposure Area (65°23'45.88" N 96°41'16.21" W) (WTSE-1)** | | | | | | | | | | | | | | | | | | | | | | | |
| 13-Jan-22 | < 0.00005 | 20 | < 0.005 | < 0.00002 | 13.7 | < 0.0006 | < 0.00050 | 49 | 0.09 | 0.0342 | < 0.00001 | 0.0008 | 0.36 | < 0.0100 | < 0.00050 | 13.8 | < 0.0002 | < 0.001 | 122.3 | 0.60 | 6.54 | 15.01 | 105.5 |
| 28-Feb-22 | < 0.0004 | 22 | 0.00869 | < 0.000005 | 16.0 | 0.0002 | 0.000118 | 46.1 | 0.147 | 0.0267 | < 0.00001 | 0.000587 | 0.46 | 0.0028 | 0.00005 | 15 | 0.000004 | 0.000287 | 158.1 | 0.10 | 7.44 | 13.21 | 98.2 |
| 3-Apr-22 | < 0.0004 | 23 | 0.00568 | < 0.000005 | 15.0 | 0.0002 | 0.000068 | 45.5 | 0.0484 | 0.0142 | < 0.00001 | 0.000479 | 0.55 | 0.0018 | 0.000049 | 15 | 0.000003 | 0.000178 | 130.8 | 0.89 | 7.06 | 12.42 | 97.6 |
| **Water Quality Monitoring Reference Area (64°58'10.90" N 96°09'51.37" W) (ST-MMER-1-EEM-TPS)** | | | | | | | | | | | | | | | | | | | | | | | |
| 28-Feb-22 | < 0.0004 | 7.1 | 0.0052 | 0.000025 | < 1.0 | < 0.0010 | < 0.00020 | 11.10 | < 0.010 | 0.002300 | < 0.00001 | < 0.0010 | < 0.10 | 0.001 | < 0.00010 | 4.9 | < 0.000010 | < 0.00010 | 29.8 | 0.69 | 6.51 | 16.1 | 115.20 |
| 3-Apr-22 | < 0.0004 | 6.9 | 0.0016 | < 0.000005 | < 1.0 | < 0.0001 | 0.000005 | 9.89 | 0.0014 | 0.000284 | < 0.00001 | 0.000107 | < 0.10 | < 0.001 | < 0.00004 | 4.7 | < 0.000002 | 0.000039 | 0.0 | 0.8 | 7.36 | 13.3 | 109.10 |

| | Arsenic | Copper | Cyanide | Lead | Nickel | Ra226 | TSS | Zinc |
|---|---|---|---|---|---|---|---|---|
| | mg/L | mg/L | mg/L | mg/L | mg/L | Bq/L | mg/L | mg/L |
| **Water Quality Monitoring Exposure Area (65°23'45.88" N 96°41'16.21" W) (WTSE-1)** | | | | | | | | |
| 13-Jan-22 | 0.0019 | 0.0016 | 0.004 | < 0.00017 | 0.0049 | < 0.005 | 2 | < 0.001 |
| 28-Feb-22 | 0.00206 | 0.000684 | < 0.0005 | 0.000020 | 0.0041 | < 0.005 | 1 | 0.00181 |
| 3-Apr-22 | 0.000826 | 0.000699 | 0.00505 | 0.000008 | 0.0039 | < 0.005 | < 1 | 0.00077 |
| **Water Quality Monitoring Reference Area (64°58'10.90" N 96°09'51.37" W) (ST-MMER-1-EEM-TPS)** | | | | | | | | |
| 28-Feb-22 | 0.000210 | 0.000510 | < 0.0050 | < 0.00020 | < 0.0010 | < 0.005 | < 1 | 0.0157 |
| 3-Apr-22 | 0.000188 | 0.000391 | < 0.0005 | < 0.000005 | 0.0005 | < 0.005 | < 1 | 0.00052 |

## 8.4 ENVIRONMENTAL BIOLOGICAL STUDY

### 8.4.1 Meadowbank Site - EEM Study Design Cycle 4

Seepage water is collected along the East Dike and discharged to Second Portage Lake via outfall MMER-3, but during Cycles 1, 2 and 3, this Final Discharge Point (FDP) has been determined as not being the effluent with the greatest potential to have an adverse effect on the receiving environment than discharges to Third Portage or Wally Lakes, and so EEMs focused on those other discharges. Since the effluent discharge to Wally Lake and Third Portage Lake ceased, the seepage water discharged to Second Portage Lake is the only final discharge point and, therefore, the Cycle 4 EEM exposure area under the MDMER. As per the regulation, field work for the EEM Cycle 4th was to be conducted in 2020. EEM Cycle 4 Study Design was submitted to ECCC on March 2nd, 2020 and more details regarding the design submitted can be found in Appendix 35 of the 2020 Annual Report. Comments on the study design were received on May 5th, 2020 and Agnico Eagle's response was submitted on June 1st, 2020 (Appendix 36 of the 2020 Annual Report). ECCC's approval for this EEM Cycle 4 Study Design was received on June 15th, 2020. The Cycle 4 Interpretative Report was submitted to ECCC on June 30th, 2021 (Appendix 34 of the 2021 Annual Report). On November 29th, 2022, comments from ECCC were received. Agnico Eagle's response was submitted on February 10th, 2023.

As required under the Metal and Diamond Mining Effluent Regulations, Agnico Eagle is required to conduct in 2023 the Cycle 5 study. The Cycle 5 study design was submitted to ECCC in February 2023. The next interpretive report and biological monitoring data are due on July 1st, 2024.

Agnico Eagle will continue to provide KivIA and other regulators copies of reports and data submitted to ECCC via the Annual Report once approval is received.

### 8.4.2 Whale Tail Site - EEM Study Design Cycle 1

During the Whale Tail dike construction, water was pumped from the area enclosed by sediment curtains to create an inflow and thus minimize dispersal of water from within the enclosed area, with increased suspended sediment concentrations, into the rest of Whale Tail Lake. That pumping began on July 27th , 2018, at which time Whale Tail Mine was deemed by Environment and Climate Change Canada to be subject to the Metal and Diamond Mining Effluent Regulations (MDMER) under the Fisheries Act. The MDMER requires that a first study design for the biological studies be submitted to the Minister of the Environment not later than 12 months after the day on which a mine becomes subject to section 7 of the MDMER. On July 26th, 2019, Agnico Eagle have provided to ECCC the First EEM Biological Study Design. More details regarding the design submitted can be found in Appendix 39 of the 2019 Annual Report. Comments on the study design was received on February 10th, 2020 and Agnico Eagle's response was submitted on June 19th, 2020 (Appendix 37 of the 2020 Annual Report). ECCC approval for this EEM Cycle 1 Study Design was received on July 3rd, 2020. The Cycle 1 Interpretative Report was submitted on July 26th, 2021 (Appendix 35 of the 2021 Annual Report). On November 10th, 2022, comments from ECCC were received and Agnico Eagle's response was submitted on February 10th, 2023.

As required under the Metal and Diamond Mining Effluent Regulations, Agnico Eagle is required to conduct in 2023 the Cycle 2 study. The Cycle 2 study design was submitted to ECCC in February 2023. The next interpretive report and biological monitoring data are due on July 27th, 2024.

Agnico Eagle will continue to provide KivIA and other regulators copies of reports and data submitted to ECCC via the Annual Report once approval is received.

## 8.5 MINE SITE WATER QUALITY AND FLOW MONITORING

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 15:** ***The results and interpretation of the Monitoring Program in accordance with Part I and Schedule I.***

And

**As required by NWB Water License 2AM-WTP1830 Schedule B, Item 18:** ***The results and interpretation of the Monitoring Program in accordance with Part I and Schedule I.***

And

**As required by DFO Authorizations NU-03-0191.3 Condition 3.1 (Second and Third Portage Lakes), NU-03-0191.4 (Vault Lake) Condition 3.1; NU-03-0190 Condition 5 (AWPAR), NU-14-1046 (Phaser Lake) Condition 3;** ***Submit written report summarizing monitoring results and photographic record of works and undertakings.***

This section includes the aquatic monitoring requirements as detailed under the Meadowbank Water Quality and Flow Monitoring Plan and the Whale Tail Water Quality and Flow Monitoring Plan. Summaries of associated aquatic monitoring reports are presented in the following section of this report and supporting documents are located in the listed appendices. Figures 1, 2, 3, 4 and 6 illustrate the location of sampling stations at the Meadowbank and Whale Tail mine sites, EEM receiving environment monitoring program, Vault Site, and Baker Lake marshalling facilities respectively. Certificates of Analysis will be made available on request for Meadowbank and Whale Tail. All tables from this section include historical data since 2017, if available.

### 8.5.1 Construction Activities

#### 8.5.1.1 *Meadowbank Site*

**As required by DFO Authorization NU-03-0191.3 Condition 3.1:** ***The Proponent shall undertake monitoring and report to DFO annually, by March 31st, whether works, undertakings, activities or operations for the mitigation of potential impacts to fish and fish habitat were conducted according to the conditions of this Authorization.***

And

**As required by DFO Authorization NU-03-0191.4 Condition 3.1:** ***The Proponent shall undertake monitoring and report to DFO annually, by December 31st, whether works, undertakings, activities or operations for the mitigation of potential impacts to fish and fish habitat were conducted according to the conditions of this Authorization.***

And

**As required by DFO Authorization 14-HCAA-01046 Condition 3.1:** ***The Proponent shall monitor the implementation of avoidance and mitigation measures referred to in section 2 of this authorization and report to***

***DFO, by March 31 annually and indicate whether the measures and standards to avoid and mitigate serious harm to fish were conducted according to the conditions of this authorization.***

In 2022, there were no occurrences where runoff water from any work, undertaking, activity or operation would flow directly or indirectly into a water body at the Meadowbank site. No mitigation action was necessary.

#### 8.5.1.2 *Whale Tail Site*

**As required by DFO Authorization 16-HCAA-00370 Condition 3.1:** ***The Proponent shall monitor the implementation of avoidance and mitigation measures referred to in section 2 of this authorization, and provide a stand-alone report to DFO, by March 31, annually and indicate whether the measures and standards to avoid and mitigate serious harm to fish were conducted according to the conditions of this authorization.***

And

**As required by DFO Authorization 20-HCAA-00275 Condition 3.1:** ***The Proponent shall monitor the implementation of avoidance and mitigation measures referred to in section 2 of this authorization, and provide a stand-alone report to DFO, by March 31, annually and indicate whether the measures and standards to avoid and mitigate serious harm to fish were conducted according to the conditions of this authorization.***

And

**As required by DFO Authorization 16-HCAA-00370 Condition 3.1.1:** ***The report in addition to the above shall summarizes the monitoring results related to fish and fish habitat contained in the documents listed in section 2.3. The report shall include a description of the implementation as well as an evaluation of the effectiveness of those monitoring programs in validating the changes to fish and fish habitat predicted in the Proponent's Environmental Impact Statement.***

And

**As required by DFO Authorization 20-HCAA-00275 Condition 3.1.1:** ***Demonstration of effective implementation and functioning: Providing dated photographs and inspection reports to demonstrate effective implementation and functioning of mitigation measures and standards described above to limit the impacts to fish and fish habitat to what is covered by this authorization.***

And

**As required by DFO Authorization 20-HCAA-00275 Condition 3.1.2:** ***Contingency measures: Providing details of any contingency measures that were followed, to prevent impacts greater than those covered by this authorization in the event that mitigation measures did not function as described.***

And

**As required by DFO Authorization 16-HCAA-00370 Condition 3.1.2:** ***Each year, following the submission of the annual monitoring report to DFO, the Proponent shall arrange to meet with DFO and interested parties (e.g. Kivalliq Inuit Association) to review the results of the previous year's monitoring programs. The results of the meetings and any mutually agreed upon modifications aimed at improving the effectiveness of the monitoring***

***programs shall be incorporated into the upcoming year of the monitoring programs. The Proponent shall update the monitoring programs/plans to reflect the changes, and the programs/plans shall be approved in writing by DFO prior to implementation.***

And

**As required by DFO Authorization 20-HCAA-00275 Condition 3.2.1:** ***Each year, following the submission of the annual monitoring report to DFO, the Proponent shall arrange to meet with DFO and interested parties (e.g. Kivalliq Inuit Association) to review the results of the previous year's monitoring programs. The results of the meetings and any mutually agreed upon modifications aimed at improving the effectiveness of the monitoring programs shall be incorporated into the upcoming year of the monitoring programs. The Proponent shall update the monitoring programs/plans to reflect the changes, and the programs/plans shall be approved in writing by DFO prior to implementation.***

And

**As required by DFO Authorization 16-HCAA-00370 Condition 3.1.3:** ***The annual monitoring report shall provide dated photographs with GPS coordinates and description of locations and inspection reports to demonstrate effective implementation and functioning of mitigation measures and standards described above to limit the serious harm to fish to what is covered by this authorization.***

And

**As required by DFO Authorization 16-HCAA-00370 Condition 3.1.4:** ***The annual monitoring report shall also provided details of any contingency measures that were followed to prevent impacts greater than those covered by this authorization in the event that mitigation measures did not function as described.***

By March 31st, 2023, Agnico Eagle will provide to DFO the 2022 Report on the Implementation of Measures to Avoid and Mitigate Serious Harm to Fish to address the above Conditions of the Whale Tail Fisheries Act Authorization 16-HCAA-00370 and 20-HCAA-00275. The complete report is provided as Appendix 38.

This report was developed in fulfillment of Condition 3 of these FAAs, which relates to the monitoring and reporting of measures and standards to avoid and mitigate serious harm to fish. In fulfillment of Condition 3.1, the report summarizes the implementation of the specified measures and standards to avoid and mitigate serious harm to fish. Photos and/or figures of the mitigation measures are included, as applicable (according to Condition 3.1.3 of 16-HCAA-00370 and Condition 3.1.1 of 20-HCAA-00275), along with a commentary on effectiveness based on relevant monitoring results, and any required contingency measures in the event that the mitigation did not function successfully (according to Condition 3.1.4/3.1.2).

As required by FAA 16HCAA-00370 Condition 3.1.1, an evaluation of the effectiveness of the FAA-listed monitoring programs (and other relevant monitoring programs) in validating changes to fish and fish habitat predicted in the Project FEIS is provided in Section 12.5.1.3 below as a component of the Post-Environmental Assessment Monitoring Program. This approach was adopted beginning in 2021, in consultation with DFO, in an effort to reduce redundancy in reporting and better focus this report on the implementation and effectiveness of the avoidance and mitigation measures.

In summary, all measures and standards to avoid and mitigate serious harm to fish identified in Condition 2 of FAA 16-HCAA-00370 and 20-HCAA-00275 were implemented as required in 2022. In most cases, monitoring results demonstrated these primary mitigation and avoidance measures to be effective. The implementation of contingency mitigation for the protection of fish and fish habitat was limited to corrective measures for two exceedances of peak-particle velocity measurements under the Blast Monitoring Plan. The FAA-listed and FEIS-planned mitigation measures and standards were therefore considered effective in limiting impacts of construction activities on fish and fish habitat to those authorized, and presented in Appendix 38.

In fulfillment of 16-HCAA-00370 Condition 3.1.2 and 20-HCAA-00275 Condition 3.2.1, Agnico Eagle organized a conference call with DFO and the Kivalliq Inuit Association on November 16th, 2022, to review the results of the previous year's program (2021 Report on the Implementation of Measures to Avoid and Mitigate Serious Harm – Whale Tail Project). Minutes were recorded and circulated, with no comments were received. During the meeting, one comment was made by DFO that a historical summary of blast monitoring results and associated mitigation would be useful, and Agnico Eagle has provided that summary in the 2022 Implementation of Measures to Avoid and Mitigate Serious Harm to Fish report (Appendix 38).

### 8.5.2 Dike Construction and Dewatering Activities

#### 8.5.2.1 *Meadowbank Site*

No dike construction or dewatering activities occurred in 2022.

#### 8.5.2.2 *Whale Tail Site*

Whale Tail Dike remediation work located on the downstream side of the east abutment of the Whale Tail Dike started in 2022 to ensure the performance of the structure. In August 2022 it was observed that the natural soil on the Eastern abutment had settled allowing water to ingress further into the East abutment which leads to rapid thawing of the Eastern abutment foundation and the development of cracks on the crest and sloughing of the dike slope in that area.

On September 22nd, 2022, Agnico Eagle advised DFO and NWB of their intent to start construction of a thermal berm at the Eastern upstream abutment of Whale Tail Dike as a remediation measure. This measure was strongly supported by the Meadowbank Dike Review Board (MDRB) as per their recommendation received on September 16th, 2022. The thermal berm was a component of the previously approved Whale Tail Dike design, approved by the NWB on July 16th, 2018, but construction of this portion was delayed until the present time since there was uncertainty as to its necessity.

The in-water remediation work of Whale Tail Dike started on September 25th and was completed on September 27th, 2022. The aggregate source of the material used to construct the first phase of the thermal berm was non-acid generating and non-metal leaching. In keeping with erosion and sediment control plans included in the original Whale Tail Dike design report and following the Water Quality Monitoring and Management Plan for Dike Construction and Dewatering, Agnico Eagle had in place erosion and sediment control measures to limit the migration of suspended sediment into Whale Tail Lake. Two turbidity curtains were deployed, one inner and one outer, before commencing any works and water quality monitoring for TSS was performed during and after the work and compared to limits established in Part D, Item 7 of the Water License. (Table 8-10).

**Table 8-10 Maximum allowable TSS concentrations during dike construction (NWB Type A 2AM-WTP1830 Part D Item 7)**

| Parameter | Maximum Monthly Mean (mg/L) | Short-Term Maximum (mg/L) |
|---|---|---|
| TSS in all other areas and at times when eggs/larvae are not present | 15 | 50 |
| TSS in impounded areas at all times in all areas | 15 | 50 |

Water quality monitoring was conducted by surface grab samples outside of the turbidity curtains in Whale Tail Lake (station ST-WT-DC-12), before, during and after the in-water remediation work. The Environment Department measured daily the temperature, pH, conductivity, turbidity, and dissolved oxygen. TSS were performed daily by Agnico Eagle's onsite assay laboratory using standard methods. Accredited laboratory analysis for TSS, nutrients, major ions, and metals (full suite) was also conducted weekly during and after the in-water work.

The internal and external monitoring results are presented in Table 8-11 below. All results were less than available CCME Water Quality Guidelines for the Protection of Aquatic Life and Water License Part D Item 7 (Table 8-10).

No dewatering activities occurred in 2022.

**Table 8-11 Water Quality Monitoring Whale Tail Dike Construction (ST-WT-DC-12)**

| ST-WT-DC-12 Parameter | CCME* | Unit | *Annual Average* | 9/23/2022 | 9/24/2022 | 9/25/2022 | 9/26/2022 | 9/27/2022 | 9/28/2022 | 9/29/2022 | 9/30/2022 | 10/1/2022 | 10/2/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Field Measured** | | | | | | | | | | | | | |
| Temperature | | °C | *3.4* | 5 | 5.8 | 3.6 | 2.5 | 3.6 | 4 | 3 | 2.1 | 1.2 | 3.2 |
| pH | 6.5-9.0 | pH units | *7.4* | 7.12 | 7.27 | 7.47 | 7.11 | 7.36 | 7.52 | 7.73 | 7.69 | 7.39 | 7.31 |
| Total Suspended Solids | | mg/L | *4.5* | 7.5 | 1.5 | 6.0 | 1.5 | 8.5 | 4.5 | 4.0 | 5.5 | 1.0 | 5.0 |
| Conductivity | | uS/cm | *109.3* | 96.3 | 107 | 93.9 | 98.4 | 108.6 | 169.2 | 136.7 | 98.1 | 91.8 | 92.7 |
| Dissolved oxygen | | mg/L | *11.72* | 12.05 | 11.18 | 11.13 | 11.17 | 12.46 | 11.6 | 12.53 | 12.57 | 11.52 | 10.96 |
| Turbidity | | NTU | *4.54* | 2.05 | 1.90 | 1.83 | 1.50 | 11.30 | 4.24 | 10.20 | 3.63 | 5.04 | 3.75 |
| **Conventional Parameters** | | | | | | | | | | | | | |
| Hardness, as CaCO3 | | mg/L | *35.1* | - | - | 36.4 | - | - | - | - | - | - | 33.7 |
| Total alkalinity, as $CaCO_3$ | | mg/L | *16.5* | - | - | 17 | - | - | - | - | - | - | 16 |
| Carbonate, as $CaCO_3$ | | mg/L | *1* | - | - | < 1.0 | - | - | - | - | - | - | < 1.0 |
| Bicarbonate, as $CaCO_3$ | | mg/L | *16.5* | - | - | 17 | - | - | - | - | - | - | 16 |
| Hydroxide, as $CaCO_3$ | | mg/L | *1* | - | - | < 1.0 | - | - | - | - | - | - | < 1.0 |
| TDS | | mg/L | *45* | - | - | 35 | - | - | - | - | - | - | 55 |
| TSS | 26[1] | mg/L | *2* | - | - | 2 | - | - | - | - | - | - | 2 |
| Total organic carbon | | mg/L | *3.35* | - | - | 3.4 | - | - | - | - | - | - | 3.3 |
| Dissolved organic carbon | | mg/L | *3.1* | - | - | 3.1 | - | - | - | - | - | - | 3.1 |
| **Major Ions** | | | | | | | | | | | | | |
| Chloride | 120 | **mg/L** | *12* | - | - | 12 | - | - | - | - | - | - | 12 |
| Silica | | **mg/L** | *0.19* | - | - | 0.14 | - | - | - | - | - | - | 0.24 |
| Sulfate | | **mg/L** | *9.75* | - | - | 9.5 | - | - | - | - | - | - | 10.0 |
| **Nutrients and Chlorophyll a** | | | | | | | | | | | | | |
| Ammonia ($NH_3$) | | mg/L | *0.061* | - | - | < 0.061 | - | - | - | - | - | - | < 0.061 |
| Nitrate | 13 | mg N/L | *0.17* | - | - | 0.15 | - | - | - | - | - | - | 0.18 |
| Nitrite | 0.06 | mg N/L | *0.01* | - | - | < 0.010 | - | - | - | - | - | - | < 0.010 |
| Total Kjeldahl nitrogen | | mg N/L | *0.14* | - | - | 0.17 | - | - | - | - | - | - | 0.11 |
| Total phosphorus | 0.004 | mg P/L | *0.0034* | - | - | 0.0035 | - | - | - | - | - | - | 0.0033 |
| Orthophosphate | | mg P/L | *0.01* | - | - | < 0.010 | - | - | - | - | - | - | < 0.010 |
| Chlorophyll a | | mg/L | *0.0029* | - | - | 0.0018 | - | - | - | - | - | - | 0.0040 |
| **Total Metals** | | | | | | | | | | | | | |
| Aluminum | 0.1 | mg/L | *0.0265* | - | - | 0.0185 | - | - | - | - | - | - | 0.0344 |
| Antimony | | mg/L | *0.00057* | - | - | 0.00061 | - | - | - | - | - | - | 0.00053 |
| Arsenic | 0.005 | mg/L | *0.00082* | - | - | 0.00086 | - | - | - | - | - | - | 0.00077 |
| Barium | | mg/L | *0.0149* | - | - | 0.0155 | - | - | - | - | - | - | 0.0142 |
| Beryllium | | mg/L | *0.00010* | - | - | < 0.00010 | - | - | - | - | - | - | < 0.00010 |
| Boron | 1.5 | mg/L | *0.050* | - | - | < 0.050 | - | - | - | - | - | - | < 0.050 |
| Cadmium | 0.00007 | mg/L | *0.00001* | - | - | < 0.000010 | - | - | - | - | - | - | < 0.000010 |
| Chromium | | mg/L | *0.0010* | - | - | < 0.0010 | - | - | - | - | - | - | < 0.0010 |
| Copper | 0.002 | mg/L | *0.00056* | - | - | 0.00052 | - | - | - | - | - | - | 0.00059 |
| Iron | 0.3 | mg/L | *0.0785* | - | - | 0.060 | - | - | - | - | - | - | 0.097 |
| Lead | 0.001 | mg/L | *0.00020* | - | - | < 0.00020 | - | - | - | - | - | - | < 0.00020 |
| Lithium | | mg/L | *0.0020* | - | - | < 0.0020 | - | - | - | - | - | - | < 0.0020 |
| Manganese | 2.74 | mg/L | *0.0073* | - | - | 0.0066 | - | - | - | - | - | - | 0.0079 |
| Mercury | 0.000026 | mg/L | *0.00001* | - | - | < 0.00001 | - | - | - | - | - | - | < 0.00001 |
| Molybdenum | 0.073 | mg/L | *0.0010* | - | - | < 0.0010 | - | - | - | - | - | - | < 0.0010 |
| Nickel | 0.025 | mg/L | *0.0017* | - | - | 0.0017 | - | - | - | - | - | - | 0.0017 |
| Selenium | 0.001 | mg/L | *0.00010* | - | - | < 0.00010 | - | - | - | - | - | - | < 0.00010 |
| Strontium | | mg/L | *0.0708* | - | - | 0.0770 | - | - | - | - | - | - | 0.0645 |
| Thallium | 0.0008 | mg/L | *0.00001* | - | - | < 0.000010 | - | - | - | - | - | - | < 0.000010 |
| Tin | | mg/L | *0.0050* | - | - | < 0.0050 | - | - | - | - | - | - | < 0.0050 |
| Titanium | | mg/L | *0.0050* | - | - | < 0.0050 | - | - | - | - | - | - | < 0.0050 |
| Uranium | 0.015 | mg/L | *0.00010* | - | - | < 0.00010 | - | - | - | - | - | - | < 0.00010 |
| Vanadium | | mg/L | *0.0050* | - | - | < 0.0050 | - | - | - | - | - | - | < 0.0050 |
| Zinc | 0.03 | mg/L | *0.0050* | - | - | < 0.0050 | - | - | - | - | - | - | < 0.0050 |
| **Dissolved Metals** | | | | | | | | | | | | | |
| Aluminum | 0.1 | mg/L | *0.0039* | - | - | 0.0039 | - | - | - | - | - | - | 0.0039 |
| Antimony | | mg/L | *0.00057* | - | - | 0.00061 | - | - | - | - | - | - | 0.00052 |
| Arsenic | 0.005 | mg/L | *0.0010* | - | - | 0.00112 | - | - | - | - | - | - | 0.00091 |
| Barium | | mg/L | *0.0143* | - | - | 0.0148 | - | - | - | - | - | - | 0.0137 |
| Beryllium | | mg/L | *0.00010* | - | - | < 0.00010 | - | - | - | - | - | - | < 0.00010 |
| Boron | 1.5 | mg/L | *0.050* | - | - | < 0.050 | - | - | - | - | - | - | < 0.050 |
| Cadmium | 0.00007 | mg/L | *0.00001* | - | - | < 0.000010 | - | - | - | - | - | - | < 0.000010 |
| Chromium | | mg/L | *0.0010* | - | - | < 0.0010 | - | - | - | - | - | - | < 0.0010 |
| Copper | 0.002 | mg/L | *0.00059* | - | - | 0.00052 | - | - | - | - | - | - | 0.00066 |
| Iron | 0.3 | mg/L | *0.0139* | - | - | 0.0116 | - | - | - | - | - | - | 0.0161 |
| Lead | 0.001 | mg/L | *0.00020* | - | - | < 0.00020 | - | - | - | - | - | - | < 0.00020 |
| Lithium | | mg/L | *0.0020* | - | - | < 0.0020 | - | - | - | - | - | - | < 0.0020 |
| Manganese | 2.74 | mg/L | *0.0021* | - | - | 0.001 | - | - | - | - | - | - | 0.003 |
| Mercury | 0.000026 | mg/L | *0.00001* | - | - | < 0.00001 | - | - | - | - | - | - | < 0.00001 |
| Molybdenum | 0.073 | mg/L | *0.0010* | - | - | < 0.0010 | - | - | - | - | - | - | < 0.0010 |
| Nickel | 0.025 | mg/L | *0.0020* | - | - | 0.0018 | - | - | - | - | - | - | 0.0021 |
| Selenium | 0.001 | mg/L | *0.00010* | - | - | < 0.00010 | - | - | - | - | - | - | < 0.00010 |
| Strontium | | mg/L | *0.0701* | - | - | 0.074 | - | - | - | - | - | - | 0.066 |
| Thallium | 0.0008 | mg/L | *0.00001* | - | - | < 0.000010 | - | - | - | - | - | - | < 0.000010 |
| Tin | | mg/L | *0.005* | - | - | < 0.0050 | - | - | - | - | - | - | < 0.0050 |
| Titanium | | mg/L | *0.0050* | - | - | < 0.0050 | - | - | - | - | - | - | < 0.0050 |
| Uranium | 0.015 | mg/L | *0.00010* | - | - | < 0.00010 | - | - | - | - | - | - | < 0.00010 |
| Vanadium | | mg/L | *0.0050* | - | - | < 0.0050 | - | - | - | - | - | - | < 0.0050 |
| Zinc | 0.03 | mg/L | *0.0050* | - | - | < 0.0050 | - | - | - | - | - | - | < 0.0050 |

* CCME Water Quality Guideline for the Protection of Aquatic Life, unless otherwise indicated.
Guidelines for total metals are applied equally for dissolved metals
[1] Short term limit, 25 mg/L above background (<24)

### 8.5.3 Mine Site Water Collection System

#### 8.5.3.1 *Meadowbank Site*

A water collection system comprised of the Stormwater Management Pond, attenuation ponds, tailings storage facilities, diversion ditches and sumps has been developed to control surface and groundwater at the Meadowbank Mine. The following section reviews the water quality monitoring conducted around the mine site. Specific details regarding water transfers can be found in the 2022 Water Management Plan and Report (Appendix 12).

##### *8.5.3.1.1 Stormwater Management Pond*

The Stormwater Management Pond collects runoff water as well as the STP treated effluent. A total of 22,907 $m^3$ of water was transferred from the Stormwater Management Pond to the Portage Pit in June, July, August, and September. No water was released into the environment.

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

The East and West Diversion ditches were constructed in 2012 around the North Cell TSF and the Portage WRSF. The diversion ditches are designed to redirect the fresh water from the northern area watershed away from the tailings pond and WRSF and direct it to Second (via NP2) and Third Portage Lakes. Water from the East diversion ditch (sampling station ST-5) and the West diversion ditch (sampling station ST-6) were sampled monthly during open water as per the requirements in the NWB Water License. Results are presented in Table 8-12 and Table 8-13 respectively; the sampling location is illustrated on Figure 1.

Portage Area East (ST-5) diversion ditch water quality results are shown in Table 8.12 below. TSS results for ST-5 did not exceed the maximum allowable grab sample concentration (30 mg/L) but exceeded the maximum monthly average concentration (15 mg/L), permitted by the Water License, Part F, Item 7, at 16 mg/L for the month of June. A single monthly sample during open water season is required by the Water License, and thus, the average concentration is made only of this result on June 5$^{th}$ from the certified laboratory. Internal samples were collected daily, and based on these results, the average monthly TSS concentration was 4.7 mg/L. Agnico Eagle received the ST-5 accredited laboratory results on June 30$^{th}$, so there was not an opportunity to collect an additional sample for the month of June. Agnico Eagle worked with the laboratory on mitigation measures to send earlier notification in the event of a Water License exceedance in the future.

There is no monthly sample associated to the West diversion ditch (ST-6) in June as the sample was not collected at the accurate location. Internal samples were collected daily, and based on these results, the average monthly TSS concentration was 10.6 mg/L. Results in 2022 did not exceed the maximum average concentration (15 mg/L) and maximum allowable grab sample concentration (30 mg/L) permitted by the Water License, Part F, Item 7 for the ST-6 station. Agnico Eagle reviewed the sampling protocol with the Environmental Technicians to ensure samples are collected at the correct location. Furthermore, Agnico Eagle has installed additional signage across the site to improve identification of sample station locations.

**Table 8-12 Meadowbank 2022 Non-Contact Water Diversion Ditch Water Quality Monitoring (ST-5)**

| ST-5 | MAX GRAB | MONTHLY MEAN | Unit | Annual Average | | | | | | 6/5/2022 | 7/3/2022 | 8/1/2022 | 9/4/2022 | 10/9/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | | | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | | | | | |
| **Field Measured** | | | | | | | | | | | | | | |
| Temperature | | | °C | 12.8 | 7.3 | 10.6 | 12.0 | 5.5 | 7.6 | 1.7 | 12.0 | 11.4 | 12.6 | 0.1 |
| pH | | | pH units | 8.00 | 6.97 | 7.48 | 7.67 | 7.87 | 7.93 | 7.77 | 8.16 | 7.60 | 8.39 | 7.74 |
| Conductivity | | | uS/cm | 237.0 | 127.4 | 181.6 | 193.1 | 120.9 | 134.0 | 39.8 | 150.5 | 156.5 | 151.7 | 171.5 |
| Turbidity | | | NTU | 2.79 | 3.31 | 11.27 | 5.36 | 2.94 | 5.78 | 21.30 | 2.71 | 1.08 | 0.93 | 2.89 |
| **Conventional Parameters** | | | | | | | | | | | | | | |
| TSS | 30 | 15 | mg/L | 2 | 3 | 8 | 6 | 2 | 4 | 16 | 1 | 1 | 1 | 1 |
| **Major Ions** | | | | | | | | | | | | | | |
| Cyanide | | | mg/L | 0.001 | 0.005 | 0.001 | 0.003 | 0.005 | 0.008 | 0.00051 | < 0.00050 | < 0.00050 | 0.03730 | < 0.00050 |
| Sulfate | | | mg/L | 40.1 | 27.5 | 19.4 | 23.6 | 20.1 | 19.0 | < 1.0 | 20.0 | 21.0 | 24.0 | 29.0 |
| **Total Metals** | | | | | | | | | | | | | | |
| Aluminum | | | mg/L | 0.0365 | 0.0590 | 0.2343 | 0.1064 | 0.0633 | 0.1084 | 0.4710 | 0.0185 | 0.0174 | 0.0083 | 0.0268 |
| Arsenic | | | mg/L | 0.0013 | 0.0005 | 0.0028 | 0.0018 | 0.0023 | 0.0025 | 0.00656 | 0.00139 | 0.00180 | 0.00145 | 0.00151 |
| Copper | | | mg/L | 0.0021 | 0.0037 | 0.0079 | 0.0040 | 0.0040 | 0.0034 | 0.00551 | 0.00292 | 0.00334 | 0.00265 | 0.00252 |
| Lead | | | mg/L | 0.0060 | 0.0030 | 0.0003 | 0.0003 | 0.0003 | 0.0005 | 0.00156 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Nickel | | | mg/L | 0.0047 | 0.0045 | 0.0047 | 0.0084 | 0.0052 | 0.0073 | 0.0044 | 0.0055 | 0.0068 | 0.0066 | 0.0130 |
| Zinc | | | mg/L | 0.001 | 0.001 | 0.008 | 0.004 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| **Radionuclides** | | | | | | | | | | | | | | |
| Radium-226 | | | Bq/l | 0.002 | 0.004 | 0.003 | 0.004 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |

**Table 8-13 Meadowbank 2022 Non-Contact Water Diversion Ditch Water Quality Monitoring (ST-6)**

| ST-6 | MAX GRAB | MONTHLY MEAN | Unit | *Annual Average* | | | | | | 7/3/2022 | 8/2/2022 | 9/12/2022 | 10/9/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | | | *2017* | *2018* | *2019* | *2020* | *2021* | *2022* | | | | |
| **Field Measured** | | | | | | | | | | | | | |
| Temperature | | | °C | *11.3* | *7.3* | *12.0* | *7.5* | *5.8* | *6.1* | 5.6 | 9.0 | 8.0 | 1.8 |
| pH | | | pH units | *7.92* | *7.59* | *7.17* | *7.47* | *7.62* | *7.05* | 7.31 | 6.58 | 7.24 | 7.06 |
| Conductivity | | | uS/cm | *38.8* | *41.2* | *582.1* | *33.0* | *51.1* | *49.3* | 28.0 | 36.9 | 104.3 | 28.0 |
| Turbidity | | | NTU | *1.95* | *2.39* | *10.42* | *8.00* | *2.50* | *1.75* | 2.61 | 0.56 | 2.25 | 1.59 |
| **Conventional Parameters** | | | | | | | | | | | | | |
| TSS | 30 | 15 | mg/L | *1* | *1* | *13* | *7* | *1* | *1* | 1 | < 1 | < 1 | < 1 |
| **Major Ions** | | | | | | | | | | | | | |
| Cyanide | | | mg/L | *0.002* | *0.001* | *0.003* | *0.001* | *0.005* | *0.005* | < 0.0005 | < 0.0005 | 0.0179 | < 0.0005 |
| Sulfate | | | mg/L | *6.1* | *5.6* | *29.9* | *5.5* | *9.4* | *4.7* | 4.1 | 6.2 | 4.4 | 4.2 |
| **Total Metals** | | | | | | | | | | | | | |
| Aluminum | | | mg/L | *0.0118* | *0.0120* | *0.1374* | *0.2360* | *0.0352* | *0.0114* | 0.0057 | 0.0065 | 0.0171 | 0.0163 |
| Arsenic | | | mg/L | *0.0005* | *0.0005* | *0.0009* | *0.0009* | *0.0005* | *0.0002* | 0.00025 | 0.00024 | 0.00025 | 0.00012 |
| Copper | | | mg/L | *0.0005* | *0.0009* | *0.0024* | *0.0016* | *0.0011* | *0.0005* | < 0.00050 | 0.00051 | 0.00056 | < 0.00050 |
| Lead | | | mg/L | *0.0012* | *0.0005* | *0.0003* | *0.0002* | *0.0002* | *0.0002* | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Nickel | | | mg/L | *0.0006* | *0.0005* | *0.0030* | *0.0025* | *0.0016* | *0.0010* | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Zinc | | | mg/L | *0.001* | *0.001* | *0.002* | *0.004* | *0.005* | *0.005* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| **Radionuclides** | | | | | | | | | | | | | |
| Radium-226 | | | Bq/l | *0.002* | *0.002* | *0.004* | *0.002* | *0.005* | *0.006* | < 0.005 | 0.010 | < 0.005 | < 0.005 |

#### *8.5.3.1.3 East Dike Discharge (ST-8, ST-MMER-3)*

In 2022, water was discharged from January 1st to January 25th, April 7th to April 30th and November 20th to December 31st. A total of 22,336 $m^3$ of water collected from the seepage at the East dike was pumped to Second Portage Lake through the diffuser.

On April 9th, the level of Total Suspended Solids (TSS) from the East Dike Discharge (ST-MMER-3) to Second Portage Lake exceeded the limits set out in MDMER Schedule 4, Table 2, for the maximum authorized concentration in a grab sample (30 mg/L), at 49 mg/L and therefore the discharge to Second Portage Lake was stopped on April 30th. All water was diverted to the pits, as done in the past. Agnico Eagle continued to monitor TSS and restarted the discharge to Second Portage Lake on November 20th.

Results from samples collected in 2022 at the final discharge point (ST-8) can be found in Table 8-14. Effluent water is analyzed as per NWB Water License Schedule I. The sampling location is illustrated on Figure 1. In 2022, there was one non-compliance with the Water License Part F Item 7 and with MDMER regulations. Refer to previous Section 8.3.1.3 East Dike Discharge for complete information.

#### *8.5.3.1.4 East Dike Seepage (ST-S-1)*

As mentioned in Section 8.5.3.1.3, East Dike Seepage was discharged into the receiving environment, Second Portage Lake (SPL) January 1st to January 25th, April 7th to April 30th and November 20th to December 31st. As done in the past, when the discharge was stopped, water was directed to the Portage Pit. A total of 171,568 $m^3$ was transferred in the Portage Pit in 2022. During that period of time, samples were taken on a monthly basis as per the requirements of the NWB Water License. The ST-S-1 location is presented on Figure 1. Results are presented in Table 8-15. There are no applicable license limits.

#### *8.5.3.1.5 Portage Attenuation Pond (ST-9, ST-MMER-1)*

As of November 19th, 2014 when tailings deposition began in the South Cell TSF, the Portage Attenuation Pond ceased operation as an effluent discharge pond. There was no discharge from ST-9 into Third Portage Lake in 2022. The location of sampling station ST-9 is illustrated on Figure 1.

Channel crossing inspections were not undertaken in 2022 as no further discharge occurred from the Portage Attenuation Pond into Third Portage Lake.

#### *8.5.3.1.6 Vault Discharge (ST-10, ST-MMER-2)*

There was no discharge (sampling station ST-10, also named ST-MMER-2) from the Vault Attenuation Pond to Wally Lake in 2022. There is currently no plans to have a discharge in 2023. The location of this sampling station is illustrated on Figure 3.

**Table 8-14 Meadowbank 2022 East Dike Discharge Water Quality Monitoring (ST-8)**

| ST-8 | MAX GRAB | MONTHLY MEAN | Unit | Annual Average | | | | | | 1/4/2022 | 1/17/2022 | 4/11/2022 | 4/26/2022 | 11/21/2022 | 12/6/2022 | 12/12/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | | | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | | | | | | | |
| **Field Measured** | | | | | | | | | | | | | | | | |
| Temperature | | | °C | 10.54 | - | - | 4.70 | 1.73 | 0.54 | 1.1 | -0.4 | 1.2 | 0.1 | 0.9 | 0.4 | 0.5 |
| pH | | | pH units | 7.82 | 7.66 | 7.53 | 7.82 | 7.69 | 7.93 | 8.65 | 7.33 | 7.69 | 8.04 | 8.05 | 7.49 | 8.24 |
| Conductivity | | | uS/cm | 105.05 | - | - | 79.93 | 82.55 | 79.57 | 68.5 | 62.9 | 83.5 | 81.7 | 131.8 | 63.9 | 64.7 |
| Turbidity | | | NTU | 6.11 | 6.01 | 2.13 | 2.24 | 3.98 | 2.80 | 5.24 | 3.23 | 2.06 | 2.81 | 0.62 | 3.10 | 2.55 |
| **Conventional Parameters** | | | | | | | | | | | | | | | | |
| TSS | 30 | 15 | mg/L | 10 | 1 | 3 | 2 | 7 | 5 | 10 | 11 | 2 | 2 | < 1 | 4 | 3 |
| **Major Ions** | | | | | | | | | | | | | | | | |
| Cyanide | | | mg/L | 0.002 | 0.001 | 0.002 | 0.001 | 0.004 | 0.001 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | 0.00060 |
| Sulfate | | | mg/L | 9 | 8 | 9 | 11 | 7 | 7 | 6.0 | 6.3 | 6.6 | 7.4 | 6.6 | 6.6 | 6.2 |
| **Total Metals** | | | | | | | | | | | | | | | | |
| Aluminum | | | mg/L | 0.043 | 0.046 | 0.032 | 0.031 | 0.089 | 0.067 | 0.1420 | 0.1020 | 0.0453 | 0.0477 | 0.0245 | 0.0591 | 0.0494 |
| Arsenic | | | mg/L | 0.0011 | 0.0005 | 0.0010 | 0.0040 | 0.0008 | 0.0011 | 0.00097 | 0.00099 | 0.00136 | 0.00079 | 0.00123 | 0.00120 | 0.00112 |
| Copper | | | mg/L | 0.0012 | 0.0005 | 0.0013 | 0.0016 | 0.0010 | 0.0014 | 0.00145 | 0.00142 | 0.00119 | 0.00172 | 0.00126 | 0.00165 | 0.00115 |
| Lead | | | mg/L | 0.0008 | 0.0003 | 0.0003 | 0.0007 | 0.0002 | 0.0002 | < 0.00020 | 0.00016 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Nickel | | | mg/L | 0.0007 | 0.0005 | 0.0006 | 0.0018 | 0.0033 | 0.0009 | < 0.0010 | 0.0006 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Zinc | | | mg/L | 0.003 | 0.001 | 0.003 | 0.004 | 0.004 | 0.005 | < 0.0050 | 0.0017 | < 0.0050 | 0.0068 | < 0.0050 | < 0.0050 | < 0.0050 |
| **Radionuclides** | | | | | | | | | | | | | | | | |
| Radium-226 | | | Bq/l | 0.002 | 0.003 | 0.002 | 0.006 | 0.005 | 0.006 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | 0.0090 |

**Table 8-15 Meadowbank 2022 East Dike Seepage Water Quality Monitoring (ST-S-1)**

| ST-S-1 | Unit | Annual Average | | | | | 2/14/2022 | 3/14/2022 | 6/5/2022 | 7/10/2022 | 8/2/2022 | 9/11/2022 | 10/3/2022 | 11/8/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | *2018* | *2019* | *2020* | *2021* | *2022* | | | | | | | | |
| **Field Measured** | | | | | | | | | | | | | | |
| Temperature | °C | *10.6* | *-* | *7.6* | *5.8* | *2.7* | 0.7 | 0.4 | 1.4 | 4.4 | 5.6 | 4.4 | 3.7 | 0.7 |
| pH | pH units | *7.54* | *7.83* | *8.11* | *7.65* | *7.99* | 7.51 | 7.54 | 8.54 | 7.93 | 7.35 | 8.77 | 8.28 | 8.03 |
| Conductivity | uS/cm | *105.1* | *-* | *118.5* | *426.6* | *116.5* | 69.6 | 74.9 | 80.3 | 84.8 | 137.1 | 182.0 | 240.0 | 63.4 |
| Turbidity | NTU | *5.22* | *28.79* | *1.73* | *7.04* | *15.90* | 2.55 | 2.21 | 6.37 | 8.14 | 3.34 | 96.70 | 6.75 | 1.16 |
| **Conventional Parameters** | | | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *32.30* | *38.80* | *60.00* | *50.79* | *59.13* | 31.8 | 33.7 | 37.4 | 37.8 | 55.1 | 152.0 | 95.0 | 30.2 |
| Total alkalinity, as $CaCO_3$ | mg/L | *31.00* | *42.77* | *44.00* | *31.11* | *33.25* | 28 | 32 | 32 | 30 | 33 | 39 | 43 | 29 |
| TDS | mg/L | *58.00* | *59.77* | *77.00* | *63.33* | *73.13* | 20 | 25 | 35 | 55 | 50 | 225 | 145 | 30 |
| TSS | mg/L | *6* | *47* | *2* | *9* | *6* | 5 | 6 | 6 | 6 | 3 | 19 | 4 | < 1 |
| **Major Ions** | | | | | | | | | | | | | | |
| Chloride | mg/L | *1.1* | *1.8* | *2.9* | *1.2* | *1.2* | 1.1 | 1.2 | 1.0 | 1.3 | < 1.0 | 1.7 | 1.4 | < 1.0 |
| Cyanide | mg/L | *0.001* | *0.001* | *0.003* | *0.005* | *0.001* | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | 0.00055 | < 0.00050 |
| Fluoride | mg/L | *0.11* | *0.11* | *0.11* | *0.12* | *0.12* | < 0.10 | 0.11 | < 0.10 | < 0.10 | 0.11 | 0.17 | 0.14 | 0.14 |
| Sulfate | mg/L | *11.90* | *14.91* | *22.10* | *22.64* | *28.98* | 6.7 | 7.1 | 7.4 | 13.0 | 27.0 | 110.0 | 54.0 | 6.6 |
| **Nutrients** | | | | | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | *0.03* | *0.02* | *0.01* | *0.07* | *0.06* | 0.10 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Nitrate | mg N/L | *0.01* | *0.01* | *0.43* | *0.37* | *0.41* | < 0.10 | < 0.10 | < 0.10 | 0.65 | 0.45 | 1.11 | 0.70 | < 0.10 |
| Nitrite | mg N/L | *0.014* | *0.319* | *0.013* | *0.010* | *0.010* | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| **Total Metals** | | | | | | | | | | | | | | |
| Aluminum | mg/L | *0.0440* | *0.4047* | *0.0300* | *0.1741* | *0.1263* | 0.0604 | 0.0947 | 0.0907 | 0.1140 | 0.0705 | 0.4410 | 0.1130 | 0.0264 |
| Arsenic | mg/L | *0.0044* | *0.0026* | *0.0032* | *0.0136* | *0.0022* | 0.00096 | 0.00103 | 0.00168 | 0.00210 | 0.00199 | 0.00578 | 0.00271 | 0.00116 |
| Barium | mg/L | *0.0074* | *0.0112* | *0.0103* | *0.0098* | *0.0105* | 0.0076 | 0.0081 | 0.0090 | 0.0086 | 0.0112 | 0.0196 | 0.0138 | 0.0061 |
| Cadmium | mg/L | *0.00002* | *0.00005* | *0.00002* | *0.00001* | *0.00002* | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000005 | < 0.000010 | 0.000127 | < 0.000010 | < 0.000010 |
| Chromium | mg/L | *0.0008* | *0.0050* | *0.0006* | *0.0026* | *0.0015* | < 0.0010 | < 0.0010 | 0.0010 | 0.0006 | < 0.0010 | 0.0054 | 0.0010 | < 0.0010 |
| Copper | mg/L | *0.0009* | *0.0020* | *0.0023* | *0.0029* | *0.0021* | 0.00140 | 0.00153 | 0.00269 | 0.00260 | 0.00217 | 0.00272 | 0.00206 | 0.00124 |
| Iron | mg/L | *0.1100* | *0.7942* | *0.0600* | *0.3488* | *0.2294* | 0.0860 | 0.1480 | 0.1740 | 0.1860 | 0.1060 | 0.8960 | 0.2270 | 0.0120 |
| Lead | mg/L | *0.0003* | *0.0003* | *0.0002* | *0.0008* | *0.0002* | < 0.00020 | < 0.00020 | 0.00032 | 0.00022 | < 0.00020 | 0.00028 | 0.00022 | < 0.00020 |
| Manganese | mg/L | *0.0036* | *0.0166* | *0.0240* | *0.0201* | *0.0368* | 0.0031 | 0.0036 | 0.0043 | 0.0043 | 0.0068 | 0.2560 | 0.0154 | < 0.0010 |
| Mercury | mg/L | *0.00001* | *0.00002* | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0005* | *0.0009* | *0.0015* | *0.0012* | *0.0012* | < 0.0010 | < 0.0010 | < 0.0010 | 0.0006 | < 0.0010 | 0.0027 | 0.0014 | < 0.0010 |
| Nickel | mg/L | *0.0015* | *0.0039* | *0.0046* | *0.0054* | *0.0089* | < 0.0010 | < 0.0010 | 0.0013 | 0.0013 | 0.0020 | 0.0595 | 0.0045 | < 0.0010 |
| Selenium | mg/L | *0.0022* | *0.0015* | *0.0010* | *0.0001* | *0.0001* | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00004 | < 0.00010 | 0.00022 | < 0.00010 | < 0.00010 |
| Silver | mg/L | *0.00010* | *0.00024* | *0.00010* | *0.00002* | *0.00002* | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000005 | < 0.000020 | 0.000008 | < 0.000020 | < 0.000020 |
| Thallium | mg/L | *0.00040* | *0.00048* | *0.00020* | *0.00001* | *0.00001* | < 0.000010 | < 0.000010 | < 0.000010 | 0.000004 | < 0.000010 | 0.000020 | < 0.000010 | < 0.000010 |
| Zinc | mg/L | *0.001* | *0.008* | *0.001* | *0.008* | *0.008* | < 0.0050 | 0.0161 | 0.0067 | 0.0044 | 0.0064 | 0.0168 | < 0.0050 | < 0.0050 |

#### *8.5.3.1.7 Portage Rock Storage Facility (ST-16)*

The Portage Waste Rock Storage Facility (PWRSF) has been in operation since 2009. In 2013, ponded water was observed at the south-east base of the PWRSF (sampling station ST-16). This was first reported in the 2013 Annual Report (as well as to regulators in July 2013) as a small volume of the seepage, with elevated levels of cyanide, nickel and copper (among other constituents) had migrated, through a rockfill perimeter road, to the near shore area of NP-2 Lake. Agnico Eagle determined, in 2013, that the seepage contained reclaim water from the North Cell TSF that had flowed under the PWRSF to a sump area designated as sampling station ST-16 (refer to WRSF Seepage Golder Report in Appendix G5 of the 2013 Annual Report).

Mitigation measures were implemented in 2013 and this included daily inspections during the freshet period, the installation of a pumping system in ST-16 to direct accumulated water back to the North Cell TSF, installation of four thermistors to analyse freezing in the PWRSF and installation of a filter barrier along RF-1 and 2 to prevent water and tailings egress from the North Cell (tailings water) through the PWRSF to ST-16. As part of progressive reclamation capping of the North Cell tailings commenced in winter 2015. The North portion on the North Cell was capped in 2015 and a 30m strip was placed in front of RF-1 and RF-2 in 2016 to eventually connect to the 2015 capping in winter 2017. In 2017, capping of the North Cell with soapstone continued for areas that were located outside the tailings covered areas. Capping was placed on original ground along the Portage WRSF western boundary and at the northern boundary of the cell to fill the gaps left during capping from previous years and the existing infrastructures around the cell. The capping was placed in these areas to prevent any tailings and contact water migration outside the North Cell perimeter. The tailings are capped in the area of RF-1 and RF-2 which assist to prevent any seepage migration from the North Cell.

In 2022, 499,627 m$^3$ of North Cell water was transferred to the South Cell minimizing the water contained in this cell.

Thermistors installed in 2013 indicate that freezeback is occurring along the seepage path. Since 2014, a permanent pumping system has been operating at ST-16, to collect water and pump it to the TSF North Cell. Water volumes pumped from ST-16 and deposited in the North Cell TSF are provided in Table 8-16. The water volume pumped in 2022 at ST-16 was 25,492 m$^3$, which is lower than the pumped volumes since 2018 (Table 8-16). The volume pumped also included snow melt and precipitation accumulating into this sump. The installation of the filters at RF-1 and RF-2, capping of tailings and decreased water volume in the North Cell contributed to be effective in controlling and stopping seepage from the North Cell.

**Table 8-16 Meadowbank Waste Rock Seepage pumped volume 2014-2022**

| Year | Volume pumped (m$^3$) |
|---|---|
| 2014 | 32,169 |
| 2015 | 19,236 |
| 2016 | 20,844 |
| 2017 | 25,815 |
| 2018 | 12,606 |
| 2019 | 33,782 |
| 2020 | 75,082 |
| 2021 | 50,780 |
| 2022 | 25,492 |

From 2014 to 2018, average analysis results for applicable parameters confirmed no impacts to downstream lakes (NP-1, Dogleg, Second Portage Lake). The average Nickel, Cyanide Free, Cyanide Total, Ammonia (NH3) and Ammonia Nitrogen results are all below CCME, Water License and MDMER criteria in NP-2 Lake from 2014 – 2018. From the results, the action plan implemented by Agnico Eagle has been very successful in preventing any further seepage into NP2 Lake and into the ST-16 sump itself. All seepage water is entirely contained inside the ST-16 sump. The MDRB has commented on the success of this action plan. The till plug, pumping system, installation of filters and effective tailings beaches at RF-1 and RF-2, progressive tailings capping at RF-1 and RF-2 and the dewatering of the North Cell have effectively mitigated this problem. In addition, thermistors installed in the WRSF indicate freezing in the former seep path is occurring (which would mean that no water is migrating). Refer to the 2018 Annual Report for the results.

The KivIA requested that Agnico Eagle continue monitoring until there is a five year period of non-detect cyanide results. In 2018 (five previous year), the monitoring indicated that yearly average for CN levels does not exceed the CCME guideline, the MDMER or Water License limit for effluent discharge into the environment for NP-2, NP-1 and downstream lakes, Dogleg and Second Portage. Thus, based on the analysis of the previous results, Agnico Eagle has suspended the program in 2019. However, ECCC's comment regarding the 2018 Annual Report recommended that Agnico Eagle continue to monitor Lake NP-2 on a yearly basis for the same suite of parameters that has been measured since 2014. Water quality results for ST-16 and NP-2 South in 2022 can be found in Table 8-17 and 8-18, respectively. Monitoring stations are illustrated on Figure 1. Results are presented for information purposes only as there are no applicable water license limits at this location.

In accordance with the 2023 Freshet Action Plan (see Appendix D of the 2022 Water Management Report and Plan Version 9 (Appendix 12), Agnico Eagle will continue in 2023 to control the ST-16 location and to monitor the water quality, as needed. This is conducted to assess and prevent any impact to the receiving environment (NP-2) and to downstream lakes (NP-1, Dogleg and Second Portage).

**Table 8-17 Meadowbank 2022 WRSF Seepage Water Quality Monitoring (ST-16)**

| ST-16 | Unit | Annual Average | | | | | | 6/5/2022 | 7/3/2022 | 8/1/2022 | 9/4/2022 | 10/9/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | | | | | |
| **Field Measured** | | | | | | | | | | | | |
| Temperature | °C | 14.1 | 9.2 | 13.1 | 9.1 | 4.5 | 6.3 | 6.1 | 7.0 | 7.0 | 11.3 | 0.1 |
| pH | pH units | 7.48 | 7.54 | 7.75 | 7.70 | 7.67 | 7.27 | 7.25 | 7.36 | 6.44 | 7.99 | 7.30 |
| Conductivity | uS/cm | 435.3 | 401.3 | 406.4 | 288.9 | 281.8 | 294.7 | 89.6 | 288.0 | 301.0 | 384.0 | 411.0 |
| Turbidity | NTU | 2.74 | 4.15 | 2.90 | 22.53 | 12.91 | 23.23 | 17.30 | 62.20 | 28.30 | 3.69 | 4.68 |
| **Conventional Parameters** | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | 154 | 176 | 167 | 140 | 125 | 143 | 42.6 | 124.0 | 146.0 | 203.0 | 197.0 |
| Total alkalinity, as $CaCO_3$ | mg/L | 77 | 75 | 61 | 75 | 63 | 86 | 30 | 85 | 85 | 120 | 110 |
| Carbonate, as $CaCO_3$ | mg/L | 2 | 2 | 2 | 4 | 1 | 1 | < 1.0 | - | < 1.0 | < 1.0 | < 1.0 |
| Bicarbonate, as $CaCO_3$ | mg/L | 77 | 72 | 61 | 78 | 62 | 86 | 30 | - | 84 | 120 | 110 |
| TDS | mg/L | 315 | 248 | 2 | 187 | 182 | 174 | 35 | 195 | 205 | 280 | 155 |
| TSS | mg/L | 4 | 1 | 265 | 10 | 8 | 15 | 8 | 34 | 20 | 1 | 12 |
| Total organic carbon | mg/L | 8.68 | 7.35 | 3.87 | 4.10 | 2.88 | 4.15 | 3.2 | - | 3.5 | 5.7 | 4.2 |
| Dissolved organic carbon | mg/L | 8.65 | 6.25 | 4.77 | 2.63 | 2.64 | 3.80 | 2.7 | - | 3.5 | 5.1 | 3.9 |
| Colour | TCU | 16 | - | - | 77 | 12 | 16 | 13 | - | 18 | 21 | 11 |
| **Major Ions** | | | | | | | | | | | | |
| Bromide | mg/L | 0.09 | - | - | 0.07 | 1.00 | 1.00 | < 1.0 | - | < 1.0 | < 1.0 | < 1.0 |
| Chloride | mg/L | 9.6 | 5.2 | 5.2 | 3.0 | 3.0 | 3.8 | 1.3 | 3.8 | 3.1 | 5.4 | 5.2 |
| Cyanide | mg/L | 0.074 | 0.002 | 0.002 | 0.001 | 0.005 | 0.002 | < 0.00050 | 0.00194 | 0.00312 | 0.00132 | 0.00172 |
| Cyanide (free) | mg/L | 0.00500 | 0.00500 | 0.00200 | 0.00100 | 0.00306 | 0.00315 | < 0.0020 | - | 0.005 | 0.0036 | < 0.0020 |
| Cyanide (WAD) | mg/L | 0.0528 | 0.0010 | 0.0013 | 0.0010 | 0.0019 | 0.0013 | 0.0009 | - | 0.0019 | 0.0017 | 0.00058 |
| Fluoride | mg/L | 0.23 | 0.19 | 0.20 | 0.17 | 0.20 | 0.19 | 0.10 | 0.20 | 0.25 | 0.21 | 0.19 |
| Silica | mg/L | 2.98 | 2.98 | 2.57 | 5.01 | 4.10 | 3.93 | 1.3 | - | 4.3 | 4.2 | 5.9 |
| Sulfate | mg/L | 92 | 106 | 102 | 67 | 64 | 70 | 12 | 64 | 66 | 100 | 110 |
| Thiocyanate | mg/L | 0.10 | 0.05 | 0.05 | 0.05 | 0.20 | 1.15 | < 4.00 | - | < 0.20 | < 0.20 | < 0.20 |
| Thiosulphates | mg/L | 0.02 | 0.05 | 0.02 | 0.02 | 0.20 | 1.15 | < 4.00 | - | < 0.20 | < 0.20 | < 0.20 |
| **Nutrients and Chlorophyll a** | | | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | 0.32 | 0.08 | 0.07 | 0.06 | 0.05 | 0.11 | < 0.050 | 0.130 | < 0.050 | 0.260 | 0.083 |
| Nitrate | mg N/L | 6.30 | 4.20 | 5.44 | 2.50 | 3.28 | 1.45 | 0.36 | 0.58 | 2.11 | 2.21 | 1.97 |
| Nitrite | mg N/L | 0.070 | 0.035 | 0.040 | 0.035 | 0.014 | 0.015 | < 0.010 | 0.019 | 0.016 | 0.020 | < 0.010 |
| Total Kjeldahl nitrogen | mg N/L | 1.32 | 0.82 | 0.62 | 0.39 | 0.23 | 0.27 | 0.23 | - | 0.15 | 0.45 | 0.23 |
| Total phosphorus | mg P/L | 0.031 | 0.012 | 0.020 | 0.013 | 0.013 | 0.013 | 0.0260 | - | 0.0160 | 0.0064 | 0.0055 |
| Orthophosphate | mg P/L | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.015 | - | < 0.010 | 0.012 | < 0.010 |
| Chlorophyll a | mg/L | 0.2775 | 0.3100 | 0.5533 | 0.0871 | 0.0002 | 0.0003 | 0.00013 | 0.00024 | 0.00047 | 0.00068 | 0.00016 |

| ST-16 | Unit | Annual Average | | | | | | 6/5/2022 | 7/3/2022 | 8/1/2022 | 9/4/2022 | 10/9/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | | | | | |
| **Total Metals** | | | | | | | | | | | | |
| Aluminum | mg/L | 0.0383 | 0.0297 | 2.3067 | 0.6415 | 0.2966 | 0.5739 | 0.3950 | 1.7000 | 0.6490 | 0.0277 | 0.0980 |
| Antimony | mg/L | 0.00023 | 0.00027 | 0.00027 | 0.00010 | 0.00125 | 0.00080 | 0.00102 | - | 0.00108 | 0.00061 | < 0.00050 |
| Arsenic | mg/L | 0.0006 | 0.0024 | 0.0186 | 0.0140 | 0.0464 | 0.0146 | 0.03380 | 0.01090 | 0.01610 | 0.00719 | 0.00523 |
| Barium | mg/L | 0.0163 | 0.0190 | 0.0191 | 0.0147 | 0.0150 | 0.0181 | 0.0082 | 0.0256 | 0.0174 | 0.0218 | 0.0177 |
| Beryllium | mg/L | 0.00050 | 0.00050 | 0.00050 | 0.00050 | 0.00010 | 0.00010 | < 0.00010 | - | < 0.00010 | < 0.00010 | < 0.00010 |
| Boron | mg/L | 0.013 | 0.017 | 0.010 | 0.010 | 0.050 | 0.050 | < 0.050 | - | < 0.050 | < 0.050 | < 0.050 |
| Cadmium | mg/L | 0.000020 | 0.000030 | 0.000020 | 0.000020 | 0.000011 | 0.000013 | < 0.000010 | 0.000018 | 0.000015 | 0.000011 | < 0.000010 |
| Calcium (total) | mg/L | 34.2 | 36.8 | 32.1 | 32.4 | 27.5 | 33.2 | 9.72 | - | 32.00 | 45.70 | 45.40 |
| Chromium | mg/L | 0.00060 | 0.00110 | 0.00107 | 0.00805 | 0.00566 | 0.00382 | 0.0061 | 0.0075 | 0.0033 | < 0.0010 | 0.0012 |
| Cobalt | mg/L | 0.0013 | 0.0009 | 0.0011 | 0.0014 | 0.0009 | 0.0012 | 0.00081 | - | 0.00186 | 0.00111 | 0.00093 |
| Copper | mg/L | 0.0180 | 0.0158 | 0.0105 | 0.0103 | 0.0050 | 0.0100 | 0.00542 | 0.01960 | 0.00787 | 0.01020 | 0.00710 |
| Iron | mg/L | 0.315 | 0.360 | 0.150 | 1.018 | 0.514 | 1.466 | 0.763 | 3.480 | 1.780 | 0.861 | 0.447 |
| Lead | mg/L | 0.0016 | 0.0003 | 0.0003 | 0.0007 | 0.0003 | 0.0009 | 0.00106 | 0.00219 | 0.00064 | < 0.00020 | < 0.00020 |
| Lithium | mg/L | 0.0180 | 0.0050 | 0.0050 | 0.0050 | 0.0020 | 0.0022 | < 0.0020 | - | 0.0026 | 0.0021 | < 0.0020 |
| Magnesium (total) | mg/L | 17.05 | 17.00 | 18.13 | 14.48 | 13.59 | 15.57 | 4.46 | - | 16.00 | 21.50 | 20.30 |
| Manganese | mg/L | 0.1315 | 11.3582 | 0.0371 | 0.0620 | 0.0594 | 0.1991 | 0.0596 | 0.5010 | 0.1550 | 0.1830 | 0.0967 |
| Mercury | mg/L | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.0106 | 0.0109 | 0.0181 | 0.0136 | 0.0209 | 0.0123 | 0.0113 | 0.0090 | 0.0224 | 0.0115 | 0.0072 |
| Nickel | mg/L | 0.0203 | 0.0158 | 0.0102 | 0.0143 | 0.0094 | 0.0181 | 0.0076 | 0.0368 | 0.0176 | 0.0131 | 0.0156 |
| Potassium (total) | mg/L | 8.35 | 6.18 | 8.12 | 6.70 | 6.98 | 6.87 | 2.89 | - | 8.05 | 9.17 | 7.37 |
| Selenium | mg/L | 0.0010 | 0.0009 | 0.0006 | 0.0010 | 0.0008 | 0.0003 | 0.00014 | 0.00025 | 0.00056 | 0.00038 | 0.00035 |
| Silver | mg/L | 0.000100 | 0.000100 | 0.000100 | 0.000100 | 0.000021 | 0.000022 | < 0.000020 | 0.000030 | < 0.000020 | < 0.000020 | < 0.000020 |
| Sodium (total) | mg/L | 14.76 | 11.56 | 11.63 | 8.25 | 5.68 | 7.23 | 1.52 | - | 5.99 | 11.00 | 10.40 |
| Strontium | mg/L | 0.157 | 0.203 | 0.190 | 0.140 | 0.153 | 0.173 | 0.0489 | - | 0.1720 | 0.2410 | 0.2320 |
| Thallium | mg/L | 0.00080 | 0.00020 | 0.00020 | 0.00020 | 0.00001 | 0.00002 | < 0.000010 | 0.000046 | 0.000022 | 0.000019 | 0.000011 |
| Tin | mg/L | 0.001 | 0.001 | 0.001 | 0.001 | 0.005 | 0.005 | < 0.0050 | - | < 0.0050 | < 0.0050 | < 0.0050 |
| Titanium | mg/L | 0.0350 | 0.0433 | 0.0100 | 0.0267 | 0.0100 | 0.0123 | 0.0095 | - | 0.0295 | < 0.0050 | < 0.0050 |
| Uranium | mg/L | 0.0050 | 0.0043 | 0.0057 | 0.0040 | 0.0048 | 0.0048 | 0.00108 | - | 0.00499 | 0.00639 | 0.00655 |
| Vanadium | mg/L | 0.001 | 0.001 | 0.001 | 0.002 | 0.005 | 0.005 | < 0.0050 | - | < 0.0050 | < 0.0050 | < 0.0050 |
| Zinc | mg/L | 0.001 | 0.001 | 0.001 | 0.003 | 0.005 | 0.005 | < 0.0050 | 0.0072 | < 0.0050 | < 0.0050 | < 0.0050 |
| **Dissolved Metals** | | | | | | | | | | | | |
| Aluminum | mg/L | 0.0060 | 0.0060 | 0.0005 | 0.0060 | 0.0069 | 0.0088 | 0.0122 | - | 0.0099 | 0.0095 | 0.0035 |
| Antimony | mg/L | 0.00023 | 0.00010 | 0.00037 | 0.00010 | 0.00121 | 0.00078 | 0.00097 | - | 0.00101 | 0.00062 | < 0.00050 |
| Arsenic | mg/L | 0.0008 | 0.0008 | 0.0161 | 0.0048 | 0.0434 | 0.0111 | 0.02780 | - | 0.01010 | 0.00373 | 0.00286 |
| Barium | mg/L | 0.0154 | 0.0176 | 0.0168 | 0.0064 | 0.0197 | 0.0146 | 0.0061 | - | 0.0136 | 0.0209 | 0.0177 |

| ST-16 | Unit | Annual Average | | | | | | 6/5/2022 | 7/3/2022 | 8/1/2022 | 9/4/2022 | 10/9/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | | | | | |
| Beryllium | mg/L | 0.00050 | 0.00050 | 0.00050 | 0.00050 | 0.00010 | 0.00010 | < 0.00010 | - | < 0.00010 | < 0.00010 | < 0.00010 |
| Boron | mg/L | 0.0100 | 0.0200 | 0.0100 | 0.0100 | 0.0500 | 0.0500 | < 0.050 | - | < 0.050 | < 0.050 | < 0.050 |
| Cadmium | mg/L | 0.00002 | 0.00003 | 0.00002 | 0.00002 | 0.00001 | 0.00002 | < 0.000010 | - | < 0.000010 | 0.000058 | < 0.000010 |
| Chromium | mg/L | 0.00060 | 0.00090 | 0.00060 | 0.00060 | 0.00100 | 0.00100 | < 0.0010 | - | < 0.0010 | < 0.0010 | < 0.0010 |
| Cobalt | mg/L | 0.00123 | 0.00065 | 0.00097 | 0.00050 | 0.00046 | 0.00070 | 0.00029 | - | 0.00072 | 0.00103 | 0.00077 |
| Copper | mg/L | 0.01433 | 0.01270 | 0.00807 | 0.00597 | 0.00535 | 0.00606 | 0.00395 | - | 0.00447 | 0.00990 | 0.00592 |
| Iron | mg/L | 0.1450 | 0.0967 | 0.0267 | 0.0333 | 0.0492 | 0.0839 | 0.0372 | - | 0.1680 | 0.0823 | 0.0480 |
| Lead | mg/L | 0.00030 | 0.00030 | 0.00160 | 0.00021 | 0.00020 | 0.00037 | 0.00031 | - | 0.00022 | 0.00073 | < 0.00020 |
| Lithium | mg/L | 0.0050 | 0.0050 | 0.0050 | 0.0050 | 0.0020 | 0.0020 | < 0.0020 | - | < 0.0020 | 0.0020 | < 0.0020 |
| Manganese | mg/L | 0.1140 | 9.8916 | 0.0263 | 0.0500 | 0.0525 | 0.1019 | 0.0475 | - | 0.1000 | 0.1680 | 0.0920 |
| Mercury | mg/L | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | - | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.00983 | 0.01033 | 0.01687 | 0.00993 | 0.02130 | 0.01243 | 0.0110 | - | 0.0208 | 0.0107 | 0.0072 |
| Nickel | mg/L | 0.01763 | 0.01443 | 0.00847 | 0.00917 | 0.00660 | 0.01068 | 0.0047 | - | 0.0103 | 0.0134 | 0.0143 |
| Selenium | mg/L | 0.00100 | 0.00117 | 0.00063 | 0.00100 | 0.00072 | 0.00035 | 0.00013 | - | 0.00053 | 0.00036 | 0.00039 |
| Silver | mg/L | 0.00010 | 0.00010 | 0.00010 | 0.00010 | 0.00002 | 0.00002 | < 0.000020 | - | < 0.000020 | < 0.000020 | < 0.000020 |
| Strontium | mg/L | 0.1548 | 0.0002 | 0.0005 | 0.1220 | 0.1524 | 0.1694 | 0.0454 | - | 0.1600 | 0.2450 | 0.2270 |
| Thallium | mg/L | 0.00080 | 0.00020 | 0.00020 | 0.00020 | 0.00001 | 0.00001 | < 0.000010 | - | < 0.000010 | 0.000017 | < 0.000010 |
| Tin | mg/L | 0.0010 | 0.0010 | 0.0010 | 0.0010 | 0.0050 | 0.0127 | < 0.0050 | - | < 0.0050 | 0.0357 | < 0.0050 |
| Titanium | mg/L | 0.030 | 0.030 | 0.010 | 0.010 | 0.005 | 0.005 | < 0.0050 | - | < 0.0050 | < 0.0050 | < 0.0050 |
| Uranium | mg/L | 0.0043 | 0.0045 | 0.0050 | 0.0033 | 0.0045 | 0.0045 | 0.00086 | - | 0.00454 | 0.00609 | 0.00656 |
| Vanadium | mg/L | 0.001 | 0.001 | 0.001 | 0.001 | 0.005 | 0.005 | < 0.0050 | - | < 0.0050 | < 0.0050 | < 0.0050 |
| Zinc | mg/L | 0.001 | 0.001 | 0.003 | 0.001 | 0.006 | 0.007 | < 0.0050 | - | < 0.0050 | 0.0123 | < 0.0050 |

**Table 8-18 Meadowbank 2022 NP-2 South Water Quality Monitoring**

| NP2-South | Unit | *Annual Average* | | | | | | 6/5/2022 | 7/5/2022 | 8/1/2022 | 9/4/2022 | 10/9/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | *2017* | *2018* | *2019* | *2020* | *2021* | *2022* | | | | | |
| **Field Measured** | | | | | | | | | | | | |
| Temperature | °C | *11.7* | *9.7* | *11.0* | *10.3* | *5.3* | *7.7* | 2.5 | 14.0 | 11.0 | 11.1 | 0.1 |
| pH | pH units | *7.79* | *7.72* | *7.46* | *7.85* | *7.61* | *7.64* | 7.12 | 7.38 | 7.75 | 8.35 | 7.58 |
| Conductivity | uS/cm | *231.4* | *205.5* | *195.4* | *173.2* | *148.5* | *133.9* | 50.2 | 145.8 | 159.4 | 140.2 | 174.1 |
| Turbidity | NTU | *1.40* | *1.81* | *1.70* | *1.47* | *2.63* | *2.69* | 7.17 | 1.30 | 1.04 | 1.00 | 2.93 |
| **Conventional Parameters** | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *74* | *69* | *71* | *90* | *64* | *66* | 23.0 | 67.8 | 78.8 | 75.4 | 85.4 |
| Total alkalinity, as $CaCO_3$ | mg/L | *56* | *50* | *37* | *63* | *46* | *49* | 16 | 52 | 57 | 58 | 64 |
| Carbonate, as $CaCO_3$ | mg/L | *2* | *2* | *2* | *5* | *1* | *1* | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bicarbonate, as $CaCO_3$ | mg/L | *56* | *50* | *37* | *63* | *45* | *49* | 16 | 52 | 56 | 58 | 63 |
| TDS | mg/L | *147* | *108* | *118* | *113* | *69* | *68* | 10 | 95 | 65 | 95 | 75 |
| TSS | mg/L | *3* | *2* | *1* | *2* | *2* | *2* | 5 | < 1 | 1 | < 1 | < 1 |
| Total organic carbon | mg/L | *5.9* | *4.9* | *3.7* | *4.1* | *3.9* | *3.9* | 3.3 | 3.9 | 4.2 | 3.9 | 4.1 |
| Dissolved organic carbon | mg/L | *5.9* | *3.8* | *3.7* | *3.9* | *3.7* | *3.6* | 2.5 | 3.8 | 3.9 | 3.8 | 3.9 |
| Colour | TCU | *6* | *5* | *-* | *11* | *11* | *7* | 10 | 7 | 6 | 4 | 7 |
| **Major Ions** | | | | | | | | | | | | |
| Bromide | mg/L | *0.06* | *0.03* | *-* | *0.05* | *1.00* | *1.00* | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chloride | mg/L | *4.6* | *3.6* | *3.1* | *2.2* | *1.9* | *1.6* | < 1.0 | 1.6 | 1.9 | 1.7 | 1.7 |
| Cyanide | mg/L | *0.002* | *0.001* | *0.001* | *0.001* | *0.005* | *0.001* | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 |
| Cyanide (free) | mg/L | *0.0050* | *0.0050* | *0.0010* | *0.0013* | *0.0025* | *0.0028* | < 0.0020 | 0.0025 | 0.0028 | 0.0027 | 0.0038 |
| Cyanide (WAD) | mg/L | *0.0021* | *0.0010* | *0.0010* | *0.0010* | *0.0013* | *0.0006* | < 0.00050 | < 0.00050 | 0.00055 | 0.001 | < 0.00050 |
| Fluoride | mg/L | *0.13* | *0.12* | *0.13* | *0.12* | *0.12* | *0.12* | < 0.10 | 0.11 | 0.13 | 0.11 | 0.13 |
| Silica | mg/L | *0.51* | *0.41* | *1.00* | *0.81* | *0.76* | *0.50* | 0.63 | 0.34 | 0.32 | 0.38 | 0.85 |
| Sulfate | mg/L | *44.4* | *39.2* | *31.7* | *32.6* | *22.2* | *20.7* | 5.6 | 22.0 | 23.0 | 23.0 | 30.0 |
| Thiocyanate | mg/L | *0.11* | *0.05* | *0.05* | *0.05* | *0.20* | *0.96* | < 4.00 | < 0.20 | < 0.20 | < 0.20 | < 0.20 |
| Thiosulphates | mg/L | *0.02* | *0.02* | *-* | *0.02* | *0.20* | *0.96* | < 4.00 | < 0.20 | < 0.20 | < 0.20 | < 0.20 |
| **Nutrients and Chlorophyll a** | | | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | *0.05* | *0.03* | *0.01* | *0.02* | *0.05* | *0.05* | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Nitrate | mg N/L | *0.09* | *0.01* | *0.14* | *0.08* | *0.19* | *0.11* | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.15 |
| Nitrite | mg N/L | *0.01* | *0.18* | *0.01* | *0.03* | *0.01* | *0.01* | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Total Kjeldahl nitrogen | mg N/L | *0.62* | *0.24* | *0.23* | *0.19* | *0.18* | *0.18* | 0.17 | 0.24 | 0.14 | 0.20 | 0.16 |
| Total phosphorus | mg P/L | *2.2300* | *0.0058* | *0.0100* | *0.0200* | *0.0040* | *0.0049* | 0.0110 | 0.0039 | < 0.0050 | 0.0023 | 0.0022 |
| Orthophosphate | mg P/L | *0.010* | *0.010* | *0.010* | *0.013* | *0.010* | *0.010* | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Chlorophyll a | mg/L | *1.0500* | *1.3200* | *-* | *0.0013* | *0.0015* | *0.0007* | 0.00028 | 0.00031 | 0.00150 | 0.00120 | 0.00032 |

| NP2-South | Unit | Annual Average | | | | | | 6/5/2022 | 7/5/2022 | 8/1/2022 | 9/4/2022 | 10/9/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | | | | | |
| **Total Metals** | | | | | | | | | | | | |
| Aluminum | mg/L | 0.0670 | 0.0060 | 0.0430 | 0.0150 | 0.0699 | 0.0365 | 0.1200 | 0.0113 | 0.0080 | 0.0055 | 0.0378 |
| Antimony | mg/L | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0005 | 0.0005 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 |
| Arsenic | mg/L | 0.00050 | 0.00057 | 0.00080 | 0.00103 | 0.00275 | 0.00186 | 0.00327 | 0.00137 | 0.00167 | 0.00142 | 0.00157 |
| Barium | mg/L | 0.0050 | 0.0045 | 0.0042 | 0.0038 | 0.0049 | 0.0041 | 0.0034 | 0.0045 | 0.0040 | 0.0037 | 0.0050 |
| Beryllium | mg/L | 0.0005 | 0.0005 | 0.0005 | 0.0005 | 0.0001 | 0.0001 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 |
| Boron | mg/L | 0.01 | 0.01 | 0.01 | 0.01 | 0.05 | 0.05 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Cadmium | mg/L | 0.00002 | 0.00002 | 0.00002 | 0.00002 | 0.00001 | 0.00001 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| Calcium (total) | mg/L | 19.1 | 17.6 | 18.4 | 23.4 | 16.1 | 16.8 | 5.99 | 17.50 | 20.20 | 19.10 | 21.20 |
| Chromium | mg/L | 0.0006 | 0.0007 | 0.0006 | 0.0006 | 0.0010 | 0.0011 | 0.0013 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Cobalt | mg/L | 0.00063 | 0.00050 | 0.00050 | 0.00087 | 0.00053 | 0.00030 | 0.00068 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Copper | mg/L | 0.0035 | 0.0032 | 0.0038 | 0.0040 | 0.0035 | 0.0027 | 0.00245 | 0.00296 | 0.00298 | 0.00242 | 0.00273 |
| Iron | mg/L | 0.130 | 0.093 | 0.060 | 0.153 | 0.115 | 0.117 | 0.232 | 0.084 | 0.105 | 0.058 | 0.108 |
| Lead | mg/L | 0.00080 | 0.00083 | 0.00030 | 0.00021 | 0.00022 | 0.00026 | 0.00049 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Lithium | mg/L | 0.005 | 0.005 | 0.005 | 0.005 | 0.002 | 0.002 | < 0.0020 | < 0.0020 | < 0.0020 | < 0.0020 | < 0.0020 |
| Magnesium (total) | mg/L | 6.57 | 6.10 | 6.16 | 7.72 | 5.73 | 5.86 | 1.95 | 5.83 | 6.90 | 6.72 | 7.91 |
| Manganese | mg/L | 0.0150 | 0.0108 | 0.0062 | 0.0357 | 0.0215 | 0.0189 | 0.0574 | 0.0107 | 0.0124 | 0.0076 | 0.0066 |
| Mercury | mg/L | 0.00002 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.0006 | 0.0005 | 0.0006 | 0.0007 | 0.0018 | 0.0017 | < 0.0010 | 0.0013 | 0.0019 | 0.0019 | 0.0022 |
| Nickel | mg/L | 0.0053 | 0.0055 | 0.0111 | 0.0155 | 0.0140 | 0.0094 | 0.0116 | 0.0070 | 0.0068 | 0.0078 | 0.0136 |
| Potassium (total) | mg/L | 2.33 | 1.92 | 1.94 | 2.35 | 1.65 | 1.56 | 0.787 | 1.550 | 1.850 | 1.790 | 1.820 |
| Selenium | mg/L | 0.0010 | 0.0008 | 0.0008 | 0.0010 | 0.0001 | 0.0001 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 |
| Silver | mg/L | 0.00010 | 0.00010 | 0.00010 | 0.00010 | 0.00002 | 0.00002 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| Sodium (total) | mg/L | 9.76 | 7.05 | 5.17 | 4.92 | 2.66 | 2.35 | 0.71 | 2.55 | 2.78 | 2.80 | 2.92 |
| Strontium | mg/L | 0.0830 | 0.0677 | 0.0735 | 0.0773 | 0.0654 | 0.0655 | 0.0232 | 0.0694 | 0.0769 | 0.0766 | 0.0816 |
| Thallium | mg/L | 0.00080 | 0.00020 | 0.00020 | 0.00020 | 0.00001 | 0.00001 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| Tin | mg/L | 0.001 | 0.001 | 0.001 | 0.001 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Titanium | mg/L | 0.018 | 0.013 | 0.010 | 0.010 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Uranium | mg/L | 0.0010 | 0.0010 | 0.0010 | 0.0013 | 0.0012 | 0.0012 | 0.00038 | 0.00119 | 0.00127 | 0.00134 | 0.00178 |
| Vanadium | mg/L | 0.0005 | 0.0005 | 0.0005 | 0.0005 | 0.0050 | 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Zinc | mg/L | 0.0025 | 0.0010 | 0.0010 | 0.0037 | 0.0050 | 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| **Dissolved Metals** | | | | | | | | | | | | |
| Aluminum | mg/L | 0.0060 | 0.0053 | 0.0028 | 0.0087 | 0.0163 | 0.0088 | 0.0197 | 0.0122 | 0.0041 | 0.0050 | 0.0031 |
| Antimony | mg/L | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0005 | 0.0005 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 |
| Arsenic | mg/L | 0.00050 | 0.00057 | 0.00065 | 0.00053 | 0.00234 | 0.00168 | 0.00241 | 0.00203 | 0.00133 | 0.00098 | 0.00163 |
| Barium | mg/L | 0.0044 | 0.0047 | 0.0055 | 0.0028 | 0.0106 | 0.0042 | 0.0030 | 0.0053 | 0.0039 | 0.0038 | 0.0049 |

| NP2-South | Unit | Annual Average | | | | | | 6/5/2022 | 7/5/2022 | 8/1/2022 | 9/4/2022 | 10/9/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | *2017* | *2018* | *2019* | *2020* | *2021* | *2022* | | | | | |
| Beryllium | mg/L | *0.0005* | *0.0005* | *0.0005* | *0.0005* | *0.0001* | *0.0001* | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 |
| Boron | mg/L | *0.01* | *0.01* | *0.01* | *0.01* | *0.05* | *0.05* | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Cadmium | mg/L | *0.00002* | *0.00003* | *0.00002* | *0.00002* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | 0.00002 | < 0.00001 |
| Chromium | mg/L | *0.0008* | *0.0007* | *0.0006* | *0.0006* | *0.0010* | *0.0010* | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Cobalt | mg/L | *0.00064* | *0.00050* | *0.00050* | *0.00067* | *0.00039* | *0.00028* | 0.00058 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Copper | mg/L | *0.0027* | *0.0028* | *0.0027* | *0.0019* | *0.0031* | *0.0043* | 0.00219 | 0.00729 | 0.00278 | 0.00271 | 0.00629 |
| Iron | mg/L | *0.030* | *0.017* | *0.010* | *0.013* | *0.031* | *0.032* | 0.0384 | 0.0588 | 0.0223 | 0.0201 | 0.0222 |
| Lead | mg/L | *0.0005* | *0.0004* | *0.0003* | *0.0002* | *0.0002* | *0.0003* | < 0.00020 | 0.00071 | < 0.00020 | < 0.00020 | < 0.00020 |
| Lithium | mg/L | *0.005* | *0.005* | *0.005* | *0.005* | *0.002* | *0.002* | < 0.0020 | < 0.0020 | < 0.0020 | < 0.0020 | < 0.0020 |
| Manganese | mg/L | *0.0046* | *0.0057* | *0.0016* | *0.0233* | *0.0147* | *0.0162* | 0.0614 | 0.0059 | 0.0044 | 0.0050 | 0.0041 |
| Mercury | mg/L | *0.00001* | *0.00001* | *0.00001* | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0005* | *0.0005* | *0.0006* | *0.0006* | *0.0018* | *0.0017* | < 0.0010 | 0.0014 | 0.0017 | 0.0019 | 0.0023 |
| Nickel | mg/L | *0.0043* | *0.0051* | *0.0089* | *0.0185* | *0.0119* | *0.0092* | 0.0107 | 0.0084 | 0.0054 | 0.0079 | 0.0137 |
| Selenium | mg/L | *0.0010* | *0.0010* | *0.0010* | *0.0010* | *0.0001* | *0.0001* | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 |
| Silver | mg/L | *0.00010* | *0.00010* | *0.00010* | *0.00010* | *0.00002* | *0.00002* | 0.000028 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| Strontium | mg/L | *0.07* | *0.07* | *0.06* | *0.06* | *0.06* | *0.07* | 0.0234 | 0.0712 | 0.0715 | 0.0785 | 0.0886 |
| Thallium | mg/L | *0.00080* | *0.00020* | *0.00030* | *0.00020* | *0.00001* | *0.00001* | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| Tin | mg/L | *0.001* | *0.001* | *0.001* | *0.001* | *0.005* | *0.005* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Titanium | mg/L | *0.018* | *0.013* | *0.010* | *0.010* | *0.005* | *0.005* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Uranium | mg/L | *0.0010* | *0.0010* | *0.0010* | *0.0010* | *0.0011* | *0.0012* | 0.00032 | 0.00132 | 0.00120 | 0.00131 | 0.00184 |
| Vanadium | mg/L | *0.0005* | *0.0005* | *0.0005* | *0.0005* | *0.0050* | *0.0050* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Zinc | mg/L | *0.0010* | *0.0013* | *0.0010* | *0.0010* | *0.0062* | *0.0056* | < 0.0050 | 0.0082 | < 0.0050 | < 0.0050 | < 0.0050 |

#### *8.5.3.1.8 North Portage Pit (ST-17)*

Since 2019, there is no longer a sump associated with the North Portage Pit and thus, as per the Water License, Agnico Eagle has started to consider this area as the Portage Pit Lake (ST-17 Lake). The naming convention of ST-17 replaced ST-17 Lake when the in-pit tailings deposition in the Portage pits started in 2020. Refer to previous annual reports for ST-17 Lake and ST-17 Pit Sump results.

In 2022, nine (9) samples were collected in North Portage Pit (ST-17) from January to April and June to October. The Pore Water Quality Monitoring Program is followed. The sampling location is illustrated on Figure 1. Results are presented in Table 8-19. There are no applicable NWB Water License limits.

#### *8.5.3.1.9 South Portage Pit (ST-19)*

There is no longer a sump associated with the South Portage Pit since the end of 2019. Sump sampling results (ST-19 Pit Sump) can be found in previous annual reports. In 2020, samples were taken in the pit under ST-19 Lake's name. In August 2020, the in-pit tailings deposition started in the Portage pits and the station name was modified for ST-19 instead of ST-19 Lake. The location remains the same for water collection, only the use of a different station name.

In 2022, water from South Portage Pit (ST-19) was sampled monthly. Results are presented in Table 8-20. There are no applicable NWB Water License limits. The Pore Water Quality Monitoring Program is followed since 2020. The sampling location is illustrated on Figure 1.

**Table 8-19 Meadowbank 2022 North Portage Pit Water Quality Monitoring (ST-17)**

| ST-17 | Unit | *Annual Average* | | | 1/12/2022 | 2/7/2022 | 3/13/2022 | 4/10/2022 | 6/12/2022 | 7/10/2022 | 8/2/2022 | 9/11/2022 | 10/4/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | *2020* | *2021* | *2022* | | | | | | | | | |
| **Field Measured** | | | | | | | | | | | | | |
| Temperature | °C | *8.4* | *4.8* | *4.0* | 0.0 | 1.2 | 0.2 | 0.6 | 3.6 | 13.2 | 10.0 | 5.9 | 1.1 |
| pH | pH units | *7.24* | *7.78* | *8.13* | 7.53 | 7.19 | 7.71 | 8.02 | 7.73 | 8.64 | 8.55 | 9.84 | 7.97 |
| Conductivity | uS/cm | *2391.7* | *1775.5* | *2020.3* | 2596 | 33 | 2880 | 3065 | 1169 | 1718 | 2450 | 1426 | 2846 |
| Turbidity | NTU | *14.25* | *7.44* | *13.25* | 4.37 | 5.71 | 4.36 | 6.33 | 20.60 | 18.20 | 13.90 | 37.90 | 7.86 |
| **Conventional Parameters** | | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *610* | *476* | *612* | 655 | 675 | 741 | 847 | 294 | 463 | 604 | 453 | 773 |
| Total alkalinity, as $CaCO_3$ | mg/L | *91* | *78* | *114* | 130 | 130 | 140 | 140 | 59 | 73 | 120 | 91 | 140 |
| Carbonate, as $CaCO_3$ | mg/L | *-* | *1.00* | *1.00* | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bicarbonate, as $CaCO_3$ | mg/L | *92* | *78* | *113* | 130 | 130 | 140 | 140 | 58 | 72 | 120 | 91 | 140 |
| TDS | mg/L | *1120* | *1178* | *1632* | 1850 | 1890 | 2030 | 2040 | 810 | 1280 | 1620 | 1190 | 1980 |
| TSS | mg/L | *63* | *3* | *13* | 3 | 3 | 2 | 3 | 22 | 17 | 17 | 43 | 4 |
| Total organic carbon | mg/L | *13.8* | *10.8* | *20.4* | 15 | 17 | 14 | 18 | 11 | 16 | 30 | 45 | 18 |
| Dissolved organic carbon | mg/L | *12.5* | *9.6* | *17.2* | 15 | 17 | *14* | 18 | 10 | 12 | 22 | 30 | 17 |
| Sodium Adsorption Ratio (salinity in water) | - | *-* | *3.04* | *4.13* | 4.4 | 4.6 | 4.8 | 5.0 | 2.8 | 3.7 | 4.2 | 2.8 | 4.9 |
| Oxidation-Reduction Potential | mV | *-* | *277.8* | *241.8* | 306 | 257 | 193 | 206 | 234 | 230 | 250 | 270 | 230 |
| **Major Ions** | | | | | | | | | | | | | |
| Bromide | mg/L | *0.79* | *1.26* | *1.54* | < 1.0 | < 1.0 | 1.3 | < 5.0 | < 1.0 | < 1.0 | 1.2 | < 1.0 | 1.4 |
| Chloride | mg/L | *124.5* | *99.7* | *127.8* | 130 | 140 | 150 | 180 | 72 | 100 | 120 | 88 | 170 |
| Cyanide | mg/L | *0.067* | *0.132* | *0.085* | 0.0172 | 0.0541 | 0.0634 | 0.3680 | 0.0849 | 0.0378 | 0.0466 | 0.0246 | 0.0664 |
| Cyanide (free) | mg/L | *0.0265* | *0.1931* | *0.0395* | 0.0029 | 0.0180 | 0.0280 | 0.2300 | 0.0550 | 0.0032 | 0.0097 | < 0.0020 | 0.0066 |
| Cyanide (WAD) | mg/L | *0.0550* | *0.0858* | *0.0521* | 0.0083 | 0.0240 | 0.0450 | 0.2700 | 0.0710 | 0.0049 | 0.0210 | 0.0091 | 0.0160 |
| Fluoride | mg/L | *0.25* | *0.24* | *0.31* | 0.32 | 0.32 | 0.39 | 0.35 | 0.23 | 0.22 | 0.28 | 0.36 | 0.32 |
| Silica | mg/L | *6.17* | *3.65* | *5.96* | 6.2 | 6.4 | 7.0 | 7.6 | 3.0 | 4.3 | 5.2 | 6.2 | 7.7 |
| Sulfate | mg/L | *720* | *673* | *961* | 1000 | 1100 | 1100 | 1300 | 430 | 870 | 1000 | 650 | 1200 |
| **Nutrients** | | | | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | *13.09* | *17.63* | *23.62* | 28 | 30 | 33 | 33 | 9 | 13 | 22 | 10 | 35 |
| Nitrate | mg N/L | *2.82* | *1.56* | *1.23* | 1.60 | 2.21 | 0.56 | 1.57 | 0.50 | 1.08 | 1.95 | 0.55 | 1.07 |
| Nitrite | mg N/L | *0.256* | *0.180* | *0.199* | 0.207 | 0.264 | 0.075 | 0.162 | 0.064 | 0.641 | 0.202 | 0.028 | 0.152 |
| Total Kjeldahl nitrogen | mg N/L | *25* | *28* | *38* | 46 | 49 | 44 | 53 | 16 | 27 | 40 | 19 | 50 |
| Total phosphorus | mg P/L | *0.098* | *0.028* | *0.169* | 0.004 | 0.013 | 0.026 | 0.018 | 0.350 | 0.130 | 0.210 | 0.750 | 0.019 |
| Orthophosphate | mg P/L | *0.080* | *0.021* | *0.077* | 0.027 | 0.024 | 0.073 | 0.037 | 0.250 | 0.011 | 0.033 | 0.210 | 0.031 |
| **Total Metals** | | | | | | | | | | | | | |
| Aluminum | mg/L | *0.4100* | *0.0464* | *0.0876* | 0.0106 | 0.0130 | 0.0069 | 0.0711 | 0.2700 | 0.0607 | 0.1200 | 0.1670 | 0.0688 |

| ST-17 | Unit | Annual Average | | | 1/12/2022 | 2/7/2022 | 3/13/2022 | 4/10/2022 | 6/12/2022 | 7/10/2022 | 8/2/2022 | 9/11/2022 | 10/4/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2020 | 2021 | 2022 | | | | | | | | | |
| Antimony | mg/L | - | 0.00304 | 0.00341 | 0.00456 | 0.00541 | 0.00277 | 0.00548 | 0.00098 | 0.00190 | 0.00412 | 0.00081 | 0.00467 |
| Arsenic | mg/L | 0.3950 | 0.0808 | 0.1021 | 0.0895 | 0.0926 | 0.2360 | 0.1770 | 0.0354 | 0.0511 | 0.0625 | 0.0520 | 0.1230 |
| Barium | mg/L | 0.0473 | 0.0256 | 0.0329 | 0.0354 | 0.0404 | 0.0353 | 0.0472 | 0.0154 | 0.0248 | 0.0382 | 0.0222 | 0.0375 |
| Beryllium | mg/L | - | 0.00009 | 0.00002 | 0.000041 | < 0.000020 | < 0.000020 | < 0.000020 | 0.000016 | < 0.000010 | < 0.000010 | 0.000017 | < 0.000020 |
| Boron | mg/L | - | 0.0635 | 0.1498 | 0.139 | 0.156 | 0.156 | 0.179 | 0.053 | 0.091 | 0.118 | 0.144 | 0.312 |
| Cadmium | mg/L | 0.00002 | 0.00005 | 0.00003 | 0.000072 | 0.000043 | < 0.000010 | < 0.000010 | 0.000014 | 0.000026 | 0.000033 | 0.000029 | 0.000021 |
| Calcium (total) | mg/L | 214.6 | 157.1 | 203.3 | 218 | 226 | 249 | 287 | 95 | 152 | 205 | 137 | 261 |
| Chromium | mg/L | 0.00335 | 0.00070 | 0.00111 | < 0.00020 | 0.00035 | < 0.00020 | 0.00306 | 0.00245 | 0.00068 | 0.00102 | 0.00155 | 0.00046 |
| Copper | mg/L | 0.514 | 0.704 | 0.440 | 0.495 | 0.595 | 0.246 | 0.741 | 0.162 | 0.568 | 0.901 | 0.028 | 0.225 |
| Iron | mg/L | 1.298 | 0.291 | 0.628 | 0.243 | 0.227 | 0.409 | 0.532 | 1.180 | 0.700 | 0.758 | 1.100 | 0.502 |
| Lead | mg/L | 0.00045 | 0.00097 | 0.00070 | 0.000581 | 0.000482 | 0.000241 | 0.000927 | 0.001420 | 0.000639 | 0.000597 | 0.000614 | 0.000826 |
| Lithium | mg/L | - | 0.00366 | 0.00509 | 0.0049 | 0.0052 | 0.0044 | 0.0050 | 0.0034 | 0.0037 | 0.0044 | 0.0100 | 0.0048 |
| Magnesium (total) | mg/L | 18.60 | 20.32 | 25.26 | 26.7 | 27.0 | 29.2 | 31.4 | 13.8 | 20.3 | 22.3 | 26.9 | 29.7 |
| Manganese | mg/L | 0.2574 | 0.4986 | 0.5492 | 0.617 | 0.559 | 0.571 | 0.541 | 0.461 | 0.492 | 0.476 | 0.752 | 0.474 |
| Mercury | mg/L | 0.00001 | 0.00005 | 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 |
| Molybdenum | mg/L | 0.0952 | 0.0702 | 0.0886 | 0.0946 | 0.1010 | 0.1410 | 0.1400 | 0.0366 | 0.0590 | 0.0688 | 0.0408 | 0.1160 |
| Nickel | mg/L | 0.1076 | 0.4539 | 0.1984 | 0.411 | 0.405 | 0.136 | 0.284 | 0.058 | 0.127 | 0.174 | 0.025 | 0.165 |
| Potassium (total) | mg/L | 79.22 | 49.30 | 64.17 | 69.4 | 77.5 | 79.7 | 94.1 | 25.3 | 46.3 | 65.4 | 34.5 | 85.3 |
| Selenium | mg/L | 0.0224 | 0.0216 | 0.0256 | 0.0301 | 0.0343 | 0.0174 | 0.0404 | 0.0064 | 0.0195 | 0.0408 | 0.0045 | 0.0369 |
| Silver | mg/L | 0.00035 | 0.00016 | 0.00009 | 0.000106 | 0.000093 | 0.000021 | 0.000089 | 0.000051 | 0.000125 | 0.000259 | 0.000022 | 0.000045 |
| Sodium (total) | mg/L | 203.9 | 181.3 | 221.0 | 251 | 262 | 267 | 307 | 106 | 172 | 214 | 129 | 281 |
| Strontium | mg/L | - | 0.519 | 0.873 | 0.883 | 0.941 | 1.030 | 1.200 | 0.411 | 0.675 | 0.887 | 0.707 | 1.120 |
| Thallium | mg/L | 0.00067 | 0.00007 | 0.00001 | 0.0000194 | 0.0000104 | 0.0000051 | 0.0000166 | 0.0000081 | 0.0000141 | 0.0000136 | 0.0000123 | 0.0000126 |
| Tin | mg/L | - | 0.0002 | 0.0003 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00040 |
| Titanium | mg/L | - | 0.0027 | 0.0023 | < 0.0010 | < 0.0010 | < 0.0010 | 0.0040 | 0.0059 | 0.0008 | 0.0023 | 0.0036 | < 0.0010 |
| Uranium | mg/L | - | 0.0090 | 0.0162 | 0.0168 | 0.0179 | 0.0231 | 0.0246 | 0.0064 | 0.0109 | 0.0136 | 0.0104 | 0.0218 |
| Vanadium | mg/L | - | 0.0003 | 0.0004 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00040 | 0.00056 | 0.00023 | 0.00038 | 0.00052 | < 0.00040 |
| Zinc | mg/L | 0.072 | 0.004 | 0.004 | 0.00711 | 0.00412 | 0.00519 | 0.00386 | 0.00285 | 0.00166 | 0.00354 | 0.00400 | 0.00241 |
| **Dissolved Metals** | | | | | | | | | | | | | |
| Aluminum | mg/L | 0.0118 | 0.0077 | 0.0088 | 0.0070 | 0.0037 | 0.0051 | 0.0099 | 0.0056 | 0.0105 | 0.0123 | 0.0198 | 0.0056 |
| Antimony | mg/L | - | 0.00313 | 0.00335 | 0.00461 | 0.00509 | 0.00212 | 0.00515 | 0.00109 | 0.00198 | 0.00414 | 0.00077 | 0.00519 |
| Arsenic | mg/L | 0.34538 | 0.05523 | 0.06373 | 0.0533 | 0.0640 | 0.1540 | 0.1070 | 0.0226 | 0.0179 | 0.0320 | 0.0274 | 0.0954 |
| Barium | mg/L | 0.0483 | 0.0247 | 0.0321 | 0.0362 | 0.0388 | 0.0345 | 0.0454 | 0.0138 | 0.0212 | 0.0373 | 0.0203 | 0.0416 |
| Beryllium | mg/L | - | 0.00001 | 0.00002 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000020 |
| Boron | mg/L | - | 0.081 | 0.131 | 0.136 | 0.145 | 0.160 | 0.155 | 0.056 | 0.091 | 0.116 | 0.147 | 0.173 |
| Cadmium | mg/L | 0.00002 | 0.00002 | 0.00002 | 0.000054 | 0.000033 | 0.000014 | 0.000013 | 0.000012 | 0.000021 | 0.000023 | 0.000018 | 0.000020 |
| Chromium | mg/L | 0.00550 | 0.00026 | 0.00019 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00010 | < 0.00010 | 0.00028 | 0.00026 | < 0.00020 |

| ST-17 | Unit | Annual Average | | | 1/12/2022 | 2/7/2022 | 3/13/2022 | 4/10/2022 | 6/12/2022 | 7/10/2022 | 8/2/2022 | 9/11/2022 | 10/4/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2020 | 2021 | 2022 | | | | | | | | | |
| Copper | mg/L | *0.327* | *0.563* | *0.255* | 0.366 | 0.374 | 0.122 | 0.593 | 0.155 | 0.107 | 0.400 | 0.020 | 0.161 |
| Iron | mg/L | *0.020* | *0.034* | *0.040* | 0.0167 | 0.0390 | 0.0189 | 0.0067 | 0.0496 | 0.0180 | 0.0443 | 0.0965 | 0.0699 |
| Lead | mg/L | *0.00049* | *0.00012* | *0.00020* | 0.000612 | 0.000123 | 0.000147 | 0.000139 | 0.000077 | 0.000094 | 0.000224 | 0.000176 | 0.000174 |
| Lithium | mg/L | - | *0.00339* | *0.00515* | 0.0052 | 0.0048 | 0.0047 | 0.0044 | 0.0031 | 0.0038 | 0.0042 | 0.0108 | 0.0053 |
| Manganese | mg/L | *0.2039* | *0.4678* | *0.4717* | 0.609 | 0.537 | 0.544 | 0.497 | 0.445 | 0.183 | 0.368 | 0.542 | 0.520 |
| Mercury | mg/L | *0.00001* | *0.00005* | *0.00010* | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 |
| Molybdenum | mg/L | *0.0898* | *0.0655* | *0.0880* | 0.0941 | 0.1010 | 0.1350 | 0.1290 | 0.0373 | 0.0519 | 0.0687 | 0.0411 | 0.1340 |
| Nickel | mg/L | *0.0919* | *0.4255* | *0.1869* | 0.4110 | 0.3880 | 0.1260 | 0.2570 | 0.0602 | 0.0808 | 0.1610 | 0.0205 | 0.1780 |
| Selenium | mg/L | *0.0225* | *0.0179* | *0.0257* | 0.0310 | 0.0339 | 0.0184 | 0.0370 | 0.0079 | 0.0181 | 0.0409 | 0.0048 | 0.0390 |
| Silver | mg/L | *0.00018* | *0.00012* | *0.00007* | 0.000016 | 0.000067 | < 0.000010 | 0.000311 | 0.000018 | - | 0.000064 | 0.000011 | 0.000024 |
| Strontium | mg/L | *0.573* | *0.546* | *0.876* | 0.905 | 0.958 | 0.990 | 1.130 | 0.426 | 0.620 | 0.923 | 0.723 | 1.210 |
| Thallium | mg/L | *0.00035* | *0.00007* | *0.00001* | 0.0000191 | 0.0000183 | 0.0000044 | 0.0000200 | 0.0000043 | 0.0000136 | 0.0000127 | 0.0000082 | 0.0000114 |
| Tin | mg/L | - | *0.0002* | *0.0057* | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00040 | 0.04820 | < 0.00020 | 0.00048 | < 0.00020 | < 0.00040 |
| Titanium | mg/L | - | *0.0006* | *0.0008* | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0010 |
| Uranium | mg/L | - | *0.0082* | *0.0158* | 0.0170 | 0.0172 | 0.0220 | 0.0200 | 0.0064 | 0.0111 | 0.0123 | 0.0104 | 0.0256 |
| Vanadium | mg/L | - | *0.0002* | *0.0003* | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00040 |
| Zinc | mg/L | *0.001* | *0.006* | *0.004* | 0.01040 | 0.00375 | 0.00876 | 0.00438 | 0.00155 | 0.00198 | 0.00338 | 0.00085 | 0.00124 |

**Table 8-20 Meadowbank 2022 South Portage Pit Water Quality Monitoring (ST-19)**

| ST-19 | Unit | *Annual Average* | | | 1/24/2022 | 2/8/2022 | 3/13/2022 | 4/10/2022 | 5/9/2022 | 6/5/2022 | 7/10/2022 | 8/28/2022 | 9/11/2022 | 10/4/2022 | 11/15/2022 | 12/4/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | *2020* | *2021* | *2022* | | | | | | | | | | | | |
| **Field Measured** | | | | | | | | | | | | | | | | |
| Temperature | °C | *-* | *3.9* | *4.7* | 2.0 | 0.8 | 0.4 | 1.2 | 1.2 | 4.4 | 16.4 | 12.0 | 10.2 | 5.3 | 1.2 | 1.2 |
| pH | pH units | *7.75* | *8.20* | *8.29* | 8.10 | 8.16 | 8.62 | 8.52 | 8.63 | 8.64 | 7.89 | 8.11 | 7.93 | 8.42 | 8.18 | 8.25 |
| Conductivity | uS/cm | *2677* | *2971* | *4588* | 4318 | 4496 | 4208 | 4473 | 4804 | 4553 | 3972 | 4322 | 4847 | 4722 | 5138 | 5197 |
| Turbidity | NTU | *-* | *3.99* | *24.85* | 4.14 | 1.99 | 3.75 | 189.00 | 8.22 | 18.00 | 49.20 | 3.68 | 0.61 | 8.75 | 3.23 | 7.65 |
| **Conventional Parameters** | | | | | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *871* | *988* | *1333* | 1300 | 1240 | 1260 | 1350 | 1280 | 1350 | 1220 | 1390 | 1370 | 1390 | 1390 | 1450 |
| Total alkalinity, as $CaCO_3$ | mg/L | *90* | *91* | *103* | 110 | 110 | 100 | 98 | 100 | 94 | 98 | 120 | 100 | 110 | 100 | 100 |
| Carbonate, as $CaCO_3$ | mg/L | *-* | *1.0* | *1.1* | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | 2.1 | < 1.0 | 1.2 | < 1.0 | < 1.0 |
| Bicarbonate, as $CaCO_3$ | mg/L | *-* | *90* | *102* | 100 | 110 | 100 | 98 | 100 | 94 | 97 | 120 | 100 | 110 | 100 | 99 |
| TDS | mg/L | *17* | *2680* | *3719* | 3310 | 3570 | 3620 | 3250 | 3490 | 3830 | 3280 | 4850 | 3690 | 3670 | 4060 | 4010 |
| TSS | mg/L | *1* | *15* | *52* | 4 | 9 | 15 | 390 | 26 | 30 | 77 | 9 | 6 | 37 | 8 | 16 |
| Total organic carbon | mg/L | *18.7* | *26.0* | *54.0* | 45 | 46 | 45 | 44 | 50 | 55 | 44 | 59 | 58 | 62 | 69 | 71 |
| Dissolved organic carbon | mg/L | *17.7* | *25.4* | *52.4* | 44 | 43 | 42 | 43 | 46 | 49 | 47 | 57 | 59 | 62 | 66 | 71 |
| Sodium Adsorption Ratio (salinity in water) | - | *-* | *4.6* | *6.0* | 5.7 | 5.7 | 5.9 | 5.9 | 5.8 | 5.8 | 5.4 | 6.0 | 5.8 | 6.3 | 6.8 | 7.0 |
| Oxidation-Reduction Potential | mV | *-* | *192.9* | *177.5* | < 0 | 209 | 205 | 171 | 172 | 184 | 200 | 200 | 200 | 190 | 200 | 200 |
| **Major Ions** | | | | | | | | | | | | | | | | |
| Bromide | mg/L | *-* | *2.33* | *4.47* | < 5.0 | < 10.0 | < 1.0 | < 5.0 | < 10.0 | < 10.0 | 1.5 | < 2.0 | 1.2 | < 5.0 | 1.5 | 1.4 |
| Chloride | mg/L | *200.0* | *219.9* | *435.8* | 380 | 390 | 400 | 410 | 410 | 460 | 380 | 460 | 420 | 470 | 490 | 560 |
| Cyanide | mg/L | *0.049* | *0.310* | *1.733* | 4.280 | 4.290 | 2.180 | 0.873 | 2.050 | 3.840 | 0.044 | 0.046 | 0.303 | 0.290 | 0.653 | 1.950 |
| Cyanide (free) | mg/L | *0.0180* | *0.3700* | *0.2021* | 0.110 | 1.500 | 0.250 | 0.048 | 0.006 | < 0.010 | 0.004 | 0.031 | 0.085 | 0.094 | 0.270 | 0.018 |
| Cyanide (WAD) | mg/L | *0.0210* | *0.2300* | *0.8188* | 3.300 | 3.000 | 0.790 | 0.350 | 0.011 | 0.960 | 0.004 | 0.020 | 0.120 | 0.070 | 0.470 | 0.730 |
| Fluoride | mg/L | *0.39* | *0.25* | *0.16* | 0.17 | 0.16 | 0.16 | 0.15 | 0.17 | 0.15 | 0.17 | 0.18 | 0.14 | 0.14 | 0.13 | 0.14 |
| Silica | mg/L | *-* | *6.00* | *7.14* | 7.2 | 7.9 | 7.1 | 8.0 | 7.9 | 5.8 | 5.8 | 6.5 | 8.1 | 8.7 | 6.8 | 5.9 |
| Sulfate | mg/L | *1150* | *1032* | *1808* | 1700 | 1700 | 1500 | 1800 | 1600 | 1800 | 1600 | 2000 | 1900 | 1800 | 2100 | 2200 |
| **Nutrients** | | | | | | | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | *14.72* | *40.11* | *53.08* | 49 | 51 | 49 | 47 | 50 | 50 | 46 | 59 | 58 | 60 | 57 | 61 |
| Nitrate | mg N/L | *2.04* | *8.17* | *12.11* | 10.90 | 10.30 | 9.92 | 9.46 | 10.10 | 11.20 | 11.70 | 12.40 | 13.20 | 15.20 | 15.20 | 15.70 |
| Nitrite | mg N/L | *0.080* | *0.280* | *0.347* | 0.407 | 0.384 | 0.366 | 0.389 | 0.379 | 0.372 | 0.304 | 0.308 | 0.315 | 0.314 | 0.302 | 0.321 |
| Total Kjeldahl nitrogen | mg N/L | *-* | *66* | *110* | 94 | 95 | 92 | 99 | 96 | 99 | 89 | 130 | 120 | 130 | 130 | 140 |
| Total phosphorus | mg P/L | *0.010* | *0.027* | *0.031* | 0.022 | 0.017 | < 0.020 | 0.160 | 0.015 | < 0.010 | 0.041 | 0.011 | 0.020 | 0.038 | 0.009 | < 0.010 |
| Orthophosphate | mg P/L | *-* | *0.039* | *0.038* | 0.038 | 0.029 | 0.035 | 0.022 | 0.030 | 0.054 | 0.023 | 0.028 | 0.042 | 0.110 | 0.023 | 0.023 |
| **Total Metals** | | | | | | | | | | | | | | | | |
| Aluminum | mg/L | *0.0190* | *0.0947* | *0.9945* | 0.0270 | 0.0292 | 0.0496 | 9.6300 | 0.3090 | 0.1700 | 0.9420 | 0.0848 | 0.0351 | 0.5450 | 0.0499 | 0.0621 |

| ST-19 | Unit | *Annual Average* | | | 1/24/2022 | 2/8/2022 | 3/13/2022 | 4/10/2022 | 5/9/2022 | 6/5/2022 | 7/10/2022 | 8/28/2022 | 9/11/2022 | 10/4/2022 | 11/15/2022 | 12/4/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | *2020* | *2021* | *2022* | | | | | | | | | | | | |
| Antimony | mg/L | *-* | *0.01139* | *0.01543* | 0.0203 | 0.0192 | 0.0202 | 0.0114 | 0.0184 | 0.0084 | 0.0120 | 0.0155 | 0.0172 | 0.0134 | 0.0142 | 0.0149 |
| Arsenic | mg/L | *0.0108* | *0.1296* | *0.1502* | 0.1740 | 0.1040 | 0.0582 | 0.1130 | 0.0968 | 0.1190 | 0.0953 | 0.1150 | 0.1750 | 0.5670 | 0.0937 | 0.0908 |
| Barium | mg/L | *0.0292* | *0.0893* | *0.1329* | 0.129 | 0.135 | 0.173 | 0.211 | 0.144 | 0.136 | 0.112 | 0.117 | 0.112 | 0.105 | 0.108 | 0.113 |
| Beryllium | mg/L | *-* | *0.00002* | *0.00006* | < 0.000050 | < 0.000050 | < 0.000020 | 0.000209 | < 0.000050 | 0.000085 | 0.000030 | < 0.000050 | < 0.000050 | < 0.000050 | < 0.000050 | < 0.000050 |
| Boron | mg/L | *-* | *0.1990* | *0.2951* | 0.291 | 0.279 | 0.253 | 0.262 | 0.413 | 0.355 | 0.237 | 0.287 | 0.335 | 0.265 | 0.259 | 0.305 |
| Cadmium | mg/L | *0.00002* | *0.00007* | *0.00019* | 0.000214 | 0.000079 | 0.000180 | 0.000384 | 0.000050 | 0.000076 | 0.000210 | 0.000307 | 0.000231 | 0.000127 | 0.000265 | 0.000133 |
| Calcium (total) | mg/L | *267.0* | *358.0* | *492.8* | 478 | 454 | 465 | 487 | 473 | 498 | 446 | 517 | 509 | 519 | 521 | 547 |
| Chromium | mg/L | *0.00060* | *0.00190* | *0.03978* | 0.00076 | 0.00074 | 0.00183 | 0.41300 | 0.01200 | 0.00502 | 0.01850 | 0.00212 | 0.00070 | 0.02040 | 0.00085 | 0.00142 |
| Copper | mg/L | *0.003* | *2.451* | *3.178* | 3.08 | 3.79 | 4.90 | 5.41 | 5.68 | 4.31 | 5.56 | 0.89 | 1.02 | 0.53 | 1.38 | 1.59 |
| Iron | mg/L | *0.070* | *0.277* | *2.785* | 0.197 | 0.518 | 0.724 | 25.500 | 1.100 | 1.020 | 2.110 | 0.198 | 0.045 | 1.620 | 0.145 | 0.248 |
| Lead | mg/L | *0.00017* | *0.00056* | *0.00912* | 0.0405 | 0.0050 | 0.0015 | 0.0441 | 0.0024 | 0.0017 | 0.0053 | 0.0022 | 0.0003 | 0.0036 | 0.0010 | 0.0019 |
| Lithium | mg/L | *-* | *0.00337* | *0.00426* | 0.0034 | 0.0030 | 0.0025 | 0.0115 | < 0.0025 | < 0.0025 | 0.0039 | 0.0045 | 0.0051 | 0.0045 | 0.0034 | 0.0043 |
| Magnesium (total) | mg/L | *50.10* | *23.40* | *24.87* | 25.4 | 25.0 | 23.0 | 33.2 | 24.2 | 25.2 | 27.0 | 24.2 | 25.0 | 23.4 | 21.5 | 21.3 |
| Manganese | mg/L | *1.3510* | *0.0456* | *0.1250* | 0.0368 | 0.0411 | 0.0407 | 0.9420 | 0.0581 | 0.0374 | 0.1040 | 0.0514 | 0.0397 | 0.0718 | 0.0395 | 0.0377 |
| Mercury | mg/L | *0.00001* | *0.00010* | *0.00022* | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.0015 |
| Molybdenum | mg/L | *0.1804* | *0.1051* | *0.1097* | 0.126 | 0.115 | 0.111 | 0.113 | 0.106 | 0.110 | 0.095 | 0.114 | 0.113 | 0.106 | 0.105 | 0.103 |
| Nickel | mg/L | *0.0338* | *0.2757* | *0.7080* | 0.346 | 0.680 | 1.140 | 1.210 | 1.320 | 1.910 | 0.674 | 0.316 | 0.261 | 0.197 | 0.206 | 0.236 |
| Potassium (total) | mg/L | *66.60* | *138.20* | *186.83* | 185 | 179 | 177 | 189 | 174 | 183 | 160 | 195 | 191 | 196 | 201 | 212 |
| Selenium | mg/L | *0.0010* | *0.1071* | *0.1752* | 0.172 | 0.151 | 0.147 | 0.157 | 0.151 | 0.163 | 0.153 | 0.194 | 0.210 | 0.195 | 0.198 | 0.211 |
| Silver | mg/L | *0.00010* | *0.00040* | *0.00044* | 0.000343 | 0.000059 | 0.000074 | 0.000321 | 0.000466 | 0.000086 | 0.000855 | 0.001080 | 0.000731 | 0.001140 | 0.000085 | 0.000073 |
| Sodium (total) | mg/L | *391.0* | *330.0* | *473.1* | 472 | 445 | 414 | 442 | 432 | 466 | 404 | 498 | 527 | 490 | 535 | 552 |
| Strontium | mg/L | *0.924* | *1.346* | *2.169* | 1.97 | 1.89 | 2.18 | 2.29 | 2.16 | 2.19 | 1.95 | 2.18 | 2.14 | 2.08 | 2.36 | 2.64 |
| Thallium | mg/L | *0.00020* | *0.00010* | *0.00003* | 0.000018 | < 0.000010 | 0.000013 | 0.000178 | < 0.000010 | 0.000029 | 0.000047 | 0.000020 | 0.000012 | 0.000020 | < 0.000010 | 0.000019 |
| Tin | mg/L | *-* | *0.0005* | *0.0009* | < 0.0010 | < 0.0010 | < 0.0004 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0004 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Titanium | mg/L | *-* | *0.0018* | *0.0528* | < 0.0025 | < 0.0025 | 0.0017 | 0.5420 | 0.0160 | < 0.0100 | 0.0184 | < 0.0025 | < 0.0025 | 0.0300 | < 0.0025 | < 0.0025 |
| Uranium | mg/L | *-* | *0.0192* | *0.0148* | 0.0164 | 0.0159 | 0.0142 | 0.0141 | 0.0150 | 0.0150 | 0.0217 | 0.0125 | 0.0140 | 0.0131 | 0.0127 | 0.0128 |
| Vanadium | mg/L | *-* | *0.0006* | *0.0038* | < 0.0010 | < 0.0010 | < 0.0004 | 0.0336 | < 0.0010 | < 0.0010 | 0.0022 | < 0.0010 | < 0.0010 | 0.0015 | < 0.0010 | < 0.0010 |
| Zinc | mg/L | *0.001* | *0.002* | *0.006* | 0.0122 | 0.0030 | 0.0040 | 0.0252 | < 0.0050 | < 0.0050 | 0.0037 | 0.0034 | 0.0008 | < 0.0050 | 0.0011 | 0.0014 |
| **Dissolved Metals** | | | | | | | | | | | | | | | | |
| Aluminum | mg/L | *0.0060* | *0.0085* | *0.0135* | - | 0.0092 | 0.0074 | 0.0119 | 0.0099 | 0.0117 | 0.0142 | 0.0163 | 0.0271 | 0.0112 | 0.0133 | 0.0159 |
| Antimony | mg/L | *-* | *0.01046* | *0.01616* | - | 0.0191 | 0.0204 | 0.0161 | 0.0202 | 0.0116 | 0.0136 | 0.0170 | 0.0147 | 0.0156 | 0.0149 | 0.0146 |
| Arsenic | mg/L | *0.00120* | *0.12000* | *0.13282* | - | 0.1020 | 0.0582 | 0.0566 | 0.0935 | 0.1190 | 0.0843 | 0.1100 | 0.1530 | 0.5090 | 0.0872 | 0.0882 |
| Barium | mg/L | *0.0201* | *0.0797* | *0.1268* | - | 0.134 | 0.172 | 0.161 | 0.153 | 0.138 | 0.103 | 0.118 | 0.102 | 0.096 | 0.106 | 0.112 |
| Beryllium | mg/L | *-* | *0.00002* | *0.00004* | - | < 0.000050 | < 0.000020 | < 0.000020 | < 0.000050 | < 0.000050 | < 0.000050 | < 0.000050 | < 0.000050 | < 0.000020 | < 0.000050 | < 0.000050 |
| Boron | mg/L | *-* | *0.190* | *0.277* | - | 0.257 | 0.269 | 0.229 | 0.272 | 0.254 | 0.231 | 0.320 | 0.331 | 0.273 | 0.304 | 0.302 |
| Cadmium | mg/L | *0.00002* | *0.00006* | *0.00014* | - | 0.000074 | 0.000173 | 0.000065 | < 0.000025 | < 0.000025 | 0.000182 | 0.000294 | 0.000207 | 0.000104 | 0.000266 | 0.000135 |
| Chromium | mg/L | *0.00060* | *0.00029* | *0.00042* | - | < 0.00050 | < 0.00020 | < 0.00020 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00020 | < 0.00050 | < 0.00050 |

| ST-19 | Unit | Annual Average | | | 1/24/2022 | 2/8/2022 | 3/13/2022 | 4/10/2022 | 5/9/2022 | 6/5/2022 | 7/10/2022 | 8/28/2022 | 9/11/2022 | 10/4/2022 | 11/15/2022 | 12/4/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | *2020* | *2021* | *2022* | | | | | | | | | | | | |
| Copper | mg/L | *0.0005* | *2.0440* | *3.2285* | - | 3.68 | 4.93 | 4.91 | 5.95 | 5.60 | 5.19 | 0.89 | 0.90 | 0.42 | 1.41 | 1.64 |
| Iron | mg/L | *0.010* | *0.011* | *0.147* | - | 0.3450 | 0.5370 | 0.0414 | 0.2870 | 0.2000 | 0.0141 | 0.0051 | 0.0161 | 0.0129 | 0.0261 | 0.1320 |
| Lead | mg/L | *0.00017* | *0.00010* | *0.00029* | - | 0.000502 | 0.000733 | 0.000243 | 0.000161 | 0.000168 | 0.000367 | 0.000354 | 0.000155 | 0.000040 | 0.000217 | 0.000214 |
| Lithium | mg/L | *-* | *0.00345* | *0.00345* | - | 0.0025 | 0.0028 | 0.0024 | 0.0026 | < 0.0025 | 0.0037 | 0.0049 | 0.0045 | 0.0039 | 0.0038 | 0.0044 |
| Manganese | mg/L | *1.2296* | *0.0445* | *0.0403* | - | 0.0453 | 0.0364 | 0.0507 | 0.0345 | 0.0195 | 0.0768 | 0.0475 | 0.0350 | 0.0290 | 0.0347 | 0.0337 |
| Mercury | mg/L | *0.00001* | *0.00010* | *0.00010* | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 |
| Molybdenum | mg/L | *0.1618* | *0.0992* | *0.1075* | - | 0.1190 | 0.1120 | 0.1130 | 0.1030 | 0.0957 | 0.0889 | 0.1130 | 0.1040 | 0.1140 | 0.1190 | 0.1010 |
| Nickel | mg/L | *-* | *0.245* | *0.651* | - | 0.650 | 1.120 | 0.953 | 1.360 | 1.300 | 0.580 | 0.342 | 0.238 | 0.176 | 0.210 | 0.236 |
| Selenium | mg/L | *0.001* | *0.096* | *0.172* | - | 0.150 | 0.147 | 0.152 | 0.154 | 0.174 | 0.141 | 0.191 | 0.175 | 0.201 | 0.193 | 0.209 |
| Silver | mg/L | *0.00010* | *0.00033* | *0.00068* | - | 0.000180 | 0.000126 | 0.001190 | 0.000503 | 0.001310 | - | 0.001100 | 0.000705 | 0.001520 | 0.000079 | 0.000094 |
| Strontium | mg/L | *0.995* | *1.274* | *2.186* | - | 1.94 | 2.23 | 2.25 | 2.37 | 2.22 | 1.84 | 2.19 | 2.00 | 2.03 | 2.38 | 2.60 |
| Thallium | mg/L | *0.00020* | *0.00005* | *0.00002* | - | 0.000028 | 0.000016 | 0.000014 | 0.000017 | < 0.000010 | 0.000034 | 0.000024 | 0.000011 | 0.000006 | 0.000012 | 0.000018 |
| Tin | mg/L | *-* | *0.0005* | *0.0008* | - | < 0.0010 | < 0.0004 | < 0.0004 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0004 | < 0.0010 | < 0.0010 |
| Titanium | mg/L | *-* | *0.0012* | *0.0021* | - | < 0.0025 | < 0.0010 | < 0.0010 | < 0.0025 | < 0.0025 | < 0.0025 | < 0.0025 | < 0.0025 | < 0.0010 | < 0.0025 | < 0.0025 |
| Uranium | mg/L | *-* | *0.0188* | *0.0143* | - | 0.0155 | 0.0145 | 0.0134 | 0.0145 | 0.0145 | 0.0220 | 0.0127 | 0.0119 | 0.0129 | 0.0130 | 0.0126 |
| Vanadium | mg/L | *-* | *0.0005* | *0.0008* | - | < 0.0010 | < 0.0004 | < 0.0004 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0004 | < 0.0010 | < 0.0010 |
| Zinc | mg/L | *0.001* | *0.001* | *0.002* | - | 0.00162 | 0.00291 | 0.00187 | 0.00136 | 0.00122 | 0.00631 | 0.00201 | 0.00109 | 0.00042 | < 0.00050 | 0.00347 |

#### *8.5.3.1.10 Goose Pit (ST-20)*

Mining activities have ceased in the Goose Pit in April 2015. Starting in June 2015, no additional water was pumped out of the Goose Pit sump; instead runoff and groundwater were kept in the pit to contribute to natural re-flooding of the pit. On May 24th, 2019, Agnico Eagle received from NWB the Ministers Approval regarding the Amendment No.3 to Type A Water License 2AM-MEA1526 to authorize Water Uses and Waste Deposits associated with the In-Pit Tailings Disposal. In-Pit Deposition in Goose Pit started on July 5th, 2019.

Since the in-pit tailings deposition started in July 2019, the station name has been changed for ST-20 instead of ST-20 Lake. Nomenclature modification only, the sampling location remains the same. Refer to previous annual reports for the ST-20 Lake sampling results.

In 2022, Agnico Eagle collected five (5) monthly water quality samples at the bottom of Goose Pit (ST-20) Results of sampling conducted at station ST-20 are presented in Table 8-21. The station location is illustrated in Figure 1.

Five samples were also collected monthly during open water from June to October at the sump at the top of Goose Pit (sampling station ST-20 Goose Pit Sump). The data is presented in Table 8-22, the sampling location is illustrated on Figure 1. There are no applicable license limits for ST-20 Goose Pit Sump and ST-20 as the water was not directly released into the environment; the data is presented for information purposes only.

#### *8.5.3.1.11 Tailings Storage Facility (ST-21)*

The North Cell Tailings Storage Facility became operational in February 2010. On November 17th, 2014 the reclaim water intake was transferred from the North Cell TSF to the South Cell TSF. Tailings deposition was also stopped in the North Cell TSF and commenced in the South Cell TSF at that time. As per the NWB Water License, sampling station ST-21 changed location from the North to the South Cell. Sampling was conducted monthly as per the requirements of the NWB Water License. On July 5th, 2019, tailings deposition started in Goose Pit. There are no applicable license limits for this station as the water is pumped into Portage Pit. Sample results are presented in Table 8-23. The location of sampling station ST-21 (South Cell TSF) is illustrated on Figure 1. As per the Water License, no further monitoring in the TSF North Cell is required.

#### *8.5.3.1.12 Vault Pit Lake (ST-26)*

In 2014, a sump was constructed in Vault Pit in an area of water accumulation. Water from Vault Pit is sampled monthly during open water as per the requirements in the NWB Water License. Since 2020, water from Vault Pit sump (ST-23) is no longer sampled due to the natural reflooding of the Pit, samples are now collected from the Vault Pit Lake (ST-26) (Table 8-24). Please refer to previous annual reports for ST-23 results. The Vault Pit Lake was sampled monthly during open water as per the requirements in the NWB Water License (sampling station ST-26 on Figure 3). In 2022 no water was pumped to the Vault Attenuation Pond as per previous years. Water is rather kept in the pit and contributes to the natural reflooding. There are no applicable license limits for ST-26.

**Table 8-21 Meadowbank 2022 Goose Pit Water Quality Monitoring (ST-20)**

| ST-20 | Unit | Annual Average | | | | 6/19/2022 | 7/12/2022 | 8/2/2022 | 9/11/2022 | 10/4/2022 |
|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2019 | 2020 | 2021 | 2022 | | | | | |
| **Field Measured** | | | | | | | | | | |
| Temperature | °C | - | 7.9 | 7.8 | 8.9 | 4.8 | 19.3 | 11.0 | 7.6 | 2.0 |
| pH | pH units | - | 8.28 | 8.02 | 7.81 | 7.18 | 8.15 | 7.84 | 7.77 | 8.10 |
| Conductivity | uS/cm | - | 2362.3 | 2021.4 | 1441.4 | 442 | 1135 | 1430 | 1899 | 2301 |
| Turbidity | NTU | - | 3.85 | 3.87 | 3.35 | 3.22 | 3.22 | 2.08 | 5.67 | 2.54 |
| **Conventional Parameters** | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | 405.0 | 817.3 | 527.2 | 359.1 | 52.7 | 270.0 | 401.0 | 499.0 | 573.0 |
| Total alkalinity, as $CaCO_3$ | mg/L | 61.0 | 81.0 | 100.4 | 77.6 | 23 | 59 | 77 | 99 | 130 |
| Carbonate, as $CaCO_3$ | mg/L | 2.0 | 7.0 | 1.1 | 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bicarbonate, as $CaCO_3$ | mg/L | 61 | 78 | 98 | 75 | 23 | 58 | 76 | 98 | 120 |
| TDS | mg/L | 803 | 1493 | 1396 | 977 | 245 | 710 | 1040 | 1350 | 1540 |
| TSS | mg/L | 20 | 11 | 3 | 4 | 4 | 2 | 4 | 6 | 4 |
| Total organic carbon | mg/L | 6.70 | - | 12.80 | 6.78 | 1.2 | 5.0 | 7.2 | 9.5 | 11.0 |
| Dissolved organic carbon | mg/L | 9.00 | 17.00 | 11.72 | 6.18 | 1.5 | 4.7 | 6.5 | 8.2 | 10.0 |
| Sodium Adsorption Ratio (salinity in water) | - | - | - | 3.20 | 2.43 | 0.84 | 2.10 | 2.70 | 3.00 | 3.50 |
| Oxidation-Reduction Potential | mV | - | - | 222.14 | 242.60 | 173 | 270 | 430 | 170 | 170 |
| **Major Ions** | | | | | | | | | | |
| Bromide | mg/L | - | - | 1 | 2 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 5.0 |
| Chloride | mg/L | 80 | 224 | 109 | 58 | 25 | 52 | 14 | 87 | 110 |
| Cyanide | mg/L | 0.152 | 0.370 | 0.058 | 0.018 | 0.0060 | 0.0216 | 0.0295 | 0.0172 | 0.0167 |
| Cyanide (free) | mg/L | 0.1470 | - | 0.0143 | 0.0059 | 0.0072 | 0.0110 | 0.0033 | 0.0027 | 0.0052 |
| Cyanide (WAD) | mg/L | - | 0.3812 | 0.0336 | 0.0137 | 0.0057 | 0.0190 | 0.0240 | 0.0088 | 0.0110 |
| Fluoride | mg/L | - | 0.27 | 0.25 | 0.26 | 0.19 | 0.24 | 0.27 | 0.28 | 0.30 |
| Silica | mg/L | 12.7 | 7.2 | 5.9 | 4.8 | 1.4 | 3.8 | 5.0 | 6.6 | 7.4 |
| Sulfate | mg/L | 469 | 943 | 768 | 596 | 130 | 380 | 650 | 820 | 1000 |
| **Nutrients** | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | 10.5 | 22.5 | 23.2 | 19.2 | 2.9 | 14.0 | 20.0 | 24.0 | 35.0 |
| Nitrate | mg N/L | 1.90 | 3.91 | 2.05 | 0.77 | 0.31 | 0.34 | 2.78 | 0.27 | 0.13 |
| Nitrite | mg N/L | 0.020 | 0.180 | 0.462 | 0.614 | 0.147 | 0.524 | 0.019 | 1.060 | 1.320 |
| Total Kjeldahl nitrogen | mg N/L | 18 | 43 | 36 | 24 | 3.4 | 18.0 | 26.0 | 32.0 | 42.0 |
| Total phosphorus | mg P/L | 0.060 | 0.063 | 0.023 | 0.017 | 0.0073 | 0.0087 | 0.0120 | 0.0290 | 0.0290 |
| Orthophosphate | mg P/L | 0.05 | 1.38 | 0.15 | 0.07 | 0.010 | 0.024 | < 0.010 | 0.130 | 0.190 |
| **Total Metals** | | | | | | | | | | |
| Aluminum | mg/L | 0.5880 | 0.1693 | 0.0526 | 0.0375 | 0.0757 | 0.0196 | 0.0140 | 0.0547 | 0.0233 |
| Antimony | mg/L | 0.0040 | 0.0133 | 0.0140 | 0.0086 | 0.00104 | 0.00640 | 0.00958 | 0.01190 | 0.01410 |
| Arsenic | mg/L | 0.0191 | 0.8344 | 0.5060 | 0.3106 | 0.0339 | 0.2210 | 0.3270 | 0.4410 | 0.5300 |
| Barium | mg/L | 0.0383 | 0.0637 | 0.0434 | 0.0308 | 0.00672 | 0.02610 | 0.03340 | 0.04290 | 0.04500 |
| Beryllium | mg/L | 0.00050 | 0.00050 | 0.00002 | 0.00001 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000020 |
| Boron | mg/L | 0.030 | 0.010 | 0.137 | 0.099 | 0.015 | 0.077 | 0.101 | 0.152 | 0.151 |
| Cadmium | mg/L | 0.00024 | 0.00050 | 0.00001 | 0.00001 | 0.0000061 | 0.0000111 | 0.0000074 | 0.0000078 | < 0.000010 |
| Calcium (total) | mg/L | 127.00 | 309.00 | 197.84 | 132.18 | 18.7 | 99.2 | 148.0 | 182.0 | 213.0 |
| Chromium | mg/L | 0.00940 | 0.00162 | 0.00063 | 0.00067 | 0.00226 | 0.00023 | 0.00020 | 0.00045 | 0.00022 |
| Copper | mg/L | 0.5609 | 2.5258 | 0.0245 | 0.0058 | 0.00188 | 0.00611 | 0.00691 | 0.00706 | 0.00687 |
| Iron | mg/L | 1.030 | 0.458 | 0.112 | 0.092 | 0.1890 | 0.0487 | 0.0455 | 0.1190 | 0.0554 |
| Lead | mg/L | 0.00030 | 0.00024 | 0.00036 | 0.00018 | 0.000448 | 0.000132 | 0.000079 | 0.000107 | 0.000117 |
| Lithium | mg/L | 0.01300 | 0.00517 | 0.00345 | 0.00381 | 0.00143 | 0.00426 | 0.00411 | 0.00506 | 0.00420 |
| Magnesium (total) | mg/L | 21 | 13 | 9 | 7 | 1.49 | 5.54 | 7.57 | 10.60 | 10.10 |
| Manganese | mg/L | 0.0509 | 0.0474 | 0.0501 | 0.0528 | 0.0282 | 0.0487 | 0.0567 | 0.0702 | 0.0604 |
| Mercury | mg/L | 0.00002 | 0.00001 | 0.00008 | 0.00008 | < 0.00001 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 |
| Molybdenum | mg/L | 0.1281 | 0.1025 | 0.0770 | 0.0493 | 0.00586 | 0.03670 | 0.05480 | 0.06940 | 0.07950 |
| Nickel | mg/L | 0.0232 | 0.1656 | 0.0653 | 0.0410 | 0.00743 | 0.03080 | 0.04590 | 0.05540 | 0.06530 |
| Potassium (total) | mg/L | 35.90 | 137.54 | 80.18 | 52.63 | 7.77 | 39.50 | 56.00 | 74.30 | 85.60 |
| Selenium | mg/L | 0.0052 | 0.0479 | 0.0329 | 0.0197 | 0.0024 | 0.0145 | 0.0222 | 0.0270 | 0.0322 |
| Silver | mg/L | - | 0.000900 | 0.000040 | 0.000013 | 0.000008 | 0.000016 | 0.000016 | 0.000015 | < 0.000010 |
| Sodium (total) | mg/L | 149.0 | 274.2 | 157.9 | 104.7 | 13.5 | 77.1 | 113.0 | 151.0 | 169.0 |
| Strontium | mg/L | 0.620 | 0.693 | 0.543 | 0.396 | 0.068 | 0.346 | 0.421 | 0.550 | 0.596 |
| Thallium | mg/L | 0.00020 | 0.00020 | 0.00002 | 0.00001 | 0.0000049 | 0.0000132 | 0.0000096 | 0.0000117 | 0.0000109 |
| Tin | mg/L | 0.0010 | 0.0010 | 0.0003 | 0.0003 | < 0.0002 | < 0.0002 | < 0.0002 | 0.0003 | < 0.0004 |
| Titanium | mg/L | 0.010 | 0.010 | 0.002 | 0.002 | 0.0041 | 0.0006 | < 0.0005 | 0.0016 | < 0.0010 |
| Uranium | mg/L | 0.0130 | 0.0080 | 0.0064 | 0.0049 | 0.00083 | 0.00367 | 0.00525 | 0.00754 | 0.00704 |
| Vanadium | mg/L | 0.0020 | 0.0008 | 0.0005 | 0.0003 | 0.00028 | 0.00026 | 0.00028 | 0.00045 | < 0.00040 |
| Zinc | mg/L | 0.0030 | 0.0028 | 0.0015 | 0.0014 | 0.00101 | 0.00250 | 0.00070 | 0.00207 | 0.00050 |
| **Dissolved Metals** | | | | | | | | | | |
| Aluminum | mg/L | 0.0240 | 0.0088 | 0.0111 | 0.0116 | 0.00738 | 0.00858 | 0.00710 | 0.02340 | 0.01160 |
| Antimony | mg/L | 0.00320 | 0.01277 | 0.01210 | 0.00872 | 0.00114 | 0.00624 | 0.00942 | 0.01150 | 0.01530 |
| Arsenic | mg/L | 0.0146 | 0.7832 | 0.3984 | 0.3085 | 0.0354 | 0.2090 | 0.3270 | 0.4020 | 0.5690 |
| Barium | mg/L | 0.0303 | 0.0552 | 0.0430 | 0.0305 | 0.00552 | 0.02490 | 0.03350 | 0.04050 | 0.04810 |
| Beryllium | mg/L | 0.00050 | 0.00050 | 0.00001 | 0.00001 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000020 |
| Boron | mg/L | 0.010 | 0.010 | 0.141 | 0.108 | 0.016 | 0.076 | 0.104 | 0.153 | 0.191 |
| Cadmium | mg/L | 0.000020 | 0.000020 | 0.000019 | 0.000011 | 0.0000152 | < 0.0000050 | 0.0000117 | 0.0000110 | 0.0000110 |
| Chromium | mg/L | 0.0006 | 0.0006 | 0.0002 | 0.0002 | < 0.00010 | < 0.00010 | 0.00014 | 0.00024 | < 0.00020 |
| Copper | mg/L | 0.3543 | 0.6846 | 0.0197 | 0.0033 | 0.00137 | 0.00373 | 0.00412 | 0.00289 | 0.00438 |
| Iron | mg/L | 0.010 | 0.010 | 0.007 | 0.009 | 0.0045 | 0.0050 | 0.0030 | 0.0251 | 0.0071 |
| Lead | mg/L | 0.00030 | 0.00024 | 0.00012 | 0.00006 | 0.0000305 | 0.0000291 | 0.0000633 | 0.0001280 | 0.0000300 |
| Lithium | mg/L | 0.00500 | 0.00517 | 0.00344 | 0.00389 | 0.00138 | 0.00408 | 0.00423 | 0.00488 | 0.00490 |
| Manganese | mg/L | 0.0309 | 0.0265 | 0.0413 | 0.0427 | 0.0232 | 0.0249 | 0.0452 | 0.0606 | 0.0594 |
| Mercury | mg/L | 0.00001 | 0.00001 | 0.00008 | 0.00008 | < 0.00001 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 |
| Molybdenum | mg/L | 0.1025 | 0.0937 | 0.0705 | 0.0511 | 0.0064 | 0.0358 | 0.0553 | 0.0707 | 0.0874 |
| Nickel | mg/L | 0.0150 | 0.1433 | 0.0622 | 0.0398 | 0.00685 | 0.02840 | 0.04580 | 0.05110 | 0.06690 |
| Selenium | mg/L | 0.00200 | 0.03800 | 0.03218 | 0.02041 | 0.00256 | 0.01420 | 0.02140 | 0.02850 | 0.03540 |
| Silver | mg/L | 0.51400 | 0.00010 | 0.00002 | 0.00001 | 0.000005 | - | 0.000006 | 0.000009 | < 0.000010 |
| Strontium | mg/L | 0.0100 | 0.6288 | 0.5940 | 0.4079 | 0.0724 | 0.3280 | 0.4690 | 0.5410 | 0.6290 |
| Thallium | mg/L | - | - | 0.00002 | 0.00001 | 0.0000087 | 0.0000146 | 0.0000110 | 0.0000113 | 0.0000083 |
| Tin | mg/L | 0.0010 | - | 0.0003 | 0.0003 | < 0.0002 | < 0.0002 | < 0.0002 | 0.0003 | < 0.0004 |
| Titanium | mg/L | 0.0002 | 0.0100 | 0.0006 | 0.0006 | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0010 |
| Uranium | mg/L | 0.0110 | 0.0070 | 0.0063 | 0.0048 | 0.00077 | 0.00364 | 0.00546 | 0.00670 | 0.00737 |
| Vanadium | mg/L | 0.0005 | 0.0007 | 0.0004 | 0.0003 | < 0.00020 | 0.00022 | 0.00029 | 0.00030 | < 0.00040 |
| Zinc | mg/L | 0.0010 | 0.0010 | 0.0029 | 0.0014 | 0.00040 | 0.00174 | 0.00212 | 0.00204 | 0.00066 |

**Table 8-22 Meadowbank 2022 Goose Pit Sump Water Quality Monitoring (ST-20 Pit Sump)**

| ST-20 Pit Sump Parameter | Unit | Annual Average | | | | | | 6/19/2022 | 7/12/2022 | 8/2/2022 | 9/11/2022 | 10/4/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | | | | | |
| **Field Measured** | | | | | | | | | | | | |
| Temperature | °C | - | - | - | - | 10.7 | 9.1 | 10.2 | 18.3 | 9.5 | 7.1 | 0.6 |
| pH | pH units | 7.92 | 7.48 | 8.49 | 7.88 | 7.89 | 7.68 | 7.50 | 8.04 | 7.44 | 7.65 | 7.78 |
| Conductivity | uS/cm | - | - | - | - | 388.5 | 463.6 | 469 | 481 | 490 | 401 | 477 |
| Turbidity | NTU | 9.02 | 13.5 | 12.94 | 17.99 | 10.71 | 14.30 | 9.16 | 2.22 | 2.83 | 22.00 | 35.30 |
| **Conventional Parameters** | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | 226 | 149 | - | - | 193 | 210 | 209 | 202 | 208 | 217 | 214 |
| Total alkalinity, as $CaCO_3$ | mg/L | 86 | 46 | - | - | 55 | 56 | 55 | 53 | 55 | 56 | 60 |
| TDS | mg/L | 423 | 236 | 225 | 228 | 306 | 307 | 300 | 315 | 305 | 355 | 260 |
| TSS | mg/L | 5 | 8 | 8 | 9 | 7 | 6 | 3 | 1 | 1 | 6 | 19 |
| **Major Ions** | | | | | | | | | | | | |
| Chloride | mg/L | 12.7 | 7.7 | 5.0 | 5.6 | 7.4 | 13.4 | 13 | 14 | 14 | 13 | 13 |
| Cyanide | mg/L | 0.002 | 0.003 | 0.001 | 0.001 | 0.007 | 0.002 | 0.00145 | 0.00165 | 0.00134 | 0.00388 | < 0.00050 |
| Fluoride | mg/L | 0.18 | 0.20 | 0.17 | 0.19 | 0.26 | 0.29 | 0.30 | 0.26 | 0.29 | 0.29 | 0.32 |
| Sulfate | mg/L | 147.3 | 0.2 | 0.2 | 108.0 | 145.0 | 160.0 | 150 | 160 | 160 | 160 | 170 |
| **Nutrients and Chlorophyll a** | | | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | 1.16 | 0.16 | 0.59 | 0.05 | 0.11 | 0.05 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Nitrate | mg N/L | 13.22 | 5.37 | 3.79 | 3.48 | 3.58 | 2.87 | 3.01 | 2.97 | 2.77 | 2.65 | 2.94 |
| Nitrite | mg N/L | 0.130 | 0.020 | 0.038 | 0.025 | 0.017 | 0.019 | 0.020 | 0.033 | 0.017 | 0.016 | < 0.010 |
| **Total Metals** | | | | | | | | | | | | |
| Aluminum | mg/L | 0.1120 | 0.1997 | 0.1995 | 0.3995 | 0.1801 | 0.1773 | 0.1250 | 0.0342 | 0.0273 | 0.4240 | 0.2760 |
| Arsenic | mg/L | 0.00290 | 0.00150 | 0.00188 | 0.00623 | 0.00373 | 0.00365 | 0.00205 | 0.00403 | 0.00297 | 0.00519 | 0.00399 |
| Barium | mg/L | 0.0410 | 0.0218 | 0.0201 | 0.0169 | 0.0214 | 0.0199 | 0.0187 | 0.0187 | 0.0188 | 0.0226 | 0.0205 |
| Cadmium | mg/L | 0.00003 | 0.00002 | 0.00002 | 0.00002 | 0.00002 | 0.00002 | 0.0000239 | 0.0000143 | 0.0000209 | 0.0000210 | 0.0000186 |
| Chromium | mg/L | 0.00060 | 0.00267 | 0.00285 | 0.00395 | 0.00137 | 0.00219 | 0.00075 | 0.00028 | 0.00031 | 0.00742 | 0.00220 |
| Copper | mg/L | 0.0020 | 0.0015 | 0.0019 | 0.0036 | 0.0011 | 0.0012 | 0.00083 | 0.00081 | 0.00091 | 0.00189 | 0.00158 |
| Iron | mg/L | 0.210 | 0.323 | 0.355 | 0.678 | 0.317 | 0.339 | 0.2300 | 0.0538 | 0.0497 | 0.8300 | 0.5320 |
| Lead | mg/L | 0.00030 | 0.00030 | 0.00030 | 0.00039 | 0.00030 | 0.00039 | 0.000239 | 0.000065 | 0.000097 | 0.000738 | 0.000791 |
| Manganese | mg/L | 0.0990 | 0.1174 | 0.0529 | 0.0460 | 0.0359 | 0.0316 | 0.0629 | 0.0231 | 0.0166 | 0.0265 | 0.0290 |
| Mercury | mg/L | 0.00002 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.0066 | 0.0049 | 0.0048 | 0.0033 | 0.0044 | 0.0043 | 0.00404 | 0.00425 | 0.00456 | 0.00463 | 0.00403 |
| Nickel | mg/L | 0.0760 | 0.0754 | 0.0338 | 0.0840 | 0.0460 | 0.0377 | 0.0400 | 0.0310 | 0.0372 | 0.0426 | 0.0378 |
| Selenium | mg/L | 0.0017 | 0.0008 | 0.0007 | 0.0010 | 0.0007 | 0.0006 | 0.000684 | 0.000649 | 0.000702 | 0.000587 | 0.000602 |
| Silver | mg/L | 0.00170 | 0.00010 | 0.00010 | 0.00010 | 0.00001 | 0.00001 | < 0.0000050 | < 0.0000050 | < 0.0000050 | 0.0000091 | < 0.0000050 |
| Thallium | mg/L | 0.00080 | 0.00040 | 0.00020 | 0.00020 | 0.00004 | 0.00003 | 0.0000143 | 0.0000276 | 0.0000362 | 0.0000539 | 0.0000383 |
| Zinc | mg/L | 0.0023 | 0.0017 | 0.0014 | 0.0025 | 0.0022 | 0.0035 | 0.00168 | 0.00142 | 0.00084 | 0.01100 | 0.00234 |

**Table 8-23 Meadowbank 2022 Tailings Storage Facility Water Quality Monitoring (ST-21)**

| ST-21-S | Unit | Annual Average | | | | | | 6/5/2022 | 7/10/2022 | 8/2/2022 | 9/11/2022 | 10/3/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | | | | | |
| **Field Measured** | | | | | | | | | | | | |
| Temperature | °C | - | - | - | 8.3 | 5.5 | 9.3 | 10.8 | 20.5 | 9.0 | 6.0 | 0.3 |
| pH | pH units | 8.22 | 8.24 | 8.03 | 7.91 | 8.12 | 7.37 | 7.35 | 7.80 | 7.57 | 6.95 | 7.20 |
| Conductivity | uS/cm | - | - | - | 1160 | 1583 | 1202 | 1079 | 1140 | 1334 | 1277 | 1181 |
| Turbidity | NTU | 7.85 | 16.28 | 16.22 | 19.71 | 36.36 | 23.00 | 18.20 | 3.85 | 9.17 | 14.90 | 68.90 |
| **Conventional Parameters** | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | 1224 | 1119 | 810 | - | 419 | 424 | 312 | 372 | 447 | 576 | 413 |
| Total alkalinity, as $CaCO_3$ | mg/L | 127 | 118 | 79 | 75 | 88 | 68 | 42 | 75 | 83 | 57 | 83 |
| TDS | mg/L | 3033 | 2628 | 1606 | 735 | 1186 | 835 | 735 | 785 | 905 | 1050 | 700 |
| TSS | mg/L | 11 | 8 | 15 | 35 | 42 | 21 | 14 | 2 | 7 | 5 | 76 |
| **Major Ions** | | | | | | | | | | | | |
| Chloride | mg/L | 370.8 | 441.7 | 206.3 | 43.7 | 101.8 | 34.0 | 74.0 | 22.0 | 32.0 | 25.0 | 17.0 |
| Cyanide | mg/L | 0.890 | 1.018 | 0.952 | 0.024 | 0.055 | 0.036 | 0.0306 | 0.0071 | 0.0209 | 0.0249 | 0.0977 |
| Cyanide (free) | mg/L | 0.3700 | 0.1630 | 3.2000 | 0.0038 | 0.0420 | 0.0076 | 0.0140 | 0.0051 | 0.0071 | 0.0100 | < 0.0020 |
| Cyanide (WAD) | mg/L | 0.1700 | 0.0810 | 2.4520 | 0.0028 | 0.0138 | 0.0093 | 0.0220 | 0.0037 | 0.0088 | 0.0080 | 0.0042 |
| Fluoride | mg/L | 0.40 | 0.47 | 0.42 | 0.26 | 0.23 | 0.21 | 0.11 | 0.18 | 0.33 | 0.18 | 0.26 |
| Sulfate | mg/L | 1855 | 2151 | 1153 | 383 | 570 | 488 | 390 | 470 | 550 | 660 | 370 |
| **Nutrients** | | | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | 43.6 | 50.5 | 22.3 | 6.0 | 15.7 | 4.7 | 3.3 | 7.7 | 6.5 | 2.4 | 3.5 |
| Nitrate | mg N/L | 3.69 | 4.86 | 4.35 | 4.49 | 7.42 | 3.29 | 2.30 | 1.46 | 2.25 | 3.64 | 6.80 |
| Nitrite | mg N/L | 0.240 | 0.630 | 0.270 | 0.353 | 0.213 | 0.201 | 0.091 | 0.442 | 0.244 | 0.132 | 0.094 |
| **Total Metals** | | | | | | | | | | | | |
| Aluminum | mg/L | 0.110 | 0.238 | 0.099 | 0.453 | 0.910 | 0.629 | 0.3170 | 0.0606 | 0.1800 | 0.3490 | 2.2400 |
| Arsenic | mg/L | 0.0086 | 0.0171 | 0.0218 | 0.0190 | 0.0923 | 0.0466 | 0.0585 | 0.0312 | 0.0274 | 0.0495 | 0.0663 |
| Barium | mg/L | 0.0860 | 0.1368 | 0.0421 | 0.0287 | 0.0381 | 0.0327 | 0.0324 | 0.0354 | 0.0315 | 0.0307 | 0.0335 |
| Cadmium | mg/L | 0.00150 | 0.00270 | 0.00010 | 0.00003 | 0.00009 | 0.00009 | 0.0001020 | 0.0000834 | 0.0000793 | 0.0000914 | 0.0000943 |
| Chromium | mg/L | 0.00150 | 0.00229 | 0.00149 | 0.00313 | 0.02466 | 0.01242 | 0.00856 | 0.00082 | 0.00307 | 0.00994 | 0.03970 |
| Copper | mg/L | 0.370 | 0.908 | 1.605 | 0.079 | 2.796 | 0.061 | 0.0461 | 0.0269 | 0.0445 | 0.0182 | 0.1690 |
| Iron | mg/L | 0.049 | 1.092 | 0.469 | 1.243 | 2.614 | 1.619 | 0.954 | 0.156 | 0.536 | 1.050 | 5.400 |
| Lead | mg/L | 0.0014 | 0.0031 | 0.0021 | 0.0050 | 0.0153 | 0.0056 | 0.005140 | 0.000949 | 0.002230 | 0.004240 | 0.015600 |
| Manganese | mg/L | 0.2800 | 0.4865 | 0.3420 | 0.5820 | 0.3444 | 0.4976 | 0.196 | 0.606 | 0.666 | 0.472 | 0.548 |
| Mercury | mg/L | 0.00027 | 0.00019 | 0.00002 | 0.00001 | 0.00006 | 0.00006 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.5300 | 0.5168 | 0.2373 | 0.0590 | 0.0417 | 0.0267 | 0.0255 | 0.0263 | 0.0377 | 0.0239 | 0.0200 |
| Nickel | mg/L | 0.130 | 0.120 | 0.099 | 0.030 | 1.139 | 0.129 | 0.0889 | 0.1480 | 0.1380 | 0.1370 | 0.1310 |
| Selenium | mg/L | 0.0480 | 0.0698 | 0.0054 | 0.0013 | 0.0417 | 0.0076 | 0.01610 | 0.00889 | 0.00704 | 0.00373 | 0.00209 |
| Silver | mg/L | 0.0004 | 0.0002 | 0.0004 | 0.0001 | 0.0009 | 0.0001 | 0.0003070 | 0.0000216 | 0.0000194 | 0.0000153 | 0.0000770 |
| Thallium | mg/L | 0.00080 | 0.00055 | 0.00062 | 0.00020 | 0.00004 | 0.00002 | 0.0000126 | 0.0000216 | 0.0000243 | 0.0000146 | 0.0000336 |
| Zinc | mg/L | 0.010 | 0.005 | 0.005 | 0.004 | 0.005 | 0.004 | 0.00398 | 0.00151 | 0.00454 | 0.00335 | 0.00890 |

**Table 8-24 Meadowbank 2022 Vault Pit Water Quality Monitoring (ST-26)**

| ST-26 | Unit | Annual Average | | | 6/19/2022 | 7/17/2022 | 8/7/2022 | 9/13/2022 | 10/2/2022 |
|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2020 | 2021 | 2022 | | | | | |
| **Field Measured** | | | | | | | | | |
| Temperature | °C | 9.1 | 6.7 | 8.8 | 4.8 | 14.2 | 12.9 | 7.5 | 4.7 |
| pH | pH units | 7.99 | 7.60 | 7.63 | 7.48 | 7.27 | 7.77 | 7.74 | 7.90 |
| Conductivity | uS/cm | 279 | 219 | 288 | 218 | 257 | 257 | 235 | 472 |
| Turbidity | NTU | 1.61 | 4.78 | 3.10 | 2.31 | 6.90 | 0.81 | 3.12 | 2.36 |
| **Conventional Parameters** | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | 119 | 104 | 114 | 91.4 | 113.0 | 121.0 | 119.0 | 125.0 |
| Total alkalinity, as $CaCO_3$ | mg/L | 55 | 46 | 49 | 42 | 49 | 49 | 51 | 52 |
| Carbonate, as $CaCO_3$ | mg/L | 5 | 1 | 1 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bicarbonate, as $CaCO_3$ | mg/L | 55.6 | 45.4 | 48.6 | 42 | 49 | 49 | 51 | 52 |
| TDS | mg/L | 125 | 150 | 148 | 125 | 140 | 170 | 210 | 95 |
| TSS | mg/L | 20 | 8 | 2 | 1 | 2 | 2 | 2 | 1 |
| Total organic carbon | mg/L | 2.3 | 1.7 | 1.6 | 1.6 | 1.5 | 1.5 | 1.6 | 1.8 |
| Dissolved organic carbon | mg/L | 2.4 | 1.6 | 1.5 | 1.5 | 1.5 | 1.4 | 1.5 | 1.7 |
| **Major Ions** | | | | | | | | | |
| Chloride | mg/L | 8.28 | 7.12 | 8.22 | 6.7 | 8.4 | 8.6 | 8.8 | 8.6 |
| Cyanide | mg/L | 0.001 | 0.005 | 0.001 | < 0.00050 | < 0.00050 | 0.0037 | < 0.00050 | < 0.00050 |
| Cyanide (free) | mg/L | 0.0010 | 0.0025 | 0.0024 | < 0.0020 | 0.0037 | < 0.0020 | 0.0024 | < 0.0020 |
| Silica | mg/L | 3.86 | 2.32 | 2.54 | 2.1 | 2.4 | 2.5 | 2.8 | 2.9 |
| Sulfate | mg/L | 61.8 | 53.0 | 59.4 | 47 | 59 | 60 | 62 | 69 |
| **Nutrients** | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | 0.148 | 0.074 | 0.054 | 0.057 | < 0.050 | < 0.050 | < 0.050 | 0.063 |
| Nitrate | mg N/L | 2.23 | 1.61 | 1.54 | 1.17 | 1.30 | 1.63 | 1.64 | 1.97 |
| Nitrite | mg N/L | 0.018 | 0.012 | 0.013 | 0.010 | 0.022 | 0.014 | < 0.010 | < 0.010 |
| Total Kjeldahl nitrogen | mg N/L | 0.36 | 0.13 | 0.12 | 0.11 | < 0.10 | < 0.10 | 0.20 | < 0.10 |
| Total phosphorus | mg P/L | 0.028 | 0.006 | 0.003 | 0.0020 | < 0.0050 | < 0.0050 | < 0.0010 | < 0.0010 |
| Orthophosphate | mg P/L | 0.016 | 0.010 | 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| **Total Metals** | | | | | | | | | |
| Aluminum | mg/L | 0.0270 | 0.2543 | 0.0419 | 0.0445 | 0.0239 | 0.0278 | 0.0598 | 0.0533 |
| Antimony | mg/L | 0.0003 | 0.0013 | 0.0013 | 0.00102 | 0.00126 | 0.00129 | 0.00139 | 0.00155 |
| Arsenic | mg/L | 0.0045 | 0.0032 | 0.0028 | 0.00259 | 0.00270 | 0.00261 | 0.00308 | 0.00317 |
| Barium | mg/L | 0.01204 | 0.01366 | 0.01484 | 0.0116 | 0.0137 | 0.0156 | 0.0190 | 0.0143 |
| Beryllium | mg/L | 0.00050 | 0.00010 | 0.00005 | < 0.00010 | < 0.00010 | < 0.000010 | < 0.000010 | < 0.000010 |
| Boron | mg/L | 0.01 | 0.04 | 0.03 | < 0.050 | < 0.050 | < 0.010 | 0.013 | 0.014 |
| Cadmium | mg/L | 0.000020 | 0.000014 | 0.000010 | < 0.000010 | < 0.000010 | 0.000008 | 0.000010 | 0.000011 |
| Calcium (total) | mg/L | 34.6 | 30.2 | 33.4 | 26.7 | 33.5 | 35.5 | 34.7 | 36.7 |
| Chromium | mg/L | 0.0006 | 0.0010 | 0.0005 | < 0.0010 | < 0.0010 | 0.0002 | 0.0003 | < 0.00010 |
| Copper | mg/L | 0.0017 | 0.0013 | 0.0011 | 0.00114 | 0.00119 | 0.00118 | 0.00104 | 0.00115 |
| Iron | mg/L | 0.06 | 0.46 | 0.06 | 0.0820 | 0.0330 | 0.0295 | 0.0845 | 0.0775 |
| Lead | mg/L | 0.0002 | 0.0009 | 0.0002 | 0.00029 | < 0.00020 | 0.00012 | 0.00023 | 0.00022 |
| Lithium | mg/L | 0.0050 | 0.0023 | 0.0022 | < 0.0020 | 0.0023 | 0.0020 | 0.0024 | 0.0024 |
| Magnesium (total) | mg/L | 7.94 | 6.96 | 7.39 | 6.00 | 7.22 | 7.75 | 7.85 | 8.11 |
| Manganese | mg/L | 0.0212 | 0.0194 | 0.0092 | 0.01810 | 0.01320 | 0.00798 | 0.00375 | 0.00285 |
| Mercury | mg/L | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.0219 | 0.0212 | 0.0228 | 0.0180 | 0.0214 | 0.0229 | 0.0254 | 0.0262 |
| Nickel | mg/L | 0.0021 | 0.0022 | 0.0016 | 0.0015 | 0.0016 | 0.0016 | 0.00168 | 0.0018 |
| Potassium (total) | mg/L | 3.26 | 2.72 | 2.67 | 2.19 | 2.61 | 2.85 | 2.74 | 2.94 |
| Selenium | mg/L | 0.0009 | 0.0003 | 0.0003 | 0.00023 | 0.00029 | 0.00028 | 0.00029 | 0.00033 |
| Sodium (total) | mg/L | 3.67 | 2.71 | 2.82 | 2.31 | 2.81 | 3.01 | 2.89 | 3.09 |
| Strontium | mg/L | 0.219 | 0.215 | 0.233 | 0.190 | 0.233 | 0.242 | 0.247 | 0.255 |
| Thallium | mg/L | 0.000200 | 0.000017 | 0.000015 | 0.0000110 | 0.0000160 | 0.0000137 | 0.0000158 | 0.0000177 |
| Tin | mg/L | 0.001 | 0.004 | 0.002 | < 0.0050 | < 0.0050 | < 0.0002 | < 0.0002 | < 0.0002 |
| Titanium | mg/L | 0.01 | 0.0044 | 0.0027 | < 0.0050 | < 0.0050 | < 0.0005 | 0.0024 | < 0.0005 |
| Uranium | mg/L | 0.0052 | 0.0055 | 0.0056 | 0.00445 | 0.00565 | 0.00535 | 0.00605 | 0.00661 |
| Vanadium | mg/L | 0.0005 | 0.0040 | 0.0021 | < 0.0050 | < 0.0050 | < 0.0002 | < 0.0002 | < 0.0002 |
| Zinc | mg/L | 0.001 | 0.005 | 0.003 | < 0.0050 | < 0.0050 | 0.0010 | 0.0011 | 0.0017 |
| **Dissolved Metals** | | | | | | | | | |
| Aluminum | mg/L | 0.0062 | 0.0190 | 0.0131 | 0.0104 | 0.0103 | 0.0126 | 0.0166 | 0.0156 |
| Antimony | mg/L | 0.0003 | 0.0013 | 0.0013 | 0.00103 | 0.00130 | 0.00128 | 0.00138 | 0.00155 |
| Arsenic | mg/L | 0.0034 | 0.0027 | 0.0028 | 0.00221 | 0.00251 | 0.00234 | 0.00321 | 0.00349 |
| Barium | mg/L | 0.0110 | 0.0127 | 0.0137 | 0.0115 | 0.0143 | 0.0148 | 0.0135 | 0.0142 |
| Beryllium | mg/L | 0.00050 | 0.00010 | 0.00005 | < 0.00010 | < 0.00010 | < 0.00001 | < 0.00001 | < 0.00001 |
| Boron | mg/L | 0.01 | 0.04 | 0.03 | < 0.050 | < 0.050 | 0.012 | 0.012 | 0.017 |
| Cadmium | mg/L | 0.000020 | 0.000011 | 0.000011 | < 0.000010 | < 0.000010 | 0.000015 | 0.000008 | 0.000010 |
| Chromium | mg/L | 0.0006 | 0.0008 | 0.0005 | < 0.00100 | < 0.00100 | 0.00030 | 0.00012 | < 0.00010 |
| Copper | mg/L | 0.0014 | 0.0010 | 0.0020 | 0.00203 | 0.00098 | 0.00304 | 0.00219 | 0.00165 |
| Iron | mg/L | 0.0100 | 0.0072 | 0.0104 | < 0.0050 | < 0.0050 | 0.0054 | 0.0341 | 0.0027 |
| Lead | mg/L | 0.00022 | 0.00017 | 0.00012 | < 0.00020 | < 0.00020 | 0.00005 | 0.00012 | 0.00005 |
| Lithium | mg/L | 0.0050 | 0.0021 | 0.0023 | < 0.0020 | 0.0023 | 0.0023 | 0.0025 | 0.0024 |
| Manganese | mg/L | 0.0112 | 0.0110 | 0.0083 | 0.01690 | 0.01170 | 0.00556 | 0.00533 | 0.00201 |
| Mercury | mg/L | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.0188 | 0.0212 | 0.0224 | 0.0179 | 0.0217 | 0.0211 | 0.0247 | 0.0267 |
| Nickel | mg/L | 0.0015 | 0.0016 | 0.0021 | 0.00160 | 0.00160 | 0.00284 | 0.00237 | 0.00186 |
| Selenium | mg/L | 0.0011 | 0.0003 | 0.0003 | 0.000230 | 0.000280 | 0.000254 | 0.000262 | 0.000334 |
| Strontium | mg/L | 0.204 | 0.215 | 0.230 | 0.197 | 0.239 | 0.226 | 0.226 | 0.262 |
| Thallium | mg/L | - | 0.000016 | 0.000012 | < 0.000010 | 0.000016 | 0.000011 | 0.000008 | 0.000017 |
| Tin | mg/L | - | 0.004 | 0.002 | < 0.0050 | < 0.0050 | < 0.0002 | 0.0015 | < 0.0002 |
| Titanium | mg/L | 0.010 | 0.004 | 0.002 | < 0.0050 | < 0.0050 | < 0.0005 | < 0.0005 | < 0.0005 |
| Uranium | mg/L | 0.0044 | 0.0053 | 0.0056 | 0.00447 | 0.00557 | 0.00547 | 0.00541 | 0.00684 |
| Vanadium | mg/L | 0.001 | 0.004 | 0.002 | < 0.0050 | < 0.0050 | < 0.0002 | < 0.0002 | < 0.0002 |
| Zinc | mg/L | 0.001 | 0.004 | 0.004 | < 0.0050 | < 0.0050 | 0.0032 | 0.0069 | 0.0010 |

#### *8.5.3.1.13 Vault Rock Storage Facility (ST-24)*

The Vault Waste Rock Storage Facility (VWRSF) has been in operation since 2013. As in the past years, ponded water was observed at the base of the VWRSF (sampling station ST-24). In 2022, water was sampled in June, July, August, September and October. As per NWB Water License, samples were collected to assess water quality and the results are presented in Table 8-25. No water was pumped from this location as it is mainly a ponding area without flow and will dry-up during warmer months. There are no applicable license limits at this location as there is no discharge to the environment; the data is presented for information purposes only. The location of this sampling station (ST-24) is illustrated on Figure 3.

#### *8.5.3.1.14 Vault Attenuation Pond (ST-25)*

Surface water was sampled monthly during open water from the Vault Attenuation Pond as per the requirements in the NWB Type A Water License (sampling station ST-25). There are no applicable license limits. The data is presented in Table 8-26 for information purposes only. The location of sampling station ST-25 is illustrated on Figure 3. There was no water pumped out from the Vault Attenuation Pond to Wally Lake in 2022.

**Table 8-25 Meadowbank 2022 Vault Waste Rock Storage Facility Seepage Water Quality Monitoring (ST-24)**

| ST-24 | Unit | Annual Average | | | | | | 6/19/2022 | 7/17/2022 | 8/7/2022 | 9/13/2022 | 10/2/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | *2017* | *2018* | *2019* | *2020* | *2021* | *2022* | | | | | |
| **Field Measured** | | | | | | | | | | | | |
| Temperature | °C | *-* | *-* | *-* | *11.05* | *7.45* | *8.14* | 6.0 | 12.5 | 13.3 | 6.8 | 2.1 |
| pH | pH units | *6.36* | *7.29* | *7.65* | *7.71* | *7.63* | *7.67* | 7.49 | 7.41 | 7.92 | 7.79 | 7.73 |
| Conductivity | uS/cm | *-* | *-* | *-* | *265.6* | *235.0* | *331.2* | 169.2 | 234.0 | 360.0 | 306.0 | 587.0 |
| Turbidity | NTU | *91.60* | *24.41* | *6.47* | *2.88* | *4.13* | *1.55* | 2.27 | 1.01 | 0.72 | 2.15 | 1.61 |
| **Conventional Parameters** | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | 86 | 117 | 85 | 133 | 110 | *139* | 72 | 110 | 169 | 172 | 174 |
| Total alkalinity, as $CaCO_3$ | mg/L | *32* | *42* | *39* | *53* | *43* | *52* | 30 | 43 | 65 | 64 | 60 |
| TDS | mg/L | *118* | *207* | *143* | *175* | *158* | *173* | 105 | 125 | 210 | 210 | 215 |
| TSS | mg/L | *38* | *27* | *5* | *4* | *3* | *1* | 2 | 1 | < 1 | < 1 | 1 |
| **Major Ions** | | | | | | | | | | | | |
| Chloride | mg/L | *1.5* | *3.6* | *1.8* | *4.8* | *4.6* | *3.1* | 2.1 | 2.8 | 4.0 | 3.3 | 3.5 |
| Cyanide | mg/L | *0.001* | *0.001* | *0.001* | *0.001* | *0.005* | *0.001* | 0.00205 | 0.00059 | 0.00135 | < 0.00050 | 0.00186 |
| Fluoride | mg/L | *0.08* | *0.09* | *0.10* | *0.09* | *0.10* | *0.10* | < 0.10 | < 0.10 | < 0.10 | 0.10 | 0.11 |
| Sulfate | mg/L | *44* | *102* | *66* | *74* | *64* | *85* | 47 | 63 | 94 | 110 | 110 |
| **Nutrients** | | | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | *0.29* | *0.23* | *0.19* | *0.03* | *0.61* | *0.07* | < 0.050 | < 0.050 | < 0.050 | 0.065 | 0.078 |
| Nitrate | mg N/L | *2.41* | *2.99* | *2.17* | *2.29* | *1.16* | *1.10* | 0.60 | 0.74 | 1.32 | 1.33 | 1.51 |
| Nitrite | mg N/L | *0.02* | *0.03* | *0.03* | *0.01* | *0.01* | *0.01* | < 0.010 | 0.012 | < 0.010 | < 0.010 | < 0.010 |
| **Total Metals** | | | | | | | | | | | | |
| Aluminum | mg/L | *2.0100* | *0.4790* | *0.1238* | *0.0895* | *0.1059* | *0.0346* | 0.0546 | 0.0354 | 0.0197 | 0.0380 | 0.0254 |
| Arsenic | mg/L | *0.0005* | *0.0005* | *0.0045* | *0.0029* | *0.0021* | *0.0018* | 0.00089 | 0.00202 | 0.00221 | 0.00194 | 0.00170 |
| Barium | mg/L | *0.0253* | *0.0229* | *0.0150* | *0.0141* | *0.0127* | *0.0136* | 0.0089 | 0.0111 | 0.0158 | 0.0163 | 0.0161 |
| Cadmium | mg/L | *0.00008* | *0.00010* | *0.00006* | *0.00002* | *0.00003* | *0.00002* | 0.00003 | 0.00002 | 0.00002 | 0.00003 | 0.00003 |
| Chromium | mg/L | *0.0062* | *0.0007* | *0.0009* | *0.0006* | *0.0010* | *0.0010* | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Copper | mg/L | *0.0072* | *0.0068* | *0.0062* | *0.0036* | *0.0036* | *0.0034* | 0.00290 | 0.00285 | 0.00345 | 0.00390 | 0.00372 |
| Iron | mg/L | *2.92* | *1.13* | *0.25* | *0.17* | *0.17* | *0.10* | 0.105 | 0.059 | 0.052 | 0.149 | 0.141 |
| Lead | mg/L | *0.0003* | *0.0003* | *0.0003* | *0.0002* | *0.0003* | *0.0002* | 0.00020 | < 0.00020 | < 0.00020 | 0.00020 | < 0.00020 |
| Manganese | mg/L | *0.1912* | *0.1888* | *0.0513* | *0.0418* | *0.0303* | *0.0185* | 0.0225 | 0.0072 | 0.0070 | 0.0334 | 0.0224 |
| Mercury | mg/L | *0.00001* | *0.00002* | *0.00001* | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0072* | *0.0109* | *0.0138* | *0.0156* | *0.0151* | *0.0170* | 0.0070 | 0.0139 | 0.0209 | 0.0217 | 0.0214 |
| Nickel | mg/L | *0.1250* | *0.0079* | *0.0050* | *0.0045* | *0.0038* | *0.0026* | 0.0028 | 0.0020 | 0.0019 | 0.0032 | 0.0029 |
| Selenium | mg/L | *0.0010* | *0.0016* | *0.0006* | *0.0010* | *0.0002* | *0.0003* | 0.00017 | 0.00022 | 0.00033 | 0.00035 | 0.00044 |
| Silver | mg/L | *0.00010* | *0.00010* | *0.00034* | *0.00010* | *0.00002* | *0.00002* | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| Thallium | mg/L | *0.00080* | *0.00060* | *0.00020* | *0.00020* | *0.00001* | *0.00001* | < 0.000010 | 0.000011 | 0.000013 | 0.000011 | 0.000012 |
| Zinc | mg/L | *0.013* | *0.004* | *0.006* | *0.001* | *0.005* | *0.005* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |

**Table 8-26 Meadowbank 2022 Vault Attenuation Pond Water Quality Monitoring (ST-25)**

| ST-25 | Unit | *Annual Average* | | | | | | 6/19/2022 | 7/17/2022 | 8/7/2022 | 9/13/2022 | 10/2/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | *2017* | *2018* | *2019* | *2020* | *2021* | *2022* | | | | | |
| **Field Measured** | | | | | | | | | | | | |
| Temperature | °C | *-* | *-* | *-* | *9.9* | *6.7* | *8.5* | 5.8 | 15.0 | 13.1 | 6.5 | 2.2 |
| pH | pH units | *7.83* | *7.24* | *7.55* | *7.68* | *7.61* | *7.27* | 7.22 | 6.85 | 7.03 | 7.50 | 7.76 |
| Conductivity | uS/cm | *-* | *-* | *-* | *177.7* | *136.0* | *182.2* | 141.2 | 176.4 | 173.5 | 144.0 | 276.0 |
| Turbidity | NTU | *16.39* | *7.63* | *5.44* | *4.18* | *1.74* | *1.23* | 1.19 | 1.08 | 0.97 | 1.45 | 1.48 |
| **Conventional Parameters** | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *118* | *102* | *84* | *88* | *58* | *69* | 56.3 | 72.8 | 73.8 | 70.9 | 73.3 |
| Total alkalinity, as $CaCO_3$ | mg/L | *54* | *36* | *36* | *41* | *21* | *28* | 23 | 29 | 32 | 27 | 30 |
| TDS | mg/L | *188* | *181* | *140* | *114* | *86* | *93* | 90 | 90 | 90 | 105 | 90 |
| TSS | mg/L | *30* | *11* | *4* | *6* | *2* | *2* | 2 | 2 | 2 | 1 | 2 |
| **Major Ions** | | | | | | | | | | | | |
| Chloride | mg/L | *9.8* | *7.1* | *6.1* | *5.4* | *5.0* | *3.5* | 2.9 | 3.9 | 3.6 | 3.4 | 3.6 |
| Cyanide | mg/L | *0.005* | *0.002* | *0.001* | *0.001* | *0.005* | *0.001* | 0.00201 | < 0.00050 | < 0.00050 | 0.00056 | 0.00092 |
| Fluoride | mg/L | *0.10* | *0.15* | *0.14* | *0.10* | *0.10* | *0.10* | < 0.10 | 0.10 | 0.10 | 0.11 | 0.11 |
| Sulfate | mg/L | *88.4* | *74.6* | *58.4* | *43.9* | *36.1* | *45.8* | 40 | 47 | 48 | 46 | 48 |
| **Nutrients** | | | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | *1.86* | *0.88* | *0.45* | *0.15* | *0.28* | *0.05* | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Nitrate | mg N/L | *1.40* | *0.02* | *1.20* | *0.97* | *0.59* | *0.26* | 0.42 | 0.27 | 0.30 | 0.19 | 0.14 |
| Nitrite | mg N/L | *2.19* | *2.69* | *0.01* | *0.05* | *0.01* | *0.01* | < 0.010 | 0.011 | < 0.010 | < 0.010 | < 0.010 |
| **Total Metals** | | | | | | | | | | | | |
| Aluminum | mg/L | *0.634* | *0.254* | *0.158* | *0.168* | *0.041* | *0.022* | 0.0202 | 0.0197 | 0.0153 | 0.0296 | 0.0275 |
| Arsenic | mg/L | *0.0041* | *0.0006* | *0.0017* | *0.0011* | *0.0005* | *0.0005* | 0.00037 | 0.00053 | 0.00056 | 0.00059 | 0.00059 |
| Barium | mg/L | *0.0230* | *0.0236* | *0.0169* | *0.0179* | *0.0127* | *0.0142* | 0.0132 | 0.0153 | 0.0146 | 0.0135 | 0.0142 |
| Cadmium | mg/L | *0.00002* | *0.00007* | *0.00009* | *0.00002* | *0.00002* | *0.00001* | 0.000013 | 0.000014 | 0.000012 | 0.000011 | < 0.000010 |
| Chromium | mg/L | *0.0022* | *0.0020* | *0.0010* | *0.0011* | *0.0010* | *0.0010* | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Copper | mg/L | *0.0037* | *0.0066* | *0.0073* | *0.0039* | *0.0015* | *0.0018* | 0.00150 | 0.00201 | 0.00188 | 0.00196 | 0.00180 |
| Iron | mg/L | *0.990* | *0.500* | *0.373* | *0.314* | *0.060* | *0.032* | 0.035 | 0.028 | 0.013 | 0.040 | 0.044 |
| Lead | mg/L | *0.0003* | *0.0003* | *0.0003* | *0.0002* | *0.0002* | *0.0002* | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Manganese | mg/L | *0.069* | *0.129* | *0.101* | *6.018* | *0.011* | *0.006* | 0.0099 | 0.0061 | 0.0035 | 0.0045 | 0.0041 |
| Mercury | mg/L | *0.00001* | *0.00001* | *0.00001* | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0170* | *0.0062* | *0.0033* | *0.0045* | *0.0044* | *0.0045* | 0.0032 | 0.0046 | 0.0050 | 0.0048 | 0.0048 |
| Nickel | mg/L | *0.0052* | *0.0122* | *0.0093* | *0.0043* | *0.0019* | *0.0017* | 0.0020 | 0.0018 | 0.0015 | 0.0016 | 0.0016 |
| Selenium | mg/L | *0.0013* | *0.0008* | *0.0011* | *0.0009* | *0.0001* | *0.0001* | < 0.00010 | 0.00011 | 0.00012 | < 0.00010 | 0.00011 |
| Silver | mg/L | *-* | *0.00010* | *0.00025* | *0.00010* | *0.00002* | *0.00002* | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| Thallium | mg/L | *0.00080* | *0.00050* | *0.00020* | *0.00020* | *0.00001* | *0.00001* | < 0.000010 | 0.000011 | 0.000011 | < 0.000010 | < 0.000010 |
| Zinc | mg/L | *0.002* | *0.009* | *0.007* | *0.002* | *0.005* | *0.005* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |

#### *8.5.3.1.15 WRSF – Waste Extension Pool (WEP/ ST-30 and ST-31)*

In 2014, as per inspections conducted within the framework of the Freshet Action Plan, runoff was noted at the northeast side of the NPAG waste rock extension pile in a natural depression (WEP). Agnico Eagle contained this runoff and pumped it back to the North Cell TSF as a precaution and to prevent egress to the East Diversion non-contact water ditch. In 2022, 36,086 $m^3$ of water was pumped from the WEP collection system to the North Cell TSF which includes 23,619 $m^3$ of water from WEP1 and 12,467 $m^3$ from WEP2. The water from the WEP collection system is pumped to the ST-16 sump system, and then pumped to the North Cell TSF. Table 8-27 below provide 2016 – 2022 pumped volume for WEP1 and WEP2.

**Table 8-27 Meadowbank 2016-2022 Volume of Water Pumped from WEP 1 and WEP 2**

| Years | WEP 1 pumped volume ($m^3$) | WEP 2 pumped volume ($m^3$) | Total volume system ($m^3$) |
|---|---|---|---|
| 2016 | 3,694 | 1,802 | 5,496 |
| 2017 | 14,456 | 10,282 | 24,738 |
| 2018 | 13,923 | 8,169 | 22,092 |
| 2019 | 14,680 | 20,431 | 35,111 |
| 2020 | 23,543 | 17,243 | 40,786 |
| 2021 | 16,120 | 9,236 | 25,356 |
| 2022 | 23,619 | 12,467 | 36,086 |

WEP1 and WEP2 sumps were constructed in September 2015 (Appendix G4 of the 2015 Annual Report) to better manage water around the northeast side of the PWRSF and to ensure that all water ponding behind the PWRSF is transferred back to the North Cell TSF (and eventually transferred to the South Cell). The sumps WEP1 and WEP2 have replaced the natural depression forming the former WEP for the water management in this area. Sump locations are illustrated on Appendix G4 of the 2015 Annual Report. Sampling have commence in 2016 at sumps WEP1 and WEP2 as per NWB Water License 2AM-MEA1530. There are no applicable license limits. The sampling locations are illustrated on Figure 1 and results are presented in Table 8-28 for WEP1 (ST-30) and Table 8-29 for WEP2 (ST-31).

Results of samples collected in 2022 at station ST-5 (East Diversion ditch discharge point into NP2) are documented in Table 8-12. The results from summer 2022 show that no water coming from the former WEP collection system was in contact with the East Diversion ditch. Agnico Eagle will continue to monitor the area and will ensure that water collected in WEP1 and WEP2 sumps are pumped back into the North Cell TSF.

**Table 8-28 Meadowbank 2022 Waste Extension Pool WEP1 Water Quality Monitoring (ST-30)**

| ST-30 | Unit | Annual Average | | | | | | 6/6/2022 | 7/3/2022 | 7/17/2022 | 8/1/2022 | 9/11/2022 | 10/3/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | | | | | | |
| **Field Measured** | | | | | | | | | | | | | |
| Temperature | °C | - | - | - | 9.4 | 7.1 | 8.8 | 9.6 | 17.1 | 13.5 | 7.5 | 5.0 | 0.0 |
| pH | pH units | 7.49 | 7.42 | 7.42 | 7.36 | 7.53 | 7.33 | 7.17 | 7.63 | 7.19 | 7.49 | 6.89 | 7.58 |
| Conductivity | uS/cm | - | - | - | 220.8 | 187.3 | 250.1 | 55.7 | 244.0 | 288.0 | 260.0 | 262.0 | 391.0 |
| Turbidity | NTU | 44.26 | 8.35 | 7.51 | 6.04 | 3.91 | 65.64 | 6.52 | 365.00 | 8.18 | 4.83 | 4.02 | 5.27 |
| **Conventional Parameters** | | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | 157 | 66 | 115 | 113 | 92 | 111 | 23.5 | 125.0 | 101.0 | 128.0 | 124.0 | 164.0 |
| Total alkalinity, as $CaCO_3$ | mg/L | 105 | 54 | 51 | 73 | 55 | 73 | 18 | 86 | 79 | 90 | 68 | 96 |
| TDS | mg/L | 249 | 136 | 169 | 150 | 145 | 151 | 30 | 230 | 140 | 120 | 190 | 195 |
| TSS | mg/L | 14 | 6 | 6 | 6 | 1 | 25 | 4 | 130 | 4 | 2 | 1 | 10 |
| **Major Ions** | | | | | | | | | | | | | |
| Chloride | mg/L | 6.7 | 2.7 | 2.5 | 2.3 | 2.1 | 3.1 | < 1.0 | 9.0 | 2.5 | 2.3 | 1.6 | 2.1 |
| Cyanide | mg/L | 0.032 | 0.010 | 0.005 | 0.008 | 0.006 | 0.009 | 0.00429 | 0.00987 | 0.00886 | 0.01600 | 0.00713 | 0.00574 |
| Cyanide (free) | mg/L | 0.007 | 0.005 | 0.054 | 0.002 | 0.005 | 0.004 | 0.0058 | 0.0022 | 0.0072 | 0.0053 | < 0.0020 | < 0.0020 |
| Cyanide (WAD) | mg/L | 0.003 | 0.006 | 0.001 | 0.002 | 0.003 | 0.004 | 0.0033 | 0.0035 | 0.0067 | 0.0065 | 0.0043 | 0.0025 |
| Fluoride | mg/L | 0.18 | 0.13 | 0.13 | 0.13 | 0.14 | 0.17 | < 0.10 | 0.19 | 0.24 | 0.16 | 0.18 | 0.12 |
| Sulfate | mg/L | 71.4 | 32.2 | 44.8 | 34.2 | 40.1 | 40.7 | 6.1 | 38.0 | 35.0 | 42.0 | 61.0 | 62.0 |
| **Nutrients** | | | | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | 1.37 | 0.19 | 0.10 | 0.26 | 0.13 | 0.28 | 0.063 | 1.100 | 0.130 | 0.063 | 0.140 | 0.160 |
| Nitrate | mg N/L | 0.79 | 0.39 | 1.79 | 1.45 | 1.56 | 1.31 | 0.14 | < 0.10 | 0.29 | 1.11 | 3.24 | 2.97 |
| Nitrite | mg N/L | 0.048 | 0.017 | 0.103 | 0.040 | 0.013 | 0.021 | 0.012 | 0.030 | 0.026 | 0.015 | 0.030 | 0.014 |
| **Total Metals** | | | | | | | | | | | | | |
| Aluminum | mg/L | 0.864 | 0.122 | 0.072 | 0.113 | 0.055 | 1.932 | 0.120 | 10.800 | 0.141 | 0.071 | 0.065 | 0.393 |
| Arsenic | mg/L | 0.0420 | 0.0047 | 0.0084 | 0.0032 | 0.0108 | 0.0141 | 0.05050 | 0.01310 | 0.00582 | 0.00287 | 0.01080 | 0.00170 |
| Barium | mg/L | 0.0190 | 0.0102 | 0.0101 | 0.0149 | 0.0124 | 0.0266 | 0.0053 | 0.0877 | 0.0166 | 0.0161 | 0.0167 | 0.0174 |
| Cadmium | mg/L | 0.00002 | 0.00002 | 0.00003 | 0.00002 | 0.00001 | 0.00003 | 0.000011 | 0.000095 | 0.000012 | 0.000012 | 0.000005 | 0.000015 |
| Chromium | mg/L | 0.0036 | 0.0015 | 0.0030 | 0.0013 | 0.0014 | 0.0096 | 0.0027 | 0.0419 | 0.0010 | < 0.0010 | 0.0006 | 0.0020 |
| Copper | mg/L | 0.0120 | 0.0109 | 0.0137 | 0.0123 | 0.0057 | 0.0112 | 0.00640 | 0.03830 | 0.00706 | 0.00552 | 0.00429 | 0.00575 |
| Iron | mg/L | 3.140 | 0.875 | 0.467 | 1.108 | 0.474 | 4.110 | 0.35 | 20.00 | 1.22 | 1.43 | 0.27 | 1.39 |
| Lead | mg/L | 0.0009 | 0.0003 | 0.0003 | 0.0003 | 0.0002 | 0.0025 | 0.00030 | 0.01370 | 0.00026 | < 0.00020 | 0.00015 | 0.00059 |
| Manganese | mg/L | 0.6800 | 0.0664 | 0.0143 | 10.9900 | 0.0392 | 0.2136 | 0.0719 | 0.7440 | 0.0589 | 0.1220 | 0.0459 | 0.2390 |
| Mercury | mg/L | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.0018 | 0.0018 | 0.0040 | 0.0025 | 0.0035 | 0.0043 | 0.0046 | 0.0024 | 0.0080 | 0.0044 | 0.0051 | 0.0014 |
| Nickel | mg/L | 0.0120 | 0.0047 | 0.0045 | 0.0044 | 0.0028 | 0.0089 | 0.0035 | 0.0342 | 0.0044 | 0.0034 | 0.0024 | 0.0057 |
| Selenium | mg/L | 0.0010 | 0.0023 | 0.0007 | 0.0010 | 0.0003 | 0.0003 | 0.00017 | 0.00031 | 0.00023 | 0.00026 | 0.00065 | 0.00041 |
| Silver | mg/L | 0.00010 | 0.00010 | 0.00010 | 0.00010 | 0.00002 | 0.00003 | < 0.000020 | 0.000094 | 0.000010 | < 0.000020 | 0.000006 | < 0.000020 |
| Thallium | mg/L | 0.00080 | 0.00050 | 0.00020 | 0.00020 | 0.00001 | 0.00004 | < 0.000010 | 0.000197 | 0.000008 | < 0.000010 | 0.000005 | < 0.000010 |
| Zinc | mg/L | 0.003 | 0.001 | 0.001 | 0.002 | 0.005 | 0.010 | < 0.0050 | 0.0440 | 0.0014 | < 0.0050 | 0.0009 | < 0.0050 |

**Table 8-29 Meadowbank 2022 Waste Extension Pool WEP2 Water Quality Monitoring (ST-31)**

| ST-31 | Unit | *Annual Average* | | | | | | 6/7/2022 | 7/10/2022 | 7/17/2022 | 8/1/2022 | 9/11/2022 | 10/3/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | *2017* | *2018* | *2019* | *2020* | *2021* | *2022* | | | | | | |
| **Field Measured** | | | | | | | | | | | | | |
| Temperature | °C | *-* | *-* | *-* | *9.7* | *6.4* | *8.9* | 2.2 | 20.7 | 16.6 | 7.9 | 5.3 | 0.6 |
| pH | pH units | *7.66* | *7.30* | *7.34* | *7.67* | *7.34* | *7.43* | 6.97 | 8.00 | 7.45 | 7.67 | 6.74 | 7.72 |
| Conductivity | uS/cm | *-* | *-* | *-* | *213.2* | *190.7* | *232.2* | 105.3 | 217.8 | 262.0 | 278.0 | 224.0 | 306.0 |
| Turbidity | NTU | *12.94* | *18.24* | *7.94* | *4.17* | *4.06* | *7.90* | 8.26 | 1.04 | 2.36 | 2.20 | 3.12 | 30.40 |
| **Conventional Parameters** | | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *96* | *72* | *115* | *101* | *94* | *109* | 52 | 102 | 119 | 135 | 122 | 126 |
| Total alkalinity, as $CaCO_3$ | mg/L | *79* | *52* | *50* | *75* | *60* | *79* | 43 | 92 | 85 | 100 | 76 | 80 |
| TDS | mg/L | *212* | *112* | *125* | *142* | *150* | *145* | 75 | 130 | 145 | 165 | 195 | 160 |
| TSS | mg/L | *10* | *79* | *5* | *3* | *4* | *6* | 7 | 1 | 3 | 1 | 3 | 20 |
| **Major Ions** | | | | | | | | | | | | | |
| Chloride | mg/L | *12.2* | *5.6* | *2.9* | *3.2* | *2.6* | *2.3* | 1.2 | 2.1 | 2.7 | 2.3 | 2.0 | 3.5 |
| Cyanide | mg/L | *0.0020* | *0.0020* | *0.0010* | *0.0010* | *0.0050* | *0.0022* | 0.00093 | 0.00067 | 0.00094 | 0.00131 | 0.00281 | 0.00672 |
| Cyanide (free) | mg/L | *0.012* | *0.005* | *0.001* | *0.001* | *0.003* | *0.002* | 0.0034 | < 0.0020 | < 0.0020 | 0.0035 | < 0.0020 | < 0.0020 |
| Cyanide (WAD) | mg/L | *0.002* | *0.002* | *0.001* | *0.001* | *0.001* | *0.001* | 0.00094 | 0.00077 | 0.00054 | 0.00110 | 0.00130 | 0.00066 |
| Fluoride | mg/L | *0.15* | *0.13* | *0.11* | *0.13* | *0.13* | *0.19* | 0.13 | 0.19 | 0.22 | 0.21 | 0.18 | 0.19 |
| Sulfate | mg/L | *41.7* | *30.9* | *39.0* | *31.5* | *39.4* | *37.8* | 10 | 21 | 44 | 42 | 57 | 53 |
| **Nutrients** | | | | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | *1.82* | *0.04* | *0.06* | *0.05* | *0.10* | *0.05* | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Nitrate | mg N/L | *3.09* | *0.34* | *1.12* | *1.04* | *1.15* | *0.76* | 0.30 | < 0.10 | 0.12 | 0.33 | 2.07 | 1.64 |
| Nitrite | mg N/L | *0.19* | *0.15* | *0.02* | *0.02* | *0.01* | *0.01* | 0.012 | < 0.010 | 0.014 | < 0.010 | 0.019 | < 0.010 |
| **Total Metals** | | | | | | | | | | | | | |
| Aluminum | mg/L | *0.192* | *1.259* | *0.074* | *0.086* | *0.099* | *0.194* | 0.2050 | 0.0366 | 0.0532 | 0.0414 | 0.0793 | 0.7490 |
| Arsenic | mg/L | *0.0046* | *0.0024* | *0.0440* | *0.0195* | *0.0594* | *0.0071* | 0.01470 | 0.00675 | 0.00668 | 0.00581 | 0.00226 | 0.00616 |
| Barium | mg/L | *0.0097* | *0.0178* | *0.0083* | *0.0112* | *0.0109* | *0.0119* | 0.0078 | 0.0092 | 0.0127 | 0.0138 | 0.0143 | 0.0136 |
| Cadmium | mg/L | *0.000020* | *0.000020* | *0.000020* | *0.000020* | *0.000011* | *0.000009* | 0.000010 | < 0.000010 | 0.000005 | < 0.000010 | < 0.000005 | 0.000016 |
| Chromium | mg/L | *0.0027* | *0.0059* | *0.0023* | *0.0011* | *0.0021* | *0.0042* | 0.0032 | < 0.0010 | 0.0008 | < 0.0010 | 0.0011 | 0.0182 |
| Copper | mg/L | *0.0016* | *0.0046* | *0.0018* | *0.0032* | *0.0013* | *0.0016* | 0.00158 | 0.00202 | 0.00171 | 0.00139 | 0.00096 | 0.00218 |
| Iron | mg/L | *0.630* | *2.738* | *0.337* | *0.343* | *0.286* | *0.473* | 0.557 | 0.077 | 0.237 | 0.256 | 0.249 | 1.460 |
| Lead | mg/L | *0.0022* | *0.0003* | *0.0003* | *0.0003* | *0.0002* | *0.0002* | 0.00026 | < 0.00020 | 0.00005 | < 0.00020 | 0.00005 | 0.00055 |
| Manganese | mg/L | *0.1500* | *0.1248* | *0.0508* | *0.0948* | *0.0357* | *0.0583* | 0.0774 | 0.0056 | 0.0680 | 0.0466 | 0.0559 | 0.0965 |
| Mercury | mg/L | *0.00003* | *0.00001* | *0.00001* | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0014* | *0.0008* | *0.0068* | *0.0046* | *0.0103* | *0.0058* | 0.0066 | 0.0048 | 0.0060 | 0.0061 | 0.0067 | 0.0047 |
| Nickel | mg/L | *0.0039* | *0.0087* | *0.0034* | *0.0032* | *0.0042* | *0.0042* | 0.0038 | 0.0024 | 0.0031 | 0.0034 | 0.0024 | 0.0100 |
| Selenium | mg/L | *0.0010* | *0.0025* | *0.0005* | *0.0010* | *0.0002* | *0.0002* | 0.00013 | < 0.00010 | 0.00012 | 0.00015 | 0.00045 | 0.00021 |
| Silver | mg/L | *0.00010* | *0.00010* | *0.00010* | *0.00010* | *0.00002* | *0.00002* | < 0.000020 | < 0.000020 | < 0.000005 | < 0.000020 | < 0.000005 | < 0.000020 |
| Thallium | mg/L | *0.00080* | *0.00050* | *0.00020* | *0.00020* | *0.00001* | *0.00001* | < 0.000010 | < 0.000010 | 0.000005 | < 0.000010 | 0.000003 | < 0.000010 |
| Zinc | mg/L | *0.002* | *0.054* | *0.001* | *0.001* | *0.005* | *0.004* | < 0.0050 | < 0.0050 | 0.0007 | < 0.0050 | 0.0012 | < 0.0050 |

#### *8.5.3.1.16 Saddle Dam 3 (ST-32)*

Water accumulated at the base of Saddle Dam 3 was pumped into the South Cell TSF (11,876 $m^3$ in 2022). This water originates from non-contact surface runoff from the surrounding terrain. Water samples were collected during the open water season to assess water quality. There are no applicable license limits for this location as the water was not being released into the environment; the data is presented in Table 8-32 for information purposes only. The sampling location (ST-32) is illustrated on Figure 1. Water accumulation at the toe of Saddle Dam 3 does not have any consequence on the integrity of the TSF infrastructure. As stated previously, water was pumped back to the South Cell TSF as a mitigation measure. Inspections continue to be held at this location on a weekly basis to ensure conformity. Table 8-30 below provide 2016 – 2022 pumped volume from ST-32.

**Table 8-30 Meadowbank 2016-2022 Volume of Water Pumped from Saddle Dam 3 (ST-32)**

| Years | ST-32 pumped volume ($m^3$) |
|---|---|
| 2016 | 22,095 |
| 2017 | 16,061 |
| 2018 | 21,962 |
| 2019 | 28,198 |
| 2020 | 27,093 |
| 2021 | 15,885 |
| 2022 | 11,876 |

#### *8.5.3.1.17 Saddle Dam 1 (ST-S-2)*

Water accumulated at the base of Saddle Dam 1 was pumped into the North Cell TSF (9,987 $m^3$ in 2022). This water originates from non-contact surface runoff from the surrounding terrain because of the topography. Water samples were collected during the open water season to assess water quality. There are no applicable license limits for this location as the water was not being released into the environment; the data is presented in Table 8-33 for information purposes only. The sampling location (ST-S-2) is illustrated on Figure 1. The water accumulation at the toe of Saddle Dam 1 does not have any major consequence on the integrity of the TSF infrastructure, as the water is pumped and properly managed. As previously mentioned, water was pumped back to the North Cell TSF as a mitigation measure. Inspections continue to be held at this location on a weekly basis to ensure conformity. Table 8-31 below provide 2015 – 2022 pumped volume from ST-S-2.

**Table 8-31 Meadowbank 2015 - 2022 Volume of Water Pumped from Saddle Dam 1 (ST-S-2)**

| Years | ST-S-2 pumped volume ($m^3$) |
|---|---|
| 2015 | 7,185 |
| 2016 | 15,960 |
| 2017 | 13,102 |
| 2018 | 3,626 |
| 2019 | 7,050 |
| 2020 | 15,457 |
| 2021 | 7,323 |
| 2022 | 9,987 |

**Table 8-32 Meadowbank 2022 Saddle Dam 3 Water Quality Monitoring (ST-32)**

| ST-32 | Unit | Annual Average | | | | | | 6/5/2022 | 7/3/2022 | 8/2/2022 | 9/13/2022 | 10/3/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | | | | | |
| **Field Measured** | | | | | | | | | | | | |
| Temperature | °C | - | - | - | 13.6 | 6.7 | 6.0 | 7.4 | 10.0 | 8.8 | 3.5 | 0.3 |
| pH | pH units | 7.57 | 7.45 | 7.51 | 7.89 | 7.69 | 7.45 | 7.57 | 7.82 | 6.62 | 7.65 | 7.58 |
| Conductivity | uS/cm | - | - | - | 475.4 | 411.1 | 468.1 | 218 | 447 | 519 | 491 | 666 |
| Turbidity | NTU | 104.55 | 97.98 | 11.02 | 17.72 | 30.76 | 39.21 | 136.00 | 2.41 | 3.33 | 17.60 | 36.70 |
| **Conventional Parameters** | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | 357 | 195 | 262 | 209 | 202 | 208 | 107 | 191 | 225 | 251 | 267 |
| Total alkalinity, as $CaCO_3$ | mg/L | 121 | 266 | 46 | 73 | 66 | 74 | 50 | 75 | 87 | 72 | 85 |
| TDS | mg/L | 665 | 56 | 19 | 301 | 339 | 305 | 140 | 260 | 320 | 375 | 430 |
| TSS | mg/L | 504 | 335 | 406 | 6 | 16 | 28 | 76 | 1 | 1 | 8 | 54 |
| **Major Ions** | | | | | | | | | | | | |
| Chloride | mg/L | 16.2 | 14.7 | 25.6 | 13.5 | 13.8 | 11.7 | 5.6 | 10.0 | 14.0 | 15.0 | 14.0 |
| Cyanide | mg/L | 0.049 | 0.016 | 0.008 | 0.004 | 0.009 | 0.010 | 0.03370 | 0.00179 | 0.00176 | 0.00358 | 0.00701 |
| Fluoride | mg/L | 0.38 | 0.32 | 0.31 | 0.24 | 0.25 | 0.30 | 0.12 | 0.32 | 0.41 | 0.33 | 0.33 |
| Sulfate | mg/L | 185 | 117 | 136 | 110 | 115 | 113 | 46 | 110 | 120 | 150 | 140 |
| **Nutrients** | | | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | 4.34 | 6.79 | 2.30 | 0.24 | 0.47 | 0.52 | 0.068 | 0.059 | 0.190 | 0.790 | 1.500 |
| Nitrate | mg N/L | 16.53 | 23.23 | 16.64 | 9.45 | 7.29 | 8.98 | 1.33 | 6.63 | 8.85 | 12.50 | 15.60 |
| Nitrite | mg N/L | 0.35 | 0.17 | 0.08 | 0.07 | 0.06 | 0.05 | 0.025 | 0.040 | 0.031 | 0.046 | 0.094 |
| **Total Metals** | | | | | | | | | | | | |
| Aluminum | mg/L | 11.010 | 1.456 | 0.494 | 0.137 | 0.493 | 0.943 | 2.920 | 0.024 | 0.054 | 0.324 | 1.390 |
| Arsenic | mg/L | 0.0075 | 0.0074 | 0.0392 | 0.0426 | 0.0258 | 0.0393 | 0.0497 | 0.0370 | 0.0426 | 0.0447 | 0.0223 |
| Barium | mg/L | 0.2200 | 0.0498 | 0.0508 | 0.0318 | 0.0350 | 0.0416 | 0.0351 | 0.0331 | 0.0400 | 0.0491 | 0.0505 |
| Cadmium | mg/L | 0.00013 | 0.00005 | 0.00005 | 0.00002 | 0.00003 | 0.00003 | 0.000076 | < 0.000010 | 0.000015 | 0.000016 | 0.000029 |
| Chromium | mg/L | 0.05000 | 0.01395 | 0.00873 | 0.00193 | 0.01056 | 0.01608 | 0.0456 | < 0.0010 | 0.0010 | 0.0031 | 0.0297 |
| Copper | mg/L | 0.0830 | 0.0132 | 0.0058 | 0.0035 | 0.0095 | 0.0077 | 0.01850 | 0.00242 | 0.00275 | 0.00505 | 0.00968 |
| Iron | mg/L | 22.380 | 2.685 | 0.863 | 0.275 | 0.905 | 1.801 | 5.420 | 0.049 | 0.112 | 0.615 | 2.810 |
| Lead | mg/L | 0.0150 | 0.0054 | 0.0003 | 0.0002 | 0.0020 | 0.0047 | 0.01930 | < 0.00020 | 0.00024 | 0.00046 | 0.00324 |
| Manganese | mg/L | 2.880 | 0.444 | 0.291 | 0.088 | 0.144 | 0.096 | 0.1700 | 0.0440 | 0.0484 | 0.0844 | 0.1320 |
| Mercury | mg/L | 0.00005 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.0037 | 0.0063 | 0.0108 | 0.0078 | 0.0089 | 0.0082 | 0.0069 | 0.0098 | 0.0093 | 0.0076 | 0.0076 |
| Nickel | mg/L | 0.180 | 0.051 | 0.067 | 0.031 | 0.039 | 0.044 | 0.0428 | 0.0358 | 0.0463 | 0.0350 | 0.0598 |
| Selenium | mg/L | 0.0030 | 0.0011 | 0.0027 | 0.0013 | 0.0011 | 0.0008 | 0.00028 | 0.00071 | 0.00081 | 0.00111 | 0.00119 |
| Silver | mg/L | 0.00043 | 0.00010 | 0.00010 | 0.00010 | 0.00005 | 0.00002 | 0.000042 | < 0.000020 | < 0.000020 | < 0.000020 | 0.000021 |
| Thallium | mg/L | 0.00080 | 0.00050 | 0.00020 | 0.00020 | 0.00005 | 0.00006 | 0.000052 | 0.000027 | 0.000040 | 0.000071 | 0.000098 |
| Zinc | mg/L | 0.073 | 0.007 | 0.002 | 0.036 | 0.005 | 0.006 | 0.0110 | < 0.0050 | < 0.0050 | < 0.0050 | 0.0052 |

**Table 8-33 Meadowbank 2022 Saddle Dam 1 Water Quality Monitoring (ST-S-2)**

| ST-S-2 | Unit | *Annual Average* | | | | | | 6/5/2022 | 7/3/2022 | 8/2/2022 | 9/12/2022 | 10/3/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | | ***2017*** | ***2018*** | ***2019*** | ***2020*** | ***2021*** | ***2022*** | | | | | |
| **Field Measured** | | | | | | | | | | | | |
| Temperature | °C | *-* | *-* | *-* | *8.8* | *5.0* | *5.6* | 2.8 | 14.7 | 6.1 | 4.3 | 0.3 |
| pH | pH units | *7.92* | *7.60* | *7.04* | *7.93* | *7.64* | *7.64* | 7.76 | 7.59 | 7.40 | 7.69 | 7.76 |
| Conductivity | uS/cm | *-* | *-* | *-* | *548.7* | *490.4* | *778.2* | 141.8 | 653.0 | 816.0 | 969.0 | 1311.0 |
| Turbidity | NTU | *21.05* | *27.90* | *21.03* | *7.33* | *21.37* | *33.61* | 142.00 | 6.61 | 7.44 | 2.94 | 9.07 |
| **Conventional Parameters** | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *215* | *191* | *483* | *311* | *238* | *361* | 78.1 | 312.0 | 381.0 | 512.0 | 522.0 |
| Total alkalinity, as $CaCO_3$ | mg/L | *69* | *50* | *33* | *60* | *60* | *60* | 28 | 69 | 69 | 65 | 69 |
| TDS | mg/L | *302* | *282* | *450* | *376* | *396* | *579* | 115 | 510 | 625 | 845 | 800 |
| TSS | mg/L | *9* | *5* | *111* | *4* | *15* | *79* | 360 | 11 | 18 | 2 | 6 |
| **Major Ions** | | | | | | | | | | | | |
| Chloride | mg/L | *5.40* | *5.67* | *11.30* | *6.20* | *6.24* | *8.66* | 1.9 | 6.9 | 9.5 | 12.0 | 13.0 |
| Cyanide | mg/L | *0.009* | *0.014* | *0.016* | *0.003* | *0.008* | *0.010* | 0.02130 | 0.00446 | 0.01240 | 0.00508 | 0.00822 |
| Cyanide (free) | mg/L | *0.014* | *0.005* | *0.006* | *0.002* | *0.004* | *0.003* | 0.0027 | < 0.0020 | 0.0046 | 0.0032 | < 0.0020 |
| Cyanide (WAD) | mg/L | *0.007* | *0.003* | *0.005* | *0.002* | *0.003* | *0.003* | < 0.0005 | 0.0030 | 0.0034 | 0.0050 | 0.0029 |
| Fluoride | mg/L | *0.21* | *0.22* | *0.15* | *0.18* | *0.17* | *0.21* | < 0.10 | 0.23 | 0.23 | 0.23 | 0.24 |
| Sulfate | mg/L | *110* | *164* | *299* | *217* | *186* | *322* | 40 | 270 | 310 | 530 | 460 |
| **Nutrients** | | | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | *0.095* | *0.143* | *0.267* | *0.063* | *0.815* | *0.084* | 0.170 | < 0.050 | < 0.050 | 0.100 | < 0.050 |
| Nitrate | mg N/L | *9.72* | *4.72* | *3.34* | *4.11* | *5.83* | *6.03* | 0.59 | 5.61 | 8.85 | 7.31 | 7.79 |
| Nitrite | mg N/L | *0.020* | *0.020* | *0.050* | *0.035* | *0.020* | *0.015* | 0.013 | < 0.010 | < 0.010 | 0.032 | < 0.010 |
| **Total Metals** | | | | | | | | | | | | |
| Aluminum | mg/L | *0.280* | *0.235* | *1.523* | *0.270* | *0.567* | *1.132* | 4.540 | 0.199 | 0.500 | 0.040 | 0.383 |
| Arsenic | mg/L | *0.0360* | *0.0167* | *0.0309* | *0.0317* | *0.0204* | *0.0289* | 0.0371 | 0.0146 | 0.0421 | 0.0271 | 0.0237 |
| Barium | mg/L | *0.016* | *0.017* | *0.026* | *0.022* | *0.022* | *0.029* | 0.0311 | 0.0263 | 0.0274 | 0.0304 | 0.0314 |
| Cadmium | mg/L | *0.00003* | *0.00003* | *0.00002* | *0.00002* | *0.00004* | *0.00008* | 0.000124 | 0.000028 | 0.000045 | 0.000068 | 0.000111 |
| Chromium | mg/L | *0.0046* | *0.0017* | *0.0138* | *0.0024* | *0.0054* | *0.0120* | 0.0449 | 0.0028 | 0.0061 | < 0.0010 | 0.0052 |
| Copper | mg/L | *0.0035* | *0.0041* | *0.0119* | *0.0032* | *0.0043* | *0.0073* | 0.0176 | 0.0031 | 0.0055 | 0.0031 | 0.0071 |
| Iron | mg/L | *0.520* | *0.497* | *3.943* | *0.460* | *0.918* | *2.431* | 9.700 | 0.482 | 1.110 | 0.086 | 0.779 |
| Lead | mg/L | *0.0015* | *0.0007* | *0.0054* | *0.0003* | *0.0023* | *0.0054* | 0.0211 | 0.0012 | 0.0025 | < 0.0002 | 0.0021 |
| Manganese | mg/L | *0.081* | *0.251* | *0.296* | *0.110* | *0.110* | *0.190* | 0.2260 | 0.0862 | 0.0674 | 0.2970 | 0.2740 |
| Mercury | mg/L | *0.00024* | *0.00013* | *0.00001* | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0110* | *0.0096* | *0.0095* | *0.0080* | *0.0083* | *0.0110* | 0.0038 | 0.0130 | 0.0127 | 0.0161 | 0.0093 |
| Nickel | mg/L | *0.0250* | *0.0325* | *0.0547* | *0.0291* | *0.0232* | *0.0544* | 0.0397 | 0.0252 | 0.0374 | 0.0607 | 0.1090 |
| Selenium | mg/L | *0.0010* | *0.0010* | *0.0026* | *0.0013* | *0.0009* | *0.0014* | 0.00021 | 0.00122 | 0.00198 | 0.00212 | 0.00169 |
| Silver | mg/L | *0.00010* | *0.00010* | *0.00010* | *0.00010* | *0.00002* | *0.00003* | 0.000080 | < 0.000020 | 0.000033 | < 0.000020 | < 0.000020 |
| Thallium | mg/L | *0.00080* | *0.00060* | *0.00020* | *0.00020* | *0.00002* | *0.00002* | 0.000052 | < 0.000010 | 0.000014 | 0.000015 | 0.000016 |
| Zinc | mg/L | *0.003* | *0.056* | *0.077* | *0.002* | *0.121* | *0.062* | 0.0393 | < 0.0050 | 0.2530 | < 0.0050 | 0.0052 |

#### *8.5.3.1.18 Central Dike Seepage (ST-S-5)*

Sampling was conducted at a minimum on a monthly as per the requirements of the NWB Water License. There are no applicable license limits for this station as the water is pumped to the Portage Pit. Sample results are presented in Table 8-35. See Figure 1 for the location of ST-S-5. A total of 524,431 $m^3$ of water was pumped in 2022 from this sump. The volume of water pumped from Central Dike in 2022 is lower than in 2021. The lower volume of the last three years (2020, 2021 and 2022) compared to previous years, could be explained by the pumped water destination. In July 2019 tailings deposition was switched to Goose Pit and the Central Dike seepage was directed in Pit A. This had the impact of further decreasing the Central Dike seepage rate. In 2020, the seepage continued to be pumped to the Portage Pit for most of the year rather than the South Cell TSF where the seepage would eventually flow back to the dike in a closed loop. In 2021, no water was pumped back to the South Cell and in 2022, only 13,852 $m^3$ were pumped to South Cell. Refer to Section 8.5.8.1.2 for details on the Central Dike seepage regarding consequences and mitigation measures in place. Table 8-34 below provide 2015 – 2022 pumped volume from ST-S-5.

**Table 8-34 Meadowbank 2015 - 2022 Volume of Water Pumped from Central Dike Seepage (ST-S-5)**

| Years | ST-S-5 pumped volume ($m^3$) |
|---|---|
| 2015 | 2,948,024 |
| 2016 | 4,597,688 |
| 2017 | 4,699,046 |
| 2018 | 2,306,369 |
| 2019 | 2,123,002 |
| 2020 | 704,020 |
| 2021 | 883,315 |
| 2022 | 524,431 |

#### *8.5.3.1.19 Phaser Pit (ST-41 Lake)*

The Phaser Pit Sump (ST-41) was constructed during 2018 operation to manage the water runoff from the pit. In 2020, due to the natural reflooding ongoing of the pit, Agnico Eagle start considering this as Phaser Pit Lake (ST-41 Lake). Refer to previous annual reports for ST-41 sump results. In 2022, ST-41 Lake monthly samples were conducted from June to October, during open water season as per the requirements of the NWB Water License. There are no applicable license limits. The data is presented in Table 8-36. Sampling station ST-41 Lake is illustrated on Figure 3. No water was transferred to Phaser Attenuation Pond and all water was kept in the pit to promote the natural reflooding.

#### *8.5.3.1.20 BB Phaser Pit (ST-42 Lake)*

The BB Phaser Pit Sump was constructed during 2018 operation to manage the water runoff from the pit. In 2020, due to the natural reflooding of the pit, BB Phaser Pit Sump is no longer an active station and Agnico Eagle considers this station as BB Phaser Pit Lake (ST-42 Lake). Refer to previous annual reports for ST-42 sump results. In 2022, monthly samples have been conducted from June to October during open water season, as per the requirements of the NWB Water License. There are no applicable license limits. The data is presented in Table 8-37. Sampling station ST-42 Lake is illustrated on Figure 3. No water has been transferred to Phaser Attenuation Pond since 2019. All water was kept in the pit to promote the natural reflooding.

#### *8.5.3.1.21 Phaser Attenuation Pond (ST-43)*

During 2022, no water from Phaser and BB Phaser Pits was pumped and transferred to Phaser Attenuation Pond (ST-43). Water accumulated in Phaser Attenuation pond used to be transferred to the Vault Attenuation pond. Similar to previous years, in 2022, no water was transferred and all water was kept in the pond to promote the natural reflooding. Monthly samples have been conducted during open water season as per the requirements of the NWB Water License. There are no applicable license limits. The data is presented in Table 8-38. Sampling station ST-43 is illustrated on Figure 3.

**Table 8-35 Meadowbank 2022 Central Dike Seepage Water Quality Monitoring (ST-S-5)**

| ST-S-5 | Unit | *Annual Average* | | | | | | 1/16/2022 | 1/24/2022 | 2/14/2022 | 3/21/2022 | 4/10/2022 | 5/17/2022 | 7/10/2022 | 8/1/2022 | 9/11/2022 | 10/3/2022 | 12/26/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | *2017* | *2018* | *2019* | *2020* | *2021* | *2022* | | | | | | | | | | | |
| **Field Measured** | | | | | | | | | | | | | | | | | | |
| Temperature | °C | *-* | *-* | *-* | *3.8* | *1.8* | *2.1* | 0.0 | 0.7 | 0.4 | 0.8 | 0.1 | 1.0 | 9.0 | 7.4 | 3.6 | 0.2 | 0.1 |
| pH | pH units | *7.52* | *7.56* | *7.60* | *7.61* | *7.49* | *7.93* | 8.93 | 7.65 | 7.24 | 8.68 | 7.86 | 7.51 | 8.25 | 7.95 | 7.39 | 7.89 | 7.85 |
| Conductivity | uS/cm | *-* | *-* | *-* | *3545* | *3335* | *2807* | 3030 | 3175 | 3182 | 3260 | 2987 | 2903 | 2013 | 2677 | 1439 | 3241 | 2965 |
| Turbidity | NTU | *11.89* | *17.27* | *19.36* | *13.36* | *13.23* | *14.42* | 12.00 | 9.44 | 7.39 | 13.50 | 10.60 | 13.50 | 19.20 | 26.20 | 17.30 | 23.00 | 6.52 |
| **Conventional Parameters** | | | | | | | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *1126* | *1094* | *1038* | *987* | *838* | *774* | 873 | 830 | 899 | 815 | 861 | 766 | 568 | 719 | 501 | 781 | 901 |
| Total alkalinity, as $CaCO_3$ | mg/L | *125* | *116* | *89* | *118* | *122* | *138* | 150 | 160 | 160 | 150 | 140 | 140 | 100 | 120 | 93 | 140 | 170 |
| TDS | mg/L | *2753* | *2376* | *2174* | *2160* | *2438* | *1907* | 2200 | 2200 | 2120 | 2180 | 2100 | 2150 | 1590 | 1870 | 1060 | 1880 | 1630 |
| TSS | mg/L | *5* | *8* | *9* | *6* | *3* | *6* | 4 | 4 | 3 | 4 | 1 | 5 | 10 | 19 | 5 | 7 | 6 |
| **Major Ions** | | | | | | | | | | | | | | | | | | |
| Chloride | mg/L | *379.4* | *459.6* | *334.6* | *286.3* | *222.4* | *151.0* | 170 | 180 | 180 | 190 | 180 | 170 | 120 | 120 | 61 | 140 | 150 |
| Cyanide | mg/L | *0.200* | *0.140* | *0.057* | *0.058* | *0.076* | *0.047* | 0.0586 | 0.0538 | 0.0514 | 0.0779 | 0.0578 | 0.0627 | 0.0185 | 0.0242 | 0.0176 | 0.0390 | 0.0555 |
| Cyanide (free) | mg/L | *0.360* | *0.053* | *0.012* | *0.016* | *0.092* | *0.025* | 0.0120 | 0.0160 | 0.0800 | 0.0630 | 0.0210 | 0.0250 | 0.0150 | 0.0130 | 0.0061 | 0.0098 | 0.0140 |
| Cyanide (WAD) | mg/L | *0.080* | *0.114* | *0.017* | *0.011* | *0.019* | *0.018* | 0.019 | 0.019 | 0.018 | 0.028 | 0.026 | 0.025 | 0.011 | 0.010 | 0.007 | 0.014 | 0.017 |
| Sulfate | mg/L | *1714* | *2019* | *1716* | *1529* | *1403* | *1203* | 1300 | 1300 | 1300 | 1300 | 1400 | 1300 | 1000 | 1200 | 630 | 1200 | 1300 |
| **Nutrients** | | | | | | | | | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | *29.83* | *31.49* | *25.14* | *26.28* | *28.57* | *22.02* | 25.0 | 26.0 | 26.0 | 25.0 | 23.0 | 23.0 | 20.0 | 21.0 | 9.2 | 21.0 | 23.0 |
| Nitrate | mg N/L | *0.10* | *0.07* | *0.37* | *0.14* | *0.27* | *0.28* | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.40 | < 0.10 | 1.74 | 0.11 | < 0.10 |
| Nitrite | mg N/L | *0.020* | *0.020* | *0.069* | *0.047* | *0.026* | *0.026* | 0.026 | 0.020 | 0.020 | < 0.010 | < 0.010 | < 0.010 | 0.019 | 0.011 | 0.136 | 0.016 | < 0.010 |
| **Total Metals** | | | | | | | | | | | | | | | | | | |
| Aluminum | mg/L | *0.015* | *0.008* | *0.022* | *0.038* | *0.018* | *0.029* | 0.0105 | < 0.0060 | < 0.0060 | < 0.0060 | 0.0071 | 0.0388 | 0.0247 | 0.0190 | 0.1100 | 0.0863 | 0.0082 |
| Arsenic | mg/L | *0.0550* | *0.0420* | *0.0587* | *0.0533* | *0.0465* | *0.0565* | 0.0381 | 0.0313 | 0.0309 | 0.0420 | 0.0352 | 0.0499 | 0.0647 | 0.1070 | 0.0425 | 0.0639 | 0.1160 |
| Barium | mg/L | *0.0240* | *0.0245* | *0.0231* | *0.0226* | *0.0204* | *0.0191* | 0.0201 | 0.0190 | 0.0214 | 0.0184 | 0.0198 | 0.0183 | 0.0167 | 0.0185 | 0.0176 | 0.0193 | 0.0213 |
| Cadmium | mg/L | *0.00079* | *0.00089* | *0.00015* | *0.00014* | *0.00002* | *0.00002* | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000010 | < 0.000020 | 0.000044 | < 0.000020 | < 0.000020 |
| Chromium | mg/L | *0.001* | *0.001* | *0.001* | *0.001* | *0.002* | *0.002* | < 0.0020 | < 0.0020 | < 0.0020 | < 0.0020 | < 0.0020 | < 0.0020 | 0.0002 | < 0.0020 | 0.0009 | < 0.0020 | < 0.0020 |
| Copper | mg/L | *0.005* | *0.005* | *0.031* | *0.002* | *0.001* | *0.001* | 0.0041 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | 0.0019 | 0.0003 | < 0.0010 | 0.0008 | < 0.0010 | < 0.0010 |
| Iron | mg/L | *1.8* | *1.7* | *2.1* | *1.6* | *1.3* | *1.4* | 1.050 | 0.764 | 0.776 | 1.080 | 0.880 | 1.410 | 1.230 | 2.030 | 0.968 | 1.850 | 2.900 |
| Lead | mg/L | *0.0028* | *0.0003* | *0.0004* | *0.0005* | *0.0004* | *0.0006* | 0.00204 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00040 | 0.00098 | 0.00007 | < 0.00040 | 0.00035 | < 0.00040 | < 0.00040 |
| Manganese | mg/L | *2.19* | *2.20* | *2.02* | *2.01* | *1.61* | *1.55* | 1.77 | 1.70 | 1.84 | 1.69 | 1.87 | 1.59 | 1.06 | 1.29 | 0.79 | 1.65 | 1.82 |
| Mercury | mg/L | *0.00001* | *0.00006* | *0.00002* | *0.00001* | *0.00003* | *0.00009* | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00001 | - | < 0.00010 |
| Molybdenum | mg/L | *0.3000* | *0.2900* | *0.2300* | *0.1910* | *0.1486* | *0.1032* | 0.120 | 0.118 | 0.131 | 0.114 | 0.117 | 0.111 | 0.083 | 0.102 | 0.048 | 0.102 | 0.089 |
| Nickel | mg/L | *0.0180* | *0.0231* | *0.0343* | *0.0108* | *0.0056* | *0.0072* | 0.0045 | 0.0055 | 0.0037 | 0.0026 | 0.0026 | 0.0034 | 0.0057 | 0.0047 | 0.0378 | 0.0067 | < 0.0020 |
| Selenium | mg/L | *0.0140* | *0.0110* | *0.0024* | *0.0012* | *0.0007* | *0.0007* | 0.00133 | 0.00137 | 0.00080 | 0.00067 | 0.00093 | 0.00045 | 0.00061 | 0.00062 | 0.00054 | 0.00039 | < 0.00020 |
| Silver | mg/L | *0.00014* | *0.00010* | *0.00018* | *0.00011* | *0.00004* | *0.00003* | < 0.000040 | < 0.000040 | < 0.000040 | < 0.000040 | < 0.000040 | < 0.000040 | < 0.000010 | < 0.000040 | < 0.000005 | < 0.000040 | < 0.000040 |

| ST-S-5 | Unit | Annual Average | | | | | | 1/16/2022 | 1/24/2022 | 2/14/2022 | 3/21/2022 | 4/10/2022 | 5/17/2022 | 7/10/2022 | 8/1/2022 | 9/11/2022 | 10/3/2022 | 12/26/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | | *2017* | *2018* | *2019* | *2020* | *2021* | *2022* | | | | | | | | | | | |
| Thallium | mg/L | *0.00080* | *0.00053* | *0.00045* | *0.00027* | *0.00003* | *0.00002* | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000004 | < 0.000020 | 0.000013 | < 0.000020 | < 0.000020 |
| Zinc | mg/L | *0.003* | *0.002* | *0.008* | *0.004* | *0.010* | *0.009* | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | 0.002 | < 0.010 | 0.002 | < 0.010 | < 0.010 |
| **Dissolved Metals** | | | | | | | | | | | | | | | | | | |
| Aluminum | mg/L | *0.006* | *0.006* | *0.002* | *0.006* | *0.007* | *0.007* | < 0.0060 | < 0.0060 | < 0.0060 | < 0.0060 | < 0.0060 | < 0.0060 | 0.0082 | 0.0083 | 0.0084 | < 0.0060 | < 0.0060 |
| Arsenic | mg/L | *0.0140* | *0.0136* | *0.0128* | *0.0102* | *0.0187* | *0.0227* | 0.011 | 0.009 | 0.010 | 0.016 | 0.009 | 0.026 | 0.018 | 0.020 | 0.010 | 0.007 | 0.114 |
| Barium | mg/L | *0.0210* | *0.0250* | *0.0200* | *0.0210* | *0.0198* | *0.0187* | 0.0194 | 0.0200 | 0.0223 | 0.0190 | 0.0186 | 0.0193 | 0.0156 | 0.0165 | 0.0151 | 0.0176 | 0.0218 |
| Cadmium | mg/L | *0.00075* | *0.00094* | *0.00015* | *0.00007* | *0.00002* | *0.00002* | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | 0.000007 | < 0.000020 | 0.000041 | < 0.000020 | < 0.000020 |
| Chromium | mg/L | *0.0007* | *0.0010* | *0.0006* | *0.0007* | *0.0020* | *0.0017* | < 0.0020 | < 0.0020 | < 0.0020 | < 0.0020 | < 0.0020 | < 0.0020 | 0.0001 | < 0.0020 | < 0.0001 | < 0.0020 | < 0.0020 |
| Copper | mg/L | *0.0053* | *0.0055* | *0.0209* | *0.0011* | *0.0006* | *0.0009* | 0.00147 | 0.00161 | 0.00086 | < 0.00040 | 0.00172 | 0.00054 | 0.00127 | 0.00050 | 0.00042 | < 0.00040 | 0.00082 |
| Iron | mg/L | *0.0600* | *0.2000* | *0.0600* | *0.0400* | *0.3614* | *0.3292* | 0.135 | 0.115 | 0.187 | 0.113 | 0.022 | 0.541 | 0.016 | 0.023 | 0.009 | < 0.010 | 2.450 |
| Lead | mg/L | *0.0037* | *0.0003* | *0.0003* | *0.0003* | *0.0004* | *0.0003* | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00040 | 0.00015 | < 0.00040 | 0.00005 | < 0.00040 | < 0.00040 |
| Manganese | mg/L | *2.14* | *2.27* | *1.97* | *1.85* | *1.62* | *1.54* | 1.77 | 1.75 | 1.87 | 1.85 | 1.73 | 1.76 | 0.96 | 1.07 | 0.75 | 1.53 | 1.93 |
| Mercury | mg/L | *0.00010* | *0.00002* | *0.00005* | *0.00001* | *0.00003* | *0.00009* | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00001 | < 0.00010 | < 0.00010 |
| Molybdenum | mg/L | *0.300* | *0.298* | *0.223* | *0.177* | *0.145* | *0.104* | 0.120 | 0.125 | 0.133 | 0.124 | 0.114 | 0.114 | 0.083 | 0.093 | 0.046 | 0.098 | 0.089 |
| Nickel | mg/L | *0.0180* | *0.0238* | *0.0332* | *0.0093* | *0.0057* | *0.0067* | 0.0048 | 0.0044 | 0.0037 | 0.0027 | 0.0026 | 0.0031 | 0.0058 | 0.0038 | 0.0342 | 0.0060 | 0.0026 |
| Selenium | mg/L | *0.0180* | *0.0173* | *0.0033* | *0.0015* | *0.0007* | *0.0009* | 0.0017 | 0.0016 | 0.0010 | 0.0009 | 0.0012 | 0.0008 | 0.0006 | 0.0005 | 0.0006 | 0.0005 | 0.0002 |
| Silver | mg/L | *0.00013* | *0.00010* | *0.00010* | *0.00009* | *0.00004* | *0.00004* | < 0.000040 | < 0.000040 | < 0.000040 | < 0.000040 | < 0.000040 | < 0.000040 | - | < 0.000040 | < 0.000005 | < 0.000040 | < 0.000040 |
| Thallium | mg/L | *0.00080* | *0.00055* | *0.00036* | *0.00030* | *0.00003* | *0.00002* | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | 0.000004 | < 0.000020 | 0.000013 | < 0.000020 | < 0.000020 |
| Zinc | mg/L | *0.002* | *0.001* | *0.002* | *0.004* | *0.010* | *0.009* | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | 0.005 | 0.011 | 0.001 | < 0.010 | < 0.010 |

**Table 8-36 Meadowbank 2022 Phaser Pit Water Quality Monitoring (ST-41 Lake)**

| ST-41 LAKE | Unit | *Annual Average* | | | 6/19/2022 | 7/17/2022 | 8/7/2022 | 9/13/2022 | 10/2/2022 |
|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | | *2020* | *2021* | *2022* | | | | | |
| **Field Measured** | | | | | | | | | |
| Temperature | °C | *16.8* | *8.9* | *7.7* | 3.9 | 12.9 | 12.9 | 6.3 | 2.5 |
| pH | pH units | *7.68* | *7.79* | *7.76* | 7.82 | 6.96 | 7.77 | 8.02 | 8.21 |
| Conductivity | uS/cm | *149.73* | *151.35* | *200.44* | 120.1 | 164.0 | 175.3 | 198.8 | 344.0 |
| Turbidity | NTU | *5.86* | *4.56* | *2.38* | 6.41 | 2.12 | 0.58 | 1.49 | 1.29 |
| **Conventional Parameters** | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *83* | *75* | *82* | 54.7 | 66.2 | 85.5 | 110.0 | 95.6 |
| Total alkalinity, as $CaCO_3$ | mg/L | *28* | *37* | *44* | 33 | 38 | 45 | 57 | 48 |
| Carbonate, as $CaCO_3$ | mg/L | *-* | *1* | *1* | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bicarbonate, as $CaCO_3$ | mg/L | *-* | *37* | *44* | 33 | 38 | 45 | 56 | 48 |
| TDS | mg/L | *102* | *103* | *115* | 80 | 85 | 115 | 165 | 130 |
| TSS | mg/L | *4* | *4* | *2* | 3 | 2 | < 1 | 2 | 1 |
| Total organic carbon | mg/L | *1.9* | *2.8* | *2.4* | 2.3 | 2.4 | 2.1 | 2.3 | 3.1 |
| Dissolved organic carbon | mg/L | *1.7* | *2.6* | *2.3* | 2.0 | 2.5 | 2.1 | 2.1 | 2.8 |
| **Major Ions** | | | | | | | | | |
| Chloride | mg/L | *2.00* | *2.65* | *2.82* | 2.0 | 2.3 | 2.8 | 3.5 | 3.5 |
| Cyanide | mg/L | *0.001* | *0.005* | *0.001* | < 0.00050 | < 0.00050 | 0.00165 | 0.00079 | < 0.00050 |
| Cyanide (free) | mg/L | *0.001* | *0.002* | *0.002* | 0.0022 | < 0.0020 | < 0.0020 | 0.0036 | < 0.0020 |
| Silica | mg/L | *-* | *2.03* | *2.06* | 1.4 | 1.3 | 2.0 | 2.9 | 2.7 |
| Sulfate | mg/L | *34.4* | *37.3* | *37.2* | 23 | 30 | 35 | 50 | 48 |
| **Nutrients** | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | *0.08* | *0.05* | *0.05* | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Nitrate | mg N/L | *1.89* | *1.17* | *0.79* | 0.48 | 0.45 | 0.84 | 1.12 | 1.08 |
| Nitrite | mg N/L | *0.02* | *0.01* | *0.01* | < 0.010 | 0.012 | < 0.010 | < 0.010 | < 0.010 |
| Total Kjeldahl nitrogen | mg N/L | *-* | *0.14* | *0.10* | 0.11 | 0.11 | < 0.10 | < 0.10 | < 0.10 |
| Total phosphorus | mg P/L | *-* | *0.0048* | *0.0035* | 0.0036 | < 0.0050 | < 0.0050 | 0.0027 | 0.0014 |
| Orthophosphate | mg P/L | *-* | *0.01* | *0.01* | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| **Total Metals** | | | | | | | | | |
| Aluminum | mg/L | *0.110* | *0.116* | *0.062* | 0.1360 | 0.0336 | 0.0288 | 0.0869 | 0.0242 |
| Antimony | mg/L | *-* | *0.0006* | *0.0007* | 0.000405 | 0.000468 | 0.000752 | 0.000911 | 0.000786 |
| Arsenic | mg/L | *0.0021* | *0.0017* | *0.0016* | 0.00159 | 0.00145 | 0.00181 | 0.00177 | 0.00157 |
| Barium | mg/L | *0.0117* | *0.0142* | *0.0157* | 0.0119 | 0.0125 | 0.0159 | 0.0213 | 0.0168 |
| Beryllium | mg/L | *-* | *0.00001* | *0.00001* | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| Boron | mg/L | *-* | *0.01* | *0.01* | < 0.01 | 0.019 | < 0.01 | < 0.01 | < 0.01 |
| Cadmium | mg/L | *0.00002* | *0.00002* | *0.00001* | 0.0000091 | 0.0000050 | < 0.0000050 | 0.0000070 | 0.0000097 |
| Calcium (total) | mg/L | *25.40* | *23.03* | *25.28* | 16.9 | 20.4 | 26.4 | 33.6 | 29.1 |
| Chromium | mg/L | *0.0006* | *0.0003* | *0.0003* | 0.00072 | < 0.00010 | < 0.00010 | 0.00032 | 0.00016 |
| Copper | mg/L | *0.0029* | *0.0034* | *0.0029* | 0.00275 | 0.00253 | 0.00277 | 0.00314 | 0.00341 |
| Iron | mg/L | *0.1867* | *0.1946* | *0.0974* | 0.2710 | 0.0532 | 0.0159 | 0.1220 | 0.0247 |
| Lead | mg/L | *0.0003* | *0.0005* | *0.0003* | 0.000561 | 0.000316 | 0.000102 | 0.000193 | 0.000123 |
| Lithium | mg/L | *-* | *0.0014* | *0.0014* | 0.00116 | 0.00125 | 0.00133 | 0.00170 | 0.00148 |
| Magnesium (total) | mg/L | *4.77* | *4.33* | *4.69* | 3.05 | 3.69 | 4.72 | 6.45 | 5.56 |
| Manganese | mg/L | *0.0579* | *0.0242* | *0.0060* | 0.0160 | 0.0037 | 0.0014 | 0.0040 | 0.0048 |
| Mercury | mg/L | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0059* | *0.0074* | *0.0095* | 0.00647 | 0.00661 | 0.00975 | 0.01420 | 0.01030 |
| Nickel | mg/L | *0.0059* | *0.0039* | *0.0019* | 0.00240 | 0.00171 | 0.00138 | 0.00134 | 0.00252 |
| Potassium (total) | mg/L | *-* | *1.95* | *1.85* | 1.33 | 1.53 | 2.03 | 2.31 | 2.05 |
| Selenium | mg/L | *0.0010* | *0.0002* | *0.0002* | 0.000112 | 0.000124 | 0.000168 | 0.000250 | 0.000227 |
| Sodium (total) | mg/L | *-* | *1.34* | *1.30* | 0.887 | 1.060 | 1.360 | 1.620 | 1.590 |
| Strontium | mg/L | *-* | *0.127* | *0.130* | 0.0878 | 0.1030 | 0.1280 | 0.1760 | 0.1570 |
| Thallium | mg/L | *0.00020* | *0.00001* | *0.00001* | < 0.0000020 | 0.0000050 | 0.0000068 | 0.0000073 | 0.0000081 |
| Tin | mg/L | *-* | *0.0002* | *0.0002* | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Titanium | mg/L | *-* | *0.0023* | *0.0012* | 0.00277 | < 0.00050 | < 0.00050 | 0.00183 | < 0.00050 |
| Uranium | mg/L | *-* | *0.0039* | *0.0041* | 0.00264 | 0.00304 | 0.00406 | 0.00574 | 0.00497 |
| Vanadium | mg/L | *-* | *0.0002* | *0.0002* | 0.00024 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Zinc | mg/L | *0.016* | *0.003* | *0.001* | 0.00104 | 0.00048 | 0.00064 | 0.00078 | 0.00157 |
| **Dissolved Metals** | | | | | | | | | |
| Aluminum | mg/L | *0.008* | *0.027* | *0.022* | 0.0191 | 0.0239 | 0.0208 | 0.0282 | 0.0155 |
| Antimony | mg/L | *-* | *0.0006* | *0.0007* | 0.000411 | 0.000504 | 0.000774 | 0.000975 | 0.000806 |
| Arsenic | mg/L | *0.0007* | *0.0015* | *0.0019* | 0.00129 | 0.00210 | 0.00178 | 0.00275 | 0.00169 |
| Barium | mg/L | *0.0072* | *0.0133* | *0.0151* | 0.0103 | 0.0141 | 0.0139 | 0.0203 | 0.0168 |
| Beryllium | mg/L | *-* | *0.00001* | *0.00001* | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| Boron | mg/L | *-* | *0.01* | *0.01* | < 0.01 | 0.01 | < 0.01 | < 0.01 | 0.01 |
| Cadmium | mg/L | *0.00002* | *0.00002* | *0.00001* | 0.0000096 | 0.0000084 | < 0.0000050 | 0.0000074 | 0.0000108 |
| Chromium | mg/L | *0.0006* | *0.0001* | *0.0002* | 0.00023 | < 0.00010 | < 0.00010 | 0.00025 | < 0.00010 |
| Copper | mg/L | *0.001* | *0.003* | *0.003* | 0.00224 | 0.00258 | 0.00361 | 0.00294 | 0.00328 |
| Iron | mg/L | *0.010* | *0.031* | *0.024* | 0.0313 | 0.0255 | 0.0040 | 0.0523 | 0.0083 |
| Lead | mg/L | *0.0003* | *0.0002* | *0.0002* | 0.000106 | 0.000186 | 0.000176 | 0.000172 | 0.000180 |
| Lithium | mg/L | *-* | *0.0014* | *0.0014* | 0.00097 | 0.00138 | 0.00143 | 0.00164 | 0.00160 |
| Manganese | mg/L | *0.0383* | *0.0209* | *0.0055* | 0.01270 | 0.00385 | 0.00150 | 0.00550 | 0.00406 |
| Mercury | mg/L | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0025* | *0.0073* | *0.0095* | 0.00647 | 0.00714 | 0.00939 | 0.01440 | 0.01030 |
| Nickel | mg/L | *0.0037* | *0.0035* | *0.0020* | 0.00186 | 0.00193 | 0.00149 | 0.00192 | 0.00261 |
| Selenium | mg/L | *0.0010* | *0.0002* | *0.0002* | 0.000121 | 0.000134 | 0.000137 | 0.000237 | 0.000222 |
| Strontium | mg/L | *-* | *0.126* | *0.129* | 0.0844 | 0.1110 | 0.1260 | 0.1640 | 0.1610 |
| Thallium | mg/L | *0.00020* | *0.00001* | *0.00001* | 0.0000052 | 0.0000053 | 0.0000065 | 0.0000068 | 0.0000084 |
| Tin | mg/L | *-* | *0.0002* | *0.0003* | < 0.00020 | < 0.00020 | < 0.00020 | 0.00050 | < 0.00020 |
| Titanium | mg/L | *-* | *0.0005* | *0.0005* | < 0.00050 | < 0.00050 | < 0.00050 | 0.00056 | < 0.00050 |
| Uranium | mg/L | *-* | *0.0038* | *0.0042* | 0.00253 | 0.00324 | 0.00414 | 0.00563 | 0.00528 |
| Vanadium | mg/L | *-* | *0.0002* | *0.0002* | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Zinc | mg/L | *0.001* | *0.001* | *0.002* | 0.00032 | 0.00184 | 0.00608 | 0.00195 | 0.00085 |

**Table 8-37 Meadowbank 2022 BB Phaser Pit Water Quality Monitoring (ST-42 Lake)**

| ST-42 LAKE | Unit | Annual Average | | | 6/19/2022 | 7/17/2022 | 8/7/2022 | 9/13/2022 | 10/2/2022 |
|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2020 | 2021 | 2022 | | | | | |
| **Field Measured** | | | | | | | | | |
| Temperature | °C | 4.3 | 5.1 | 7.7 | 5.7 | 15.3 | 13.3 | 0.5 | 3.8 |
| pH | pH units | 7.99 | 7.68 | 7.29 | 7.55 | 6.66 | 7.47 | 6.80 | 7.97 |
| Conductivity | uS/cm | 161.5 | 127.1 | 162.5 | 109.5 | 136.0 | 135.1 | 135.7 | 296.0 |
| Turbidity | NTU | 1.78 | 4.77 | 2.00 | 5.93 | 1.20 | 0.51 | 1.46 | 0.92 |
| **Conventional Parameters** | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | 79.50 | 60.96 | 64.32 | 48.3 | 60.3 | 63.1 | 68.4 | 81.5 |
| Total alkalinity, as $CaCO_3$ | mg/L | 55 | 32 | 35 | 28 | 34 | 34 | 37 | 41 |
| Carbonate, as $CaCO_3$ | mg/L | - | 1 | 1 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bicarbonate, as $CaCO_3$ | mg/L | - | 32 | 34 | 28 | 34 | 34 | 36 | 40 |
| TDS | mg/L | 46 | 88 | 80 | 55 | 75 | 100 | 70 | 100 |
| TSS | mg/L | 4 | 5 | 2 | 4 | 2 | 1 | 1 | < 1 |
| Total organic carbon | mg/L | - | 3.5 | 3.1 | 3.2 | 3.0 | 3.0 | 3.2 | 3.3 |
| Dissolved organic carbon | mg/L | 5.6 | 3.3 | 3.1 | 3.1 | 3.0 | 2.8 | 3.3 | 3.2 |
| **Major Ions** | | | | | | | | | |
| Chloride | mg/L | 1.6 | 2.2 | 2.0 | 1.7 | 2.0 | 2.1 | 1.9 | 2.3 |
| Cyanide | mg/L | 0.001 | 0.005 | 0.002 | 0.00066 | < 0.00050 | 0.00802 | < 0.00050 | < 0.00050 |
| Cyanide (free) | mg/L | 0.001 | 0.002 | 0.003 | < 0.0020 | 0.0027 | < 0.0020 | 0.0022 | 0.0042 |
| Silica | mg/L | - | 2.3 | 2.4 | 1.9 | 2.0 | 2.1 | 2.8 | 3.1 |
| Sulfate | mg/L | 39 | 30 | 30 | 22.0 | 26.0 | 28.0 | 33.0 | 41.0 |
| **Nutrients** | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | 0.06 | 0.05 | 0.06 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | 0.110 |
| Nitrate | mg N/L | 1.18 | 0.76 | 0.67 | 0.53 | 0.59 | 0.66 | 0.73 | 0.86 |
| Nitrite | mg N/L | 0.01 | 0.01 | 0.01 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Total Kjeldahl nitrogen | mg N/L | - | 0.14 | 0.12 | 0.12 | 0.13 | < 0.10 | 0.11 | 0.12 |
| Total phosphorus | mg P/L | 0.0100 | 0.0044 | 0.0035 | 0.0051 | < 0.0050 | < 0.0050 | 0.0015 | < 0.0010 |
| Orthophosphate | mg P/L | - | 0.01 | 0.01 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| **Total Metals** | | | | | | | | | |
| Aluminum | mg/L | 0.0600 | 0.1497 | 0.0616 | 0.1350 | 0.0402 | 0.0312 | 0.0666 | 0.0350 |
| Antimony | mg/L | - | 0.00055 | 0.00052 | 0.000372 | 0.000486 | 0.000497 | 0.000540 | 0.000696 |
| Arsenic | mg/L | 0.00180 | 0.00166 | 0.00150 | 0.00150 | 0.00146 | 0.00149 | 0.00149 | 0.00154 |
| Barium | mg/L | 0.0162 | 0.0113 | 0.0115 | 0.00989 | 0.01010 | 0.01010 | 0.01320 | 0.01440 |
| Beryllium | mg/L | - | 0.00002 | 0.00001 | 0.000014 | < 0.000010 | < 0.000010 | 0.000011 | 0.000012 |
| Boron | mg/L | - | 0.01 | 0.01 | < 0.01 | 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Cadmium | mg/L | 0.00002 | 0.00002 | 0.00001 | 0.0000158 | 0.0000082 | 0.0000108 | 0.0000176 | 0.0000163 |
| Calcium (total) | mg/L | 24.2 | 18.7 | 19.7 | 14.7 | 18.6 | 19.3 | 20.8 | 25.3 |
| Chromium | mg/L | 0.00060 | 0.00044 | 0.00021 | 0.00048 | 0.00023 | < 0.00010 | 0.00016 | < 0.00010 |
| Copper | mg/L | 0.0049 | 0.0045 | 0.0035 | 0.00320 | 0.00326 | 0.00323 | 0.00385 | 0.00386 |
| Iron | mg/L | 0.075 | 0.271 | 0.087 | 0.2230 | 0.0548 | 0.0224 | 0.0959 | 0.0366 |
| Lead | mg/L | 0.00017 | 0.00097 | 0.00016 | 0.000402 | 0.000108 | 0.000054 | 0.000131 | 0.000096 |
| Lithium | mg/L | - | 0.00128 | 0.00123 | 0.00111 | 0.00118 | 0.00104 | 0.00139 | 0.00141 |
| Magnesium (total) | mg/L | 4.67 | 3.45 | 3.64 | 2.82 | 3.35 | 3.60 | 3.98 | 4.43 |
| Manganese | mg/L | 0.0154 | 0.0206 | 0.0093 | 0.01380 | 0.00412 | 0.00229 | 0.00975 | 0.01650 |
| Mercury | mg/L | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.0044 | 0.0043 | 0.0044 | 0.00344 | 0.00411 | 0.00440 | 0.00486 | 0.00505 |
| Nickel | mg/L | 0.0058 | 0.0044 | 0.0031 | 0.00328 | 0.00276 | 0.00278 | 0.00344 | 0.00341 |
| Potassium (total) | mg/L | - | 1.50 | 1.45 | 1.14 | 1.37 | 1.47 | 1.54 | 1.73 |
| Selenium | mg/L | 0.00100 | 0.00014 | 0.00012 | 0.000091 | 0.000110 | 0.000129 | 0.000118 | 0.000131 |
| Sodium (total) | mg/L | - | 1.17 | 1.16 | 0.917 | 1.080 | 1.140 | 1.220 | 1.460 |
| Strontium | mg/L | - | 0.0902 | 0.0934 | 0.0692 | 0.0816 | 0.0894 | 0.1020 | 0.1250 |
| Thallium | mg/L | 0.00020 | 0.00001 | 0.00001 | 0.0000085 | 0.0000061 | 0.0000070 | 0.0000082 | 0.0000079 |
| Tin | mg/L | - | 0.0002 | 0.0002 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Titanium | mg/L | - | 0.0034 | 0.0013 | 0.00365 | < 0.00050 | < 0.00050 | 0.00135 | < 0.00050 |
| Uranium | mg/L | - | 0.0034 | 0.0033 | 0.00257 | 0.00305 | 0.00307 | 0.00365 | 0.00422 |
| Vanadium | mg/L | - | 0.0003 | 0.0002 | 0.00022 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Zinc | mg/L | 0.001 | 0.002 | 0.001 | 0.00124 | 0.00118 | 0.00053 | 0.00129 | 0.00235 |
| **Dissolved Metals** | | | | | | | | | |
| Aluminum | mg/L | 0.0190 | 0.0384 | 0.0222 | 0.0178 | 0.0263 | 0.0207 | 0.0242 | 0.0218 |
| Antimony | mg/L | - | 0.00054 | 0.00053 | 0.000375 | 0.000485 | 0.000530 | 0.000529 | 0.000710 |
| Arsenic | mg/L | 0.00125 | 0.00140 | 0.00170 | 0.00122 | 0.00154 | 0.00156 | 0.00258 | 0.00158 |
| Barium | mg/L | 0.0124 | 0.0103 | 0.0112 | 0.00926 | 0.01230 | 0.00900 | 0.01080 | 0.01440 |
| Beryllium | mg/L | - | 0.00001 | 0.00001 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000010 |
| Boron | mg/L | - | 0.01 | 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Cadmium | mg/L | 0.00002 | 0.00001 | 0.00001 | 0.0000115 | 0.0000077 | < 0.0000050 | 0.0000129 | 0.0000125 |
| Chromium | mg/L | 0.00060 | 0.00012 | 0.00012 | 0.00018 | < 0.00010 | < 0.00010 | 0.00013 | < 0.00010 |
| Copper | mg/L | 0.0035 | 0.0037 | 0.0038 | 0.00347 | 0.00321 | 0.00381 | 0.00425 | 0.00413 |
| Iron | mg/L | 0.010 | 0.042 | 0.018 | 0.0217 | 0.0206 | 0.0089 | 0.0254 | 0.0156 |
| Lead | mg/L | 0.00017 | 0.00020 | 0.00010 | 0.0000779 | 0.0000365 | 0.0000717 | 0.0002790 | 0.0000370 |
| Lithium | mg/L | - | 0.00117 | 0.00137 | 0.00094 | 0.00123 | 0.00160 | 0.00157 | 0.00153 |
| Manganese | mg/L | 0.0005 | 0.0126 | 0.0078 | 0.01100 | 0.00278 | 0.00138 | 0.00920 | 0.01450 |
| Mercury | mg/L | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.0041 | 0.0042 | 0.0044 | 0.00346 | 0.00433 | 0.00436 | 0.00476 | 0.00518 |
| Nickel | mg/L | 0.0047 | 0.0040 | 0.0031 | 0.00306 | 0.00273 | 0.00275 | 0.00364 | 0.00331 |
| Selenium | mg/L | 0.00075 | 0.00013 | 0.00012 | 0.000097 | 0.000112 | 0.000113 | 0.000107 | 0.000151 |
| Strontium | mg/L | - | 0.0876 | 0.0935 | 0.0690 | 0.0871 | 0.0851 | 0.0951 | 0.1310 |
| Thallium | mg/L | 0.000200 | 0.000008 | 0.000006 | 0.0000049 | 0.0000047 | 0.0000051 | 0.0000064 | 0.0000072 |
| Tin | mg/L | - | 0.0003 | 0.0003 | < 0.00020 | < 0.00020 | < 0.00020 | 0.00049 | < 0.00020 |
| Titanium | mg/L | - | 0.0006 | 0.0005 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 |
| Uranium | mg/L | - | 0.0034 | 0.0033 | 0.00238 | 0.00315 | 0.00312 | 0.00342 | 0.00456 |
| Vanadium | mg/L | - | 0.0003 | 0.0002 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Zinc | mg/L | 0.001 | 0.004 | 0.003 | 0.00084 | 0.00123 | 0.00303 | 0.00676 | 0.00077 |

**Table 8-38 Meadowbank 2022 Phaser Attenuation Pond Water Quality Monitoring (ST-43)**

| ST-43 Parameter | Unit | *Annual Average* 2018 | 2019 | 2020 | 2021 | 2022 | 6/19/2022 | 7/17/2022 | 8/7/2022 | 9/13/2022 | 10/2/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Field Measured** | | | | | | | | | | | |
| Temperature | °C | *-* | *-* | *12.7* | *8.1* | *9.2* | 9.8 | 15.0 | 14.5 | 5.9 | 0.7 |
| pH | pH units | *7.29* | *7.17* | *7.55* | *7.53* | *7.66* | 7.51 | 7.61 | 7.69 | 7.67 | 7.84 |
| Conductivity | uS/cm | *-* | *-* | *158.5* | *126.5* | *163.9* | 131.5 | 106.6 | 161.8 | 143.4 | 276.0 |
| Turbidity | NTU | *10.10* | *19.91* | *1.98* | *1.35* | *1.39* | 1.34 | 0.94 | 0.89 | 2.32 | 1.44 |
| **Conventional Parameters** | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *254.0* | *73.5* | *69.8* | *62.2* | *70.0* | 56.8 | 66.8 | 75.8 | 75.7 | 74.7 |
| Total alkalinity, as $CaCO_3$ | mg/L | *16* | *35* | *28* | *23* | *31* | 26 | 31 | 33 | 33 | 33 |
| TDS | mg/L | *355* | *122* | *91* | *85* | *87* | 100 | 80 | 115 | 105 | 35 |
| TSS | mg/L | *4* | *13* | *5* | *1* | *1* | 2 | < 1 | 2 | 1 | 1 |
| **Major Ions** | | | | | | | | | | | |
| Chloride | mg/L | *5.5* | *2.2* | *1.6* | *2.8* | *3.7* | 2.7 | 4.8 | 3.3 | 3.7 | 3.8 |
| Cyanide | mg/L | *0.005* | *0.004* | *0.001* | *0.005* | *0.001* | 0.00063 | < 0.00050 | 0.00128 | 0.00077 | < 0.00050 |
| Fluoride | mg/L | *0.15* | *0.10* | *0.07* | *0.10* | *0.10* | < 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.10 |
| Sulfate | mg/L | *287* | *65* | *45* | *39* | *41* | 34 | 41 | 45 | 43 | 44 |
| **Nutrients** | | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | *3.73* | *1.91* | *0.08* | *0.31* | *0.06* | 0.083 | < 0.050 | < 0.050 | < 0.050 | 0.064 |
| Nitrate | mg N/L | *5.55* | *2.56* | *0.95* | *0.42* | *0.14* | 0.26 | < 0.10 | < 0.10 | 0.12 | < 0.10 |
| Nitrite | mg N/L | *0.733* | *0.040* | *0.013* | *0.010* | *0.010* | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| **Total Metals** | | | | | | | | | | | |
| Aluminum | mg/L | *0.516* | *0.708* | *0.058* | *0.051* | *0.037* | 0.03340 | 0.03100 | 0.03670 | 0.05180 | 0.03400 |
| Arsenic | mg/L | *0.00087* | *0.00170* | *0.00065* | *0.00066* | *0.00068* | 0.000492 | 0.000754 | 0.000778 | 0.000711 | 0.000656 |
| Barium | mg/L | *0.055* | *0.020* | *0.011* | *0.011* | *0.012* | 0.0119 | 0.0133 | 0.0116 | 0.0128 | 0.0113 |
| Cadmium | mg/L | *0.001223* | *0.000198* | *0.000020* | *0.000050* | *0.000024* | 0.0000411 | 0.0000184 | 0.0000153 | 0.0000243 | 0.0000222 |
| Chromium | mg/L | *0.00060* | *0.00100* | *0.00085* | *0.00011* | *0.00013* | 0.00015 | < 0.00010 | < 0.00010 | 0.00017 | 0.00012 |
| Copper | mg/L | *0.0350* | *0.0159* | *0.0048* | *0.0030* | *0.0034* | 0.00297 | 0.00352 | 0.00393 | 0.00319 | 0.00328 |
| Iron | mg/L | *2.653* | *1.340* | *0.340* | *0.204* | *0.140* | 0.148 | 0.175 | 0.166 | 0.115 | 0.097 |
| Lead | mg/L | *0.00040* | *0.00030* | *0.00024* | *0.00022* | *0.00015* | 0.000149 | 0.000186 | 0.000141 | 0.000139 | 0.000117 |
| Manganese | mg/L | *0.6735* | *0.1745* | *0.0581* | *0.0257* | *0.0140* | 0.0303 | 0.0104 | 0.0075 | 0.0124 | 0.0094 |
| Mercury | mg/L | *0.00001* | *0.00001* | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0035* | *0.0047* | *0.0008* | *0.0014* | *0.0018* | 0.00113 | 0.00185 | 0.00217 | 0.00205 | 0.00186 |
| Nickel | mg/L | *0.0998* | *0.0272* | *0.0107* | *0.0051* | *0.0035* | 0.00458 | 0.00256 | 0.00228 | 0.00394 | 0.00408 |
| Selenium | mg/L | *0.00180* | *0.00440* | *0.00100* | *0.00007* | *0.00006* | 0.000048 | 0.000063 | 0.000073 | 0.000069 | 0.000064 |
| Silver | mg/L | *0.000100* | *0.000100* | *0.000100* | *0.000012* | *0.000014* | 0.0000133 | 0.0000182 | 0.0000163 | 0.0000120 | 0.0000105 |
| Thallium | mg/L | *0.00020* | *0.00020* | *0.00020* | *0.00001* | *0.00001* | < 0.0000020 | 0.0000083 | 0.0000104 | 0.0000083 | 0.0000075 |
| Zinc | mg/L | *0.103* | *0.026* | *0.004* | *0.003* | *0.002* | 0.00207 | 0.00298 | 0.00071 | 0.00201 | 0.00220 |

#### *8.5.3.1.22 Landfarm*

Meadowbank's first landfarm (Landfarm 1 – ST-14) was located on the north-west side of the South Tailings Cell (Tailing Storage Facility; TSF) that is currently flooded and is now inactive. Landfarm 2 (ST-14b) was constructed in 2016, contaminated soil has been added since 2017. Surface runoff, due to snow melt and rain, was identified from the landfarm and sampled, as per the Water License requirements. Results are shown in Table 8-39. Water was naturally flowing towards the adjacent Tailing Storage Facilities. No other runoff water outside the landfarm was observed. Refer to the Landfarm report (Appendix 30) for more information.

**Table 8-39 Meadowbank 2022 Lanfarm Quality Monitoring (ST-14b)**

| ST-14b<br>Parameter | Unit | 6/12/2022 |
|---|---|---|
| **Field Measured** | | |
| pH | pH units | 7.81 |
| **Conventional Parameters** | | |
| TSS | mg/L | 2100 |
| **Total Metals** | | |
| Arsenic | mg/L | 0.0375 |
| Copper | mg/L | 0.099 |
| Lead | mg/L | 0.028 |
| Nickel | mg/L | 0.155 |
| **Volatile Organics** | | |
| Benzene | mg/L | < 0.0002 |
| Ethylbenzene | mg/L | < 0.0002 |
| Toluene | mg/L | < 0.0002 |
| Xylenes | mg/L | < 0.0004 |
| F2 (C10-C16) | mg/L | < 0.1 |
| F3 (C16-C34) | mg/L | 0.35 |
| F4 (C34-C50) | mg/L | < 0.2 |

#### *8.5.3.1.23 Landfill*

No water quality monitoring was completed at the landfill in 2022 as no leachate was observed.

### 8.5.3.2 *Whale Tail Site*

#### *8.5.3.2.1 Whale Tail Attenuation Pond (ST-WT-1)*

The Whale Tail Attenuation pond has been in operation since May 20th, 2020. Water from the Whale Tail Attenuation Pond is transferred in the IVR Attenuation Pond before being treated in the WTP and then discharged in either Whale Tail South or Mammoth Lake via the submerged diffusers. Samples from the Whale Tail Attenuation Pond (ST-WT-1) prior to treatment, are to be collected four times per year as per the Water License, however Agnico Eagle collected samples more frequently than prescribed in 2022. The results for 2022 are presented in Table 8-41 below. Sampling station is illustrated on Figure 4.

#### *8.5.3.2.2 IVR Attenuation Pond (ST-WT-23)*

The IVR Attenuation Pond has been in operation since in 2021. Water from the IVR Attenuation Pond is treated in the WTP prior to being discharged in either Whale Tail South or Mammoth Lake via the submerged diffusers. Samples from the IVR Attenuation Pond (ST-WT-23) prior to treatment, are to be collected four times per year as per the Water License, however Agnico Eagle collected samples more frequently than prescribed in 2022. The results for 2022 are presented in Table 8-42 below. Sampling station is illustrated on Figure 4.

#### *8.5.3.2.3 Whale Tail Waste Rock Storage Facility Pond (ST-WT-3)*

In 2022, water was observed in the Whale Tail WRSF pond. As per the Water License, water samples are required to be taken four (4) time per calendar year. In 2022, five (5) water samples during open water were taken and the data is presented in Table 8-43. There are no applicable license limits for this station. Sampling station ST-WT-3 is illustrated on Figure 4. A total of 34,667 $m^3$ was pumped from this pond in 2022. Table 8-40 below provide 2019 – 2022 pumped volume from ST-WT-3.

**Table 8-40 Whale Tail WRSF 2019-2022 Volume of Water Pumped from (ST-WT-3)**

| Years | ST-WT-3 pumped volume ($m^3$) |
|---|---|
| 2019 | 203,707 |
| 2020 | 115,632 |
| 2021 | 65,167 |
| 2022 | 34,667 |

#### *8.5.3.2.4 Whale Tail Pit (ST-WT-4)*

In 2019, with the development of the Whale Tail Pit, Agnico Eagle started water quality monitoring in the pit/sump. As per the Water License, water samples need to be taken four (4) time per calendar year. In 2022, thirty-eight (38) water samples were taken and the data is presented in Table 8-44. Agnico Eagle has taken more frequent samples, when safe to do and when water is present in the pit, starting in July 2019 to have a better understanding of the water management on site. There are no applicable license limits. Sampling station ST-WT-4 is illustrated on Figure 4. A total of 842,248 $m^3$ was pumped from the Whale Tail pit sumps to the Whale Tail and IVR Attenuation Ponds in 2022.

#### *8.5.3.2.5 IVR Pit (ST-WT-18)*

In 2022, Agnico Eagle continued to collect water quality samples in the IVR Pit sump (ST-WT-18) during the development of the IVR Pit. As per the Water License, water samples need to be taken four (4) time per calendar year. In 2022, three (3) water samples were taken and the data is presented in Table 8-45. Agnico Eagle has taken monthly samples, when safe to do and when water was present in the pit. A total of 57,887 $m^3$ was pumped from the IVR Pit to the IVR Attenuation pond in 2022. There are no applicable license limits. Sampling station ST-WT-18 is illustrated on Figure 4.

#### *8.5.3.2.6 Lake A47 (ST-WT-6)*

Due to dewatering of this lake in 2020, this station is no longer operational.

**Table 8-41 Whale Tail Attenuation Pond 2022 Water Quality Monitoring (ST-WT-1)**

| ST-WT-1 | Unit | *Annual Average* | | | 1/7/2022 | 2/7/2022 | 4/4/2022 | 5/1/2022 | 5/23/2022 | 5/30/2022 | 6/6/2022 | 6/13/2022 | 6/20/2022 | 6/27/2022 | 7/25/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | *2020* | *2021* | *2022* | | | | | | | | | | | |
| **Field Measured** | | | | | | | | | | | | | | | |
| Temperature | °C | *4.4* | *2.0* | *4.0* | 0.2 | 1.5 | 0.2 | -0.3 | 0.3 | 0.3 | 3.2 | 1.2 | 2.7 | 2.1 | 11.5 |
| pH | pH units | *7.54* | *7.37* | *7.14* | 7.23 | 7.33 | 7.23 | 7.42 | 7.01 | 7.06 | 6.84 | 7.11 | 6.97 | 7.01 | 6.95 |
| Conductivity | uS/cm | *337.5* | *280.5* | *339.5* | 160 | 158 | 254 | 213 | 250 | 233 | 211 | 190 | 217 | 209 | 494 |
| Turbidity | NTU | *63.9* | *60.1* | *53.9* | 14.6 | 10.8 | 12.1 | 22.0 | 24.8 | 81.5 | 207.0 | 291.0 | 152.0 | 156.0 | 13.3 |
| **Conventional Parameters** | | | | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *156* | *107* | *126* | 63 | 59 | 100 | 82 | 90 | 95 | 84 | 78 | 87 | 85 | 104 |
| Total alkalinity, as $CaCO_3$ | mg/L | *59* | *49* | *46* | 38 | 36 | 55 | 43 | 45 | 45 | 36 | 35 | 38 | 38 | 44 |
| TDS | mg/L | *212* | *174* | *195* | 155 | 135 | 105 | 80 | 150 | 120 | 105 | 175 | 120 | 120 | 160 |
| TSS | mg/L | *67* | *64* | *41* | 7 | 6 | 23 | 15 | 14 | 88 | 130 | 200 | 120 | 110 | 11 |
| **Major Ions** | | | | | | | | | | | | | | | |
| Chloride | mg/L | *52.8* | *30.5* | *29.8* | 15 | 15 | 26 | 24 | 28 | 28 | 24 | 19 | 22 | 21 | 27 |
| Fluoride | mg/L | *0.12* | *0.14* | *0.13* | 0.10 | 0.10 | 0.13 | 0.14 | 0.14 | 0.12 | 0.13 | 0.10 | 0.13 | 0.13 | 0.18 |
| Sulfate | mg/L | *28.9* | *34.0* | *59.7* | 18 | 18 | 33 | 24 | 28 | 22 | 23 | 25 | 33 | 31 | 50 |
| **Nutrients** | | | | | | | | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | *1.35* | *1.10* | *1.11* | 0.10 | 0.08 | 0.13 | 0.15 | 0.29 | 0.47 | 0.39 | 0.54 | 0.45 | 0.34 | 0.87 |
| Ammonia Nitrogen | mg N/L | *0.02* | *0.90* | *0.92* | 0.09 | 0.06 | 0.11 | 0.12 | 0.23 | 0.39 | 0.32 | 0.44 | 0.37 | 0.28 | 0.72 |
| Nitrate | mg N/L | *2.47* | *1.80* | *2.37* | 0.31 | 0.29 | 0.50 | 0.39 | 0.59 | 0.50 | 0.65 | 0.78 | 0.91 | 0.89 | 2.18 |
| Nitrite | mg N/L | *0.14* | *0.12* | *0.10* | < 0.010 | < 0.010 | < 0.010 | < 0.010 | 0.023 | 0.037 | 0.033 | 0.055 | 0.073 | 0.054 | 0.140 |
| Total phosphorus | mg P/L | *0.05* | *0.06* | *0.05* | 0.015 | 0.015 | 0.028 | 0.020 | 0.016 | 0.094 | 0.120 | 0.180 | 0.150 | 0.120 | 0.013 |
| **Total Metals** | | | | | | | | | | | | | | | |
| Aluminum | mg/L | *0.801* | *1.080* | *0.828* | 0.117 | 0.068 | 0.281 | 0.195 | 0.265 | 2.020 | 2.620 | 3.530 | 2.980 | 2.570 | 0.262 |
| Arsenic | mg/L | *0.0304* | *0.0399* | *0.1834* | 0.0096 | 0.0091 | 0.0128 | 0.0715 | 0.0321 | 0.0811 | 0.0876 | 0.1350 | 0.1570 | 0.1060 | 0.1280 |
| Barium | mg/L | *0.0817* | *0.0655* | *0.0525* | 0.0296 | 0.0284 | 0.0461 | 0.0416 | 0.0445 | 0.0560 | 0.0528 | 0.0526 | 0.0612 | 0.0560 | 0.0463 |
| Cadmium | mg/L | *0.000028* | *0.000021* | *0.000030* | 0.000011 | 0.000013 | 0.000019 | 0.000012 | 0.000014 | 0.000018 | 0.000033 | 0.000034 | 0.000039 | 0.000028 | 0.000019 |
| Chromium | mg/L | *0.0115* | *0.0166* | *0.0082* | 0.0024 | < 0.0010 | 0.0019 | 0.0020 | 0.0041 | 0.0303 | 0.0254 | 0.0212 | 0.0179 | 0.0202 | 0.0042 |
| Copper | mg/L | *0.0033* | *0.0034* | *0.0034* | 0.00167 | 0.00106 | 0.00414 | 0.00222 | 0.00963 | 0.00635 | 0.00533 | 0.00497 | 0.00681 | 0.00472 | 0.00164 |
| Iron | mg/L | *1.98* | *2.69* | *1.94* | 1.21 | 1.18 | 1.67 | 1.12 | 0.93 | 3.84 | 5.01 | 6.16 | 5.37 | 4.60 | 0.80 |
| Lead | mg/L | *0.00065* | *0.00204* | *0.00135* | 0.00034 | 0.00022 | 0.00244 | 0.00320 | 0.00191 | 0.00248 | 0.00274 | 0.00319 | 0.00353 | 0.00256 | 0.00040 |
| Manganese | mg/L | *0.370* | *0.330* | *0.295* | 0.219 | 0.215 | 0.368 | 0.273 | 0.261 | 0.296 | 0.256 | 0.274 | 0.314 | 0.307 | 0.296 |
| Mercury | mg/L | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0055* | *0.0048* | *0.0089* | 0.0026 | 0.0019 | 0.0034 | 0.0036 | 0.0053 | 0.0051 | 0.0038 | 0.0036 | 0.0049 | 0.0046 | 0.0066 |
| Nickel | mg/L | *0.0175* | *0.0146* | *0.0389* | 0.0035 | 0.0016 | 0.0054 | 0.0146 | 0.0150 | 0.0292 | 0.0275 | 0.0362 | 0.0426 | 0.0361 | 0.0303 |
| Selenium | mg/L | *0.00088* | *0.00028* | *0.00033* | < 0.00010 | < 0.00010 | 0.00012 | < 0.00010 | < 0.00010 | 0.00012 | 0.00013 | 0.00013 | 0.00017 | 0.00015 | 0.00024 |
| Silver | mg/L | *0.000097* | *0.000022* | *0.000020* | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | 0.000021 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| Thallium | mg/L | *0.00019* | *0.00003* | *0.00003* | < 0.000010 | < 0.000010 | 0.000015 | 0.000015 | 0.000017 | 0.000039 | 0.000038 | 0.000054 | 0.000050 | 0.000046 | 0.000022 |
| Zinc | mg/L | *0.0041* | *0.0075* | *0.0090* | < 0.0050 | 0.0055 | 0.0063 | 0.0060 | 0.0110 | 0.0163 | 0.0151 | 0.0173 | 0.0207 | 0.0130 | < 0.0050 |

| ST-WT-1 | Unit | Annual Average | | | 8/1/2022 | 8/8/2022 | 8/15/2022 | 8/22/2022 | 8/29/2022 | 9/5/2022 | 9/12/2022 | 9/19/2022 | 10/8/2022 | 10/10/2022 | 10/24/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | *2020* | *2021* | *2022* | | | | | | | | | | | |
| **Field Measured** | | | | | | | | | | | | | | | |
| Temperature | °C | *4.4* | *2.0* | *4.0* | 8.7 | 11.6 | 11.8 | 7.8 | 5.7 | 7.2 | 5.2 | 5.1 | 1.3 | 0.5 | 0.3 |
| pH | pH units | *7.54* | *7.37* | *7.14* | 7.27 | 7.59 | 7.02 | 7.23 | 6.64 | 7.22 | 7.08 | 7.13 | 7.50 | 6.72 | 7.60 |
| Conductivity | uS/cm | *337.5* | *280.5* | *339.5* | 300 | 261 | 371 | 351 | 409 | 381 | 591 | 841 | 485 | 445 | 446 |
| Turbidity | NTU | *63.9* | *60.1* | *53.9* | 16.4 | 18.4 | 32.0 | 20.6 | 19.5 | 7.8 | 20.9 | 29.5 | 11.8 | 13.6 | 10.3 |
| **Conventional Parameters** | | | | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *156* | *107* | *126* | 108 | 91 | 127 | 131 | 148 | 135 | 228 | 339 | 198 | 182 | 165 |
| Total alkalinity, as $CaCO_3$ | mg/L | *59* | *49* | *46* | 44 | 41 | 51 | 52 | 55 | 53 | 57 | 53 | 46 | 43 | 68 |
| TDS | mg/L | *212* | *174* | *195* | 180 | 180 | 240 | 185 | 230 | 280 | 315 | 480 | 280 | 280 | 215 |
| TSS | mg/L | *67* | *64* | *41* | 26 | 16 | 20 | 26 | 18 | 6 | 14 | 27 | 8 | 14 | 4 |
| **Major Ions** | | | | | | | | | | | | | | | |
| Chloride | mg/L | *52.8* | *30.5* | *29.8* | 29 | 25 | 31 | 29 | 32 | 32 | 46 | 58 | 42 | 44 | 38 |
| Fluoride | mg/L | *0.12* | *0.14* | *0.13* | 0.12 | 0.15 | 0.14 | 0.12 | 0.13 | 0.12 | 0.15 | 0.20 | 0.13 | 0.13 | 0.16 |
| Sulfate | mg/L | *28.9* | *34.0* | *59.7* | 49 | 39 | 60 | 59 | 72 | 74 | 140 | 240 | 120 | 86 | 70 |
| **Nutrients** | | | | | | | | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | *1.35* | *1.10* | *1.11* | 0.52 | 0.19 | 1.60 | 1.10 | 1.90 | 1.40 | 1.90 | 3.90 | 1.50 | 0.79 | 5.80 |
| Ammonia Nitrogen | mg N/L | *0.02* | *0.90* | *0.92* | 0.43 | 0.16 | 1.40 | 0.91 | 1.50 | 1.20 | 1.60 | 3.20 | 1.20 | 0.65 | 4.80 |
| Nitrate | mg N/L | *2.47* | *1.80* | *2.37* | 2.22 | 1.38 | 5.03 | 3.81 | 5.36 | 3.67 | 4.72 | 6.51 | 3.10 | 2.83 | 5.57 |
| Nitrite | mg N/L | *0.14* | *0.12* | *0.10* | 0.102 | 0.068 | 0.217 | 0.171 | 0.218 | 0.146 | 0.176 | 0.273 | 0.086 | 0.064 | 0.161 |
| Total phosphorus | mg P/L | *0.05* | *0.06* | *0.05* | 0.029 | 0.017 | 0.029 | 0.027 | 0.017 | 0.013 | 0.039 | 0.032 | 0.052 | 0.034 | 0.018 |
| **Total Metals** | | | | | | | | | | | | | | | |
| Aluminum | mg/L | *0.801* | *1.080* | *0.828* | 0.426 | 0.246 | 0.378 | 0.386 | 0.194 | 0.094 | 0.374 | 0.703 | 0.143 | 0.257 | 0.112 |
| Arsenic | mg/L | *0.0304* | *0.0399* | *0.1834* | 0.1530 | 0.1340 | 0.1630 | 0.1520 | 0.1320 | 0.2730 | 0.5480 | 0.5880 | 0.5520 | 0.2610 | 0.2500 |
| Barium | mg/L | *0.0817* | *0.0655* | *0.0525* | 0.0481 | 0.0414 | 0.0506 | 0.0598 | 0.0596 | 0.0553 | 0.0644 | 0.0854 | 0.0556 | 0.0591 | 0.0613 |
| Cadmium | mg/L | *0.000028* | *0.000021* | *0.000030* | 0.000023 | 0.000017 | 0.000013 | 0.000016 | 0.000020 | 0.000015 | 0.000027 | 0.000091 | 0.000024 | 0.000161 | < 0.000010 |
| Chromium | mg/L | *0.0115* | *0.0166* | *0.0082* | 0.0042 | 0.0024 | 0.0028 | 0.0033 | 0.0021 | 0.0015 | 0.0098 | 0.0161 | 0.0018 | 0.0032 | 0.0032 |
| Copper | mg/L | *0.0033* | *0.0034* | *0.0034* | 0.00169 | 0.00139 | 0.00169 | 0.00245 | 0.00176 | 0.00151 | 0.00116 | 0.00698 | 0.00107 | 0.00188 | 0.00386 |
| Iron | mg/L | *1.98* | *2.69* | *1.94* | 1.11 | 0.93 | 1.05 | 1.03 | 0.74 | 0.50 | 0.99 | 2.30 | 0.52 | 0.78 | 0.89 |
| Lead | mg/L | *0.00065* | *0.00204* | *0.00135* | 0.00123 | 0.00042 | 0.00071 | 0.00061 | 0.00043 | 0.00042 | 0.00038 | 0.00100 | 0.00030 | 0.00069 | 0.00039 |
| Manganese | mg/L | *0.370* | *0.330* | *0.295* | 0.246 | 0.228 | 0.216 | 0.264 | 0.318 | 0.255 | 0.404 | 0.585 | 0.355 | 0.301 | 0.244 |
| Mercury | mg/L | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0055* | *0.0048* | *0.0089* | 0.0070 | 0.0058 | 0.0143 | 0.0120 | 0.0148 | 0.0120 | 0.0135 | 0.0171 | 0.0112 | 0.0085 | 0.0341 |
| Nickel | mg/L | *0.0175* | *0.0146* | *0.0389* | 0.0340 | 0.0246 | 0.0329 | 0.0377 | 0.0445 | 0.0508 | 0.0797 | 0.1360 | 0.0747 | 0.0449 | 0.0530 |
| Selenium | mg/L | *0.00088* | *0.00028* | *0.00033* | 0.00025 | 0.00022 | 0.00037 | 0.00059 | 0.00053 | 0.00047 | 0.00080 | 0.00122 | 0.00054 | 0.00042 | 0.00028 |
| Silver | mg/L | *0.000097* | *0.000022* | *0.000020* | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| Thallium | mg/L | *0.00019* | *0.00003* | *0.00003* | 0.000026 | 0.000019 | 0.000026 | 0.000025 | 0.000023 | 0.000020 | 0.000030 | 0.000045 | 0.000025 | 0.000059 | 0.000013 |
| Zinc | mg/L | *0.0041* | *0.0075* | *0.0090* | 0.0123 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | 0.0064 | 0.0084 | 0.0080 | 0.0116 | < 0.0050 |

**Table 8-42 IVR Attenuation Pond 2022 Water Quality Monitoring (ST-WT-23)**

| ST-WT-23 | Unit | Annual Average | | 1/7/2022 | 1/10/2022 | 2/26/2022 | 2/28/2022 | 4/3/2022 | 4/25/2022 | 5/23/2022 | 5/30/2022 | 6/6/2022 | 6/13/2022 | 6/20/2022 | 6/27/2022 | 7/25/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2021 | 2022 | | | | | | | | | | | | | |
| **Field Measured** | | | | | | | | | | | | | | | | |
| Temperature | °C | 5.8 | 4.0 | 0.2 | -0.4 | 0.1 | 0.7 | 0.4 | 0.1 | 0.3 | 0.4 | 1.2 | 2.0 | 2.3 | 3.6 | 15.1 |
| pH | pH units | 7.31 | 7.09 | 6.98 | 7.16 | 6.90 | 6.83 | 7.69 | 7.16 | 6.92 | 7.08 | 6.78 | 7.10 | 6.94 | 7.02 | 7.17 |
| Conductivity | uS/cm | 335.1 | 416.5 | 603 | 239 | 453 | 533 | 529 | 547 | 276 | 258 | 230 | 224 | 161 | 175 | 399 |
| Turbidity | NTU | 44.7 | 26.9 | 18.6 | 10.0 | 6.2 | 20.4 | 4.7 | 8.9 | 16.5 | 42.7 | 200.0 | 112.0 | 61.2 | 62.4 | 8.4 |
| **Conventional Parameters** | | | | | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | 127 | 158 | 243 | 93 | 191 | 216 | 190 | 216 | 97 | 94 | 93 | 69 | 61 | 67 | 138 |
| Total alkalinity, as $CaCO_3$ | mg/L | 44 | 54 | 94 | 51 | 88 | 91 | 91 | 94 | 48 | 46 | 41 | 33 | 30 | 32 | 45 |
| TDS | mg/L | 232 | 262 | 435 | 180 | 260 | 295 | 330 | 310 | 170 | 165 | 155 | 145 | 85 | 130 | 215 |
| TSS | mg/L | 28 | 27 | 61 | 7 | 31 | 93 | 2 | 47 | 6 | 37 | 130 | 120 | 30 | 38 | 5 |
| **Major Ions** | | | | | | | | | | | | | | | | |
| Chloride | mg/L | 35 | 49 | 61 | 23 | 48 | 63 | 61 | 62 | 32 | 31 | 28 | 17 | 17 | 19 | 44 |
| Fluoride | mg/L | 0.12 | 0.15 | 0.20 | 0.14 | 0.21 | 0.29 | 0.29 | 0.27 | 0.15 | 0.12 | 0.10 | < 0.10 | < 0.10 | < 0.10 | 0.13 |
| Sulfate | mg/L | 50 | 59 | 92 | 29 | 52 | 62 | 64 | 63 | 28 | 24 | 22 | 20 | 19 | 23 | 48 |
| **Nutrients** | | | | | | | | | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | 0.97 | 0.87 | 0.49 | 0.13 | 0.40 | 1.80 | 3.60 | 2.70 | 0.47 | 0.54 | 0.88 | 0.49 | 0.31 | 0.32 | 0.28 |
| Ammonia Nitrogen | mg N/L | 0.77 | 0.71 | 0.40 | 0.11 | 0.33 | 1.50 | 2.90 | 2.20 | 0.38 | 0.44 | 0.72 | 0.41 | 0.25 | 0.26 | 0.23 |
| Nitrate | mg N/L | 2.26 | 3.11 | 3.27 | 0.59 | 0.94 | 2.33 | 3.59 | 3.47 | 1.13 | 0.92 | 1.25 | 0.83 | 0.70 | 0.81 | 4.03 |
| Nitrite | mg N/L | 0.136 | 0.064 | 0.039 | < 0.010 | < 0.010 | 0.071 | 0.115 | 0.091 | 0.031 | 0.040 | 0.052 | 0.053 | 0.045 | 0.032 | 0.095 |
| Total phosphorus | mg P/L | 0.0220 | 0.0446 | 0.014 | 0.120 | 0.014 | 0.160 | 0.076 | 0.190 | 0.067 | 0.076 | 0.130 | 0.088 | 0.031 | 0.035 | 0.002 |
| **Total Metals** | | | | | | | | | | | | | | | | |
| Aluminum | mg/L | 0.748 | 0.497 | 0.380 | 0.088 | 0.168 | 0.951 | 0.048 | 0.564 | 0.161 | 0.849 | 3.090 | 2.620 | 0.990 | 1.000 | 0.126 |
| Arsenic | mg/L | 0.07119 | 0.25934 | 0.0666 | 0.0136 | 0.0425 | 0.5460 | 1.8200 | 1.4700 | 0.1570 | 0.1710 | 0.1680 | 0.1380 | 0.0586 | 0.0547 | 0.0652 |
| Barium | mg/L | 0.0554 | 0.0688 | 0.1200 | 0.0431 | 0.1030 | 0.1150 | 0.0822 | 0.1200 | 0.0484 | 0.0506 | 0.0635 | 0.0500 | 0.0342 | 0.0379 | 0.0700 |
| Cadmium | mg/L | 0.00003 | 0.00003 | 0.000052 | 0.000013 | 0.000024 | 0.000047 | < 0.000050 | 0.000038 | 0.000011 | 0.000016 | 0.000035 | 0.000034 | 0.000019 | 0.000020 | 0.000020 |
| Chromium | mg/L | 0.0125 | 0.0072 | 0.0042 | < 0.0010 | 0.0013 | 0.0081 | < 0.0050 | 0.0056 | 0.0035 | 0.0153 | 0.0510 | 0.0391 | 0.0092 | 0.0075 | 0.0017 |
| Copper | mg/L | 0.00264 | 0.00256 | 0.0084 | 0.0026 | 0.0021 | 0.0048 | < 0.0025 | 0.0028 | 0.0011 | 0.0032 | 0.0062 | 0.0058 | 0.0026 | 0.0021 | 0.0046 |
| Iron | mg/L | 1.77 | 1.20 | 1.11 | 1.12 | 0.92 | 2.02 | 0.17 | 1.74 | 0.56 | 1.76 | 6.43 | 5.68 | 1.91 | 1.88 | 0.38 |
| Lead | mg/L | 0.00124 | 0.00087 | 0.00165 | 0.00049 | 0.00073 | 0.00122 | 0.00210 | 0.00065 | 0.00028 | 0.00133 | 0.00298 | 0.00260 | 0.00125 | 0.00125 | 0.00101 |
| Manganese | mg/L | 0.266 | 0.229 | 0.359 | 0.276 | 0.371 | 0.446 | 0.355 | 0.486 | 0.243 | 0.263 | 0.286 | 0.227 | 0.149 | 0.179 | 0.170 |
| Mercury | mg/L | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.0031 | 0.0072 | 0.0064 | 0.0029 | 0.0070 | 0.0111 | 0.0113 | 0.0117 | 0.0055 | 0.0050 | 0.0033 | 0.0024 | 0.0024 | 0.0030 | 0.0047 |
| Nickel | mg/L | 0.0281 | 0.047 | 0.0490 | 0.0056 | 0.0234 | 0.1040 | 0.2420 | 0.1910 | 0.0275 | 0.0332 | 0.0387 | 0.0350 | 0.0174 | 0.0174 | 0.0169 |
| Selenium | mg/L | 0.00039 | 0.00028 | 0.00036 | 0.00013 | 0.00016 | 0.00021 | < 0.00050 | 0.00022 | < 0.00010 | 0.00010 | 0.00016 | 0.00012 | 0.00011 | 0.00011 | 0.00023 |
| Silver | mg/L | 0.00003 | 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | 0.00002 | < 0.00010 | < 0.00004 | < 0.00002 | < 0.00002 | 0.00003 | 0.00003 | < 0.00002 | < 0.00002 | < 0.00002 |
| Thallium | mg/L | 0.000039 | 0.000028 | 0.000031 | < 0.000010 | 0.000022 | 0.000035 | < 0.000050 | 0.000045 | 0.000015 | 0.000026 | 0.000052 | 0.000040 | 0.000022 | 0.000023 | 0.000031 |
| Zinc | mg/L | 0.0072 | 0.0089 | 0.0192 | 0.0080 | < 0.0050 | 0.0073 | < 0.0250 | 0.0100 | < 0.0050 | 0.0067 | 0.0137 | 0.0128 | 0.0069 | 0.0061 | 0.0113 |

| ST-WT-23 | Unit | Annual Average | | 8/1/2022 | 8/8/2022 | 8/15/2022 | 8/22/2022 | 8/29/2022 | 9/5/2022 | 9/12/2022 | 9/19/2022 | 10/3/2022 | 10/10/2022 | 10/17/2022 | 10/24/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | | *2021* | *2022* | | | | | | | | | | | | |
| **Field Measured** | | | | | | | | | | | | | | | |
| Temperature | °C | *5.8* | *4.0* | 10.8 | 11.6 | 11.6 | 8.7 | 6.1 | 8.4 | 6.1 | 5.2 | 2.5 | 0.6 | 0.6 | 1.0 |
| pH | pH units | *7.31* | *7.09* | 7.16 | 7.36 | 6.64 | 7.32 | 6.70 | 7.15 | 6.92 | 7.05 | 7.17 | 6.97 | 7.61 | 7.36 |
| Conductivity | uS/cm | *335.1* | *416.5* | 332 | 352 | 368 | 396 | 417 | 427 | 615 | 664 | 542 | 587 | 561 | 524 |
| Turbidity | NTU | *44.7* | *26.9* | 3.5 | 11.7 | 8.6 | 2.6 | 2.9 | 13.8 | 15.9 | 5.4 | 15.6 | 9.5 | 7.2 | 4.4 |
| **Conventional Parameters** | | | | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *127* | *158* | 115 | 127 | 136 | 136 | 156 | 152 | 241 | 255 | 212 | 231 | 217 | 199 |
| Total alkalinity, as $CaCO_3$ | mg/L | *44* | *54* | 40 | 43 | 45 | 44 | 46 | 49 | 52 | 44 | 45 | 47 | 47 | 57 |
| TDS | mg/L | *232* | *262* | 215 | 230 | 260 | 220 | 250 | 260 | 435 | 495 | 320 | 345 | 315 | 320 |
| TSS | mg/L | *28* | *27* | 3 | 10 | 8 | 2 | 3 | 13 | 10 | 2 | 8 | 5 | 4 | 2 |
| **Major Ions** | | | | | | | | | | | | | | | |
| Chloride | mg/L | *35* | *49* | 37 | 37 | 38 | 40 | 42 | 42 | 83 | 100 | 80 | 79 | 69 | 71 |
| Fluoride | mg/L | *0.12* | *0.15* | 0.10 | 0.12 | 0.12 | 0.12 | 0.13 | 0.12 | 0.13 | 0.11 | 0.16 | 0.12 | 0.13 | 0.14 |
| Sulfate | mg/L | *50* | *59* | 48 | 52 | 55 | 60 | 63 | 68 | 120 | 99 | 86 | 97 | 98 | 85 |
| **Nutrients** | | | | | | | | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | *0.97* | *0.87* | 0.11 | 0.41 | 0.84 | 0.31 | 0.28 | 0.87 | 1.30 | 0.59 | 0.52 | 1.10 | 0.84 | 2.20 |
| Ammonia Nitrogen | mg N/L | *0.77* | *0.71* | 0.09 | 0.34 | 0.69 | 0.25 | 0.23 | 0.72 | 1.10 | 0.48 | 0.43 | 0.87 | 0.69 | 1.80 |
| Nitrate | mg N/L | *2.26* | *3.11* | 3.54 | 3.47 | 4.24 | 4.53 | 5.41 | 4.50 | 4.91 | 4.94 | 4.20 | 4.64 | 4.45 | 5.15 |
| Nitrite | mg N/L | *0.136* | *0.064* | 0.055 | 0.062 | 0.108 | 0.084 | 0.079 | 0.091 | 0.124 | 0.071 | 0.046 | 0.068 | 0.054 | 0.083 |
| Total phosphorus | mg P/L | *0.0220* | *0.0446* | 0.002 | 0.002 | 0.004 | < 0.001 | 0.005 | 0.022 | 0.021 | 0.007 | 0.009 | 0.011 | 0.015 | 0.014 |
| **Total Metals** | | | | | | | | | | | | | | | |
| Aluminum | mg/L | *0.748* | *0.497* | 0.054 | 0.161 | 0.129 | 0.034 | 0.065 | 0.221 | 0.213 | 0.081 | 0.155 | 0.139 | 0.097 | 0.048 |
| Arsenic | mg/L | *0.07119* | *0.25934* | 0.0442 | 0.0480 | 0.0699 | 0.0402 | 0.0469 | 0.1550 | 0.3490 | 0.2480 | 0.1430 | 0.2160 | 0.2070 | 0.1450 |
| Barium | mg/L | *0.0554* | *0.0688* | 0.0513 | 0.0559 | 0.0534 | 0.0531 | 0.0555 | 0.0615 | 0.0757 | 0.0852 | 0.0659 | 0.0721 | 0.0702 | 0.0820 |
| Cadmium | mg/L | *0.00003* | *0.00003* | 0.000020 | 0.000019 | 0.000017 | 0.000027 | 0.000027 | 0.000018 | 0.000031 | 0.000025 | 0.000024 | 0.000023 | 0.000022 | 0.000022 |
| Chromium | mg/L | *0.0125* | *0.0072* | < 0.0010 | 0.0025 | 0.0014 | < 0.0010 | 0.0014 | 0.004 | 0.0059 | 0.0023 | 0.0032 | 0.0023 | 0.0015 | < 0.0010 |
| Copper | mg/L | *0.00264* | *0.00256* | 0.0014 | 0.0015 | 0.0012 | 0.0013 | 0.0021 | 0.0014 | 0.0010 | 0.0009 | 0.0010 | 0.0010 | 0.0010 | 0.0015 |
| Iron | mg/L | *1.77* | *1.20* | 0.18 | 0.43 | 0.36 | 0.13 | 0.23 | 0.63 | 0.58 | 0.23 | 0.46 | 0.42 | 0.36 | 0.25 |
| Lead | mg/L | *0.00124* | *0.00087* | 0.00024 | 0.00030 | 0.00031 | 0.00036 | 0.00124 | 0.00030 | 0.00030 | < 0.00020 | 0.00026 | 0.00023 | 0.00030 | 0.00023 |
| Manganese | mg/L | *0.266* | *0.229* | 0.096 | 0.166 | 0.107 | 0.079 | 0.069 | 0.174 | 0.298 | 0.178 | 0.162 | 0.228 | 0.198 | 0.163 |
| Mercury | mg/L | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0031* | *0.0072* | 0.0039 | 0.0042 | 0.0093 | 0.0086 | 0.0093 | 0.0100 | 0.0104 | 0.0088 | 0.0072 | 0.0081 | 0.0085 | 0.0149 |
| Nickel | mg/L | *0.0281* | *0.047* | 0.0178 | 0.0273 | 0.0200 | 0.0156 | 0.0161 | 0.0328 | 0.0561 | 0.0368 | 0.0291 | 0.0387 | 0.0393 | 0.0343 |
| Selenium | mg/L | *0.00039* | *0.00028* | 0.00018 | 0.00026 | 0.00027 | 0.00025 | 0.00031 | 0.00039 | 0.00063 | 0.00053 | 0.00043 | 0.00051 | 0.00045 | 0.00036 |
| Silver | mg/L | *0.00003* | *0.00002* | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 | < 0.00002 |
| Thallium | mg/L | *0.000039* | *0.000028* | 0.000023 | 0.000027 | 0.000031 | 0.000024 | 0.000024 | 0.000027 | 0.000028 | 0.000025 | 0.000020 | 0.000025 | 0.000022 | 0.000021 |
| Zinc | mg/L | *0.0072* | *0.0089* | < 0.0050 | < 0.0050 | < 0.0050 | 0.0116 | 0.0231 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |

**Table 8-43 Whale Tail 2022 Waste Rock Storage Facility Pond Water Quality Monitoring (ST-WT-3)**

| ST-WT-3 | Unit | Annual Average | | | | | 5/29/2022 | 6/5/2022 | 7/3/2022 | 8/2/2022 | 9/4/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2018 | 2019 | 2020 | 2021 | 2022 | | | | | |
| **Field Measured** | | | | | | | | | | | |
| Temperature | °C | - | 8.6 | 8.6 | 5.4 | 6.8 | 0.5 | 5.0 | 12.6 | 8.1 | 7.6 |
| pH | pH units | 6.84 | 7.08 | 7.18 | 7.41 | 7.04 | 7.65 | 7.22 | 6.91 | 6.78 | 6.62 |
| Conductivity | uS/cm | - | 501.8 | 280.8 | 184.8 | 190.9 | 88 | 52 | 170 | 270 | 374 |
| Turbidity | NTU | 222.45 | 27.53 | 23.89 | 26.19 | 12.76 | 27.3 | 22.8 | 2.6 | 8.9 | 2.2 |
| **Conventional Parameters** | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | 64 | 485 | 135 | 74 | 79 | 43.1 | 22.1 | 64.3 | 110.0 | 154.0 |
| Total alkalinity, as $CaCO_3$ | mg/L | 15 | 44 | 42 | 23 | 36 | 31 | 15 | 30 | 57 | 46 |
| TDS | mg/L | - | 354 | 185 | 132 | 117 | 60 | < 10 | 120 | 150 | 245 |
| TSS | mg/L | 47 | 14 | 16 | 31 | 10 | 26 | 14 | 3 | 4 | 1 |
| **Major Ions** | | | | | | | | | | | |
| Chloride | mg/L | 16.5 | 24.7 | 11.4 | 4.9 | 4.08 | 1.7 | 1.4 | 3.5 | 4.7 | 9.1 |
| Fluoride | mg/L | 0.05 | 0.15 | 0.05 | 0.10 | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Sulfate | mg/L | 38.0 | 148.2 | 79.9 | 46.9 | 47.52 | 12 | 6 | 44 | 56 | 120 |
| **Nutrients** | | | | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | - | - | - | 0.17 | 0.07 | 0.084 | 0.082 | < 0.061 | < 0.061 | < 0.061 |
| Ammonia Nitrogen | mg N/L | 0.08 | 0.90 | 0.28 | 0.14 | 0.06 | 0.069 | 0.067 | < 0.050 | < 0.050 | < 0.050 |
| Nitrate | mg N/L | 2.44 | 8.90 | 2.31 | 2.05 | 1.61 | 0.28 | 0.22 | 1.56 | 2.87 | 3.13 |
| Nitrite | mg N/L | 0.01 | 0.45 | 0.03 | 0.01 | 0.02 | 0.036 | < 0.010 | < 0.010 | 0.021 | < 0.010 |
| Total phosphorus | mg P/L | - | 0.044 | 0.030 | 0.030 | 0.018 | 0.045 | 0.029 | 0.005 | 0.006 | 0.003 |
| **Total Metals** | | | | | | | | | | | |
| Aluminum | mg/L | 2.792 | 0.676 | 0.627 | 0.792 | 0.361 | 0.953 | 0.495 | 0.076 | 0.257 | 0.026 |
| Arsenic | mg/L | 0.0110 | 0.0079 | 0.0113 | 0.0087 | 0.0084 | 0.00988 | 0.01280 | 0.00407 | 0.01180 | 0.00340 |
| Barium | mg/L | 0.0569 | 0.0830 | 0.0563 | 0.0349 | 0.0327 | 0.0191 | 0.0143 | 0.0271 | 0.0509 | 0.0522 |
| Cadmium | mg/L | 0.000020 | 0.000042 | 0.000024 | 0.000021 | 0.000013 | 0.000018 | 0.000011 | < 0.000010 | 0.000016 | < 0.000010 |
| Chromium | mg/L | 0.0135 | 0.0054 | 0.0100 | 0.0141 | 0.0074 | 0.0187 | 0.0107 | 0.0017 | 0.0050 | < 0.0010 |
| Copper | mg/L | 0.0082 | 0.0030 | 0.0032 | 0.0029 | 0.0026 | 0.00327 | 0.00256 | 0.00179 | 0.00367 | 0.00170 |
| Iron | mg/L | 5.22 | 1.29 | 4.42 | 1.58 | 0.78 | 2.180 | 0.892 | 0.201 | 0.528 | 0.117 |
| Lead | mg/L | 0.0033 | 0.0004 | 0.0005 | 0.0010 | 0.0007 | 0.00106 | 0.00094 | < 0.00020 | 0.00094 | < 0.00020 |
| Manganese | mg/L | 0.1957 | 0.4912 | 0.3027 | 0.1069 | 0.0534 | 0.0604 | 0.0774 | 0.0126 | 0.0752 | 0.0413 |
| Mercury | mg/L | 0.00001 | 0.00002 | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | < 0.0010 | < 0.0010 | < 0.0010 | 0.0019 | < 0.0010 |
| Nickel | mg/L | 0.0243 | 0.0361 | 0.0277 | 0.0166 | 0.0091 | 0.0149 | 0.0090 | 0.0062 | 0.0089 | 0.0067 |
| Selenium | mg/L | 0.00050 | 0.00349 | 0.00122 | 0.00048 | 0.00039 | 0.00012 | 0.00011 | 0.00025 | 0.00096 | 0.00052 |
| Silver | mg/L | 0.00010 | 0.00016 | 0.00010 | 0.00002 | 0.00002 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| Thallium | mg/L | 0.000200 | 0.000320 | 0.000200 | 0.000030 | 0.000023 | 0.000028 | 0.000017 | 0.000019 | 0.000030 | 0.000023 |
| Zinc | mg/L | 0.0165 | 0.0049 | 0.0032 | 0.0067 | 0.0051 | 0.0054 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| **Dissolved Metals** | | | | | | | | | | | |
| Aluminum | mg/L | - | 0.0167 | 0.0060 | 0.0388 | 0.0176 | 0.0423 | 0.0217 | 0.0085 | 0.0108 | 0.0047 |
| Arsenic | mg/L | - | 0.00411 | 0.00621 | 0.00473 | 0.00559 | 0.00342 | 0.00950 | 0.00396 | 0.00867 | 0.00239 |
| Barium | mg/L | - | 0.0699 | 0.0457 | 0.0283 | 0.0306 | 0.0120 | 0.0111 | 0.0299 | 0.0473 | 0.0529 |
| Cadmium | mg/L | - | 0.000116 | 0.000024 | 0.000017 | 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| Chromium | mg/L | - | 0.0009 | 0.0006 | 0.0012 | 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Copper | mg/L | - | 0.00173 | 0.00126 | 0.00180 | 0.00221 | 0.00132 | 0.00163 | 0.00351 | 0.00240 | 0.00220 |
| Iron | mg/L | - | 0.09 | 0.03 | 0.20 | 0.09 | 0.2120 | 0.0633 | 0.0605 | 0.0687 | 0.0301 |
| Lead | mg/L | - | 0.00035 | 0.00024 | 0.00024 | 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | 0.00022 | < 0.00020 |
| Manganese | mg/L | - | 0.4582 | 0.2381 | 0.0844 | 0.0447 | 0.0303 | 0.0659 | 0.0133 | 0.0702 | 0.0439 |
| Mercury | mg/L | - | 0.00002 | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | - | 0.0017 | 0.0008 | 0.0010 | 0.0012 | < 0.0010 | < 0.0010 | < 0.0010 | 0.0018 | < 0.0010 |
| Nickel | mg/L | - | 0.033 | 0.021 | 0.011 | 0.006 | 0.0066 | 0.0053 | 0.0059 | 0.0071 | 0.0071 |
| Selenium | mg/L | - | 0.00333 | 0.00117 | 0.00045 | 0.00037 | < 0.00010 | 0.00013 | 0.00026 | 0.00081 | 0.00055 |
| Silver | mg/L | - | 0.00011 | 0.00010 | 0.00002 | 0.00002 | < 0.000020 | < 0.000020 | 0.000028 | < 0.000020 | < 0.000020 |
| Thallium | mg/L | - | 0.00021 | 0.00020 | 0.00002 | 0.00002 | < 0.000010 | 0.000011 | 0.000020 | 0.000027 | 0.000023 |
| Zinc | mg/L | - | 0.0019 | 0.0014 | 0.0050 | 0.0057 | < 0.0050 | < 0.0050 | 0.0083 | < 0.0050 | < 0.0050 |

**Table 8-44 Whale Tail Pit Sump 2022 Water Quality Monitoring (ST-WT-4)**

| ST-WT-4 | Unit | Annual Average | | | | 1/17/2022 | 1/30/2022 | 2/12/2022 | 2/22/2022 | 3/7/2022 | 4/5/2022 | 5/6/2022 | 5/10/2022 | 5/21/2022 | 5/23/2022 | 5/29/2022 | 6/10/2022 | 6/19/2022 | 6/28/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2019 | 2020 | 2021 | 2022 | | | | | | | | | | | | | | |
| **Field Measured** | | | | | | | | | | | | | | | | | | | |
| Temperature | °C | *6.1* | *4.0* | *1.9* | *2.6* | 3.3 | 0.8 | 0.0 | 0.4 | 0.6 | 1.1 | 4.1 | 0.5 | 0.5 | 0.4 | 1.6 | 4.1 | 4.3 | 3.4 |
| pH | pH units | *7.49* | *7.81* | *7.48* | *7.24* | 7.45 | 7.13 | 6.78 | 6.61 | 8.37 | 8.41 | 7.23 | 7.11 | 6.90 | 7.11 | 7.40 | 7.49 | 7.62 | 7.12 |
| Conductivity | uS/cm | *952* | *701* | *417* | *492* | 577 | 308 | 387 | 301 | 309 | 355 | 301 | 231 | 286 | 290 | 405 | 679 | 386 | 365 |
| Turbidity | NTU | *42.8* | *65.8* | *77.9* | *13.1* | 53.0 | 12.2 | 41.6 | 5.9 | 2.2 | 51.6 | 2.5 | 2.2 | 11.6 | 4.6 | 20.9 | 29.6 | 5.9 | 4.2 |
| **Conventional Parameters** | | | | | | | | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *323* | *353* | *255* | *188* | 195 | 117 | 143 | 113 | 115 | 140 | 113 | 112 | 102 | 112 | 141 | 199 | 139 | 141 |
| Total alkalinity, as $CaCO_3$ | mg/L | *71* | *118* | *67* | *69* | 88 | 58 | 62 | 60 | 55 | 65 | 53 | 53 | 54 | 55 | 83 | 100 | 58 | 59 |
| TDS | mg/L | *559* | *454* | *275* | *394* | 325 | 225 | 165 | 265 | 195 | 245 | 130 | 120 | 215 | 175 | 215 | 410 | 200 | 270 |
| TSS | mg/L | *90* | *1953* | *1813* | *12* | 32 | 11 | 20 | 3 | 1 | 68 | 3 | 2 | 10 | 2 | 31 | 23 | 3 | 4 |
| **Major Ions** | | | | | | | | | | | | | | | | | | | |
| Chloride | mg/L | *105* | *112* | *49* | *47* | 63 | 38 | 41 | 37 | 38 | 38 | 36 | 35 | 35 | 35 | 37 | 53 | 36 | 36 |
| Fluoride | mg/L | *0.15* | *0.20* | *0.21* | *0.22* | 0.30 | 0.24 | 0.26 | 0.24 | 0.24 | 0.26 | 0.22 | 0.23 | 0.21 | 0.23 | 0.30 | 0.24 | 0.24 | 0.22 |
| Sulfate | mg/L | *123* | *59* | *54* | *84* | 41 | 33 | 43 | 32 | 28 | 35 | 31 | 33 | 33 | 30 | 40 | 93 | 64 | 61 |
| **Nutrients** | | | | | | | | | | | | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | *-* | *-* | *1.64* | *2.99* | 0.86 | 0.15 | 3.30 | 0.54 | 0.34 | 3.20 | 0.17 | 0.19 | 0.36 | 0.24 | 3.20 | 6.60 | 1.20 | 0.84 |
| Ammonia Nitrogen | mg N/L | *-* | *4.79* | *1.38* | *2.46* | 0.71 | 0.13 | 2.70 | 0.44 | 0.28 | 2.70 | 0.14 | 0.16 | 0.29 | 0.20 | 2.70 | 5.40 | 1.00 | 0.69 |
| Nitrate | mg N/L | *16.33* | *9.76* | *2.76* | *4.14* | 0.96 | 0.10 | 3.68 | 0.33 | 0.15 | 2.30 | 0.20 | 0.15 | 0.25 | 0.10 | 1.98 | 14.80 | 2.05 | 1.65 |
| Nitrite | mg N/L | *0.760* | *0.499* | *0.219* | *0.230* | 0.024 | < 0.010 | 0.110 | 0.014 | < 0.010 | 0.062 | < 0.010 | < 0.010 | 0.015 | 0.011 | 0.199 | 1.600 | 0.187 | 0.115 |
| Total phosphorus | mg P/L | *0.06* | *0.06* | *0.93* | *0.04* | 0.014 | 0.006 | 0.019 | 0.008 | 0.009 | 0.220 | 0.005 | 0.005 | 0.011 | 0.006 | 0.048 | 0.420 | 0.026 | 0.027 |
| **Total Metals** | | | | | | | | | | | | | | | | | | | |
| Aluminum | mg/L | *1.500* | *4.890* | *8.252* | *0.400* | 1.240 | 0.336 | 0.694 | 0.083 | 0.049 | 2.390 | 0.090 | 0.090 | 0.218 | 0.112 | 0.973 | 0.709 | 0.178 | 0.088 |
| Arsenic | mg/L | *0.0400* | *0.0533* | *0.1453* | *0.6933* | 0.109 | 0.045 | 0.782 | 0.351 | 0.365 | 3.850 | 0.144 | 0.133 | 0.102 | 0.073 | 0.676 | 4.290 | 0.645 | 0.473 |
| Barium | mg/L | *0.122* | *0.282* | *0.183* | *0.077* | 0.1020 | 0.0803 | 0.0775 | 0.0671 | 0.0675 | 0.0390 | 0.0708 | 0.0694 | 0.0616 | 0.0647 | 0.0754 | 0.0600 | 0.0705 | 0.0772 |
| Cadmium | mg/L | *0.000032* | *0.000031* | *0.000067* | *0.000023* | < 0.000010 | < 0.000010 | < 0.000020 | < 0.000010 | < 0.000010 | < 0.000050 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000100 | < 0.000010 | < 0.000010 |
| Chromium | mg/L | *0.0369* | *0.1593* | *0.2670* | *0.0136* | 0.0431 | 0.0132 | 0.0312 | 0.0037 | 0.0022 | 0.1540 | 0.0039 | 0.0052 | 0.0083 | 0.0224 | 0.0394 | 0.0400 | 0.0069 | 0.0032 |
| Copper | mg/L | *0.00951* | *0.02253* | *0.01390* | *0.00425* | 0.0016 | 0.0014 | 0.0052 | < 0.0005 | < 0.0005 | 0.0059 | < 0.0005 | < 0.0005 | < 0.0005 | < 0.0005 | 0.0029 | < 0.0050 | 0.0173 | 0.0023 |
| Iron | mg/L | *2.71* | *6.43* | *15.09* | *1.02* | 2.990 | 0.858 | 1.940 | 0.250 | 0.188 | 4.780 | 0.249 | 0.230 | 0.563 | 0.568 | 2.090 | 1.630 | 0.536 | 0.253 |
| Lead | mg/L | *0.00125* | *0.00762* | *0.01095* | *0.00143* | 0.00095 | 0.00089 | 0.00217 | < 0.00020 | < 0.00020 | 0.00180 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | 0.00066 | < 0.00200 | 0.00131 | 0.00039 |
| Manganese | mg/L | *0.377* | *0.442* | *0.590* | *0.244* | 0.307 | 0.243 | 0.239 | 0.196 | 0.202 | 0.152 | 0.202 | 0.204 | 0.193 | 0.214 | 0.210 | 0.178 | 0.191 | 0.207 |
| Mercury | mg/L | *0.00004* | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | - |
| Molybdenum | mg/L | *0.0092* | *0.0214* | *0.0093* | *0.0231* | 0.0103 | 0.0068 | 0.0114 | 0.0080 | 0.0077 | 0.0075 | 0.0100 | 0.0118 | 0.0127 | 0.0162 | 0.0142 | 0.0140 | 0.0114 | 0.0116 |
| Nickel | mg/L | *0.0410* | *0.0735* | *0.1237* | *0.1138* | 0.0387 | 0.0201 | 0.0934 | 0.0682 | 0.0800 | 0.3810 | 0.0353 | 0.0348 | 0.0262 | 0.0216 | 0.1100 | 0.5230 | 0.1060 | 0.0883 |
| Selenium | mg/L | *0.00427* | *0.00282* | *0.00048* | *0.00060* | 0.00017 | < 0.00010 | < 0.00020 | < 0.00010 | 0.00020 | < 0.00050 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | 0.00022 | < 0.00100 | 0.00040 | 0.00028 |
| Silver | mg/L | *0.00010* | *0.00024* | *0.00004* | *0.00004* | < 0.000020 | < 0.000020 | < 0.000040 | < 0.000020 | < 0.000020 | < 0.00010 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | 0.000020 | < 0.000200 | < 0.000020 | < 0.000020 |
| Thallium | mg/L | *0.000200* | *0.000586* | *0.000258* | *0.000027* | 0.000033 | 0.000014 | 0.000023 | < 0.000010 | < 0.000010 | < 0.000050 | < 0.000010 | < 0.000010 | 0.000011 | < 0.000010 | 0.000031 | < 0.000100 | 0.000022 | 0.000018 |
| Zinc | mg/L | *0.0043* | *0.0199* | *0.0226* | *0.0111* | 0.006 | 0.017 | < 0.010 | < 0.005 | < 0.005 | < 0.025 | < 0.005 | 0.006 | < 0.005 | < 0.005 | < 0.005 | < 0.050 | 0.011 | < 0.005 |

| ST-WT-4 | Unit | Annual Average | | | | 7/5/2022 | 7/12/2022 | 7/18/2022 | 7/28/2022 | 7/31/2022 | 8/9/2022 | 8/20/2022 | 8/24/2022 | 8/29/2022 | 9/6/2022 | 9/12/2022 | 9/19/2022 | 9/25/2022 | 10/5/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | | *2019* | *2020* | *2021* | *2022* | | | | | | | | | | | | | | |
| **Field Measured** | | | | | | | | | | | | | | | | | | | |
| Temperature | °C | *6.1* | *4.0* | *1.9* | *2.6* | 9.7 | 7.8 | 6.5 | 7.5 | 5.9 | 7.2 | 5.2 | 4.8 | 4.1 | 4.8 | 4.0 | 4.9 | 2.0 | 0.6 |
| pH | pH units | *7.49* | *7.81* | *7.48* | *7.24* | 6.75 | 6.52 | 7.21 | 7.36 | 6.85 | 6.64 | 6.92 | 6.67 | 6.70 | 7.20 | 7.33 | 7.07 | 7.20 | 6.98 |
| Conductivity | uS/cm | *952* | *701* | *417* | *492* | 572 | 391 | 758 | 379 | 521 | 538 | 623 | 767 | 618 | 530 | 838 | 839 | 593 | 701 |
| Turbidity | NTU | *42.8* | *65.8* | *77.9* | *13.1* | 5.4 | 3.1 | 5.5 | 2.3 | 2.9 | 4.2 | 5.6 | 7.2 | 4.4 | 7.3 | 10.3 | 12.9 | 7.0 | 5.8 |
| **Conventional Parameters** | | | | | | | | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *323* | *353* | *255* | *188* | 201 | 147 | 254 | 141 | 204 | 206 | 253 | 273 | 236 | 188 | 331 | 360 | 211 | 294 |
| Total alkalinity, as $CaCO_3$ | mg/L | *71* | *118* | *67* | *69* | 72 | 61 | 85 | 59 | 66 | 67 | 94 | 94 | 77 | 79 | 73 | 57 | 54 | 60 |
| TDS | mg/L | *559* | *454* | *275* | *394* | 345 | 270 | 420 | 230 | 330 | 375 | 380 | 465 | 410 | 305 | 585 | 540 | 295 | 490 |
| TSS | mg/L | *90* | *1953* | *1813* | *12* | 8 | 1 | 4 | 1 | 4 | 4 | 4 | 7 | 6 | 12 | 9 | 10 | 6 | 3 |
| **Major Ions** | | | | | | | | | | | | | | | | | | | |
| Chloride | mg/L | *105* | *112* | *49* | *47* | 48 | 38 | 66 | 40 | 46 | 47 | 42 | 63 | 47 | 44 | 60 | 74 | 71 | 61 |
| Fluoride | mg/L | *0.15* | *0.20* | *0.21* | *0.22* | 0.21 | 0.20 | 0.29 | 0.21 | 0.23 | 0.25 | 0.14 | 0.21 | 0.19 | 0.19 | 0.20 | 0.21 | 0.16 | 0.18 |
| Sulfate | mg/L | *123* | *59* | *54* | *84* | 94 | 62 | 150 | 54 | 110 | 110 | 130 | 150 | 130 | 100 | 240 | 230 | 110 | 200 |
| **Nutrients** | | | | | | | | | | | | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | *-* | *-* | *1.64* | *2.99* | 5.90 | 1.10 | 5.00 | 0.48 | 1.30 | 1.10 | 4.00 | 5.90 | 3.40 | 2.70 | 3.30 | 3.60 | 1.50 | 2.60 |
| Ammonia Nitrogen | mg N/L | *-* | *4.79* | *1.38* | *2.46* | 4.80 | 0.86 | 4.10 | 0.39 | 1.00 | 0.94 | 3.30 | 4.80 | 2.80 | 2.20 | 2.70 | 3.00 | 1.30 | 2.20 |
| Nitrate | mg N/L | *16.33* | *9.76* | *2.76* | *4.14* | 10.30 | 2.42 | 8.93 | 1.33 | 5.95 | 5.28 | 9.04 | 12.00 | 5.77 | 3.81 | 7.08 | 7.31 | 2.26 | 4.84 |
| Nitrite | mg N/L | *0.760* | *0.499* | *0.219* | *0.230* | 0.665 | 0.215 | 0.701 | 0.071 | 0.514 | 0.446 | 0.380 | 0.566 | 0.266 | 0.259 | 0.383 | 0.391 | 0.104 | 0.138 |
| Total phosphorus | mg P/L | *0.06* | *0.06* | *0.93* | *0.04* | 0.040 | 0.015 | 0.058 | 0.008 | 0.120 | 0.057 | 0.015 | 0.020 | 0.009 | 0.016 | 0.030 | 0.028 | 0.014 | 0.036 |
| **Total Metals** | | | | | | | | | | | | | | | | | | | |
| Aluminum | mg/L | *1.500* | *4.890* | *8.252* | *0.400* | 0.225 | 0.045 | 0.142 | 0.067 | 0.131 | 0.148 | 0.107 | 0.151 | 0.146 | 0.245 | 0.253 | 0.275 | 0.181 | 0.085 |
| Arsenic | mg/L | *0.0400* | *0.0533* | *0.1453* | *0.6933* | 0.418 | 0.496 | 1.160 | 0.526 | 2.020 | 1.530 | 0.319 | 0.456 | 0.311 | 0.377 | 1.020 | 0.553 | 0.473 | 1.320 |
| Barium | mg/L | *0.122* | *0.282* | *0.183* | *0.077* | 0.0746 | 0.0760 | 0.0602 | 0.0761 | 0.0762 | 0.0695 | 0.1470 | 0.0994 | 0.0842 | 0.0678 | 0.0681 | 0.0700 | 0.0645 | 0.0781 |
| Cadmium | mg/L | *0.000032* | *0.000031* | *0.000067* | *0.000023* | < 0.000010 | < 0.000010 | < 0.000020 | < 0.000010 | < 0.000050 | < 0.000050 | 0.000010 | 0.000022 | 0.000012 | < 0.000010 | 0.000022 | 0.000071 | 0.000024 | < 0.000020 |
| Chromium | mg/L | *0.0369* | *0.1593* | *0.2670* | *0.0136* | 0.0075 | 0.0015 | 0.0030 | 0.0025 | 0.0053 | 0.0076 | 0.0031 | 0.0034 | 0.0047 | 0.0035 | 0.0056 | 0.0069 | 0.0051 | 0.0033 |
| Copper | mg/L | *0.00951* | *0.02253* | *0.01390* | *0.00425* | 0.0025 | 0.0008 | 0.0019 | 0.0022 | 0.0284 | < 0.0025 | 0.0162 | 0.0127 | 0.0140 | 0.0006 | 0.0023 | 0.0035 | 0.0006 | < 0.0010 |
| Iron | mg/L | *2.71* | *6.43* | *15.09* | *1.02* | 0.698 | 0.141 | 0.497 | 0.171 | 0.371 | 0.339 | 0.689 | 0.946 | 0.676 | 0.885 | 0.664 | 1.360 | 0.490 | 0.228 |
| Lead | mg/L | *0.00125* | *0.00762* | *0.01095* | *0.00143* | 0.00045 | 0.00022 | < 0.00040 | < 0.00020 | 0.00220 | < 0.00100 | 0.00393 | 0.00455 | 0.00523 | 0.00034 | < 0.00040 | 0.00044 | 0.00022 | < 0.00040 |
| Manganese | mg/L | *0.377* | *0.442* | *0.590* | *0.244* | 0.225 | 0.190 | 0.200 | 0.173 | 0.201 | 0.170 | 0.539 | 0.381 | 0.316 | 0.268 | 0.333 | 0.543 | 0.309 | 0.331 |
| Mercury | mg/L | *0.00004* | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0092* | *0.0214* | *0.0093* | *0.0231* | 0.0150 | 0.0138 | 0.0182 | 0.0147 | 0.0161 | 0.0204 | 0.0254 | 0.0334 | 0.0303 | 0.0233 | 0.0259 | 0.0198 | 0.0178 | 0.0251 |
| Nickel | mg/L | *0.0410* | *0.0735* | *0.1237* | *0.1138* | 0.1150 | 0.0963 | 0.1780 | 0.0953 | 0.2980 | 0.2430 | 0.0949 | 0.1290 | 0.0798 | 0.0699 | 0.1160 | 0.1120 | 0.1090 | 0.1690 |
| Selenium | mg/L | *0.00427* | *0.00282* | *0.00048* | *0.00060* | 0.00047 | 0.00027 | 0.00089 | 0.00025 | 0.00089 | 0.00092 | 0.00266 | 0.00119 | 0.00100 | 0.00063 | 0.00131 | 0.00124 | 0.00056 | 0.00100 |
| Silver | mg/L | *0.00010* | *0.00024* | *0.00004* | *0.00004* | < 0.000020 | < 0.000020 | < 0.000040 | < 0.000020 | < 0.00010 | < 0.00010 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000040 | < 0.000020 | < 0.000020 | < 0.000040 |
| Thallium | mg/L | *0.000200* | *0.000586* | *0.000258* | *0.000027* | 0.000020 | 0.000015 | < 0.000020 | 0.000016 | < 0.000050 | < 0.000050 | 0.000035 | 0.000028 | 0.000021 | 0.000020 | 0.000024 | 0.000033 | 0.000025 | 0.000027 |
| Zinc | mg/L | *0.0043* | *0.0199* | *0.0226* | *0.0111* | < 0.005 | < 0.005 | < 0.010 | 0.005 | < 0.025 | < 0.025 | 0.013 | 0.016 | 0.015 | < 0.0050 | < 0.010 | 0.006 | < 0.005 | < 0.010 |

| ST-WT-4 | Unit | *Annual Average* | | | | 10/16/2022 | 10/26/2022 | 11/4/2022 | 11/7/2022 | 11/14/2022 | 11/21/2022 | 12/12/2022 | 12/19/2022 | 12/20/2022 | 12/25/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | | *2019* | *2020* | *2021* | *2022* | | | | | | | | | | |
| **Field Measured** | | | | | | | | | | | | | | | |
| Temperature | °C | *6.1* | *4.0* | *1.9* | *2.6* | 0.5 | 0.3 | 0.1 | 0.1 | -0.5 | -0.2 | -0.5 | 0.0 | 0.2 | -0.2 |
| pH | pH units | *7.49* | *7.81* | *7.48* | *7.24* | 7.84 | 7.41 | 7.57 | 7.44 | 6.96 | 6.86 | 6.86 | 7.88 | 7.84 | 8.47 |
| Conductivity | uS/cm | *952* | *701* | *417* | *492* | 487 | 861 | 544 | 409 | 419 | 371 | 541 | 362 | 546 | 295 |
| Turbidity | NTU | *42.8* | *65.8* | *77.9* | *13.1* | 7.3 | 3.3 | 4.8 | 2.8 | 4.4 | 2.8 | 14.7 | 67.4 | 36.9 | 20.9 |
| **Conventional Parameters** | | | | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *323* | *353* | *255* | *188* | 204 | 372 | 174 | 176 | 161 | 152 | 192 | 185 | 204 | 124 |
| Total alkalinity, as $CaCO_3$ | mg/L | *71* | *118* | *67* | *69* | 67 | 90 | 70 | 73 | 70 | 66 | 95 | 55 | 56 | 63 |
| TDS | mg/L | *559* | *454* | *275* | *394* | 265 | 550 | 3570 | 255 | 265 | 495 | 335 | 195 | 270 | 160 |
| TSS | mg/L | *90* | *1953* | *1813* | *12* | 7 | 2 | 3 | 1 | 2 | 2 | 9 | 82 | 29 | 21 |
| **Major Ions** | | | | | | | | | | | | | | | |
| Chloride | mg/L | *105* | *112* | *49* | *47* | 49 | 110 | 46 | 42 | 43 | 43 | 44 | 35 | 23 | 32 |
| Fluoride | mg/L | *0.15* | *0.20* | *0.21* | *0.22* | 0.22 | 0.21 | 0.24 | 0.22 | 0.22 | 0.21 | 0.22 | 0.21 | 0.19 | 0.21 |
| Sulfate | mg/L | *123* | *59* | *54* | *84* | 93 | 210 | 68 | 61 | 62 | 54 | 52 | 41 | 62 | 37 |
| **Nutrients** | | | | | | | | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | *-* | *-* | *1.64* | *2.99* | 1.10 | 4.30 | 3.60 | 2.80 | 2.60 | 1.80 | 10.00 | 5.30 | 16.00 | 3.10 |
| Ammonia Nitrogen | mg N/L | *-* | *4.79* | *1.38* | *2.46* | 0.92 | 3.60 | 2.90 | 2.30 | 2.20 | 1.40 | 8.40 | 4.40 | 13.00 | 2.60 |
| Nitrate | mg N/L | *16.33* | *9.76* | *2.76* | *4.14* | 1.70 | 7.75 | 2.78 | 2.99 | 2.11 | 0.95 | 12.20 | 2.85 | 7.21 | 1.75 |
| Nitrite | mg N/L | *0.760* | *0.499* | *0.219* | *0.230* | 0.071 | 0.502 | 0.044 | 0.053 | 0.069 | 0.027 | 0.170 | 0.086 | 0.193 | 0.052 |
| Total phosphorus | mg P/L | *0.06* | *0.06* | *0.93* | *0.04* | 0.020 | 0.066 | 0.004 | 0.003 | 0.008 | 0.007 | 0.020 | 0.097 | 0.054 | 0.055 |
| **Total Metals** | | | | | | | | | | | | | | | |
| Aluminum | mg/L | *1.500* | *4.890* | *8.252* | *0.400* | 0.232 | 0.064 | 0.077 | 0.056 | 0.075 | 0.083 | 0.294 | 2.880 | 1.260 | 0.723 |
| Arsenic | mg/L | *0.0400* | *0.0533* | *0.1453* | *0.6933* | 0.616 | 1.640 | 0.067 | 0.063 | 0.283 | 0.145 | 0.228 | 0.034 | 0.218 | 0.036 |
| Barium | mg/L | *0.122* | *0.282* | *0.183* | *0.077* | 0.0666 | 0.0668 | 0.0766 | 0.0823 | 0.0645 | 0.0648 | 0.1120 | 0.0882 | 0.1340 | 0.0658 |
| Cadmium | mg/L | *0.000032* | *0.000031* | *0.000067* | *0.000023* | < 0.000010 | < 0.000050 | 0.000019 | 0.000018 | 0.000022 | 0.000014 | 0.000013 | 0.000058 | 0.000022 | < 0.000010 |
| Chromium | mg/L | *0.0369* | *0.1593* | *0.2670* | *0.0136* | 0.0082 | < 0.0050 | 0.0020 | 0.0016 | 0.0023 | 0.0028 | 0.0077 | 0.0121 | 0.0347 | 0.0023 |
| Copper | mg/L | *0.00951* | *0.02253* | *0.01390* | *0.00425* | 0.0007 | < 0.0025 | 0.0008 | < 0.0005 | 0.0012 | 0.0007 | 0.0057 | 0.0040 | 0.0109 | 0.0007 |
| Iron | mg/L | *2.71* | *6.43* | *15.09* | *1.02* | 0.546 | 0.191 | 0.248 | 0.190 | 0.226 | 0.196 | 0.881 | 6.280 | 2.950 | 1.630 |
| Lead | mg/L | *0.00125* | *0.00762* | *0.01095* | *0.00143* | 0.00033 | < 0.00100 | 0.00024 | < 0.00020 | < 0.00020 | < 0.00020 | 0.00056 | 0.01530 | 0.00178 | 0.00321 |
| Manganese | mg/L | *0.377* | *0.442* | *0.590* | *0.244* | 0.214 | 0.329 | 0.191 | 0.192 | 0.189 | 0.165 | 0.206 | 0.230 | 0.259 | 0.178 |
| Mercury | mg/L | *0.00004* | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | - | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0092* | *0.0214* | *0.0093* | *0.0231* | 0.0287 | 0.0299 | 0.0393 | 0.0416 | 0.0357 | 0.0310 | 0.0562 | 0.0418 | 0.0678 | 0.0521 |
| Nickel | mg/L | *0.0410* | *0.0735* | *0.1237* | *0.1138* | 0.1250 | 0.3850 | 0.0344 | 0.0316 | 0.0497 | 0.0344 | 0.0510 | 0.0092 | 0.0682 | 0.0040 |
| Selenium | mg/L | *0.00427* | *0.00282* | *0.00048* | *0.00060* | 0.00038 | 0.00075 | 0.00032 | 0.00066 | 0.00049 | 0.00034 | 0.00044 | < 0.00010 | 0.00222 | < 0.00010 |
| Silver | mg/L | *0.00010* | *0.00024* | *0.00004* | *0.00004* | < 0.000020 | < 0.00010 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | 0.000057 | < 0.000020 | < 0.000020 |
| Thallium | mg/L | *0.000200* | *0.000586* | *0.000258* | *0.000027* | 0.000023 | < 0.000050 | 0.000032 | 0.000024 | 0.000024 | 0.000011 | 0.000032 | 0.000048 | 0.000039 | 0.000012 |
| Zinc | mg/L | *0.0043* | *0.0199* | *0.0226* | *0.0111* | < 0.005 | < 0.025 | < 0.005 | 0.006 | < 0.005 | < 0.005 | < 0.005 | 0.025 | < 0.005 | 0.024 |

**Table 8-45 IVR Pit Sump 2022 Water Quality Monitoring (ST-WT-18)**

| ST-WT-18 | Unit | *Annual Average* | | | 6/4/2022 | 9/9/2022 | 9/25/2022 |
|---|---|---|---|---|---|---|---|
| Parameter | | *2020* | *2021* | *2022* | | | |
| **Field Measured** | | | | | | | |
| Temperature | °C | *2.8* | *4.3* | *5.5* | 2.2 | 13.2 | 1.0 |
| pH | pH units | *7.39* | *7.77* | *7.43* | 8.02 | 6.85 | 7.41 |
| Conductivity | uS/cm | *1009.0* | *1971.8* | *1300.3* | 437 | 1643 | 1821 |
| Turbidity | NTU | *36* | *450* | *108* | 237 | 47 | 41 |
| **Conventional Parameters** | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *610* | *1400* | *534* | 135 | 756 | 712 |
| Total alkalinity, as $CaCO_3$ | mg/L | *78* | *105* | *98* | 99 | 84 | 110 |
| TDS | mg/L | *723* | *1173* | *750* | 270 | 960 | 1020 |
| TSS | mg/L | *28* | *7872* | *458* | 130 | 1200 | 44 |
| **Major Ions** | | | | | | | |
| Chloride | mg/L | *297* | *378* | *203* | 19 | 280 | 310 |
| Fluoride | mg/L | *0.12* | *0.18* | *0.17* | 0.14 | 0.18 | 0.18 |
| Sulfate | mg/L | *35* | *198* | *180* | 51 | 220 | 270 |
| Nutrients | | | | | | | |
| Ammonia ($NH_3$) | mg/L | *-* | *10.7* | *9.8* | 8.4 | 11.0 | 9.9 |
| Ammonia Nitrogen | mg N/L | *1.4* | *9.0* | *8.0* | 6.9 | 8.9 | 8.1 |
| Nitrate | mg N/L | *2.1* | *15.4* | *15.3* | 10.0 | 17.6 | 18.2 |
| Nitrite | mg N/L | *0.19* | *1.51* | *0.98* | 0.628 | 0.886 | 1.420 |
| Total phosphorus | mg P/L | *0.02* | *3.84* | *0.20* | 0.11 | 0.27 | 0.22 |
| **Total Metals** | | | | | | | |
| Aluminum | mg/L | *0.6* | *48.2* | *6.5* | 3.3 | 15.4 | 0.9 |
| Arsenic | mg/L | *0.003* | *3.420* | *4.493* | 1.13 | 4.79 | 7.56 |
| Barium | mg/L | *0.304* | *0.736* | *0.157* | 0.081 | 0.242 | 0.148 |
| Cadmium | mg/L | *0.00002* | *0.00036* | *0.00009* | < 0.00002 | 0.00015 | < 0.00010 |
| Chromium | mg/L | *0.009* | *1.903* | *0.392* | 0.199 | 0.924 | 0.052 |
| Copper | mg/L | *0.0044* | *0.0610* | *0.0063* | 0.0047 | 0.0092 | < 0.0050 |
| Iron | mg/L | *1.1* | *81.0* | *10.5* | 4.99 | 25.30 | 1.34 |
| Lead | mg/L | *0.0002* | *0.0402* | *0.0026* | 0.0010 | 0.0047 | < 0.0020 |
| Manganese | mg/L | *2.36* | *3.16* | *0.17* | 0.050 | 0.361 | 0.101 |
| Mercury | mg/L | *0.000010* | *0.000064* | *0.000010* | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0019* | *0.0082* | *0.0163* | 0.009 | 0.017 | 0.023 |
| Nickel | mg/L | *0.032* | *1.031* | *0.306* | 0.085 | 0.407 | 0.425 |
| Selenium | mg/L | *0.00075* | *0.00289* | *0.00273* | 0.0010 | 0.0037 | 0.0035 |
| Silver | mg/L | *0.00010* | *0.00127* | *0.00015* | 0.00006 | < 0.00020 | < 0.00020 |
| Thallium | mg/L | *0.000200* | *0.001706* | *0.000164* | 0.00007 | 0.00030 | 0.00012 |
| Zinc | mg/L | *0.006* | *0.110* | *0.054* | < 0.010 | 0.102 | < 0.050 |

#### *8.5.3.2.7 Whale Tail South Channel / Lake A45 (ST-WT-13)*

In 2022, water from the Whale Tail South Channel (former Lake A45) (ST-WT-13) was sampled on a monthly basis during open water as per the requirements in the NWB Water License (sampling station ST-WT-13 on Figure 4). Applicable license limits for this station include effluent water quality limits for TSS of 15 mg/L for the maximum authorized monthly mean and 30 mg/L for the maximum authorized concentration in a grab sample. Monthly results are presented in Table 8-47. The total monthly flow in the Whale Tail South Channel is presented in Table 8-46.

**Table 8-46 Whale Tail South Channel Flow 2022**

| Month | Total Monthly Flow ($m^3$) |
|---|---|
| January | - |
| February | - |
| March | - |
| April | - |
| May | - |
| June | 254,979 |
| July | 66,950 |
| August | 0 |
| September | 6,476 |
| October | 196,982 |
| November | 57,971 |
| December | - |
| **Total** | **583,359** |

**Table 8-47 Whale Tail South Channel Water 2022 Quality Monitoring (ST-WT-13)**

| ST-WT-13 | MAX GRAB | MONTHLY MEAN | Unit | *Annual Average* | | | | 6/5/2022 | 7/5/2022 | 8/8/2022 | 9/10/2022 | 10/2/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | | | *2019** | *2020* | *2021* | *2022* | | | | | |
| **Field Measured** | | | | | | | | | | | | |
| Temperature | | | °C | *6.1* | *5.8* | *5.5* | *6.5* | 1.6 | 10.7 | 12.1 | 6.0 | 2.3 |
| pH | | | pH units | *7.40* | *7.52* | *7.75* | *7.48* | 7.61 | 7.66 | 7.11 | 7.32 | 7.68 |
| Conductivity | | | uS/cm | *22.7* | *52.3* | *44.0* | *83.4* | 39.1 | 55.6 | 71.9 | 196.1 | 54.5 |
| Turbidity | | | NTU | *0.98* | *1.59* | *2.25* | *6.68* | 8.39 | 0.82 | 18.10 | 3.60 | 2.47 |
| **Conventional Parameters** | | | | | | | | | | | | |
| TSS | 30 | 15 | mg/L | *2* | *3* | *2* | *3* | 5 | < 1 | 5 | < 1 | < 1 |
| **Major Ions** | | | | | | | | | | | | |
| Sulfate | | | mg/L | *1.3* | *3.5* | *2.3* | *4.5* | 2.7 | 3.2 | 4.2 | 7.6 | 4.6 |
| **Nutrients** | | | | | | | | | | | | |
| Ammonia Nitrogen | | | mg N/L | *-* | *-* | *0.066* | *0.050* | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Un-Ionized Ammonia, calculated | | | mg N/L | *-* | *-* | *0.00079* | *0.00060* | < 0.00061 | < 0.00054 | < 0.00061 | < 0.00061 | < 0.00061 |
| **Total Metals** | | | | | | | | | | | | |
| Aluminum | | | mg/L | *0.0098* | *0.0472* | *0.0589* | *0.0936* | 0.223 | 0.016 | 0.144 | 0.058 | 0.027 |
| Arsenic | | | mg/L | *0.00050* | *0.00336* | *0.00148* | *0.00541* | 0.00292 | 0.00228 | 0.00869 | 0.00948 | 0.00366 |
| Copper | | | mg/L | *0.00050* | *0.00106* | *0.00055* | *0.00089* | 0.00096 | 0.00067 | 0.00099 | 0.00125 | 0.00057 |
| Lead | | | mg/L | *0.00030* | *0.00020* | *0.00020* | *0.00028* | 0.00032 | < 0.00020 | 0.00042 | 0.00027 | < 0.00020 |
| Nickel | | | mg/L | *0.0005* | *0.0010* | *0.0018* | *0.0017* | 0.0031 | < 0.0010 | 0.0019 | 0.0016 | < 0.0010 |
| Zinc | | | mg/L | *0.0013* | *0.0010* | *0.0050* | *0.0050* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |

* Prior to Whale Tail South Channel construction

##### *8.5.3.2.8 Lake A16 Outlet (ST-WT-14)*

In 2022, water from the Lake A16 outlet (ST-WT-14) was sampled in July, August and September during open water as per the monthly requirements in the NWB Water License (sampling station ST-WT-14 on Figure 4). There are no applicable license limits. Results are presented in Table 8-48.

##### *8.5.3.2.9 Lake A15 (ST-WT-15)*

In 2022, water from the Lake A15 (ST-WT-15) was sampled in July, August and September during open water as per the monthly requirements in the NWB Water License (sampling station ST-WT-15 on Figure 4). There are no applicable license limits. Results are presented in Table 8-49.

**Table 8-48 Whale Tail 2022 Lake A16 Outlet Water Quality Monitoring (ST-WT-14)**

| ST-WT-14 | Unit | Annual Average | | | | | 7/10/2022 | 8/8/2022 | 9/4/2022 |
|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2018 | 2019 | 2020 | 2021 | 2022 | | | |
| **Field Measured** | | | | | | | | | |
| Temperature | °C | 13.7 | 7.3 | 8.8 | 10.8 | 15.3 | 21.5 | 13.0 | 11.4 |
| pH | pH units | 6.68 | 6.87 | 7.28 | 7.66 | 7.06 | 7.11 | 7.01 | 7.05 |
| Conductivity | uS/cm | 57.3 | 75.0 | 203.0 | 107.1 | 113.0 | 107.7 | 105.4 | 125.8 |
| Turbidity | NTU | 0.29 | 0.50 | 0.64 | 0.75 | 0.70 | 0.66 | 0.56 | 0.88 |
| **Conventional Parameters** | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | 19.0 | 22.3 | 86.5 | 39.6 | 41.1 | 39.0 | 39.5 | 44.7 |
| Total alkalinity, as $CaCO_3$ | mg/L | 7 | 10 | 49 | 11 | 14 | 14 | 14 | 15 |
| Carbonate, as $CaCO_3$ | mg/L | 2 | 2 | 4 | 1 | 1 | < 1.0 | < 1.0 | < 1.0 |
| Bicarbonate, as $CaCO_3$ | mg/L | 7 | 10 | 49 | 11 | 14 | 14 | 14 | 15 |
| TDS | mg/L | 38 | 50 | 142 | 70 | 82 | 90 | 65 | 90 |
| TSS | mg/L | 1 | 1 | 2 | 2 | 1 | < 1 | 1 | 2 |
| Total organic carbon | mg/L | 1.2 | 1.6 | 2.9 | 1.9 | 2.6 | 2.7 | 2.8 | 2.2 |
| Dissolved organic carbon | mg/L | 1.1 | 1.8 | 3.3 | 1.7 | 2.3 | 2.5 | 2.4 | 2.1 |
| **Major Ions** | | | | | | | | | |
| Chloride | mg/L | 11 | 12 | 37 | 16 | 14 | 13 | 13 | 15 |
| Silica | mg/L | 0.6 | 0.8 | 15.9 | 0.9 | 0.3 | 0.39 | 0.31 | 0.26 |
| Sulfate | mg/L | 4 | 5 | 19 | 12 | 15 | 14 | 14 | 18 |
| **Nutrients** | | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | - | - | - | 0.061 | 0.094 | 0.160 | < 0.061 | < 0.061 |
| Ammonia Nitrogen | mg N/L | 0.01 | 0.03 | 0.03 | 0.05 | 0.08 | 0.130 | < 0.050 | < 0.050 |
| Nitrate | mg N/L | 0.01 | 0.01 | 0.56 | 0.35 | 0.22 | 0.18 | 0.17 | 0.30 |
| Nitrite | mg N/L | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | < 0.010 | < 0.010 | < 0.010 |
| Total Kjeldahl nitrogen | mg N/L | 0.11 | 0.26 | 0.27 | 0.12 | 0.24 | 0.14 | 0.39 | 0.20 |
| Total phosphorus | mg P/L | 0.010 | 0.010 | 0.019 | 0.002 | 0.003 | < 0.0010 | < 0.0050 | 0.0016 |
| Orthophosphate | mg P/L | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | < 0.010 | < 0.010 | < 0.010 |
| **Total Metals** | | | | | | | | | |
| Aluminum | mg/L | 0.0050 | 0.0077 | 0.0060 | 0.0109 | 0.0062 | 0.0075 | 0.0054 | 0.0057 |
| Antimony | mg/L | 0.0001 | 0.0001 | 0.0001 | 0.0005 | 0.0008 | 0.00077 | 0.00074 | 0.00088 |
| Arsenic | mg/L | 0.00050 | 0.00050 | 0.00063 | 0.00059 | 0.00090 | 0.00103 | 0.00088 | 0.00080 |
| Barium | mg/L | 0.0093 | 0.0076 | 0.0473 | 0.0171 | 0.0165 | 0.0177 | 0.0159 | 0.0159 |
| Beryllium | mg/L | 0.0005 | 0.0005 | 0.0005 | 0.0001 | 0.0001 | < 0.00010 | < 0.00010 | < 0.00010 |
| Boron | mg/L | 0.01 | 0.01 | 0.01 | 0.05 | 0.05 | < 0.050 | < 0.050 | < 0.050 |
| Cadmium | mg/L | 0.00002 | 0.00002 | 0.00003 | 0.00001 | 0.00001 | < 0.000010 | < 0.000010 | < 0.000010 |
| Calcium (total) | mg/L | 5.65 | 6.78 | 25.40 | 11.40 | 11.67 | 11.1 | 11.1 | 12.8 |
| Chromium | mg/L | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | < 0.0010 | < 0.0010 | < 0.0010 |
| Copper | mg/L | 0.00050 | 0.00067 | 0.00130 | 0.00061 | 0.00069 | 0.00074 | 0.00061 | 0.00073 |
| Iron | mg/L | 0.010 | 0.023 | 0.025 | 0.028 | 0.018 | 0.016 | 0.019 | 0.020 |
| Lead | mg/L | 0.0003 | 0.0003 | 0.0003 | 0.0002 | 0.0002 | < 0.00020 | < 0.00020 | < 0.00020 |
| Lithium | mg/L | 0.005 | 0.005 | 0.006 | 0.002 | 0.002 | < 0.0020 | < 0.0020 | < 0.0020 |
| Magnesium (total) | mg/L | 1.3 | 1.6 | 5.7 | 2.7 | 2.9 | 2.73 | 2.86 | 3.10 |
| Manganese | mg/L | 0.0007 | 0.0012 | 0.0084 | 0.0035 | 0.0017 | 0.0018 | 0.0015 | 0.0019 |
| Mercury | mg/L | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.0005 | 0.0005 | 0.0005 | 0.0010 | 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Nickel | mg/L | 0.0012 | 0.0011 | 0.0029 | 0.0014 | 0.0010 | 0.0011 | < 0.0010 | < 0.0010 |
| Potassium (total) | mg/L | 0.7 | 1.2 | 4.4 | 2.5 | 2.8 | 2.58 | 2.77 | 3.14 |
| Selenium | mg/L | 0.0005 | 0.0005 | 0.0010 | 0.0001 | 0.0001 | < 0.00010 | < 0.00010 | < 0.00010 |
| Sodium (total) | mg/L | 0.05 | 0.86 | 3.29 | 1.72 | 2.15 | 1.88 | 2.08 | 2.48 |
| Strontium | mg/L | 0.0500 | - | - | 0.0732 | 0.0820 | 0.0764 | 0.0798 | 0.0897 |
| Thallium | mg/L | 0.00020 | 0.00020 | 0.00020 | 0.00001 | 0.00001 | < 0.000010 | < 0.000010 | < 0.000010 |
| Tin | mg/L | 0.001 | 0.001 | 0.001 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 |
| Titanium | mg/L | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | < 0.0050 | < 0.0050 | < 0.0050 |
| Uranium | mg/L | 0.0010 | 0.0010 | 0.0010 | 0.0001 | 0.0001 | < 0.00010 | < 0.00010 | < 0.00010 |
| Vanadium | mg/L | 0.0005 | 0.0005 | 0.0005 | 0.0050 | 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Zinc | mg/L | 0.001 | 0.012 | 0.001 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 |
| **Dissolved Metals** | | | | | | | | | |
| Aluminum | mg/L | 0.0050 | 0.0005 | 0.0060 | 0.0047 | 0.0069 | 0.0143 | 0.0035 | < 0.0030 |
| Antimony | mg/L | 0.0001 | 0.0001 | 0.0001 | 0.0005 | 0.0008 | 0.00074 | 0.00068 | 0.00087 |
| Arsenic | mg/L | 0.00050 | 0.00050 | 0.00050 | 0.00099 | 0.00099 | 0.00129 | 0.00117 | 0.00050 |
| Barium | mg/L | 0.0093 | 0.0071 | 0.0421 | 0.0173 | 0.0157 | 0.0166 | 0.0143 | 0.0161 |
| Beryllium | mg/L | 0.0005 | 0.0005 | 0.0005 | 0.0001 | 0.0001 | < 0.00010 | < 0.00010 | < 0.00010 |
| Boron | mg/L | 0.01 | 0.01 | 0.01 | 0.05 | 0.05 | < 0.050 | < 0.050 | < 0.050 |
| Cadmium | mg/L | 0.000020 | - | - | 0.000011 | 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| Chromium | mg/L | 0.00002 | 0.00060 | 0.00060 | 0.00100 | 0.00100 | < 0.0010 | < 0.0010 | < 0.0010 |
| Copper | mg/L | 0.00060 | 0.00057 | 0.00065 | 0.00057 | 0.00160 | 0.00353 | 0.00057 | 0.00071 |
| Iron | mg/L | 0.002 | 0.010 | 0.010 | 0.009 | 0.008 | 0.0126 | 0.0053 | 0.0055 |
| Lead | mg/L | 0.0100 | 0.0011 | 0.0003 | 0.0002 | 0.0003 | 0.00055 | < 0.00020 | < 0.00020 |
| Lithium | mg/L | 0.005 | 0.005 | 0.005 | 0.002 | 0.002 | < 0.0020 | < 0.0020 | < 0.0020 |
| Manganese | mg/L | 0.0005 | 0.0005 | 0.0047 | 0.0019 | 0.0010 | < 0.0010 | 0.0010 | < 0.0010 |
| Mercury | mg/L | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.0005 | 0.0005 | 0.0005 | 0.0010 | 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Nickel | mg/L | 0.0005 | 0.0008 | 0.0025 | 0.0015 | 0.0011 | 0.0012 | < 0.0010 | < 0.0010 |
| Selenium | mg/L | 0.0010 | 0.0010 | 0.0010 | 0.0001 | 0.0001 | < 0.00010 | < 0.00010 | < 0.00010 |
| Strontium | mg/L | 0.0050 | - | - | 0.0732 | 0.0786 | 0.0749 | 0.0736 | 0.0872 |
| Thallium | mg/L | 0.00020 | 0.00020 | 0.00020 | 0.00001 | 0.00001 | < 0.000010 | < 0.000010 | < 0.000010 |
| Tin | mg/L | 0.001 | 0.001 | 0.001 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 |
| Titanium | mg/L | 0.010 | 0.010 | 0.010 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 |
| Uranium | mg/L | 0.0010 | 0.0010 | 0.0010 | 0.0001 | 0.0001 | 0.00011 | < 0.00010 | < 0.00010 |
| Vanadium | mg/L | 0.0005 | 0.0005 | 0.0005 | 0.0050 | 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Zinc | mg/L | 0.001 | 0.002 | 0.002 | 0.005 | 0.008 | 0.0140 | < 0.0050 | < 0.0050 |

**Table 8-49 Whale Tail 2022 Lake A15 Outlet Water Quality Monitoring (ST-WT-15)**

| ST-WT-15 | Unit | Annual Average | | | | | 7/10/2022 | 8/8/2022 | 9/4/2022 |
|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2018 | 2019 | 2020 | 2021 | 2022 | | | |
| **Field Measured** | | | | | | | | | |
| Temperature | °C | 10.0 | 7.8 | 9.1 | 11.2 | 14.5 | 21.5 | 12.8 | 9.1 |
| pH | pH units | 6.75 | 6.88 | 7.44 | 7.56 | 7.10 | 7.2 | 7.12 | 6.99 |
| Conductivity | uS/cm | 57.9 | 73.0 | 145.9 | 110.0 | 109.3 | 104.2 | 105.1 | 118.6 |
| Turbidity | NTU | - | 0.76 | 0.48 | 0.71 | 1.33 | 2.00 | 1.36 | 0.62 |
| **Conventional Parameters** | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | 20 | 22 | 58 | 39 | 40 | 36.6 | 38.5 | 44.4 |
| Total alkalinity, as $CaCO_3$ | mg/L | 7 | 10 | 43 | 11 | 14 | 12 | 14 | 16 |
| Carbonate, as $CaCO_3$ | mg/L | 2 | 2 | 4 | 1 | 1 | < 1.0 | < 1.0 | < 1.0 |
| Bicarbonate, as $CaCO_3$ | mg/L | 7 | 10 | 43 | 11 | 14 | 12 | 14 | 15 |
| TDS | mg/L | 39 | 48 | 100 | 58 | 88 | 100 | 70 | 95 |
| TSS | mg/L | 1 | 1 | 2 | 1 | 2 | < 1 | 1 | 4 |
| Total organic carbon | mg/L | 1.5 | 1.6 | 2.4 | 2.0 | 2.4 | 2.9 | 2.1 | 2.3 |
| Dissolved organic carbon | mg/L | 1.5 | 1.6 | 2.4 | 2.0 | 2.3 | 2.6 | 2.2 | 2.0 |
| **Major Ions** | | | | | | | | | |
| Chloride | mg/L | 10.9 | 10.7 | 22.9 | 15.7 | 13.7 | 13 | 13 | 15 |
| Silica | mg/L | 0.59 | 0.85 | 1.71 | 0.70 | 0.34 | 0.44 | 0.32 | 0.27 |
| Sulfate | mg/L | 3 | 5 | 14 | 12 | 15 | 14 | 14 | 18 |
| **Nutrients** | | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | - | - | - | 0.061 | 0.061 | < 0.061 | < 0.061 | < 0.061 |
| Ammonia Nitrogen | mg N/L | 0.02 | 0.01 | 0.01 | 0.05 | 0.05 | < 0.050 | < 0.050 | < 0.050 |
| Nitrate | mg N/L | 0.04 | 0.02 | 0.59 | 0.33 | 0.27 | 0.28 | 0.22 | 0.30 |
| Nitrite | mg N/L | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | < 0.010 | < 0.010 | < 0.010 |
| Total Kjeldahl nitrogen | mg N/L | 0.07 | 0.28 | 0.25 | 0.13 | 0.11 | 0.11 | 0.11 | 0.10 |
| Total phosphorus | mg P/L | 0.0100 | 0.0100 | 0.0175 | 0.0021 | 0.0040 | < 0.0050 | < 0.0010 | 0.0060 |
| Orthophosphate | mg P/L | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | < 0.010 | < 0.010 | < 0.010 |
| **Total Metals** | | | | | | | | | |
| Aluminum | mg/L | 0.0050 | 0.0050 | 0.0060 | 0.0078 | 0.0390 | 0.0099 | 0.0081 | 0.0991 |
| Antimony | mg/L | 0.00010 | 0.00010 | 0.00010 | 0.00063 | 0.00075 | 0.00077 | 0.00066 | 0.00082 |
| Arsenic | mg/L | 0.00050 | 0.00050 | 0.00050 | 0.00076 | 0.00131 | 0.00099 | 0.00073 | 0.00220 |
| Barium | mg/L | 0.0081 | 0.0071 | 0.0261 | 0.0160 | 0.0182 | 0.0158 | 0.0166 | 0.0221 |
| Beryllium | mg/L | 0.0005 | 0.0005 | 0.0005 | 0.0001 | 0.0001 | < 0.00010 | < 0.00010 | < 0.00010 |
| Boron | mg/L | 0.01 | 0.01 | 0.01 | 0.05 | 0.05 | < 0.050 | < 0.050 | < 0.050 |
| Cadmium | mg/L | 0.00002 | 0.00002 | 0.00002 | 0.00001 | 0.00001 | < 0.000010 | < 0.000010 | 0.000021 |
| Calcium (total) | mg/L | 5.85 | 6.46 | 16.68 | 11.17 | 11.33 | 10.4 | 10.9 | 12.7 |
| Chromium | mg/L | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | < 0.0010 | < 0.0010 | 0.0014 |
| Copper | mg/L | 0.00050 | 0.00057 | 0.00068 | 0.00052 | 0.00077 | 0.00068 | 0.00069 | 0.00095 |
| Iron | mg/L | 0.01 | 0.02 | 0.02 | 0.02 | 0.11 | 0.017 | 0.032 | 0.292 |
| Lead | mg/L | 0.0003 | 0.0003 | 0.0003 | 0.0002 | 0.0002 | < 0.00020 | < 0.00020 | < 0.00020 |
| Lithium | mg/L | 0.005 | 0.005 | 0.005 | 0.002 | 0.002 | < 0.0020 | < 0.0020 | < 0.0020 |
| Magnesium (total) | mg/L | 1.44 | 1.49 | 3.85 | 2.65 | 2.81 | 2.59 | 2.76 | 3.09 |
| Manganese | mg/L | 0.0005 | 0.0010 | 0.0018 | 0.0016 | 0.0546 | 0.0019 | 0.0019 | 0.1600 |
| Mercury | mg/L | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.0005 | 0.0005 | 0.0005 | 0.0010 | 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Nickel | mg/L | 0.0009 | 0.0010 | 0.0016 | 0.0011 | 0.0022 | 0.0011 | < 0.0010 | 0.0044 |
| Potassium (total) | mg/L | 0.71 | 1.16 | 3.25 | 2.50 | 2.73 | 2.47 | 2.59 | 3.14 |
| Selenium | mg/L | 0.0010 | 0.0010 | 0.0010 | 0.0001 | 0.0001 | < 0.00010 | < 0.00010 | < 0.00010 |
| Sodium (total) | mg/L | 0.05 | 0.88 | 2.29 | 1.72 | 2.10 | 1.84 | 2.03 | 2.43 |
| Strontium | mg/L | 0.0490 | - | - | 0.0755 | 0.0796 | 0.0735 | 0.0772 | 0.0881 |
| Thallium | mg/L | 0.00020 | 0.00020 | 0.00020 | 0.00001 | 0.00001 | < 0.000010 | < 0.000010 | < 0.000010 |
| Tin | mg/L | 0.001 | 0.001 | 0.001 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 |
| Titanium | mg/L | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | < 0.0050 | < 0.0050 | < 0.0050 |
| Uranium | mg/L | 0.0010 | 0.0010 | 0.0010 | 0.0001 | 0.0001 | < 0.00010 | < 0.00010 | 0.00017 |
| Vanadium | mg/L | 0.0005 | 0.0005 | 0.0005 | 0.0050 | 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Zinc | mg/L | 0.001 | 0.001 | 0.001 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 |
| **Dissolved Metals** | | | | | | | | | |
| Aluminum | mg/L | 0.0050 | 0.0005 | 0.0060 | 0.0037 | 0.0037 | 0.0043 | 0.0037 | < 0.0030 |
| Antimony | mg/L | 0.0001 | 0.0001 | 0.0001 | 0.0006 | 0.0007 | 0.00075 | 0.00063 | 0.00079 |
| Arsenic | mg/L | 0.00050 | 0.00050 | 0.00063 | 0.00074 | 0.00064 | 0.00092 | 0.00065 | 0.00034 |
| Barium | mg/L | 0.0083 | 0.0059 | 0.0246 | 0.0161 | 0.0160 | 0.0157 | 0.0161 | 0.0162 |
| Beryllium | mg/L | 0.0005 | 0.0005 | 0.0005 | 0.0001 | 0.0001 | < 0.00010 | < 0.00010 | < 0.00010 |
| Boron | mg/L | 0.01 | 0.01 | 0.01 | 0.05 | 0.05 | < 0.050 | < 0.050 | < 0.050 |
| Cadmium | mg/L | 0.00002 | - | - | 0.00001 | 0.00001 | < 0.000010 | < 0.000010 | < 0.000010 |
| Chromium | mg/L | 0.00002 | 0.00060 | 0.00060 | 0.00100 | 0.00100 | < 0.0010 | < 0.0010 | < 0.0010 |
| Copper | mg/L | 0.00070 | 0.00063 | 0.00050 | 0.00047 | 0.00085 | 0.00094 | 0.00073 | 0.00089 |
| Iron | mg/L | 0.0007 | 0.0100 | 0.0100 | 0.0083 | 0.0057 | < 0.0050 | 0.0066 | 0.0054 |
| Lead | mg/L | 0.0100 | 0.0003 | 0.0003 | 0.0002 | 0.0002 | < 0.00020 | < 0.00020 | < 0.00020 |
| Lithium | mg/L | 0.005 | 0.005 | 0.005 | 0.002 | 0.002 | < 0.0020 | < 0.0020 | < 0.0020 |
| Manganese | mg/L | 0.0005 | 0.0005 | 0.0013 | 0.0012 | 0.0015 | < 0.0010 | 0.0012 | 0.0023 |
| Mercury | mg/L | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.0005 | 0.0005 | 0.0005 | 0.0010 | 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Nickel | mg/L | 0.0010 | 0.0010 | 0.0016 | 0.0011 | 0.0010 | 0.0011 | < 0.0010 | < 0.0010 |
| Selenium | mg/L | 0.0010 | 0.0010 | 0.0010 | 0.0001 | 0.0001 | < 0.00010 | < 0.00010 | < 0.00010 |
| Strontium | mg/L | 0.0470 | - | - | 0.0757 | 0.0753 | 0.0704 | 0.0717 | 0.0837 |
| Thallium | mg/L | 0.00020 | 0.00020 | 0.00020 | 0.00001 | 0.00001 | < 0.000010 | < 0.000010 | < 0.000010 |
| Tin | mg/L | 0.001 | 0.001 | 0.001 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 |
| Titanium | mg/L | 0.010 | 0.010 | 0.010 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 |
| Uranium | mg/L | 0.0010 | 0.0010 | 0.0010 | 0.0001 | 0.0001 | < 0.00010 | < 0.00010 | < 0.00010 |
| Vanadium | mg/L | 0.0005 | 0.0005 | 0.0005 | 0.0050 | 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Zinc | mg/L | 0.001 | 0.001 | 0.001 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 |

#### *8.5.3.2.10 Whale Tail Dike Seepage (ST-WT-17)*

As discussed in Section 8.5.8.2.2 below, during dewatering operations of the Whale Tail North Basin, a small inflow of water was observed out of the downstream toe of Whale Tail Dike (WTD) in a low depression. Once the dewatering of the Whale Tail North Basin was complete in 2020, the seepage water was directed to the Whale Tail Attenuation Pond and managed as part of this infrastructure. The same water management strategy was used in 2022.

Water quality sampling was conducted at least on a monthly basis, in 2022, as per the seepage requirements of the NWB Water License. Sample results are presented in Table 8-50. See Figure 4 for the location of ST-WT-17. Refer to Section 8.5.8.2.2 for details on the Whale Tail Dike seepage regarding consequences and mitigation measures in place.

#### *8.5.3.2.11 Whale Tail South Transfer (ST-WT-26)*

Water transfer from Whale Tail South to Mammoth Lake was not done in 2022 as the Whale Tail South Channel construction was operational. The channel facilitates the passive flow of water from Whale Tail South to Mammoth Lake.

#### *8.5.3.2.12 Water Ponding Around Whale Tail WRSF (ST-WT-30, ST-WT-31, ST-WT-32, ST-WT-33)*

There are four monitoring stations for water ponding around the Whale Tail WRSF. These locations are outlined in Figure 4. Water quality monitoring was conducted on a monthly basis, during open water season, as per the NWB Water License. There are no applicable license limits for these monitoring stations. Sample results are presenting in Table 8-51 for ST-WT-30, Table 8-52 for ST-WT-31, Table 8-53 for ST-WT-32, and Table 8-54 for ST-WT-33.

#### *8.5.3.2.13 Water Ponding Around IVR WRSF (ST-WT-28, ST-WT-34, ST-WT-35, ST-WT-36)*

There are four monitoring stations for water ponding around the IVR WRSF (ST-WT-34, ST-WT-35 and ST-WT-36) and one sump (ST-WT-28). These locations are outlined in Figure 4. Water quality monitoring was conducted on a monthly basis, during open water season, as per the NWB Water License. There are no applicable license limits for these monitoring stations. Sample results are presented in Table 8-55 for ST-WT-34, Table 8-56 for ST-WT-28, Table 8-57 for ST-WT-35, and Table 8-58 for ST-WT-36.

#### *8.5.3.2.14 IVR Diversion Channel (ST-WT-37)*

The IVR Diversion Channel was constructed in Q3 2020 and was commissioned during freshet in 2021. The purpose of the channel is to direct non-contact water from the North-East watershed towards Nemo Lake. Applicable license limits for this station include effluent water quality limits for TSS of 15 mg/L for the maximum authorized monthly mean and 30 mg/L for the maximum authorized concentration in a grab sample. The location is outlined in Figure 4 and results from samples collected in 2022 are provided in Table 8-59. No samples were collected in July and August because the channel was dry.

**Table 8-50 Whale Tail Dike Seepage 2022 Water Quality Monitoring (ST-WT-17)**

| ST-WT-17 | Unit | Annual Average | | | | 1/2/2022 | 1/24/2022 | 1/30/2022 | 2/6/2022 | 2/27/2022 | 3/7/2022 | 3/21/2022 | 4/5/2022 | 4/17/2022 | 5/1/2022 | 5/15/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2019 | 2020 | 2021 | 2022 | | | | | | | | | | | |
| **Field Measured** | | | | | | | | | | | | | | | | |
| Temperature | °C | 6.6 | 3.5 | 3.1 | 1.7 | 0.1 | 0.0 | 0.2 | 0.4 | 0.2 | 0.1 | 0.2 | 0.2 | 0.1 | 0.0 | 0.8 |
| pH | pH units | 8.10 | 9.65 | 9.24 | 8.44 | 8.90 | 9.33 | 9.20 | 9.71 | 9.97 | 10.20 | 8.55 | 9.04 | 8.14 | 7.57 | 8.06 |
| Conductivity | uS/cm | 126.7 | 171.2 | 145.9 | 171.0 | 162.1 | 173.1 | 153.3 | 157.3 | 608.0 | 174.1 | 154.2 | 155.0 | 169.5 | 148.0 | 180.1 |
| Turbidity | NTU | 21.7 | 5.5 | 7.2 | 11.7 | 2.59 | 1.27 | 1.65 | 1.43 | 3.04 | 2.58 | 7.77 | 4.34 | 9.02 | 4.39 | 44.80 |
| **Conventional Parameters** | | | | | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | 44 | 64 | 57 | 63 | 60.2 | 59.2 | 60.0 | 62.9 | 70.0 | 65.9 | 62.4 | 70.7 | 63.5 | 63.2 | 72.3 |
| Total alkalinity, as $CaCO_3$ | mg/L | 30 | 56 | 37 | 37 | 39 | 36 | 41 | 41 | 42 | 36 | 40 | 36 | 41 | 36 | 43 |
| TDS | mg/L | 87 | 87 | 93 | 101 | 55 | 110 | 130 | 105 | 125 | 105 | 95 | 140 | 90 | 40 | 70 |
| TSS | mg/L | 17 | 5 | 14 | 13 | 4 | 3 | 2 | 5 | 5 | 2 | 10 | 18 | 6 | 4 | 54 |
| **Major Ions** | | | | | | | | | | | | | | | | |
| Chloride | mg/L | 18 | 16 | 14 | 14 | 13 | 13 | 14 | 15 | 16 | 16 | 15 | 15 | 16 | 16 | 15 |
| Fluoride | mg/L | 0.10 | 0.11 | 0.11 | 0.11 | < 0.10 | 0.11 | 0.11 | < 0.10 | 0.12 | 0.14 | 0.11 | 0.15 | 0.11 | 0.11 | < 0.10 |
| Sulfate | mg/L | 7.3 | 9.8 | 11.7 | 16.8 | 14 | 13 | 13 | 15 | 17 | 16 | 16 | 16 | 16 | 16 | 15 |
| **Nutrients** | | | | | | | | | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | - | - | 0.059 | 0.062 | < 0.061 | < 0.061 | < 0.061 | < 0.061 | < 0.061 | < 0.061 | 0.071 | < 0.061 | < 0.061 | < 0.061 | 0.074 |
| Ammonia Nitrogen | mg N/L | 0.030 | 0.021 | 0.051 | 0.051 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | 0.058 | < 0.050 | < 0.050 | < 0.050 | 0.061 |
| Nitrate | mg N/L | 0.12 | 0.21 | 0.34 | 0.35 | 0.33 | 0.37 | 0.35 | 0.38 | 0.42 | 0.39 | 0.36 | 0.39 | 0.41 | 0.41 | 0.47 |
| Nitrite | mg N/L | 0.02 | 0.02 | 0.01 | 0.01 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Total phosphorus | mg P/L | 0.023 | 0.021 | 0.013 | 0.013 | 0.0072 | 0.0037 | 0.0044 | 0.0053 | 0.0073 | 0.0038 | 0.0100 | 0.0089 | 0.0093 | 0.0051 | 0.0380 |
| **Total Metals** | | | | | | | | | | | | | | | | |
| Aluminum | mg/L | 0.310 | 0.110 | 0.163 | 0.317 | 0.095 | 0.038 | 0.031 | 0.036 | 0.048 | 0.053 | 0.130 | 0.082 | 0.106 | 0.068 | 1.440 |
| Arsenic | mg/L | 0.0113 | 0.0112 | 0.0076 | 0.0079 | 0.0067 | 0.0060 | 0.0059 | 0.0063 | 0.0080 | 0.0080 | 0.0076 | 0.0087 | 0.0077 | 0.0074 | 0.0117 |
| Barium | mg/L | 0.0262 | 0.0315 | 0.0261 | 0.0310 | 0.0264 | 0.0254 | 0.0267 | 0.0292 | 0.0264 | 0.0261 | 0.0274 | 0.0310 | 0.0277 | 0.0287 | 0.0423 |
| Cadmium | mg/L | 0.000048 | 0.000022 | 0.000013 | 0.000014 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000013 |
| Chromium | mg/L | 0.003 | 0.002 | 0.003 | 0.008 | 0.0016 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | 0.0015 | 0.0021 | 0.0016 | 0.0015 | 0.0010 | 0.0367 |
| Copper | mg/L | 0.009 | 0.002 | 0.002 | 0.002 | 0.00134 | 0.00133 | 0.00130 | 0.00135 | 0.00155 | 0.00138 | 0.00151 | 0.00161 | 0.00147 | 0.00132 | 0.00353 |
| Iron | mg/L | 0.77 | 0.23 | 0.33 | 0.70 | 0.189 | 0.072 | 0.061 | 0.072 | 0.086 | 0.103 | 0.292 | 0.168 | 0.236 | 0.145 | 2.620 |
| Lead | mg/L | 0.0004 | 0.0003 | 0.0003 | 0.0004 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | 0.00020 | < 0.00020 | 0.00028 | < 0.00020 | 0.00144 |
| Manganese | mg/L | 0.078 | 0.044 | 0.091 | 0.109 | 0.065 | 0.058 | 0.063 | 0.074 | 0.092 | 0.099 | 0.117 | 0.131 | 0.128 | 0.135 | 0.162 |
| Mercury | mg/L | 0.00001 | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.0025 | 0.0019 | 0.0020 | 0.0020 | 0.0018 | 0.0017 | 0.0018 | 0.0019 | 0.0025 | 0.0022 | 0.0022 | 0.0025 | 0.0022 | 0.0022 | 0.0020 |
| Nickel | mg/L | 0.0030 | 0.0019 | 0.0019 | 0.0033 | 0.0011 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | 0.0011 | 0.0014 | 0.0013 | 0.0012 | 0.0011 | 0.0119 |
| Selenium | mg/L | 0.00099 | 0.00089 | 0.00025 | 0.00012 | 0.00012 | 0.00013 | 0.00012 | 0.00011 | 0.00015 | 0.00013 | 0.00013 | 0.00015 | 0.00011 | 0.00010 | 0.00012 |
| Silver | mg/L | 0.00049 | 0.00010 | 0.00003 | 0.00002 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| Thallium | mg/L | - | 0.00020 | 0.00003 | 0.00001 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000013 | 0.000010 | < 0.000010 | < 0.000010 | 0.000033 |
| Zinc | mg/L | 0.002 | 0.004 | 0.005 | 0.006 | < 0.0050 | < 0.0050 | 0.0091 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | 0.0056 |

| ST-WT-17 | Unit | Annual Average | | | | 5/29/2022 | 6/8/2022 | 6/15/2022 | 7/3/2022 | 8/2/2022 | 9/4/2022 | 9/12/2022 | 10/5/2022 | 11/7/2022 | 12/6/2022 | 12/25/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2019 | 2020 | 2021 | 2022 | | | | | | | | | | | |
| **Field Measured** | | | | | | | | | | | | | | | | |
| Temperature | °C | 6.6 | 3.5 | 3.1 | 1.7 | 1.0 | 3.0 | 4.5 | 6.2 | 8.6 | 7.4 | 4.1 | 0.3 | 0.1 | 0.1 | -0.2 |
| pH | pH units | 8.10 | 9.65 | 9.24 | 8.44 | 8.14 | 7.27 | 7.58 | 8.63 | 9.50 | 6.63 | 7.60 | 7.28 | 8.78 | 7.77 | 7.72 |
| Conductivity | uS/cm | 126.7 | 171.2 | 145.9 | 171.0 | 154.9 | 159.3 | 154.4 | 143.7 | 142.7 | 141.0 | 14.2 | 141.8 | 157.3 | 154.5 | 164.1 |
| Turbidity | NTU | 21.7 | 5.5 | 7.2 | 11.7 | 90.40 | 7.47 | 3.93 | 2.31 | 1.44 | 2.43 | 2.77 | 4.76 | 4.83 | 33.80 | 20.00 |
| **Conventional Parameters** | | | | | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | 44 | 64 | 57 | 63 | 79.7 | 74.0 | 62.6 | 56.2 | 55.0 | 51.6 | 53.9 | 56.5 | 62.4 | 66.8 | 66.9 |
| Total alkalinity, as $CaCO_3$ | mg/L | 30 | 56 | 37 | 37 | 40 | 39 | 39 | 35 | 39 | 32 | 33 | 32 | 33 | 34 | 34 |
| TDS | mg/L | 87 | 87 | 93 | 101 | 110 | 125 | 105 | 155 | 85 | 105 | 60 | 45 | 110 | 135 | 120 |
| TSS | mg/L | 17 | 5 | 14 | 13 | 90 | 5 | 4 | 3 | < 1 | 1 | 2 | 3 | 3 | 49 | 17 |
| **Major Ions** | | | | | | | | | | | | | | | | |
| Chloride | mg/L | 18 | 16 | 14 | 14 | 14 | 15 | 14 | 13 | 13 | 13 | 12 | 12 | 14 | 16 | 16 |
| Fluoride | mg/L | 0.10 | 0.11 | 0.11 | 0.11 | < 0.10 | < 0.10 | < 0.10 | 0.12 | 0.13 | < 0.10 | < 0.10 | < 0.10 | 0.10 | < 0.10 | 0.10 |
| Sulfate | mg/L | 7.3 | 9.8 | 11.7 | 16.8 | 15 | 18 | 17 | 15 | 15 | 16 | 20 | 22 | 19 | 23 | 23 |
| **Nutrients** | | | | | | | | | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | - | - | 0.059 | 0.062 | < 0.061 | 0.065 | < 0.061 | < 0.061 | < 0.061 | < 0.061 | < 0.061 | < 0.061 | < 0.061 | < 0.061 | 0.062 |
| Ammonia Nitrogen | mg N/L | 0.030 | 0.021 | 0.051 | 0.051 | < 0.050 | 0.054 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | 0.051 |
| Nitrate | mg N/L | 0.12 | 0.21 | 0.34 | 0.35 | 0.39 | 0.46 | 0.39 | 0.27 | 0.10 | 0.17 | 0.30 | 0.29 | 0.29 | 0.28 | 0.44 |
| Nitrite | mg N/L | 0.02 | 0.02 | 0.01 | 0.01 | 0.019 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Total phosphorus | mg P/L | 0.023 | 0.021 | 0.013 | 0.013 | 0.0580 | 0.0310 | 0.0210 | 0.0059 | < 0.0010 | 0.0022 | 0.0027 | 0.0039 | 0.0064 | 0.0360 | 0.0084 |
| **Total Metals** | | | | | | | | | | | | | | | | |
| Aluminum | mg/L | 0.310 | 0.110 | 0.163 | 0.317 | 2.950 | 1.070 | 0.078 | 0.047 | 0.028 | 0.030 | 0.031 | 0.087 | 0.057 | 0.326 | 0.147 |
| Arsenic | mg/L | 0.0113 | 0.0112 | 0.0076 | 0.0079 | 0.0191 | 0.0116 | 0.0067 | 0.0069 | 0.0088 | 0.0056 | 0.0053 | 0.0060 | 0.0071 | 0.0065 | 0.0060 |
| Barium | mg/L | 0.0262 | 0.0315 | 0.0261 | 0.0310 | 0.0607 | 0.0477 | 0.0305 | 0.0253 | 0.0256 | 0.0279 | 0.0284 | 0.0280 | 0.0270 | 0.0316 | 0.0317 |
| Cadmium | mg/L | 0.000048 | 0.000022 | 0.000013 | 0.000014 | 0.000018 | 0.000031 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000022 | 0.000035 | 0.000025 | 0.000012 | 0.000016 | 0.000013 |
| Chromium | mg/L | 0.003 | 0.002 | 0.003 | 0.008 | 0.0816 | 0.0295 | 0.0015 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | 0.0014 | < 0.0010 | 0.0018 | 0.0018 |
| Copper | mg/L | 0.009 | 0.002 | 0.002 | 0.002 | 0.00547 | 0.00262 | 0.00124 | 0.00115 | 0.00117 | 0.00127 | 0.00131 | 0.00130 | 0.00118 | 0.00181 | 0.00131 |
| Iron | mg/L | 0.77 | 0.23 | 0.33 | 0.70 | 5.230 | 1.830 | 0.153 | 0.080 | 0.037 | 0.413 | 0.393 | 0.546 | 0.628 | 1.280 | 0.834 |
| Lead | mg/L | 0.0004 | 0.0003 | 0.0003 | 0.0004 | 0.00275 | 0.00092 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | 0.00072 | 0.00021 |
| Manganese | mg/L | 0.078 | 0.044 | 0.091 | 0.109 | 0.199 | 0.143 | 0.094 | 0.077 | 0.040 | 0.108 | 0.120 | 0.114 | 0.112 | 0.129 | 0.130 |
| Mercury | mg/L | 0.00001 | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.0025 | 0.0019 | 0.0020 | 0.0020 | 0.0018 | 0.0019 | 0.0018 | 0.0019 | 0.0024 | 0.0017 | 0.0018 | 0.0019 | 0.0020 | 0.0016 | 0.0018 |
| Nickel | mg/L | 0.0030 | 0.0019 | 0.0019 | 0.0033 | 0.0249 | 0.0098 | 0.0014 | < 0.0010 | < 0.0010 | 0.0015 | 0.0019 | 0.0021 | 0.0013 | 0.0023 | 0.0016 |
| Selenium | mg/L | 0.00099 | 0.00089 | 0.00025 | 0.00012 | 0.00013 | < 0.00010 | < 0.00010 | < 0.00010 | 0.00011 | < 0.00010 | < 0.00010 | 0.00011 | 0.00011 | 0.00010 | < 0.00010 |
| Silver | mg/L | 0.00049 | 0.00010 | 0.00003 | 0.00002 | 0.000021 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| Thallium | mg/L | - | 0.00020 | 0.00003 | 0.00001 | 0.000058 | 0.000028 | < 0.000010 | < 0.000010 | 0.000010 | 0.000011 | 0.000010 | 0.000011 | < 0.000010 | < 0.000010 | < 0.000010 |
| Zinc | mg/L | 0.002 | 0.004 | 0.005 | 0.006 | 0.0104 | 0.0068 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | 0.0059 | < 0.0050 | < 0.0050 | < 0.0050 | 0.0138 |

**Table 8-51 Whale Tail WRSF Ponding 2022 Water Quality Monitoring (ST-WT-30)**

| ST-WT-30 | Unit | Annual Average | | | 6/1/2022 | 7/3/2022 | 8/2/2022 | 9/4/2022 |
|---|---|---|---|---|---|---|---|---|
| Parameter | | *2020** | *2021* | *2022* | | | | |
| **Field Measured** | | | | | | | | |
| Temperature | °C | *4.9* | *7.7* | *6.5* | 1.0 | 12.7 | 4.4 | 8.0 |
| pH | pH units | *7.07* | *7.35* | *7.03* | 6.92 | 6.78 | 7.61 | 6.81 |
| Conductivity | uS/cm | *209.1* | *172.5* | *163.0* | 56 | 139 | 193 | 264 |
| Turbidity | NTU | *4.3* | *8.7* | *8.5* | 29.2 | 2.1 | 1.8 | 1.1 |
| **Conventional Parameters** | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *103* | *70* | *76* | 28 | 56 | 102 | 117 |
| Total alkalinity, as $CaCO_3$ | mg/L | *65* | *33* | *45* | 24 | 30 | 56 | 69 |
| TDS | mg/L | *-* | *113* | *121* | 35 | 105 | 155 | 190 |
| TSS | mg/L | *7* | *3* | *4* | 9 | 2 | 4 | 1 |
| **Major Ions** | | | | | | | | |
| Chloride | mg/L | *7.4* | *4.2* | *3.8* | 1.2 | 3.5 | 5.1 | 5.4 |
| Fluoride | mg/L | *0.04* | *0.10* | *0.10* | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Sulfate | mg/L | *31.5* | *31.9* | *34.9* | 4 | 28 | 51 | 57 |
| **Nutrients** | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | *-* | *0.185* | *0.093* | 0.11 | < 0.06 | 0.14 | 0.06 |
| Ammonia Nitrogen | mg N/L | *0.240* | *0.153* | *0.075* | 0.089 | < 0.050 | 0.110 | 0.050 |
| Nitrate | mg N/L | *1.93* | *2.71* | *1.60* | 0.22 | 1.85 | 3.37 | 0.97 |
| Nitrite | mg N/L | *0.090* | *0.029* | *0.019* | < 0.010 | < 0.010 | 0.041 | 0.015 |
| **Total Metals** | | | | | | | | |
| Aluminum | mg/L | *0.1465* | *0.1980* | *0.2614* | 0.9160 | 0.0452 | 0.0597 | 0.0245 |
| Arsenic | mg/L | *0.0171* | *0.0115* | *0.0113* | 0.0223 | 0.0039 | 0.0104 | 0.0086 |
| Barium | mg/L | *0.0626* | *0.0441* | *0.0442* | 0.0222 | 0.0385 | 0.0586 | 0.0576 |
| Cadmium | mg/L | *0.000020* | *0.000016* | *0.000017* | 0.000028 | < 0.000010 | 0.000019 | < 0.000010 |
| Chromium | mg/L | *0.0021* | *0.0057* | *0.0074* | 0.0262 | 0.0010 | 0.0015 | < 0.0010 |
| Copper | mg/L | *0.00290* | *0.00204* | *0.00212* | 0.00243 | 0.00137 | 0.00246 | 0.00220 |
| Iron | mg/L | *0.705* | *0.388* | *0.548* | 1.560 | 0.071 | 0.383 | 0.176 |
| Lead | mg/L | *0.00017* | *0.00047* | *0.00049* | 0.00125 | < 0.00020 | 0.00029 | < 0.00020 |
| Manganese | mg/L | *1.386* | *0.117* | *0.124* | 0.128 | 0.021 | 0.302 | 0.047 |
| Mercury | mg/L | *0.00003* | *0.00001* | *0.00001* | 0.00001 | < 0.00001 | < 0.00001 | 0.00001 |
| Molybdenum | mg/L | *0.001* | *0.001* | *0.001* | < 0.0010 | < 0.0010 | 0.0013 | < 0.0010 |
| Nickel | mg/L | *0.0169* | *0.0125* | *0.0102* | 0.0152 | 0.0068 | 0.0112 | 0.0075 |
| Selenium | mg/L | *0.00100* | *0.00119* | *0.00067* | 0.00028 | 0.00077 | 0.00124 | 0.00037 |
| Silver | mg/L | *0.00010* | *0.00002* | *0.00002* | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| Thallium | mg/L | *0.000200* | *0.000022* | *0.000019* | 0.000024 | 0.000013 | 0.000023 | 0.000015 |
| Zinc | mg/L | *0.0025* | *0.0055* | *0.0050* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |

**2020 Annual average from Perim-0.*

**Table 8-52 Whale Tail WRSF Ponding 2022 Water Quality Monitoring (ST-WT-31)**

| ST-WT-31 | Unit | *Annual Average* | | | 6/8/2022 | 7/3/2022 | 8/2/2022 | 9/4/2022 |
|---|---|---|---|---|---|---|---|---|
| Parameter | | *2020** | *2021* | *2022* | | | | |
| **Field Measured** | | | | | | | | |
| Temperature | °C | *5.4* | *6.7* | *6.7* | 3.6 | 8.7 | 8.0 | 6.3 |
| pH | pH units | *7.27* | *7.33* | *7.14* | 7.12 | 6.88 | 7.65 | 6.90 |
| Conductivity | uS/cm | *130.5* | *163.0* | *181.9* | 37 | 145 | 235 | 311 |
| Turbidity | NTU | *21.3* | *11.0* | *69.4* | 19.3 | 1.2 | 255.0 | 2.0 |
| **Conventional Parameters** | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *65.0* | *63.8* | *72.5* | 16.0 | 54.8 | 89.3 | 130.0 |
| Total alkalinity, as $CaCO_3$ | mg/L | *35* | *30* | *41* | 13 | 39 | 50 | 62 |
| TDS | mg/L | - | *104* | *121* | 35 | 85 | 135 | 230 |
| TSS | mg/L | *16* | *6* | *4* | 12 | 1 | < 1 | < 1 |
| **Major Ions** | | | | | | | | |
| Chloride | mg/L | *5.7* | *3.8* | *2.9* | < 1.0 | 3.1 | 3.4 | 4.1 |
| Fluoride | mg/L | *0.03* | *0.10* | *0.10* | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Sulfate | mg/L | *41.6* | *31.0* | *32.5* | 3 | 25 | 28 | 74 |
| **Nutrients** | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | - | *0.119* | *0.069* | 0.093 | < 0.061 | < 0.061 | < 0.061 |
| Ammonia Nitrogen | mg N/L | *0.065* | *0.096* | *0.057* | 0.076 | < 0.050 | < 0.050 | < 0.050 |
| Nitrate | mg N/L | *0.34* | *2.68* | *1.92* | 0.22 | 0.44 | 2.87 | 4.14 |
| Nitrite | mg N/L | *0.030* | *0.015* | *0.022* | < 0.010 | < 0.010 | 0.016 | 0.050 |
| **Total Metals** | | | | | | | | |
| Aluminum | mg/L | *0.7625* | *0.2896* | *0.1576* | 0.4800 | 0.0448 | 0.0726 | 0.0328 |
| Arsenic | mg/L | *0.0622* | *0.0132* | *0.0158* | 0.0168 | 0.0062 | 0.0174 | 0.0228 |
| Barium | mg/L | *0.0375* | *0.0371* | *0.0404* | 0.0141 | 0.0327 | 0.0493 | 0.0654 |
| Cadmium | mg/L | *0.000020* | *0.000021* | *0.000029* | < 0.000010 | 0.000022 | 0.000071 | 0.000011 |
| Chromium | mg/L | *0.0183* | *0.0076* | *0.0043* | 0.0126 | 0.0013 | 0.0022 | < 0.0010 |
| Copper | mg/L | *0.00275* | *0.00221* | *0.00204* | 0.00199 | 0.00254 | 0.00188 | 0.00173 |
| Iron | mg/L | *1.400* | *0.464* | *0.262* | 0.802 | 0.070 | 0.115 | 0.060 |
| Lead | mg/L | *0.00039* | *0.00049* | *0.00039* | 0.00090 | < 0.00020 | 0.00026 | < 0.00020 |
| Manganese | mg/L | *0.436* | *0.035* | *0.026* | 0.0352 | 0.0283 | 0.0209 | 0.0213 |
| Mercury | mg/L | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0010* | *0.0015* | *0.0019* | < 0.0010 | < 0.0010 | 0.0028 | 0.0029 |
| Nickel | mg/L | *0.0441* | *0.0105* | *0.0103* | 0.0068 | 0.0112 | 0.0105 | 0.0127 |
| Selenium | mg/L | *0.00100* | *0.00094* | *0.00073* | 0.00013 | 0.00032 | 0.00130 | 0.00116 |
| Silver | mg/L | *0.00010* | *0.00002* | *0.00002* | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| Thallium | mg/L | *0.000200* | *0.000020* | *0.000024* | 0.000015 | 0.000020 | 0.000034 | 0.000026 |
| Zinc | mg/L | *0.0020* | *0.0050* | *0.0050* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |

**2020 Annual average from Perim-1.*

**Table 8-53 Whale Tail WRSF Ponding 2022 Water Quality Monitoring (ST-WT-32)**

| ST-WT-32 | Unit | *Annual Average* | | | 6/5/2022 | 7/3/2022 | 8/2/2022 | 9/10/2022 |
|---|---|---|---|---|---|---|---|---|
| Parameter | | *2020** | *2021* | *2022* | | | | |
| **Field Measured** | | | | | | | | |
| Temperature | °C | *3.4* | *6.9* | *6.5* | 3.6 | 13.5 | 6.3 | 2.6 |
| pH | pH units | *7.05* | *7.16* | *7.21* | 7.23 | 7.17 | 7.54 | 6.91 |
| Conductivity | uS/cm | *177.4* | *128.9* | *113.2* | 51.5 | 108.4 | 119.8 | 172.9 |
| Turbidity | NTU | *13.1* | *14.0* | *7.5* | 22.8 | 2.1 | 0.9 | 4.1 |
| **Conventional Parameters** | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *80* | *51* | *42* | 20.7 | 40.5 | 43.4 | 64.6 |
| Total alkalinity, as $CaCO_3$ | mg/L | *33* | *22* | *21* | 16 | 24 | 17 | 26 |
| TDS | mg/L | *-* | *86* | *50* | 10 | 55 | 65 | 70 |
| TSS | mg/L | *10* | *9* | *4* | 11 | 2 | < 1 | 1 |
| **Major Ions** | | | | | | | | |
| Chloride | mg/L | *6.0* | *4.0* | *1.8* | < 1.0 | 2.1 | 2.1 | 1.8 |
| Fluoride | mg/L | *0.03* | *0.10* | *0.10* | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Sulfate | mg/L | *49.6* | *27.2* | *29.8* | 4 | 23 | 51 | 41 |
| **Nutrients** | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | *-* | *0.112* | *0.063* | < 0.061 | < 0.061 | < 0.061 | 0.069 |
| Ammonia Nitrogen | mg N/L | *0.575* | *0.093* | *0.052* | < 0.050 | < 0.050 | < 0.050 | 0.056 |
| Nitrate | mg N/L | *3.69* | *1.45* | *1.59* | 0.38 | 0.71 | 1.94 | 3.32 |
| Nitrite | mg N/L | *0.025* | *0.018* | *0.010* | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| **Total Metals** | | | | | | | | |
| Aluminum | mg/L | *0.2640* | *0.3610* | *0.1403* | 0.4230 | 0.0595 | 0.0190 | 0.0598 |
| Arsenic | mg/L | *0.0151* | *0.0084* | *0.0105* | 0.0259 | 0.0116 | 0.0014 | 0.0033 |
| Barium | mg/L | *0.0571* | *0.0420* | *0.0298* | 0.0167 | 0.0334 | 0.0286 | 0.0406 |
| Cadmium | mg/L | *0.000020* | *0.000016* | *0.000010* | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| Chromium | mg/L | *0.0058* | *0.0097* | *0.0040* | 0.0117 | 0.0015 | < 0.0010 | 0.0017 |
| Copper | mg/L | *0.00105* | *0.00145* | *0.00105* | 0.00135 | 0.00120 | 0.00069 | 0.00097 |
| Iron | mg/L | *0.575* | *0.594* | *0.236* | 0.743 | 0.084 | 0.020 | 0.097 |
| Lead | mg/L | *0.00024* | *0.00061* | *0.00039* | 0.00097 | < 0.00020 | < 0.00020 | < 0.00020 |
| Manganese | mg/L | *0.130* | *0.066* | *0.020* | 0.0509 | 0.0212 | 0.0021 | 0.0057 |
| Mercury | mg/L | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.00100* | *0.00125* | *0.00168* | < 0.0010 | < 0.0010 | 0.0017 | 0.0030 |
| Nickel | mg/L | *0.0216* | *0.0107* | *0.0056* | 0.0075 | 0.0083 | 0.0029 | 0.0038 |
| Selenium | mg/L | *0.00100* | *0.00085* | *0.00105* | 0.0002 | 0.0003 | 0.0015 | 0.0022 |
| Silver | mg/L | *0.00010* | *0.00002* | *0.00002* | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| Thallium | mg/L | *0.000200* | *0.000020* | *0.000013* | 0.000015 | 0.000016 | < 0.000010 | < 0.000010 |
| Zinc | mg/L | *0.003* | *0.006* | *0.005* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |

**2020 Annual average from Perim-2.*

**Table 8-54 Whale Tail WRSF Ponding 2022 Water Quality Monitoring (ST-WT-33)**

| ST-WT-33 | Unit | *Annual Average* | | | 6/5/2022 | 7/3/2022 | 8/2/2022 | 9/4/2022 |
|---|---|---|---|---|---|---|---|---|
| Parameter | | *2020** | *2021* | *2022* | | | | |
| **Field Measured** | | | | | | | | |
| Temperature | °C | *7.9* | *5.2* | *7.0* | 5.3 | 8.9 | 9.5 | 4.3 |
| pH | pH units | *6.87* | *7.12* | *7.29* | 7.39 | 7.05 | 7.76 | 6.94 |
| Conductivity | uS/cm | *307.0* | *207.5* | *196.3* | 30 | 165 | 253 | 337 |
| Turbidity | NTU | *12.6* | *9.0* | *40.9* | 142 | 9 | 9 | 3 |
| **Conventional Parameters** | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *166* | *88* | *79* | 32 | 69 | 74 | 143 |
| Total alkalinity, as $CaCO_3$ | mg/L | *52* | *42* | *62* | 15 | 61 | 60 | 110 |
| TDS | mg/L | *-* | *135* | *131* | 45 | 140 | 120 | 220 |
| TSS | mg/L | *10* | *6* | *47* | 170 | 6 | 9 | 2 |
| **Major Ions** | | | | | | | | |
| Chloride | mg/L | *10.5* | *6.2* | *3.4* | < 1.0 | 4.0 | 3.6 | 4.9 |
| Fluoride | mg/L | *0.06* | *0.10* | *0.10* | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Sulfate | mg/L | *87.6* | *42.3* | *25.4* | 0.7 | 18.0 | 29.0 | 54.0 |
| **Nutrients** | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | *-* | *0.138* | *0.101* | < 0.061 | < 0.061 | 0.170 | 0.110 |
| Ammonia Nitrogen | mg N/L | *0.115* | *0.114* | *0.083* | < 0.050 | < 0.050 | 0.140 | 0.093 |
| Nitrate | mg N/L | *1.31* | *1.80* | *0.65* | 0.13 | 0.18 | 0.57 | 1.73 |
| Nitrite | mg N/L | *0.030* | *0.055* | *0.031* | < 0.010 | < 0.010 | 0.034 | 0.069 |
| **Total Metals** | | | | | | | | |
| Aluminum | mg/L | *0.3570* | *0.3038* | *0.9886* | 3.420 | 0.305 | 0.185 | 0.044 |
| Arsenic | mg/L | *0.0170* | *0.0148* | *0.0340* | 0.0436 | 0.0220 | 0.0220 | 0.0483 |
| Barium | mg/L | *0.0770* | *0.0597* | *0.0606* | 0.0373 | 0.0562 | 0.0596 | 0.0893 |
| Cadmium | mg/L | *0.000020* | *0.000028* | *0.000015* | 0.00001 | 0.00002 | 0.00002 | 0.00001 |
| Chromium | mg/L | *0.0030* | *0.0086* | *0.0370* | 0.1330 | 0.0084 | 0.0052 | 0.0014 |
| Copper | mg/L | *0.00325* | *0.00189* | *0.00309* | 0.0048 | 0.0042 | 0.0016 | 0.0018 |
| Iron | mg/L | *0.875* | *0.586* | *1.975* | 5.90 | 0.61 | 1.12 | 0.27 |
| Lead | mg/L | *0.00017* | *0.00058* | *0.00104* | 0.00237 | 0.00088 | 0.00048 | 0.00043 |
| Manganese | mg/L | *0.860* | *0.294* | *0.326* | 0.151 | 0.213 | 0.750 | 0.188 |
| Mercury | mg/L | *0.00002* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.00100* | *0.00135* | *0.00248* | < 0.0010 | 0.0013 | 0.0020 | 0.0056 |
| Nickel | mg/L | *0.0279* | *0.0149* | *0.0189* | 0.0417 | 0.0126 | 0.0111 | 0.0101 |
| Selenium | mg/L | *0.00100* | *0.00065* | *0.00057* | 0.00011 | 0.00031 | 0.00067 | 0.00119 |
| Silver | mg/L | *0.00010* | *0.00002* | *0.00002* | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| Thallium | mg/L | *0.000200* | *0.000031* | *0.000036* | 0.000055 | 0.000029 | 0.000023 | 0.000035 |
| Zinc | mg/L | *0.009* | *0.005* | *0.006* | 0.0087 | < 0.0050 | < 0.0050 | < 0.0050 |

**2020 Annual average from Perim-3.*

**Table 8-55 Whale Tail IVR WRSF Ponding 2022 Water Quality Monitoring (ST-WT-34)**

| ST-WT-34 | Unit | Annual Average | | 5/29/2022 | 6/27/2022 | 7/5/2022 | 8/1/2022 | 9/25/2022 |
|---|---|---|---|---|---|---|---|---|
| Parameter | | 2021 | 2022 | | | | | |
| **Field Measured** | | | | | | | | |
| Temperature | °C | 6.5 | 5.1 | 0.6 | 5.8 | 12.5 | 5.3 | 1.2 |
| pH | pH units | 6.94 | 6.96 | 7.21 | 6.93 | 6.84 | 6.90 | 6.93 |
| Conductivity | uS/cm | 1309 | 1195 | 362 | 2260 | 1062 | 2290 | 3 |
| Turbidity | NTU | 8.4 | 142.9 | 419 | 135 | 58 | 69 | 33 |
| **Conventional Parameters** | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | 523 | 736 | 161 | 982 | 429 | 1030 | 1080 |
| Total alkalinity, as $CaCO_3$ | mg/L | 51 | 74 | 57 | 69 | 81 | 80 | 83 |
| TDS | mg/L | 878 | 1156 | 230 | 1660 | 840 | 1560 | 1490 |
| TSS | mg/L | 4 | 106 | 340 | 56 | 30 | 66 | 36 |
| **Major Ions** | | | | | | | | |
| Chloride | mg/L | 310 | 463 | 55 | 630 | 230 | 640 | 760 |
| Fluoride | mg/L | 0.10 | 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Sulfate | mg/L | 79 | 56 | 20 | 58 | 41 | 86 | 77 |
| **Nutrients and Chlorophyll a** | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | 1.5 | 1.8 | 2.0 | 2.4 | 1.0 | 2.2 | 1.5 |
| Ammonia Nitrogen | mg N/L | 1.2 | 1.5 | 1.6 | 2.0 | 0.8 | 1.8 | 1.2 |
| Nitrate | mg N/L | 2.73 | 1.69 | 1.90 | 1.90 | 0.98 | 2.05 | 1.64 |
| Nitrite | mg N/L | 0.257 | 0.059 | 0.058 | 0.073 | 0.042 | 0.081 | 0.039 |
| **Total Metals** | | | | | | | | |
| Aluminum | mg/L | 0.0587 | 2.4748 | 8.010 | 1.420 | 0.703 | 1.490 | 0.751 |
| Arsenic | mg/L | 0.0228 | 0.0290 | 0.0518 | 0.0182 | 0.0409 | 0.0209 | 0.0134 |
| Barium | mg/L | 0.272 | 0.337 | 0.122 | 0.371 | 0.158 | 0.561 | 0.471 |
| Cadmium | mg/L | 0.000051 | 0.000179 | 0.000051 | 0.000100 | 0.000048 | 0.000394 | 0.000300 |
| Chromium | mg/L | 0.0017 | 0.0214 | 0.0691 | 0.0118 | 0.0079 | 0.0100 | 0.0080 |
| Copper | mg/L | 0.00091 | 0.00603 | 0.0133 | 0.0051 | 0.0032 | 0.0047 | 0.0038 |
| Iron | mg/L | 1.094 | 7.362 | 18.30 | 8.00 | 3.49 | 4.62 | 2.40 |
| Lead | mg/L | 0.00022 | 0.00348 | 0.00879 | 0.00373 | 0.00174 | 0.00213 | 0.00099 |
| Manganese | mg/L | 1.14 | 2.99 | 0.50 | 2.01 | 1.22 | 6.51 | 4.73 |
| Mercury | mg/L | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.0021 | 0.0027 | 0.0030 | 0.0024 | 0.0029 | 0.0033 | < 0.0020 |
| Nickel | mg/L | 0.0229 | 0.0327 | 0.0387 | 0.0272 | 0.0195 | 0.0391 | 0.0388 |
| Selenium | mg/L | 0.00053 | 0.00037 | 0.00031 | 0.00036 | 0.00030 | 0.00053 | 0.00035 |
| Silver | mg/L | 0.00002 | 0.00005 | 0.000090 | < 0.000040 | < 0.000020 | < 0.000040 | < 0.000040 |
| Thallium | mg/L | 0.000043 | 0.000062 | 0.000130 | 0.000059 | 0.000032 | 0.000047 | 0.000041 |
| Zinc | mg/L | 0.005 | 0.016 | 0.038 | < 0.010 | < 0.005 | 0.017 | < 0.010 |

**Table 8-56 Whale Tail IVR WRSF Sump 2022 Water Quality Monitoring (ST-WT-28)**

| ST-WT-28 Parameter | Unit | *Annual Average* | 7/5/2022 | 8/1/2022 | 9/6/2022 |
|---|---|---|---|---|---|
| **Field Measured** | | | | | |
| Temperature | °C | *8.7* | 11.2 | 5.9 | 9.0 |
| pH | pH units | *7.05* | 7.15 | 7.31 | 6.69 |
| Conductivity | uS/cm | *296* | 486 | 396 | 6 |
| Turbidity | NTU | *8.6* | 6.1 | 17.3 | 2.4 |
| **Conventional Parameters** | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *1067* | 199 | 172 | 2830 |
| Total alkalinity, as $CaCO_3$ | mg/L | *54* | 61 | 63 | 39 |
| TDS | mg/L | *1323* | 315 | 265 | 3390 |
| TSS | mg/L | *10* | 3 | 11 | 16 |
| **Major Ions** | | | | | |
| Chloride | mg/L | *712* | 20 | 15 | 2100 |
| Fluoride | mg/L | *0.11* | 0.14 | < 0.10 | < 0.10 |
| Sulfate | mg/L | *99* | 110 | 76 | 110 |
| **Nutrients** | | | | | |
| Ammonia ($NH_3$) | mg/L | *0.45* | 0.69 | 0.36 | 0.29 |
| Ammonia Nitrogen | mg N/L | *0.37* | 0.57 | 0.29 | 0.24 |
| Nitrate | mg N/L | *6.76* | 7.52 | 8.71 | 4.05 |
| Nitrite | mg N/L | *0.063* | 0.108 | 0.052 | 0.028 |
| **Total Metals** | | | | | |
| Aluminum | mg/L | *0.2039* | 0.0996 | 0.4060 | 0.1060 |
| Arsenic | mg/L | *0.0627* | 0.0981 | 0.0670 | 0.0231 |
| Barium | mg/L | *0.2194* | 0.0663 | 0.0669 | 0.5250 |
| Cadmium | mg/L | *0.000238* | 0.000015 | 0.000026 | 0.000672 |
| Chromium | mg/L | *0.0075* | 0.0038 | 0.0138 | < 0.0050 |
| Copper | mg/L | *0.0016* | 0.0012 | 0.0012 | < 0.0025 |
| Iron | mg/L | *0.4247* | 0.181 | 0.702 | 0.391 |
| Lead | mg/L | *0.0008* | 0.0006 | 0.0009 | < 0.0010 |
| Manganese | mg/L | *2.038* | 0.203 | 0.262 | 5.650 |
| Mercury | mg/L | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0037* | 0.0040 | 0.0020 | < 0.0050 |
| Nickel | mg/L | *0.0606* | 0.0343 | 0.0385 | 0.1090 |
| Selenium | mg/L | *0.00059* | 0.00078 | 0.00044 | 0.00055 |
| Silver | mg/L | *0.000047* | < 0.00002 | < 0.00002 | < 0.00010 |
| Thallium | mg/L | *0.000138* | 0.000069 | 0.000067 | 0.000279 |
| Zinc | mg/L | *0.012* | < 0.005 | < 0.005 | < 0.025 |

**Table 8-57 Whale Tail IVR WRSF Ponding 2022 Water Quality Monitoring (ST-WT-35)**

| ST-WT-35 | Unit | *Annual Average* | | 5/29/2022 | 6/5/2022 | 7/5/2022 | 8/1/2022 | 9/10/2022 |
|---|---|---|---|---|---|---|---|---|
| Parameter | | *2021* | *2022* | | | | | |
| **Field Measured** | | | | | | | | |
| Temperature | °C | *6.2* | *5.2* | 0.2 | 4.1 | 9.9 | 6.9 | 4.7 |
| pH | pH units | *7.35* | *7.22* | 7.56 | 7.48 | 7.00 | 7.18 | 6.90 |
| Conductivity | uS/cm | *236* | *106* | 71.6 | 66.6 | 154.3 | 145.1 | 89.9 |
| Turbidity | NTU | *2.8* | *24.2* | 31.8 | 65.5 | 7.0 | 9.4 | 7.2 |
| **Conventional Parameters** | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *92* | *46* | 33.7 | 36.3 | 66.8 | 63.1 | 30.4 |
| Total alkalinity, as $CaCO_3$ | mg/L | *50* | *40* | 35 | 26 | 62 | 59 | 17 |
| TDS | mg/L | *138* | *65* | 30 | 15 | 120 | 95 | 65 |
| TSS | mg/L | *3* | *25* | 18 | 75 | 10 | 10 | 10 |
| **Major Ions** | | | | | | | | |
| Chloride | mg/L | *10* | *3* | 1.5 | < 1.0 | 3.9 | 4.0 | 2.6 |
| Fluoride | mg/L | *0.100* | *0.100* | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Sulfate | mg/L | *51* | *8* | 2 | 2 | 11 | 10 | 12 |
| **Nutrients** | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | *0.40* | *0.07* | < 0.061 | 0.130 | < 0.061 | < 0.061 | < 0.061 |
| Ammonia Nitrogen | mg N/L | *0.30* | *0.06* | < 0.050 | 0.110 | < 0.050 | < 0.050 | < 0.050 |
| Nitrate | mg N/L | *0.54* | *0.33* | 0.12 | < 0.10 | < 0.10 | < 0.10 | 1.25 |
| Nitrite | mg N/L | *0.065* | *0.014* | 0.013 | < 0.010 | < 0.010 | < 0.010 | 0.029 |
| **Total Metals** | | | | | | | | |
| Aluminum | mg/L | *0.08145* | *0.80080* | 0.715 | 2.580 | 0.255 | 0.158 | 0.296 |
| Arsenic | mg/L | *0.1365* | *0.0357* | 0.0509 | 0.0558 | 0.0413 | 0.0270 | 0.0035 |
| Barium | mg/L | *0.072* | *0.039* | 0.0295 | 0.0390 | 0.0568 | 0.0446 | 0.0273 |
| Cadmium | mg/L | *0.000020* | *0.000021* | 0.000021 | 0.000017 | 0.000023 | 0.000023 | 0.000020 |
| Chromium | mg/L | *0.0019* | *0.0291* | 0.0275 | 0.1010 | 0.0058 | 0.0035 | 0.0077 |
| Copper | mg/L | *0.00099* | *0.00184* | 0.00128 | 0.00298 | 0.00244 | 0.00136 | 0.00113 |
| Iron | mg/L | *0.306* | *2.107* | 1.460 | 4.260 | 0.943 | 3.350 | 0.521 |
| Lead | mg/L | *0.00031* | *0.00080* | 0.00071 | 0.00189 | 0.00062 | 0.00053 | 0.00026 |
| Manganese | mg/L | *0.41* | *0.67* | 0.098 | 0.136 | 0.669 | 1.860 | 0.568 |
| Mercury | mg/L | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | 0.00002 | 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0019* | *0.0013* | < 0.0010 | < 0.0010 | 0.0024 | < 0.0010 | < 0.0010 |
| Nickel | mg/L | *0.0177* | *0.0158* | 0.0163 | 0.0344 | 0.0122 | 0.0091 | 0.0068 |
| Selenium | mg/L | *0.00038* | *0.00016* | < 0.00010 | 0.00010 | 0.00026 | 0.00014 | 0.00020 |
| Silver | mg/L | *0.00002* | *0.00002* | < 0.000020 | 0.000021 | < 0.000020 | < 0.000020 | < 0.000020 |
| Thallium | mg/L | *0.000031* | *0.000026* | 0.000031 | 0.000052 | 0.000021 | 0.000013 | 0.000015 |
| Zinc | mg/L | *0.005* | *0.009* | < 0.0050 | 0.0077 | 0.0100 | 0.0190 | < 0.0050 |

**Table 8-58 Whale Tail IVR WRSF Ponding 2022 Water Quality Monitoring (ST-WT-36)**

| ST-WT-36 | Unit | *Annual Average* | | 5/29/2022 | 6/5/2022 | 7/5/2022 | 8/1/2022 | 9/4/2022 |
|---|---|---|---|---|---|---|---|---|
| Parameter | | *2021* | *2022* | | | | | |
| **Field Measured** | | | | | | | | |
| Temperature | °C | *6.6* | *6.3* | 0.7 | 5.8 | 10.5 | 6.4 | 8.0 |
| pH | pH units | *7.45* | *7.21* | 7.45 | 7.33 | 7.13 | 7.16 | 7.00 |
| Conductivity | uS/cm | *209* | *176* | 110 | 118 | 184 | 230 | 237 |
| Turbidity | NTU | *6.9* | *28.0* | 54.9 | 71.7 | 2.2 | 9.8 | 1.5 |
| **Conventional Parameters** | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *82* | *74* | 52 | 53 | 74 | 98 | 93 |
| Total alkalinity, as $CaCO_3$ | mg/L | *46* | *48* | 45 | 43 | 48 | 54 | 49 |
| TDS | mg/L | *148* | *104* | 70 | 45 | 115 | 140 | 150 |
| TSS | mg/L | *4* | *18* | 32 | 49 | 1 | 9 | < 1 |
| **Major Ions** | | | | | | | | |
| Chloride | mg/L | *7* | *5* | 3 | 2 | 5 | 7 | 9 |
| Fluoride | mg/L | *0.10* | *0.10* | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Sulfate | mg/L | *27* | *28* | 6 | 7 | 32 | 46 | 48 |
| **Nutrients** | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | *0.60* | *0.10* | 0.13 | 0.15 | 0.11 | < 0.06 | < 0.06 |
| Ammonia Nitrogen | mg N/L | *0.50* | *0.08* | 0.10 | 0.12 | 0.09 | < 0.05 | < 0.05 |
| Nitrate | mg N/L | *4.25* | *0.93* | 0.34 | 0.28 | 0.83 | 1.55 | 1.65 |
| Nitrite | mg N/L | *0.070* | *0.017* | 0.024 | 0.022 | 0.015 | 0.013 | < 0.010 |
| **Total Metals** | | | | | | | | |
| Aluminum | mg/L | *0.210* | *0.750* | 1.470 | 1.780 | 0.061 | 0.419 | 0.020 |
| Arsenic | mg/L | *0.1355* | *0.1460* | 0.210 | 0.155 | 0.175 | 0.102 | 0.088 |
| Barium | mg/L | *0.067* | *0.063* | 0.0486 | 0.0461 | 0.0645 | 0.0805 | 0.0747 |
| Cadmium | mg/L | *0.000010* | *0.000011* | 0.000015 | 0.000011 | < 0.000010 | < 0.000010 | < 0.000010 |
| Chromium | mg/L | *0.0059* | *0.0264* | 0.0530 | 0.0637 | 0.0018 | 0.0127 | < 0.0010 |
| Copper | mg/L | *0.00123* | *0.00146* | 0.00185 | 0.00231 | 0.00101 | 0.00131 | 0.00082 |
| Iron | mg/L | *0.327* | *1.317* | 2.60 | 3.03 | 0.13 | 0.79 | 0.04 |
| Lead | mg/L | *0.00030* | *0.00081* | 0.00152 | 0.00173 | < 0.00020 | 0.00042 | < 0.00020 |
| Manganese | mg/L | *0.0300* | *0.0679* | 0.1070 | 0.1140 | 0.0298 | 0.0385 | 0.0502 |
| Mercury | mg/L | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0013* | *0.0013* | 0.0016 | 0.0012 | 0.0015 | 0.0014 | 0.0010 |
| Nickel | mg/L | *0.0112* | *0.0200* | 0.0318 | 0.0314 | 0.0130 | 0.0154 | 0.0084 |
| Selenium | mg/L | *0.00058* | *0.00027* | 0.00015 | 0.00015 | 0.00027 | 0.00050 | 0.00030 |
| Silver | mg/L | *0.00002* | *0.00002* | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| Thallium | mg/L | *0.000021* | *0.000033* | 0.000042 | 0.000046 | 0.000023 | 0.000031 | 0.000021 |
| Zinc | mg/L | *0.005* | *0.005* | 0.0055 | 0.0058 | < 0.0050 | < 0.0050 | < 0.0050 |

**Table 8-59 Whale Tail IVR Diversion Ditch 2022 Water Quality Monitoring (ST-WT-37)**

| ST-WT-37 | MAX GRAB | MONTHLY MEAN | Unit | *Annual Average* | | 5/31/2022 | 6/5/2022 | 9/10/2022 |
|---|---|---|---|---|---|---|---|---|
| Parameter | | | | *2021* | *2022* | | | |
| **Field Measured** | | | | | | | | |
| Temperature | | | °C | *6.6* | *5.0* | 0.3 | 9.4 | 5.2 |
| pH | | | pH units | *7.81* | *7.36* | 7.39 | 7.46 | 7.22 |
| Conductivity | | | uS/cm | *41.9* | *53.0* | 30.2 | 34.3 | 94.5 |
| Turbidity | | | NTU | *3.79* | *7.49* | 12.20 | 7.44 | 2.82 |
| **Conventional Parameters** | | | | | | | | |
| TSS | 30 | 15 | mg/L | *2* | *5* | 10 | 3 | 1 |
| **Major Ions** | | | | | | | | |
| Sulfate | | | mg/L | *2.8* | *4.0* | < 1.0 | < 1.0 | 10 |
| **Nutrients** | | | | | | | | |
| Ammonia Nitrogen | | | mg N/L | *0.07* | *0.05* | < 0.050 | < 0.050 | < 0.050 |
| Un-Ionized Ammonia, calculated | | | mg N/L | *0.00102* | *0.00061* | < 0.00061 | < 0.00061 | < 0.00061 |
| **Total Metals** | | | | | | | | |
| Aluminum | | | mg/L | *0.111* | *0.217* | 0.443 | 0.165 | 0.044 |
| Arsenic | | | mg/L | *0.00231* | *0.00509* | 0.00810 | 0.00404 | 0.00312 |
| Copper | | | mg/L | *0.0010* | *0.0011* | 0.00104 | 0.00085 | 0.00129 |
| Lead | | | mg/L | *0.00020* | *0.00025* | 0.00034 | < 0.00020 | < 0.00020 |
| Nickel | | | mg/L | *0.0025* | *0.0043* | 0.0064 | 0.0032 | 0.0032 |
| Zinc | | | mg/L | *0.005* | *0.005* | < 0.0050 | < 0.0050 | < 0.0050 |

#### *8.5.3.2.15 Whale Tail / IVR Attenuation Pond Discharge*

##### *8.5.3.2.15.1 Mammoth Lake (ST-WT-2 and ST-WT-2a)*

There are two active submerged diffusers to facilitate discharge from the Whale Tail and IVR Attenuation Ponds to Mammoth Lake, the East and West Diffuser. As per Water License 2AM-WTP1830, the discharge from the East and West diffusers are to be sampled weekly during discharge.

The East diffuser sampling station is ST-WT-2a and discharge occurred from June 16th to June 30th, 2022 and July 24th to September 20th, 2022. A total volume of 872,789 $m^3$ was discharged in 2022. The results for ST-WT-2a are provided in Table 8-60. There were no exceedances of Water License or MDMER criteria in 2022. The sampling location is outlined in Figure 4.

No water was discharged through Mammoth Lake West Diffuser (ST-WT-2) in 2022.

Effluents have demonstrated to be non-acutely lethal. Refer to Section 8.3.2 (MDMER-7 and MDMER-8) above for the results.

##### *8.5.3.2.15.2 Whale Tail South (ST-WT-24 and ST-WT-24a)*

In 2022, water from Whale Tail and IVR Attenuation Ponds was discharged to Whale Tail South in the approved submerged diffusers. As per Water License 2AM-WTP1830 the discharge are sampled on a weekly basis during discharge.

The permanent diffuser sampling station is ST-WT-24 and was discharging January 7th to January 13th, February 26th to February 28th, April 3rd to 6th, April 24th to 25th, May 22nd to June 16th, October 3rd to 29th. A total volume of 1,115,285 $m^3$ was discharged. The location is outlined in Figure 4 and 2022 results from ST-WT-24 are provided in Table 8-61.

During the month of April, the level of Total arsenic (As) concentrations from the treated discharge into Whale Tail South Lake (ST-MDMER-11/ST-WT-24) exceeded the maximum limits set out in 2AM-WTP1830 Part F Item 5 for maximum authorized concentration in a grab sample (0.20mg/L) and maximum authorized monthly mean concentration (0.10mg/L), and MDMER Schedule 4, Table 2, for the maximum authorized monthly mean concentration (0.30mg/L).

Effluents have demonstrated to be non-acutely lethal, however in May, the monthly acute toxicity test collected on May 23rd for rainbow trout as required by MDMER Section 14.1 and the Water License Part F Section 6 (a) was deemed invalid due to the mortality in the blank of the test exceeding the acceptable percentage (10% or less), thus invalidating the test according to the criteria of the reference method. This event was reported to ECCC and CIRNAC on June 2nd and a follow-up report was submitted to the inspectors on June 23rd. Refer to Section 8.3.2 (MDMER-11) above for the results.

No water was discharged through Whale Tail South Lake Temporary Diffuser (ST-WT-24a) in 2022.

**Table 8-60 Whale Tail / IVR Attenuation Pond Discharge to Mammoth Lake East Diffuser (ST-WT-2a)**

| ST-WT-2a | MAX GRAB | MONTHLY MEAN | Unit | *Annual Average* | | | 6/18/2022 | 6/20/2022 | 6/27/2022 | 7/25/2022 | 8/1/2022 | 8/8/2022 | 8/15/2022 | 8/22/2022 | 8/29/2022 | 9/5/2022 | 9/12/2022 | 9/19/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | | | | *2020* | *2021* | *2022* | | | | | | | | | | | | |
| **Field Measured** | | | | | | | | | | | | | | | | | | |
| Temperature | | | °C | *7.4* | *7.1* | *7.7* | 3.4 | 3.5 | 4.0 | 12.7 | 11.0 | 11.5 | 11.3 | 8.7 | 6.9 | 8.2 | 5.5 | 5.4 |
| pH | 6.0-9.5 | 6.0-9.5 | pH units | *6.89* | *7.11* | *6.96* | 6.91 | 6.89 | 6.66 | 7.05 | 6.83 | 7.39 | 6.89 | 7.18 | 6.60 | 7.20 | 6.98 | 6.91 |
| Conductivity | | | uS/cm | *437.2* | *315.8* | *379.1* | 196 | 184 | 186 | 380 | 336 | 368 | 383 | 403 | 422 | 427 | 607 | 658 |
| Turbidity | | | NTU | *7.6* | *1.1* | *1.1* | 1.12 | 0.76 | 0.68 | 0.85 | 1.14 | 2.45 | 1.36 | 1.02 | 0.88 | 0.70 | 1.25 | 1.16 |
| **Conventional Parameters** | | | | | | | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | | | mg/L | *205* | *121* | *136* | 66 | 62 | 62 | 136 | 118 | 123 | 132 | 142 | 152 | 152 | 241 | 251 |
| Total alkalinity, as $CaCO_3$ | | | mg/L | *47* | *36* | *39* | 32 | 31 | 30 | 48 | 38 | 37 | 39 | 40 | 41 | 45 | 46 | 41 |
| Carbonate, as $CaCO_3$ | | | mg/L | *5* | *1* | *1* | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bicarbonate, as $CaCO_3$ | | | mg/L | *47* | *36* | *39* | 32 | 31 | 30 | 48 | 38 | 37 | 39 | 40 | 41 | 45 | 46 | 40 |
| TDS | | | mg/L | *-* | *232* | *234* | 105 | 100 | 105 | 210 | 225 | 235 | 245 | 240 | 250 | 260 | 385 | 445 |
| TSS | 30 | 15 | mg/L | *6* | *1* | *2* | < 1 | < 1 | 1 | < 1 | 2 | 4 | 3 | 2 | 1 | < 1 | 3 | 2 |
| Total organic carbon | | | mg/L | *3.0* | *3.4* | *2.4* | 2.0 | 1.9 | 1.8 | 2.1 | 2.5 | 2.4 | 2.6 | 2.4 | 2.8 | 2.2 | 2.9 | 3.0 |
| Dissolved organic carbon | | | mg/L | *3.5* | *3.1* | *2.2* | 1.6 | 1.6 | 1.7 | 2.1 | 2.3 | 2.2 | 2.5 | 2.3 | 2.4 | 2.1 | 2.7 | 2.8 |
| **Major Ions** | | | | | | | | | | | | | | | | | | |
| Chloride | | | mg/L | *78* | *37* | *43* | 18 | 17 | 19 | 43 | 37 | 39 | 38 | 40 | 42 | 42 | 79 | 100 |
| Silica | | | mg/L | *5.9* | *5.5* | *4.6* | 3.5 | 3.1 | 3.7 | 5.1 | 4.6 | 4.4 | 4.7 | 4.2 | 4.5 | 5.4 | 5.7 | 5.7 |
| Sulfate | | | mg/L | *48* | *55* | *63* | 34 | 32 | 30 | 54 | 54 | 62 | 65 | 66 | 72 | 81 | 110 | 100 |
| **Nutrients** | | | | | | | | | | | | | | | | | | |
| Ammonia ($NH_3$) | | | mg/L | *-* | *1.07* | *0.49* | 0.38 | 0.30 | 0.34 | 0.35 | < 0.06 | 0.39 | 0.81 | 0.29 | 0.25 | 0.82 | 1.30 | 0.62 |
| Ammonia Nitrogen | 32 | 16 | mg N/L | *1.63* | *0.89* | *0.41* | 0.31 | 0.25 | 0.28 | 0.29 | < 0.05 | 0.32 | 0.67 | 0.24 | 0.21 | 0.67 | 1.10 | 0.51 |
| Nitrate | | | mg N/L | *3.21* | *2.36* | *3.47* | 0.81 | 0.73 | 0.91 | 3.82 | 3.43 | 3.35 | 4.19 | 4.45 | 5.35 | 4.66 | 5.00 | 4.89 |
| Nitrite | | | mg N/L | *0.180* | *0.185* | *0.075* | 0.057 | 0.042 | 0.032 | 0.088 | 0.054 | 0.061 | 0.107 | 0.080 | 0.081 | 0.095 | 0.128 | 0.073 |
| Total Kjeldahl nitrogen | | | mg N/L | *2.13* | *1.14* | *0.61* | 0.41 | 0.35 | 0.50 | 0.33 | 0.39 | 0.48 | 0.89 | 0.45 | 0.72 | 1.00 | 1.30 | 0.54 |
| Total phosphorus | 0.6 | 0.3 | mg P/L | *0.0141* | *0.0025* | *0.0021* | 0.0014 | 0.0024 | 0.0020 | < 0.0010 | 0.0100 | < 0.0010 | < 0.0010 | < 0.0010 | 0.0014 | < 0.0010 | 0.0019 | 0.0013 |
| Orthophosphate | | | mg P/L | *0.01* | *0.01* | *0.01* | < 0.010 | < 0.010 | < 0.010 | < 0.010 | 0.011 | < 0.010 | < 0.010 | < 0.010 | 0.010 | < 0.010 | < 0.010 | < 0.010 |
| **Total Metals** | | | | | | | | | | | | | | | | | | |
| Aluminum | 1 | 0.5 | mg/L | *0.026* | *0.011* | *0.010* | 0.0084 | 0.0074 | 0.0066 | 0.0105 | 0.0113 | 0.0158 | 0.0130 | 0.0099 | 0.0055 | 0.0037 | 0.0136 | 0.0132 |
| Antimony | | | mg/L | *0.0013* | *0.0085* | *0.0072* | 0.00459 | 0.00376 | 0.00340 | 0.00844 | 0.00669 | 0.00550 | 0.00625 | 0.00568 | 0.00523 | 0.00850 | 0.01540 | 0.01340 |
| Arsenic | 0.2 | 0.1 | mg/L | *0.00456* | *0.00847* | *0.00963* | 0.0050 | 0.0023 | 0.0013 | 0.0036 | 0.0072 | 0.0120 | 0.0065 | 0.0052 | 0.0042 | 0.0054 | 0.0220 | 0.0409 |
| Barium | | | mg/L | *0.0902* | *0.0479* | *0.0515* | 0.0297 | 0.0268 | 0.0289 | 0.0674 | 0.0487 | 0.0516 | 0.0490 | 0.0528 | 0.0499 | 0.0589 | 0.0733 | 0.0813 |
| Beryllium | | | mg/L | *0.0005* | *0.0001* | *0.0001* | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 |
| Boron | | | mg/L | *0.01* | *0.05* | *0.05* | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Cadmium | 0.004 | 0.002 | mg/L | *0.000020* | *0.000017* | *0.000012* | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000011 | 0.000014 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000019 | 0.000022 |
| Calcium (total) | | | mg/L | *61* | *34* | *39* | 18.8 | 17.7 | 18.1 | 38.5 | 33.6 | 34.6 | 37.7 | 39.7 | 43.8 | 43.7 | 68.8 | 73.0 |
| Chromium | 0.04 | 0.02 | mg/L | *0.0007* | *0.0010* | *0.0010* | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Copper | 0.2 | 0.1 | mg/L | *0.00297* | *0.00174* | *0.00099* | 0.0010 | 0.0008 | 0.0008 | 0.0010 | 0.0009 | 0.0010 | 0.0014 | 0.0010 | 0.0009 | 0.0011 | 0.0012 | 0.0010 |
| Iron | 2 | 1 | mg/L | *0.568* | *0.181* | *0.262* | 0.053 | 0.053 | 0.054 | 0.095 | 0.354 | 0.749 | 0.481 | 0.307 | 0.221 | 0.151 | 0.276 | 0.351 |
| Lead | 0.1 | 0.05 | mg/L | *0.00023* | *0.00021* | *0.00020* | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Lithium | | | mg/L | *0.0091* | *0.0062* | *0.0072* | 0.0027 | 0.0026 | 0.0028 | 0.0084 | 0.0055 | 0.0058 | 0.0057 | 0.0059 | 0.0063 | 0.0077 | 0.0149 | 0.0185 |
| Magnesium (total) | | | mg/L | *12.77* | *9.14* | *9.48* | 4.6 | 4.3 | 4.1 | 9.8 | 8.4 | 8.8 | 9.2 | 10.4 | 10.3 | 10.5 | 16.8 | 16.6 |
| Manganese | | | mg/L | *0.558* | *0.247* | *0.177* | 0.205 | 0.180 | 0.185 | 0.173 | 0.105 | 0.202 | 0.150 | 0.108 | 0.095 | 0.193 | 0.334 | 0.192 |
| Mercury | 0.008 | 0.004 | mg/L | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | | | mg/L | *0.0033* | *0.0029* | *0.0059* | 0.0028 | 0.0022 | 0.0025 | 0.0047 | 0.0037 | 0.0032 | 0.0074 | 0.0076 | 0.0083 | 0.0102 | 0.0098 | 0.0082 |
| Nickel | 0.5 | 0.25 | mg/L | *0.0221* | *0.0185* | *0.0213* | 0.0162 | 0.0125 | 0.0118 | 0.0121 | 0.0157 | 0.0244 | 0.0176 | 0.0144 | 0.0138 | 0.0292 | 0.0532 | 0.0343 |
| Potassium (total) | | | mg/L | *12.14* | *8.65* | *9.47* | 4.4 | 4.2 | 4.1 | 11.0 | 8.9 | 9.3 | 10.5 | 11.0 | 10.6 | 10.3 | 15.0 | 14.3 |
| Selenium | | | mg/L | *0.00097* | *0.00040* | *0.00026* | 0.00011 | 0.00010 | < 0.00010 | 0.00021 | 0.00017 | 0.00024 | 0.00024 | 0.00020 | 0.00025 | 0.00032 | 0.00062 | 0.00052 |
| Sodium (total) | | | mg/L | *7.99* | *6.72* | *11.32* | 8.4 | 7.7 | 6.5 | 13.1 | 11.1 | 12.0 | 11.8 | 12.1 | 13.1 | 11.9 | 15.1 | 13.1 |
| Strontium | | | mg/L | *0.384* | *0.274* | *0.341* | 0.153 | 0.141 | 0.154 | 0.354 | 0.262 | 0.281 | 0.297 | 0.310 | 0.335 | 0.360 | 0.673 | 0.766 |
| Thallium | | | mg/L | *0.000200* | *0.000015* | *0.000021* | 0.000012 | 0.000011 | 0.000011 | 0.000030 | 0.000023 | 0.000022 | 0.000026 | 0.000023 | 0.000021 | 0.000022 | 0.000026 | 0.000021 |

| ST-WT-2a | MAX GRAB | MONTHLY MEAN | Unit | Annual Average | | | 6/18/2022 | 6/20/2022 | 6/27/2022 | 7/25/2022 | 8/1/2022 | 8/8/2022 | 8/15/2022 | 8/22/2022 | 8/29/2022 | 9/5/2022 | 9/12/2022 | 9/19/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | | | 2020 | 2021 | 2022 | | | | | | | | | | | | |
| Tin | | | mg/L | *0.0010* | *0.0050* | *0.0050* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Titanium | | | mg/L | *0.0100* | *0.0050* | *0.0050* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Uranium | | | mg/L | *0.00112* | *0.00116* | *0.00122* | 0.00056 | 0.00038 | 0.00045 | 0.00172 | 0.00082 | 0.00072 | 0.00072 | 0.00109 | 0.00148 | 0.00143 | 0.00266 | 0.00265 |
| Vanadium | | | mg/L | *0.0005* | *0.0050* | *0.0050* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Zinc | 0.2 | 0.1 | mg/L | *0.0096* | *0.0081* | *0.0055* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | 0.0059 | 0.0076 | < 0.0050 | < 0.0050 | 0.0063 | 0.0066 | < 0.0050 |
| **Dissolved Metals** | | | | | | | | | | | | | | | | | | |
| Aluminum | | | mg/L | *0.0060* | *0.0042* | *0.0038* | < 0.0030 | < 0.0030 | 0.0030 | 0.0114 | < 0.0030 | < 0.0030 | 0.0036 | < 0.0030 | < 0.0030 | < 0.0030 | < 0.0030 | < 0.0030 |
| Antimony | | | mg/L | *0.00123* | *0.00843* | *0.00749* | 0.0044 | 0.0082 | 0.0035 | 0.0083 | 0.0069 | 0.0054 | 0.0059 | 0.0055 | 0.0052 | 0.0081 | 0.0156 | 0.0130 |
| Arsenic | | | mg/L | *0.00214* | *0.00622* | *0.02057* | 0.00424 | 0.21700 | 0.00075 | 0.00220 | 0.00250 | 0.00144 | 0.00132 | 0.00122 | 0.00137 | 0.00217 | 0.00706 | 0.00559 |
| Barium | | | mg/L | *0.08053* | *0.04832* | *0.05180* | 0.0284 | 0.0415 | 0.0279 | 0.0659 | 0.0512 | 0.0519 | 0.0454 | 0.0505 | 0.0498 | 0.0562 | 0.0739 | 0.0790 |
| Beryllium | | | mg/L | *0.0005* | *0.0001* | *0.0001* | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 |
| Boron | | | mg/L | *0.01* | *0.05* | *0.05* | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Cadmium | | | mg/L | *0.000020* | *0.000018* | *0.000011* | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000013 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000023 |
| Chromium | | | mg/L | *0.0006* | *0.0010* | *0.0010* | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Copper | | | mg/L | *0.00259* | *0.00169* | *0.00120* | 0.00088 | 0.00195 | 0.00074 | 0.00096 | 0.00120 | 0.00102 | 0.00132 | 0.00102 | 0.00184 | 0.00122 | 0.00135 | 0.00094 |
| Iron | | | mg/L | *0.019* | *0.085* | *0.017* | 0.0140 | 0.0118 | 0.0142 | 0.0143 | 0.0175 | 0.0119 | 0.0214 | 0.0228 | 0.0154 | 0.0138 | 0.0247 | 0.0188 |
| Lead | | | mg/L | *0.00023* | *0.00021* | *0.00020* | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Lithium | | | mg/L | *0.0083* | *0.0059* | *0.0074* | 0.0027 | 0.0038 | 0.0026 | 0.0078 | 0.0064 | 0.0059 | 0.0054 | 0.0056 | 0.0066 | 0.0073 | 0.0156 | 0.0190 |
| Manganese | | | mg/L | *0.6743* | *0.2490* | *0.1758* | 0.204 | 0.182 | 0.182 | 0.174 | 0.106 | 0.199 | 0.141 | 0.101 | 0.092 | 0.191 | 0.333 | 0.204 |
| Mercury | | | mg/L | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | | | mg/L | *0.0029* | *0.0029* | *0.0059* | 0.0027 | 0.0055 | 0.0024 | 0.0044 | 0.0033 | 0.0030 | 0.0069 | 0.0075 | 0.0081 | 0.0091 | 0.0094 | 0.0081 |
| Nickel | | | mg/L | *0.0184* | *0.0186* | *0.0240* | 0.0157 | 0.0457 | 0.0121 | 0.0125 | 0.0158 | 0.0239 | 0.0182 | 0.0147 | 0.0129 | 0.0308 | 0.0511 | 0.0345 |
| Selenium | | | mg/L | *0.00097* | *0.00041* | *0.00025* | 0.00011 | 0.00020 | < 0.00010 | 0.00020 | 0.00017 | 0.00020 | 0.00024 | 0.00022 | 0.00024 | 0.00035 | 0.00050 | 0.00051 |
| Strontium | | | mg/L | *0.3472* | *0.2770* | *0.3462* | 0.150 | 0.188 | 0.153 | 0.348 | 0.304 | 0.295 | 0.288 | 0.297 | 0.322 | 0.361 | 0.670 | 0.778 |
| Thallium | | | mg/L | *0.000200* | *0.000016* | *0.000021* | 0.000012 | 0.000015 | 0.000013 | 0.000030 | 0.000023 | 0.000023 | 0.000025 | 0.000024 | 0.000020 | 0.000024 | 0.000017 | 0.000024 |
| Tin | | | mg/L | *0.001* | *0.005* | *0.005* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Titanium | | | mg/L | *0.010* | *0.005* | *0.005* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Uranium | | | mg/L | *0.0011* | *0.0011* | *0.0012* | 0.00058 | 0.00076 | 0.00043 | 0.00157 | 0.00080 | 0.00056 | 0.00058 | 0.00106 | 0.00141 | 0.00138 | 0.00260 | 0.00259 |
| Vanadium | | | mg/L | *0.001* | *0.005* | *0.005* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Zinc | | | mg/L | *0.0084* | *0.0093* | *0.0059* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | 0.0070 | 0.0085 | 0.0065 | 0.0058 | 0.0074 | < 0.0050 |
| **Volatile Organics** | | | | | | | | | | | | | | | | | | |
| Petroleum Hydrocarbons F (C10-C50) | 6 | 3 | mg/L | *0.1* | *0.5* | *0.2* | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |

**Table 8-61 Whale Tail / IVR Attenuation Pond Discharge to Whale Tail South Permanent Diffuser (ST-WT-24)**

| ST-WT-24 | MAX GRAB | MONTHLY MEAN | Unit | Annual Average | | | 1/8/2022 | 1/10/2022 | 2/26/2022 | 2/28/2022 | 4/3/2022 | 4/25/2022 | 5/23/2022 | 5/30/2022 | 6/6/2022 | 6/13/2022 | 10/3/2022 | 10/10/2022 | 10/17/2022 | 10/24/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | | | *2020* | *2021* | *2022* | | | | | | | | | | | | | | |
| **Field Measured** | | | | | | | | | | | | | | | | | | | | |
| Temperature | | | °C | *0.8* | *1.4* | *1.1* | 0.7 | -0.3 | 0.5 | 0.7 | 0.7 | 0.3 | 0.2 | 0.5 | 3.4 | 4.5 | 2.1 | 0.6 | 0.6 | 1.0 |
| pH | 6.0-9.5 | 6.0-9.5 | pH units | *7.09* | *7.01* | *7.04* | 6.67 | 7.03 | 7.04 | 6.65 | 7.30 | 7.15 | 6.87 | 6.73 | 6.86 | 7.11 | 7.19 | 7.01 | 7.57 | 7.36 |
| Conductivity | | | uS/cm | *239* | *308* | *430* | 492 | 239 | 471 | 528 | 540 | 534 | 274 | 280 | 248 | 173 | 545 | 600 | 573 | 530 |
| Turbidity | | | NTU | *1.0* | *0.8* | *1.4* | 3.75 | 0.59 | 1.89 | 1.62 | 1.09 | 0.61 | 1.13 | 1.66 | 1.75 | 2.02 | 1.86 | 0.59 | 0.86 | 0.77 |
| **Conventional Parameters** | | | | | | | | | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | | | mg/L | *104* | *116* | *163* | 195 | 94 | 192 | 210 | 188 | 203 | 100 | 94 | 79 | 59 | 211 | 240 | 219 | 204 |
| Total alkalinity, as $CaCO_3$ | | | mg/L | *52* | *41* | *57* | 72 | 40 | 79 | 80 | 85 | 87 | 42 | 45 | 38 | 29 | 41 | 49 | 46 | 58 |
| Carbonate, as $CaCO_3$ | | | mg/L | *4* | *1* | *1* | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bicarbonate, as $CaCO_3$ | | | mg/L | *51* | *40* | *56* | 72 | 40 | 79 | 80 | 84 | 87 | 41 | 45 | 38 | 29 | 41 | 48 | 45 | 57 |
| TDS | | | mg/L | *-* | *196* | *272* | 440 | 265 | 265 | 320 | 310 | 315 | 180 | 165 | 95 | 130 | 320 | 360 | 325 | 315 |
| TSS | 30 | 15 | mg/L | *3* | *2* | *3* | 8 | 2 | 4 | 14 | 1 | < 2 | 2 | < 1 | 2 | 2 | 2 | 2 | < 1 | 2 |
| Total organic carbon | | | mg/L | *4.0* | *2.6* | *2.9* | 3.5 | 2.4 | 3.8 | 3.5 | 2.8 | 3.4 | 2.7 | 2.7 | 3.0 | 2.0 | 2.5 | 2.6 | 2.5 | 2.6 |
| Dissolved organic carbon | | | mg/L | *3.0* | *2.5* | *2.6* | 3.3 | 2.4 | 3.6 | 3.3 | 2.7 | 3.4 | 2.2 | 2.3 | 2.2 | 1.8 | 2.5 | 2.4 | 2.3 | 2.5 |
| **Major Ions** | | | | | | | | | | | | | | | | | | | | |
| Chloride | | | mg/L | *33.5* | *33.5* | *50.6* | 46 | 23 | 49 | 64 | 58 | 63 | 32 | 30 | 27 | 17 | 81 | 79 | 69 | 71 |
| Silica | | | mg/L | *7.8* | *7.2* | *9.4* | 13 | 8 | 12 | 15 | 18 | 18 | 7 | 6 | 4 | 3 | 5 | 6 | 11 | 6 |
| Sulfate | | | mg/L | *31* | *51* | *66* | 84 | 39 | 60 | 72 | 71 | 68 | 41 | 39 | 33 | 31 | 92 | 110 | 100 | 88 |
| **Nutrients** | | | | | | | | | | | | | | | | | | | | |
| Ammonia ($NH_3$) | | | mg/L | *-* | *0.83* | *1.18* | 0.36 | 0.15 | 0.43 | 1.80 | 3.60 | 2.70 | 0.44 | 0.51 | 0.82 | 0.47 | 0.59 | 1.10 | 0.86 | 2.70 |
| Ammonia Nitrogen | 32 | 16 | mg N/L | *-* | *0.73* | *0.98* | 0.29 | 0.13 | 0.35 | 1.50 | 3.00 | 2.30 | 0.36 | 0.42 | 0.67 | 0.39 | 0.48 | 0.88 | 0.71 | 2.30 |
| Nitrate | | | mg N/L | *1.33* | *1.65* | *2.55* | 2.45 | 0.60 | 0.91 | 2.36 | 3.64 | 3.50 | 1.12 | 0.88 | 1.26 | 0.79 | 4.20 | 4.27 | 4.42 | 5.23 |
| Nitrite | | | mg N/L | *0.048* | *0.064* | *0.054* | 0.034 | < 0.010 | < 0.010 | 0.071 | 0.118 | 0.090 | 0.033 | 0.037 | 0.054 | 0.041 | 0.044 | 0.072 | 0.054 | 0.087 |
| Total Kjeldahl nitrogen | | | mg N/L | *1.54* | *0.90* | *1.19* | 0.59 | 0.28 | 0.47 | 1.70 | 3.10 | 2.30 | 0.64 | 0.62 | 0.91 | 0.76 | 0.54 | 1.60 | 1.00 | 2.20 |
| Total phosphorus | 0.6 | 0.3 | mg P/L | *0.027* | *0.009* | *0.003* | < 0.0010 | 0.0080 | 0.0019 | 0.0039 | 0.0029 | 0.0056 | 0.0027 | 0.0076 | 0.0046 | < 0.0010 | < 0.0010 | 0.0017 | 0.0024 | 0.0013 |
| Orthophosphate | | | mg P/L | *0.01* | *0.01* | *0.02* | < 0.010 | < 0.010 | < 0.010 | < 0.010 | 0.097 | 0.030 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| **Total Metals** | | | | | | | | | | | | | | | | | | | | |
| Aluminum | 1 | 0.5 | mg/L | *0.0270* | *0.0149* | *0.0179* | 0.0545 | 0.0079 | 0.0240 | 0.0457 | 0.0100 | 0.0065 | 0.0109 | 0.0088 | 0.0298 | 0.0181 | 0.0107 | 0.0078 | 0.0061 | 0.0093 |
| Antimony | | | mg/L | *0.00026* | *0.00414* | *0.01579* | 0.00672 | 0.00086 | 0.00324 | 0.02400 | 0.06740 | 0.05470 | 0.00518 | 0.00533 | 0.00735 | 0.00452 | 0.01020 | 0.01160 | 0.01110 | 0.00888 |
| Arsenic | 0.2 | 0.1 | mg/L | *0.00199* | *0.00373* | *0.05714* | 0.0135 | 0.0013 | 0.0089 | 0.0612 | 0.4480 | 0.1850 | 0.0071 | 0.0054 | 0.0087 | 0.0049 | 0.0132 | 0.0136 | 0.0127 | 0.0163 |
| Barium | | | mg/L | *0.05634* | *0.04894* | *0.06541* | 0.0916 | 0.0404 | 0.0982 | 0.0991 | 0.0685 | 0.0920 | 0.0454 | 0.0422 | 0.0362 | 0.0263 | 0.0579 | 0.0703 | 0.0677 | 0.0800 |
| Beryllium | | | mg/L | *0.0006* | *0.0002* | *0.0001* | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 |
| Boron | | | mg/L | *0.028* | *0.044* | *0.050* | < 0.050 | < 0.050 | < 0.050 | < 0.050 | 0.052 | 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Cadmium | 0.004 | 0.002 | mg/L | *0.000029* | *0.000018* | *0.000014* | 0.000032 | < 0.000010 | 0.000020 | < 0.000010 | 0.000014 | 0.000014 | 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000011 | 0.000014 | 0.000016 | 0.000016 |
| Calcium (total) | | | mg/L | *29.31* | *32.38* | *46.96* | 56.3 | 28.0 | 55.8 | 59.7 | 50.7 | 54.5 | 29.5 | 27.4 | 22.3 | 16.6 | 62.3 | 70.7 | 63.6 | 60.0 |
| Chromium | 0.04 | 0.02 | mg/L | *0.0006* | *0.0010* | *0.0010* | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Copper | 0.2 | 0.1 | mg/L | *0.0025* | *0.0014* | *0.0017* | 0.00285 | 0.00134 | 0.00175 | 0.00145 | 0.00352 | 0.00387 | 0.00101 | 0.00151 | 0.00095 | 0.00088 | 0.00077 | 0.00118 | 0.00105 | 0.00169 |
| Iron | 2 | 1 | mg/L | *0.393* | *0.231* | *0.285* | 0.994 | 0.282 | 0.655 | 0.211 | 0.105 | 0.254 | 0.168 | 0.133 | 0.234 | 0.126 | 0.211 | 0.181 | 0.167 | 0.270 |
| Lead | 0.1 | 0.05 | mg/L | *0.000174* | *0.000196* | *0.000203* | 0.00021 | < 0.00020 | < 0.00020 | < 0.00020 | 0.00023 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Lithium | | | mg/L | *0.0060* | *0.0048* | *0.0079* | 0.0074 | 0.0033 | 0.0071 | 0.0077 | 0.0074 | 0.0067 | 0.0056 | 0.0064 | 0.0063 | 0.0026 | 0.0128 | 0.0138 | 0.0124 | 0.0109 |
| Magnesium (total) | | | mg/L | *7.0* | *8.1* | *11.2* | 13.3 | 5.8 | 12.9 | 14.9 | 14.9 | 16.1 | 6.4 | 6.2 | 5.6 | 4.3 | 13.4 | 15.5 | 14.6 | 13.1 |
| Manganese | | | mg/L | *0.249* | *0.261* | *0.294* | 0.350 | 0.298 | 0.383 | 0.444 | 0.360 | 0.421 | 0.274 | 0.309 | 0.226 | 0.166 | 0.172 | 0.261 | 0.224 | 0.227 |
| Mercury | 0.008 | 0.004 | mg/L | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | | | mg/L | *0.0047* | *0.0037* | *0.0072* | 0.0043 | 0.0020 | 0.0069 | 0.0110 | 0.0111 | 0.0113 | 0.0040 | 0.0039 | 0.0029 | 0.0020 | 0.0084 | 0.0079 | 0.0077 | 0.0173 |
| Nickel | 0.5 | 0.25 | mg/L | *0.0045* | *0.0157* | *0.0541* | 0.0333 | 0.0057 | 0.0241 | 0.0746 | 0.2150 | 0.1890 | 0.0257 | 0.0260 | 0.0156 | 0.0128 | 0.0234 | 0.0374 | 0.0378 | 0.0375 |
| Potassium (total) | | | mg/L | *5.79* | *6.77* | *9.61* | 12.7 | 5.9 | 10.9 | 11.2 | 11.1 | 12.5 | 6.1 | 6.7 | 6.3 | 4.1 | 10.9 | 12.6 | 12.0 | 11.6 |
| Selenium | | | mg/L | *0.00057* | *0.00033* | *0.00022* | 0.00025 | < 0.00010 | 0.00014 | 0.00015 | 0.00016 | 0.00017 | < 0.00010 | < 0.00010 | 0.00012 | < 0.00010 | 0.00042 | 0.00052 | 0.00042 | 0.00033 |
| Sodium (total) | | | mg/L | *5.80* | *6.47* | *10.95* | 11.6 | 4.7 | 10.7 | 14.7 | 14.1 | 14.7 | 8.0 | 10.1 | 7.2 | 7.6 | 12.3 | 13.1 | 12.4 | 12.1 |
| Strontium | | | mg/L | *0.218* | *0.254* | *0.392* | 0.458 | 0.287 | 0.428 | 0.383 | 0.323 | 0.405 | 0.251 | 0.239 | 0.208 | 0.136 | 0.595 | 0.668 | 0.570 | 0.537 |
| Thallium | | | mg/L | *0.000177* | *0.000038* | *0.000017* | 0.000021 | < 0.000010 | 0.000018 | < 0.000010 | 0.000023 | 0.000026 | 0.000013 | 0.000013 | < 0.000010 | < 0.000010 | 0.000016 | 0.000022 | 0.000021 | 0.000021 |

| ST-WT-24 | MAX GRAB | MONTHLY MEAN | Unit | *Annual Average* | | | 1/8/2022 | 1/10/2022 | 2/26/2022 | 2/28/2022 | 4/3/2022 | 4/25/2022 | 5/23/2022 | 5/30/2022 | 6/6/2022 | 6/13/2022 | 10/3/2022 | 10/10/2022 | 10/17/2022 | 10/24/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | | | | *2020* | *2021* | *2022* | | | | | | | | | | | | | | |
| Tin | | | mg/L | *0.002* | *0.004* | *0.005* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Titanium | | | mg/L | *0.009* | *0.006* | *0.005* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Uranium | | | mg/L | *0.00098* | *0.00117* | *0.00261* | 0.00335 | 0.00062 | 0.00622 | 0.00652 | 0.00236 | 0.00460 | 0.00051 | 0.00055 | 0.00084 | 0.00038 | 0.00323 | 0.00262 | 0.00236 | 0.00232 |
| Vanadium | | | mg/L | *0.00050* | *0.00440* | *0.00500* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Zinc | 0.2 | 0.1 | mg/L | *0.0058* | *0.0073* | *0.0070* | 0.0091 | 0.0066 | 0.0097 | 0.0072 | 0.0071 | 0.0126 | 0.0077 | 0.0085 | < 0.0050 | 0.0050 | < 0.0050 | < 0.0050 | 0.0050 | < 0.0050 |
| **Dissolved Metals** | | | | | | | | | | | | | | | | | | | | |
| Aluminum | | | mg/L | *0.0048* | *0.0034* | *0.0030* | < 0.0030 | < 0.0030 | < 0.0030 | < 0.0030 | < 0.0030 | < 0.0030 | 0.0030 | < 0.0030 | < 0.0030 | < 0.0030 | < 0.0030 | < 0.0030 | < 0.0030 | < 0.0030 |
| Antimony | | | mg/L | *0.00036* | *0.00405* | *0.01547* | 0.00643 | 0.00084 | 0.00305 | 0.02410 | 0.06690 | 0.05290 | 0.00485 | 0.00499 | 0.00745 | 0.00453 | 0.01010 | 0.01130 | 0.01080 | 0.00829 |
| Arsenic | | | mg/L | *0.00092* | *0.00226* | *0.04635* | 0.00081 | 0.00035 | 0.00089 | 0.05680 | 0.40900 | 0.15700 | 0.00120 | 0.00225 | 0.00465 | 0.00334 | 0.00268 | 0.00365 | 0.00306 | 0.00317 |
| Barium | | | mg/L | *0.0562* | *0.0486* | *0.0647* | 0.0909 | 0.0420 | 0.0982 | 0.0994 | 0.0671 | 0.0913 | 0.0433 | 0.0404 | 0.0370 | 0.0263 | 0.0581 | 0.0679 | 0.0665 | 0.0777 |
| Beryllium | | | mg/L | *0.0004* | *0.0002* | *0.0001* | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 |
| Boron | | | mg/L | *0.0157* | *0.0436* | *0.0501* | < 0.050 | < 0.050 | < 0.050 | < 0.050 | 0.051 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Cadmium | | | mg/L | *0.000024* | *0.000016* | *0.000013* | 0.000027 | < 0.000010 | 0.000018 | < 0.000010 | 0.000012 | 0.000012 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000011 | 0.000013 | 0.000015 | 0.000015 |
| Chromium | | | mg/L | *0.0007* | *0.0009* | *0.0010* | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Copper | | | mg/L | *0.00206* | *0.00132* | *0.00163* | 0.00121 | 0.00137 | 0.00171 | 0.00349 | 0.00320 | 0.00209 | 0.00091 | 0.00110 | 0.00149 | 0.00083 | 0.00103 | 0.00124 | 0.00106 | 0.00202 |
| Iron | | | mg/L | *0.0298* | *0.0691* | *0.0471* | 0.115 | 0.090 | 0.060 | 0.057 | 0.039 | 0.145 | 0.017 | 0.027 | 0.037 | 0.012 | 0.008 | 0.014 | 0.009 | 0.030 |
| Lead | | | mg/L | *0.00017* | *0.00020* | *0.00020* | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Lithium | | | mg/L | *0.0049* | *0.0047* | *0.0079* | 0.0074 | 0.0034 | 0.0069 | 0.0078 | 0.0073 | 0.0067 | 0.0055 | 0.0071 | 0.0063 | 0.0025 | 0.0139 | 0.0139 | 0.0109 | 0.0116 |
| Manganese | | | mg/L | *0.246* | *0.241* | *0.293* | 0.356 | 0.308 | 0.381 | 0.443 | 0.357 | 0.428 | 0.246 | 0.296 | 0.229 | 0.164 | 0.173 | 0.261 | 0.236 | 0.229 |
| Mercury | | | mg/L | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | | | mg/L | *0.0046* | *0.0036* | *0.0070* | 0.0042 | 0.0021 | 0.0068 | 0.0110 | 0.0107 | 0.0109 | 0.0038 | 0.0039 | 0.0030 | 0.0020 | 0.0082 | 0.0077 | 0.0076 | 0.0165 |
| Nickel | | | mg/L | *0.0037* | *0.0163* | *0.0535* | 0.0328 | 0.0059 | 0.0231 | 0.0728 | 0.2130 | 0.1910 | 0.0234 | 0.0241 | 0.0157 | 0.0127 | 0.0237 | 0.0373 | 0.0369 | 0.0363 |
| Selenium | | | mg/L | *0.00047* | *0.00031* | *0.00021* | 0.00023 | < 0.00010 | 0.00014 | 0.00014 | 0.00016 | 0.00017 | < 0.00010 | < 0.00010 | 0.00012 | < 0.00010 | 0.00039 | 0.00044 | 0.00041 | 0.00034 |
| Strontium | | | mg/L | *0.219* | *0.251* | *0.389* | 0.470 | 0.299 | 0.432 | 0.388 | 0.316 | 0.398 | 0.237 | 0.248 | 0.212 | 0.133 | 0.608 | 0.622 | 0.548 | 0.529 |
| Thallium | | | mg/L | *0.000173* | *0.000038* | *0.000015* | 0.000020 | < 0.000010 | 0.000018 | < 0.000010 | 0.000021 | 0.000021 | 0.000010 | 0.000012 | < 0.000010 | < 0.000010 | 0.000013 | 0.000016 | 0.000017 | 0.000024 |
| Tin | | | mg/L | *0.002* | *0.004* | *0.005* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Titanium | | | mg/L | *0.009* | *0.006* | *0.005* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Uranium | | | mg/L | *0.00096* | *0.00104* | *0.00251* | 0.00296 | 0.00057 | 0.00599 | 0.00648 | 0.00226 | 0.00456 | 0.00046 | 0.00053 | 0.00081 | 0.00035 | 0.00325 | 0.00262 | 0.00209 | 0.00220 |
| Vanadium | | | mg/L | *0.0011* | *0.0044* | *0.0050* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Zinc | | | mg/L | *0.0059* | *0.0079* | *0.0065* | 0.0081 | 0.0063 | 0.0070 | 0.0093 | 0.0062 | 0.0063 | 0.0070 | 0.0106 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| **Volatile Organics** | | | | | | | | | | | | | | | | | | | | |
| Petroleum Hydrocarbons F ($C_{10}$-$C_{50}$) | 6 | 3 | mg/L | *0.4* | *0.4* | *0.2* | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 | - | < 0.2 | - | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |

#### *8.5.3.2.16 Groundwater Storage Pond Effluent – GSP-1 (ST-WT-20)*

The management of underground water was transferred from the Water License 2BB-MEA1828 to the 2AM-WTP1830 License in 2020. Groundwater Storage Pond One (GSP-1) formally A-P5 (MEA-4) is used to store water from the underground operations. A total volume of 2,550 $m^3$ was pumped from underground to GSP-1 (ST-WT-20) in 2022 from June to August. As per the Water License, sampling is conducted four times per year minimum. Agnico Eagle collected samples on a monthly basis. Results are provided in Table 8-62 below and the sampling location outlined in Figure 4.

**Table 8-62 Whale Tail Groundwater Storage Pond (GSP-1) 2022 Water Quality Monitoring (ST-WT-20)**

| ST-WT-20 Parameter | Unit | Annual Average 2020 | Annual Average 2021 | Annual Average 2022 | 2/6/2022 | 3/7/2022 | 4/5/2022 | 5/1/2022 | 6/8/2022 | 7/3/2022 | 8/1/2022 | 9/4/2022 | 10/2/2022 | 11/21/2022 | 12/12/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Field Measured** | | | | | | | | | | | | | | | |
| Temperature | °C | *9.4* | *6.9* | *3.2* | 0.2 | 0.1 | 0.2 | -0.5 | 3.4 | 11.1 | 10.5 | 8.6 | 2.3 | 0.1 | -0.8 |
| pH | pH units | *7.43* | *7.25* | *6.72* | 6.50 | 7.11 | 6.51 | 6.40 | 6.63 | 7.56 | 6.87 | 6.42 | 6.88 | 6.45 | 6.57 |
| Conductivity | uS/cm | *2070* | *12673* | *18310* | 10480 | 12010 | 11130 | 11810 | 2155 | 4030 | 5210 | 6650 | 7430 | 8740 | 9540 |
| Turbidity | NTU | *17.4* | *5.1* | *2.8* | 1.65 | 1.24 | 1.20 | 0.90 | 7.58 | 2.15 | 1.33 | 1.45 | 7.62 | 4.05 | 1.50 |
| **Conventional Parameters** | | | | | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | *1209* | *1778* | *3633* | 4590 | 5160 | 5240 | 5780 | 792 | 1690 | 2500 | 2480 | 3290 | 3960 | 4480 |
| Total alkalinity, as $CaCO_3$ | mg/L | *47* | *40* | *45* | 57 | 61 | 62 | 63 | 22 | 26 | 42 | 34 | 39 | 43 | 46 |
| TDS | mg/L | *1446* | *2643* | *4598* | 5300 | 6040 | 7190 | 6800 | 1360 | 2050 | 3190 | 3890 | 4930 | 5150 | 4680 |
| TSS | mg/L | *18* | *10* | *6* | 3 | 7 | 7 | 8 | 11 | 10 | 3 | 3 | 11 | 2 | 4 |
| **Major Ions** | | | | | | | | | | | | | | | |
| Chloride | mg/L | *672* | *1285* | *2369* | 3300 | 2900 | 3600 | 3300 | 560 | 1100 | 1600 | 1900 | 2200 | 2700 | 2900 |
| Fluoride | mg/L | *0.07* | *0.10* | *0.10* | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Sulfate | mg/L | *24* | *35* | *74* | 85 | 84 | 110 | 110 | 24 | 37 | 48 | 61 | 70 | 90 | 99 |
| **Nutrients** | | | | | | | | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | *-* | *14.5* | *32.7* | 45 | 52 | 49 | 54 | 7.1 | 14 | 20 | 22 | 28 | 34 | 35 |
| Ammonia Nitrogen | mg N/L | *7.0* | *12.0* | *26.9* | 37 | 43 | 41 | 44 | 6 | 11 | 16 | 18 | 23 | 28 | 29 |
| Un-Ionized Ammonia, calculated | mg N/L | *0.07* | *0.05* | *0.02* | 0.012 | 0.056 | 0.013 | 0.011 | 0.003 | 0.100 | 0.028 | 0.010 | 0.021 | 0.008 | 0.010 |
| Nitrate | mg N/L | *17.75* | *34.37* | *76.56* | 103 | 99 | 112 | 118 | 16 | 32 | 44 | 59 | 70 | 93 | 97 |
| Nitrite | mg N/L | *0.23* | *0.52* | *2.00* | 1.89 | 2.36 | 2.57 | 2.77 | 0.30 | 0.72 | 1.35 | 2.08 | 2.28 | 2.76 | 2.95 |
| **Total Metals** | | | | | | | | | | | | | | | |
| Aluminum | mg/L | *0.243* | *0.161* | *0.079* | < 0.030 | < 0.030 | < 0.030 | < 0.060 | 0.363 | 0.084 | 0.037 | < 0.015 | 0.163 | < 0.030 | < 0.030 |
| Arsenic | mg/L | *0.0084* | *0.0402* | *0.0092* | 0.0069 | 0.0076 | 0.0086 | 0.0082 | 0.0212 | 0.0110 | 0.0112 | 0.0077 | 0.0065 | 0.0061 | 0.0059 |
| Barium | mg/L | *0.353* | *0.379* | *0.645* | 0.859 | 0.952 | 0.986 | 1.110 | 0.156 | 0.279 | 0.425 | 0.452 | 0.546 | 0.649 | 0.682 |
| Cadmium | mg/L | *0.000327* | *0.000824* | *0.002032* | 0.00251 | 0.00280 | 0.00306 | 0.00353 | 0.00036 | 0.00081 | 0.00128 | 0.00145 | 0.00194 | 0.00226 | 0.00235 |
| Chromium | mg/L | *0.0034* | *0.0058* | *0.0097* | < 0.010 | < 0.010 | < 0.010 | < 0.020 | 0.012 | < 0.005 | < 0.005 | < 0.005 | < 0.010 | < 0.010 | < 0.010 |
| Copper | mg/L | *0.0027* | *0.0021* | *0.0044* | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0100 | 0.0010 | < 0.0025 | < 0.0025 | < 0.0025 | < 0.0050 | < 0.0050 | < 0.0050 |
| Iron | mg/L | *0.49* | *0.26* | *0.16* | < 0.10 | < 0.10 | < 0.10 | < 0.20 | 0.58 | 0.12 | 0.06 | < 0.05 | 0.25 | < 0.10 | < 0.10 |
| Lead | mg/L | *0.00041* | *0.00080* | *0.00176* | < 0.0020 | < 0.0020 | < 0.0020 | < 0.0040 | < 0.0004 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0020 | < 0.0020 | < 0.0020 |
| Manganese | mg/L | *1.91* | *1.81* | *3.97* | 5.36 | 6.08 | 6.40 | 7.08 | 0.87 | 1.60 | 2.20 | 2.31 | 3.33 | 3.96 | 4.50 |
| Mercury | mg/L | *0.00001* | *0.00001* | *0.00001* | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | *0.0035* | *0.0042* | *0.0088* | < 0.010 | < 0.010 | < 0.010 | < 0.020 | < 0.002 | < 0.005 | < 0.005 | < 0.005 | < 0.010 | < 0.010 | < 0.010 |
| Nickel | mg/L | *0.0537* | *0.0843* | *0.1652* | 0.202 | 0.226 | 0.244 | 0.274 | 0.049 | 0.077 | 0.114 | 0.117 | 0.147 | 0.179 | 0.188 |
| Selenium | mg/L | *0.00097* | *0.00055* | *0.00102* | 0.0012 | 0.0013 | 0.0015 | < 0.0020 | 0.0003 | < 0.0005 | 0.0006 | 0.0006 | < 0.0010 | 0.0012 | < 0.0010 |
| Silver | mg/L | *0.00010* | *0.00008* | *0.00018* | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00040 | < 0.00004 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00020 | < 0.00020 | < 0.00020 |
| Thallium | mg/L | *0.00021* | *0.00017* | *0.00032* | 0.00038 | 0.00048 | 0.00051 | 0.00057 | 0.00007 | 0.00014 | 0.00024 | 0.00024 | 0.00028 | 0.00029 | 0.00035 |
| Zinc | mg/L | *0.009* | *0.019* | *0.044* | < 0.050 | < 0.050 | < 0.050 | < 0.100 | < 0.010 | < 0.025 | < 0.025 | < 0.025 | < 0.050 | < 0.050 | < 0.050 |

#### *8.5.3.2.17 Erosion Management*

**As required by NIRB Project Certificate 008 Condition 11:** ***The Proponent shall develop and implement an Erosion Management Plan to prevent or minimize erosion and its resulting effects from project-related land disturbance.***

In accordance with Condition 11 of NIRB Project Certificate No. 008, Agnico Eagle maintains an Erosion Management Plan (V2; December 2018) for the Whale Tail site. This plan presents the monitoring and mitigation actions related to three specific events which have the potential to cause erosional concerns: dike construction and dewatering, freshet, and the rise of water levels in Whale Tail South.

##### *8.5.3.2.17.1 Water Quality*

For each of these three events, monitoring consists of water quality analyses and/or visual inspections in erosion-prone areas, which are conducted and reported under a number of programs, as follows.

- For erosion related to dike construction and dewatering:
  - Water quality analysis is conducted under the *Water Quality Monitoring and Management Plan for Dike Construction and Dewatering,* as described in Section 8.5.2.2 of this report.

- For erosion related to freshet:
  - Water quality analysis is conducted under the *Water Quality and Flow Monitoring Plan* (according to NWB Type A Water License requirements), as described in Section 8.5 of this report.
  - Visual inspections with water quality analysis as required are conducted under the *Freshet Action Plan* (results below)

- For erosion related to rise of water levels in Whale Tail South:
  - Water quality analysis is conducted under the *Core Receiving Environment Monitoring Plan (CREMP)* (Appendix 33 of this report)
  - Visual inspections are conducted under the *Erosion Management Plan* (results below)

Results of visual assessments and any required water quality monitoring for erosional concerns under the *Freshet Action Plan* and *Erosion Management Plan* are reported here (Whale Tail Site, Whale Tail Haul Road, Whale Tail South Flooding). Other results including water quality monitoring for dike construction and dewatering, water quality monitoring under the Water Quality and Flow Monitoring Plan, and water quality monitoring under the CREMP are reported under the various sections of this Annual Report, as described above.

##### *8.5.3.2.17.2 Freshet Action Plan Monitoring*

Under the Freshet Action Plan, inspections of Whale Tail Site and Whale Tail Haul Road water management infrastructure (including bridges, culverts, ditches, Whale Tail South channel, IVR diversion channel) are conducted daily to weekly by trained personnel starting in May.

According to the *Erosion Management Plan*, erosional concerns are recorded, such as: bed erosion upstream and downstream of watercourse crossing structures, scour under bridge abutments and abutment foundations, erosion along cutslopes and fillslopes of embankments (rill and gully erosion), etc.

Water quality monitoring for turbidity/TSS is also conducted as required based on visual observations. TSS is analyzed by onsite assay laboratory procedures when excess turbidity is observed by visual inspection. TSS is analyzed by commercial accredited laboratory if any elevated results are received from the onsite laboratory. Laboratory-measured TSS results that exceed 30 mg/L are reported to appropriate regulators.

An inspection log is maintained, documenting general conditions at each location, observations on flow rates and clarity, turbidity sample collection (as required), and any mitigation measures that are implemented to prevent erosional concerns.

In addition, opportunistic visual assessments are conducted for erosions concerns along the newly flooded shoreline of Whale Tail South.

In 2022, no major 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.).

Similarly, no major turbidity concerns were identified, no water quality samples were required to be collected, and no contingency mitigation measures (e.g. straw booms or woodchip booms) were required to be installed for Whale Tail Haul Road infrastructure.

As described previously, turbidity/TSS samples are required to be collected at various onsite water management infrastructure locations according to the NWB Water License (e.g. the IVR Diversion Channel, WTS Channel, WRSF Ponds), and results are provided in the relevant Water Quality and Flow Monitoring sections of this report. According to the Water Management Plan, pumping from various sumps (e.g. WT WRSF Pond, Mammoth Dike sumps, tank farm sump) occurs as required to reduce potential for erosional concerns, and volumes are provided in the relevant Water Quality and Flow Monitoring sections of this report.

For onsite visual inspections of erosional concerns under the Freshet Action Plan, no major erosional concerns were observed (e.g. scour, bed erosion, gullying, etc.) requiring management action. The following situations with potential to lead to erosional concerns were identified, with actions taken as described.

1. In August 2020, culverts were installed across the road leading to the emulsion plant, near the Mammoth Dike south abutment, after ponding water was observed on the upstream (south) side of this road during freshet. In 2021, overland flow was again observed across this road in May, while culverts were blocked with ice and snow. Attempts were made to thaw the culverts, but some flow across the road continued until mid-June (in 2020 prior to culvert installation, the overland flow continued until mid-July). Sediments control measures (straw and wood-chip booms) were installed downstream of the road to avoid potential sediments transportation. In 2022, plywood was installed to stop snow accumulating in the culverts over winter, and in the spring, snow was cleared from the culvert areas and the plywood was removed. No flow over the road was recorded during freshet, but booms were still installed on the south side of the road (late May) and these successfully addressed turbidity concerns.

#### *8.5.3.2.17.3 Whale Tail South Flooding*

Flooding of Whale Tail South (WTS) was complete in 2019. However, visual inspections continued in 2022 during the open water season throughout the WTS flood zone. Since flooding has been complete for three years, these surveys were conducted opportunistically by Environment Department technicians to ensure that erosion along the new banks did not mobilize excess TSS into Whale Tail Lake. Shorelines were observed for any major instability, along with signs of permafrost degradation such as ground ice melting, gully and fissuring. None of these issues were identified in 2022 and no mitigation was required.

### 8.5.4 Sewage Treatment Plant

#### 8.5.4.1 *Meadowbank Site*

The Meadowbank mine site has one Seprotech L333 (STP-SEP) sewage treatment plant (STP) and three Little John 100 units (LJ-MIX) in operation; the equipment operates together with one sewage discharge effluent stream directed to the Stormwater Management Pond (SMP). In 2022, water was pumped from the SMP to the Portage pit in June, July, August, and September. There is no discharge to any receiving waters. The SMP also collects spring runoff from the surrounding area.

Samples are taken in accordance with Operation & Maintenance Manual – Sewage Treatment Plan for the purpose of determining operating efficiency of the units. Sample results are available in Table 8-64, for influent (STP-IN), Seprotech L333 and LJ-MIX effluent. Results of the sample analysis are submitted to the NWB in the monthly monitoring reports.

The total volume of treated sewage discharged in 2022 was 26,691 $m^3$. In addition, 279 $m^3$ of sewage sludge was collected and disposed of in the Tailings Storage Facility. A monthly summary of the volume of STP waste is presented in Table 8-63.

**Table 8-63 Meadowbank 2022 Sewage Treatment Plant Waste Volume**

| Sewage volume from STP 2022 | | | |
|---|---|---|---|
| **Month** | **Total flow to biodisks ($m^3$)** | **Total Lift station #3 out ($m^3$)** | **Lift #2 and Biodisks sludge out ($m^3$)** |
| | *Sewage Collected at EQ tank* | *All water (grey and black) discharged to SMP* | *Sewage sludge removed from STP* |
| January | 1,913 | 2,598 | 20 |
| February | 2,148 | 2,867 | 0 |
| March | 2,140 | 3,091 | 14 |
| April | 2,013 | 2,927 | 27 |
| May | 2,256 | 3,225 | 34 |
| June | 2,077 | 2,913 | 20 |
| July | 2,418 | 3,262 | 60 |
| August | 2,521 | 3,377 | 0 |
| September | 2,339 | 3,091 | 36 |
| October | 2,343 | 3,370 | 10 |
| November | 2,283 | 3,201 | 45 |
| December | 2,240 | 3,125 | 13 |
| **Total** | **26,691** | **37,047** | **279** |

*Note:*
*Daily the sewage truck picks up greywater from TCG and then grease from kitchen and brings it the Tailings Pond*
*After that the sewage truck picks up sewage from various locations around the mine and brings it the STP*

**Table 8-64 Meadowbank 2022 Sewage Treatment Plan (STP-IN, STP-SEP and LJ-MIX)**

| STP-IN Parameter | Unit | 1/31/2022 | 2/23/2022 | 3/21/2022 | 4/11/2022 | 5/16/2022 | 6/6/2022 | 7/4/2022 | 8/1/2022 | 9/5/2022 | 10/4/2022 | 11/7/2022 | 12/6/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Field Measured** | | | | | | | | | | | | | |
| pH | pH units | 7.5 | 7.2 | 6.3 | 7.2 | 6.7 | 7.0 | 7.2 | 7.1 | 6.6 | 6.9 | 7.3 | 7.6 |
| **Conventional Parameters** | | | | | | | | | | | | | |
| TSS | mg/L | 85 | 140 | 110 | 5 | 300 | 380 | 210 | 62 | 83 | 500 | 210 | 1100 |
| **Nutrients** | | | | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | 58 | 85 | 86 | 9 | 81 | 84 | 66 | 57 | 67 | 83 | 87 | 93 |
| Un-Ionized Ammonia, calculated | mg N/L | 1.10 | 0.75 | 0.13 | 0.09 | 0.20 | 0.41 | 0.45 | 0.31 | 0.14 | 0.28 | 0.91 | 1.80 |
| Nitrate | mg N/L | < 0.10 | < 0.10 | < 0.10 | 17.60 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Nitrite | mg N/L | < 0.010 | 0.028 | < 0.010 | 0.094 | 0.011 | < 0.010 | 0.017 | < 0.010 | 0.013 | < 0.010 | 0.020 | < 0.010 |
| Total Kjeldahl nitrogen | mg N/L | 70 | 94 | 97 | 11 | 84 | 88 | 79 | 67 | 70 | 82 | 98 | 100 |
| Biochemical Oxygen Demand | mg/L | 53 | 170 | 220 | 5 | 140 | 35 | 98 | 77 | 100 | 99 | 160 | 320 |
| Chemical Oxygen Demand | mg/L | 260 | 300 | 560 | 45 | 400 | 210 | 180 | 230 | 300 | 360 | 370 | 1600 |
| Total phosphorus | mg P/L | 6.5 | 9.4 | 13 | 12 | 9.0 | 10 | 8.1 | 5.8 | 8.0 | 7.8 | 13 | 20 |
| **Coliforms** | | | | | | | | | | | | | |
| Total Coliform | CFU/100mL | - | < 10000000 | 230000000 | 28000000 | 31000000 | 16000000 | 3000000 | 18000000 | 29000000 | 8000000 | 12000000 | 29000000 |
| Fecal Coliform | CFU/100mL | 5700000 | 4100000 | 14000000 | 4300000 | 2200000 | 440000 | 1182000 | 6000000 | 6000000 | 5700000 | 6300000 | 5000000 |
| Atypical colonies | CFU/100mL | >200000000 | 1140000000 | 210000000 | 36000000 | 58000000 | 19000000 | 22000000 | 86000000 | 45000000 | 42000000 | 17000000 | 38000000 |

| STP-SEP<br>Parameter | Unit | 1/31/2022 | 2/23/2022 | 3/21/2022 | 4/11/2022 | 5/16/2022 | 6/6/2022 | 7/4/2022 | 8/1/2022 | 9/5/2022 | 10/4/2022 | 11/7/2022 | 12/6/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Field Measured** | | | | | | | | | | | | | |
| pH | pH units | 5.3 | 5.4 | 5.2 | 5.7 | 6.7 | 6.8 | 6.9 | 6.9 | 6.0 | 6.9 | 6.9 | 7.0 |
| **Conventional Parameters** | | | | | | | | | | | | | |
| TSS | mg/L | 11 | 14 | 12 | 140 | 4 | 5 | 6 | 6 | 16 | 3 | 7 | 64 |
| **Nutrients** | | | | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | 14 | 12 | 13 | 85 | 15 | 12 | 23 | 24 | 30 | 36 | 35 | 36 |
| Un-Ionized Ammonia, calculated | mg N/L | 0.001 | 0.002 | 0.001 | 0.026 | 0.032 | 0.040 | 0.072 | 0.081 | 0.015 | 0.067 | 0.110 | 0.150 |
| Nitrate | mg N/L | 21.6 | 24.7 | 25.6 | < 0.1 | 18.8 | 15.6 | 12.6 | 10.8 | 6.6 | 7.2 | 5.5 | 7.3 |
| Nitrite | mg N/L | 0.03 | 0.01 | 0.02 | 0.04 | 0.22 | 0.42 | 0.34 | 0.96 | 1.94 | 3.93 | 2.04 | 1.68 |
| Total Kjeldahl nitrogen | mg N/L | 15 | 14 | 16 | 94 | 15 | 14 | 27 | 28 | 33 | 33 | 35 | 34 |
| Biochemical Oxygen Demand | mg/L | 7 | 9 | 7 | 250 | 4 | 5 | 7 | 6 | 49 | 78 | 7 | 39 |
| Chemical Oxygen Demand | mg/L | 44 | 43 | 66 | 580 | 40 | 40 | 45 | 36 | 86 | 48 | 55 | 96 |
| **Coliforms** | | | | | | | | | | | | | |
| Total Coliform | CFU/100mL | < 100 | 1200 | 10000 | 100 | 800 | < 100 | 1000 | 7500 | 8000 | 40000 | 800 | 200 |
| Fecal Coliform | CFU/100mL | < 10 | < 10 | < 100 | < 2 | < 10 | 9 | < 100 | 10 | 640 | 4900 | 180 | 80 |
| Atypical colonies | CFU/100mL | 1000 | 3100 | 410000 | 7700 | 13400 | 6500 | 144000 | 4500 | 16000 | 45000 | 5200 | 2100 |

| STP-LJ-MIX<br>Parameter | Unit | 1/31/2022 | 2/23/2022 | 3/21/2022 | 4/11/2022 | 5/16/2022 | 6/6/2022 | 7/4/2022 | 8/1/2022 | 9/5/2022 | 10/4/2022 | 11/7/2022 | 12/6/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Field Measured** | | | | | | | | | | | | | |
| pH | pH units | 6.2 | 5.8 | 5.8 | 5.5 | 5.8 | 6.8 | 6.5 | 6.6 | 6.2 | 5.2 | 5.4 | 6.8 |
| **Conventional Parameters** | | | | | | | | | | | | | |
| TSS | mg/L | 3 | 6 | 5 | 13 | 7 | 7 | 11 | 6 | 16 | 7 | 8 | 6 |
| **Nutrients** | | | | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | 13 | 24 | 12 | 19 | 9 | 10 | 11 | 19 | 27 | 13 | 15 | 23 |
| Un-Ionized Ammonia, calculated | mg N/L | 0.012 | 0.008 | 0.004 | 0.003 | 0.002 | 0.040 | 0.015 | 0.030 | 0.023 | 0.001 | 0.002 | 0.061 |
| Nitrate | mg N/L | 22.2 | 37.3 | 16.7 | 14.8 | 15.8 | 10.9 | 11.6 | 33.8 | 8.6 | 17.2 | 11.5 | 29.4 |
| Nitrite | mg N/L | 0.083 | 0.027 | 0.259 | 0.155 | < 0.050 | 0.153 | 0.397 | 0.033 | 0.066 | 0.351 | 1.020 | 0.148 |
| Total Kjeldahl nitrogen | mg N/L | 14 | 26 | 13 | 22 | 12 | 14 | 14 | 22 | 31 | 14 | 17 | 25 |
| Biochemical Oxygen Demand | mg/L | < 2 | 4 | 3 | 6 | 3 | 6 | 8 | < 10 | 14 | 6 | 11 | 43 |
| Chemical Oxygen Demand | mg/L | 21 | 61 | 48 | 57 | 37 | 120 | 54 | 32 | 61 | 52 | 62 | 47 |
| **Coliforms** | | | | | | | | | | | | | |
| Total Coliform | CFU/100mL | < 100 | 1400 | 1500 | < 10000 | < 100 | 1800 | < 10000 | 900 | 11000 | < 10 | 900 | < 100 |
| Fecal Coliform | CFU/100mL | < 10 | 10 | 160 | 5 | 11 | < 10 | 1000 | 7 | 2900 | 74 | 100 | 5 |
| Atypical colonies | CFU/100mL | 1000 | 4300 | 2000 | 230000 | 17300 | 1800 | 91000 | 13600 | 18000 | 710 | 2700 | 2000 |

### 8.5.4.2 *Whale Tail Site*

In 2022, effluent from the Sewage Treatment Plan was discharged to the IVR Attenuation Pond on a daily basis. The total volume of treated sewage discharged in 2022 from the Newterra associated to the permanent camp was 35,947 $m^3$. In addition, 997,5 $m^3$ of sewage sludge was collected and disposed of in the Whale Tail WRSF. A monthly summary of the volume of STP waste is presented in Table 8-65.

**Table 8-65 Whale Tail 2022 Sewage Treatment Plant Waste Volume**

| Sewage volume from STP 2022 | | |
|---|---|---|
| **Month** | **Total flow out Newterra Permanent Camp ($m^3$)** | **Sludge Removal ($m^3$)** |
| January | 2,038 | 19.0 |
| February | 2,726 | 92.0 |
| March | 2,902 | 85.0 |
| April | 2,966 | 119.0 |
| May | 3,212 | 94.0 |
| June | 2,843 | 84.0 |
| July | 2,966 | 57.0 |
| August | 2,992 | 76.0 |
| September | 3,044 | 96.0 |
| October | 3,197 | 88.0 |
| November | 3,143 | 94.0 |
| December | 3,920 | 93.5 |
| **Total** | **35,947** | **997,5** |

As per Water License Schedule I Sampling location ST-WT-11 (Figure 4), effluent is to be sampled four times per calendar year. To asses the efficiency of the STP, a monthly sample was taken at the STP effluent. Results are provided in Table 8-67 below. There are no applicable license limits. Agnico Eagle intends to follow the operational/design parameters outlined in Table 8-66, however operational realities have made meeting the Nitrate Nitrogen and Total Phosphorus operating targets challenging. Nevertheless, it is important to highlight that no issues have occurred in the surrounding environment as a result of the deviation to the operational targets. In 2022, results were above the operational targets for nitrate, phosphorus and as well as one instance of elevated levels of total oil and grease and residual chlorine. Also, the pH was slightly below operational targets in September and October 2022.

**Table 8-66 Whale Tail STP Operational Parameters**

| Parameters | Unit | Effluent |
|---|---|---|
| pH | pH units | 6.5 – 9.0 |
| Oil, Grease | mg/L | <5 |
| Biological Oxygen Demand (BOD) | mg/L | <25 |
| Total Suspended Solids | mg/L | <25 |
| Unionized Ammonia Nitrogen (NH3-N) | mg-N/L | <1.25 |
| Nitrate Nitrogen (NO3-N) | mg-N/L | <5 |
| Total Phosphorus (P) | mg-P/L | <0.5 |
| Fecal Coliform | CFU/100 ml | <200 |
| Total Residual Chlorine | mg/L | <0.2 |

In 2022, nitrate levels remained above operational targets despite increasing Micro C dosing with an average of 14.03 mg/L compared to 12.12 mg/L in 2021 and 16.51 mg/L in 2020. A modification to the system was completed in 2022 to allow higher Micro C dosing, therefore nitrate levels are expected to decrease. Agnico Eagle will continue monitor the nitrate level in 2023.

In 2022, a modification to the sewage treatment plant system allowed increased dosing of Alum for phosphorus removal. As a result, total phosphorus levels decreased in 2022 with an average of 1.77 mg P/L compared to 3.94 mg P/L in 2021 and 5.96 mg P/L in 2020. In 2023, these levels are expected to continue to decrease. If higher levels of Alum dosing prove insufficient for phosphorus removal, Agnico Eagle will reconsider Re300 chemistry.

In 2022, one result for total residual chlorine (0.3 mg/L) was above the operational/design target (<0.2 mg/L).

**Table 8-67 Whale Tail 2022 Sewage Treatment Plan (ST-WT-11)**

| ST-WT-11 | Unit | Annual Average | | | 1/4/2022 | 2/7/2022 | 3/7/2022 | 4/4/2022 | 5/11/2022 | 6/7/2022 | 7/4/2022 | 8/2/2022 | 9/7/2022 | 10/4/2022 | 11/7/2022 | 12/6/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2020 | 2021 | 2022 | | | | | | | | | | | | |
| **Field Measured** | | | | | | | | | | | | | | | | |
| pH | pH units | 7.0 | 7.1 | 6.9 | 7.1 | 7.0 | 7.3 | 7.1 | 7.9 | 6.6 | 6.6 | 6.7 | 6.4 | 6.4 | 6.9 | 6.8 |
| **Conventional Parameters** | | | | | | | | | | | | | | | | |
| Turbidity | NTU | 1.21 | 1.14 | 0.15 | 0.5 | < 0.1 | < 0.1 | 0.1 | < 0.1 | < 0.1 | < 0.1 | 0.1 | 0.2 | 0.2 | 0.1 | 0.1 |
| Hardness, as $CaCO_3$ | mg/L | 71 | 76 | 85 | 69 | 89 | 98 | 109 | 105 | 82 | 75 | 76 | 63 | 64 | 92 | 103 |
| Total alkalinity, as $CaCO_3$ | mg/L | 112 | 55 | 35 | 50 | 39 | 53 | 12 | 33 | 23 | 23 | 16 | 67 | 51 | 42 | 8 |
| TDS | mg/L | - | 325 | 337 | 365 | 315 | 335 | 430 | 315 | 255 | 375 | 360 | 295 | 290 | 420 | 290 |
| TSS | mg/L | 3 | 3 | 2 | 5 | 1 | 1 | < 1 | < 1 | 1 | < 1 | 2 | 4 | 1 | 1 | < 1 |
| Chlorine, Total Residual | mg/L | - | 0.1 | 0.2 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | 0.1 | < 0.1 | 0.2 | 0.2 | 0.2 | 0.3 | 0.1 | 0.2 |
| **Major Ions** | | | | | | | | | | | | | | | | |
| Chloride | mg/L | 81.1 | 75.2 | 75.2 | 58 | 80 | 90 | 84 | 86 | 59 | 78 | 63 | 69 | 65 | 85 | 85 |
| Fluoride | mg/L | 0.06 | 0.09 | 0.10 | < 0.10 | 0.10 | 0.14 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 | < 0.10 |
| Sulfate | mg/L | 38.5 | 37.8 | 53.3 | 83 | 40 | 37 | 54 | 46 | 56 | 54 | 73 | 56 | 44 | 48 | 48 |
| **Nutrients and Chlorophyll a** | | | | | | | | | | | | | | | | |
| Ammonia ($NH_3$) | mg/L | - | 0.1 | 0.1 | 0.10 | 0.14 | 0.18 | 0.11 | 0.09 | 0.12 | 0.11 | < 0.06 | 0.14 | < 0.06 | 0.23 | < 0.06 |
| Ammonia Nitrogen | mg N/L | 0.27 | 0.12 | 0.10 | 0.083 | 0.110 | 0.150 | 0.094 | 0.075 | 0.096 | 0.090 | < 0.050 | 0.120 | < 0.050 | 0.190 | < 0.050 |
| Un-Ionized Ammonia, calculated | mg N/L | - | - | 0.0004 | - | - | - | - | - | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | < 0.0004 | 0.0005 | < 0.0004 |
| Nitrate | mg N/L | 16.51 | 12.12 | 14.03 | 16.2 | 17.5 | 10.6 | 18.9 | 11.0 | 10.3 | 22.0 | 21.6 | 5.3 | 9.1 | 11.5 | 16.1 |
| Nitrite | mg N/L | 0.14 | 0.05 | 0.03 | 0.011 | < 0.010 | 0.050 | 0.033 | 0.041 | 0.023 | 0.051 | < 0.010 | 0.021 | < 0.010 | 0.070 | 0.021 |
| Biochemical Oxygen Demand, 5 Day | mg/L | 9 | 2 | 2 | 4 | < 2 | < 2 | 3 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 | < 2 |
| Total phosphorus | mg P/L | 5.96 | 3.94 | 1.77 | 1.7 | 3.6 | 2.3 | 0.001 | 1.8 | 1.8 | 3.0 | 1.0 | 0.9 | - | 2.0 | 1.5 |
| Orthophosphate | mg P/L | 6.11 | 4.10 | 1.89 | 1.4 | 3.5 | 3.3 | 2.4 | 1.5 | 1.3 | 2.8 | 0.9 | 1.0 | 1.8 | 1.5 | 1.3 |
| **General Organics** | | | | | | | | | | | | | | | | |
| Total oil and grease | mg/L | 1.7 | 1.5 | 4.1 | < 0.5 | 0.8 | 0.8 | 0.9 | < 0.5 | < 0.5 | < 0.5 | 0.7 | < 0.5 | < 0.5 | 0.5 | 21.0 |
| **Total Metals** | | | | | | | | | | | | | | | | |
| Aluminum | mg/L | 0.0394 | 0.0381 | 0.0384 | 0.0398 | 0.0245 | 0.0190 | 0.1290 | 0.0212 | 0.0394 | 0.0214 | 0.0219 | 0.0370 | 0.0418 | 0.0184 | 0.0416 |
| Arsenic | mg/L | 0.0059 | 0.0053 | 0.0061 | 0.0050 | 0.0056 | 0.0039 | 0.0042 | 0.0079 | 0.0084 | 0.0072 | 0.0056 | 0.0071 | 0.0099 | 0.0052 | 0.0053 |
| Barium | mg/L | 0.0037 | 0.0093 | 0.0045 | 0.0043 | 0.0045 | 0.0056 | 0.0058 | 0.0036 | 0.0037 | 0.0031 | 0.0027 | 0.0033 | 0.0045 | 0.0067 | 0.0069 |
| Cadmium | mg/L | 0.000026 | 0.000031 | 0.000024 | 0.000010 | 0.000031 | < 0.000010 | 0.000067 | 0.000026 | 0.000017 | 0.000030 | 0.000011 | < 0.000010 | 0.000020 | 0.000015 | 0.000046 |
| Chromium | mg/L | 0.001 | 0.001 | 0.001 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Copper | mg/L | 0.0154 | 0.0096 | 0.0049 | 0.00415 | 0.00544 | 0.00261 | 0.00658 | 0.00424 | 0.00506 | 0.00716 | 0.00397 | 0.00328 | 0.00497 | 0.00391 | 0.00719 |
| Iron | mg/L | 0.05 | 0.06 | 0.05 | 0.049 | 0.040 | 0.052 | 0.085 | 0.064 | 0.042 | 0.046 | 0.027 | 0.030 | 0.055 | 0.057 | 0.033 |
| Lead | mg/L | 0.00034 | 0.00996 | 0.00056 | 0.00058 | 0.00063 | 0.00047 | < 0.00020 | 0.00082 | 0.00030 | 0.00102 | < 0.00020 | 0.00059 | 0.00064 | 0.00068 | 0.00047 |
| Manganese | mg/L | 0.0027 | 0.0149 | 0.0317 | 0.0159 | 0.0236 | 0.0226 | 0.0807 | 0.0508 | 0.0215 | 0.0375 | 0.0363 | 0.0059 | 0.0160 | 0.0271 | 0.0492 |
| Mercury | mg/L | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.0012 | 0.0011 | 0.0013 | 0.0010 | 0.0016 | 0.0016 | < 0.0010 | 0.0015 | 0.0011 | 0.0019 | 0.0011 | 0.0014 | 0.0011 | 0.0012 | < 0.0010 |
| Nickel | mg/L | 0.007 | 0.009 | 0.009 | 0.0063 | 0.0079 | 0.0056 | 0.0106 | 0.0180 | 0.0167 | 0.0095 | 0.0066 | 0.0055 | 0.0075 | 0.0062 | 0.0098 |
| Selenium | mg/L | 0.0010 | 0.0003 | 0.0001 | < 0.00010 | 0.00013 | 0.00011 | < 0.00010 | 0.00010 | 0.00011 | 0.00013 | 0.00011 | < 0.00010 | 0.00012 | 0.00010 | 0.00011 |
| Silver | mg/L | 0.00011 | 0.00005 | 0.00002 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| Thallium | mg/L | - | 0.00001 | 0.00001 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000011 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| Zinc | mg/L | 0.057 | 0.065 | 0.086 | 0.0398 | 0.0790 | 0.0562 | 0.1950 | 0.1040 | 0.0682 | 0.0761 | 0.0580 | 0.0426 | 0.0812 | 0.0875 | 0.1670 |
| **Coliforms** | | | | | | | | | | | | | | | | |
| Total Coliform | CFU/100mL | 491 | 1877 | 210 | 6 | < 10 | < 10 | 10 | < 0 | 1400 | < 100 | < 10 | 200 | 10 | 300 | 250 |
| Fecal Coliform | CFU/100mL | 10 | 36 | 5 | < 2 | < 2 | < 2 | 5 | 2 | 15 | 10 | < 2 | 3 | < 2 | 10 | 2 |
| Atypical colonies | CFU/100mL | 10940 | 27945 | 544 | 200 | 40 | 30 | 580 | 40 | 1300 | 2700 | 50 | 190 | 50 | 360 | 480 |

### 8.5.5 Bulk Fuel Storage Facility

#### 8.5.5.1 *Meadowbank Site*

Water collected in the secondary containment area of the bulk fuel storage tank at the Meadowbank mine site was sampled on June 5th, 2022. Water from the Meadowbank tank farm was directed south of the tank farm to the Meadowbank Stormwater Management Pond and did not reach any receiving environment. Results are presented in Table 8-68 and the sampling location (ST-37) is illustrated on Figure 1. No water quality parameters exceeded the water quality limit stipulated in Part F, Item 9 of the 2AM-MEA1530 Water License. Notification to the CIRNAC Inspector, made in accordance with Part F, Item 13 of NWB License 2AM-MEA1530 to empty the secondary containment area, was sent June 1st, 2022. As a result, approximately 200 $m^3$ of water was discharged in June to the Stormwater Management Pond via a temporary pipe from the secondary containment area of the Meadowbank bulk fuel storage tank.

**Table 8-68 Meadowbank 2022 Bulk Fuel Storage Facility Water Quality Monitoring (ST-37)**

| ST-37 | Max grab | Max monthly mean | Sample date | 6/5/2022 |
|---|---|---|---|---|
| Parameter | | | Unit | |
| **Field Measured** | | | | |
| pH | 6.0 - 9.5 | 6.0 - 9.5 | pH units | 7.49 |
| **Conventional Parameters** | | | | |
| TSS | 30 | 15 | mg/L | 12 |
| **Nutrients** | | | | |
| Ammonia ($NH_3$) | | | mg/L | 1.3 |
| Ammonia Nitrogen | 6.0 | 6.0 | mg N/L | 1.1 |
| **General Organics** | | | | |
| Total oil and grease | 5 and no visible sheen | 5 and no visible sheen | mg/L | 1.1 |
| **Total Metals** | | | | |
| Arsenic | 1 | 0.5 | mg/L | 0.0115 |
| Copper | 0.6 | 0.3 | mg/L | 0.0024 |
| Lead | 0.1 | 0.1 | mg/L | 0.0006 |
| Nickel | 1 | 0.5 | mg/L | 0.0082 |
| Zinc | 1 | 0.5 | mg/L | < 0.0050 |
| **Volatile Organics** | | | | |
| Benzene | 0.37 | 0.37 | mg/L | < 0.00020 |
| Ethylbenzene | 0.09 | 0.09 | mg/L | < 0.00020 |
| Toluene | 0.002 | 0.002 | mg/L | < 0.00020 |
| Xylenes | | | mg/L | < 0.00040 |

#### 8.5.5.2 *Baker Lake Marshalling Facilities*

Water in the secondary containment area of the main diesel bulk fuel storage facilities (Tanks 1-4; ST-40.2 and Tanks 7 – 8; ST-40.3) at the Baker Lake Marshalling Facility was sampled on May 31st, 2022. Notification to the CIRNAC Inspector, made in accordance with Part F, Item 13 of NWB License 2AM-MEA1530 to empty secondary containment areas, was sent on June 1st, 2022. No water quality parameters exceeded the water quality limit stipulated in Part F, Item 9 of the 2AM-MEA1530 Water License. In June, approximately 1,800 $m^3$ from Tanks 1-4 containment area and 1,000 $m^3$ from Tanks 7-8 containment area was discharged to the environment. No water was discharged in June for station ST-38 and ST-40.1 and water was brought back by tanker to Meadowbank Site.

Water was also sampled from Tanks 1 – 4 (ST-40.2) and Tanks 7-8 (ST-40.3) on September 11th, 2022. A second notification to the CIRNAC Inspector was sent on September 12th. In September, approximately 1,055 $m^3$ was pumped from Tank 1-4 containment area and 700 $m^3$ for Tank 7-8 containment area. No water was discharged in June for station ST-38 and ST-40.1 and water was brought back by tanker to Meadowbank Site.

The locations of these sampling stations (ST-38, ST-40.1, ST-40.2, and ST-40.3) are illustrated on Figure 5 and results are presented in Table 8-69.

**Table 8-69 Baker Lake 2022 Bulk Fuel Storage Facility Water Quality Monitoring (ST-38, ST-40.2, and ST-40.3)**

| BULK FUEL | MAX GRAB | MAX MEAN | Unit | 5/31/2022 | 5/31/2022 | 9/11/2022 | 9/11/2022 |
|---|---|---|---|---|---|---|---|
| Parameter | | | | ST-40.2 | ST-40.3 | ST-40.2 | ST-40.3 |
| **Field Measured** | | | | | | | |
| pH | 6.0 - 9.5 | 6.0 - 9.5 | pH units | 7.71 | 7.73 | 7.44 | 8.25 |
| **Conventional Parameters** | | | | | | | |
| TSS | 30 | 15 | mg/L | 7 | 7 | 6 | 1 |
| **Nutrients** | | | | | | | |
| Ammonia ($NH_3$) | | | mg/L | < 0.061 | < 0.061 | < 0.061 | < 0.061 |
| Ammonia Nitrogen | 6.0 | 6.0 | mg N/L | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| **General Organics** | | | | | | | |
| Total oil and grease | 5 and no visible sheen | 5 and no visible sheen | mg/L | < 0.50 | < 0.50 | < 0.50 | < 0.50 |
| **Total Metals** | | | | | | | |
| Arsenic | 1 | 0.5 | mg/L | 0.0006 | 0.0008 | 0.0011 | 0.0030 |
| Copper | 0.6 | 0.3 | mg/L | 0.0040 | 0.0016 | 0.0040 | 0.0018 |
| Lead | 0.1 | 0.1 | mg/L | 0.0004 | 0.0003 | 0.0005 | < 0.0002 |
| Nickel | 1 | 0.5 | mg/L | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Zinc | 1 | 0.5 | mg/L | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| **Volatile Organics** | | | | | | | |
| Benzene | 0.37 | 0.37 | mg/L | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Ethylbenzene | 0.09 | 0.09 | mg/L | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Toluene | 0.002 | 0.002 | mg/L | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Xylenes | | | mg/L | < 0.00040 | < 0.00040 | < 0.00040 | < 0.00040 |

A service inspection was performed in June 2022 on tank 1 and 2 according to the latest edition of API 653 standard with additional demands from the corrosion team on site. Some modifications and improvements on Tank 6 were also completed in 2022 following the inspector's recommendations. In addition, the storage tanks (5, 6, 7 and 8) at Baker Lake have been painted white to reduce corrosion and heat absorption.

In addition, following the 2022 annual geotechnical inspection, similar deficiencies were highlighted from previous years around the Bake Lake Fuel Farm. As a result, an investigation into repeated deficiencies was launched. Repeated deficiencies were linked to exposed membrane and/or damaged membrane. To preserve the integrity of the secondary containment, access to the area was restricted. A contractor was retained to performed the required fixes over the summer, however, due to workforce availability (unexpected resignations) they were unable to complete the mandate in 2022. This will be completed during the summer of 2023.

Baker Lake Bulk Fuel Storage: Environmental Performance Monitoring Plan (Appendix 17 of the 2021 Annual Report) was updated and approved by the NWB in March 2022. Section 5 of this management plan details the environmental performance monitoring plan which is a tiered approach with an emphasis on visual and operational inspections; routine surface water sampling to control and monitor the quality of the contact water; and event monitoring (in the case of a spill emergency or occurrence). Management of the bulk fuel storage facility will be guided by the monitoring results. As detailed in this plan, Agnico Eagle committed to increasing visual inspections of the Baker Lake Marshalling Facilities from weekly to twice weekly during Freshet and summer months. Monthly inspections are also conducted by the Energy and Infrastructure Department. Inspection of the facility included: tank and piping condition, secondary containment berm structure and integrity, indicators of liner damage, precipitation/ run-off accumulation, evidence of tampering or misuse, any structural abnormalities and visible sheens on contact water pools and crush material inside the secondary containment. Furthermore, Agnico Eagle is following the annual recommendations from the third-party Geotechnical Inspection of the Marshalling Facility. This report and the Agnico Eagle implementation plan are provided respectively in Appendix 9 and 15.

#### 8.5.5.3 *Whale Tail Site*

In 2022, a 10-day notice was sent to CIRNAC on September 13th, 2022 with the advisement that water would be discharged from the secondary containment of the Whale Tail 1.5 million litre diesel tank farm (ST-WT-12). Water was discharged behind the tank which responds to the IVR Attenuation Pond and did not reach any receiving environment.

In 2022, water from the secondary containment of the powerhouse fuel tank (ST-WT-16) was brought back by tanker to the Meadowbank site for disposal.

### 8.5.6 All Weather Access Road/ Whale Tail Haul Road and Quarries*

#### 8.5.6.1 *Meadowbank Site*

**As required by DFO Authorizations NU-03-0190 Condition 5.3 (AWPAR);** ***A photographic record of before, during and after construction, during decommissioning and after restoration, showing that all works and undertakings have been completed according to the approved Plan and conditions of this authorization […]***

A geotechnical structural inspection of the AWAR, including all culverts, bridges and quarries, was conducted by WSP Golder in 2022. This annual inspection is a requirement of the Water License. The findings are presented in the report titled 'Meadowbank and Whale Tail 2022 Annual Geotechnical Inspection', attached in Appendix 9. Agnico Eagle responses to the recommendations from the inspection are also included in Appendix 15.

In relation to Fisheries and Oceans Canada Authorizations NU-03-0190, NU-03-0191.3, NU-03-0191.4, NU-08-0013 and NU-14-1046 Agnico Eagle maintains a Habitat Compensation Monitoring Plan (Version 4, 2017) to ensure that fish habitat compensation features are constructed and functioning as intended. Based on the schedule described in the Habitat Compensation Monitoring Plan, monitoring of compensation features currently occurs every 2 years. Monitoring was conducted in 2021 for the constructed spawning pad, located at stream crossing R02 along the all-weather access road. The

* TSM- Biodiversity and Conservation Management

constructed spawning pads were visually confirmed to be stable as designed. Refer to the 2021 Habitat Compensation Monitoring Report provided in Appendix 45 of the 2021 Annual Report for more details. The next monitoring is planned for the summer of 2023.

Pre-freshet and freshet inspections were conducted at crossings along the AWAR in 2022. These inspections are conducted to document the presence/absence of flow, erosional concerns and turbidity plumes. Beginning of June 2022, streams began flowing and by mid-June all of the streams and rivers along the AWAR opened up.

Weekly inspections are also conducted along the AWAR on a year round basis. During the freshet and open water season, any visual turbidity plumes or erosion along the AWAR, culverts or HADD crossings are documented by Environmental Technicians. In 2022, no visual turbidity plumes or erosion concerns were observed.

#### 8.5.6.2 *Whale Tail Site*

A geotechnical structural inspection of the Whale Tail Haul Road, including all culverts, bridges, eskers and quarries, was conducted in 2022. This annual inspection is a requirement of the Water License. The findings are presented in the report titled 'Meadowbank and Whale Tail 2022 Annual Geotechnical Inspection', attached in Appendix 9. Agnico Eagle responses to the recommendations from the inspection are also included in Appendix 15.

Pre-freshet and freshet inspections were conducted weekly at crossings along the Whale Tail Haul Road, eskers and quarries in 2022. These inspections are conducted to document the presence/absence of flow, erosional concerns and turbidity plumes and to ensure that runoff, if any, would be free of any visible sheen and would not impact the environment. In 2022, no major 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.). Refer to Section 8.5.3.2.17 for more details.

### 8.5.7 QAQC Sampling

**As required by NIRB Project Certificate No.004, Condition 23:** ***ensure that water quality monitoring performed at locations within receiving waters that allow for an assimilative capacity assessment of concern to regulators, be carried out by an independent contractor and submitted to an independent accredited lab for analysis, on a type and frequency basis as determined by the NWB; results of analysis shall be provided to the NWB and NIRB's Monitoring Officer.***

And

**As required by NWB Water License 2AM-MEA1530 Part I, Item 17:** ***The Licensee shall annually review the approved QA/QC Plan and modify the Plan as necessary. Proposed changes shall be submitted to an Accredited Laboratory for approval.***

And

**As required by NWB Water License 2AM-WTP1830 Part I, Item 20:** ***The Licensee shall annually review the approved QA/QC Plan and modify the Plan as necessary. Proposed changes shall be submitted to an Accredited Laboratory for approval.***

The objective of quality assurance and quality control (QA/QC) program is to assure that the chemical data collected are representative of the material being sampled, are of known quality, are properly documented, and are scientifically defensible. Data quality was assured throughout the collection and analysis of samples using specified standardized procedures, by the employment of accredited laboratories, and by staffing the program with experienced technicians.

Most of the chemical analyses for Meadowbank and Whale Tail sites were performed by Bureau Veritas (BV) in Ontario, an accredited facility. All data from BV lab underwent a vigorous internal QA/QC process, including the use of spiked samples and duplicate samples. All QA/QC data passed the laboratories acceptable limits. The laboratory certificates of quality control can be provided on request for Meadowbank and Whale Tail.

Toxicity tests were performed by Bureau Veritas in Quebec and Aquatox in Ontario, while sublethal tests were performed by Aquatox. Testing was conducted as stipulated in the corresponding Environment Canada Biological Test Methods. QA/QC measures implemented by the lab, including the use of reference toxicants, met the acceptable limits. Toxicity reports for Meadowbank and Whale Tail can be provided on request.

Agnico Eagle also requires the services of laboratory as Bureau Veritas in Edmonton, Alberta, H2Lab in Val-D'Or, Quebec and SGS in Lakefield, Ontario. Agnico Eagle also uses the services of ALS for many of the CREMP and AEMP water quality analysis.

Field blanks (FB) are laboratory bottles filled with deionized water in the field, and then treated as a normal sample (N). They are used to identify errors or contamination in sample collection and analysis. Trip blank (TB) are laboratory pre-filed bottles with DI water carried to the sampling location and are left unopened. Duplicate field water quality samples (FD) are collected simultaneously in the field and used to assess sampling variability and sample homogeneity.

The QA/QC Plan was revised in March 2023 (Version 8) and can be found in Appendix 8.

#### 8.5.7.1 *Meadowbank Site*

In 2022, 213 water samples were collected (excluding Groundwater and CREMP monitoring programs), 53 duplicates, 53 field blanks and 32 trip blanks, which represents 25% of duplicate, 25% of field blanks and 15% of trip blanks which is higher than the QA/QC duplicate program objective of 10%.

The following presents the percentage of duplicate and field samples collected from each of the monitoring programs:

- MDMER and EEM monitoring programs: 10 duplicate samples, 10 field blanks and 6 trip blanks were collected from a total of 27 samples, representing 37% of duplicate, 37% of field blanks and 22% of trip blanks;

- STP monitoring program: 6 duplicate samples, 6 field blanks and 6 trip blanks were collected from a total of 36 samples, representing 17 % of duplicate, field blanks and trip blanks;

- Surface water monitoring programs: 34 duplicate samples, 34 field blanks and 19 trip blanks were collected from a total of 145 samples, representing 23 % for duplicate and field blanks and 13% for trip blanks;

- Bulk fuel storage facilities monitoring program: 3 duplicate samples, 3 field blanks and 1 trip blanks samples were collected from a total of 5 samples, representing 60 % for duplicate and field blank and 20% for trip blank;

- Groundwater Monitoring Program; 4 and 5 duplicates were collected, respectively, during the July and September monitoring session. One (1) field blank and 1 trip blank were also collected for each groundwater monitoring session (refer to Section 4.6 of Appendix 42 for the 2022 Meadowbank Groundwater Monitoring Report), which aligns with the frequency outlined in the current QAQC Management Plan (Appendix 8); and

- Core Receiving Environment Monitoring Program (CREMP); A combined total of 20 duplicates collected between the Meadowbank Lakes, Baker Lake, and the Whale Tail Lakes, corresponding to approximately 14% of the total number of water samples. Travel blanks (TB), de-ionized (DI) blanks and Equipment Blanks were submitted for all sampling events (refer to Appendix 33 for the 2022 CREMP Report), which aligns with the frequency outlined in the current QAQC Management Plan (Appendix 8).

Analytical precision is a measurement of the variability associated with duplicate analyses of the same sample in the laboratory. Duplicate results were assessed using the relative percent difference (RPD) between measurements. The equation used to calculate a RPD is:

RPD = (A-B)/ ((A+B)/2)*100; where: A = field sample; B = duplicate sample.

Large variations in RPD values are often observed between duplicate samples when the concentrations of analytes are low and approaching the detection limit. Consequently, a RPD of 20% for concentrations of field and duplicates samples that both exceed 10x the method detection limit (MDL) is considered notable. The analytical precision of one QA/QC sampling event is characterized as:

-High, when less than 10% of the parameters have variations that are notable;

-Medium, when 10 to 30% of the parameters have variations that are notable;

-Low, when more than 30% of the parameters have variations that are notable.

Meadowbank results of the QA/QC data are presented in Tables 1-1 to 1-31 of Appendix 55 for the MDMER and EEM, Surface Water, STP and Bulk Fuel Storage Facility monitoring programs. The following is a summary of the QA/QC results, per sampling program:

- MDMER and EEM (Tables 1-1 to 1-4, Appendix 55): All the duplicate samples collected were considered as having high analytical precision.

- Surface Water (Tables 1-5 to 1-26 and 1-29 to 1-31, Appendix 55): All QA/QC sampling events conducted within the surface water quality program are rated as having high analytical precision except for four (4) samples having a medium analytical precision of 11% (x2), 12% and 25%.

- STP (Table 1-27, Appendix 55): Analytical precision is rated high for three (3) samples, medium for two (2) samples (10% to 11%) and low for one (1) sampling event (50%), this represents respectively 50% with high analytical precision, 33% with medium analytical precision and 17% with low analytical precision. However, as the number of parameters analysed is low, one sample with notable variation between field and duplicate and field bank and lab blank samples will trigger a medium or low analytical precision.

- Bulk Fuel Storage Facility (Table 1-28, Appendix 55): Analytical precision is rated high for the duplicate sampling event conducted at the Bulk Storage Facility.

RPD values were also calculated for field blanks (FB) and lab blanks (LB) in 2022 as the QA/QC Plan. All field blank samples are considered to have high analytical precision.

The QA/QC plan was followed and samples were collected by qualified technicians. Given the high number of samples collected in 2022, it is common to have some RPD exceedances as a result of the discrete differences in the original and field duplicates. Given the variability of these exceedances (occurring with different parameters, on different dates for different sampling programs) and the high number of successful samples, it is evident that field QA/QC standards during water sampling were maintained during sampling in 2022. Agnico Eagle environmental technicians will continue to follow standard QA/QC procedures for surface water sampling that requires the use of sample bottles that are provided by an accredited laboratory, proper handling, and storage of bottles to prevent cross-contamination between areas and, if appropriate, thoroughly rinsing the sample containers with sample water prior to sample collection.

Each equipment used for field measurement are calibrated prior each usage. Calibration datasheets are kept for future reference, if needed.

#### 8.5.7.2 *Whale Tail Site*

In 2022, 254 samples were collected (excluding Groundwater and CREMP monitoring programs), 60 duplicates, 58 field blanks and 29 trip blanks, which represents 24% of duplicate, 23% of field blanks and 11% of trip blanks which is higher than the QA/QC duplicate program objective of 10%.

The following presents the percentage of duplicate and field samples collected from each of the monitoring programs:

- MDMER and EEM monitoring programs: 18 duplicate samples, 18 field blanks and 9 trip blanks were collected from a total of 42 samples, representing 43% of duplicate and field blanks and 21% of trip blanks;

- Surface water monitoring programs: 40 duplicate samples, 38 field blanks and 19 trip blanks were collected from a total of 200 samples, representing 20% of duplicates, 19% of field blanks, 10% of trip blanks;

- STP monitoring program: 2 duplicate samples, 2 field blanks, and 1 trip blank were collected from a total of 12 samples, representing 17% of duplicate and field blanks and 8% of trip blank;

- Groundwater Monitoring Program; 2 duplicates, 1 field blank and 1 trip blank were collected (refer to Appendix 43 for the 2022 Whale Tail Groundwater report), which aligns with the frequency outlined in the current QAQC Management Plan (Appendix 8); and

- Core Receiving Environment Monitoring Program (CREMP); A combined total of 20 duplicates collected between the Meadowbank Lakes, Baker Lake, and the Whale Tail Lakes, corresponding to approximately 14% of the total number of water samples. Travel blanks (TB), de-ionized (DI) blanks and Equipment Blanks were submitted for all sampling events (refer to Appendix 33 for the 2022 CREMP Report), which aligns with the frequency outlined in the current QAQC Management Plan (Appendix 8).

Analytical precision is a measurement of the variability associated with duplicate analyses of the same sample in the laboratory. Duplicate results were assessed using the relative percent difference (RPD) between measurements. The equation used to calculate a RPD is:

RPD = (A-B)/ ((A+B)/2)*100; where: A = field sample; B = duplicate sample.

Large variations in RPD values are often observed between duplicate samples when the concentrations of analytes are low and approaching the detection limit. Consequently, a RPD of 20% for concentrations of field and duplicates samples that both exceed 10x the method detection limit (MDL) is considered notable. The analytical precision of one QAQC sampling event is characterized as:

-High, when less than 10% of the parameters have variations that are notable;

-Medium, when 10 to 30% of the parameters have variations that are notable;

-Low, when more than 30% of the parameters have variations that are notable.

Results of the QA/QC data are presented in Tables 8-103 to 8-126 of Appendix 55 for the MDMER and EEM, Surface Water, STP, respectively. The following is a brief summary of the QA/QC results, per sampling program:

- MDMER and EEM (Tables 1-32 to 1-38, Appendix 55): All the duplicate samples collected were considered as having high analytical precision, except for one sample that has a medium (26%) analytical precision.

- Surface Water (Tables 1-39 – 1-48 and 1-50 – 1-60, Appendix 55): All QAQC sampling events conducted within the surface water quality program are rated as having high analytical precision except for four (4) having a medium analytical precision between 11% and 25% and one sample with a low analytical precision (32%).

- STP (Table 8-116, Appendix 55): Analytical precision is rated high for all sampling events except for one sampling event with a medium analytical precision of 19%.

RPD values were also calculated for field blanks (FB) and lab blanks (LB) in 2022 as per the QA/QC Plan. All field blank samples are considered to have high analytical precision.

The QA/QC plan was followed, and samples were collected by qualified technicians. It is common to have some RPD exceedances as a result of the discrete differences in the original and field duplicates. Given the variability of these exceedances (occurring with different parameters, on different dates for different sampling programs) and the high number of successful samples, it is evident that field QA/QC standards during water sampling were maintained during sampling in 2022. Agnico Eagle technicians will continue to follow standard QA/QC procedures for surface water sampling that requires the use of sample bottles that are provided by an accredited laboratory, proper handling and storage of bottles to prevent cross-contamination between areas and, if appropriate, thoroughly rinsing the sample containers with sample water prior to sample collection.

Each equipment used for field measurement are calibrated prior each usage. Calibration datasheets are kept for future reference, if needed.

### 8.5.8 Seepage

#### 8.5.8.1 *Meadowbank Site*

**As required by NWB Water License 2AM-MEA1530 Part I, Item 14: *The results and interpretation of the Seepage Monitoring program in accordance with Part I, Item 13***
**The Seepage Monitoring program includes the following locations:**

- **Lake water Seepage Through Dewatering Dikes;**
- **Seepage (of any kind) Through Central Dike;**
- **Seepage and Runoff from the Landfill(s);**
- **Subsurface Seepage and Surface Runoff from Waste Rock Piles;**
- **Seepage at Pit Wall and Pit Wall Freeze/Thaw;**
- **Permafrost Aggradation;**
- **Mill Seepage.**

And

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 10*: Summary of quantities and analysis* of seepage and runoff monitoring from the Landfills, Waste Rock Storage Facility and Central Dike.**

##### *8.5.8.1.1 Lake water seepage through dewatering dikes*

Seepage flow at East Dike is measured by the flow meters installed in the two seepage collection sumps downstream of East Dike. The average flow measured during the year 2022 was estimated to be around 531 $m^3$/day. The measured flow is generally decreasing compared to values from the early years of operation of the dike. Please refer to Section 8.5.3.1.3 for a discussion regarding East Dike Discharge to Second Portage Lake. This section discusses the water quality monitoring results and compliance with MDMER and Water License. Refer to Table 8-2 in Section 8.3.1.3 above for the volume of water discharged to Second Portage Lake and to in Section 8.5.3.1.4 for discharge to Portage Pit. More information can also be found in the Water Management Plan (Version 11) in Appendix 12.

Seepage channels at the toe of Bay-Goose Dike can be observed in the summer. That water naturally reports to the Bay-Goose Pit and is not managed by pumping. Agnico Eagle conducts punctual flow monitoring at predetermined locations to get an estimate of the seepage evolution. The flow in the channels is measured using a bucket and a stopwatch (averaging between 6.5 and 9.9 $m^3$/day in 2022). The reading frequency is approximately once per week during summer time.

#### *8.5.8.1.2 Seepage through Central Dike*

As mentioned in Section 3.1.1c of this report, seepage was observed at the downstream toe of Central Dike since the fall period of 2014. This water was contained between the West road and the Central Dike downstream toe. Agnico Eagle utilized piezometers, thermistors and a groundwater well to monitor the dike integrity, the foundation temperatures, and the piezometric levels within the structure and its foundation. The seepage is located within the mining footprint, away from the receiving environment and is confined directly downstream. The average seepage rate at Central Dike is within a similar trend than in 2021 with variations between 23 $m^3$/h in April 2022 and 150 $m^3$/hr in June 2022.

The Central Dike seepage situation is considered stable and well managed as Agnico Eagle has the pumping capacity to deal with the seepage flow rate, the integrity of the infrastructure has not been compromised, and no tailings were found outside the perimeter of the South Cell TSF.

The monitoring of the Central Dike seepage will continue throughout the operating life of the dike, with analysis of the instrumentation results and water quality monitoring, as required.

#### *8.5.8.1.3 Seepage and runoff from the landfill*

Results and interpretation of this monitoring program are discussed in Section 8.5.3.1.23 above.

#### *8.5.8.1.4 Subsurface seepage and surface runoff from waste rock piles*

Sections 8.5.3.1.7 and 8.5.3.1.13 provide details regarding seepage monitoring at the Portage and Vault WRSF.

#### *8.5.8.1.5 Seepage at pit wall and pit wall freeze/thaw and permafrost aggradation*

No mining activities occurred in Vault Pit, Phaser Pit, BB Phaser Pit, Portage Pit A, Portage Pit E, and Goose Pit. Therefore, any seepage is contributing to the re-flooding of the pits.

During the summer of 2022 seepage was observed at the toe of the D-Dump – North end of Pit E for the first time in 2022. Also, water inflow was noted in one area (flowing from Pond D on the southeast wall) of the Vault Pit in 2022.

No major seepage inflows were observed in Goose, Phaser and in BB Phaser Pits in 2022.

The “2022 Annual Open Pit Geomechanical Inspection” provides more details regarding seepage at pit walls (Appendix 10).

#### *8.5.8.1.6 Mill seepage Meadowbank Site*

On November 4th, 2013, it was observed that water was seeping through the road in front of the Assay Lab Road. Construction of an interception trench was completed in April-May 2014 and repairs and sealing of containment structures within the mill were completed during the summer of 2014. In

November 2015 work was conducted to repair portions of the mill floor and ensure its watertight integrity. Additional elastomeric sealant was applied in the floor joints. Agnico Eagle also put in place an internal action plan and monitoring program for this seep in 2014. The monitoring is part of the Freshet Action Plan. Refer to Appendix D of the 2022 Water Management Report and Plan (Appendix 12) for more details regarding the monitoring and action taken by Agnico Eagle before, during and after the freshet at this seepage area.

In 2022, pumping of the mill seepage trench occurred from May to September. No flow of water has been pumped during winter months in 2022 in the interception trench and recovery well MW-203 because of frozen conditions. Table 8-70 below presents the volumes of water pumped back to the mill from the seepage from 2014 to 2022. A significant increase was observed in 2019 compared to previous years. This is mainly attributable to the significant higher volume of rainfall received in 2019. Agnico Eagle is confident that the corrective measures implemented in previous years (refer to previous Annual Report for more information) are still effective and prevent potential contaminated water from reaching any receiving environment.

**Table 8-70 Meadowbank Assay Road Seepage pumped volume 2014-2022**

| Month | Pumped Volume ($m^3$) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **2014** | **2015** | **2016** | **2017** | **2018** | **2019** | **2020** | **2021** | **2022** |
| January | 0 | 871 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| February | 0 | 306 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| March | 0 | 500 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| April | 0 | 680 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| May | 2,450 | 347 | 0 | 3,025 | 0 | 0 | 0 | 3,177 | 455 |
| June | 1,935 | 10,803 | 2,588 | 3,973 | 5,095 | 10,058 | 23,730 | 1,546 | 2,725 |
| July | 1,158 | 6,633 | 2,270 | 4,961 | 4,148 | 17,273 | 4,215 | 1,075 | 2,534 |
| August | 3,979 | 4,467 | 3,599 | 3,782 | 2,912 | 22,320 | 2,975 | 1,247 | 4,146 |
| September | 2,420 | 4,584 | 2,109 | 6,687 | 1,490 | 20,225 | 1,873 | 1,090 | 4,864 |
| October | 1,043 | 1,188 | 512 | 549 | 0 | 1,740 | 0 | 2,161 | 0 |
| November | 842 | 164 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| December | 871 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **14,698** | **30,543** | **11,078** | **22,977** | **13,645** | **71,616** | **32,792** | **10,296** | **14,724** |

Daily visual inspections were conducted during freshet. Prior and after freshet, inspections were conducted weekly and after rain events.

Monthly water quality samples were collected when water was present at the interception trench and Third Portage Lake as well as Monitoring Wells MW-04, MW-05, MW-06, MW-07 and MW-08 (presented on Figure 16 below). Tables 8-71 and Table 8-72 contain monitoring results from the interception trench/wells and Third Portage Lake (TPL-Assay), respectively. It should be noted that well MW-04, MW-06 and MW-08 were dry in 2022, and only one sample was collected at MW-05, and two samples at MW-07.

In 2022, CN Free results were all under or near the detection limit of the CCME guideline for the Protection of Aquatic Life. Concentrations of CN total are below regulatory Water License and MDMER guidelines. Concentrations of copper are below MDMER and/or Water License guidelines at the trench and monitoring wells, except for MW-05. Although, the concentrations of copper are all higher than the CCME guideline. In addition, iron concentration are higher than the CCME guideline for the wells MW-05 and MW-07 and for one sample taken at the mill trench in June. As the well (MW-05) was dry in 2020, in 2021 and for most of 2022, the water collected in 2022 was likely a contribution of surface runoff which could explain the higher results for iron and copper. Results will be further investigated and validated during the 2023 sampling program.

Monitoring will be continued in 2023 as per the Freshet Action Plan to identify if trending is maintained. Impacts to the environments have been avoided by pumping collected water back to the milling process with no water being discharged to the environment. As well, concentrations at TPL are all below the CCME guideline for the Protection of Aquatic Life for CN Free, copper and iron.

In summary, monitoring in TPL indicates that there has been no impact to the near shore receiving waters. The seepage appears to be effectively contained and the source area has been repaired. Follow up monitoring will continue in 2023 in accordance with the 2023 Freshet Action Plan.

**Figure 16 Meadowbank General Layout of the Assay Road Seepage**

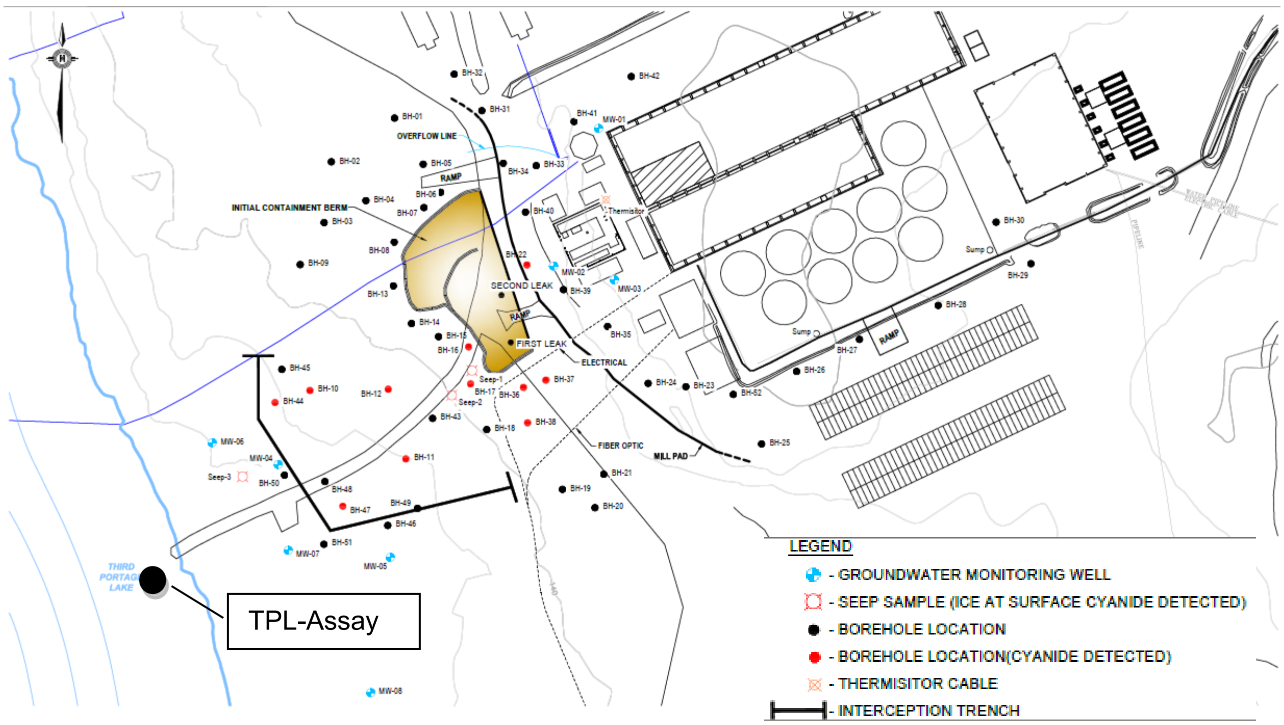


**Table 8-71 Meadowbank Assay Road Seepage Trench and Well Water Quality Monitoring 2014-2022**

| Date | Mill Trench | | | | MW-04 | | | | MW-05 | | | | MW-06 | | | | MW-07 | | | | MW-08 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CN t (mg/L) | Free CN (mg/L) | Cu (mg/L) | Fe (mg/L) | CN t (mg/L) | Free CN (mg/L) | Cu (mg/L) | Fe (mg/L) | CN t (mg/L) | Free CN (mg/L) | Cu (mg/L) | Fe (mg/L) | CN t (mg/L) | Free CN (mg/L) | Cu (mg/L) | Fe (mg/L) | CN t (mg/L) | Free CN (mg/L) | Cu (mg/L) | Fe (mg/L) | CN t (mg/L) | Free CN (mg/L) | Cu (mg/L) | Fe (mg/L) |
| **Regulatory guideline Water License** | **1** | **NA** | **0.2** | **NA** | **1** | **NA** | **0.2** | **NA** | **1** | **NA** | **0.2** | **NA** | **1** | **NA** | **0.2** | **NA** | **1** | **NA** | **0.2** | **NA** | **1** | **NA** | **0.2** | **NA** |
| **Regulatory guideline MDMER** | **1** | **NA** | **0.6** | **NA** | **1** | **NA** | **0.6** | **NA** | **1** | **NA** | **0.6** | **NA** | **1** | **NA** | **0.6** | **NA** | **1** | **NA** | **0.6** | **NA** | **1** | **NA** | **0.6** | **NA** |
| **Regulatory guideline CCME** | **NA** | **0.005** | **0.002** | **0.3** | **NA** | **0.005** | **0.002** | **0.3** | **NA** | **0.005** | **0.002** | **0.3** | **NA** | **0.005** | **0.002** | **0.3** | **NA** | **0.005** | **0.002** | **0.3** | **NA** | **0.005** | **0.002** | **0.3** |
| **2014** | | | | | | | | | | | | | | | | | | | | | | | | |
| 5/26/2014 | 0.087 | | 0.01 | 1 | Dry | | | | Dry | | | | Dry | | | | Dry | | | | Dry | | | |
| 6/17/2014 | 0.44 | 0.061 | 0.057 | 1.6 | Dry | | | | Dry | | | | Dry | | | | 0.069 | | 0.14 | 2.2 | 0.024 | <0.005 | 0.11 | 0.41 |
| 7/21/2014 | 0.38 | 0.020 | 0.031 | 1.6 | Dry | | | | Not enough water | | | | Dry | | | | Dry | | | | <0.005 | <0.01 | 0.014 | 0.43 |
| 8/19/2014 | 0.17 | 0.028 | 0.012 | 1.5 | 0.12 | | 0.076 | 5.80 | <0.005 | <0.01 | 0.031 | 2.2 | 0.1 | | 0.24 | 4.8 | 0.046 | <0.02 | 0.1 | 9.4 | <0.005 | <0.01 | 0.055 | 6.40 |
| 9/29/2014 | 0.03 | | 0.008 | 0.77 | | | | | | | | | | | | | 0.001 | | 0.134 | 10.9 | | | | |
| 11/18/2014 | Frozen | | | | Frozen | | | | Frozen | | | | Frozen | | | | Frozen | | | | Frozen | | | |
| **2015** | | | | | | | | | | | | | | | | | | | | | | | | |
| 7/29/2015 | 0.024 | | 0.005 | 0.72 | Dry | | | | <0.005 | | 0.13 | 1.49 | Dry | | | | Dry | | | | <0.005 | | 0.27 | 2.92 |
| 8/4/2015 | 0.038 | <0.005 | 0.008 | 0.6 | Dry | | | | Dry | | | | Dry | | | | Dry | | | | <0.005 | <0.005 | 0.17 | 17.2 |
| 9/17/2015 | 0.030 | | 0.005 | 0.2 | Dry | | | | Dry | | | | Dry | | | | 0.008 | <0.005 | 0.047 | 4.53 | <0.005 | <0.005 | 0.016 | 8.1 |
| **2016** | | | | | | | | | | | | | | | | | | | | | | | | |
| 8/8/2016 | 0.022 | 0.016 | 0.025 | 0.3 | Dry | | | | Dry | | | | Not enough water | | | | <0.005 | <0.005 | 0.295 | 39.8 | <0.005 | <0.005 | 0.371 | 62.8 |
| 8/16/2016 | No sample taken | | | | Dry | | | | Dry | | | | Not enough water | | | | 0.007 | | 0.181 | 27.8 | <0.005 | | 0.114 | 19.8 |
| 9/6/2016 | | 0.007 | | | Dry | | | | Dry | | | | Dry | | | | | <0.005 | | | Not enough water | | | |
| 10/14/2016 | Frozen | | | | Dry | | | | Dry | | | | Dry | | | | | 0.005 | | | Dry | | | |
| **2017** | | | | | | | | | | | | | | | | | | | | | | | | |
| 6/11/2017 | 0.057 | | 0.005 | 1.33 | Dry | | | | Dry | | | | Dry | | | | Frozen | | | | Dry | | | |
| 7/4/2017 | No sample taken | | | | Not enough water | | | | | <0.005 | | | Dry | | | | | <0.005 | | | | <0.005 | | |
| 7/9/2017 | 0.024 | 0.017 | 0.004 | | Dry | | | | Dry | | | | Dry | | | | <0.001 | | | | Dry | | | |
| 7/14/2017 | 0.028 | <0.005 | 0.002 | | Dry | | | | | | | | Dry | | | | No sample taken | | | | No sample taken | | | |
| 7/18/2017 | 0.013 | <0.005 | 0.003 | 0.36 | Dry | | | | <0.01 | <0.005 | | | Dry | | | | 0.002 | <0.005 | 0.067 | 23.8 | | <0.005 | 0.026 | 10.5 |

| Date | Mill Trench | | | | MW-04 | | | | MW-05 | | | | MW-06 | | | | MW-07 | | | | MW-08 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CN t (mg/L) | Free CN (mg/L) | Cu (mg/L) | Fe (mg/L) | CN t (mg/L) | Free CN (mg/L) | Cu (mg/L) | Fe (mg/L) | CN t (mg/L) | Free CN (mg/L) | Cu (mg/L) | Fe (mg/L) | CN t (mg/L) | Free CN (mg/L) | Cu (mg/L) | Fe (mg/L) | CN t (mg/L) | Free CN (mg/L) | Cu (mg/L) | Fe (mg/L) | CN t (mg/L) | Free CN (mg/L) | Cu (mg/L) | Fe (mg/L) |
| **Regulatory guideline Water License** | **1** | **NA** | **0.2** | **NA** | **1** | **NA** | **0.2** | **NA** | **1** | **NA** | **0.2** | **NA** | **1** | **NA** | **0.2** | **NA** | **1** | **NA** | **0.2** | **NA** | **1** | **NA** | **0.2** | **NA** |
| **Regulatory guideline MDMER** | **1** | **NA** | **0.6** | **NA** | **1** | **NA** | **0.6** | **NA** | **1** | **NA** | **0.6** | **NA** | **1** | **NA** | **0.6** | **NA** | **1** | **NA** | **0.6** | **NA** | **1** | **NA** | **0.6** | **NA** |
| **Regulatory guideline CCME** | **NA** | **0.005** | **0.002** | **0.3** | **NA** | **0.005** | **0.002** | **0.3** | **NA** | **0.005** | **0.002** | **0.3** | **NA** | **0.005** | **0.002** | **0.3** | **NA** | **0.005** | **0.002** | **0.3** | **NA** | **0.005** | **0.002** | **0.3** |
| 7/28/2017 | 0.011 | <0.005 | 0.004 | | Dry | | | | Dry | | | | Dry | | | | No sample taken | | | | No sample taken | | | |
| 8/22/2017 | 0.021 | 0.005 | 0.003 | 0.61 | Dry | | | | Dry | | | | Dry | | | | 0.013 | <0.005 | 0.354 | 161 | Not enough water | | | |
| 9/19/2017 | 0.005 | 0.005 | 0.005 | 0.05 | Dry | | | | Dry | | | | Dry | | | | 0.011 | <0.005 | 0.143 | 25.9 | Dry | | | |
| **2018** | | | | | | | | | | | | | | | | | | | | | | | | |
| 6/28/2018 | Frozen | | | | Frozen | | | | Frozen | | | | Frozen | | | | Frozen | | | | Frozen | | | |
| 7/16/2018 | 0.016 | 0.014 | 0.005 | 0.18 | Dry | | | | Dry | | | | Dry | | | | Equipment broken | | | | Frozen | | | |
| 8/20/2018 | 0.014 | 0.015 | 0.005 | 0.08 | Dry | | | | Dry | | | | Dry | | | | Equipment broken | | | | Dry | | | |
| 9/17/2018 | 0.006 | <0.005 | 0.004 | 0.08 | Dry | | | | Dry | | | | Dry | | | | No sample taken | | | | Dry | | | |
| 9/24/2018 | No sample taken | | | | Dry | | | | Dry | | | | Dry | | | | 0.004 | <0.005 | 0.051 | 20.3 | Dry | | | |
| **2019** | | | | | | | | | | | | | | | | | | | | | | | | |
| 7/8/2019 | 0.044 | 0.013 | 0.006 | - | Dry | | | | Dry | | | | Dry | | | | Dry | | | | Dry | | | |
| 7/9/2019 | 0.047 | <0.001 | 0.005 | 0.04 | Dry | | | | Dry | | | | Dry | | | | Dry | | | | Dry | | | |
| 8/2/2019 | | | | | Dry | | | | <0.001 | <0.001 | 0.008 | 1.77 | 0.042 | <0.001 | 0.014 | 2.76 | 0.002 | <0.001 | 0.036 | 17.8 | Not enough water | | | |
| 8/17/2019 | 0.048 | 0.01 | 0.004 | 0.03 | Not enough water | | | | Not enough water | | | | Not enough water | | | | Not enough water | | | | Not enough water | | | |
| 8/30/2019 | 0.008 | 0.002 | 0.004 | - | Not enough water | | | | Not enough water | | | | Not enough water | | | | Not enough water | | | | Dry | | | |
| 9/6/2019 | <0.001 | 0.001 | 0.003 | - | Not enough water | | | | Not enough water | | | | Not enough water | | | | Not enough water | | | | Dry | | | |
| 9/26/2019 | 0.025 | 0.011 | 0.006 | - | Dry | | | | Dry | | | | Dry | | | | Dry | | | | Dry | | | |
| **2020** | | | | | | | | | | | | | | | | | | | | | | | | |
| 6/8/2020 | 0.038 | 0.010 | 0.007 | 0.60 | Dry | | | | Dry | | | | Dry | | | | Dry | | | | Dry | | | |
| 7/7/2020 | 0.025 | 0.005 | 0.006 | - | Dry | | | | Dry | | | | Dry | | | | Dry | | | | Dry | | | |
| 7/14/2020 | 0.038 | 0.013 | 0.006 | - | Dry | | | | Dry | | | | Dry | | | | Not enough water | | | | Not enough water | | | |
| 7/27/2020 | 0.022 | 0.012 | 0.004 | 0.08 | Dry | | | | <0.001 | <0.001 | 0.008 | 5.8 | Dry | | | | Not enough water | | | | Not enough water | | | |
| 7/30/2020 | 0.022 | 0.017 | 0.005 | - | Dry | | | | Dry | | | | Dry | | | | Not enough water | | | | Not enough water | | | |
| 8/4/2020 | 0.01 | 0.009 | 0.005 | - | Dry | | | | Dry | | | | Dry | | | | Not enough water | | | | Not enough water | | | |

| Date | Mill Trench | | | | MW-04 | | | | MW-05 | | | | MW-06 | | | | MW-07 | | | | MW-08 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | CN t (mg/L) | Free CN (mg/L) | Cu (mg/L) | Fe (mg/L) | CN t (mg/L) | Free CN (mg/L) | Cu (mg/L) | Fe (mg/L) | CN t (mg/L) | Free CN (mg/L) | Cu (mg/L) | Fe (mg/L) | CN t (mg/L) | Free CN (mg/L) | Cu (mg/L) | Fe (mg/L) | CN t (mg/L) | Free CN (mg/L) | Cu (mg/L) | Fe (mg/L) | CN t (mg/L) | Free CN (mg/L) | Cu (mg/L) | Fe (mg/L) |
| **Regulatory guideline Water License** | **1** | **NA** | **0.2** | **NA** | **1** | **NA** | **0.2** | **NA** | **1** | **NA** | **0.2** | **NA** | **1** | **NA** | **0.2** | **NA** | **1** | **NA** | **0.2** | **NA** | **1** | **NA** | **0.2** | **NA** |
| **Regulatory guideline MDMER** | **1** | **NA** | **0.6** | **NA** | **1** | **NA** | **0.6** | **NA** | **1** | **NA** | **0.6** | **NA** | **1** | **NA** | **0.6** | **NA** | **1** | **NA** | **0.6** | **NA** | **1** | **NA** | **0.6** | **NA** |
| **Regulatory guideline CCME** | **NA** | **0.005** | **0.002** | **0.3** | **NA** | **0.005** | **0.002** | **0.3** | **NA** | **0.005** | **0.002** | **0.3** | **NA** | **0.005** | **0.002** | **0.3** | **NA** | **0.005** | **0.002** | **0.3** | **NA** | **0.005** | **0.002** | **0.3** |
| 8/10/2020 | 0.016 | 0.010 | 0.004 | 0.04 | Dry | | | | Dry | | | | Dry | | | | 0.006 | <0.001 | 0.026 | 11 | Not enough water | | | |
| 8/18/2020 | 0.012 | <0.001 | 0.004 | - | Dry | | | | Dry | | | | Dry | | | | Not enough water | | | | Not enough water | | | |
| 8/25/2020 | 0.011 | 0.010 | 0.005 | - | Dry | | | | Dry | | | | Dry | | | | Not enough water | | | | Not enough water | | | |
| 9/1/2020 | 0.062 | 0.008 | 0.005 | - | Dry | | | | Dry | | | | Dry | | | | Dry | | | | Dry | | | |
| 9/22/2020 | 0.006 | 0.005 | 0.003 | - | Dry | | | | Dry | | | | Dry | | | | Dry | | | | Dry | | | |
| 9/29/2020 | 0.008 | 0.001 | 0.004 | 0.14 | Dry | | | | Dry | | | | Dry | | | | Dry | | | | Dry | | | |
| **2021** | | | | | | | | | | | | | | | | | | | | | | | | |
| 6/16/2021 | 0.04 | 0.006 | 0.005 | 1.5 | Dry | | | | Dry | | | | Dry | | | | Dry | | | | Dry | | | |
| 7/12/2021 | 0.061 | 0.003 | 0.014 | 7.33 | Dry | | | | Dry | | | | Dry | | | | <0.0050 | 0.002 | 0.033 | 34.8 | Dry | | | |
| 8/9/2021 | 0.036 | 0.021 | 0.0038 | 0.174 | Dry | | | | Dry | | | | Dry | | | | 0.007 | 0.003 | 0.014 | 14.3 | Dry | | | |
| 9/6/2021 | 0.036 | 0.003 | 0.0031 | 0.072 | Dry | | | | Dry | | | | Dry | | | | Dry | | | | Dry | | | |
| 10/10/2021 | 0.059 | 0.025 | 0.0030 | 0.103 | Dry | | | | Dry | | | | Dry | | | | Dry | | | | Dry | | | |
| **2022** | | | | | | | | | | | | | | | | | | | | | | | | |
| 6/5/2022 | 0.012 | 0.006 | 0.0118 | 3.790 | Dry | | | | Dry | | | | Dry | | | | Dry | | | | Dry | | | |
| 6/21/2022 | - | - | - | - | Dry | | | | Dry | | | | Dry | | | | 0.0060 | <0.0020 | 0.0264 | 26.3 | Dry | | | |
| 7/3/2022 | 0.035 | 0.019 | 0.0033 | 0.029 | Dry | | | | Dry | | | | Dry | | | | Dry | | | | Dry | | | |
| 7/5/2022 | - | - | - | - | Dry | | | | <0.050 | <0.0020 | 1.31 | 369 | Dry | | | | 0.00426 | <0.0020 | 0.0900 | 75.0 | Dry | | | |
| 8/1/2022 | 0.017 | 0.014 | 0.0031 | 0.110 | Dry | | | | Dry | | | | Dry | | | | Dry | | | | Dry | | | |
| 8/28/2022 | - | - | - | - | Dry | | | | Dry | | | | Dry | | | | Dry | | | | Dry | | | |
| 9/25/2022 | 0.059 | 0.046 | 0.0036 | 0.057 | Dry | | | | Dry | | | | Dry | | | | Dry | | | | Dry | | | |

**Table 8-72 Meadowbank Assay Road Seepage 2022 TPL-Assay Water Quality Monitoring**

| TPL-Assay | Unit | Annual Average | | | | | | 6/21/2022 | 7/10/2022 | 8/1/2022 | 9/4/2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Parameter | | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | | | | |
| **Field Measured** | | | | | | | | | | | |
| Temperature | °C | 15.0 | 8.0 | 11.0 | 11.0 | 7.2 | 12.4 | 7.7 | 19.4 | 11.9 | 10.5 |
| pH | pH units | 7.60 | 7.40 | 7.40 | 7.90 | 7.60 | 7.40 | 7.25 | 7.50 | 7.13 | 7.72 |
| Conductivity | uS/cm | 104.3 | 105.1 | 86.2 | 98.9 | 99.2 | 100.2 | 121.9 | 99.2 | 95.2 | 84.4 |
| Turbidity | NTU | 1.560 | 0.950 | 3.200 | 1.990 | 0.996 | 1.103 | 2.02 | 1.09 | 0.60 | 0.70 |
| **Conventional Parameters** | | | | | | | | | | | |
| Hardness, as $CaCO_3$ | mg/L | 34 | 33 | 36 | 51 | 41 | 38 | 38.5 | 38.0 | 39.5 | 37.3 |
| Total alkalinity, as $CaCO_3$ | mg/L | 39 | 30 | 22 | 38 | 25 | 26 | 26 | 27 | 25 | 25 |
| Carbonate, as $CaCO_3$ | mg/L | - | - | 2 | 5 | 1 | 1 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bicarbonate, as $CaCO_3$ | mg/L | - | - | 22 | 38 | 25 | 26 | 26 | 27 | 25 | 25 |
| TDS | mg/L | 63 | 59 | 68 | 65 | 57 | 55 | 35 | 65 | 55 | 65 |
| TSS | mg/L | 2 | 1 | 2 | 3 | 1 | 1 | 2 | < 1 | < 1 | < 1 |
| Total organic carbon | mg/L | 3.5 | 2.6 | 2.2 | 2.5 | 2.0 | 2.0 | 2.0 | 2.0 | 1.9 | 2.1 |
| Dissolved organic carbon | mg/L | 3.20 | 2.40 | 2.20 | 1.90 | 1.86 | 1.90 | 1.7 | 2.1 | 1.9 | 1.9 |
| Colour | TCU | 2.0 | 1.0 | 1.0 | 5.0 | 2.8 | 2.3 | 2 | 3 | < 2 | < 2 |
| **Major Ions** | | | | | | | | | | | |
| Bromide | mg/L | 0.07 | 0.05 | 0.06 | 0.07 | 1.00 | 1.00 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chloride | mg/L | 4.3 | 4.4 | 3.6 | 5.0 | 5.7 | 5.2 | 5.2 | 5.1 | 5.2 | 5.2 |
| Cyanide | mg/L | 0.004 | 0.001 | 0.013 | 0.001 | 0.005 | 0.001 | 0.00064 | < 0.00050 | < 0.00050 | 0.00205 |
| Cyanide (free) | mg/L | 0.005 | 0.005 | 0.001 | 0.001 | 0.002 | 0.002 | < 0.0020 | < 0.0020 | 0.0023 | 0.0022 |
| Cyanide (WAD) | mg/L | 0.003 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | < 0.00050 | < 0.00050 | < 0.00050 | 0.00150 |
| Fluoride | mg/L | 0.11 | 0.12 | 0.28 | 0.10 | 0.11 | 0.10 | 0.10 | < 0.10 | < 0.10 | 0.11 |
| Silica | mg/L | 0.50 | 0.34 | 0.49 | 0.79 | 0.46 | 0.34 | 0.55 | 0.33 | 0.27 | 0.19 |
| Sulfate | mg/L | 12.2 | 12.2 | 15.5 | 15.6 | 15.4 | 15.0 | 16 | 15 | 14 | 15 |
| Thiocyanate | mg/L | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | < 0.20 | < 0.20 | < 0.20 | < 0.20 |
| Thiosulphates | mg/L | - | - | - | 0.02 | 0.20 | 0.20 | < 0.20 | < 0.20 | < 0.20 | < 0.20 |
| **Nutrients and Chlorophyll a** | | | | | | | | | | | |
| Ammonia Nitrogen | mg N/L | 0.04 | 0.01 | 0.02 | 0.02 | 0.05 | 0.05 | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Nitrate | mg N/L | 0.02 | 0.01 | 0.07 | 0.01 | 0.10 | 0.34 | < 0.10 | 1.05 | < 0.10 | < 0.10 |
| Nitrite | mg N/L | 0.01 | 0.01 | 0.01 | 0.02 | 0.01 | 0.01 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Total Kjeldahl nitrogen | mg N/L | 0.61 | 0.16 | 0.30 | 0.16 | 0.12 | 0.15 | 0.18 | 0.13 | 0.19 | 0.10 |
| Total phosphorus | mg P/L | 0.022 | 0.014 | 0.010 | 0.020 | 0.001 | 0.003 | 0.0021 | < 0.0050 | < 0.0050 | 0.0013 |
| Orthophosphate | mg P/L | 0.01 | 0.01 | 0.01 | 0.07 | 0.01 | 0.01 | < 0.010 | < 0.010 | < 0.010 | < 0.010 |
| Chlorophyll a | mg/L | - | - | - | 0.001 | 0.002 | 0.001 | 0.00099 | - | 0.00079 | 0.00091 |
| **Total Metals** | | | | | | | | | | | |
| Aluminum | mg/L | 0.006 | 0.017 | 0.013 | 0.022 | 0.014 | 0.010 | 0.0144 | 0.0141 | 0.0055 | 0.0057 |
| Antimony | mg/L | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0005 | 0.0005 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 |
| Arsenic | mg/L | 0.0005 | 0.0005 | 0.0005 | 0.0005 | 0.0008 | 0.0010 | 0.00086 | 0.00135 | 0.00090 | 0.00070 |
| Barium | mg/L | 0.0022 | 0.0032 | 0.0065 | 0.0050 | 0.0060 | 0.0053 | 0.0062 | 0.0057 | 0.0046 | 0.0045 |
| Beryllium | mg/L | 0.0005 | 0.0005 | 0.0005 | 0.0005 | 0.0001 | 0.0001 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 |
| Boron | mg/L | 0.01 | 0.01 | 0.01 | 0.01 | 0.05 | 0.05 | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Cadmium | mg/L | 0.00002 | 0.00002 | 0.00002 | 0.00002 | 0.00001 | 0.00001 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| Calcium (total) | mg/L | - | - | 10.27 | 14.4 | 11.56 | 10.78 | 10.8 | 10.8 | 11.1 | 10.4 |
| Chromium | mg/L | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Cobalt | mg/L | 0.0005 | 0.0005 | 0.0005 | 0.0005 | 0.0002 | 0.0002 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Copper | mg/L | 0.0008 | 0.0006 | 0.0008 | 0.0006 | 0.0008 | 0.0008 | 0.00080 | 0.00090 | 0.00074 | 0.00065 |
| Iron | mg/L | 0.010 | 0.010 | 0.046 | 0.133 | 0.036 | 0.052 | 0.043 | 0.098 | 0.036 | 0.032 |
| Lead | mg/L | 0.0026 | 0.0004 | 0.0003 | 0.0002 | 0.0002 | 0.0002 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Lithium | mg/L | 0.005 | 0.005 | 0.005 | 0.005 | 0.002 | 0.002 | < 0.0020 | < 0.0020 | < 0.0020 | < 0.0020 |
| Magnesium (total) | mg/L | 2.62 | 2.67 | 2.99 | 3.73 | 2.99 | 2.77 | 2.81 | 2.65 | 2.86 | 2.74 |
| Manganese | mg/L | 0.0023 | 0.0007 | 0.0066 | 0.0118 | 0.0049 | 0.0055 | 0.0067 | 0.0075 | 0.0041 | 0.0036 |
| Mercury | mg/L | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Nickel | mg/L | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Potassium (total) | mg/L | 1.23 | 1.09 | 1.23 | 1.75 | 1.45 | 1.38 | 1.27 | 1.42 | 1.45 | 1.37 |
| Selenium | mg/L | 0.0010 | 0.0005 | 0.0005 | 0.0010 | 0.0001 | 0.0001 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 |
| Silver | mg/L | 0.00010 | 0.00010 | 0.00010 | 0.00010 | 0.00002 | 0.00002 | < 0.000020 | < 0.000020 | < 0.000020 | < 0.000020 |
| Sodium (total) | mg/L | - | - | 2.10 | 2.5 | 1.99 | 1.70 | 1.70 | 1.68 | 1.73 | 1.69 |
| Strontium | mg/L | 0.05 | 0.04 | 0.07 | 0.05 | 0.06 | 0.06 | 0.0536 | 0.0616 | 0.0556 | 0.0575 |
| Thallium | mg/L | 0.00080 | 0.00020 | 0.00020 | 0.00020 | 0.00001 | 0.00001 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| Tin | mg/L | 0.001 | 0.001 | 0.001 | 0.001 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Titanium | mg/L | 0.010 | 0.010 | 0.010 | 0.010 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Uranium | mg/L | 0.0010 | 0.0010 | 0.0010 | 0.0010 | 0.0002 | 0.0002 | 0.00016 | 0.00020 | 0.00018 | 0.00019 |
| Vanadium | mg/L | 0.001 | 0.001 | 0.001 | 0.001 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Zinc | mg/L | 0.001 | 0.001 | 0.001 | 0.001 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| **Dissolved Metals** | | | | | | | | | | | |
| Aluminum | mg/L | 0.010 | 0.009 | 0.003 | 0.006 | 0.004 | 0.005 | < 0.0030 | 0.0062 | 0.0047 | 0.0060 |
| Antimony | mg/L | 0.0001 | 0.0001 | 0.0001 | 0.0001 | 0.0005 | 0.0005 | < 0.00050 | < 0.00050 | < 0.00050 | < 0.00050 |
| Arsenic | mg/L | 0.0018 | 0.0005 | 0.0005 | 0.0005 | 0.0007 | 0.0013 | 0.00259 | 0.00120 | 0.00078 | 0.00075 |
| Barium | mg/L | 0.0033 | 0.0031 | 0.0052 | 0.0042 | 0.0117 | 0.0057 | 0.0073 | 0.0056 | 0.0046 | 0.0052 |
| Beryllium | mg/L | 0.0010 | 0.0010 | 0.0010 | 0.0010 | 0.0001 | 0.0001 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 |
| Boron | mg/L | 0.01 | 0.01 | 0.01 | 0.01 | 0.05 | 0.05 | < 0.050 | < 0.050 | < 0.050 | < 0.050 |
| Cadmium | mg/L | 0.00002 | 0.00002 | 0.00002 | 0.00002 | 0.00001 | 0.00002 | < 0.000010 | < 0.000010 | < 0.000010 | 0.000051 |
| Chromium | mg/L | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Cobalt | mg/L | 0.0013 | 0.0005 | 0.0005 | 0.0005 | 0.0002 | 0.0002 | < 0.00020 | < 0.00020 | < 0.00020 | < 0.00020 |
| Copper | mg/L | 0.0009 | 0.0008 | 0.0005 | 0.0005 | 0.0007 | 0.0009 | 0.00070 | 0.00082 | 0.00108 | 0.00110 |
| Iron | mg/L | 0.085 | 0.025 | 0.010 | 0.010 | 0.009 | 0.019 | 0.0169 | 0.0261 | 0.0131 | 0.0180 |
| Lead | mg/L | 0.0026 | 0.0004 | 0.0003 | 0.0002 | 0.0002 | 0.0003 | < 0.00020 | < 0.00020 | 0.00046 | 0.00025 |
| Lithium | mg/L | 0.005 | 0.005 | 0.005 | 0.005 | 0.002 | 0.002 | < 0.0020 | < 0.0020 | < 0.0020 | < 0.0020 |
| Manganese | mg/L | 0.006 | 0.003 | 0.004 | 0.001 | 0.003 | 0.006 | 0.0083 | 0.0056 | 0.0044 | 0.0037 |
| Mercury | mg/L | 0.00001 | 0.00003 | 0.00001 | 0.00001 | 0.00001 | 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 | < 0.00001 |
| Molybdenum | mg/L | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | < 0.0010 | < 0.0010 | < 0.0010 | < 0.0010 |
| Nickel | mg/L | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.001 | 0.0014 | < 0.0010 | 0.0012 | < 0.0010 |
| Selenium | mg/L | 0.0010 | 0.0006 | 0.0006 | 0.0010 | 0.0001 | 0.0001 | < 0.00010 | < 0.00010 | < 0.00010 | < 0.00010 |
| Silver | mg/L | 0.00010 | 0.00010 | 0.00010 | 0.00010 | 0.00002 | 0.00009 | 0.000295 | < 0.000020 | < 0.000020 | < 0.000020 |
| Strontium | mg/L | 0.04 | 0.03 | 0.04 | 0.05 | 0.06 | 0.06 | 0.0595 | 0.0576 | 0.0559 | 0.0562 |
| Thallium | mg/L | 0.00080 | 0.00020 | 0.00020 | 0.00020 | 0.00001 | 0.00001 | < 0.000010 | < 0.000010 | < 0.000010 | < 0.000010 |
| Tin | mg/L | 0.001 | 0.001 | 0.001 | 0.001 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Titanium | mg/L | 0.010 | 0.010 | 0.010 | 0.010 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Uranium | mg/L | 0.0010 | 0.0010 | 0.0010 | 0.0010 | 0.0002 | 0.0002 | 0.00019 | 0.00020 | 0.00019 | 0.00018 |
| Vanadium | mg/L | 0.001 | 0.001 | 0.001 | 0.001 | 0.005 | 0.005 | < 0.0050 | < 0.0050 | < 0.0050 | < 0.0050 |
| Zinc | mg/L | 0.003 | 0.001 | 0.001 | 0.001 | 0.006 | 0.006 | < 0.0050 | < 0.0050 | 0.0097 | 0.0058 |

### 8.5.8.2 *Whale Tail Site*

**As required by NWB Water License 2AM-WTP1830 Schedule B, Item 13*: Summary of quantities and analysis of Seepage and runoff monitoring from the Landfill, Waste Rock Storage Facility and associated dikes/berms***

#### *8.5.8.2.1 Lake water seepage through dewatering dikes*

Lake water seepage was observed at Whale Tail Dike and is summarized in Section 8.5.8.2.2 below. No other lake water seepage was observed at the other dewatering dikes in 2022.

No seepage occurred from WRSF Dike in 2022. The mitigation measures implemented in 2020 were successful in ensuring the proper performance of this infrastructure.

#### *8.5.8.2.2 Seepage through Whale Tail Dike*

The Whale Tail Dike was commissioned on March 5$^{th}$, 2019 with the beginning of the dewatering activity of the North Basin.

In July 2019, seepage streams were observed on the downstream toe of Whale Tail Dike. The flow was measured using v-notch weirs at approximately 300 m$^3$/h which is higher than what was anticipated in the water balance. A detailed investigation including additional instrumentation and geophysics was conducted for a better understanding of the seepage phenomenon at the Whale Tail Dike.

A pumping system was installed to collect and manage the non-contact seepage water but has not yet been commissioned. The collected seepage water will be discharged to Whale Tail South Basin via a diffuser without treatment if the water quality meets the discharge criteria of the Water License 2AM-WTP1830. Until the system is commissioned and discharge criteria are met, water will overflow from the pump stations to the Whale Tail Attenuation Pond and be managed as part of this infrastructure.

An intensive grouting campaign was conducted between Q4 2019 and Q1 2020 to further reduce the seepage flow. The campaign was successful in reducing the seepage by more than 50 %. In 2022, the seepage rate was stable compared to 2020-2021 and was about 100 to 150 m$^3$/h.

#### *8.5.8.2.3 Seepage and runoff from the landfill*

The Whale Tail Landfill was commissioned in October 2019.  No seepage from this structure is observed.

#### *8.5.8.2.4 Subsurface seepage and surface runoff from waste rock piles*

No subsurface seepage was observed from the WRSF in 2022. Surface runoff were collected and managed as per the strategy detailed in the water management plan.

#### *8.5.8.2.5 Seepage at pit wall and pit wall freeze/thaw and permafrost aggradation*

Seepage was observed in Whale Tail Pit along the south and west walls exposed bench faces. In 2022, 842,248 m$^3$ of water was pumped out of Whale Tail Pit. That number included groundwater inflow as well as snowmelt and runoff. The groundwater inflow comes from Whale Tail South as well as some infiltration from the Whale Tail Attenuation Pond. A permanent sump within the pit will be implemented in 2023 to intercept that water before it reaches the pit floor.

Refer to the “2022 Annual Open Pit Geomechanical Inspection” for more details regarding seepage at pit walls (Appendix 10).

## 8.6 BLAST MONITORING [4]

### 8.6.1 Meadowbank Site

**As required by NIRB Project Certificate No.004, Condition 85*: develop a detailed blasting program to minimize the effects of blasting on fish and fish habitat, water quality, and wildlife and terrestrial VECs.***

In accordance with NIRB Project Certificate No.004, Condition 85, Agnico Eagle Meadowbank Complex developed a blasting program which complies with *The Guidelines for the Use of Explosives In or Near Canadian Fisheries Water* (Wright and Hopky, 1998) as modified by the DFO for use in the North and adhere to guidance provided in *Monitoring Explosive-Based Winter Seismic Exploration in Waterbodies* (Cott and Hanna, 2005). As a result, Agnico Eagle conducts monitoring to evaluate blast related peak particle velocity and overpressure to protect nearby fish bearing waters.

No blast monitoring was conducted at the Meadowbank mine site in 2022 as mining operations ceased in 2019.

### 8.6.2 Whale Tail Site

**As required by DFO Authorization 16-HCAA-00370 Condition 2.3.3*: The proponent shall develop a blasting mitigation plan in consultation with DFO to ensure effects on fish and fish habitat are minimized, as per Nunavut Impact Review Board Project Certificate No. 008 Condition 22. The Blasting mitigations plan shall be submitted to DFO prior to construction for approval, and shall adhere to the guidance provided in the Monitoring Explosive-Based Winter Seismic Exploration in Waterbodies, NWT 2000-2002.***

And

**As required by DFO Authorization 20-HCAA-00275 Condition 2.3.8*: The proponent shall develop a blasting mitigation plan in consultation with DFO to ensure effects on fish and fish habitat are minimized, as per Nunavut Impact Review Board Project Certificate No. 008 Condition 22. The Blasting mitigations plan shall be submitted to DFO prior to construction for approval, and shall adhere to the guidance provided in the Monitoring Explosive-Based Winter Seismic Exploration in Waterbodies, NWT 2000-2002.***

And

**As required by NIRB Project Certificate No.008 Condition 22: *The Proponent shall engage with Fisheries and Oceans Canada to develop project specific thresholds, mitigation and monitoring for any blasting activities that would exceed the requirements of Fisheries and Oceans Canada’s Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters. If project-specific thresholds, mitigation and monitoring requirements are developed, the Proponent shall identify these requirements in the annual report provided to the NIRB.***

[4] TSM – Biodiversity and Conservation Management

In accordance with NIRB Project Certificate No.008, Condition 22, DFO 16-HCAA-00370 Condition 2.3.3 and DFO 20-HCAA-00275 Condition 2.3.8, Agnico Eagle had developed a blasting program which complies with *The Guidelines for the Use of Explosives In or Near Canadian Fisheries Water* (Wright and Hopky, 1998) as modified by the DFO for use in the North and adhere to guidance provided in *Monitoring Explosive-Based Winter Seismic Exploration in Waterbodies* (Cott and Hanna, 2005). As a result, Agnico Eagle conducts monitoring to evaluate blast related peak particle velocity and overpressure to protect nearby fish bearing waters.

Agnico Eagle has updated the Blast Monitoring Program (Version 8, March 2023 – Appendix 40) to reflect the actual blast monitoring locations on site. This Version 8 is submitted as part of the 2022 Annual Report.

The results of the 2022 blast monitoring program are available in the report titled "2022 Meadowbank and Whale Tail Blast Monitoring Report for the Protection of Nearby Fish Habitat" attached as Appendix 41.

Peak particle velocity (PPV) and overpressure monitoring data was recorded throughout 2022 during blasting activities at Whale Tail, IVR and IVR West Pits for the protection of fish. The locations of the blast monitoring stations on surface in 2022 at Whale Tail Mine are highlighted in Figure 1 of the report: Blast Monitoring Report found in Appendix 41.

In 2022, 187 blasts were monitored at IVR pits. There were two (2) blasts exceeding the PPV concentration DFO limit of 13 mm/s and no blast (0) exceeding the IPC measurement DFO limit of 50kPa.

For Whale Tail Pit, 186 blasts were monitored. There were no (0) PPV readings exceeding 13 mm/s and no blast (0) exceeding the IPC measurements DFO limit of 50 kPa.

Table 8-73 presents a summary of PPV and IPC exceedance and Table 8-74 Maximum and Average PPV and IPC from 2018 - 2022.

**Table 8-73 Whale Tail Mine PPV and IPC exceedance from 2018-2022**

| Year | PPV exceedance | IPC exceedance |
|---|---|---|
| 2018 | 2 | 0 |
| 2019 | 8 | 0 |
| 2020 | 4 | 0 |
| 2021 | 0 | 0 |
| 2022 | 2 | 0 |
| **Total** | **16** | **0** |

**Table 8-74 Whale Tail Mine Maximum and Average PPV and IPC from 2018 – 2022**

| Location | Parameters | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|
| Whale Tail Pit | Max PPV (mm/s) | 26.1 | 20.9 | 14.6 | 12.7 | 11.05 |
| | Average PPV (mm/s) | 4.5 | 2.16 | 0.98 | 1.6 | 3.36 |
| | Max IPC (kPa) | 30.54 | 24.46 | 17.09 | 14.9 | 12.93 |
| | Average IPC (kPa) | 5.01 | 2.23 | 1.19 | 1.4 | 3.93 |
| IVR Pit | Max PPV (mm/s) | N/A | N/A | 6.5 | 8.6 | 17.37 |
| | Average PPV (mm/s) | N/A | N/A | 0.67 | 1.22 | 3.98 |
| | Max IPC (kPa) | N/A | N/A | 7.59 | 10.1 | 20.33 |
| | Average IPC (kPa) | N/A | N/A | 0.81 | 1.2 | 4.66 |

## 8.7 GROUNDWATER MONITORING

### 8.7.1 Meadowbank Site

**As required by NIRB Project Certificate No.004 Condition 8:** ***Continue to undertake semi-annual groundwater samples and re-evaluate the groundwater quality after each sample collection; report the results of each re-evaluation to NIRB's Monitoring Officer, INAC and EC.***

The full results of the 2022 groundwater monitoring program are available in Appendix 42. Below is a summary of the results and Agnico Eagle will refer to the report presented in the Appendix for a complete review and discussion of the results and location of the sampling locations.

The objective of the 2022 groundwater monitoring program was to document groundwater and surface water quality for effects related to mining operations associated with the deposition of tailings in the tailings storage facility (TSF) and in-pit tailings deposition (IPD). Monitoring activities completed in 2022 include water level measurement and sampling of groundwater and surface water at monitoring locations for the analysis of chemical parameters listed in Group 2 of Table 2 Schedule I of the Meadowbank Water License and isotopes of water (oxygen-18 and deuterium). Monitoring well MW-16-01 serves to investigate potential groundwater quality effects from the TSF, while monitoring wells MW-IPD-01(s), MW-IPD-01(d), MW-IPD-07 and MW-IPD-09 serve to investigate potential effects to groundwater from the IPD. Wall seepage samples were collected from the east wall of Portage Pit-A in July and September 2022 to assess potential groundwater quality effects related to the TSF and IPD. Seepage at Pit E could not be sampled due to the unsafe ground conditions and the flooded conditions in the pit at the seepage inflow point.

The report (Appendix 42) includes a description of the surface water and groundwater sampling and a presentation of the water quality results.

Groundwater quality results were compared to the Portage effluent quality discharge limits stipulated in the Meadowbank Water License, for comparative purposes only, as there are no groundwater quality criteria applicable to the site. All groundwater samples collected in 2022 met these screening criteria.

In 2022, the chemical signature of the groundwater at MW-16-01 continues to trend towards that of the reclaim water based on elevated concentrations of arsenic, chloride, copper, iron, cyanide and sulphate relative to other monitoring locations. The groundwater quality at monitoring well MW-16-01 is interpreted to be affected by reclaim water from the South Cell TSF based on similar chemical signatures to reclaim water monitoring stations ST-21-North, ST-21-South (South Cell TSF surface water) and ST-S-5 (Central Dike seepage). These monitoring locations are located hydraulically downgradient of the South Cell TSF and Central Dike.

The chemical signature of the 2022 Pit-A wall seepage samples is dominated by major ions sulphate, magnesium and calcium and are interpreted to be representative of intermediate water signature (between that of natural waters and mine affected waters). The elevated concentrations of sulphate can also be related to the dissolution of sulfate salt from the oxidation of sulphide minerals in pit wall rock, while calcium and magnesium likely reflect alkalinity consumption from the same rock. Similarly, elevated concentration of copper measured in September 2022, may be influenced by waste rock contact water since the Pit-A east wall seep is located downgradient of the Second Portage Lake but adjacent to the Central (waste rock) Dump. Site access safety concerns associated with rising water levels in Pit-E may not allow the collection of pit wall seepage samples in the future.

The isotopic fingerprint evaluation show that δ18O and δ2H do not provide a reliable method of fingerprinting TSF seepage effects on groundwater because the isotopic signature of TSF water is more affected by seasonality than by source concentrations. At Meadowbank, chemical fingerprint is a stronger indicator of TSF seepage effects, where the presence of elevated cyanide and arsenic concentrations are associated with mining operations, specifically water from the TSF and Central Dike Pond. These results exclude any other source (i.e., mine rock contact water) that could fingerprint differently the isotopic composition of the groundwater and surface water at the station MW-16-01, ST-21-N, and ST-21-S. The 2022 isotope sampling program was not helpful in distinguishing between the reclaim water and waste rock contact water.

The groundwater quality in monitoring wells MW-IPD-01(d), MW-IPD-01(s), MW-IPD-07, MW-IPD-09 continues to display a natural water signature and can be used as background values against which to monitor groundwater quality in the future.

Based on the results of the 2022 groundwater monitoring program, the monitored groundwater quality locations do not appear to be affected by in-pit deposition operations in the Goose Pit from July 2019 to August 2021 or Portage Pit-E since operations commenced in August 2020. The four IPD monitoring wells remain hydraulically downgradient from Second Portage Lake (MW-IPD-01(s) and MW-IPD-01(d)) and Third Portage Lake (MW-IPD-07 and MW-IPD-09), such that water quality at these monitors is likely to be influenced by surface water flowing (Lake water seeping) west towards the monitoring wells and into the pits and not the TSF or IPD operations, at this time.

The groundwater monitoring program was initiated in 2003. A total of 14 groundwater monitoring wells were installed between 2003 to 2018 to characterize the groundwater within the five site areas: South and Central Dike, East Flat (East Dike area), Goose Pit, Portage Pit-A and Portage Pit-E. The available historical groundwater monitoring program analytical results from 2003 to 2022 are discussed in Section 4.3 of the 2022 Groundwater Monitoring Report (Appendix 42).

### 8.7.2 Whale Tail Site

**As required by NIRB Project Certificate No.008 Condition 15:** ***The required Groundwater Monitoring Plan should be submitted to the NIRB at least 30 days prior to the start of construction, with subsequent plan revisions or updates submitted annually thereafter.* S*ubject to the additional direction and requirements of the Nunavut Water Board, the Proponent shall prepare and implement a Groundwater Monitoring Plan that, at a minimum includes:***

- ***The collection of additional site-specific hydraulic data (e.g., from new monitoring wells) in key areas during the pre-development, construction and operation phases;***
- ***Definition of vertical and horizontal groundwater flows in the project development areas;***
- ***Delineates monitoring plans for both vertical and horizontal ground water; and***
- ***Thresholds that will trigger the implementation of adaptive management strategies that reflect site specific conditions encountered at the project site.***

And

**As required by NIRB Project Certificate No.008 Condition 16:** ***An updated Groundwater Monitoring Plan that outlines the Proponent's plans to fulfill this term and condition should be submitted to the NIRB at least 30 days prior to the start of construction, with subsequent plan revisions or updates submitted annually thereafter. Within two years of commencing operations, the Proponent shall:***

***a) Conduct additional analyses to determine the approximate fill time for the Whale Tail Pit at closure;***

***b) Undertake a hydrogeological characterization study to assess the potential for arsenic and phosphorous diffusion from submerged Whale Tail pit walls;***

***c) If the results of the characterization study indicate a moderate to high potential for arsenic and/or phosphorous diffusion, perform detailed hydrodynamic modelling of the flooded pit lake prior to closure to evaluate meromictic conditions and flooded pit water quality; and***

***d) Add these required activities to the site Groundwater Monitoring Plan.***

In Appendix 43, the 2022 Groundwater Management Monitoring Report presented a compilation of the site-specific data collection in 2022 and the review of 2022 monitoring data undertaken by Agnico Eagle to meet the requirements established in the Groundwater Monitoring Plan (Version 3_NWB, May 2019). The following is a summary of the report and Agnico Eagle will refer the reader to the whole report in Appendix 43 for an exhaustive comprehension of the program and results for 2022.

In 2022, only Whale Tail Pit intercepted groundwater. IVR Pit and Whale Tail Underground are both located in permafrost and no interception of groundwater occurred.

Westbay Well Sampling

Hydrostatic pressures were measured in September 2022 at Westbay Well AMQ16-626 to monitor hydraulic heads and changes in groundwater flow conditions. Following the pressure measurements, groundwater samples were collected to monitor the TDS and groundwater quality. A technical memorandum documenting this work, sampling results and historical monitoring from AMQ16-626 is included in Attachment A of the complete report (Appendix 43).

Water samples were collected from Ports 3 and 4 of AMQ16-626 in September 2022 to assess groundwater quality.

Based on the data from Ports 3 and 4, the calculated TDS content of Formation water is estimated to range between 1,079 mg/L and 2,431 mg/L. These TDS values are slightly less saline than historical sampling results, which may reflect the lower residual drilling fluid content in the collected samples and therefore inferred higher accuracy is the calculated Formation water quality but are overall reasonably consistent with the TDS profile adopted in the FEIS.

Arsenic, which is a constituent of interest in the ore and waste rock to be mined, occurs in groundwater at concentrations that are low and consistent with previous reliable data collected from the well. Radium-226 in groundwater measured in 2022 at Ports 3 and 4 were below the Federal MDMER Effluent criteria.

The assumptions for the conceptual model for the site are considered unchanged by 2022 groundwater quality monitoring at AMQ16-626.

Thermal Monitoring

Nine thermistors were installed in 2020 to monitor the talik zone near the south wall of the Whale Tail Pit. In August 2021 these thermistors were dismantled due to mining activity in the sector and no data was available for 2022. While active, these thermistors were used to evaluate if during open pit mining and with the dewatering of the North Basin, the closed talik zone progressively freezes back. Through the year 2021 until their dismantling in August, it was possible to observe some freeze-back of the upper bedrock in thermistors PSW-DH2 TH, PSW-DH3 TH, PSW-DH7 TH and PSW-DH10 TH, resulting in minor changes to the talik zone.

As part of the Whale Tail Dike Operation Maintenance and Surveillance manual, performance of the Whale Tail Dike was monitored with thermistors located downstream and/or upstream (U/S) of the WTD. Agnico Eagle indicates that the trend of permafrost degradation noted at the abutments in 2021 did not progress laterally based on the thermistor readings, however, they did note field observations indicative of further degradation (observed settlement upstream and downstream of the east and west abutments). The thermal regime in this area has not yet reach an equilibrium.

Hydraulic Head Monitoring

The 2022 calculated freshwater hydraulic heads are lower than those measured prior to mine development (2018 and 2019) and have continued to decrease each year as the pit has been developed, which reflects the dewatering of the North Basin and the mining of Whale Tail Pit.

Seepage Surveys

Agnico Eagle notes that seepage has consistently been observed in the southeast wall in 2022 (herein referred to as south wall), and the seepage forms ice in the pit walls during the winter. The seepage is attributed to a highly weathered zone near surface as opposed to faults, which is consistent with the original conceptual model for the Whale Tail Mine and the prediction of a seepage face in the south wall.

Comparison of Model Predicted Values to Measured Values

In 2021, inflow measurements were trending 50% higher than predicted for based on the groundwater model developed for the FEIS, triggering a review and update of the groundwater model. On this basis, Lorax completed a model update and recalibrated the model to operational data. Documentation of the model update is provided in Attachment F of the complete report (Appendix 43), and a summary of the updated groundwater inflow predictions based on the recalibrated model are provided in Table 4 of the 2022 Groundwater Management Monitoring Report (Appendix 43).

The flow observed in the months of January, February, March, October, November and December ranged between 885 to 2,309 $m^3$/day, with an average flow rate of 1,597 $m^3$/day. Flow measurements during the winter months are the best estimate of groundwater inflow rates to the Whale Tail Pit since surface water inflows should be minimal. The inflow in the winter will reflect saline groundwater inflow and seepage from the Whale Tail Attenuation Pond and South Basin of Whale Tail Lake, with input from the Whale Tail Attenuation Pond expected to be most significant. Overall, inflow measurements are trending 48% lower than the updated predictions for 2022, and no revision of the model based on the triggers is required.

As part of the updated groundwater modelling, groundwater inflow to the open pit was predicted to be composed of 35% inflow from the Whale Tail Attenuation Pond and 67% inflow from Whale Tail South Basin. Overall, TDS measured in pit wall seepage was similar to the TDS measured in the Whale Tail Attenuation Pond (within 50 mg/L). The TDS in the Whale Tail Pit Sump tended to slightly higher than both the Whale Tail Attenuation Pond, which in turn was generally higher than the Whale Tail Dike Seepage. In the winter months the TDS in the Whale Tail Pit Sump were generally within 100 mg/L of the TDS in the Whale Tail Attenuation Pond. These observations suggests that the source water proportions may be overpredicting the contribution of water from the Whale Tail Dike Seepage. Overall, measured groundwater inflow to the open pit in the winter was 48% lower than predicted values using the updated model for 2022, and its possible that the model is overpredicting inflow from the Whale Tail South Basin. Water quality predictions from the site wide water quality model should be reviewed in 2023 to further evaluate if the TDS observed in the pit sump and pit wall seepage is consistent with the proportions predicted by the groundwater model, or if there are surface water loading of TDS, such as from pit wall runoff.

## 8.8 HABITAT COMPENSATION MONITORING PROGRAM

### 8.8.1 Meadowbank Site

**As required by DFO Authorizations NU-03-0191.3 Condition 3 and 6 (Second and Third Portage Lakes), NU-03-0191.4 (Vault Lake) Condition 3 and 6; NU-03-0190 Condition 5 (AWPAR), NU-14-1046 (Phaser Lake) Condition 3 and 5; *Submit written report summarizing monitoring results and photographic record of works and undertakings.***

And

**As required by NIRB Project Certificate No 004 Condition 53:** ***Agnico Eagle Mines Ltd. shall, in consultation with the HTOs and DFO, develop a Fish Habitat Monitoring Plan, including augmenting baseline fisheries data in the period prior to operation, with the clear objective of demonstrating the success of the No Net Loss Plan approved by the DFO. The Fish Habitat Monitoring Plan should include Phaser Lake. The updated plan should be provided to the NIRB for review at least 30 days prior to commencement of construction activities. Results from the fisheries baseline data to be provided in the annual report to the NIRB***

#### 8.8.1.1 *No Net Loss Plan*

Since in-pit deposition of tailings material was permitted within the Portage area beginning in 2019, Agnico Eagle is currently working with DFO to adapt the Meadowbank Gold Project No Net Loss Plan (NNLP) associated with FAA NU-03-0191.3, as necessary. An addendum to the NNLP which describes proposed changes in habitat compensation related to in-pit deposition of tailings material was submitted to DFO in December, 2020. DFO's review was received in May, 2022. Agnico Eagle submitted a response to these comments directly to DFO in July, 2022, with a follow-up call in August, 2022. Agnico Eagle continues to work with DFO in consultation with local stakeholders (BLHTO, KivIA) on final site selection and baseline monitoring requirements for this offsetting plan amendment. Proposed changes do not impact the compensation monitoring that was required in 2022 under the HCMP schedule, so this addendum is not discussed further here.

#### 8.8.1.2 *Habitat Compensation Monitoring Plan*

According to Fisheries and Oceans Canada (DFO) Fisheries Act Authorizations (FAAs) NU-0190, NU-03-0191.3, NU-03-0191.4 and 14-HCAA-01046, Agnico Eagle maintains a Habitat Compensation Monitoring Plan (HCMP; Version 4, February, 2017) to demonstrate whether fish habitat compensation features at the Meadowbank site are constructed and functioning as intended. Offsetting features constructed to date include:

1. AWAR Spawning Pads - located at stream crossing R02 along the all-weather access road (AWAR) to Baker Lake (NU-0190)

2. Dewatering Dike Faces (Exterior) – exterior faces of dewatering dikes in the Portage Pit area (East Dike and Bay-Goose Dike) (NU-03-0191.3)

3. Dogleg Ponds – flooding and access enhancements for a series of ponds adjacent to the Portage area (NU-03-0191.3)

4. Vault and Phaser Lakes – re-flooding and access enhancements for Vault and Phaser Lakes following pit development, along with creation of in-water habitat features through substrate alterations (NU-03-0191.4, 14-HCAA-01046)

Under the HCMP, monitoring for these features last occurred in 2021, and results were provided in the 2021 Habitat Compensation Monitoring Report (Appendix 45 of the 2021 Annual Report).

In 2022, no biological monitoring was required but substrate mapping was planned for the dewatered basins of Vault and Phaser Lakes. These areas are undergoing re-flooding, and substrate data was scheduled to be collected while lake basins are mostly dry, for eventual comparison to requirements of the accepted NNL and offsetting plans. In September, 2022, the required observational substrate data was recorded through on-the-ground transects . These data will be incorporated into future HCMP reports to help determine when offsetting criteria for success have been met.

In 2023, monitoring is scheduled for each set of features as follows.

1. AWAR Spawning Pads

Monitoring according to the HCMP is scheduled for the AWAR spawning pads in 2023. As per the HCMP, monitoring methods to continue assessing use of the spawning pads include hoopnetting, larval drift trapping, visual observations, opportunistic angling/underwater camera imagery, and water temperature and water level measurement. This will be the ninth year of monitoring in the post-construction period, after the spawning pads were built in the winter of 2008-2009. According to Condition 5.2 of the FAA (NU-03-0190), monitoring is required to continue every other year until decommissioning of the AWAR crossing. However, the timeline for road decommissioning is now significantly extended compared to assumptions at the time of the NNLP (originally est. 2018-2020, now 2031). Monitoring results to date demonstrate that the spawning pads continue to be stable as designed 14 years post-construction, and that adult fish populations in good condition continue to access and spawn within the R02 reach. As a result, and since monitoring has now continued beyond the original timeline, Agnico Eagle anticipates proposing a revision to the HCMP monitoring methods, and will confirm these changes with DFO ahead of the 2023 field season.

2. Dewatering Dike Faces (Exterior)

2021 was the final year of required monitoring for the exterior faces of the East Dike and Bay-Goose Dike, prior to evaluation of the success of the features using a weight-of-evidence approach. As described in the 2021 Habitat Compensation Monitoring Report (Appendix 45 of the 2021 Annual Report), while periphyton growth is slow and has not yet reached reference levels, dewatering dike faces were constructed as designed in the NNLP and are stable as fish habitat with suitable water quality for aquatic life, and have recorded fish presence at rates no lower than reference areas. Since periphyton communities are considered healthy and there is no reason to believe that biomass will not eventually reach reference levels, the weight of evidence indicates that dike faces are functioning as fish habitat, as assumed in the NNLP. As a result, no further compensation-related monitoring for these features is planned, but this will be confirmed in consultation with DFO prior to the 2023 field season.

3. Dogleg Ponds

In accordance with the HCMP schedule, monitoring for the Dogleg Ponds is not scheduled in 2023. Monitoring will be conducted again 2025, after which time success will be determined.

4. Vault and Phaser Lakes

As described above, re-flooding is ongoing in Vault and Phaser Lakes, and this is estimated to continue until 2026. Monitoring according to the HCMP will resume at that time.

### 8.8.2 Whale Tail Site

#### 8.8.2.1 *Fish Habitat Offsetting Plan*

**As required by NIRB Project Certificate No.008 Condition 24:** ***The Proponent shall engage Fisheries and Oceans Canada, and other interested parties to further assess:***

- ***Whether the increased surface area of Whale Tail Lake is a viable offset to habitat losses resulting from development of the Project; and***

- ***Whether Whale Tail end pit would support fish in the post closure scenario.***

***Results of this assessment should be incorporated into the Habitat Compensation Plan and/or the Conceptual Fisheries Offsetting Plan as appropriate. The updated information should be submitted to the NIRB at within 60 days of the issuance of the Project Certificate***

And

**As required by DFO Authorization 20-HCAA-00275 Condition 5.3.2:** ***The Proponent shall monitor to validate Agnico Eagle Mines Ltd.'s Habitat Suitability Index (HSI). The monitoring shall be conducted to the satisfaction of DFO. Where appropriate, the HSI will incorporate additional knowledge generated by the monitoring plans and complementary measures research projects of the Approved Project (PATH No.: 16-HCAA-00370) and adjust the Habitat Evaluation Procedure (HEP) model according to the results generated. The HSI will be used to refine, as necessary, the performance end-points in habitat units for offsetting***

And

**As required by DFO Authorization 16-HCAA-00370 Condition 5.2.1:** ***The Proponent shall monitor to validate Agnico Eagle Mines Ltd.'s Habitat Suitability Index (HSI). The monitoring shall be conducted to the satisfaction of DFO. Where appropriate, the HSI will incorporate additional knowledge generated by the complementary measures research projects under section 4.2.2, in particular research project 4.2.2.1c, and adjust the Habitat Evaluation Procedure (HEP) model according to the results generated. The HSI will be use to refine, as necessary, the performance end-points in habitat units for offsetting***

As required by NIRB Project Certificate No.008 Condition 24, Agnico Eagle has submitted the Fish Habitat Offsetting Plan (Appendix 51 of the 2018 Annual Report) in March 2018 (accepted by DFO through Fisheries Act Authorization 16-HCAA-00370 on July 23rd, 2018). This document incorporates the requested analysis of fish habitat gains from increased surface area in Whale Tail Lake and water quality modelling for Whale Tail Mine.

As described in FAA 16-HCAA-00370 Condition 5.2.1 and 20-HCAA-00275 Condition 5.3.2, Agnico Eagle will work with DFO to develop a plan for monitoring to validate HSIs used in offsetting plans for the Whale Tail Mine. This plan will incorporate (where appropriate) additional knowledge from the complementary measures research projects.

### 8.8.2.2 *Fish Habitat Offset Monitoring Plan*

**As required by DFO Authorization 16-HCAA-00370 Condition 5.1.1.2:** ***The proponent shall provided an updated Whale Tail Pit Fish Habitat Offset Monitoring Plan, prepared by Agnico Eagle Mines Ltd. To DFO for review and approval on or before December 31, 2018. This update shall include, but is not limited to, details on the monitoring methods, frequency of monitoring, sampling location and criteria for success.***

And

**As required by DFO Authorization 20-HCAA-00275 Condition 5.2.1:** ***The Proponent shall provide a Whale Tail Expansion Fish Habitat Offset Monitoring Report to DFO including geotechnical and biological and ecological monitoring as per section 5.1.1. The Proponent is required to provide the Report by March 31 of 2027 and update annually for 10 years or until DFO indicates requirements of this Authorization have been met.***

And

**As required by DFO Authorization 16-HCAA-00370 Condition 5.1.1.3:** ***The proponent shall develop a schedule for the implementation of the offsetting measures, and shall provide this schedule to DFO no later than December 31, 2019***

And

**As required by DFO Authorization 16-HCAA-00370 Condition 5.1.1.4:** ***The Proponent shall provide an annual Whale Tail Pit Fish Habitat Offset monitoring Report to DFO (and interested parties) following the construction of the offsetting habitat by March 31. The Proponent is required to provide the Whale Tail Pit Fish Habitat Monitoring Report until DFO indicates this requirement has been met***

And

**As required by DFO Authorization 20-HCAA-00275 Condition 5.2.3:** ***The Proponent shall provide a summary report of all Whale Tail Expansion Fish Habitat Offset Monitoring Reports described in section 5.2.1 before March 31, 2036 to DFO (and interested parties) which shall analyse results from the offsetting measures of the Whale Tail Expansion Project following the construction of the offsetting habitat. DFO reserves the right to request additional Summary Report if annual reporting were to continue until requirement has been met.***

And

**As required by DFO Authorization 16-HCAA-00370 Condition 5.1.1.5 and DFO Authorization 20-HCAA-00275 Condition 5.2.2:** ***As part of the annual Whale Tail fish Habitat Offset Monitoring Report, the Proponent shall include, but not limited to:***

- ***a digital photographic record with GPS coordinates of pre-construction, during construction and post construction conditions shall be compiled using the same vantage points and direction to show that the approved works have been completed in accordance with the offsetting plan***
- ***a summary of field observations for each respective year as well as as-built survey***
- ***a detailed analysis report summarizing the effectiveness of the offsetting measures***

The schedule for the implementation of the offsetting measures as per DFO Authorization 16-HCAA-00370 Condition 5.1.1.3 was submitted to DFO on January 7th, 2020 (Appendix 48 of the 2019 Annual Report).

According to DFO Authorization 16-HCAA-00370 Condition 5.1.1.2, Agnico Eagle submitted Version 1 of the Whale Tail Fish Habitat Offsets Monitoring Plan on March 2018 (Appendix 51 of the 2018 Annual Report) and having received no comment, resubmitted this plan to DFO on March 15th, 2019. This Plan was again referenced in the DFO-approved Fish Habitat Offsetting Plan for the Whale Tail Expansion Project (March 2020) and no modifications were received from DFO.

Agnico Eagle submitted Version 2 of the Whale Tail Fish Habitat Offset Monitoring Plan (developed to include requirements of both Whale Tail site FAAs 16-HCAA00370 and 20-HCAA-00275) to DFO in July, 2021, and has not received any comment. According to Conditions 4.3.3, 5.1.1.2, and 5.3.1 of 20-HCAA-00275, this Plan includes a pre-offsetting ecological monitoring program to assess the suitability of flooded areas in Whale Tail South as fish habitat, prior to construction of the A18 sill. This program is based on the monitoring methods described in the approved Whale Tail Pit Expansion Project Fish Habitat Offsetting Plan (March, 2020), and was formally initiated in 2021. Data reports are to be provided annually to DFO for the 2021, 2022, and 2023 seasons. The 2022 results are summarized below. The complete report 2022 Fish Habitat Offsets Monitoring Report is provided in Appendix 44. A final analysis report will be provided to DFO by March 31st, 2024.

In addition, according to FAA 16-HCAA-00370 Condition 5.1.1.4, 5.1.1.5, and 20-HCAA-00275 Condition 5.2.1, 5.2.2 and 5.2.3, this plan describes the schedule for monitoring of offsetting following construction of permanent offsetting features, which includes annual reporting to DFO and a final summary report (2036).

*2022 FHOMP Report Summary*

The current Fish Habitat Offsets Monitoring Plan (FHOMP; Version 2, July, 2021) for the Whale Tail Mine was developed to determine whether fish habitat offsetting described in the *Whale Tail Pit - Fish Habitat Offsetting Plan* (C. Portt and Associates, 2018) and the *Whale Tail Pit Expansion Project Fish Habitat Offsetting Plan* (ERM, 2020) is ultimately constructed and functioning as intended.

From 2021 to 2023, monitoring is conducted under the pre-offsetting ecological monitoring program of the FHOMP. This program is intended to demonstrate whether terrestrial flooding that was temporarily required for operational purposes will provide suitable habitat for fish long-term. Permanently raised water levels are accepted offsets under both the 2018 and 2020 offsetting plans for the Whale Tail Mine, and flood zone assessment prior to permanent sill construction is required under conditions of the associated Fisheries Act Authorization 20-HCAA-00275.

In 2022, FHOMP assessments included: flood zone water quality data collected through the Core Receiving Environment Monitoring Plan plus supplemental stations, periphyton growth using artificial substrate samplers, visual assessments of periphyton growth on natural rock faces, and small-bodied fish population assessments by shoreline electrofishing. Results of these assessments are presented in a data report format, with final analysis to be completed following the 2023 monitoring season.

Briefly, 2022 CREMP results continue to indicate an increase in some water quality parameters compared to baseline conditions (especially nutrients) as predicted in the 2018 FEIS Addendum (Agnico Eagle, 2018b), but suitable water quality for aquatic life within the Whale Tail flood zone. Electrofishing studies identified the presence of small-bodied fish populations in newly created shoreline habitat at catch rates and size ranges that appear similar to reference areas. Though some periphyton substrate samplers came loose from their anchors or were stranded due to a significant late-season drop in water levels, it is evident that seasonal periphyton growth is greater in WTS than reference lakes, and potentially elevated in A20 compared to reference sites. These observations are in line with 2018 FEIS Addendum predictions for increased nutrient concentrations and primary productivity in flood zone lakes. Further adjustments to sampler design are proposed for the 2023 season to reduce data loss. Periphyton visual surveys identified a wide range of periphyton cover conditions across both flood zone and reference lakes, from no coverage to >75% coverage, without a clear relationship to flood status. When present, the texture of periphyton communities within flood zone lakes may be somewhat looser (less compact) than reference sites, though this observation may have been influenced by the presence of decomposing terrestrial organic matter, and will be specifically confirmed in 2023.

In addition to flooding and other constructed habitat offsetting features, a portion of offsetting for Whale Tail Pit is provided through a suite of complementary measures (research projects). No physical monitoring is conducted in relation to research projects. However, progress monitoring is conducted to document annual activities, and results are summarized here to determine when criteria for success have been met.

Six research studies form the complementary measures for Whale Tail Mine offsetting. Due to delays that were largely as a result of the COVID-19 pandemic, some study periods have been extended, as indicated in Table 8-75 below. In 2021, Study 4: *Arctic Grayling Occupancy Modelling* was completed and criteria for success were met with publication of a peer-reviewed manuscript, as described in the 2021 Fish Habitat Offsets Monitoring Report.

**Table 8-75 Whale Tail Mine complementary measures (research projects). *Extended due to COVID or other delays (estimated termination dates as of Dec. 2022 shown).**

| Study | Lead Researcher | Study Period |
|---|---|---|
| Study 1: Assessment of changes in aquatic productivity and fish populations due to flooding of Whale Tail South and downstream lakes during operations | H. Swanson | 2018 – 2023/2024* |
| Study 2: Assessment of impacts of the Baker Lake wastewater outflow on aquatic systems including fish and fish habitat | H. Swanson | 2019 – 2025/2026* |
| Study 3: Literature review and field validation of northern lake fish habitat preferences | S. Doka | 2018 – 2024* |
| Study 4: Arctic Grayling occupancy modelling (COMPLETE) | H. Swanson | 2018 – 2021 |
| Study 5: End pit lake habitat use | TBD | 2027 – 2035 (est.) |
| Study 6: eDNA methods development | J. Stetefeld | 2018 – 2023/2024 |

#### 8.8.2.3 *Consultation*

**As required by DFO Authorization 16-HCAA-00370 Condition 5.1.1.6:** ***Each year, following the submission of the annual Whale Tail Pit Fish Habitat Offset Monitoring Report to DFO, the Proponent shall arrange to meet with DFO and interested parties (e.g., KIA) to review the results of the previous year of the monitoring program. The results of the meetings and any mutually agreed upon modifications aimed at improving the effectiveness of the offsetting monitoring program shall be incorporated into the upcoming year of the monitoring programs. The Proponent shall update the Whale Tail Pit Fish Habitat Offset Monitoring Plan, to reflect the changes, and the plans shall be approved in writing by DFO prior to implementation***

Annual meetings to review results of the previous year's Whale Tail Mine Fish Habitat Offset Monitoring Report will be implemented following the first year of constructed habitat offset monitoring.

#### 8.8.2.4 *Complementary Measures Research - Fish Habitat Offsetting Plan Whale Tail Mine*

**As required by DFO Authorization 16-HCAA-00370 Condition 4.2.1.2:** ***The Proponent shall provide updated research plans with detailed methodologies for projects listed under conditions 4.2.2.1a, b, c and d. Each updated plan shall be provided to DFO for approval on or before December 31, 2018 and at least 60 days prior to commencement of research.***

And

**As required by DFO Authorization 16-HCAA-00370 Condition 4.2.1.6:** ***The proponent shall make all effort to ensure that the results from the research projects conducted for the complementary measures are published in peer-reviewed scientific journals***

And

**As required by DFO Authorization 16-HCAA-00370 Condition 4.2.1.3:** ***The proponent shall initiate a literature review no later than November 2018, and provide the results of this review to DDO no later that February 28, 2019. This shall include an outline of the proposed studies by February 28, 2019, and a complete detailed research plans by December 31, 2019***

In compliance with DFO Authorization 16-HCAA-00370 Condition 4.2.1.2, updated research plans for these studies are provided in Annual Progress Reports on Complementary Measures, which are submitted to DFO by May 30 annually, in compliance with Condition 4.2.1.5 of the Authorization.

A summary of the research plans and details on the progress of each study listed under Condition 4.2.2.1a-e is also provided in the 2022 Fish Habitat Offset Monitoring Report (Appendix 44), including progress towards publication in peer-reviewed scientific journals.

As per Condition 4.2.1.3, the requested literature review and preliminary study outline for the end pit lake study were provided to DFO by email on March 15$^{th}$, 2019 (Appendix 42 of the 2018 Annual Report). As communicated to DFO, the complete detailed research plan will be provided once a research partner is identified, which will be approximately 1 – 2 years prior to study initiation (est. 2027).

## 8.9 MEADOWBANK FISHERIES RESEARCH ADVISORY GROUP (MFRAG)

**As required by DFO Authorization 16HCAA-00370 Condition 4.2.1.4:** ***To serve as an advisory group for the complementary measures that shall be undertaken as listed under condition 4.2.2.1, the Proponent shall establish***

***a Meadowbank Fisheries research Advisory Group (MFRAG). The MFRAG membership shall include DFO and the Proponent, an independent third party research advisor, any interested Inuit organizations within the Kivalliq Region, and other agencies or interested parties s considered appropriate by MFRAG members. The proponent shall develop a draft terms or reference and participant list for this advisory group which shall be provided to DFO by September 1, 2018.***

As part of the Fish Habitat Offsetting Plan for Whale Tail Mine (C. Portt and Associates, 2018a), the MFRAG was conceptualized to provide a forum for input from key stakeholders. The MFRAG meets annually to review project progress reports, propose and approve or reject new projects or project components, and assess whether criteria for success have been met.

In 2019, Agnico Eagle confirmed interest in MFRAG participation by DFO, the Kivalliq Inuit Association (KivIA), and the Baker Lake Hunters and Trappers Organization. As planned in the Fish Habitat Offsetting Plan for Whale Tail Pit, Appendix C (C. Portt and Associates, 2018a), Agnico Eagle also identified a third party external advisor (Dr. Kelly Munkittrick, University of Calgary) who will participate in all MFRAG activities. A draft Memorandum of Understanding and Terms of Reference (TOR) were developed by Agnico Eagle and reviewed by all parties. The initial meeting of the MFRAG was held on December 12th, 2019 in Montreal, Quebec. Representatives from all member groups were in attendance. The group received presentations by lead researchers involved in each study, and had the opportunity for questions, comments, and open discussion. Each MFRAG member group was requested to provide written comments, if any, by February 28th, 2020. Written comments were distributed to research study leads for consideration.

In 2020, the MFRAG TOR were finalized, and signed by all parties as of March, 2021. The second annual meeting of the MFRAG was held by video conference due to COVID restrictions on December 2nd, 2020, with all member groups participating (Agnico Eagle, DFO, KivIA, BLHTO). As in 2019, the group received presentations by lead researchers involved in each study, and had the opportunity for questions, comments, and open discussion. Each MFRAG member group was requested to provide written comments, if any, by January 13th, 2021. Written comments were again distributed to all member groups and the research study leads for consideration. No major concerns with research study progress were raised during the meeting or in follow-up comments.

In 2021, the third annual meeting of the MFRAG was held by video conference due to COVID restrictions on December 14th, 2021, with all member groups participating. As in previous years, the group received presentations by lead researchers involved in each study, and had the opportunity for questions, comments, and open discussion. Each MFRAG member group agreed to provide written comments, if any, by January 25th, 2022. Written comments were again distributed to all member groups and the research study leads for consideration. No major concerns with research study progress were raised during the meeting or in follow-up comments.

In 2022, the fourth MFRAG meeting was held by video conference on November 18th, 2022, with all member groups participating. The meeting format was the same as previous years. In advance of the meeting, all member groups received the previous year's Annual Progress Report, along with a non-technical summary in English and Inuktitut, and had the opportunity for questions, comments, and open discussion with the research teams. For Study 2 - Assessment of Impacts of the Baker Lake Wastewater Outflow on Fish Productivity and Fish Habitat (H. Swanson), a change in objectives was proposed to accommodate a delayed construction schedule for upgrades to the Baker Lake municipal wastewater treatment system. All MFRAG member groups were requested to provide written comments, if any, by December 16th, 2022. Comments from DFO/KivIA were received on December 23rd, 2022. Comments were also received from the external advisor, and were distributed to all parties and researchers for consideration.

## 8.10 MAMMOTH LAKE TROPHIC CHANGES

**As required by NIRB Project Certificate No.008 Condition 23:.** ***The Plan for undertaking these additional studies and associated monitoring should be submitted to the NIRB at least 30 days prior to operations, with updates submitted annually thereafter or as may otherwise be required by the NIRB. A report on the results of these studies and associated monitoring should be provided at least 30 days prior to closure. The Proponent shall, reflecting any direction from Environment and Climate Change Canada and Fisheries and Oceans Canada:***

***a) Conduct additional analysis to support the conclusions that a change in trophic status in Mammoth Lake would not impact fish productivity;***

As part of the FEIS Addendum for the Whale Tail Expansion Project (Agnico Eagle, 2018; Section 6.5), supplemental analyses were conducted to understand impacts of Project-related changes to water quality in Mammoth Lake (and downstream lakes). It was determined that anticipated increases in phosphorus would increase the lower trophic food base for fish, potentially resulting in numerical increases in forage fish such as Slimy Sculpin, and a minor but not measurable increase in growth and reproduction rates for large-bodied fish such as Lake Trout and Arctic Char. However, any observed effects are expected to be reversible during late closure or post-closure, and the stability of the fish population is not expected to be compromised. Agnico Eagle is committed to monitoring to verify phosphorus predictions through ongoing testing conducted as part of the Water Quality and Flow Monitoring Program and the CREMP.

***b) Undertake additional site-specific studies to assess the predicted trophic change on lake ecosystem productivity to monitor potential changes to downstream environments; and***

Changes in ecosystem productivity for Mammoth Lake and downstream lakes (A76) are being investigated through regular compliance monitoring programs (Water Quality and Flow Monitoring Program and the CREMP), as well as an onsite aquatic productivity study conducted by University of Waterloo (UW) researchers in partnership with Agnico Eagle. A research agreement for this project was signed in late 2018, and details of the study plan were provided in Section 8.8.2.4.1 of the 2018 Annual Report.  Annual updates are provided to DFO (May 30 annually). Baseline analyses were completed in 2018, which included small-bodied fish sampling (shoreline electrofishing), and water chemistry sampling in Whale Tail Lake, Mammoth Lake and downstream lakes. Follow-up surveys continued in 2019 - 2021. Final reporting from this research study is expected in 2023. A complete project update is provided in the Fish Habitat Offset Monitoring Report (Appendix 44).

***c) Monitor actual loadings/concentrations in the receiving environment, identify trends in downstream chemistry and productivity, and track trophic status of Mammoth Lake***

Changes in actual loadings/concentrations of parameters indicative of nutrient enrichment are monitored in the receiving environment (Mammoth Lake, A76, DS1) through the UW study described above (2018 – 2021), as well as through the CREMP (at this time, annually through closure). Water quality sampling is conducted monthly during April/May, June, July, August, and November/December, and results are reported annually. Trends in downstream chemistry are identified on an annual basis as part of this program – see Appendix 33 (CREMP Report).

## 8.11 FISH-OUT PROGRAM SUMMARY

### 8.11.1 Meadowbank Site

**As required by NIRB Project Certificate No.004 Condition 49:** ***develop, implement and report on the fish-out programs for the dewatering of Second Portage Lake, Third Portage Lake, Vault Lake and Phaser Lake.***

No fish-out program occurred in 2022.

### 8.11.2 Whale Tail Site

**As required by DFO Authorization 16HCAA-00370 Condition 2.4 and 20HCAA-00275 Clause 2.3.7:** ***The proponent shall provided a final fish-out plan to DFO at least three weeks prior to commencing the fish-out program to allow for review and approval***

And

**As required by DFO Authorization 16HCAA-00370 Condition 3.2.1:** ***All fish-out results shall be provided to DFO in a fish-out monitoring report within 2 months of the completion of a fish-out program. In addition, the Proponent shall provide DFO with photocopies of all field data/notes, copies of photographs with GPS coordinates and an electronic database of data collected and result of all sample analyses. This condition shall be followed in accordance with the General Fish-out Protocol for Lakes and Impoundments in the Northwest Territories and Nunavut***

No fish-out program occurred in 2022.

## 8.12 AEMP

### 8.12.1 Introduction

The Aquatic Effects Management Program (AEMP) for the Meadowbank site 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 in accordance with the current 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; 2022 report provided in Appendix 33). The AEMP Plan was updated in 2020 (Version 4) to include eventual tailings pore water analysis, with a further update (Version 5) in March, 2021.

According to the Plan, this 2022 AEMP synthesis report aims to fulfill the following objectives for each of the Meadowbank and Whale Tail sites:

- Identify potential sources of impact to the receiving environment and verify the conceptual site model;

- Summarize the results of each of the underlying monitoring programs, including the CREMP (the cornerstone broad-level receiving environment monitoring program);
- Review the inter-linkages among the monitoring programs;
- Integrate the results for each component program;
- Identify potential risks to the receiving aquatic ecosystem; and
- Provide conclusions and recommend additional management actions that should be considered in future monitoring.

### 8.12.2 Potential Sources of Impacts and the Conceptual Site Model (CSM)

The AEMP is founded on a conceptual site model, which is commonly used in ecological risk assessment to help understand potential relationships between site activities and the environment (e.g., water quality or certain ecological receptors). The conceptual site model (CSM) is presented in Table 8-76 and consists of the following elements:

- Stressor sources – the sources of chemical (e.g., metals) or physical (e.g., total suspended solids) stressors that can potentially impact the environment.
- Stressors – the actual agents that have the potential to cause adverse effects to the receiving environment.
- Transport pathways – the ways in which a stressor is released from the source to the receiving environment.
- Exposure media – the media where a stressor occurs in the receiving environment. A single stressor might actually end up in multiple exposure media, with different ones being most important at different times. For example, if an effluent contained mercury, it would initially be found in the water column, and then most likely would settle to sediments where it would then enter the food chain (i.e., biota tissue).
- Receptors of concern – ecological entities selected for a variety of reasons, usually including sensitivity to relevant stressors and perceived ecological importance (i.e. could be determined to be valued ecosystem components).

The potential pathways, exposure media, and receptors of concern relevant to the AEMP analysis in 2022 are listed in Table 8-76. The 2022 AEMP evaluation is provided for the Meadowbank Mine in Section 8.12.3, and for the Whale Tail Mine in Section 8.12.4.

**Table 8-76 Primary transport pathways, exposure media, and receptors of concern for the AEMP**

| | Transport Pathways | | Exposure Media | | Receptors of Concern |
|---|---|---|---|---|---|
| e,g,i | Effluent | | | a, g | Phytoplankton |
| f | Groundwater | | | g | Zooplankton |
| | | a,c,d,e,g,h,i,k | Water | | |
| c,i,k | Surface water | | | d,g,h,j | Fish |
| | | a | Sediments | | |
| m | Air | | | a,h | Benthic community |
| | | a,h | Tissue | | |
| l | Ground (vibrations) | | | d | Periphyton |
| N/A | Direct | | | d,k | Fish habitat |

Notes:

- a Core Receiving Environment Monitoring Program
- b ~~Effects Assessment Studies - targeted monitoring~~ (none in 2022)
- c Dike Construction Monitoring (Whale Tail only in 2022)
- d ~~Habitat Compensation Monitoring (MBK)/~~Fish Habitat Offsets Monitoring (Whale Tail)
- e ~~Dewatering Monitoring~~ (none in 2022)
- f Groundwater Monitoring
- g MDMER Monitoring
- h ~~EEM Biological Monitoring Studies~~ (none in 2022)
- i Water Quality and Flow Monitoring
- j ~~Fish-Out Studies~~ (none in 2022)
- k AWAR/WTHR and Quarries Water Quality Monitoring (Erosion Monitoring)
- l Blast Monitoring (Whale Tail only in 2022)
- m Air Quality Monitoring
- NA Direct, so measured in exposure medium.

## 8.12.3 Meadowbank Site AEMP

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 16:** ***The results of monitoring under the AEMP.***

### 8.12.3.1 *Summary of Results of AEMP- Related Monitoring Programs*

In 2022, AEMP-related monitoring programs for the Meadowbank site (excluding the Whale Tail site, which is assessed in Section 8.12.4) consisted of the:

- Core Receiving Environment Monitoring Program (CREMP);
- Groundwater Monitoring;
- Metal and Diamond Mining Effluent Regulation (MDMER) Monitoring;

- Minesite Water Quality and Flow Monitoring;
- Visual AWAR and Quarries Water Quality 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 2022 for the Meadowbank site include:

- EEM Biological Studies;
- Habitat Compensation Monitoring;
- Lake Dewatering Monitoring;
- Dike Construction Monitoring;
- Blast monitoring, and
- Fish-out studies.

Air quality monitoring, EEM Biological Studies, and the Habitat Compensation Monitoring Program were considered as part of the conceptual site model and when conducted, they are included in the AEMP discussion to inform the process, but these programs are not a requirement of the Type A Water License; Part I-1.

Summaries of each AEMP monitoring program are provided throughout this Annual Report, and referenced below, with additional details relevant to the AEMP, as necessary. Table 8-77 further summarizes the results of these programs in 2022 for the Meadowbank site. For detailed results of individual monitoring programs, refer to the appended reports, as referenced below. At an individual level, none of the trigger or guideline exceedances observed through these programs were assessed as having the potential to cause significant risks to the aquatic receiving environment requiring immediate management actions.

**Table 8-77 Summary of AEMP results for the Meadowbank site in 2022. 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**

| | Core Receiving Environment Monitoring Program | Effects Assessment Studies | Dike Construction Monitoring | Habitat Compensation Monitoring | Dewatering Monitoring | MDMER Monitoring[1] | EEM Biological Monitoring | Water Quality and Flow Monitoring | Fish-Out Studies | Visual AWAR and Quarry Water Quality Monitoring | Blast Monitoring | Groundwater Monitoring[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Completed in 2022?** | **Yes** | **No** | **No** | **No** | **No** | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** | **Yes** |
| **Stressor Variables** | | | | | | | | | | | | |
| suspended solids | ○ | | | | | ◍ | | ◍ | | ○ | | NA |
| sediment deposition | NA | | | | | NA | | NA | | ○ | | NA |
| water-borne toxicants | ◍ | | | | | ○ | | NA | | NA | | ○ |
| sediment toxicants | NA | | | | | NA | | NA | | NA | | NA |
| nutrients | ○ | | | | | ○ | | NA | | NA | | NA |
| other physical stressors | NA | | | | | NA | | NA | | NA | | NA |
| **Effects Variables** | | | | | | | | | | | | |
| Phytoplankton | ○ | | | | | ○ | | NA | | NA | | NA |
| Zooplankton | NA | | | | | ○ | | NA | | NA | | NA |
| Fish | NA | | | | | ○ | | NA | | NA | | NA |
| Benthic invertebrate community | ○ | | | | | NA | | NA | | NA | | NA |
| Periphyton | NA | | | | | NA | | NA | | NA | | NA |
| Fish habitat | NA | | | | | NA | | NA | | ○ | | NA |

**Notes:**

1 - Includes current-year effluent quality, acute lethality, and sub-lethal toxicity results.

2- No triggers or guidelines are applicable to groundwater. Results are compared to NWB Water License effluent criteria for comparative purposes.

○ No observed effects

◍ Trigger or guideline exceedance - early warning explained in report

● Observed effects explained in report (applies to effects variables)

#### *8.12.3.1.1 Meadowbank CREMP*

The Core Receiving Environment Monitoring Program (CREMP) report for 2022 is provided in Appendix 33, and additionally summarized in Section 8.1. Highlights in the AEMP context are provided below.

Briefly, no new mine-related changes were recorded in 2022. Similar to previous years, the before-after-control-impact (BACI) analyses identified higher concentrations of dissolved solids and constituent major ions such as calcium and magnesium at near-field areas compared to baseline/reference. While the observed changes are mine-related the observed concentrations are still relatively low and there is no evidence to suggest concentrations are increasing year-over-year or that the observed concentrations would result in adverse ecological effects. Consistent with previous reporting cycles, there were no trigger exceedances in 2022 for any water quality parameters with CCME water quality guidelines, including metals. The magnitude of potential effects on water quality in each near-field lake is considered “low” (less than CCME Water Quality Guidelines for the Protection of Aquatic Life), and consistent with original FEIS predictions.

Sediment chemistry was not required to be analyzed in 2022, and will be assessed next in 2023.

The phytoplankton community at Meadowbank showed no significant changes relative to baseline for biomass or richness in 2022, though the effect sizes for total biomass at TPN, SP, and WAL were above the 20% trigger. The apparent increase in biomass is not associated with higher nutrient concentrations, which implies the increase observed in 2022 may be natural variability. Ultimately, the long-term phytoplankton monitoring data demonstrates that mining operations have not contributed to pervasive changes in primary productivity among the NF areas.

There were no statistically significant changes to the benthic invertebrate community relative to baseline/reference conditions in 2022, except for an increase in taxa richness at SP during the 2019-2022 time period. The number of taxa at SP were within the range of reference area INUG in 2022.

#### *8.12.3.1.2 Meadowbank Habitat Compensation Monitoring*

This program was not required to be conducted in 2022.

#### *8.12.3.1.3 Meadowbank Dike Construction and Dewatering Monitoring*

No dike construction or lake dewatering occurred in 2022.

#### *8.12.3.1.4 Meadowbank Groundwater Monitoring*

The complete 2022 Groundwater Monitoring Report is provided in Appendix 42, with a summary below in the context of the AEMP. A more detailed summary of the 2022 program for the Meadowbank site is provided in Section 8.7.1.

In 2022, a total of 5 monitoring wells were in operation at the Meadowbank site. Monitoring well MW-16-01 serves to investigate potential groundwater quality effects from the TSF, while monitoring wells MW-IPD-01(s), MW-IPD-01(d), MW-IDP-07, and MW-IPD-09 serve to investigate potential effects to groundwater from the in-pit deposition (IPD) of tailings. In addition, pit wall seepage samples were collected from the east wall of Portage Pit A in 2022 to assess potential groundwater quality effects related to the TSF and IPD.

Water levels in 2022 indicated that all IPD monitoring wells remain hydraulically downgradient of either Second or Third Portage Lake, and groundwater quality in these wells continues to display a natural water signature. Well MW-16-01 is hydraulically downgradient of the TSF and Central Dike, and groundwater quality in this location is interpreted to be affected by reclaim water from the South Cell TSF. Portage Pit A seepage samples are downgradient of Second Portage Lake, but adjacent to the Central Dump (waste rock storage). The chemical signature of the Portage Pit A seepage samples is interpreted to be between that of natural water and mine-affected water, potentially influenced by waste rock contact.

While not specifically applicable to groundwater, water quality results from groundwater sampling are compared to the maximum average concentration of the Third Portage Lake effluent discharge limits (NWB Water License Table 2, Schedule I), for reference. All parameter concentrations in 2022 met these effluent criteria.

Overall, the 2022 results indicate that the monitored groundwater locations do not appear to be affected by in-pit deposition operations. The four IPD wells remain hydraulically downgradient from the adjacent lakes, such that water quality at these stations is likely influenced by surface water seeping west towards the wells and into the IPD pits. Groundwater contaminations is therefore not likely to be a potential exposure pathway into the receiving aquatic environment.

#### *8.12.3.1.5 Meadowbank Site Non-Contact Water and Effluent Monitoring*

This section includes a discussion of results from water quality monitoring under the MDMER program (and its Schedule 5, Environmental Effects Monitoring) and Agnico Eagle's Water Quality and Flow Monitoring Plan for managed non-contact water, seepage to the receiving environment, or any water discharged to the receiving environment. Complete results are provided in Section 8.3.1 and Section 8.5, and highlights are summarized here.

##### *8.12.3.1.5.1 Effluent Discharge*

In 2022, only East Dike seepage water was discharged to the receiving environment at the Meadowbank site (Second Portage Lake; SPL) as non-contact water. Effluent is sampled weekly during discharge for comparison to NWB Water License TSS limits (station ST-8), and for MDMER criteria (ST-MMER-3). Discharge occurred in January, April, November, and December, 2022. On April 9$^{th}$, the Total Suspended Solids (TSS) result exceeded the limits set out in MDMER Schedule 4, Table 2 and the NWB Water License, for the maximum authorized concentration in a grab sample (30 mg/L), at 49 mg/L. The monthly TSS average did not exceed the maximum monthly average concentration of 15 mg/L.

MDMER required analyses for acute lethality (Rainbow trout and *Daphnia magna*) and were conducted on four and five occasions, respectively (January, April, November and/or December), with one test (April) reporting more than 0% mortality (30% mortality for *Daphnia magna* in the April test).

Agnico Eagle was required to collect EEM effluent characterization samples for this station. Effluent characterization (effluent water chemistry) with acute lethal and/or sub-lethal toxicity tests was conducted on three occasions (January 17, April 18, and November 21) and results were reported to Environment and Climate Change Canada (ECCC) via the MERS electronic database reporting system. No acute or sub-lethal effects were reported for the four organisms assessed (*Ceriodaphnia dubia*, Fathead minnow, *Lemna minor*, *Pseudokirchneriella subcapitata*). The results of these toxicity tests will be analyzed in context as part of the Cycle 5 EEM Biological Monitoring Interpretive Report (2024), so will be further considered at that time.

##### *8.12.3.1.5.2 Mine site Water Collection System*

Minesite non-contact water collection locations with discharge to the receiving environment consists 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 NP-2 Lake and Third Portage Lake, respectively.

For these locations, single samples are collected monthly during open water (June – October) for analysis by an accredited laboratory and compared to NWB Water License TSS criteria for the monthly mean (15 mg/L). For the East diversion ditch, the monthly mean criteria was exceeded in the single sample collected for June (16 mg/L). Daily TSS analyses are also performed by the onsite assay laboratory for management purposes, and based on these results, the average monthly TSS concentration was 4.7 mg/L. NWB limits were not exceeded in any samples for the West Diversion Ditch in 2022.

##### *8.12.3.1.5.3 Seepage*

*Waste Rock Storage Facility Seepage*

In 2013, seepage from the North Cell TSF through the Meadowbank WRSF was identified and sampled as ST-16, and based on results Agnico Eagle initiated a targeted monitoring program for the potential receiving environment in that area (closest receptor being NP-2 Lake). The KivIA requested that Agnico Eagle continue monitoring NP-2 until cyanide concentrations were not detectable for a period of five years. The 2014 – 2018 results confirmed no impacts to downstream lakes (NP-1, Dogleg, Second Portage Lake), however, in response to ECCC's comment on the 2018 Annual Report, Agnico Eagle committed to monitoring water quality in NP-2 on a yearly basis. There are no applicable NWB Water License limits for this location.

In 2022, CN concentrations in NP-2 were below detection limits. As tailings deposition has ended in the North Cell and progressive closure activities have resulted in the isolation of the historical sources of contamination from the north cell of the tailings facility, it is evident that closure, water management and mitigation control measures continue to be effective at protecting NP-2.

*Mill Seepage*

Monitoring in Third Portage Lake in response to the mill seepage through the Assay Lab Road (identified in 2013) continues to indicate that there has been no impacts to the near shore receiving waters of Third Portage Lake. The seepage appears to be effectively contained through construction of an interception trench (2014), a pumping system and repairs within the mill that has contained the source area (repaired in 2015). Pumping is conducted from an interception trench, as required, and sampling is completed for adjacent monitoring wells and a designated near-shore monitoring station in Third Portage Lake.

As in previous years, in 2022, concentrations at the designated monitoring station in TPL were all below the CCME Guideline for the Protection of Aquatic Life for free cyanide, copper and iron, which are the parameters considered indicators of mill seepage. Follow-up monitoring will continue in 2023.

#### *8.12.3.1.6 Meadowbank EEM Biological Monitoring*

The last EEM Interpretive Report for the Meadowbank site (Cycle 4) was submitted to ECCC on July 1st, 2021. Field work associated with this report was carried out in 2020. The next field program will occur in 2023.

Results of EEM toxicity testing for the current year (2022) are reported under the Effluent Discharge section (Section 8.12.3.1.5.1).

#### *8.12.3.1.7 Meadowbank Fish-Out Studies*

No fish-outs were conducted at the Meadowbank site in 2022.

#### *8.12.3.1.8 AWAR and Quarries Water Quality Monitoring*

Under the Freshet Action Plan, pre-freshet and freshet inspections were conducted at crossings along the AWAR in 2022 daily to weekly between May 7 and September 10. These inspections are conducted to document the presence/absence of flow, erosional concerns and turbidity plumes. During the freshet and open water season, any visual turbidity plumes or erosion for culverts and bridge crossings along the AWAR are documented by Environmental Technicians. A total of 13 inspections were conducted in 2022. No turbidity plumes or erosional concerns were observed.

Regular inspections of quarries along the AWAR were also performed during the year to ensure that runoff, if any, would be free of any visible sheen and would not impact the environment. No issues with runoff water inside the quarries were noted in 2022.

#### *8.12.3.1.9 Meadowbank Blast Monitoring*

In 2022, no blast monitoring was required for the Meadowbank site because mining operations ceased in 2019.

#### *8.12.3.1.10 Meadowbank Air Quality Monitoring*

The complete 2022 Air Quality and Dustfall Monitoring Report is provided in Appendix 50 and results are summarized in Section 8.14.1.

For all Meadowbank site monitoring stations and parameters (suspended particulates, $NO_2$, dustfall), the vast majority of measurements were below relevant short-term regulatory standards or monitoring thresholds (24-h or 30-d) and regulatory standards for annual averaging times (TSP, $PM_{2.5}$, $NO_2$). The only available FEIS prediction (for annual average $PM_{2.5}$) was exceeded at one Meadowbank station, but the comparison is considered conservative because the model only includes emissions from mobile and power plant sources. The CAAQS value for this parameter was not exceeded.

For dustfall along the AWAR, no relevant exceedances of the established dust management threshold occurred (0.53 mg/cm$^2$/30 d at 500+m from the road). Total dustfall in two samples exceeded the threshold, one at 300 m (upwind side, km 18) and one at 1,000 m (downwind side, km 78), but in both cases the analysis of fixed dustfall (inorganic material, most representative of road material) was well below the guideline, so the elevated results for total dustfall (inorganic + organic, such as plant material) were considered unrelated to road activity.

### 8.12.3.2 *Integration of Monitoring Results*

The 2022 AEMP monitoring programs were integrated using the 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).

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 water monitoring programs. In cases where regular exceedances of triggers or guidelines occurred, along with potential for mine-related impacts to the receiving environment, the potential source, stressor, transport pathways, exposure media, and effects measures were further evaluated.

#### *8.12.3.2.1 Identification of Trigger or Guideline Exceedances*

In 2022, one situation occurred where triggers or guidelines were regularly exceeded in the receiving aquatic environment, likely as a result of mining activities (as determined through BACI analysis or other interpretation), as identified through the CREMP. It is noted that these results indicate an increase in the measured parameters compared to baseline/reference values only, and do not indicate an exceedance of thresholds for impacts to aquatic life (e.g. none of these parameters have CCME Water Quality Guidelines for the Protection of Aquatic Life).

1. **Changes in Conventional Parameters, Major Ions, and TDS:** Mine-related changes in a number of water quality parameters without effects-based thresholds (e.g., CCME water quality criteria) continue to be observed for all near-field lakes (alkalinity, conductivity, hardness, major cations, and total dissolved solids).

In previous years, CREMP studies have also identified and thoroughly investigated instances of elevated concentrations of chromium in TPE sediment. While sediment chemistry results have indicated increased concentrations of chromium at TPE that are likely related to dike construction, targeted bioavailability studies and the ongoing benthos community assessment through 2021 clearly demonstrated that the change is not adversely affecting the benthos community. Since sediment chemistry analyses were not required in 2022, no new information is available and this issue is not addressed in the 2022 AEMP. It will be reviewed again in 2023 when sediment coring for chemical analysis is next scheduled.

#### *8.12.3.2.2 Evaluation of Potential Sources and Discussion*

##### *8.12.3.2.2.1 Changes in Conventional Parameters, Major Ions, and TDS*

In 2022, as reported in the CREMP, statistically significant mine-related changes were detected relative to baseline/reference conditions at one or more near-field (NF) areas including TPE, TPN, SP and WAL for: conductivity, hardness, total dissolved solids, alkalinity and major ions (calcium, magnesium, potassium). In the absence of effects-based thresholds (e.g., CCME water quality criteria) for these parameters, their CREMP triggers (early warning assessment values) were set at the 95$^{th}$ percentile of baseline data. While these changes to water quality are mine-related, similar to previous years the observed concentrations in 2022 are still relatively low and there is no evidence to suggest concentrations are increasing year-over-year or that the observed concentrations would result in adverse ecological effects (a literature review was conducted in support of this conclusion in the 2019 CREMP Report).

Notwithstanding, consideration was again given here to evaluate all potential mine-related sources (namely, effluent release, seepage, managed surface water, groundwater, and fugitive dust) that may contribute to the observed changes in water quality parameters. Since the impacted parameters (conductivity, hardness, total dissolved solids, alkalinity and major ions) are largely inter-related, conductivity was used as an indicator parameter in this review. While CREMP conductivity triggers (27.4 µS/cm; set at the 95$^{th}$ centile of baseline data), do not specifically apply to effluent, seepage 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. Conductivity measured in near-field CREMP lakes in 2022 was in the range of 20 – 60 µS/cm (approximately).

The conceptual site model presented in Figure 17 assists in understanding the possible linkages (i.e., effect to stressor from the source). Based on the monitoring results for all potential pathways in 2022, it was determined that the most likely source of changes to conventional parameters continues to be effluent discharge and potentially, managed non-contact water discharge (likely current and historical).

*Evaluation of Effluent Discharge*

In 2022 and recent years, the only source of effluent discharge for the Meadowbank site was East Dike seepage, which was released to Second Portage Lake.

Conductivity results for the East Dike seepage effluent in 2022 (63 – 132 µS/cm; Table 8-14) exceeded the CREMP water quality trigger of 27.4 µS/cm. These results suggest that effluent discharge may be contributing to the observed water quality changes in the CREMP near-field lakes, as determined in previous years and noted in the CREMP report.

*Evaluation of Seepage Results*

In addition to effluent, the Portage Waste Rock Storage Facility seepage event in July 2013 during which water migrated through the perimeter rockfill road at sample station ST-16 and into NP-2 Lake was assessed historically as a potential source of impacts to NP-2 and ultimately Second Portage Lake. However, since 2014, a permanent pumping system has been operating at ST-16, to collect water and pump it to the TSF North Cell, so that pathway is no longer considered a release pathway, or likely source of impacts to the receiving environment. Nevertheless, water quality in NP-2 continues to be monitored during open water, and measured concentrations of the indicator parameters of interest here were reviewed. However, they are considered more representative of managed non-contact water inputs to Second Portage Lake than seepage inputs. Conductivity in 2022 in NP-2 exceeded the CREMP trigger, with field-measured values ranging from 50 – 174 µS/cm (Table 8-18). Taken together with results for other managed non-contact water locations (below), these may be potential sources of elevated conductivity and related parameters observed in the CREMP results for Second and Third Portage Lakes.

*Evaluation of Managed Surface Water Results*

The East and West Diversion ditches were constructed in 2012 around the North Cell TSF and the Portage RSF. The diversion ditches are designed to redirect the fresh water from the northern area watershed away from the tailings pond and WRSF and direct it to Second Portage Lake via NP-2 (East diversion ditch) and Third Portage Lake (West diversion ditch). Monthly field-measured conductivity in both diversion ditch locations (East (ST-5): 40 – 172 µS/cm; West (ST-6): 28 – 104 µS/cm) commonly exceeded the CREMP trigger (27.4 µS/cm). 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.

*Evaluation of Groundwater Results*

Results of groundwater monitoring have shown that water quality in wells located immediately adjacent to the receiving environment and just inside the perimeter of the Portage area dewatering dikes is indicative of natural water inflows. Furthermore, the observed CREMP trigger exceedances do not have signatures consistent with the primary onsite source of potential groundwater contamination (reclaim water). Therefore CREMP trigger exceedances in the receiving environment surface water do not appear to be caused by an interaction with any potential onsite source of contamination via groundwater.

*Evaluation of Air Quality and Dustfall Results*

Based on conceptual models, another potential contributor could be fugitive dust migration. Review of air quality monitoring results indicates that rates of dustfall and concentrations of total suspended particulates (the parameters most representative of particles that may become deposited) rarely exceed available air quality standards or guidelines at minesite monitoring stations. There are no FEIS predictions suitable for comparison to field-measured dustfall or TSP for the Meadowbank site, but no trends towards increasing concentrations of these parameters has been observed since monitoring began in 2011. While regulatory air quality guidelines are not set in the context of aquatic environment contamination, it is considered unlikely that dust generation has been a significant contributor to the observed changes in water quality parameters.

*Effects on Receptors of Concern*

Although these results and ongoing CREMP analyses indicate that the observed changes in water chemistry are likely mine-related, a thorough literature review and analysis in the 2019 CREMP report indicates that concentrations of these parameters at Meadowbank (which were similar 2022) remain well below concentrations associated with adverse effects reported in the literature.

This conclusion is further corroborated by results of associated monitoring programs for receptors of concern (phytoplankton, periphyton, benthic invertebrates, zooplankaton, fish & fish habitat) in 2022 or the last available year:

- As reported in the CREMP, no pervasive mine-related changes in phytoplankton or benthic invertebrate communities have been observed (apparent but not statistically significant increases in phytoplankton were observed in 2022 in some near-field lakes, but were determined as unlikely to be mine-related).

- The most recent complete review of sublethal toxicity data presented in the 2021 EEM Interpretive Report (seven complete tests from 2018 – 2020) indicated that 48 of 49 measurement endpoints met thresholds[5].

- Similarly, while results of the last EEM biological monitoring in 2020 (benthic invertebrate assessment) identified higher benthic invertebrate density at the impact sampling area (SP) than far field and reference sites, samples contained an assemblage of benthic organisms that are typical for these Arctic systems, and these results did not indicate degraded conditions as a result of mine operations.

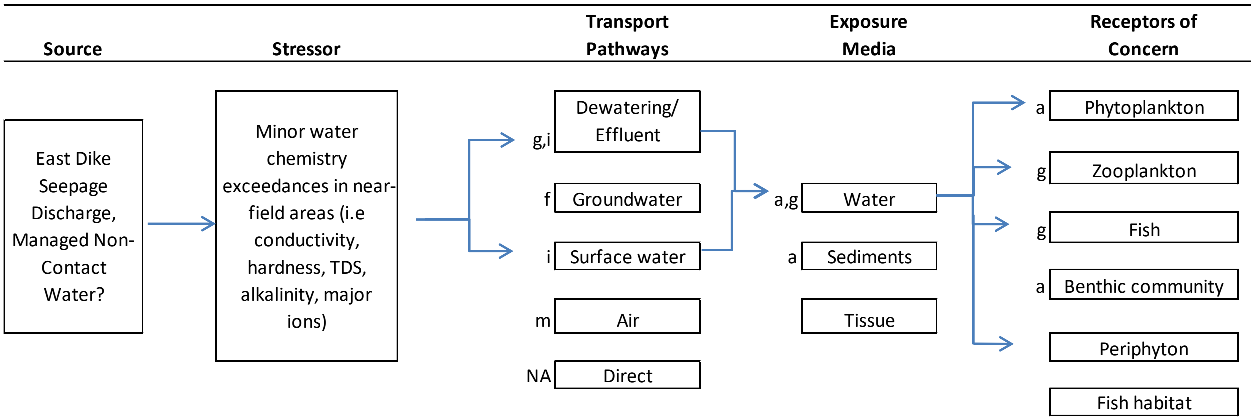
- Finally, while the last HCMP program results in 2021 indicate that periphyton growth on dike faces continues to be slow (as expected in Arctic ultraoligotrophic lakes), interstitial water quality meets CCME criteria, and fish presence around the dike faces has been confirmed.

*Management Actions*

As a result of this review, any mine-related impacts to receptors of concern will continue to be assessed through the scheduled monitoring programs and no adaptive management is planned in relation to the observed changes in conventional parameters and major ions for near-field lakes.

[5] In one 2020 test an IC25 was less than the 30% effluent concentration threshold (growth for Fathead Minnow), but these test results were identified as anomalous based widely ranging mortality across replicates.

**Figure 17 Meadowbank integrated conceptual site model for 2022 AEMP assessment of changes in near-field water quality parameters**




Notes (programs conducted in 2022 indicated above):

| | |
|---|---|
| a | Core Receiving Environment Monitoring Program |
| b | ~~Effects Assessment Studies~~ |
| c | ~~Dike Construction Monitoring~~ |
| d | ~~Habitat Compensation Monitoring Program~~ |
| e | ~~Dewatering Monitoring~~ |
| f | Groundwater Monitoring |
| g | MDMER Monitoring |
| h | ~~EEM Biological Monitoring Studies~~ |
| i | Water Quality and Flow Monitoring |
| j | ~~Fish-Out Studies~~ |
| k | ~~AWPAR and Quarry Water Quality Montoring~~ |
| l | ~~Blast Monitoring~~ |
| m | Air Quality Monitoring |
| NA | Direct, so measured in exposure medium. |

### 8.12.3.3 *Recommended Management Actions*

Based on the integration of results from these monitoring programs, the AEMP evaluation did not find an apparent excess risk to the receiving aquatic environment due to mine-related activities. No supplemental management actions are therefore planned for 2023 in relation to results of this AEMP analysis.

The following routine monitoring programs are planned:

- CREMP
  - Routine CREMP monitoring (limnology, water quality, phytoplankton, sediment core samples, benthic community assessment) in 2023.
- Water Quality and Flow Monitoring
  - Monitoring will continue as per the monitoring plan and NWB Water License requirements in 2023.

- MDMER
    - Monitoring will continue as per the MDMER requirements in 2023.
- EEM Biological Monitoring Studies
    - The next EEM Biological Monitoring will occur in 2023.
- Habitat Compensation Monitoring
    - The next scheduled HCMP monitoring will occur in 2023.
- Dewatering and Dike Construction Monitoring
    - No lake dewatering or dike construction is planned for the Meadowbank site in 2023.
- Fish-out Monitoring
    - No fish-outs for the Meadowbank site are planned for 2023.
- Blast Monitoring
    - No blasting is planned to occur for the Meadowbank site in 2023.
- Groundwater Monitoring
    - Groundwater Monitoring Report recommendations for the Meadowbank site (Appendix 42) with bi-annual sampling requirement will continue to be followed in 2023.
- Air Quality Monitoring
    - Regular ambient air quality monitoring will occur at the Meadowbank site in 2023.

### 8.12.4 Whale Tail Site AEMP

**As required by NWB Water License 2AM-WTP1830 Schedule B, Item 19: *The results of monitoring under the AEMP.***

#### 8.12.4.1 *Summary of Results of AEMP- Related Monitoring Programs*

In 2022, AEMP-related monitoring programs for the Whale Tail site included:

- Core Receiving Environment Monitoring Program (CREMP);
- Dike Construction Monitoring;
- Fish Habitat Offsets Monitoring;
- Groundwater Monitoring;
- Metal and Diamond Mining Effluent Regulation (MDMER) Monitoring;

- Minesite Water Quality and Flow Monitoring;
- Visual WTHR and Quarries Water Quality Monitoring (Erosion Monitoring);
- Blast Monitoring; and
- Air Quality 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 2022 for the Whale Tail site include:

- EEM Biological Studies;
- Lake Dewatering Monitoring; and
- Fish-Out Studies.

Air quality, the EEM Biological Studies and the Fish Habitat Offsets Monitoring Program are considered as part of the conceptual site model and are included in the AEMP discussion to inform the process, but these programs are not a requirement of the AEMP under the Type A Water License; Part I-1.

Summaries of each AEMP monitoring program are provided throughout this Annual Report, and referenced below, with additional details relevant to the AEMP, as necessary. Table 8-78 further summarizes the results of these programs in 2022 for the Whale Tail site. For detailed results of individual monitoring programs, refer to the appended reports, as referenced below. At the individual level, none of the effects-based triggers or guideline exceedances observed through these programs were assessed as having the potential to cause significant risks to the aquatic receiving environment requiring immediate changes in management actions.

**Table 8-78 Summary of aquatic effect monitoring program results for the Whale Tail site in 2022. 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 excluded from this table**

| | Core Receiving Environment Monitoring Program | Effects Assessment Studies | Dike Construction Monitoring | Fish Habitat Offsets Monitoring[1] | Dewatering Monitoring | MDMER Monitoring[2] | EEM Biological Monitoring | Water Quality and Flow Monitoring | Fish-Out Studies | Erosion Monitoring | Blast Monitoring | Groundwater Monitoring[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Completed in 2022?** | **Yes** | **No** | **Yes** | **Yes** | **No** | **Yes** | **No** | **Yes** | **No** | **Yes** | **Yes** | **Yes** |
| **Stressor Variables** | | | | | | | | | | | | |
| suspended solids | ○ | | ○ | NA | | ○ | | ○ | | ○ | NA | NA |
| sediment deposition | NA | | NA | NA | | NA | | NA | | ○ | NA | NA |
| water-borne toxicants | ◍ | | ○ | NA | | ◍ | | ◍ | | NA | NA | ○ |
| sediment toxicants | ○ | | NA | NA | | NA | | NA | | NA | NA | NA |
| nutrients | ◍ | | ○ | NA | | ○ | | ○ | | NA | NA | NA |
| other physical stressors | NA | | NA | NA | | NA | | NA | | NA | ◍ | NA |
| **Effects Variables** | | | | | | | | | | | | |
| Phytoplankton | ◍ | | NA | NA | | ◍ | | NA | | NA | NA | NA |
| Zooplankton | NA | | NA | NA | | ◍ | | NA | | NA | NA | NA |
| Fish | NA | | NA | ○ | | ○ | | NA | | NA | NA | NA |
| Benthic invertebrate community | ○ | | NA | NA | | NA | | NA | | NA | NA | NA |
| Periphyton | NA | | NA | ○ | | NA | | NA | | NA | NA | NA |
| Fish habitat | NA | | NA | NA | | NA | | NA | | ○ | NA | NA |

**Notes:**

1 - Water quality monitoring for the FHOMP is primarily conducted and reported under the CREMP. Periphyton results are preliminary.

2 - Includes current-year effluent quality, acute lethality, and sub-lethal toxicity results.

3 - No guidelines or trigger values apply to groundwater. Results are compared to FEIS assumptions.

○ No observed effects

◍ Trigger or guideline exceedance - early warning explained in report

● Observed effects explained in report (applies to effects variables)

#### *8.12.4.1.1 Whale Tail CREMP*

The Core Receiving Environment Monitoring Program report for 2022 is provided in Appendix 33, and additionally summarized in Section 8.1. Highlights in the AEMP context are provided below.

Briefly, some significant differences from baseline/reference conditions were observed in some near-field and midfield areas for: ionic compounds (calcium, magnesium, potassium, and sodium), TDS, some nutrients, lithium and titanium. Similar to results seen over the years at the Meadowbank study lakes, these trends mainly represent increases above baseline/reference conditions only; except for total phosphorus, none of the analytes with concentration increases above trigger values that were statistically significant in 2022 have effects-based guidelines for the protection of aquatic life. For those parameters, results indicate that mine-related changes have occurred, but that these changes would not be expected to result in adverse effects to aquatic life. Total phosphorus is one of the main constituents of concern for the Whale Tail Mine, with increases predicted as a result of terrestrial flooding and mine discharge. In 2022, similar to previous years, there was a statistically significant increase in total phosphorus (and other nutrients) in WTS, A20, and MAM compared to baseline/reference conditions. The increase in nutrients is likely contributing to an increase in primary productivity, as predicted in the FEIS and discussed below.

As in previous years, phytoplankton biomass was highly variable in 2022, with some apparent but not statistically significant increases relative to control or baseline conditions for WTS, MAM, A20, and A76. As discussed in the CREMP, changes in primary productivity were predicted in the FEIS and some portion of the observed increase in 2022 may be a result of natural variation. No significant changes in taxa richness were observed.

Sediment chemistry analysis (conducted on grab samples only) indicated that concentrations of metals were similar to results from the baseline period and early operations. The next complete sediment chemistry analysis (sediment cores) with full statistical comparison will occur in 2023.

Among benthic invertebrate samples, there was an apparent increase in taxa richness and total biomass at MAM and NEM, but not at other near field and mid-field lakes in 2022, suggesting the increases may be due to natural variability rather than mining influence. All other study areas were comparable with baseline/reference conditions.

#### *8.12.4.1.2 Dike Construction and Dewatering Monitoring*

While Whale Tail Dike construction was considered complete in 2019, in-water remedial work was completed on the East Abutment in September, 2022 and monitored according to the Water Quality Monitoring and Management Plan for Dike Construction and Dewatering (Section 8.5.2), so results are summarized here.

In-water work to construct the East Abutment Thermal Berm occurred from September 25 - 27. Two turbidity curtains were deployed, one inner and one outer, before commencing any works. During and after the works, the Environment Department measured daily the temperature, pH, conductivity, turbidity, and dissolved oxygen. TSS analyses on surface grab sample collected outside the turbidity curtains were also performed daily by Agnico Eagle’s onsite assay laboratory using standard methods. Accredited laboratory analysis for TSS, nutrients, major ions, and metals (full suite) was conducted weekly during and after the in-water work (September 25 and October 2). Results were compared to TSS limits established in Part D, Item 7 of the NWB Water License.

All results were less than CCME Water Quality Guidelines for the Protection of Aquatic Life (comparison for reference only) and no exceedances of the NWB Water License criteria for TSS (maximum short-term concentration of 50 mg/L; maximum monthly mean of 15 mg/L) occurred, with a maximum recorded individual value of 2.0 mg/L from the accredited laboratory.

#### *8.12.4.1.3 Whale Tail Site Non-Contact Water and Effluent Monitoring*

This section includes discussion of results from water quality monitoring under the MDMER and the Water Quality and Flow Monitoring Plan for managed non-contact water or water discharged to the receiving environment.

##### *8.12.4.1.3.1 Effluent Discharge*

Effluent discharge results for 2022 in relation to regulatory criteria are summarized here and full results (Section 8.5) are used as necessary to inform the integration of monitoring results in Section 8.12.4.2. Results of EEM-required effluent sublethal toxicity testing are described here, but are interpreted under the EEM Biological Monitoring program (next interpretation report is due in 2024), so will be considered in the AEMP context at that time.

*ST-MDMER-11/ST-WT-24 (Whale Tail South Permanent Diffuser)*

Discharge from the IVR Attenuation Pond occurred through this Whale Tail South Diffuser periodically in January, February, April, May, June, and October, 2022.

Effluent samples were collected weekly for water chemistry analysis and comparison to NWB Water License limits (station ST-WT-24) and MDMER criteria (station ST-MDMER-11). Complete results are provided in Sections 8.3.2 and 8.5.3.2.15). For samples collected in April, exceedances of MDMER and NWB limits for total arsenic occurred. Specifically, total arsenic (As) concentrations from the treated discharge exceeded the maximum limits set out in MDMER Schedule 4, Table 2, for the maximum authorized monthly mean concentration (0.30mg/L) at 0.3145 mg/L (mean of two samples collected April 3$^{rd}$ and 25$^{th}$). This event was reported to Spill Hot Line and ECCC Inspector on April 29$^{th}$ and a follow-up report was submitted to the inspector on May 27$^{th}$. There was no exceedance of the MDMER maximum authorized concentration in a grab sample (0.6 mg/L).

The NWB Water License short-term limit for total arsenic (0.2 mg/L) was also exceeded in one sample (April 3$^{rd}$, 2022) and the NWB Water License monthly mean limit for arsenic (0.1 mg/L) was exceeded for April with the average of the two results of 0.4480 mg/L on April 3$^{rd}$ ,and 0.1850 mg/L on April 25$^{th}$.

Under MDMER requirements, acute lethality tests for Rainbow Trout and *Daphnia magna* were conducted on five and six occasions, respectively, in 2022, with a maximum of 20% mortality was reported for Rainbow Trout, and 10% mortality reported for *Daphnia magna* in 100% effluent. The acute toxicity test conducted with samples collected April 3$^{rd}$ (coinciding with the maximum measured concentration of total arsenic) showed 0% mortality in both species.

Under EEM requirements, water samples were taken from the effluent discharge (ST-MDMER-11-EEM), the receiving environment exposure area (WTSE-1) and reference area (ST-EEM-TPS) for water chemistry. This data was previously reported to Environment Canada via the MERS electronic database reporting system.

*ST-MDMER-8/ST-WT-2a (Mammoth Lake East Diffuser)*

Discharge from the IVR Attenuation Pond occurred through the Mammoth Lake East Diffuser in June, July, August, and September, 2022.

Effluent samples were collected weekly for water chemistry analysis and comparison to NWB Water License limits (station ST-WT-2a) and MDMER criteria (station ST-MDMER-8). No results exceeded these criteria (Section 8.3.2).

Under MDMER requirements, acute lethality tests for Rainbow Trout and *Daphnia magna* were conducted on five occasions, with no mortality reported in Rainbow Trout tests and up to 40% mortality reported in *Daphnia magna* tests with 100% effluent.

Under EEM requirements, water quality samples were taken from the effluent discharge (ST-MDMER-8), the receiving environment exposure area (EEM-7-MAME-2) and reference area (ST-EEM-TPS) for water chemistry and sublethal toxicity analysis on two occasions. Across the four test species, sublethal effects were reported in one of two tests for *Ceriodaphnia dubia* (August 29$^{th}$, 2022), and no acute lethality or sub-lethal effects for other species were reported (Table 8-6). This data was previously reported to Environment Canada via the MERS electronic database reporting system, and the next complete interpretive report will be submitted in 2024.

#### *8.12.4.1.3.2 Mine site Water Collection System*

Water quality sampling was conducted for various locations involved in onsite water management under the NWB Water License. Complete water quality monitoring results for these locations in 2022 are provided in Section 8.5.3.2 and used as necessary below (Section 8.12.4.2) to inform the integration of monitoring results. Those locations with actual or potential direct interaction with the receiving environment include:

-Whale Tail South Channel (ST-WT-13)

- Water flowing through the Whale Tail South Channel was sampled on a monthly basis during 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 2022.

-Lake A16 (Mammoth Lake) outlet (ST-WT-14)

- In 2022, water from Lake A16 outlet (ST-WT-14) was sampled in July, August, and September during open water. There are no license limits.

-Lake A15 (ST-WT-15)

- In 2022, water from Lake A15 outlet (ST-WT-15) was sampled in July, August, and September during open water. There are no license limits.

-IVR Diversion Channel (ST-WT-37)

- Commissioned during freshet 2021, the purpose is to direct non-contact water from the North-East watershed towards Nemo Lake. 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 2022.

##### *8.12.4.1.3.3 Seepage*

Seepage and runoff from the landfill, waste rock storage facilities, and associated dikes/berms are monitored according to NWB Water License Schedule B, Item 13. Briefly, in 2022, monitoring and mitigation related to seepage and runoff for locations with potential impact the receiving environment included:

-*Seepage through dewatering dikes*

- Seepage of lake water through the Whale Tail Dike has been observed beginning in 2019 and a pumping system was installed to collect and manage the non-contact seepage water but has not yet been commissioned. Until the system is commissioned and discharge criteria are met, water will overflow from the pump stations to the Whale Tail Attenuation Pond and be managed as part of this infrastructure (no interaction with receiving environment).

-*Seepage and runoff from the landfill*

- None observed.

-*Subsurface seepage and surface runoff from Whale Tail and IVR WRSFs*

- No subsurface seepage observed in 2022 from the WRSFs. Surface runoff is collected and managed onsite as required, without specified license limits.

For seepage locations, none were considered to have potential to report directly to the receiving environment in 2022, so seepage water quality is not considered further.

#### *8.12.4.1.4 EEM Biological Monitoring*

The Cycle 1 Interpretative Report was submitted on July 26th, 2021. As required under the MDMER, the next interpretive report and biological monitoring data are due on July 27th, 2024. Results of EEM effluent toxicity testing will be interpreted under that program, so will be considered in the AEMP context at that time.

#### *8.12.4.1.5 Fish Habitat Offset Monitoring*

The complete 2022 Fish Habitat Offsets Monitoring Report for the Whale Tail Mine is provided as Appendix 44, and summarized in Section 8.8.2.

Briefly, monitoring of constructed offsets (flood zone habitat) was conducted in 2022 under the pre-offsetting ecological monitoring program of the Fish Habitat Offsets Monitoring Plan (FHOMP; June, 2021). The intent of this program is to determine whether flooded terrestrial zones of Whale Tail Lake and

Lake A18 will provide suitable fish habitat as assumed in the Project's fish habitat offsetting plans, prior to construction of the permanent water retentions sills (est. 2026). Pre-offsetting monitoring includes assessments of open-lake water quality, periphyton growth, and fish use of the flood zone habitat. In 2022, FHOMP field assessments included: flood zone and reference lake water quality data collected through the Core Receiving Environment Monitoring Plan along with supplemental sampling in lakes A63, A44, B03, and Lake 8; analysis of periphyton growth using artificial substrate samplers and periphyton visual surveys; and small-bodied fish population assessments by shoreline electrofishing. Results are presented in a data report format and final analyses will be completed following the final (2023) field season for this program.

Briefly, electrofishing studies identified the presence of small-bodied fish populations in newly created shoreline habitat at catch rates and size ranges that appear similar to reference areas. Though some periphyton substrate samplers came loose from their anchors or were stranded due to a significant late-season drop in water levels, it is evident that seasonal periphyton growth is greater in WTS than reference lakes, and potentially elevated in A20 compared to reference sites. These observations are in line with 2018 FEIS Addendum predictions for increased nutrient concentrations and primary productivity in flood zone lakes. Periphyton visual surveys identified a wide range of periphyton cover conditions across both flood zone and reference lakes, from no coverage to >75% coverage, without a clear relationship to flood status.

Six research studies form the complementary measures for Whale Tail Mine offsetting. Due to delays that were largely as a result of the COVID-19 pandemic, some study periods have been extended by one to three years. In 2021, Study 4: Arctic Grayling Occupancy Modelling was completed and criteria for success were met with publication of a peer-reviewed manuscript, as described in the 2021 Fish Habitat Offsets Monitoring Report.

Field programs in 2023 according to the FHOMP schedule will include: water quality sampling, periphyton visual surveys, periphyton artificial substrate sampling, and large-bodied fish surveys. Shoreline electrofishing surveys for small-bodied fish species will be conducted opportunistically.

#### *8.12.4.1.6 Whale Tail Fish-Out Studies*

No fish-outs were conducted in 2022.

#### *8.12.4.1.7 Whale Tail Haul Road and Quarries Water Quality Monitoring*

Visual inspections for freshet monitoring under the Freshet Action Plan occur daily or weekly during freshet for onsite and Whale Tail Haul road water management infrastructure including culverts, ditches, bridges, Whale Tail South channel and IVR diversion ditch. Weekly inspections are also conducted on a year-round basis. An inspection log is maintained, documenting general conditions at each location, observations on flow rates and clarity, turbidity sample collection (as required), and any mitigation measures that are implemented. Details are provided in Section 8.5.3.2.17.

Briefly, in 2022, no major 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).

For onsite inspections, no major erosional concerns were observed during visual inspections (e.g. scour, bed erosion, gullying, etc.). Based on visual assessments for turbidity, no water quality samples were required to be collected for measurement of TSS. As precautionary measures, straw booms or other management measures (barriers to slow rate of overland flow into ditches) were installed for some culverts to reduce potential for turbidity.

- In August 2020, culverts were installed across the road leading to the emulsion plant, near the Mammoth Dike south abutment, after ponding water was observed on the upstream (south) side of this road during freshet. In 2021, overland flow was again observed across this road in May, while culverts were blocked with ice and snow. Attempts were made to thaw the culverts, but some flow across the road continued until mid-June (in 2020 prior to culvert installation, the overland flow continued until mid-July). Sediments control measures (straw and wood-chip booms) were installed downstream of the road to avoid potential sediments transportation. In 2022, plywood was installed to stop snow accumulating in the culverts over winter, and in the spring, snow was cleared from the culvert areas and the plywood was removed. No flow over the road was recorded during freshet, but booms were still installed on the south side of the road (late May) and these successfully addressed turbidity concerns, as confirmed through visual inspection.

##### *8.12.4.1.8 Whale Tail Blast Monitoring*

A Blast Monitoring Report is produced annually, and complete results are provided in that document (Appendix 40).

Briefly, every blast is monitored with an Instantel Minimate Blaster to ensure that vibrations generated by blasting (peak particle velocity; PPV) are less than 13 mm/sec and the overpressure (instantaneous pressure change; IPC) is under 50 KPa at the nearest fish-bearing waterbody (on recommendation of DFO). The results of blast monitoring are systematically analyzed by the Engineering Department within 24 hours following the blasting operation. The blast monitoring results are interpreted and a blast mitigation plan is implemented immediately if the vibrations or the overpressure exceed the guidelines.

For the purposes of fish and fish habitat protection, PPV and IPC were recorded throughout 2022 during blasting activities at Whale Tail and IVR Pits (373 blasts monitored). No blasting was required for other construction activities.

In 2022, two exceedances of PPV limits occurred, both for IVR Pit monitoring at Nemo Lake. No exceedances of IPC limits occurred. Each were isolated incidents with no further exceedances after contingency mitigation measures were implemented.

##### *8.12.4.1.9 Whale Tail Groundwater Monitoring*

A complete summary of groundwater monitoring is provided in Section 8.7.2, and technical memorandums for groundwater monitoring are provided in Appendix 43.

For the Whale Tail site, groundwater monitoring was conducted in 2022 according to the Groundwater Monitoring Plan (2019). This monitoring program exists primarily to update site water quality and water balance models, and support water management activities and water quality planning for pit reflooding. Currently, only the Whale Tail Pit interacts with groundwater, and through the Groundwater Monitoring Plan, both groundwater inflow quantity and quality are assessed through the Westbay System monitoring well installation, and water quality analyses are conducted for pit wall seepage samples. Monitoring well results are compared to baseline/FEIS Addendum model predictions.

In 2022, hydraulic heads measured in the Westbay System continue to decrease from the pre-development phase which is attributed to the dewatering of the north basin and open pit operations. Westbay System Ports 3 and 4 were considered reliable for water quality sampling. Results for all parameters were within the same magnitude as baseline sampling, with the exception of radium and reactive silica. Concentrations of radium remained less than the MDMER effluent limit, while no limit is associated with reactive silica. Importantly, measured concentrations of arsenic, which is a constituent of interest in the rock at Whale Tail, were low and consistent with baseline concentrations. The natural content of arsenic in groundwater is still considered unlikely to have a significant effect on mine surface water quality and pit lake water quality, which is consistent with FEIS Addendum assumptions. 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.

#### *8.12.4.1.10 Whale Tail Air Quality Monitoring*

The complete 2022 Air Quality and Dustfall Monitoring Report is provided in Appendix 50, and summarized in Section 8.14.2. The objective of this program is to measure ambient outdoor concentrations of dustfall, $NO_2$, and suspended particulates (TSP, $PM_{10}$, $PM_{2.5}$) at various monitoring locations around the Meadowbank and Whale Tail sites, Meadowbank All-Weather Access Road, and Whale Tail Haul Road.

Similar to results for the Meadowbank Mine, the vast majority of air quality and dustfall measurements collected at the Whale Tail site in 2022 were below relevant short-term regulatory standards or monitoring thresholds (24-h or 30-d). Among 171 suspended particulate results (encompassing TSP, $PM_{10}$ and $PM_{2.5}$ measurements) for the 24-h averaging time, 18 exceeded regulatory criteria (12 TSP, 6 $PM_{10}$), but exceedances at this location were predicted in the Project FEIS. All $PM_{2.5}$ results for the 24-h averaging time were less than regulatory guidelines and FEIS predictions. Annual average concentrations for both TSP and $PM_{2.5}$ were less than regulatory guidelines, and values for $PM_{2.5}$ were less than the FEIS prediction, but the annual average concentration for TSP at Whale Tail exceeded the FEIS prediction which is equivalent to the management threshold.

Annual average $NO_2$ as measured using passive samplers met the GN guideline and CAAQS for both Whale Tail Site stations. All reportable results for continuous $NO_2$ monitoring were less than the relevant 1-h and 24-h standards (GN and/or CAAQS).

Finally, measured dustfall at onsite stations and Whale Tail Haul Road transects met monitoring thresholds in all cases.

### 8.12.4.2 *Integration of Monitoring Results*

The 2022 AEMP monitoring programs were integrated using the 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).

The results of the monitoring programs were integrated in a mechanistic fashion based on a thorough review to identify any patterns among the relevant receiving water monitoring programs. In cases where exceedances of triggers or guidelines occurred, along with potential for mine-related impacts to the receiving environment, the potential source, stressor, transport pathways, exposure media, and effects measures were evaluated.

##### *8.12.4.2.1 Identification of Trigger or Guideline Exceedances*

No consistent exceedances of relevant guideline values occurred for Whale Tail AEMP monitoring programs in 2022. A review of CREMP results exceeding trigger values and for which BACI trends were statistically significant was conducted in that report (Appendix 33), and results are examined here in relation to other 2022 AEMP programs.

Similar to previous years, the three situations for which impacts are identified in the CREMP as mine-related are evaluated further. In all cases, these water quality results only indicate an increase in the measured parameter compared to baseline/reference concentrations, and do not indicate an exceedance of thresholds for impacts to aquatic life or unpredicted changes (all results were within CCME Water Quality Guidelines for the Protection of Aquatic Life and/or FEIS-predicted ranges, where available).

In addition, since effluent monitoring indicated that samples collected in April for one discharge location exceeded MDMER and NWB Water License requirements for total arsenic, and this is a parameter of concern for the project, this situation is also discussed

1. **Nutrients**:

    a. N and P: Yearly mean concentrations of Total Kjeldahl Nitrogen (TKN) and total phosphorus exceeded CREMP trigger values, and showed a statistically significant increase above baseline/reference values in near field lakes (WTS, MAM, and A20) in 2022.

    b. TOC and DOC: Yearly mean concentrations of total organic carbon (TOC) and dissolved organic carbon (DOC) exceeded CREMP trigger values, and showed a statistically significant increase above baseline/reference values in near field lakes (WTS, MAM, and A20) in 2022.

    c. Phytoplankton biomass: Though there were no statistically significant increases above baseline/reference values for phytoplankton biomass in 2022 due to high variability, there was an apparent increase, with average measured values exceeding the 20% effect size trigger for WTS, MAM, A20, A76, and NEM. This effect was identified as being related to the observed increase in nutrients, so is included in the same evaluation.

2. **Conventional parameters, major ions, and TDS**: Yearly mean concentrations exceeded CREMP trigger values and statistically significant increases above baseline/reference concentrations were observed at near and mid-field areas WTS, A20, MAM, A76 and NEM for conventional parameters (alkalinity, conductivity, hardness), major ions (calcium, potassium, magnesium, sodium) and TDS.

3. **Metals**:

    a. Yearly mean concentrations exceeded CREMP trigger values and statistically significant increases above baseline/reference values were observed at MAM for lithium (and for titanium in WTS, though this was likely not mine-related).

    b. For IVR Attenuation Pond effluent discharge to Whale Tail South, samples collected in April exceeded Arsenic MDMER and/or NWB limits.

##### *8.12.4.2.2 Evaluation of Potential Source and Discussion*

Overall, five onsite water management activities were identified primarily as having the potential to impact water quality in the receiving environment. These consisted of:

**Flood-Related (Allochthonous) Inputs**

- Ongoing inputs from Whale Tail South terrestrial flooding to WTS and lakes downstream via the Whale Tail South Channel

**Effluent Discharge**

- Effluent discharge from the IVR Attenuation Pond to Whale Tail South
- Effluent discharge from the IVR Attenuation Pond to Mammoth Lake

**Managed Surface Water and Seepage**

- IVR Diversion Channel non-contact water discharge towards Nemo Lake
- Waste Rock Storage Facility toe seepage contact water control with potential inputs to Mammoth Lake (no flow observed in 2021 or 2022 so not evaluated further)

**Construction Activities**

- Whale Tail Dike remediation work (East Abutment Thermal Berm)

For each of the situations identified in Section 8.12.4.2.1, results are reviewed and discussed in the context of these potential sources, using results of other relevant AEMP monitoring programs to inform the assessment (primarily, water quality monitoring results effluent discharge, seepage, and managed surface water).

While dust deposition was identified as a potential source of impacts in the conceptual model, results of air quality monitoring in 2022 indicated that while the annual average concentration of total suspended particulates exceeded the FEIS prediction, neither TSP nor dustfall results exceeded available long-term (annual or 30-d) regulatory standards or guidelines. While these are not specifically set in the context of aquatic contamination, it is considered unlikely that dust generation at these relatively low rates has contributed significantly to the observed changes in water quality parameters, particularly given the large surface area and volume of the impacted lakes at the Whale Tail site. As a result, this potential source of impacts to surface water is not considered further.

Similarly, groundwater monitoring in 2022 indicated 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.

###### *8.12.4.2.2.1 Changes in Nutrients (TKN, TP, TOC, DOC)*

In 2022, statistically significant increases compared to baseline/reference values were observed for TKN, TP, TOC, and DOC at CREMP monitoring stations WTS, MAM and A20. Related increases in phytoplankton biomass were observed for these same lakes (as well as A76 and NEM), though none were statistically significant.

These trends are generally consistent with findings in previous impact years and FEIS Addendum predictions for increased nutrient concentrations in WTS and MAM. Comparison to FEIS predictions is further explored in the PEAMP – Section 12.5.1. Briefly, as in previous years, some individual measurements of TP and nitrate (there are no FEIS predictions for TKN) exceeded monthly FEIS predictions in WTS and/or MAM, but all concentrations were within the 10x range of uncertainty associated with those predictions, and TP measurements were within predicted trophic levels. There are no FEIS predictions for TOC, DOC, or other area impact lakes.

As suggested in previous CREMP reports, the observed changes in nutrients are considered to be a result primarily of terrestrial inundation and to a lesser extent, effluent discharge. For WTS and Mammoth Lake these activities in 2022 may be summarized as:

- WTS:
  - Flooding occurred mainly in 2019. Water levels have been maintained in WTS with regular freshet-based fluctuations, until the present.
  - Effluent discharge to WTS has occurred as required since 2019 via the Whale Tail South diffusers.
- MAM:
  - Effluent discharge via the Mammoth Lake diffusers has been ongoing as required since 2019.
  - WTS flooded waters, with allochthonous inputs due to inundation have flowed through the Whale Tail South Channel into MAM since 2020 (though pumping also occurred in fall 2019 prior to channel construction).

Changes in TOC and DOC are considered related to increased primary productivity and/or allochthonous carbon inputs (these parameters are often largely affected by flooding regimes[6]) and causality is not

[6] Youngil Kim, Sami Ullah, Tim R. Moore, Nigel T Roulet. 2014. Dissolved organic carbon and total dissolved nitrogen production by boreal soils and litter; the role of flooding, oxygen concentration and temperature. Biogeochemistry 118 no 1-3 pp 35-48.

explored further here. While the observed increases in N and TP were predicted in the FEIS and remain within the magnitude of uncertainty of those predictions, results for TKN and TP 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 2022. While the CREMP triggers for TKN (0.17 mg/L) and total phosphorus (0.0045 mg/L) 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. For context, TKN and TP measurements in Whale Tail and Mammoth Lakes in 2022 were in the following ranges:

MAM: TKN = 0.18 – 0.43 mg/L; TP = 0.0028 – 0.011 mg/L

WTS: TKN = 0.21 – 0.32 mg/L; TP = 0.0048 – 0.0093 mg/L

*Evaluation of Managed Surface Water and Seepage*

No sources of managed non-contact surface water or seepage report directly to the receiving environment of WTS or Mammoth Lake, so these sources of inputs were not considered further.

*Evaluation of Construction Activities*

In 2022, the only construction activity with potential to impact the identified lakes was construction of the East Dike Thermal Berm in September, 2022. Water quality monitoring conducted in WTS adjacent to the project prior to and following the three-day construction period indicated no exceedance of CREMP trigger for TP or TKN (Section REF).

*Evaluation of Effluent Discharge*

MAM: EEM water quality results for TP in effluent released to MAM (Section 8.3) were all less than the CREMP trigger of 0.0045 mg/L (<0.0010 – 0.0018 mg/L). Similarly, annual average TP (0.0021 mg/L) in effluent released to Mammoth Lake (monitored weekly under NWB Water License and MDMER requirements; Section 8.5.3.2.15.1) was less than the CREMP trigger.  TKN is not monitored under EEM but water quality results for nitrate in effluent released to MAM exceeded the CREMP trigger of 1.5 mg/L in two of three monitoring events (0.74, 4.24, and 5.31 mg/L). Annual average nitrate (3.47 mg/L) and TKN (0.61 mg/L) in effluent released to Mammoth Lake (monitored weekly under NWB Water License and MDMER requirements; Section 8.1.3.2.15.2) also exceeded the CREMP triggers of 1.5 mg/L and 0.17 mg/L, respectively.

WTS: EEM water quality results for TP in effluent released to WTS (Section 8.3) marginally exceeded the CREMP trigger of 0.0045 mg/L in two of four monitoring events, with reported concentrations up to 0.0057 mg/L. Annual average TP (0.003 mg/L) in effluent released to Whale Tail Lake South (monitored weekly under NWB Water License and MDMER requirements; Section 8.5.3.2.15.2) was also less than the CREMP trigger. TKN is not monitored under EEM, but water quality results for nitrate in effluent released to WTS exceeded the CREMP trigger of 1.5 mg/L in two of four monitoring events, with concentrations up to 4.33 mg/L. Annual average nitrate (2.55 mg/L) and TKN (1.19 mg/L) in effluent released to Whale Tail Lake (monitored weekly under NWB Water License and MDMER requirements; Section 8.5.3.2.15.2) also exceeded the CREMP triggers of 1.5 mg/L and 0.17 mg/L, respectively.

In all cases, EEM exposure area results in Mammoth and Whale Tail Lakes were less than CREMP nutrient triggers.

These results suggest that effluent discharge may have had a minor impact on increasing concentrations of nutrients (though particularly N) beyond trigger values in 2022, so changes are still expected to be primarily a result of terrestrial flooding. Again as noted in the CREMP, these changes remain within general impact assessment predictions of a low magnitude of impacts, and concentrations of these nutrients appear to have stabilized in the impacted lakes.

*Effects on Receptors of Concern*

*Primary Production*

The potential for increased nutrient concentrations in downstream lakes to further impact primary productivity (and higher trophic levels) was predicted in the FEIS Addendum, though predicted changes were not quantified. Observed changes are summarized briefly here, incorporating results across all applicable AEMP programs. In 2019, statistically significant increases in phytoplankton biomass were observed in WTS and MAM. Similar trends were observed in 2020, but they were not statistically significant. In 2021 and 2022, elevated nutrients and corresponding changes in phytoplankton biomass were evident in a larger suite of lakes extending further downstream from the flood zone and discharge location than previous years - WTS, A20 and downstream lakes MAM and A76, though changes in biomass were only statistically significant for A20 in 2021. There were no apparent or statistically significant changes in community composition in 2022.

Periphyton growth in WTS is monitored through the Fish Habitat Offsets Monitoring Plan (Section 8.12.4.1.5). 2022 was the first full year of periphyton monitoring under this program, and results indicated that seasonal growth in WTS is apparently greater than reference lakes (though limited reference-area samples were available). Seasonal growth in A20 appeared less than WTS, which is similar to observed trends in water-column chlorophyll-a reported in the CREMP. Periphyton sampling will occur again in 2023 and this trend will be re-examined.

*Benthic Invertebrates and Fish*

As described above, the potential for increased nutrient concentrations in downstream lakes to further impact higher trophic levels was predicted in the FEIS Addendum, though predicted changes were not quantified.

Benthic invertebrate sampling under the CREMP in 2022 indicated some apparent and/or statistically significant increases in benthos density and richness at impact lakes, but the overall evidence suggested these changes were likely due to a regional climate trend, rather than mine-related.

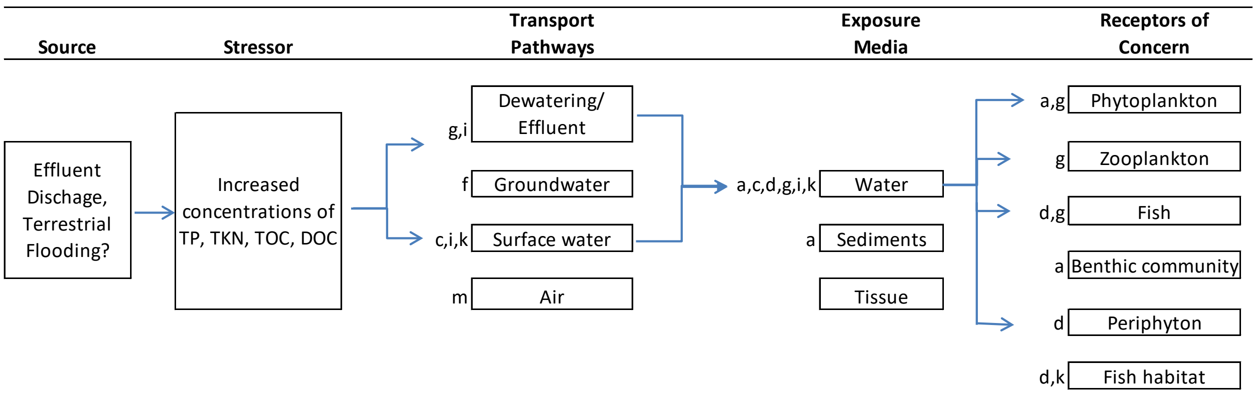
Changes in forage fish such as Slimy Sculpin in WTS and MAM are monitored through a study under the Fish Habitat Offsetting Plan (2018 – 2021; C. Portt & Associates, 2018) and through the Fish Habitat Offsets Monitoring Plan (2021). Study results to date have confirmed the presence of small bodied fishes in newly created shoreline habitat at catch rates and size ranges that appear similar to reference areas (2022 FHOMP Report; Appendix 44), though causality of changes has not yet been explored (e.g. increased physical habitat availability or more suitable habitat, or increased food availability due to nutrient inputs). The research study is expected to be completed in 2023, at which time full results will be available.

Since no unanticipated exceedances of CREMP water quality triggers with effects-based thresholds have occurred, toxicity-related impacts are not anticipated to be negatively impacting higher trophic levels. Results of whole-water toxicity testing under the EEM program will be more fully assessed as part of the next EEM Biological Monitoring Interpretive Report (2024).

*Management Actions*

Based on results of CREMP sampling in 2022, the Level 0 (routine sampling) water management strategy is in effect for 2023 according to the Whale Tail Adaptive Management Plan. This is indicated since total phosphorus and arsenic at WTS and MAM are within normal operating ranges. Based on results of this AEMP analysis, no changes to adaptive management actions are planned at this time and trends in nutrients will continue to be tracked closely in 2023.

**Figure 18. Whale Tail site integrated conceptual site model for 2022 AEMP assessment of increased nutrients in Whale Tail South, Mammoth Lake, A20, and A76**




Notes (programs conducted in 2022 indicated above):

| | |
|---|---|
| a | Core Receiving Environment Monitoring Program |
| b | ~~Effects Assessment Studies~~ |
| c | Dike Construction Monitoring |
| d | Fish Habitat Offsets Monitoring Program |
| e | ~~Dewatering Monitoring~~ |
| f | Groundwater Monitoring |
| g | MDMER Monitoring |
| h | ~~EEM Biological Monitoring Studies~~ |
| i | Water Quality and Flow Monitoring |
| j | ~~Fish-Out Studies~~ |
| k | Erosion Monitoring |
| l | Blast Monitoring |
| m | Air Quality Monitoring |

#### *8.12.4.2.2.2 Changes in Conventional Parameters, Major Ions, and TDS*

Similar to previous years and similar to the Meadowbank impact-area lakes, statistically significant increases above trigger values were observed at near and mid-field areas WTS, A20, MAM, A76 and NEM for conventional parameters (alkalinity, conductivity, hardness), major ions (calcium, potassium, magnesium, sodium) and TDS. While some exceedances of specific monthly FEIS Addendum water quality model predictions occurred for these parameters, none exceeded the order-of-magnitude level of uncertainty associated with those predictions. Importantly, none have effects-based thresholds, so 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. As described in previous years, it is likely that the observed changes are related to a combination of direct impacts of construction activities and inputs from dewatering and effluent discharge activities.

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. 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. For context, conductivity measured through the CREMP in 2022 in WTS was in the range of 100 – 134 µS/cm, MAM was in the range of 107 – 214 µS/cm, and NEM was in the range of 85 – 112 µS/cm.

*Evaluation of Effluent Discharge*

WTS: Results of EEM water chemistry analysis for effluent discharged to WTS (Section 8.3) indicated that conductivity in all four monitoring events exceeded the CREMP trigger of 49 µS/cm, and measured WTS receiving environment concentrations measured through the CREMP (max. 134 µS/cm), with concentrations ranging from 239 – 545 µS/cm. Annual average conductivity (430 µS/cm) in effluent released to Whale Tail Lake (monitored weekly under NWB Water License and MDMER requirements; Section 8.1.3.2.15) was similar.

MAM: For effluent discharged to MAM (Section 8.3), results of EEM water chemistry analysis of effluent indicated that conductivity in all three monitoring events exceeded the CREMP trigger of 49 µS/cm, with concentrations ranging from 184 – 422 µS/cm. Annual average conductivity (379 µS/cm) in effluent released to Mammoth Lake (monitored weekly under NWB Water License and MDMER requirements; Section 8.5.3.2.15) also exceeded the CREMP trigger of 49 µS/cm and receiving environment concentrations measured through the CREMP (up to 214 µS/cm).

NEM: No effluent is discharged to Nemo Lake.

*Evaluation of Managed Surface Water and Seepage*

WTS and MAM: No sources of managed non-contact surface water or seepage report directly to the receiving environment of the WTS or Mammoth Lake watershed, so these sources of inputs were not considered further for those lakes.

NEM: Managed non-contact surface water is directed towards Nemo Lake via the IVR Diversion Ditch. Water quality monitoring in 2022 indicated conductivity exceeded the CREMP trigger in all monitoring events, with concentrations ranging from 148 – 607 µS/cm.

*Evaluation of Construction Activities*

In 2022, the only construction activity with potential to impact the identified lakes (specifically, WTS) was construction of the East Dike Thermal Berm in September, 2022. Conductivity was measured daily in the receiving environment of WTS as a component of water quality monitoring for this event, and measured concentrations (92 – 169 µS/cm; Table 8-11) were similar to CREMP results.

As suggested previously, these results support previous general conclusions that the observed changes are likely related to a combination of ongoing effluent discharge and water management activities, as well as potentially historic construction and dewatering activities.

*Effects on Receptors of Concern*

As described in the CREMP report, the parameters in this group with trigger exceedances in 2022 do not have effects-based thresholds (e.g., CCME water quality guidelines), so toxicity-related impacts are not anticipated. 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.

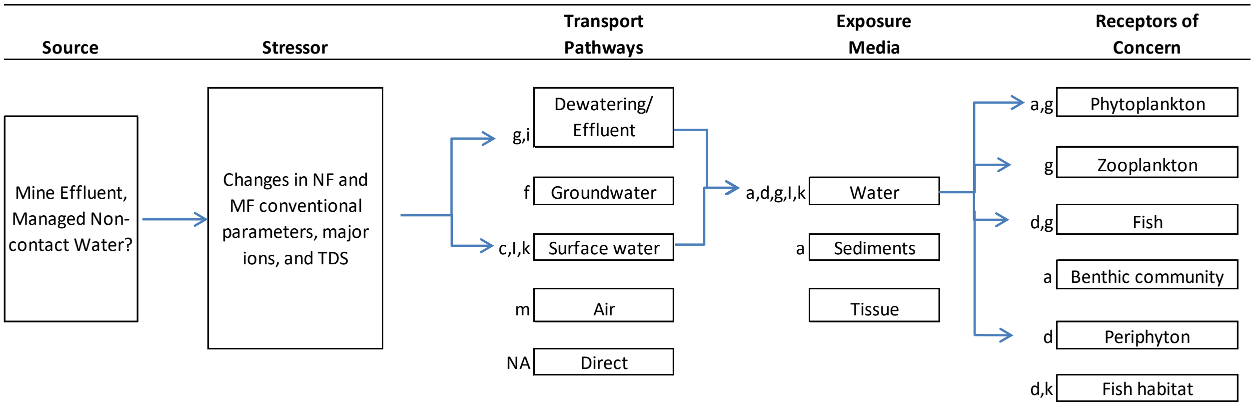
These conclusions are supported through CREMP monitoring results for phytoplankton and benthic invertebrates, as well as FHOMP monitoring for periphyton and forage fish, which generally indicate either apparent increases or no mine-related effects for these groups in the impacted lakes.

*Management Actions*

These results continue to suggest that for WTS, A20, MAM and to a lesser degree, A76, effluent discharge and allochthonous inputs from inundated shorelines are most likely the route of increased conventional parameters, major ions, and TDS. Overall, these trends are similar to those observed in the Meadowbank near-field CREMP lakes. Based on results of a CREMP review in 2019 (Appendix J of the 2019 CREMP Report) and this AEMP review, here is no evidence to suggest that measured concentrations of these parameters are resulting in adverse ecological effects in the Whale Tail Lake study area.

No changes in management actions are therefore planned as a result of this evaluation.

**Figure 19 Whale Tail site integrated conceptual site model for 2022 AEMP assessment of changes in conventional parameters, major ions, and TDS (Whale Tail South, Mammoth Lake, A20, A76 and Nemo Lake)**




Notes (programs conducted in 2022 indicated above):

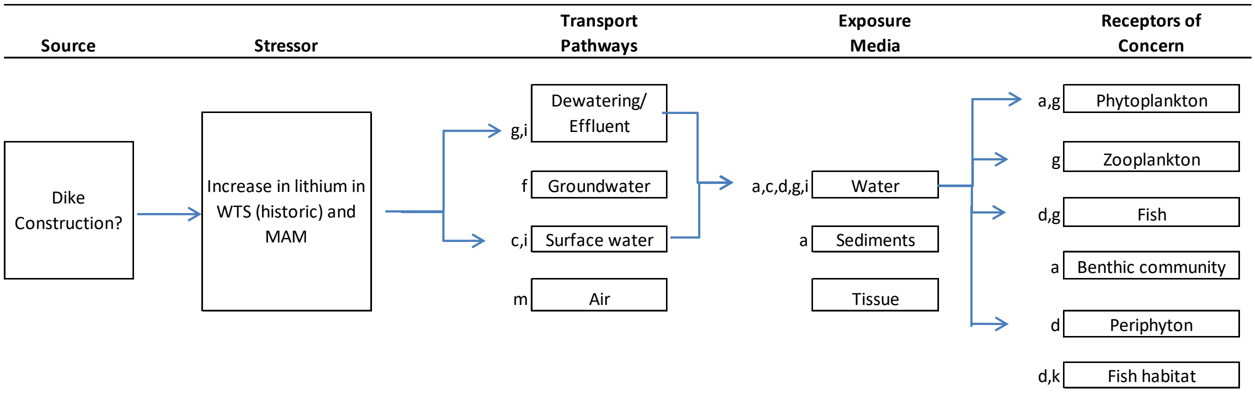
| | |
|---|---|
| a | Core Receiving Environment Monitoring Program |
| b | ~~Effects Assessment Studies~~ |
| c | Dike Construction Monitoring |
| d | Fish Habitat Offsets Monitoring Program |
| e | ~~Dewatering Monitoring~~ |
| f | Groundwater Monitoring |
| g | MDMER Monitoring |
| h | ~~EEM Biological Monitoring Studies~~ |
| i | Water Quality and Flow Monitoring |
| j | ~~Fish-Out Studies~~ |
| k | Erosion Monitoring |
| l | Blast Monitoring |
| m | Air Quality Monitoring |
| NA | Direct, so measured in exposure medium. |

#### *8.12.4.2.2.3 Changes in Lithium and Titanium*

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 MAM early in the 2019 season may have been caused by dike construction and WTN dewatering activities. This parameter has trended lower since that time, suggesting that the systems are stabilizing. In 2022, the yearly mean concentrations of both total and dissolved lithium marginally exceeded the trigger concentration in MAM only (total and dissolved lithium trigger = 0.0020 mg/L). Since lithium does not have an effects-based threshold (CCME guideline), and since the scope of FEIS Addendum water quality predictions was not exceeded, and since no apparent concerns for negative impacts to lower trophic levels were reported in the CREMP, this trigger exceedance was 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.

It is noted that concentrations of titanium in WTS in July and August exceeded the CREMP trigger value and the annual average was statistically different from baseline/reference. However this trend is not considered to be mine-related, since concentrations have generally declined since 2018 and peak concentrations in 2022 were comparable to peaks occurring in reference lakes.

**Figure 20. Whale Tail site integrated conceptual site model for 2022 AEMP assessment of changes in lithium concentrations**




Notes (programs conducted in 2022 indicated above):

| | |
|---|---|
| a | Core Receiving Environment Monitoring Program |
| b | ~~Effects Assessment Studies~~ |
| c | Dike Construction Monitoring |
| d | Fish Habitat Offsets Monitoring Program |
| e | ~~Dewatering Monitoring~~ |
| f | Groundwater Monitoring |
| g | MDMER Monitoring |
| h | ~~EEM Biological Monitoring Studies~~ |
| i | Water Quality and Flow Monitoring |
| j | ~~Fish-Out Studies~~ |
| k | Erosion Monitoring |
| l | Blast Monitoring |
| m | Air Quality Monitoring |

#### *8.12.4.2.2.4 Arsenic in Effluent*

For IVR Attenuation Pond effluent discharge to Whale Tail Lake, samples collected in April 2022 exceeded MDMER and NWB limits for total arsenic. Specifically, total arsenic (As) concentrations from the treated discharge exceeded the MDMER limit for the monthly mean concentration (0.30mg/L) at 0.3145 mg/L (mean of two samples collected April 3rd and 25th). There was no exceedance of the MDMER maximum authorized concentration in a grab sample (0.6 mg/L). The NWB Water License short-term limit for total arsenic (0.2 mg/L) was also exceeded in one of these samples (April 3, 2022) and the NWB Water License monthly mean limit for arsenic (0.1 mg/L) was exceeded for April, with the average of the two results of on April 3rd (0.4480 mg/L) and April 25th (0.1850 mg/L).

For this AEMP investigation, CREMP receiving environment water quality monitoring results for total arsenic in Whale Tail Lake South were reviewed, and none exceeded the CREMP trigger (0.013 mg/L) or FEIS prediction (0.0047 – 0.0087 mg/L), with a range of 0.00082 – 0.0024 mg/L.

In addition, MDMER toxicity tests with Rainbow Trout and *Daphnia magna* for the associated effluent samples collected on April 3rd (highest measured concentration) did not show any acute lethality (0% mortality in 100% effluent) (Section 8.3).

Trends in arsenic concentrations in effluent and the receiving environment will be reviewed again in 2023, but since the source is known (IVR Attenuation Pond effluent) and this was not an ongoing exceedance or trend observed in the receiving environment, this occurrence is not explored further in the AEMP context at this time.

#### 8.12.4.3 *Recommended Management Actions*

Based on results of this AEMP analysis, no additional supplemental management actions are planned in 2023 for the Whale Tail site as a result of this assessment.

The following routine AEMP monitoring programs will occur.

- CREMP
  - Water quality – The full CREMP program (through-ice and open water) is planned at the NF, MF, and FF areas 2023. Through-ice limnological profiles are planned at MAM, WTS, and Nemo in the months when water sampling is not completed. In addition, contingency water samples may need to be collected during the limnology-only, through-ice sampling event(s), if anomalous in-situ limnology results are observed.
  - Phytoplankton – Routine phytoplankton community monitoring.
  - Sediment chemistry – Sediment cores will be collected for chemistry analysis according to the three year cycle for this media.
  - Benthos – Routine benthic invertebrate community monitoring.
- Dike Construction and Dewatering Monitoring
  - Any required monitoring for dike construction or dewatering will follow the approved plan.
- MDMER & Water Quality and Flow Monitoring
  - Monitoring will continue as per the monitoring plan, NWB Water License criteria, and MDMER requirements in 2023.
- EEM Biological Monitoring Studies
  - Cycle 2 EEM Biological Monitoring study will be completed in 2023 with a report due in 2024.
- Fish Habitat Offset Monitoring
  - Pre-offsetting ecological monitoring to determine suitability of the flood zone as fish habitat is planned to occur in 2023.
- Fish-out Monitoring
  - No fish-outs are planned for 2023 based on current mine plans.
- Blast Monitoring
  - Blast monitoring will continue in accordance with the Blast Monitoring Program.
- Groundwater Monitoring

- o Groundwater monitoring will continue in accordance with the Groundwater Monitoring Plan.

- Air Quality Monitoring
  - o Monitoring will continue in accordance with the Air Quality and Dustfall Monitoring Plan.

## 8.13 NOISE MONITORING

### 8.13.1 Meadowbank Site

**As required by NIRB Project Certificate No.004 Condition 62:** ***Develop and implement a noise abatement plan to protect wildlife from significant mine activity noise, including blasting, drilling, equipment, vehicles and aircraft; sound meters are to be set up immediately upon issuance of the Project Certificate for the purpose of obtaining baseline data, and monitoring during and after operations.***

The 2022 noise monitoring program at the Meadowbank Site was conducted according to the Noise Monitoring and Abatement Plan (Version 4, December 2018). Complete results of the program are provided in Appendix 49 (2022 Noise Monitoring Report), and summarized below.

The objective of this program is to measure noise levels at five previously determined monitoring locations around the Meadowbank Site (R1 – R5), over at least two 24 h periods. Since high winds in the area tend to substantially reduce the quantity of available valid data, Agnico Eagle aims to conduct a minimum of two monitoring events of two to four days per station to fulfill monitoring objectives. In 2022, two surveys were performed at station R1. Only one survey was feasible for all other stations due to mechanical issues with the monitoring equipment. More information can be found in the 2022 Noise Monitoring Report provided in Appendix 49.

After data processing in accordance with standard methods (Alberta Energy Resource Conservation Board Directive 038), monitoring results are compared to the site's daytime target sound level (55 dBA), nighttime target sound level (45 dBA), and measured 24-h $L_{eq}$ values are compared to FEIS (Cumberland, 2005) predictions for the monitoring locations.

Final daytime, night-time, and 24 h $L_{eq}$ values calculated from recorded 1-min $L_{eq}$ values for each monitoring event and station are shown in Table 8-79. All monitoring results met both daytime and nighttime design targets, and FEIS predictions. Historical comparisons indicate no clear trends towards increasing sound levels at this time. Overall, target sound levels and FEIS impact predictions are rarely exceeded site-wide.

No human receptors (e.g. cabins) are located in the vicinity of noise monitoring stations, and no noise-related complaints have been received to date. Impacts of sensory disturbance on wildlife are determined separately through the Terrestrial Ecosystem Monitoring Plan (TEMP), and reported annually in the Wildlife Monitoring Summary Report.

Noise monitoring occurs annually, and will continue in 2023 according to the Noise Monitoring and Abatement Plan (Version 4, December 2018), or most recent version at the time. Actions to ensure more complete noise data collection in 2023 are planned, including in-house testing of the equipment prior to field deployment. Spare parts are now available onsite in the event of equipment failure and all monitoring equipment calibrations have been completed. More information can be found in the 2022 Noise Monitoring Report provided in Appendix 49.

**Table 8-79 Daytime, night-time, and 24-h $L_{eq}$ values for monitoring locations R1 – R5 in 2022. NA = no survey. Star (*) indicates invalid event due to operational difficulties (1-fallen noise meter; 2-corrupted data recording). No values exceeded the relevant design target or FEIS prediction.**

| Monitoring Station and Start Date | | $L_{eq, day}$ (dBA) | | $L_{eq, night}$ (dBA) | | $L_{eq, 24h}$ (dBA) | |
|---|---|---|---|---|---|---|---|
| | | *Design Target* | Measured Value | *Design Target* | Measured Value | *FEIS Prediction* | Measured Value |
| R1 | 1: 8/25<br>2: 9/04*1 | *55* | 47.0<br>- | *45* | 37.2<br>- | *58 - 63* | 45.6<br>- |
| R2 | 1: 7/07<br>2: NA | *55* | 35.7<br>- | *45* | 30.8<br>- | *58 - 63* | 34.6<br>- |
| R3 | 1: 7/04*2<br>2: NA | *55* | -<br>- | *45* | -<br>- | *49 - 53* | -<br>- |
| R4 | 1: 8/28<br>2: NA | *55* | 33.3<br>- | *45* | 34.3<br>- | *58 - 63* | 34.0<br>- |
| R5 | 1: 8/30<br>2: NA | *55* | 49.4<br>- | *45* | 40.5<br>- | *1 h $L_{eqs}$ < 57* | 48.0<br>- |

## 8.13.2 Whale Tail Site

**As required by NIRB Project Certificate No.008 Condition 5:** ***Result of all noise monitoring undertaken by the Proponent shall be provided to the Nunavut Impact Review Board on an annual basis. The Proponent shall:***

> ***a) Conduct noise monitoring at least once during each phase of the Project at four (4) locations in the vicinity of the Whale Tail Pit Project and at two (2) locations along the haul road to demonstrate that noise levels remain within predicted levels for all Project areas; and***
>
> ***b) If monitoring identifies an exceedance, the Proponent shall provide an explanation for the exceedance, a description of planned mitigation, and shall conduct additional monitoring to evaluate the effectiveness of mitigative measures.***

The 2022 noise monitoring program at the Whale Tail Site was conducted according to the Noise Monitoring and Abatement Plan (Version 4, December 2018). Complete results of the program are provided in Appendix 49 (2022 Noise Monitoring Report), and summarized below.

The objective of this program is to measure noise levels at six previously determined monitoring locations around the Whale Tail Site and Haul Road (R6 – R11), over at least two 24 h periods. One additional far field station at the Local Study Area boundary (R12) was also required to be surveyed in 2022. Since high winds in the area tend to substantially reduce the quantity of available valid data, Agnico Eagle aims to conduct a minimum of two monitoring events of two to four days per station to fulfill monitoring objectives. In 2022, one survey was performed per monitoring station due to mechanical issues with the monitoring equipment. More information can be found in the 2022 Noise Monitoring Report provided in Appendix 49.

After data processing in accordance with standard methods (Alberta Energy Resource Conservation Board Directive 038), monitoring results are compared to the site's daytime target sound level (55 dBA), nighttime target sound level (45 dBA), and measured 24-h $L_{eq}$ values are compared to FEIS Addendum (Agnico Eagle, 2018) predictions for the monitoring locations.

Final daytime, night-time, and 24 h $L_{eq}$ values calculated from recorded 1-min $L_{eq}$ values for each monitoring event and station are shown in Table 8-80. No exceedances of the site's daytime design target (55 dBA), night-time design target (45 dBA) or FEIS predictions occurred for any station.

Historical comparisons indicate no clear trends towards increasing sound levels, and FEIS impact predictions have not been exceeded to date.

No human receptors (e.g. cabins) are located in the vicinity of noise monitoring stations, and no noise-related complaints have been received to date. Impacts of sensory disturbance on wildlife are determined separately through the Terrestrial Ecosystem Monitoring Plan (TEMP), and reported annually in the Wildlife Monitoring Summary Report.

Noise monitoring occurs annually, and will continue in 2023 according to the Noise Monitoring and Abatement Plan (Version 4, December 2018), or most recent version at the time. Actions to ensure more complete noise data collection in 2023 are planned, including in-house testing of the equipment prior to field deployment. Spare parts are now available onsite in the event of equipment failure and all monitoring equipment calibrations have been completed. More information can be found in the 2022 Noise Monitoring Report provided in Appendix 49.

**Table 8-80. Daytime, night-time, and 24-h $L_{eq}$ values for near-field monitoring locations R6 – R11 and far-field monitoring location R12 in 2022. NA = no survey. Star (*) indicates invalid event due to operational difficulties (1-fallen noise meter; 2-recording error). No values exceeded the relevant design target or FEIS prediction for that location**

| Monitoring Station and Start Date | | $L_{eq, day}$ (dBA) | | $L_{eq, night}$ (dBA) | | $L_{eq, 24h}$ (dBA) | |
|---|---|---|---|---|---|---|---|
| | | *Design Target* | Measured Value | *Design Target* | Measured Value | *FEIS Prediction* | Measured Value |
| R6 | 1: 9/02<br>2: NA | *55* | 30.6<br>- | *45* | 36.1<br>- | *40.5 - 42.5* | 33.4<br>- |
| R7 | 1: 6/30*2<br>2: NA | *55* | -<br>- | *45* | -<br>- | *36.2 - 40.4* | -<br>- |
| R8a | 1: 8/30<br>2: NA | *55* | 29.6<br>- | *45* | 29.4<br>- | *36.2 – 40.4* | 29.5<br>- |
| R9a | 1: 9/16<br>2: NA | *55* | 34.9<br>- | *45* | 31.0<br>- | *40.4 - 45.1* | 34.0<br>- |
| R10a | 1: 8/25<br>2: NA | *55* | 31.1<br>- | *45* | 25.6<br>- | *36.2 – 40.4* | 29.9<br>- |
| R11a | 1: 9/02*1<br>2: NA | *55* | -<br>- | *45* | -<br>- | *45.1 – 50.0* | -<br>- |
| R12 | 1: 9/16<br>2: NA | *50* | 31.5<br>- | *40* | 29.7<br>- | *<35* | 31.0<br>- |

## 8.14 AIR QUALITY MONITORING

### 8.14.1 Meadowbank Site

**As required by NIRB Project Certificate No.004 Condition 71*: In consultation with EC, install and fund an atmospheric monitoring station to focus on particulates of concern generated at the mine site. The results of air-quality monitoring are to be reported annually to NIRB.***

And

**As required by NIRB Project Certificate No.004 Condition 74*: shall employ environmentally protective method to suppress any surface road dust.***

The 2022 air quality and dustfall monitoring program at the Meadowbank Mine was conducted according to the Air Quality and Dustfall Monitoring Plan, Version 6 (March, 2022) (Appendix 51 of the 2021 Annual Report). The objective of this program is to measure dustfall, NO2, and suspended particulates (TSP, $PM_{10}$, $PM_{2.5}$) at various monitoring locations around the Meadowbank Mine and All-Weather Access Road (AWAR).

Results obtained for the measured parameters in 2022 were primarily compared to Government of Nunavut (GN) Environmental Guidelines for Ambient Air Quality (October, 2011) and/or Canadian Ambient Air Quality Standards (CAAQS) for TSP, $PM_{2.5}$ and $NO_2$; BC Air Quality Objectives (November, 2021) for $PM_{10}$; Alberta Ambient Air Quality Guidelines (January, 2019) for passive dustfall, and to relevant model predictions from the Project's Final Environmental Impact Statement (Cumberland, 2005). Results for AWAR dustfall monitoring are also compared to thresholds for supplemental mitigation established in the Air Quality and Dustfall Monitoring Plan, Version 6 (March, 2022).

The complete report is provided as Appendix 50, and results are summarized below for the Meadowbank Mine and AWAR.

#### 8.14.1.1 *On-Site Air Quality and Dustfall Monitoring Results*

For air quality monitoring at the Meadowbank Mine, all suspended particulate results (TSP, $PM_{2.5}$) met regulatory guidelines for the annual average, and the vast majority of results met regulatory guidelines for the 24-h average for both monitoring stations (DF-1 and DF-2). For TSP, two of 63 samples across these stations exceeded the GN 24-h standard of 120 μg/m$^3$ (Figure 21). For $PM_{10}$, five of 107 samples across DF-1 and DF-2 exceeded the BC Ambient Air Quality Objective of 50 μg/m$^3$ for the 24-h average. For $PM_{2.5}$, four of 107 samples across both stations exceeded the GN guideline of 30 μg/m$^3$ for the 24-h average and the 2020 Canadian Ambient Air Quality Standard of 27 μg/m$^3$ for the 24-h average. These all occurred at DF-2. Overall, increased concentrations of suspended particulates were observed at DF-2 compared to previous years. This occurred primarily in April-May, and is considered to have been a result of a nearby structure fire and associated re-building activities.

All annual average concentrations of $NO_2$ measured by passive sampler (DF-1, DF-2) met the GN annual average guideline of 32 ppb, the CAAQS of 17 ppb, and the FEIS prediction of 4.97 ppb.

For onsite dustfall monitoring locations (DF-1 – DF-4), the total dustfall monitoring threshold of 1.58 mg/cm$^2$/30d (which is equivalent to the Alberta guideline for industrial/commercial areas) was exceeded in one sample (at DF-1) (Figure 22). Since all other results for this location were well below guidelines, this is considered an isolated incident, potentially due to a localized event, and no change in mitigation is planned based on this result.

Incinerator stack testing in 2021 indicated the average result for mercury was less than the GN limit, but the dioxin and furan result showed an exceedance of the regulatory limit of 80 pg/m$^3$. Follow-up testing in September, 2022 confirmed this result. An investigation indicated the most likely potential cause is sub-optimal stack gas temperatures. Operation of the incinerator ceased in November, 2022 pending resolution of this issue.

Overall, ambient air quality monitoring results indicated no apparent trends towards increasing air quality concerns at the Meadowbank Mine.

**Figure 21. 24-h average concentrations of total suspended particulates (TSP) at Meadowbank stations DF-1 and DF-2. Dashed line indicates the 24-hr average GN guideline for ambient air quality**

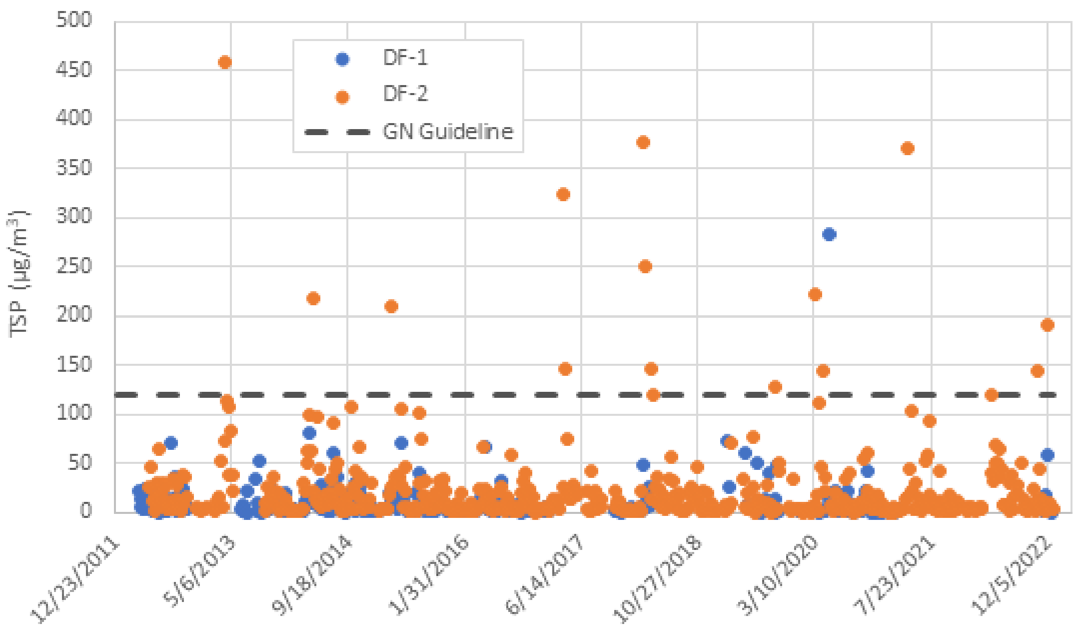
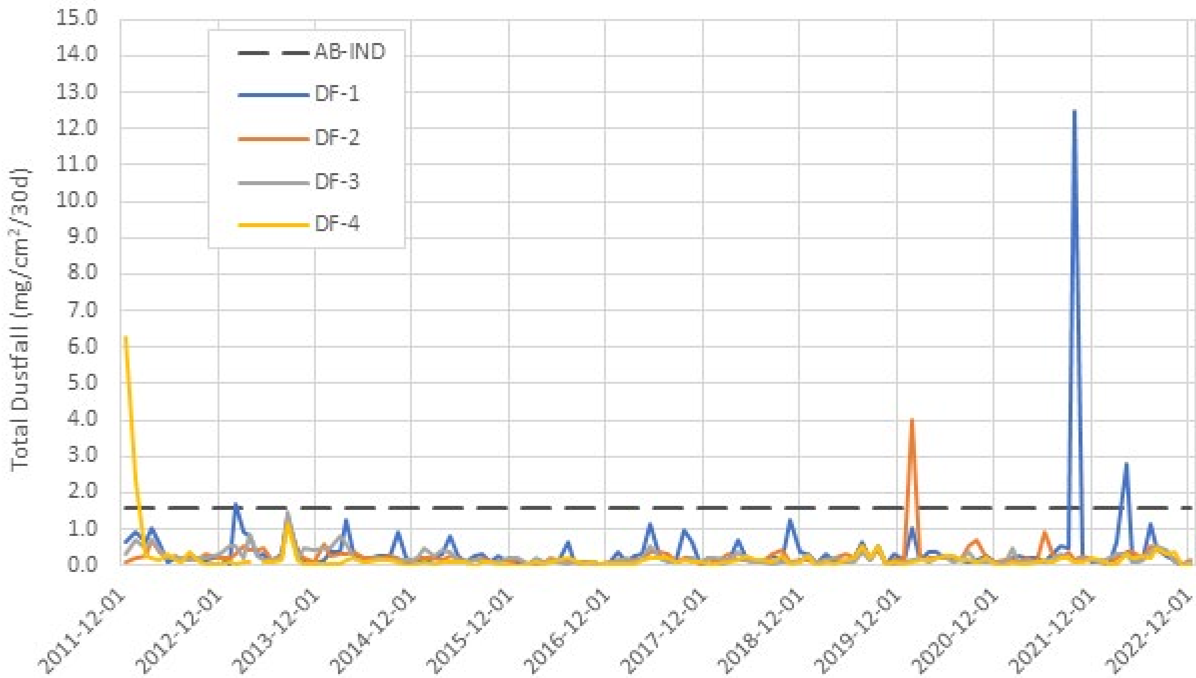


**Figure 22. 30-day-normalized rates of total dustfall at stations DF-1, DF-2, DF-3, and DF-4 at the Meadowbank Mine. AB-IND indicates the Alberta guideline for industrial/commercial areas, which is equivalent to the management threshold.**



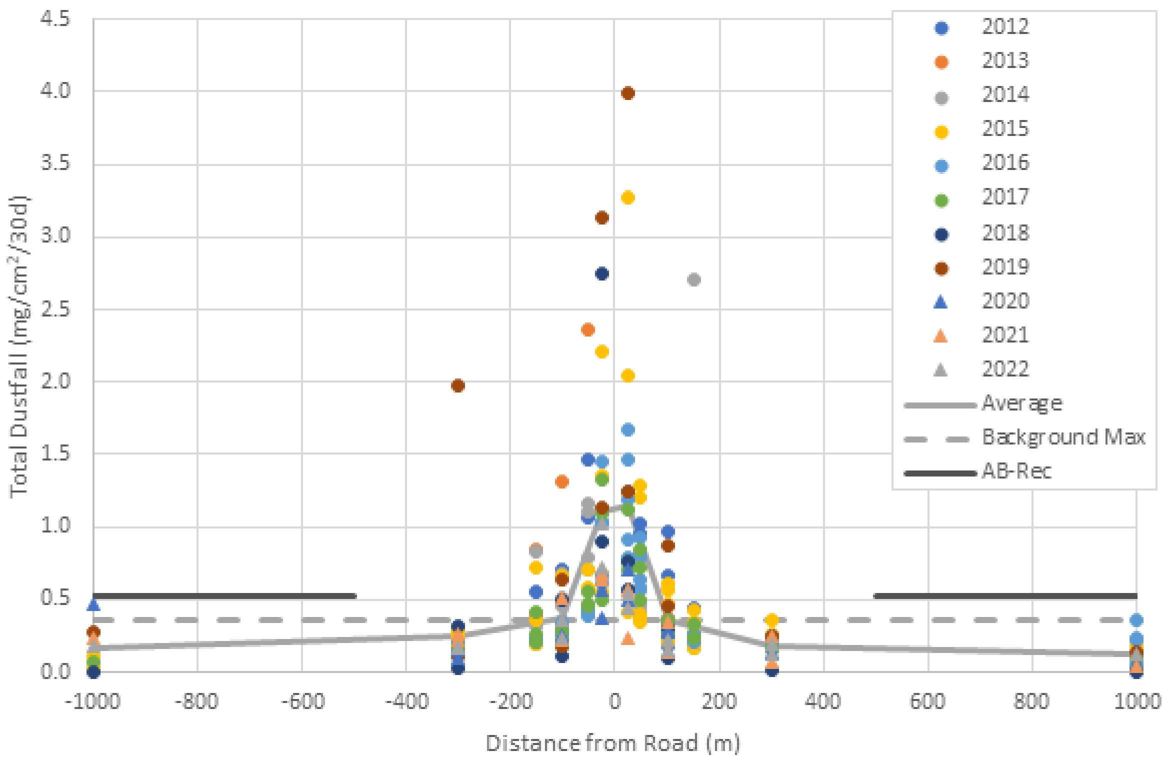

### 8.14.1.2 *AWAR Dustfall Monitoring Results*

Dustfall monitoring along the AWAR in 2022 consisted of passive sampling over two 30-d periods during July and August for 2-km transects centered on the road at km 18 and km 78. No dust suppressant is applied in these locations (see Section 8.14.1.3). Results are compared to the threshold of 0.53 mg/cm$^2$/30d at 500 m, established in the Air Quality and Dustfall Monitoring Plan (Version 6, March 2022) to assess the effectiveness of dust suppression efforts and determine the need for supplemental mitigation.

For these transects, no relevant exceedances of the established dust management threshold occurred (0.53 mg/cm$^2$/30d at 500 m). Total dustfall in two samples exceeded the threshold, but in both cases the associated results for fixed dustfall (non-organic fraction; more representative of road material) were less than the guideline, so these results are not considered to be mine-related.

Historical dustfall results for these locations are shown in Figure 23, and demonstrate that rates of dustfall have not been increasing over time.

**Figure 23 Total dustfall rates (mg/cm²/30d) for all samples collected in August sampling events since 2012 along the Meadowbank AWAR in areas without dust suppression. Negative distances represent the downwind (east) side of the road, and positive distances represent the upwind (west) side. AB-Rec represents the management threshold of 0.53 mg/cm²/30d at 500 m from the road.**




### 8.14.1.3 *Meadowbank Mine and AWAR Dust Mitigation*

Dust mitigation for the Meadowbank Mine was carried out in 2022 according to the Air Quality and Dustfall Monitoring Plan (Version 6, March 2022). Road dust mitigation options consist primarily of:

- Enforcing or temporarily lowering speed limits
- Grading road surfaces
- Placement of new coarser material on the road surface
- Road watering or application of dust suppressants

Implementation is determined by the Road Supervisor and Environment Department based on visibility concerns, or where dust deposition is potentially impacting traditional land uses, fish habitat, and/or water quality.

With regards to dust suppressant, calcium chloride was applied at various locations along the AWAR (Table 8-81), and select onsite locations as required. In addition, watering was conducted regularly for mine site roads and the airstrip, as required during the dry season.

**Table 8-81 Dust suppressant locations along the Meadowbank AWAR in 2022. Strikethrough indicates location where dust suppressant application was identified in the Air Quality Monitoring Plan (Version 6), but no application was completed in 2022. Italics indicate supplemental dust suppression locations.**

| Location Type | Dust Suppression Location | Rationale |
|---|---|---|
| Hamlet | Agnico Eagle spud barge area | High traffic area near hamlet |
| ~~Hamlet~~ | ~~Agnico Eagle tank farm to Arctic Fuel site~~ | ~~High traffic area near hamlet~~ (not applied in 2022 due to COVID restrictions) |
| AWAR | *km 6 – Baker Lake* | *High traffic area near hamlet* |
| AWAR | km 10 - 12 | High traffic area near hamlet & area of concern to HTO – proximity to lake |
| AWAR | km 24 - 26 | Area of concern to HTO – proximity to lake |
| AWAR | *km 39 - 40* | *New since 2021 (road design and surface stability; safety)* |
| AWAR | km 48 - 50 | Area of concern to HTO – water crossing |
| AWAR | km 68 - 70 | Location identified by Agnico Eagle – water crossing |
| *AWAR* | *km 72.5 – 73.5* | *New since 2020 (safety considerations)* |
| AWAR | km 80 - 84 | Location identified by Agnico Eagle – proximity to water & crossing |
| AWAR | *km 85 - 86* | *New since 2020 (safety considerations)* |
| AWAR | *km 91 - 94* | *New since 2020 (safety considerations)* |
| AWAR | *km 97 - 98* | High traffic area near site |
| Onsite | Emulsion plant turn off to Meadowbank site (km 103 – 104) | High traffic area onsite |

#### 8.14.1.4 *Community Engagement*

As described in the Air Quality and Dustfall Monitoring Plan (Version 6, March 2022), Agnico Eagle records community concerns that are raised with regards to dust generated by traffic on the AWAR and Whale Tail Haul Road. In 2022, no specific comments or complaints were received on this topic by the Meadowbank Environment Department or the Communication Relations team.

In response to the NIRB's 2019-2020 Recommendations, Agnico Eagle has begun the development of a community-based dustfall monitoring program. Agnico Eagle met with Hamlet Council on February 16$^{th}$, 2022 and the Baker Lake HTO on February 17$^{th}$, 2022 to discuss the development of the Baker Lake Dust Advisory Group (BLDAG). In August 2022, a berry picking session was held with harvesters to collect IQ and listen to the experiences of these individuals to assist Agnico Eagle in better mitigating potential effects of dust. A dust monitoring information session was planned for October, but had to be cancelled due to travel restrictions during caribou migrations. Collaborations will continue in 2023.

### 8.14.2 Whale Tail Site

**As required by NIRB Project Certificate No.008 Condition 1*: The Proponent shall:***

a) ***Develop and implement an Air Quality Monitoring and Management Plan that includes clear objectives and that specifies air quality monitoring thresholds that will trigger adaptive management responses and actions;***
b) ***In the implementation of the Plan, the Proponent shall demonstrate through active and passive monitoring of dustfall, for criteria air contaminant concentrations, incinerator stack testing, and vegetation, soil and snow chemistry sampling that dustfall and emissions of carbon monoxide (CO),***

*nitrogen dioxide (NO2), ozone (O3), sulphur dioxide (SO2), suspended particulate matter, mercury, dioxins and furans, and other chemicals remain within predicted levels and, where applicable, within levels or limits established by all applicable guidelines and regulations;*

c) ***The Proponent shall ensure continuous NO2 monitoring is undertaken downwind of mining activities to allow for comparison to relevant standards including the Canadian Ambient Air Quality Standards;***
d) ***If exceedances occur, the Proponent shall provide an explanation for the exceedance, a description of planned mitigation, and shall conduct additional monitoring to evaluate the effectiveness of mitigative measures; and***
e) ***The Proponent shall also develop, implement, and report on the quality assurance and quality control protocols used to ensure data reliability and proper functioning of equipment.***

And

**As required by NIRB Project Certificate No.008 Condition 2*****: Prior to commencing construction activities the Proponent shall update the existing Dust Management and Monitoring Plan for the Meadowbank Mine site to address and/or include the following additional items:***

- ***Align plan requirements with commitments made in the Final Environmental Impact Statement and during the Final Hearing to monitor dust along the existing all-weather access road, the Amaruq haul road and any other roads and trails associated with the Project.***
- ***Verify commitments to the utilization of dust suppressants along the all-weather access road, the Amaruq haul road and any other roads and trails associated with the Project, including a description of the type of suppressant to be utilized and the frequency and timing of applications to be made throughout the various seasons of road use.***
- ***Outline the specific triggers, thresholds, and adaptive management measures that will apply if monitoring indicates that dust deposition is higher than predicted.***

***The Proponent shall report annually to the Nunavut Impact Review Board with a summary of its dust management activities.***

The 2022 air quality and dustfall monitoring program at the Whale Tail Mine was conducted according to the Air Quality and Dustfall Monitoring Plan, Version 6 (March, 2022). The objective of this program is to measure dustfall, $NO_2$, and suspended particulates (TSP, $PM_{10}$, $PM_{2.5}$) at various monitoring locations around the Whale Tail Mine and Whale Tail Haul Road (WTHR).

Results obtained for the measured parameters in 2022 were primarily compared to Government of Nunavut (GN) Environmental Guidelines for Ambient Air Quality (October, 2011) and/or Canadian Ambient Air Quality Standards (CAAQS) for TSP, $PM_{2.5}$ and $NO_2$; BC Ambient Air Quality Objectives (November, 2021) for $PM_{10}$; Alberta Ambient Air Quality Guidelines (January, 2019) for passive dustfall, and to relevant model predictions from the Project's Final Environmental Impact Statement (Agnico Eagle, 2018). Results for WTHR dustfall monitoring are also compared to thresholds for supplemental mitigation established in the Air Quality and Dustfall Monitoring Plan, Version 6 (March, 2022).

The complete report is provided in Appendix 50, and results are summarized below for the Whale Tail site and Whale Tail Haul Road.

### 8.14.2.1 *Onsite Air Quality and Dustfall Monitoring Results*

For suspended particulates, FEIS Addendum predictions indicated that maximum 24-h TSP concentrations at DF-6b would exceed the GN 24-h standard of 120 µg/m$^3$, which occurred in twelve of 61 samples in 2022 (Figure 24). Similarly, predictions indicated that maximum $PM_{10}$ concentrations at DF-6b would exceed the BC 24-h standard of 50 µg/m$^3$, which occurred in six of 55 samples (Figure 25). All 24-h results for $PM_{2.5}$ were less than the GN guideline of 30 µg/m$^3$, the CAAQS of 27 µg/m$^3$, and the FEIS Addendum maximum model prediction of 21 - 28 µg/m$^3$. All calculated annual averages were less than regulatory guidelines (TSP, $PM_{2.5}$). However, annual average TSP at the Whale Tail station DF-6b exceeded the FEIS Addendum prediction for this location, which is equivalent to the management threshold. As a result, a review of current mitigation practices was initiated, and actions identified to help reduce generation of suspended particulates moving forward.

For $NO_2$ measured using the continuous monitor sited along the WTHR at DF-7, all available hourly and 24-h averages were well below the GN guidelines and CAAQS. This instrument was only active from January – July due to a mechanical failure. Similarly, all annual average concentrations of $NO_2$ measured by passive sampler (DF-6a, DF-8, DF-9; results available year-round) met the GN annual average guideline of 32 ppb, the CAAQS of 17 ppb, and the FEIS prediction as applicable.

Dustfall at DF-6a was monitored throughout the year using 30-days passive canisters, and the established threshold of 1.58 mg/cm$^2$/30d for total dustfall was met in all cases.

**Figure 24. 24-h average concentrations of total suspended particulates (TSP) at Whale Tail station DF-6b. Dashed line indicates the 24-hr average GN guideline for ambient air quality.**

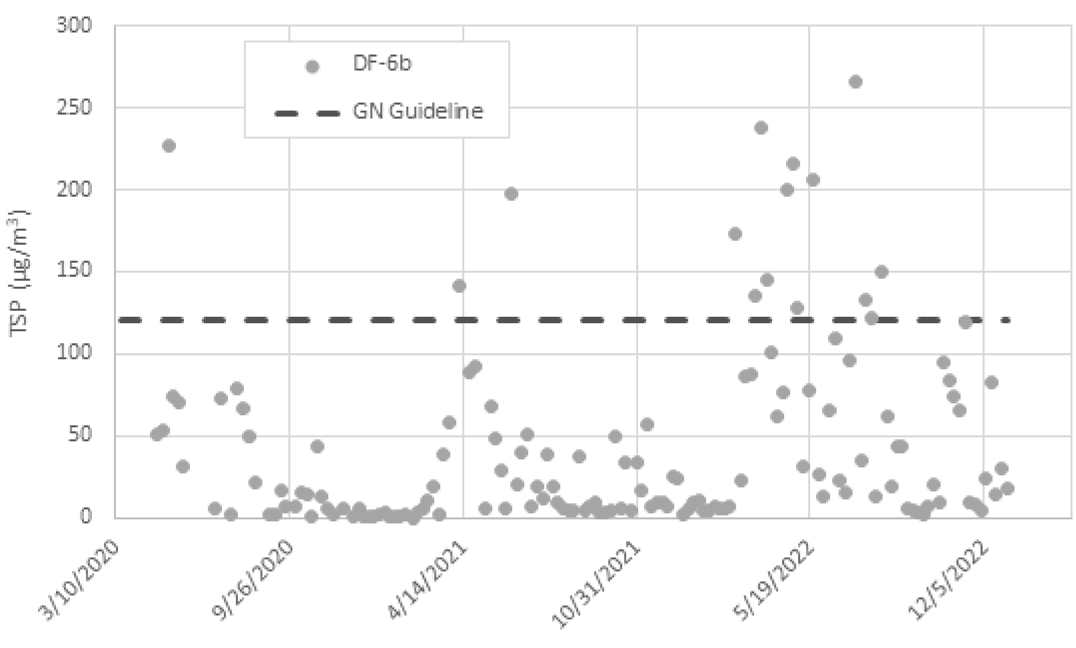
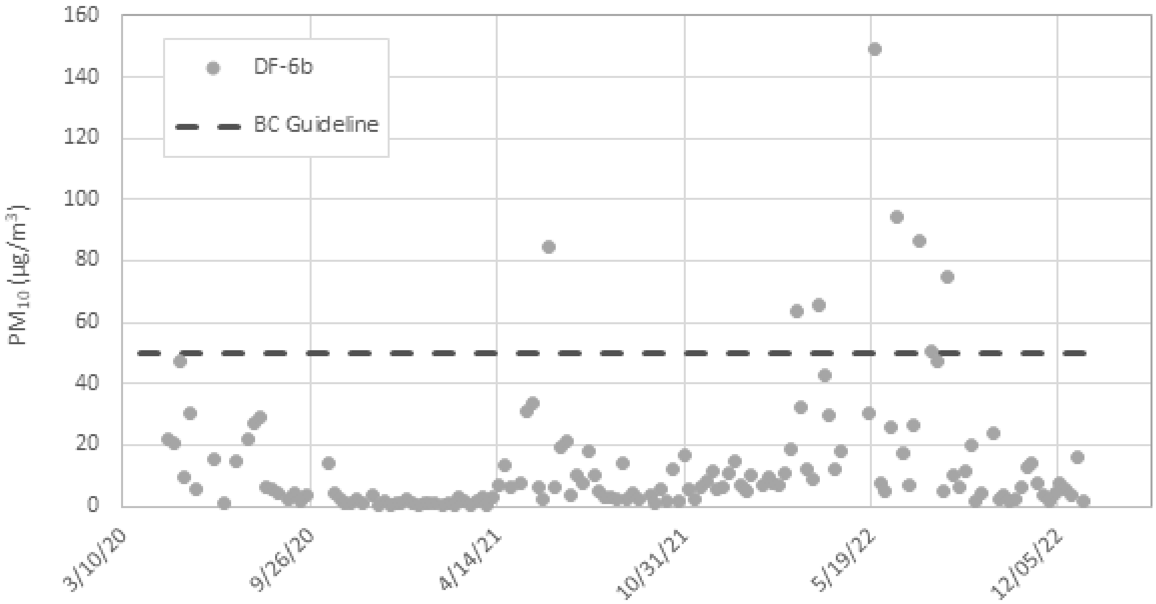


**Figure 25 24-h average concentration of airborne particulate matter less than 10 microns ($PM_{10}$) at Whale Tail station DF-6b. Dashed line indicates the BC Air Quality Objective for this parameter.**



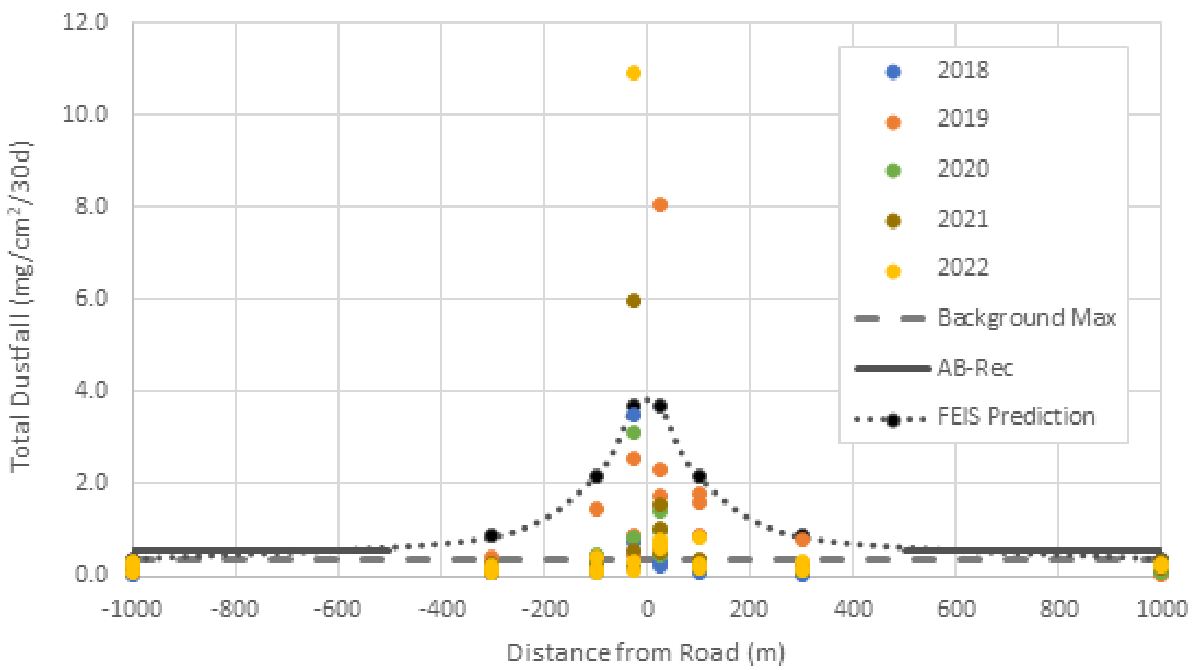

## 8.14.2.2 *WTHR Dustfall Monitoring Results*

Dustfall monitoring in 2022 consisted of passive sampling over two 30-d periods during July and August for 2-km transects centered on the road at km 134, km 151, and km 169. Results are compared to the threshold of 0.53 mg/cm$^2$/30d at 500 m, established in the Air Quality and Dustfall Monitoring Plan (Version 6, March 2022) to assess the effectiveness of dust suppression efforts and determine the need for supplemental mitigation. This threshold is equivalent to the general FEIS Addendum prediction for dust deposition along the WTHR.

In 2022, some specific FEIS Addendum model predictions were exceeded, but only for the 25 m downwind location at km 151. One total dustfall result at 300 m downwind for this location also exceeded the prediction, but the fixed dustfall result which is more representative of road material was less than the prediction. The overarching FEIS prediction that maximum deposition rates along the AWAR would decline below the AB-Rec guideline within 500 m of the road was met in all cases.

Historical dustfall results for WTHR locations along with the management threshold are shown in Figure 26.

**Figure 26. Total dustfall rates (mg/cm²/30d) for all samples collected in August along the Whale Tail Haul Road to date. 2018 and 2019 data was collected at ground level, while 2020+ samples were collected on stands. Negative distances represent the east (downwind) side of the road, and positive distances represent the west (upwind) side. FEIS Prediction values are from the FEIS Addendum Appendix 4C, Table 4-C-24 (Agnico Eagle, 2018b).**




### 8.14.2.3 *Whale Tail Mine and WTHR Dust Mitigation*

Dust mitigation for the Whale Tail Mine was carried out in 2022 according to the Air Quality and Dustfall Monitoring Plan (Version 6, March 2022) and the Whale Tail Haul Road Management Plan (Version 3, April 2020 ). Road dust mitigation options consist primarily of:

- Enforcing or temporarily lowering speed limits
- Grading road surfaces
- Placement of new coarser material on the road surface
- Road watering or application of dust suppressants

Implementation is determined by the Road Supervisor and Environment Department based on visibility concerns, or where dust deposition is potentially impacting traditional land uses, fish habitat, and/or water quality.

For Whale Tail onsite locations in 2022, road watering was conducted regularly for roads and pits in the summer season. In addition, calcium chloride dust suppressant was applied at various onsite locations in June and July.

In addition, dust suppressant in the form of calcium chloride (dry flake product) was applied to the entire length of the WTHR between May 27 and September 3, 2022. Generally, two to three applications were completed for all sections (one application along the entire length, and follow-up applications in certain areas). In addition, road watering was conducted along the entire WTHR throughout the summer season, as needed.

#### 8.14.2.4 *Community Engagement*

Community engagement with regards to dust mitigation and monitoring for the Meadowbank Complex is discussed in Section 8.14.1.4.

## 8.15 GREENHOUSE GASES

### 8.15.1 Meadowbank Site

**As required by NIRB Project Certificate No.004 Condition 73*: Cumberland shall undertake to conserve the Project's use of energy, monitor the Project's greenhouse gas emissions, and continuously review and, if possible, consider for adoption new technologies to ensure greenhouse gases meet the latest Canadian standards or criteria.***

Agnico Eagle has an Energy and Greenhouse Gas Management Strategy developed to create value for the shareholders by operating in a safe, social and environmentally responsible manner. Agnico Eagle also has an Energy Savings Committee that involved members for each different departments on site. The objective of the Energy Savings Committee is to develop department level strategies to optimize and reduce energy and fuel consumption at the Meadowbank Complex.

Different projects over the years were held by Agnico Eagle over the duration of the project to reduce the energy consumption and increase or evaluate the use of new technologies at the Meadowbank Complex:

- Use of summer fuel
- Use of solar panels in northern condition operation - test completed and successful
- Identification of energy-saving opportunities in regards to the carbon tax
- TSM flow chart implemented with Strategic Optimization team for energy-saving opportunities
- Energy dashboard improvement for better energy consumption monitoring
- Energy dashboard internal audit to ensure energy consumption data accuracy
- Time study of the service equipment to increase capacity with the same consumption
- Optimization of the incinerator to increase capacity with the same consumption
- Use of a composter at Meadowbank
- Genset Synchro R&D test on Gen 47 for future installation at the Whale Tail Power Plant. Expected fuel consumption decrease
- Whale Tail Camp Power Plant and Whale Tail underground Power Plant heat recovery study
- Insulation of remote buildings at Meadowbank
- Audit and initiate projects to improve the heat recovery from generators boiler and the distribution
- Shutting off the regrind circuit at the process plant when not required
- Implementation of a three phase energy saving campaign

- Winterizing windows at Meadowbank and Whale Tail
- Improve glycol heat usage at Whale Tail

Section 4 of the Greenhouse Gas Reduction Plan (Version 3, April 2020) details some of the reduction initiative above. The initiatives described are for both Meadowbank and Whale Tail Sites.

### 8.15.2 Whale Tail Site

**As required by NIRB Project Certificate No.008 Condition 3*: The Proponent shall maintain a Greenhouse Gas Emissions (GHG) Reduction Plan which includes:***

- ***An estimate of the Project's GHG baseline emissions;***
- ***A description of monitoring measures to be undertaken, including the methods, frequency, parameters, and a description the analysis that will be carried out on the monitoring data generated; and***
- ***A description of mitigative and adaptive strategies planned, and taken, to reduce project-related greenhouse gas emissions over the Project lifecycle.***

***The Plan should be submitted to the Nunavut Impact Review Board (NIRB) within 60 days of the issuance of the Project Certificate, with results submitted annually thereafter or as may otherwise be required by the NIRB.***

The Greenhouse Gas Reduction Plan (GHGRP) was submitted as Version 3 in April, 2020, and results of GHG emissions calculations are reported here according to Section 3.2 of the Plan, with comparisons to FEIS predictions. Values reported here for emissions in 2022 are considered preliminary at this time, with some minor adjustments possible in the final emissions calculations that will be reported to Environment and Climate Change Canada's Greenhouse Gas Emission Reporting Program by June 1st, 2022. Values for 2022 will be updated in the 2023 version of this report, as needed.

As part of the FEIS Addendum for the Whale Tail Pit Expansion Project (Agnico Eagle, 2018), Project-related emissions of GHGs were calculated using methods consistent with the GHGRP. Table 8-82 summarizes predictions of GHG emissions for the Meadowbank Complex for the peak year of production in 2022. Emissions associated with the Meadowbank Mill were calculated in the FEIS for Whale Tail Pit (Agnico Eagle, 2016), and are shown as a separate line item in Table 8-82. These values are consistent with Table 2.1 in the GHG Reduction Plan (April, 2020).

**Table 8-82 Predicted Greenhouse Gas Emissions summary for the Whale Tail Mine in the peak production year of 2022 (from Agnico Eagle, 2018) and the Meadowbank Mill (from Agnico Eagle, 2016).**

| Emissions Source | Greenhouse Gas Emissions (kt $CO_2$) |
|---|---|
| Non-road Exhaust | 142.0 |
| Generators | 18.0 |
| Heaters | 1.9 |
| Incinerator | 2.3 |
| **Whale Tail Mine Total** | **164.2** |
| Meadowbank Mill | 180.0 |
| **Meadowbank Complex Total** | **344.2** |

Calculated annual GHG emissions for the Meadowbank Complex beginning in 2018 (first year of Whale Tail Mine reporting) are provided in Table 8-83, with comparisons to FEIS predictions. Calculated emissions beginning in 2019 include both Whale Tail and Meadowbank sources combined, so only the total values are compared to FEIS predictions in Table 2. As described in the GHG Reduction Plan (April, 2020) and Table 8-82 above, FEIS Addendum predictions were developed for the maximum emission scenario (i.e. peak production; estimated to occur in 2022).

Overall, total emissions from the Meadowbank Complex (Meadowbank and Whale Tail sites) were 248,921 $tCO_2e$ in 2022, which is less than the FEIS-predicted maximum value of 344,200 $tCO_2e$.

**Table 8-83 Predicted and calculated GHG emissions (t CO2e) for all sources required under the Greenhouse Gas Pollution Pricing Act (S.C. 2018, c.12,s.186, Schedule 3) for the Meadowbank Complex. FEIS Predictions are further described in Table 8-82 above. Values for 2022 are preliminary at the time of this report.**

| Emission Type | FEIS Prediction | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|
| Electricity Generation - stationary fuel combustion emissions (Generators) | - | 91,082 | 106,499 | 107,019 | 107,505 | 113,563 |
| Electricity Generation - Stationary fuel combustion emissions (Other than generators) | - | - | 577 | 266 | 604 | 2,932 |
| Industrial process emissions | - | 987 | 560 | 1,138 | 1,181 | 1,230 |
| Industrial product use emissions | - | - | 527 | 986 | 1,005 | 644 |
| Venting emissions | - | - | - | - | - | - |
| Flaring emissions | - | - | - | - | - | - |
| Leakage emissions | - | - | - | - | - | - |
| On-site transportation emissions | - | 90,650 | 82,951 | 112,791 | 130,404 | 127,419 |
| Waste emissions | - | 2,809 | 4,450 | 3,186 | 3,193 | 3,134 |
| Wastewater emissions | - | - | - | - | - | - |
| | | | | | | |
| **TOTAL** | 344,200 | 185,528^ | 195,564* | 225,385** | 243,893*** | 248,921 |

*^In 2020, calculation methods were revised for 2019+.*
**Re-calculated in 2020. Previously reported in 2019 as 194,500.*
***Re-calculated in 2021. Previously reported in 2020 as 225,435.*
****Re-calculated in 2022. Previously reported in 2021 as 243,752.*

Calculated total monthly emissions for all sources required under the Greenhouse Gas Pollution Pricing Act (S.C. 2018, c.12,s.186, Schedule 3), for the Meadowbank Complex are shown in Figures 27 and 28, grouped by major and minor sources. Relatively little variation in sources of emissions has occurred month over month (Figure 28), though emissions overall do appear to increase in the winter months (Figure 27), likely due to heating requirements.

**Figure 27. Calculated monthly GHG emissions for the Meadowbank Complex. Minor sources include emissions related to stationary combustion, industrial processes, industrial product use, and waste emissions.**

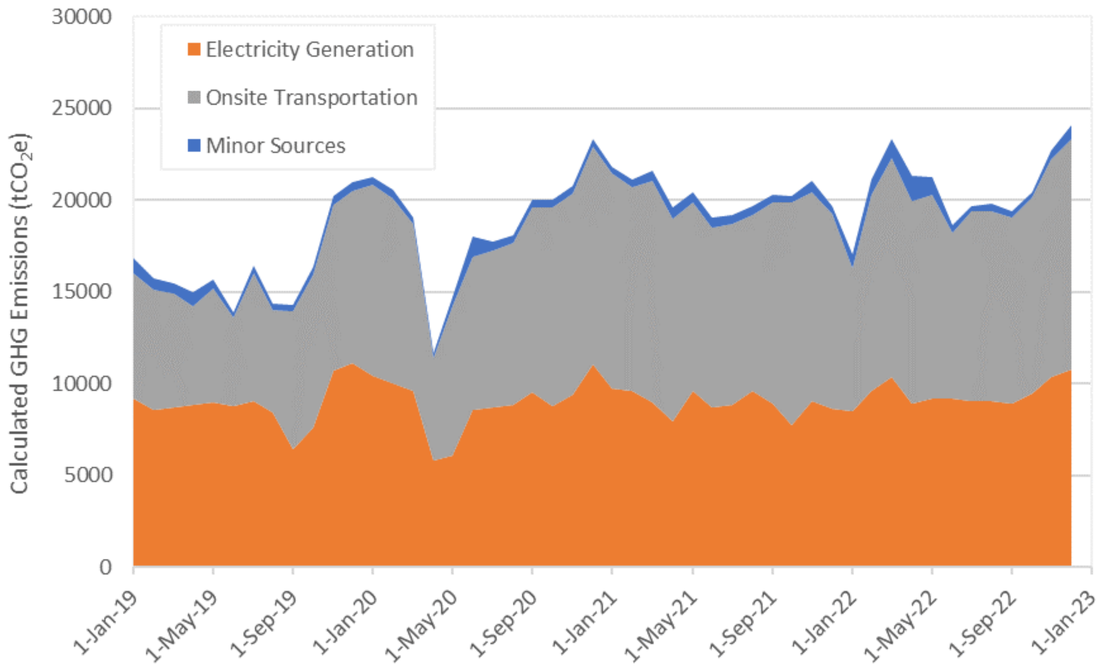
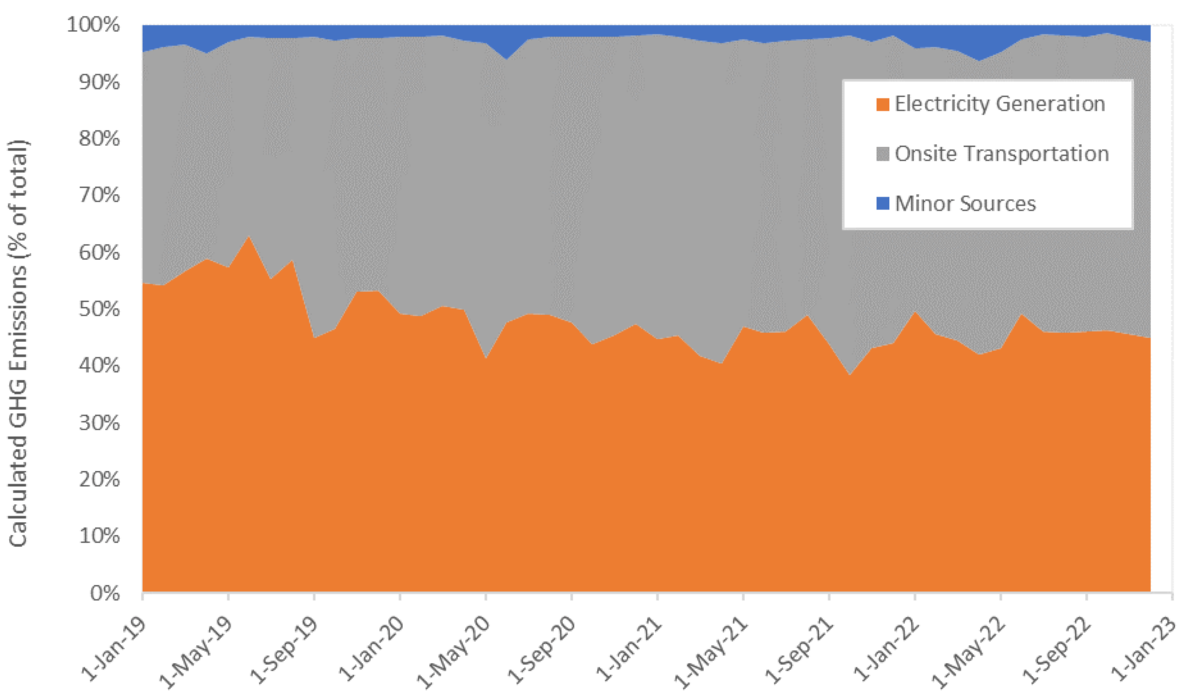
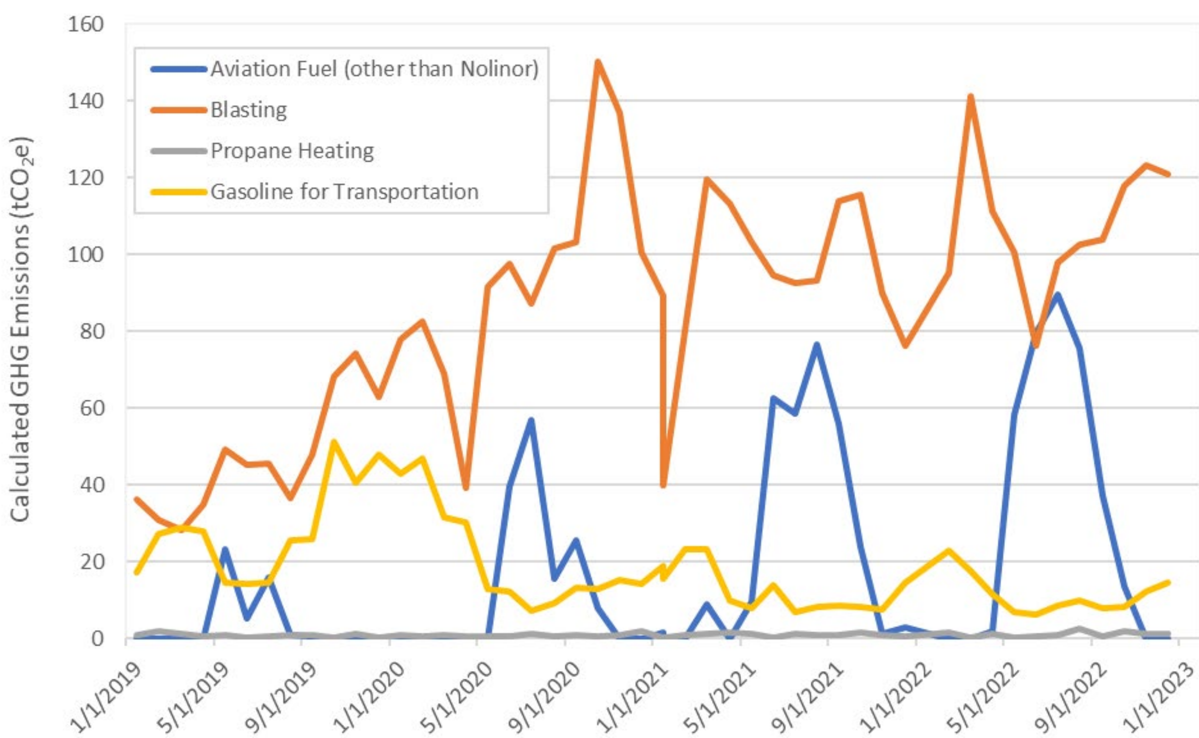



**Figure 28. Calculated monthly GHG emissions (% of total) for the Meadowbank Complex. Minor sources include emissions related to stationary combustion, industrial processes, industrial product use, and waste emissions.**



According to the GHGRP (Section 3.2), an analysis of specific sources is provided in Figure 29. These sources include aviation, blasting, propane heating, and light truck transportation using gasoline. It is noted that aviation emissions exclude aviation fuel for flights to Nunavut, which are not subject to carbon pollution pricing (https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/putting-price-on-carbon-pollution.html). Reported aviation fuel use is therefore primarily associated with helicopter use for exploration activities and personnel transport during the summer months. Use in 2020 - 2022 has increased compared to 2019 in parts to the increased in helicopter-based exploration, and the use of helicopter for personnel transport to the Baker Lake Marshalling Facilities in lieu of in-town accommodation during the COVID-19 pandemic. Emissions related to blasting steadily increased over the course of 2019 - 2021 as Whale Tail operations ramped up. Blast-related emissions appear to have generally plateaued beginning in 2021. Propane heaters form a very minor component of overall emissions and have been relatively constant (0.4 – 2.0 tons $CO_2$e/month). Similarly, use of gasoline for transportation (primarily associated with light trucks, but also potentially smaller vehicles such as ATVs and snowmobiles) has remained relatively constant, though a slight increase during the winter season of 2019-2020 was observed.

**Figure 29. Calculated emissions related to specific sources at the Meadowbank Complex from 2019 – 2022. Sources indicated in the GHGRP (April,2020).**



## 8.16 CREEL SURVEY RESULTS

**As required by DFO Authorization NU-03-0190 (AWPAR) Condition 5.2.4:** ***Engage the local Hunter Trapper Organization(s) in the development, implementation and reporting of annual creel surveys within the water bodies affected by the Plan.***

And

**NIRB Project Certificate No.004 Condition 51:** ***engage the HTOs in the development, implementation and reporting of creel surveys within waterbodies affected by the Project to the GN, DFO and local HTO.***

In March 2007, a harvest study was initiated by Agnico Eagle in association with the Baker Lake Hunters and Trappers Organization (HTO) in order to monitor and document the spatial distribution, seasonal patterns and harvest rates of hunter kills before and after construction of the Meadowbank All-Weather Access Road (AWAR). The harvest study was conducted annually and is open to Inuit and non-Inuit residents of Baker Lake who are at least 16 years of age. The harvest study focuses primarily on terrestrial wildlife harvests; however, fishing results are also recorded by the harvest study administrator in support of on-going creel surveys.

After low participation during the first year of the study, methods were strategically adapted, participation increased steadily, and valuable information on harvest patterns in the Baker Lake area was collected. The HHS, through regular visits, contributed to developing a strong relationship with local harvesters, the HTO, and GN DoE. Data were provided annually in monitoring reports from 2007 to 2015. The HHS was suspended for three years (2016 and 2018) to develop new approaches and direction.

Following consultation with the HTO, KivIA, GN, and other agencies in November 2016 (Winnipeg) and June 2017 (Ottawa), Agnico Eagle reinitiated the HHS in March 2019. The study approach was similar to previous years but suggestions and guidance received during the consultation period were incorporated into the study.

Completed discussion regarding creel survey and historic data is provided in Section 10 of the 2022 Wildlife Summary Monitoring Report (Appendix 47). The below is a summary of the findings and Agnico Eagle will refer to Appendix 47 for a complete discussion of the results.

Harvest calendars are provided on a household basis rather than an individual basis in order to simplify data entry and collection. The harvest calendar is attractive and consists of local photographs of wildlife and Baker Lake residents (see Appendix A for 2022 calendar – Appendix 47 of this report). Space is provided for each calendar day where harvest details can be documented. A map is provided at the end of the calendar that delineates a 4 $km^2$ UTM grid within the Baker Lake and Meadowbank Complex areas. Each grid has a unique code to facilitate recording of information. When calendars are issued, participants or participating households are encouraged to write harvest details (e.g., number of animals, sex, age and location [i.e., grid code]) for the appropriate date on the calendar.

Participants were interviewed in person three times during the year (i.e., June 2022, October 2022, and February 2023) by the harvest study coordinator. During the February 2023 interviews, remaining data from 2022 were collected. The purpose of the interviews is to ensure all harvest data are recorded on the calendars and to collect incidental information to compliment calendar data, including notable Caribou movements, aggregations, and unique observations. Between interview periods, participants were often contacted by phone or social media to encourage recording of harvest data.

Features of the 2022 HHS included: 1) building long-term relationships between participants and researchers; 2) increasing engagement with participants on social media platforms such as Facebook and Instagram; and 3) increasing incentives for participating in the study (e.g., gas vouchers and prizes).

The number of fishermen reporting successful fishing trips in 2022 was 30, which is higher than the average of 23 fisherman from 2007 to 2015 and 2019 to 2021 (12 years), and the highest number of fisherman reporting success since 2012. The highest numbers of fisherman reporting success in 2022 were in May and June period.

The most common fish species captured, Lake Trout, represented 72% of the total catch in 2022, which was higher than in 2020 and 2021 (67% in both years) and higher than the average of 55% from 2007 to 2015 and 2019 to 2021. Arctic Char, which were caught at the highest numbers since records began (i.e., 202 fish), represented 16% of the total catch. Lake Whitefish were captured in relatively low numbers in 2022.

Fishing trips, regardless of success rate, did not generally occur beyond the immediate areas of Baker Lake, Whitehills Lake, and along the lower AWAR. Note that the Whale Tail study area is excluded because no fishing occurred in this area. Some fishing occurred along the Thelon River system and associated lakes during the summer when these areas can be accessed by boat. Results indicate that study participants are less willing to travel long distances to catch fish, regardless of AWAR access, likely due to the abundance of fish near the Hamlet of Baker Lake.

In 2022, fishing periods with the most active fisherman was May and June. The periods with the most fish caught included the summer months (especially May and June), which reflects the high number of Lake Trout caught by fisherman heading out on the land after ice melt, and November. This trend can be observed in the overall trends from 2007 to 2015 and 2019 to 2022.

The 2022 HHS data were compared to the impact prediction thresholds to evaluate adherence to the impact predictions and the provision of adaptive management, as either a necessary or proactive measure. No thresholds were surpassed in 2022. (Section 8 of the 2022 Hunter Harvest Study and Creel Survey Summary Report, in Appendix 47).

## 8.17 NO FISHING POLICY

**As Required by NIRB Project Certificate No.004, Condition 52:** ***Cumberland shall enforce a no-fishing policy for employees while working on the job site.***

Agnico Eagle has a no-fishing policy for its Meadowbank and Whale Tail Mine Sites. The policy is enforced all through the year within environmental inspections. There were no incidents to report in 2022.

## 8.18 TERRESTRIAL ECOSYSTEM MANAGEMENT PLAN

**As Required by NIRB Project Certificate No.008, Condition 28:** ***The Proponent shall submit a revised TEMP to the Nunavut Impact Review Board (NIRB) within one (1) year of issuance of the Project Certificate, with subsequent versions provided as appropriate. Results of the TEMP shall be reported to the NIRB annually including details of how Inuit Qaujimajatuqangit contributed by knowledge holders has been considered and utilized in associated activities and updates.***

Agnico Eagle submitted the TEMP Version 7 in June 2019 (Appendix 58 of the 2019 Annual Report). This version includes revisions per additional comments from TAG members, and Whale Tail Expansion

Project environmental assessment information requests, technical comments, and technical meetings. This section include both Meadowbank and Whale Tail sites, as condition from Project Certificate no. 004 and 008. TEMP Version 8 was submitted in 2020 within 60 days of issuance of the amended Project Certificate No.008 to comply with commitments made during the Expansion Project NIRB Review Process. This version was not approved and an updated Version will be discussed with the TAG. For 2022, Version 7 of the TEMP continued as the basis for 2022 monitoring and mitigation.

### 8.18.1 Wildlife Monitoring Meadowbank and Whale Tail Site*

#### 8.18.1.1 *Annual Monitoring*

**As Required by NIRB Project Certificate No.004, Condition 55:** ***Provide the Annual Wildlife Summary Monitoring Report.***

As a requirement of the NIRB Project Certificate, the 2022 Wildlife Monitoring Summary Report (2022 Annual Report) represents the 17$^{th}$ of a series of annual reports for the Agnico Eagle Meadowbank Complex. Baseline and monitoring programs were first initiated in 1999 and will continue through the life of the Mine. Details of the wildlife monitoring program for the Project are provided in the Terrestrial Ecosystem Management Plan (Version 7, Agnico Eagle 2019). The 2022 Wildlife Monitoring Summary Report provides the monitoring objectives, methodology, historical and current year results, and management recommendations for each monitoring program. The 2022 report builds on data presented in previous reports and incorporates monitoring recommendations from these reports, as well as recommendations and requests from intervenors on past reports made during the NIRB review process. Below is a summary of the results from each component of the 2022 Wildlife Monitoring Summary Report (Appendix 47) with more details provided in the following sections.

<u>Caribou Management Decision Tree</u>

Decision tree process used data from the road, Mine site, viewshed surveys, and satellite collaring to determine the scale of caribou monitoring and management required.

<u>Caribou Satellite-Collaring Program</u>

Collar data were not available to complete the 2022 analysis.

<u>Road Surveys</u>

In 2022, 235 road surveys were conducted along the All-weather Access Road (AWAR) and 193 were conducted along the Whale Tail Haul Road (WTHR).

A total of 50,093 caribou were observed along the AWAR (213 caribou per survey) and 6,355 caribou were detected along the WTHR (33 caribou per survey).

Road surveys helped facilitate mitigation decisions along the AWAR and WTHR. The AWAR was fully closed (24 hour closure) on 45 days, closed for less than 24 hours on 71 days, and had speed restrictions applied for 84 days. In total the AWAR was closed for 1,808 hours. The WTHR was fully closed (24 hour closure) on 15 days, partially closed (less than 24 hour closure) on 63 days and had speed restrictions applied for 93 days. The WTHR was closed for 894 hours during 2022.

* TSM- Biodiversity and Conservation Management

A total of 11,242 caribou were observed crossing the AWAR and 849 caribou were observed crossing the WTHR in 2022. For annual caribou crossing observations on the AWAR, 96% (10,750 of 11,242 caribou) of observed crossing events occurred on dates with an AWAR closure. For annual caribou crossing observations on the WTHR, 83% (706 of 849 caribou) of observed crossing events occurred on dates with a WTHR closure.

On eight occasions, observed caribou were identified as Project tolerant as defined in TEMP Version 7. One caribou was identified as Project tolerant at Meadowbank, 13 caribou were identified as Project tolerant at Whale Tail, 23 caribou were identified as Project tolerant on the AWAR, and 20 caribou were identified as Project tolerant on the WTHR.

There were 10 road related mortalities recorded in 2022, including seven Arctic hares, one Arctic ground squirrel, one ptarmigan, and one wolverine. There were no road-related caribou, grizzly bear, or wolf mortalities associated with the AWAR or WTHR in 2022.

Viewshed Surveys

A total of 739 viewshed surveys were conducted over 58 days in 2022. Of the 739 viewshed surveys, 41 surveys (6%) had caribou sightings, and a total of 461 caribou were reported. Survey efforts were conducted between January 5th and 28th December, with the highest survey effort occurring in the summer.

Remote Camera Program

Artificial intelligence was used to pre-sort wildlife images from remote cameras on the Whale Tail Haul Road in 2022. Photographs flagged as containing wildlife by artificial intelligence were reviewed by a human observer. Caribou crossing events were detected in spring, summer, and winter; no caribou were detected in the fall on remote cameras.

Approximately equal numbers of crossing events were observed while the road was open (n = 13) or when a restriction was in places (n = 14). Too few crossing events were detected to statistically compare crossing rates between different road heights, backfill materials, and backfill slopes.

Pit and Mine Site Ground Surveys

In 2022, environmental personnel conducted regular Mine site inspections focusing on waste management, spills, hazardous waste management, and wildlife monitoring. Formal mine site inspections were carried out at least weekly as part of broader environmental on-site management.

Wildlife deterrents were used on 42 occasions in 2022, and were used for Artic fox, caribou, muskox, red fox, wolf, and wolverine.

There were six project-related mortalities in 2022 at Meadowbank and Whale Tail sites, including one wolverine, three Arctic fox, and two Artic hare.

Blast Monitoring

Surveys for caribou prior to blasts were performed on 191 days between January 23rd to 31 December 1st, 2022. One blast was cancelled, on April 29th, 2022, due to caribou presence within 600 m of the blast. There were 18 surveys between 2021 and 2022 where behaviour monitoring following blasting could be linked to modelled peak particle velocity (PPV) and peak pressure level (PPL). Response behaviours (i.e., alert, walking, trotting or running) were observed following half of the blasts. However, preliminary analysis based on 18 surveys found overall that the proportion of caribou performing response behaviours in a six-minute interval following blasting was not correlated with modelled PPV and PPL values. Future analyses using more behaviour monitoring sessions could account for other factors, such as caribou group size.

Wildlife Habitat Monitoring

A 109.2 ha, or 8.4% change in footprint at the Whale Tail site occurred between the assessment in 2021 and 2022. The change in footprint since the previous assessment is less than 25%. Therefore, the next comprehensive analysis is scheduled for 2024.

Hunter Harvest Study

The Hunter Harvest Study (HHS) included 59 participants in 2022. A total of 766 caribou were reported as being harvested by 55 participants in the Baker Lake HHS. The 2022 HHS data indicated that 39% of reported harvest occurred within 5 km of the AWAR, and 70% occurred within the Meadowbank RSA. In 2022, no Caribou were harvested within 5 km of the WTHR. Given the low numbers of reported harvests close to the WTHR and the prohibition of the public from the WTHR, it is unlikely that the presence of the road has resulted in increased harvest.

Predatory Mammal Den Monitoring

Monitoring of predatory mammal dens were conducted informally in 2022 through observations recorded during other monitoring programs. Potential effects due to Project-related activities were not identified to trigger monitoring of predatory mammal dens. No predatory mammal dens were observed or monitored in 2022.

Raptor Nest Monitoring

Six peregrine falcon nests were documented in Quarries 2, 8, 18, 21, and 22 in 2022. No raptor nesting evidence was observed in quarries 10.5, 26, 30, 35, 50, and 52 along the WTHR in 2022. One peregrine falcon nest was identified on a communication tower on site. No other raptor nests were identified during pit checks or incidentally during other surveys in 2022.

Raptor nest management plans were not developed at the active nest sites, as Mine-related activity was already restricted within the quarries where Falcons were observed.

Waterbird Nest Monitoring

Trent University, in collaboration with Environment and Climate Change Canada and Agnico Eagle, conducted a research study to investigate mitigation options to minimize flooding-related impacts to birds in the Whale Tail South area. The complete analysis and report on behavioural responses will be included in a second Trent University MSc Thesis manuscript to be submitted in 2023. References for any publications produced in 2023 will be provided in the 2023 Annual Report, but otherwise reporting under the Migratory Bird Protection Plan is considered complete at this time.

Breeding Bird Monitoring

Agnico Eagle will continue to survey 48 PRISM plots selected by the Canadian Wildlife Service over 10 years (2021 to 2031), and completion of AWAR and WTHR Breeding Bird Survey (BBS) routes opportunistically when qualified individuals are on site. At a minimum, these BBS routes will be conducted every 3 years during the operations, closure, and post-closure phases of the project. It is recommended that a minimum of 12 PRISM plots and both BBS routes be surveyed in June 2023. The four PRISM plots completed in 2022 will need to be revisited to take photographs of the plots from the plot corners.

Non-Native Plant Surveys

No non-native plants, as identified by the CESCC, were recorded along the AWAR, WTHR, Baker Lake tank farm, Whale Tail and Meadowbank Mine sites. Eleven surveys were completed in undisturbed tundra to survey the presence/absence of non-native weeds. Recommendations for management of non-native plants are provided.

Snow Study

In 2022 a power analysis was conducted using data from 2020-2022 to determine the total number of sampling locations required to detect very small, small and moderate effect sizes for snow hardness. Results of the power analysis indicate that sample sizes are already sufficient to evaluate at least moderate differences in snow hardness between plots (i.e., effect sizes of 50% or greater), but no such differences in snow hardness were observed. To assess differences in snow hardness for smaller effect sizes (e.g., 25%) for both study questions, snow data should be collected at a minimum of 65 locations, with six plots completed at each locations as per the study design.

Caribou Behaviour

Agnico Eagle continued a caribou behaviour study that focused on measuring different behaviour activities of caribou in relation to mine-related activities.

Road and Viewshed Comparison

Following submission of the 2021 Wildlife Monitoring Summary Report, KivIA requested comparison of the distance and direction of caribou observations from road and viewshed surveys. A preliminary discussion of the comparison was presented at the November/December TAG meeting in 2022. It was expected that viewshed surveys would detect caribou farther from the road on average, as these surveys are intended to identify caribou approaching the road as an 'early warning system'. This trend was observed in all seasons where both surveys were performed consistently, except fall 2021, however the sample size for comparison was relatively low. Results indicate that road surveys may be capable of detecting caribou at long distances (up to 4 km) from the road. Increased sample size of caribou observations from viewshed surveys would allow a more rigorous comparison of road and viewshed surveys.

### 8.18.1.2 *Harvest Study Results*

**As required by NIRB Project Certificate No.004 Condition 54**

**a. Updated terrestrial ecosystem baseline data**

See the 2022 Wildlife Monitoring Summary Report attached in Appendix 47.

**e. Details of a comprehensive hunter harvest survey to determine the effect on ungulate populations resulting from increased human access caused by the all-weather private access road, including establishing preconstruction baseline harvesting data, to be developed in consultation with local HTOs, the GN-DOE and the Nunavut Wildlife Management Board.**

As required in the TEMP, in March 2007, a harvest study was initiated by Agnico Eagle in association with the Baker Lake Hunters and Trappers Organization (HTO) in order to monitor and document the spatial distribution, seasonal patterns and harvest rates of hunter kills before and after construction of the Meadowbank All-Weather Access Road (AWAR). The harvest study was conducted annually and is open to Inuit and non-Inuit residents of Baker Lake who are at least 16 years of age. The harvest study focuses primarily on terrestrial wildlife harvests; however, fishing results are also recorded by the harvest study administrator in support of on-going creel surveys (Section 8.16 above).

After low participation during the first year of the study, methods were strategically adapted, participation increased steadily, and valuable information on harvest patterns in the Baker Lake area was collected. The HHS, through regular visits, contributed to developing a strong relationship with local harvesters, the HTO, and GN DoE. Data were provided annually in monitoring reports from 2007 to 2015. The HHS was suspended for three years (2016 and 2018) to develop new approaches and direction.

Following consultation with the HTO, KivIA, GN, and other agencies in November 2016 (Winnipeg) and June 2017 (Ottawa), Agnico Eagle reinitiated the HHS in March 2019, which for the first time also encompassed the Whale Tail RSA as part of the Meadowbank Complex. The study approach was similar to previous years but suggestions and guidance received during the consultation period were incorporated into the study. The study was conducted from 2020 to 2022 and continues into 2023.

Refer to Creel Survey Section 8.16 above for the 2022 methodology employed.

The HHS included 59 participants by the end of 2022, which is higher than the 55 participants in 2021 and lower than the 64 participating in 2020. Higher numbers in 2022 are because of several new younger participants that are replacing older hunters that “don’t hunt anymore”. Of the 2022 participants, Caribou harvest data had been collected from 55 participants, which is considerably higher than the 39 hunters reporting Caribou harvests in 2021 and the highest number since the HHS began.

Based on the previous discussion of total numbers of hunters in the Hamlet of Baker Lake, there were 389 potential hunters within the Baker Lake community in 2008. The number is comparable to the comprehensive 5-year Nunavut Wildlife Harvest Study in which 336 Baker Lake hunters were contacted and interviewed. Discussions with Baker Lake HTO members in 2019 suggest the total number of hunters is over 300. Given the historical and current number of hunters in Baker Lake, an estimate of 300 to 350 active hunters is used in this analysis. Based on these numbers, the 55 hunters reporting Caribou harvest in 2022 conservatively represent from 16 to 18% of total hunters in the community.

Hunting is highly concentrated in the vicinity of the Hamlet of Baker Lake and along the AWAR to approximately KM 85. Limited harvests were reported along the Thelon River system to Aberdeen Lake, and along the northeastern and southwestern shores of Baker Lake. Annual variation in harvest location and intensity is attributable to numerous factors. For instance, many hunters have stated during informal discussions that they have a ‘favorite’ hunting area that they frequent each year. Some hunters have stated that they prefer hunting in ‘convenient’ locations, whereas other hunters prefer remote locations well away from frequented areas. A percentage of hunters also enjoyed partaking in long distance hunting trips over multiple days.

Between 1996 and 2001, 18% of Caribou harvests were estimated to be within 5 km of the AWAR (prior to construction) and 67% of harvests occurred within the Meadowbank RSA (NWMB 2005). In the first year of the HHS study (2007), prior to completion of the AWAR, 34% of harvests were reported within 5 km of the AWAR alignment and 79% were recorded within the Meadowbank RSA. The HHS data (2007 to 2015 and 2019 to 2021) fluctuated between 34 and 54% of reported harvest within 5 km of the AWAR, and between 64 and 85% within the Meadowbank RSA. The 2022 HHS data indicated that 39% of reported harvest occurred within 5 km of the AWAR, and 70% occurred within the Meadowbank RSA. As was the case in other years, threshold levels of 20% set for monitoring the effects of the Meadowbank mine development (note – does not include the Whale Tail mine, which was approved under a separate permit with a different effect assessment) on the distribution of Caribou harvest within the RSA were not exceeded.

In 2022, no Caribou were harvested within 5 km of the WTHR, which compares to no reported harvest during the NWMB harvest study and three (3) Caribou harvested in 2021. Overall harvest numbers were too low to determine whether harvests have increased following construction of the WTHR. Within the Whale Tail RSA (note – overlaps with the Meadowbank RSA), a total of 34 harvests were reported in 2022, which is just above the average across the first 12 years of the study but lower than reported harvests in 2021 (48), 2019 (85), 2015 (53), and 2011 (103 Caribou). Given the low numbers of reported harvests close to the WTHR and the prohibition of the public from the WTHR, it is unlikely that the presence of the road has resulted in increased harvest.

Based on the NWMB (2005) and inclusive Baker Lake HHS results (2007 to 2015; 2019 to 2022), highest Caribou harvests have occurred in September and October, with a second smaller peak in March and April. The similar pattern between the studies indicates that seasonal hunting preferences have not changed markedly in the last decade.

In spring, overall Caribou hunting in the Meadowbank RSA was generally low with hunting occurring primarily in the Whitehills Lake area, along the Thelon River, and at the southwestern end of Baker Lake. Within the Whale Tail RSA, only one Caribou was harvested at the south end of Tehek Lake, which is also within the Meadowbank RSA. During the summer, Caribou in the Meadowbank RSA were harvested across a larger area but particularly along the AWAR up to around Km 85, near the Hamlet of Baker Lake, along the Thelon River to Aberdeen Lake, and around Baker Lake. One Caribou was reported as being harvested north of the Whale Tail mine site and many Caribou were harvested up to around Km 85 at the south end of the Whale Tail RSA. In the fall, hunting was much more concentrated along the AWAR around the Hamlet of Baker Lake and in the vicinity of Whitehills Lake, around the Prince River, and along the southwestern shore of Baker Lake. Caribou were not reported as being harvested along the WTHR in fall 2022. In winter, fewer Caribou were hunted along the AWAR and successful hunters were those that travelled further afield by snowmobile (e.g., along the Thelon River to Aberdeen Lake and the south side of Baker Lake).

There were 18 reported harvests for Muskox in 2022, which is considerably higher than the two (2) reported harvests in 2021. Muskox harvests were generally located east of the AWAR and within the Meadowbank RSA. Wolverines (total of 25 in 2022) were hunted in the Whitehills Lake area, along the Thelon River to Schulz and Aberdeen lakes, and at the southwestern end of Baker Lake. Wolves (total of 92 in 2022; considerably higher than the 26 reported in 2021 and comparable to the 88 reported in 2020) were either harvested close to Baker Lake, in the Whitehills Lake area, or near Aberdeen Lake area. In 2022, the presence of the AWAR may have had some influence on participant hunting patterns for Wolf.

Arctic Fox (total of 36 in 2022; compared to 5 in 2021 and 11 in 2020) was primarily trapped in the vicinity of the Hamlet of Baker Lake, while Red Fox (1 individual) was harvested near the Hamlet of Baker Lake. Two (2) Grizzly Bears were taken in 2022: one east of the AWAR and north of Whitehills Lake, and the other at the southwestern end of Baker Lake. Other rare mammal species reported as being harvested were Ermine (*Mustela richardsonii*; 2 individuals) and American Marten (*Martes americana*; 1 individual), all of which were harvested near or within the Hamlet of Baker Lake.

Bird species reported as being harvested in 2022 included Canada Goose (*Branta canadensis*; 48 individuals), gull species (*Larus sp*.; 8 individuals), ptarmigan sp. (*Lagopus sp*.; 25 individuals), Sandhill

Crane (*Grus canadensis*; 2 individuals), Snow Goose (*Anser caerulescens*; 1 individual), and Tundra Swan (*Cygnus columbianus*; 3 individuals). Birds were reported as being collected primarily around the Hamlet of Baker Lake and along the southeast shore of Baker Lake.

For the first time in the HHS, Beluga (*Huso huso*; 2 individuals) and several seal species, including Bearded Seal (*Erignathus barbatus*; 2 individuals), Harp Seal (*Pagophilus groenlandicus*; 2 individuals), and Ringed Seal (*Pusa hispida*; 4 individuals), were reported as being harvested by Baker Lake hunters in 2022 but these were all outside the Meadowbank RSA (e.g., Christopher Island at the east end of Baker Lake.

The 2022 HHS data were compared to the impact prediction thresholds to evaluate adherence to the impact predictions and the provision of adaptive management, as either a necessary or proactive measure. No thresholds were surpassed in 2022. (Section 10.0 of Appendix 47).

**f. Details of annual aerial surveys to be conducted to assess waterfowl densities in the regional study area during the construction phase and for at least the first three (3) years of operation, with the data analyzed and compared to baseline data to determine if significant effects are occurring and require mitigation.**

At Meadowbank site, given the low densities of waterbird nests identified at the mine site and along the AWAR from 2005 - 2012 (i.e., too low to determine whether changes in nest abundance or success have occurred), and the absence of data suggesting that mine or road-related effects are occurring, the waterbird nest survey program has been discontinued.

The Whale Tail Mine requires the construction of two dikes within Whale Tail Lake to divert water from the proposed pit to surrounding lakes and tributaries, resulting in flooding that will elevate water levels by 4 m and inundate approximately 157 ha of tundra during the active bird nesting window. To investigate mitigation options for minimizing flooding-related impacts to birds, Trent University, in collaboration with Environment and Climate Change Canada and Agnico Eagle, conducted active bird nest surveys and experimented with deterrent options in summer 2018, 2019 and 2021 at the Whale Tail site. Follow-up studies in 2021 did indicate average number of nests and average bird density increased from 2019 (during flooding) to 2021 (post-flood) in non-flooded plots, and nest density decreased in previously flooded plots, supporting a hypothesis of birds moving their nesting sites to areas adjacent to flooding.

Further analysis in 2022 examined this behavioural response through individual re-sightings and are detailed in Section 8.18.5 below. The complete analysis and report on behavioural responses will be included in a second Trent University MSc Thesis manuscript to be submitted in 2023. References for any publications produced in 2023 will be provided in the 2023 Annual Report, but otherwise reporting under the Migratory Bird Protection Plan is considered complete at this time.

**g. Details of an annual breeding bird plot surveys and transects along the all-weather road to be conducted during the construction phase and for at least the first three (3) years of operation.**

The breeding bird PRISM (Program for Regional and International Shorebird Monitoring) plot and bird transect monitoring programs were designed to evaluate potential Project-related changes in breeding bird species abundance, richness, and diversity over time. The program is one component of the larger monitoring strategy to evaluate the success of mitigation measures implemented to minimize the amount of vegetation (i.e., bird habitat) removed or degraded (e.g., dustfall) by the Project, and whether certain Mine activities such as the Mine site or AWAR have resulted in reduced or compromised habitat function or effectiveness (i.e., zone of influence) for breeding birds.

For the breeding bird transects, data analysis in 2011 and 2015 indicated that no road-related effects had occurred to date, and thresholds had not been exceeded; therefore, annual transect surveys were permanently suspended after 2015. In 2020, Agnico Eagle sent ECCC the comprehensive 2003-2015 analysis of all PRISM and breeding bird transect data.

Results of the comprehensive analysis determined there were no significant effects of the Project or Mine-related infrastructure on bird abundance, diversity or community composition, which supports that mitigation is effective. In 2022, Agnico Eagle Meadowbank Complex finalized a collaboration agreement with ECCC, with a focus on contributing to regional bird monitoring programs. The agreement includes a commitment to conduct 48 PRISM plots selected by CWS over 10 years (2021 to 2031), and to complete Breeding Bird Survey (BBS) routes along the AWAR and the Whale Tail Haul Road (WTHR) opportunistically when qualified individuals are on site. At a minimum, these BBS routes will be conducted every three (3) years during the operations, closure, and post-closure phases of the project. PRISM and BBS were scheduled to restart in 2022.

In 2022, two BBS routes consisting of 50 stations each were established along the AWAR and the WTHR. As well, four (4) of 48 designated PRISM plots were surveyed at Meadowbank site. In 2023, both BBS routes will be surveyed and a minimum of 12 PRISM plots will be surveyed at the Meadowbank Complex. More detailed are provided in Section 15 of the 2022 Wildlife Monitoring Summary Report (Appendix 47).

**h. Details of a monitoring program, including recording the locations and frequency of observing caribou and carnivores and any actions taken to avoid contact with or disturbance, and a specific mitigation plan for Shortearred owls and any other species of special concern pursuant to Schedule 3 of the Species at Risk Act located in the local study area or along the all-weather private access road.**

See “2022 Wildlife Monitoring Summary Report” attached in Appendix 47 for a completed discussion.

All Mine site personnel, including construction and support staff, are required to document and report wildlife observed within the LSA of the Project as well as ancillary areas (e.g., AWAR and WTHR). The protocol involves notifying staff in the Environment Department, which is intended to ensure that potential problem animals are identified. Pertinent data, and daily and weekly Mine site inspection reports are consolidated and entered into an electronic database (EquiS). Monthly summary reports and wildlife observation data are submitted to the GN and KivIA. Quarterly reports are submitted to the KivIA.

In 2022, 235 road surveys were conducted along the All-weather Access Road (AWAR) and 193 were conducted along the Whale Tail Haul Road (WTHR). Seven mammalian species and twelve avian species were detected and identified during road surveys in 2022. All seven mammal species were observed at both AWAR and WTHR, including Arctic fox, Artic ground squirrel, Arctic hare, caribou, muskox, wolf, and wolverine. Caribou and muskox were the most frequently observed mammals. Seven avian species were observed at both sites including American crow, bald eagle, Canada goose, ptarmigan sp., rough-legged hawk, sandhill crane, and snow goose. Hawk sp., osprey, and peregrine falcon were only observed at AWAR. Common raven and gull sp. were only observed at WTHR. At both AWAR and WTHR Snow geese and Canada geese were the most frequently observed species.

In 2022, six mammal species were reported during formal Pit and Mine surveys at Meadowbank, including Arctic fox, Arctic hare, caribou, muskox, red fox, and wolverine. Caribou sightings were highest from March to July, peaking in observations during May, and muskox sightings were highest in July. Wolverines were only reported once in March and once in November. Four species of birds were reported during formal Pit and Mine surveys at Meadowbank, including Canada goose, sandhill cranes, an unidentified ptarmigan, and unidentified gulls. The Canada goose was the most frequently observed bird species and was reported mostly in June and August.

Four mammal species were reported during formal Pit and Mine surveys Whale Tail Mine in 2022, including Arctic fox, Arctic hare, caribou, and muskox. The highest caribou sightings took place in August and September, followed by May and April. Muskox sightings were only recorded in July while the Arctic fox was recorded during almost every month except for June, July, and October. Arctic hare had two observations at Whale Tail Mine, once in June and once in July. Six species of birds, as well as unidentified species of geese, ducks, and ptarmigan, were observed during formal surveys at Whale Tail in 2022. Species observed include bald eagle, Canada goose, raven, crow, greater white-fronted goose, and peregrine falcon.

Refer to Section 8.18.6 below for a discussion regarding species at risk.

#### 8.18.1.3 *Caribou Migration Corridor Information Summary*

**As required by NIRB Project Certificate No.004 Condition 56:** ***Maps of caribou migration corridors shall be developed in consultation with Elders and local HTOs, including Chesterfield Inlet and placed in site offices and upgraded as new information on corridors becomes available. Information on caribou migration corridors shall be reported to the GN, KIA and NIRB's Monitoring Officer annually.***

Agnico Eagle intends to continue collaboration with the GN DoE caribou satellite-collaring program. Raw collar data were not available to complete the 2020 to 2022 analysis. However, a sharing agreement was signed between Agnico Eagle and the GN on March 3rd, 2023. Agnico Eagle intends to do the required analysis to comply with this condition of the Project Certificate.

#### 8.18.1.4 *Caribou Collaring Study Meadowbank*

**As required by NIRB Project Certificate No.004 Condition 57*****: participate in a caribou collaring program as directed by the GN-DOE***

And

**As required by NIRB Project Certificate No.008 Condition 29*****: The Proponent shall, in collaboration with the Government of Nunavut, collect additional caribou collar data and conduct analyses of this data to quantify the zone of influence and associated effects of project components on caribou movement for a study area that includes the Whale Tail mine site, the haul road, the Meadowbank Gold Mine and its All-Weather Access Road.***

***A summary of the analyses and associated effects shall be provided annually in the Proponent's annual report to the Nunavut Impact Review Board.***

Agnico Eagle intends to continue collaboration with the GN DOE caribou satellite-collaring program that includes data collected within the Meadowbank Complex RSA. The GN biologists discuss collar deployments with hunters and Elders and get approval prior to proceeding. Daily collar location maps are provided by GN DOE during the sensitive seasons to inform locations of caribou in relation to the Meadowbank Complex.

The satellite-collaring program was developed to provide information on the distribution of caribou occurring within the Meadowbank RSA and contribute data to ongoing satellite-collaring programs for the Ahiak, Qamanirjuaq, and other herds that are used by the GN for herd management. The satellite-collaring program, along with GN DOE regional data, is an important monitoring and management tool that provides a regional perspective on caribou activity near Mine operations. Another key objective of the program is to provide timely information for the caribou management and monitoring strategy at the Meadowbank and Whale Tail sites (i.e., Decision Tree approach; see 2019 TEMP).

The satellite-collaring program was initially designed to continue for five consecutive years in accordance with the original TEMP (Cumberland 2006), but collar deployments have continued beyond this period as part of a long-term caribou monitoring strategy for the region. Caribou in the Baker Lake area were first collared in May 2008, and the program has continued for more than a decade. Monitoring of collars continued in 2022 and is expected to continue through 2023.

Agnico Eagle intends to continue collaboration with the GN DoE caribou satellite-collaring program. Collar data were not available to complete the 2020, 2021 and 2022 analysis. However, a sharing agreement was signed between Agnico Eagle and the GN on March 3rd, 2023. Agnico Eagle intends to conduct the required analysis to comply with this condition of the Project Certificate.

### 8.18.1.5 *Remote Cameras*

The initial remote camera study design (October 2018 to November 2019) was intended to collect general trends on caribou crossing events and traffic or road activities on the WTHR, to inform fine scale traffic mitigation. An updated study design was implemented in November 2019, to examine the permeability of the WTHR to caribou movement as those interactions relate to the physical parameters of the road. The 2019 to 2021 remote camera data were previously analyzed for the 2020 and 2021 Wildlife Monitoring Summary Reports (Appendix 47 for both of the 2020 and 2021 Meadowbank Complex Annual Report).

Results from the 2022 remote camera program are summarized below. For more detailed information, refer to the completed discussion provided in Section 8 of the 2022 Wildlife Monitoring Summary Report in Appendix 47.

The primary objective of the remote camera program is to monitor caribou behavioural interactions with the WTHR, and adapt management practices (i.e., traffic mitigation) as required. The current remote camera program allows for comparisons to determine if caribou crossing locations along the WTHR are related to the physical parameters of the road (i.e., backfill height, slope and material grain size) and traffic rates.

Locations of remote cameras have varied across program years. The same locations were used in 2022 as in 2021. The locations of the paired remote cameras along the WTHR were selected based on high-frequency caribou crossing locations, and stratified across road height categories (i.e., <1.5 m, 1.5 to 3 m, and >3 m). Road heights were determined in the field. Backfill material and slope at camera locations were determined from construction surveys. Backfill slope along the WTHR is typically 2:1. In areas where backfill height exceeds 3 m, slope was recontoured to 4:1 for safety purposes, and to facilitate wildlife crossings. Camera location are showed on Figure 8-1 of Appendix 47.

In 2022, an automated approach was used to classify the 2,727,572 photos collected in 2022 as “near wildlife” (i.e., wildlife close enough to cameras that they could be easily identified by humans) and “far wildlife” (i.e., wildlife far away from cameras that can only be detected by differences in pixels between subsequent photographs). An image classification machine learning model was used to classify “near wildlife” and is detailed further in Section 8.4.2.1 of the Appendix 47.

A total of 1,453 photographs were selected by the automated approach, and reviewed by a human observer. There were 281 total observations, 187 observations were “near wildlife” detections and 93 “far wildlife” detections. Six species were detected in 2022: Arctic fox, Arctic hare, caribou, common raven, gray wolf, and muskox. All six species were detected on both “near wildlife” and “far wildlife” detections.

Caribou were detected between February 2$^{nd}$, 2022 and September 3$^{rd}$, 2022. The highest detection rate occurred at camera pair 4 (KM 172) in the summer, and the highest crossing rate was observed at camera pair 6 (KM 152) in the spring. No caribou were detected on remote cameras in the fall. There were 27 crossing events in 2022. Approximately equal numbers of crossing events were observed while the road was open (n = 13) or when a restriction was in places (n = 14).

Too few crossing events were detected to statistically compare crossing rates between different road heights, backfill materials, and backfill slopes. However, crossing events occurred on cameras of all road heights, both backfill slope categories and backfill slopes.

The future of the remote camera program should be discussed with the TAG. The remote camera program is unlikely to contribute to adaptive management but could provide insight into time between vehicle traffic and caribou crossing events. Deploying more cameras across the WTHR, and potentially the AWAR could increase the number of caribou crossing event detections. However, this would require significantly more effort to deploy and maintain cameras and to review camera photos.

#### 8.18.1.6 *Blasting Monitoring*

The purpose of the blast monitoring program is to measure vibration and overpressure from explosive blasts at the Whale Tail Mine and to understand how blasting vibration relates to caribou behaviour. The program aims to establish site-specific relationships between vibration and overpressure levels and blasting parameters (e.g., charge mass, charge depth), environmental conditions (e.g., seasonal variation), and propagation distances. The program includes monitoring of caribou sensory disturbance related to blasting.

Blasting is delayed when caribou or other wildlife are observed within the blast danger zone (typically 600 m from the blast centre). According to the TEMP, blasting is also delayed when caribou GST is observed within 4 km during the sensitive season, or within 5 km during the calving period, or when muskox GST is observed within 1 km. Following discussion with the TAG, the distance was relaxed to 3 km for caribou during the sensitive season, and 5 km during the calving period, to better understand effects to caribou from blasting. The Environment Department performs monitoring prior to each blast to ensure no caribou groups exceeding GST are present within these setback distances.

Results from the 2022 blast monitoring are presented in Section 9 of the 2022 Wildlife Monitoring Summary Report (Appendix 47) and summarized below. Please refer to this Appendix for a complete review of the monitoring program and discussion of the results.

Models to describe the site-specific relationship between vibration and overpressure from explosive blasting were developed using blast monitoring data collected in 2020 and 2021. Explanation on calculation of the site-specific relationships between overpressure and vibration and blasting parameters are presented in 2021 Wildlife Monitoring Summary Report (Appendix 47 of the 2021 Meadowbank

Complex Annual Report). These models can be used to estimate propagation distance of PPL and PPV based on blast charge and depth (i.e., shallow vs. deep) by season. More detail are provided in Section 9 of the 2022 Wildlife Monitoring Summary Report (Appendix 47).

Pre-blast surveys for caribou were performed on 191 days between January 23rd to December 31st, 2022. Caribou were observed on 45 days, Muskox on two days, and Canada geese and Arctic fox were observed on one day. Caribou behaviour monitoring sessions occurred on 14 days in 2022.

The metric used to quantify caribou response to blasting (i.e., average response behaviours six minutes following blasting) was determined based on data availability. Preliminary analysis found that this metric was not correlated with modelled PPV and PPL values, however the sample size was relatively small. Behaviour monitoring could aim to monitor caribou for a longer period of time following blasting to determine the time taken for response behaviours to return to pre-blast levels. Future analyses using more behaviour monitoring sessions could account for other factors such as caribou group size and presence of other disturbances (e.g., vehicle traffic). More detail are provided in Section 9 of the 2022 Wildlife Monitoring Summary Report (Appendix 47).

#### 8.18.1.7 *Snow Study*

Per Whale Tail Expansion Project commitment 9 from the TAG Meeting held in Baker Lake June 11-13, 2019, Agnico Eagle committed to complete a three-year snow monitoring program as part of the TEMP that measures snow conditions adjacent to the WTHR. The goal of the snow monitoring is to determine whether changes to snow resulting from snow removal along the WTHR result in conditions that potentially inhibit caribou movements.

Results from the 2022 snow study are summarized below. For more detailed information, refer to the completed discussion provided in Section 17.1 of the 2022 Wildlife Monitoring Summary Report in Appendix 47.

An annual sample goal of 36 survey locations was originally proposed over three years. Since 2020, a number of challenges have limited the program from achieving this goal including locating fresh caribou tracks. In 2022 a power analysis was conducted using data from 2020-2022 to determine the total number of sampling locations required to detect very small, small and moderate effect sizes for snow hardness.

A total of 20 survey locations were completed during the spring migration of 2022. Considering all plot types sampled, mean snow depth was not significantly different on the upwind side of the haul road (0.35 m [95% CI: 0.27-0.43]) compared to the downwind side of the road (0.24 m [0.18-0.31]). Average snow depth in use plots on the upwind side of the road (0.35 m [0.25-0.45]) was similar to the average snow depth in the snow-managed control plots (i.e., plots within the berm but not used by caribou) on the upwind side of the road (0.34 m [0.22-0.46]). Downwind use plots (0.23 m [0.16-0.30]) had similar average snow depths compared to downwind snow-managed control plots (0.25 m [0.16-0.34]).

Snow hardness, as measured using the push-pull gauge, was similar between plots on the upwind side (14 Newtons (N) [12-16]) and the downwind side (15 N [12-17]) of the WTHR. On both the upwind and downwind sides of the WTHR, average snow hardness was similar between use plots, snow-managed control plots, and non-managed control plots.

Based on preliminary snow data collected between 2020 and 2022, snow hardness appears to be similar across all plot types. Results of the power analysis indicate that sample sizes are already sufficient to evaluate at least moderate differences in snow hardness between plots (i.e., effect sizes of 50% or greater), but no such differences in snow hardness were observed. To assess differences in snow hardness for smaller effect sizes (e.g., 25%) for both study questions, snow data should be collected at a minimum of 65 locations, with six plots completed at each locations as per the study design (Golder 2020d). The power analysis was completed using snow hardness data rather than other metrics based on snow data availability for each plot type from 2020- 2022 survey locations (i.e., snow depth data not collected for non-managed control plots) as well as the documented influence of snow hardness on sinking depth and caribou locomotion. For future snow data collection, a full suite of snow characteristics data (snow depth, snow hardness, slope) will be collected for each plot type to facilitate comparisons. Additionally, caribou track depth information will be collected in both the use plot and in the non-managed control plot to facilitate comparison between the snow conditions within the berm area and beyond the berm area. Agnico Eagle will communicate data recording improvements to field crews, including protocols for post-field data sheet checks for quality assurance. In 2023 Agnico Eagle will explore the possibility for HTO wildlife monitors to report fresh caribou crossing tracks along the WTHR to Agnico Eagle. HTO wildlife monitors are frequently on the WTHR conducting other surveys, and prompt reporting of locations with fresh caribou crossing tracks would increase opportunities for surveying snow conditions. Data collected between 2020 and 2022 allowed for the evaluation of survey techniques and allowed for the completion of a power analysis to assess the minimum number of survey locations needed to answer monitoring questions.

#### 8.18.1.8 *Caribou Behaviour*

Please refer to the completed discussion provided in Section 17.2 of the 2022 Wildlife Monitoring Summary Report in Appendix 47.

Following the first two years of data collection (2020 and 2021) and comments from the TAG, GN, and KivIA, the protocols were updated for the 2022 season to improve the quality of the data collected.

Field surveys were conducted primarily during spring and fall migration by the Agnico Eagle environmental technicians. The technicians were trained and were dedicated to conducting behaviour surveys. Each survey lasted 30 minutes, with scan samples conducted every three minutes.

The behaviour monitoring data from 2022 were combined with data from 2020 and 2021, and all results outlined in this report use all three years, unless otherwise stated. The key findings from the 2022 program were similar to 2020 and 2021, and included:

- The standard monitoring protocols adapted from the Government of Northwest Territories Department of Environment and Natural Resources worked well at the Project site.
- 104 surveys were conducted in 2022, compared to 134 in 2021 and 116 in 2020; 63 surveys occurred during spring migration from March to May, 18 occurred during calving and summer from June to August, and 23 occurred during fall migration from September to December.
- Caribou mostly exhibited the non-response behaviours of standing, laying, feeding, and walking.
- Observations were well distributed across a range of caribou group sizes from 1 to 2 individuals to >1,000.

- Larger groups of caribou tended to be recorded further from the road. Only five groups larger than 100 individuals were recorded within 100 m of the road at the start of the survey, two in 2021 and three in 2022.

- Caribou group size was not linked to response behaviour or walking behaviour in statistical analyses.

- Statistical analysis indicated that there is a trend for caribou at greater distance from the road (>1,000 m) to have a lower proportion of response behaviours (alert and running) than caribou within 100 m of the road.

- Approximately 54% of the surveys included a disturbance event; typically, haul traffic and light trucks from the mine, and occasionally all-terrain vehicles (ATVs) from Baker Lake on the AWAR for travel and harvesting.

- Following a disturbance event, the proportion of response behaviours in a group of caribou was significantly higher, but generally returned to baseline behaviours within one or two sampling intervals (i.e., three or six minutes).

- In response to comments from the KivIA, the behaviour of “walking” was investigated for whether it may be an “alert” behaviour instead of a non-response behaviour, however, disturbances did not statistically affect the proportion of caribou walking.

- Surveyors conducted nine special 90-minute surveys during convoys in 2022 and nine in 2021, to assess whether the response to convoys was similar to that of other vehicles. Caribou responded similarly to convoys but possibly for longer than for other vehicles. More convoy surveys are needed to analyse the data statistically.

- During periods when large groups of caribou are present, the AWAR and Haul Roads are closed following a decision tree in the Meadowbank Mine TEMP, reducing the potential to record interactions between vehicles and caribou. Road closure status did not affect behaviour in the statistical analysis, possibly due to it having less explanatory power than the other variables included.

- Groups of caribou were observed on both the east and west sides of the road in all seasons, but were more commonly observed on the west side during spring migration and the east side during fall migration (a.k.a. upstream of the dominant direction of travel). Statistical analysis found that side of road and season did not affect response behaviour (alert/running), but that caribou were significantly more likely to be walking on the upstream side of the road. The dominant behaviour on the downstream side was feeding or laying down.

Based on commitments in the Terrestrial Ecosystem Management Plan, the overall objective of the caribou behaviour monitoring program was to determine if caribou activity budgets changed with distance from the mine, and to document caribou response to stressors. The primary hypothesis of this study was that caribou closer to the road would demonstrate a stronger response to vehicle disturbances. Overall, the results of the statistical analysis provided support for this hypothesis, as caribou tended to respond to disturbances, particularly when close to the road. However, the analysis also found that disturbances did not have a detectable effect on caribou behaviour after three to six minutes post-disturbance, suggesting that caribou behaviour returns to baseline relatively quickly following a disturbance. The updates applied to the survey protocol in 2021 and 2022 used feedback from the first year of data and analysis, and were helpful in improving the overall quality and accuracy of the data. Interestingly, even with these changes, the trends in the results were highly consistent between the three years of data. This increases the confidence that trends are repeatable year to year.

### 8.18.1.9 *Stop Work due to Wildlife*

**As required by NIRB Project Certificate No.004 Condition 60*: : Whenever practical, Cumberland shall implement a stop work policy when wildlife in the area may be endangered by the work being carried out.***

Numerous road closures were implemented on all project roads, to ensure safe passage to large groups of migrating Caribou herds. Section 3 of the 2022 Wildlife Monitoring Summary Report (Appendix 47) details and discusses the 2022 road closure. Below is a summary of the results.

Significant movements of caribou and muskox occurred along the AWAR throughout October and November 2022, resulting in multiple closures to Project-related traffic. The AWAR was closed (i.e., 24-hour closure) on 45 days in 2022, with 23 days due to caribou, 21 days due to weather, and 1 day due to maintenance activities. The AWAR had closure days with less than 24 hours of closure on 71 occasions, including 28 closure days due to caribou. October and November had the highest number of days with closures (both for 24 hour closures and less than 24 hour closures), aligning with caribou fall migration. In total, the AWAR was closed for a total of 1,808 hours in 2022, with the highest number of closure hours reported in October and November due to caribou migration and January due to weather. Speed restrictions were applied on 84 days on the AWAR and were mostly applied in response to both caribou and muskox presence. Mitigation measures such as reduced speeds were instituted due to the presence both muskox and caribou herds throughout the year. Traffic restrictions were applied on the AWAR on two days, during which traffic was restricted to light vehicles only due to weather. In total, there were 134 days in 2022 with road closures and speed restrictions applied on the AWAR in response to caribou and/or muskox.

Significant movements of caribou occurred along the WTHR in spring during April, resulting in multiple closures to Project-related traffic. The WTHR was fully closed (i.e., 24-hour closure) on 15 days, with seven closure days due to caribou and eight closure days due to weather. On 63 days, the WTHR experience closures occurring for less than 24 hours, with 20 closure days related to caribou and one closure day related to muskox. In total, the WTHR was closed for a total of 894 hours in 2022, with the highest number of closure hours reported in April due to caribou spring migration and January due to weather. Speed restrictions were applied on 93 days on the WTHR and in all cases were applied in response to caribou and/or muskox presence. Reduced speeds were instituted due to the presence of both muskox and caribou herds throughout the year. There were three days in 2022 during which a closure and speed restriction on the WTHR were implemented for separate reasons. On each of these three days, a speed restriction was in place due to muskox and a closure was implemented for less than 24 hours due to either weather or maintenance. Traffic restrictions were applied on the WTHR on six days, during which traffic was restricted to light vehicles only for some sections of road. In total, there were 129 days in 2022 with road closures and speed restrictions applied on the WTHR in response to caribou and/or muskox.

Road-related monitoring and mitigation were implemented according to Figures 7 and 8 of the TEMP version 7 (Agnico Eagle 2019). Collar location maps were instrumental in assessing the need for increased road monitoring. Road-related mitigation related to caribou presence in 2022 resulted in road closures and a corresponding reduction in total vehicle movements. Outside of the fall migration period, road closures were implemented or vehicle movements were restricted (e.g., light vehicles only, speed limited enforced) in response to high caribou numbers. During the fall migration period, road closures were implemented if there were two collared caribou in the regional study area. Convoys were organized by Mine Environment staff, who had the training to decide whether vehicles could continue along the road when caribou were sighted, and at times assisted by the BLHTO or the KivIA.

Regular wildlife warnings were dispatched based on observation and monitoring data. The road supervisors and operators also ensured protection of wildlife by assisting in surveillance and closing roads as needed. Radio notices reminding operators of the appropriate speed limit were made frequently by dispatchers. During caribou peak migration, notices were sent to all road occupants, regulatory agencies, local groups, and wildlife consultants were notified, and road survey efforts were increased.

The frequency of road surveys in 2022 demonstrate Agnico Eagle's commitment to preventing impacts to caribou from the AWAR and WTHR. Mitigation measures such as reduced speeds, convoys, and multiple road closures function to minimize road-related effects including mortality and injury, and to increase caribou passage. Incidental sightings in 2022 recorded in the Wildlife Log and road surveys showed that caribou crossed roads throughout the year, with especially high numbers during spring and fall migration.

Also, during road surveys, once active nests were identified within quarries along the AWAR, mine-related activity was automatically halted within the quarries with the only disturbance being traffic on the nearby AWAR.

Lastly, an open pit blasting event was cancelled at the Whale Tail Mine, on April 29th, 2022, due to caribou presence in proximity of the blast and another one was cancelled on August 23rd, 2022.

#### 8.18.1.10 *Raptor Nest Survey*

Refer to Section 13 of the 2022 Wildlife Monitoring Summary Report (Appendix 47) for a complete discussion of the methodology and results.

The raptor nest monitoring program is designed to determine Project-related effects, and the success of mitigation strategies to prevent disturbance to nesting raptors. Within the Meadowbank LSA and AWAR LSA, peregrine falcons have previously nested in quarries along the AWAR, the Portage Pit, and Goose Pit. Monitoring of peregrine falcon nests in quarries along the AWAR has been conducted since 2009. The Portage, Goose, Vault, Whale Tail, and IVR Pits are inspected for peregrine falcon activity daily prior to and during the nesting season and managed under the Peregrine falcon Management and Protection Plan.

Monitoring in 2022 included surveys for nests associated with pits and quarries along the AWAR and WTHR. Raptor activity and potential nest locations were also noted on other surveys including road surveys, viewshed surveys, freshet monitoring, and on-site environmental monitoring. In addition, a research program was conducted by Arctic Raptors in 2022, to determine the relationship between nest success and Mine activity.

Six peregrine falcon nests were documented in Quarries 2, 8, 18, 21, and 22 in 2022. A peregrine falcon was observed at Quarry 7, however the nest containing eggs in this quarry appeared to be occupied by a common raven. Nests have previously been identified in all these quarries. No raptor nesting evidence was observed in quarries along the WTHR in 2022. Peregrine falcon nesting activity (i.e., territorial behaviour) was identified on a communication tower on site, and in the Phaser Lake extension of the

Vault Pit area during the NIRB site visit. However, these nests were not identified during subsequent raptor nest monitoring. No other raptor nests were identified during pit checks or incidentally during other surveys in 2022.

A summary of observations made at the peregrine falcon nests along the AWAR in 2022 is detailed in Table 13-2 of the 2022 Wildlife Monitoring Summary Report (Appendix 47). Raptor nest management plans were not developed at the active nest sites, as Mine-related activity was already restricted within the quarries, with the only disturbance being traffic on the nearby AWAR. Intensive monitoring, which would include approaching nests by foot, was not conducted. Nest locations are not publicized to prevent inadvertent disturbance by curious Mine employees. There was no nest failures associated to mine-related activities in 2022.

Results of the analysis did not indicate project-related effects on rough-legged hawk occupancy ($\lambda = 1.08 \pm 0.17$ [mean ± standard error]). Although the value is positive, the standard error overlaps one, indicating that the population is unlikely to be increasing or decreasing (i.e., likely stable). Marginal decrease in peregrine falcon occupancy was observed ($\lambda = 0.98 \pm 0.04$) but results could not be strongly correlated to effects from the Project. Results may be related to inconsistent monitoring (e.g., monitoring that ensures minimal disturbance) and lack of statistical power to determine project-related effects. Full results of the nest occupancy analysis are included in Appendix G of the 2022 Wildlife Monitoring Summary Report.

#### 8.18.1.11 *Deterrence of Raptors*

**As required by NIRB Project Certificate No.008 Condition 36:** ***Prior to removal or deterrence of raptors, the Proponent will contact the Government of Nunavut – Department of Environment to discuss proposed mitigation options and, if required, will obtain the necessary permits. The Proponent shall include summaries of any mitigation measures implemented and permits obtained in fulfillment of this term and condition in the Proponent's annual report to the Nunavut Impact Review Board.***

There was no removal of raptor at both the Meadowbank and Whale Tail sites in 2022.

Deterrents were applied to Quarry 22 in 2022 to discourage raptor nesting. A bird deterrent cannon was deployed on May 24th, 2022 to prevent falcon activities in the quarry before scarification occurred. The bird cannon was set in the interval Random 10, meaning a shot series is randomly chosen by the control-unit between 1 and 10 minutes, blasting at 120dB. The bird cannon was removed once peregrine falcon activity was observed in the quarry on May 29th. All activity within the area, including scarification, were postponed minimizing the impact of potential nesting for this species and therefore ensure proper conditions for nesting activity.

Once an active nest has been identified, mine-related activity (e.g., vehicle operation, heavy equipment, aircrafts, blasting, etc.) is automatically halted within the quarries with the only disturbance being traffic on the nearby AWAR/WTHR.

### 8.18.2 Terrestrial Advisory Group

**As required by NIRB Project Certificate No.008 Condition 27:** ***The Proponent shall participate in a Terrestrial Advisory Group with the Government of Nunavut, the Baker Lake Hunters and Trappers Organization, the Kivalliq Inuit Association, and other parties as appropriate to continually review and refine mitigation and monitoring details within the Terrestrial Ecosystem Management Plan. Additional caribou collar data, results from associated studies, Inuit Qaujimajatuqangit shared by knowledge holders and other monitoring data as***

***available should be considered for incorporation as appropriate. Finalized Terms of Reference for the Terrestrial Advisory Group shall be provided to the NIRB within six (6) months of issuance of the Project Certificate. A summary of outcomes from Terrestrial Advisory Group meetings shall be provided to the NIRB on an annual basis in the Proponent's Annual Report.***

And

**As required by NIRB Project Certificate No.008 Condition 30:** ***The Proponent shall work with the Government of Nunavut, the Baker Lake Hunters and Trappers Organization and the Kivalliq Inuit Association through the Terrestrial Advisory Group to develop and update thresholds to trigger implementation of mitigation measures on both the AWAR and Whale Tail Haul road, up to and including temporary road closures. The Proponent shall consider how these thresholds and mitigation measures reflect caribou life cycle sensitivities as well as demonstrate how Inuit Qaujimajatuqangit was incorporated throughout the development of these criteria and procedures.***

***The Proponent shall ensure the Terrestrial Ecosystem Management Plan is updated to reflect the thresholds agreed upon in accordance with the Terrestrial Advisory Group Terms of Reference, and that this Plan along with a summary of consultation with the Terrestrial Advisory Group are submitted on an annual basis or as thresholds are otherwise modified in the Proponent's annual report to the to the Nunavut Impact Review Board***

The Term of Reference for the TAG was provided to NIRB on November 1st, 2018. Refer to Appendix 46 of the 2018 Annual Report. The TOR was officially signed by all parties in 2019.

In fulfillment of the Condition 27, a summary of outcomes from Terrestrial Advisory Group meetings are provided in the below section. Fulfillment of Condition 30 is discussed in Section 8.18.2.1.2.3.

### 8.18.2.1 *Terrestrial Advisory Group*

#### *8.18.2.1.1 Meetings Held in 2022*

In accordance with Nunavut Impact Review Board Project Certificate No.008 Term and Condition 27, a Terrestrial Advisory Group was established for the Meadowbank and Whale Tail mines. It provides technical oversight on the Mine's mitigation, monitoring and adaptive management measures related to the protection of wildlife. The following parties are actively part of the Terrestrial Advisory Group: the Baker Lake Hunter and Trapper Organization, the Government of Nunavut, the Kivalliq Inuit Association and Agnico Eagle. It is also a venue for TAG members to openly raise concerns about wildlife, and to review and discuss the results of wildlife monitoring and to discuss opportunities for ongoing research.

Terms of reference were finalized and signed by all parties in 2019. Several TAG meetings were held since June 2018. Meetings held in 2022 are summarized in Table 8-84 below.

**Table 8-84 TAG meeting held in 2022**

| Date | TAG meeting No. | Type of meeting | Parties attending |
|---|---|---|---|
| February 9th, 2022 | 10 | Conference call | Agnico Eagle, BLHTO, KivIA, GN |
| November 29th to December 1st, 2022 | 11 | In-person at Meadowbank site | Agnico Eagle, BLHTO, KivIA, GN |
| Series of meeting between October and November 2022 | NA | Conference call | Agnico Eagle, BLHTO, KivIA, GN |

Discussions held in 2022 were fruitful and led to numerous resolutions on files/brainstorming sessions. To facilitate discussions during meetings or conference calls, where possible, Agnico Eagle provided agenda and reports summarizing thoughts prior to the TAG meeting. When feedback was provided prior to the meeting, these were incorporated into the presentation made at the meeting. This ensured discussions targeted key items and facilitated resolution of issues and closing of commitments made.

#### *8.18.2.1.2 Summary of outcomes*

The next section describes the main outcomes arising from TAG meetings held in 2022 by topic. Table 8-85 below also presented the action item summary from TAG meeting held in 2022.

**Table 8-85 2022 TAG Action Item Summary**

| Action Item No. | Action Item Summary | Responsibility | Due Date | Status |
|---|---|---|---|---|
| 1 – TAG No.10 | Review TAG Meeting No.10 (Feb. 9) Presentation P5 – 2022 Spring Migration, and provide comments to Agnico . | All Members | February 23, 2022 | Complete |
| 2 - TAG No.10 | KivIA will provide comments on behavioural study methods for onsite project tolerant caribou to ERM. | KivIA | Open | Complete |
| 3 - TAG No.10 | Agnico to provide draft behavioural study report to KivIA, when available. | Agnico Eagle | Open | Complete |
| 1 – TAG No.11 | Ensure chronology of response to 2022 fall migration is fully documented. Interview other parties as required. | Agnico Eagle to lead | February 2023 | Complete |
| 2 - TAG No.11 | Agnico to provide the preliminary 2022 road closure data to GN | Agnico Eagle | Mid-January 2023 | Complete |
| 3 - TAG No.11 | GN to create animations of fall 2022 migration, integrating road closure and GST information (and create historical animations as feasible, for comparison). | GN | February, 2023 | Complete |
| 4 - TAG No.11 | In response to HTO concerns over noise of road flags, Agnico to further look into a flags pilot with larger rebar/rubber insert. | Agnico Eagle | TBD | Complete |
| 5 - TAG No.11 | To further mitigate potential generation of roadside dustfall, Agnico Eagle to further discuss with HTO the use of supplemental dust suppressant in key locations along the AWAR and/or supplemental berry analyses. | Agnico Eagle | TBD | Outstanding |
| 6 - TAG No.11 | In response to HTO concerns around changes in caribou migration patterns, GN to provide maps to HTO. | GN | TBD | Complete |
| 7 - TAG No.11 | Agnico to review decision tracking documentation and clarify for all the process for designating official TAG advice/recommendations. | Agnico Eagle | February 2023 | Complete |

| Action Item No. | Action Item Summary | Responsibility | Due Date | Status |
|---|---|---|---|---|
| 8 - TAG No.11 | Agnico Eagle to provide this meeting's presentations to all members and look into translation for HTO. | Agnico Eagle | January 2023 | Complete |
| 9 - TAG No.11 | Agnico Eagle follow up with KivIA about project tolerant memo, see what can be done with the data available and any changes that can be made. | Agnico Eagle | TBD | In progress |
| 10 - TAG No.11 | Snow study – add data collection for snow characteristics across the three road height categories. | Agnico Eagle | TBD | Outstanding |

#### *8.18.2.1.2.1 Group Size Threshold and Caribou Protection Measures*

Many discussion were held in 2020-20221 regarding the calculating method for caribou's Group Size Thresholds along with other TEMP mitigations for the WTHR and AWAR. During the March 16th, 2021 TAG meeting, an agreement was reached for the method GSTs spring and fall caribou migration.

In order to ensure that 75% of caribou crossing the Meadowbank All-Weather Access Road (AWAR) or Whale Tail Haul Road (WTHR) are subject to enhanced mitigation, the following GST calculation method, initially proposed by the GN, shall be applied prior to each migration season (spring & fall).

1 – The minimum annual sample size of caribou group observations required to revise the GST shall be 100 caribou groups observed at a distance of greater or equal to 250 m and less or equal to 1000 m from the roads.

2 – An average of the annual GSTs calculated for the AWAR and WTHR will be applied to both roads (i.e. the same GST will apply to the AWAR and WTHR).

3 – All existing years of caribou group size data (with sufficient sample size as point 1 above) shall be used to calculate a mean GST.

Based on this agreed calculation method, several discussion were held in 2022 to discuss the results of the GST implementation. GST for 2023 will continue to be based on this calculation method.

#### *8.18.2.1.2.2 Haul Road Flag*

Disturbance from haul road's flag along the AWAR and WTHR were again discussed in 2022 with the TAG members. In 2022, Agnico Eagle started the flag removal project which consist of using fixed reflective poles instead of flags. This program was not successful and had to be stopped for health and safety concerns for the road users. Presentation of this project was given in the TAG No. 10. During both TAG meetings in 2022, discussion on options to mitigate the flag disturbance were bring up by the parties. Based on these discussions, Agnico Eagle will continue to evaluate other options that will satisfy all parties. Furthermore, during the site visit with TAG members in November 2022 at Meadowbank Complex, it is Agnico Eagle's understanding that flags are a more important nuisance needing addressing than further refining the road's slope design.

#### *8.18.2.1.2.3 2021 Annual Report Comments*

Discussions included 2021 Wildlife Monitoring Summary Report comments, for potential improvement to data collection and reporting in 2022. Report sections influenced by these discussions include the caribou behaviour monitoring, road closure, convoy information, caribou migration, viewshed versus road survey, and the camera program. The 2022 Wildlife Monitoring Summary Report (Appendix 47) addressed outcomes of the TAG discussions.

#### *8.18.2.1.2.4 Caribou Behaviour*

Agnico Eagle collects different types of behaviour data on caribou that are used to inform on mine-related effects to caribou and mitigation effectiveness. Agnico Eagle presented the 2021 results of this monitoring program with the TAG, in February 2022. Based on this review, Agnico Eagle endeavored to incorporate all the suggestions of the TAG into the 2022 data collection process and analysis. The complete methodologies and result are provided in Appendix 47.

#### *8.18.2.1.2.5 Road vs Viewshed Comparison*

Presentation was given to the TAG in November/December 2022 regarding the comparison of the distance and direction of caribou observations from road and viewshed surveys. The complete result and discussion is presented in Section 17 of the Wildlife Monitoring Summary Report (Appendix 47), focusing on the maximum distance caribou were detected from the road and associated direction (i.e., side of road), and group size from road and viewshed surveys. It is assumed that viewshed surveys allow observers to detect caribou at further distances than road surveys.

#### *8.18.2.1.2.6 TAG Decision Tracking*

Discussions were held in 2022 with the TAG members to improve the processes of the decision making for any advice, decisions and recommendations made by the TAG. A decision tracker was developed, and will be further enhanced to have a signoff of TAG members on the important recommendations of the TAG.

#### *8.18.2.1.2.7 Snow Study*

As per previous years, snow studies remains one of the main topics during the TAG meetings. In 2022, a presentation was given to the TAG members regarding the snow study power analysis. Suggestions from the TAG members were received and Agnico Eagle will look at their integration for the 2023 study. Complete results and discussion of the 2022 field season are provided in Section 17 of the Wildlife Monitoring Summary Report (Appendix 47).

### 8.18.3 Wildlife Crossing Whale Tail Site

**As required by NIRB Project Certificate No.008 Condition 32:** ***The Proponent shall engage with the Baker Lake Hunters and Trappers Organization and other relevant parties to ensure that safety barriers, berms, and designed crossings associated with project infrastructure, including the haul road, are constructed and operated as necessary to allow for the safe passage of caribou and other terrestrial wildlife. Summaries of engagement with the Baker Lake Hunters and Trappers Organization regarding implementation of this condition shall be provided to the Nunavut Impact Review Board along with details of the selected crossings in the Proponent's annual report to the Nunavut Impact Review Board.***

Following consultation of the Baker Lake HTO, Agnico Eagle re-sloped, in previous years, the Whale Tail Haul Road at KM 127 to facilitate the wildlife passage in this area. BLHTO came back once the re-sloping was finalized and did not express any other concerns.

Within the TAG meetings, permeability and road design discussions are ongoing and will meet the satisfaction of all parties. Different projects are also ongoing and are being discussed at the TAG meetings, including monitoring movement of caribou with cameras. The TAG projects will be highly useful into the determination of the preferred wildlife passage and behavior in the field.

As part of the Whale Tail expansion project, Agnico Eagle has committed to conduct an analysis of available scientific and IQ caribou data (including collar, road sightings, trails, oral testimony and mapping) to determine sections of the Haul Road that are most likely to be used by migrating caribou. In July 2019, Agnico Eagle submitted to NIRB and TAG members a memo to fulfill this commitment. Following this submission, only the KivIA provided comments. Agnico Eagle submitted a revised version in August 2019 and received comments from KivIA. Agnico Eagle presented the updated report to the TAG on November 26th, 2019 for final approval. A site visit was organized for TAG members in November 2022. The Whale Tail Haul Road was observed on the field to discuss caribou obstruction. It is Agnico Eagle's understanding that flags are a more important nuisance needing addressing than further refining the Road's slope design. Further discussion remains needed to conclude the design requirement. Following this, a Construction Plan, will be provided to TAG members and the NIRB, if the WTHR enlargement to its full permitted width is required.

### 8.18.4 Wildlife Mortality Whale Tail Site

**As required by NIRB Project Certificate No.008 Condition 33:** ***A summary regarding all wildlife incidents reported, including a reference to whether compensation was or will be provided by the Proponent for direct mortalities, as well as a description of any other steps taken in fulfillment of this term and condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board. The Proponent shall provide wildlife incident reports to the appropriate authorities in a timely fashion. Wildlife incident reports should include the following information:***

> ***a) Locations (i.e., latitude and longitude), species, number of animals, a description of the animal activity, and a description of the gender and age of animals if possible;***
>
> ***b) Prior to conducting project activities, the Proponent should map the location of any sensitive wildlife sites such as denning sites, calving areas, caribou crossing sites, and raptor nests in the project area, and identify the timing of critical life history events (i.e., calving, mating, denning and nesting); and***
>
> ***c) Additionally, the Proponent should indicate potential impacts from the project, and ensure that operational activities are managed and modified to avoid impacts on wildlife and sensitive sites.***

Section 3.6.9 of the 2022 Wildlife Monitoring Summary Report (Appendix 47) describes road-related wildlife mortalities. Table 3-17 of the 2022 Wildlife Summary Report presents the wildlife mortalities related to the All-weather Access Road, and Whale Tail Haul Road in 2022. Arctic hare, Ptarmigan, Wolverine and arctic ground squirrel can be found within that table. As per the IIBA Schedule J, Item 6.1, compensation was sent to KivIA for the wolverine mortality.

Upon discovery of any roadkill remains that had not been reported to Environment staff, employees were reminded of road rules and the need to enforce these rules by Environment staff and/or road supervisors.

All employees are regularly reminded at toolbox meetings that all Project-related incidents are to be reported and that wildlife have the right-of-way at all times. Mine staff are required to stop vehicles and wait for wildlife to crossroads. No feeding wildlife and waste management practices are also regularly reviewed with employees. There were no project-related caribou, grizzly bear, or wolf mortalities associated with the AWAR or WTHR in 2022.

Section 4.5.8 of the 2022 Wildlife Monitoring Summary Report (Appendix 47) provide a summary of recorded wildlife fatalities near or within the Meadowbank and Whale Tail mine sites. One wildlife project-related mortality, a wolverine, was observed at Meadowbank in 2022. At the Whale Tail Mine, there were three Arctic fox and two Arctic hare project-related mortalities. As per the IIBA Schedule J, Item 6.1, compensation was sent, for the wolverine and arctic foxes, to KivIA and the complete report regarding these incidents were sent to the GN Conservation officer and KivIA. No other wildlife mortalities associated with the Mine sites were reported in 2022.

All 2022 project-related mortality reports are included in of the 2022 Wildlife Monitoring Summary Report.

### 8.18.5 Migratory Birds Protection Plan Whale Tail site

**As required by NIRB Project Certificate No.008 Condition 34:** ***The Proponent will maintain a Migratory Birds Protection Plan for the Project in consultation with Environment and Climate Change Canada and other interested parties. The plan should include and/or demonstrate that the Proponent give consideration to the following:***

- ***Information obtained from baseline characterization of migratory bird and vegetation communities within the predicted flood area;***
- ***Results of field tests and/or the thorough literature review of the effectiveness of preferred deterrence prior to actual flooding; and***
- ***Details regarding monitoring the effectiveness of mitigation measures during flooding.***

***Results of implementation of the Migratory Birds Protection Plan shall be reported to the Nunavut Impact Review Board on an annual basis in the Proponent's annual report.***

In July, 2018, Agnico Eagle developed the Migratory Bird Protection Plan as an appendix of the TEMP. As recommended by ECCC, Agnico Eagle updated that plan in 2020 based on results of research studies. The updated Migratory Bird Protection Plan (V3, March 2020) was provided as Appendix 64 of the 2019 Annual Report.

The 2022 Migratory Bird Protection update is provided in Section 14 of the 2022 Wildlife Summary Monitoring Report (Appendix 47), and summarized below. Note: No further monitoring is scheduled under this plan since flooding and related onsite research studies are complete.

Through collaboration with Trent University and ECCC, research studies were initiated in 2018 to determine the effectiveness of planned mitigation measures for migratory birds during flooding of the Whale Tail South area. This study was conducted over three field seasons (2018, 2019, 2021) - before, during and after flooding. The three objectives of this study were to:

1. Determine the efficacy of various audio and visual deterrents in preventing flood-zone nesting.

2. Estimate the number of nests and the species composition lost due to the flooding.

3. Examine the behavioural response of birds to:

    a. deterrents (e.g., impacts to duration on the nest) and

    b. flooding (determine whether birds re-nested nearby after the flooding events).

Complete methods and results for Objectives 1, 2, and 3a are published and available online in the Trent University MSc Thesis "*Assessing and Mitigating the Impacts of Mining-Induced Flooding on Arctic-Nesting Birds*" (Holmes, 2022) and are not revisited further here. A manuscript focussing on the investigation into the effectiveness of deterrents was submitted for publication in late 2021, and after receiving comments in 2022, revisions continue.

Complete methods and results related to Objective 3b were provided in Appendix A of the 2021 Migratory Bird Protection Report (Appendix 47 of the 2021 Annual Report), with further data analysis planned for 2022. Briefly, Holmes (2022) found no statistically significant differences in average nest or territory density between flood zone and adjacent upland control plots prior to flooding (2018) and during flooding (2019), indicating no significant evidence of birds' territory packing into habitats adjacent to flooded areas.

Follow-up studies in 2021 (Appendix A of the 2021 Migratory Bird Protection Report) did indicate average number of nests and average bird density increased from 2019 (during flooding) to 2021 (post-flood) in non-flooded plots, and nest density decreased in previously flooded plots, supporting a hypothesis of birds moving their nesting sites to areas adjacent to flooding.

Further analysis in 2022 examined this behavioural response through individual re-sightings. In total six individual Lapland Longspur were re-sighted around Whale Tail Lake. Of these, one was re-sighted in the same year (2019) while the others were sighted pre- and post-flood. On average, these birds moved 180 m, and moved uphill an average of 4.08 masl. In addition, six individual Semipalmated Sandpipers nesting around Whale Tail Lake were re-sighted. These birds moved their nesting site an average of 151 m, and moved downhill an average of 0.18 masl (two birds moved <5 m from the original nest, and the others moved 25 m, 45 m, 348 m, and 483 m). While re-sighting sample sizes are small, these data taken together at least anecdotally support the hypothesis that birds re-nest nearby post-flood (Objective 3b).

The complete analysis and report on behavioural responses will be included in a second Trent University MSc Thesis manuscript, expected to be submitted in 2023. References for any publications produced in 2023 will be provided in the 2023 Annual Report, but otherwise reporting under the Migratory Bird Protection Plan is considered complete at this time.

### 8.18.6 Species at Risk Whale Tail Site

**As required by NIRB Project Certificate No.008 Condition 35:** ***The Proponent shall ensure that the mitigation and monitoring strategies developed for Species at Risk are updated as necessary to maintain consistency with any applicable status reports, recovery strategies, action plans, and management plans that may become available through the duration of the Project. Information regarding development, implementation and monitoring of the measures developed by the Proponent in fulfillment of this term and condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board.***

The intent of the federal Species at Risk Act, is to protect species at risk from becoming extirpated or extinct as a result of human activity. Species with ranges that overlap with the Mine, may be considered to be of concern as a result of either their national, territorial or Committee on Status of Endangered

Wildlife in Canada (COSEWIC) status. To date, no species have been listed under the Nunavut Species at Risk Act.

There are six wildlife species of concern with breeding or wintering ranges that overlap with the Mine (Table 8-86). In November of 2016, caribou were designated as threatened by COSEWIC (2016).

**Table 8-86 Species of Concern Meadowbank and Whale Tail Study Areas**

| Species | COSEWIC Assessment | Federal Species at Risk Act | Potential Impact |
|---|---|---|---|
| Caribou (barren-ground population) | Threatened | No status | • Direct habitat loss<br>• Indirect habitat loss from sensory disturbance |
| Grizzly bear (western population) | Special Concern | Schedule 1 Special Concern | • May be attracted to developments if food is available<br>• Direct habitat loss |
| Wolverine (western population) | Special Concern | Schedule 1 Special Concern | • May be attracted to developments if food or shelter is available<br>• Direct habitat loss |
| Peregrine Falcon (anatum-tundrius complex) | Not at risk | No status | • Direct habitat loss |
| Short-eared Owl | Threatened | Schedule 1 Special Concern | • Direct habitat loss |
| Red-necked Phalarope | Special Concern | Schedule 1 Special Concern | • Direct habitat loss |

Agnico Eagle will ensure that the mitigation and monitoring strategies developed for Species at Risk are updated as necessary to maintain consistency with any applicable status reports, recovery strategies, action plans, and management plans that may become available through the duration of the Mine. Updates to the Species at Risk will be considered during annual review and with each new revision of the TEMP.

### 8.18.7 Invasive Vegetation Species

**As required by NIRB Project Certificate No.008 Condition 25:** ***At least 30 days prior to first shipment of equipment and supplies to the site, the Proponent's mitigation plans, protocols, monitoring and inspection program required in fulfillment of this term and condition shall be provided to the NIRB for review. Subsequently, information regarding inspections, monitoring results, and any reports as referenced above shall be included in the Proponent's annual report to the NIRB. The Proponent shall:***

> ***a) Ensure that equipment and supplies brought to the project sites are clean and free of soils that could contain plant seeds or organic matter not naturally occurring in the area***
>
> ***b) Ensure that vehicle tires and treads are inspected prior to initial use in project areas;***

***c) Incorporate protocols for monitoring for the potential introduction of invasive vegetation species (e.g. surveys of plant populations in previously disturbed areas) into relevant monitoring and management plans for the terrestrial environment; and***

***d) Ensure any introductions of non-indigenous plant species must be promptly reported to the Government of Nunavut Department of Environment.***

In 2019, Agnico Eagle initiated a non-native plant monitoring study to assess and monitor the potential introduction of non-native plant species, including weeds or invasive species. Subsequent monitoring events occurred in 2020, 2021 and 2022. Surveys will continue to be completed annually as per the TEMP Version 7. Complete 2022 results are presented in Section 16 of the 2022 Wildlife Monitoring Summary Report – Appendix 47. Agnico Eagle will refer to the complete report in Appendix as the below is a summary of the results.

Surveys at the Meadowbank Complex were conducted by a Golder vegetation ecologist between July 20$^{th}$ to 26$^{th}$, 2022. The Meadowbank Complex area includes the AWAR, WTHR, Baker Lake tank farm, Whale Tail Mine site, and Meadowbank Mine site areas.

Species were documented as they were encountered. Non-native plant surveys consisted of targeted surveys focused within high-priority or high-potential areas within the Project footprint. The high-potential areas were identified as the Project area perimeter, highly trafficked areas (e.g., fuel station), areas surrounding buildings, shipping containers, along existing roads/trails or areas of disturbance within the Project area, as well as adjacent to the AWAR and WTHR road. High potential areas also included survey locations from 2019 to 2021 where non-native plants were observed. In areas where non-native species were observed, meander surveys were conducted outside of the disturbance footprint to determine if these species had established in the native tundra. Given the length of the AWAR and WTHR, the roads were travelled via vehicle at slow speeds, while observers looked for obvious signs of weed infestations along road margins. Periodic stops were undertaken to complete meanders in areas with high potential for weed occurrences (e.g., pull-outs, work areas, road-side quarries, and other areas with disturbed substrates). A GPS was used to collect a track file of the meander route and point locations of surveys conducted.

A total of 193 individual locations were surveyed for non-native plants in 2022. This number is slightly lower than the number of survey locations in 2021 (202 locations) however, some locations around the Meadowbank Mine Site were eliminated as some populations of previously observed plants had merged together. Locations assessed included the Whale Tail and Meadowbank Mine footprint areas, the sides of the haul roads, quarries adjacent to the haul roads, undisturbed tundra, the airstrip and the Baker Lake tank farm.

No non-native plants, as identified by the CESCC, were recorded along the AWAR, WTHR, Baker Lake tank farm, Whale Tail and Meadowbank Mine sites. Eleven surveys were completed in undisturbed tundra to survey the presence/absence of non-native weeds. No non-native plants were found in the undisturbed areas surveyed.

From 2019 to 2021, many observations of what was then identified as flixweed (*Descurainia ophiaa*) were reported. A specimen of this species was collected in July 2022 and sent to the Canadian Museum of Nature for identification by a botanist. The specimen was confirmed to be the native species, northern tansy mustard (*Descurainia sophioides*). This species is a biennial herb that colonizes gravel bars, roadsides, waste sites and disturbed soils which is why it is so abundant at the Meadowbank site.

Trials of eradication on what were thought to be flixweed populations, but are now known as northern tansy mustard, were implemented in July 2021 at the Meadowbank Mine site. In total 17 sites underwent trails involving a combination of geotextile placement, hand pulling and mechanical removal. Results of these trials and more information regarding non-native plant surveys can be found in Section 16 of the 2022 Wildlife Monitoring Summary Report – Appendix 47. The eradication trials will be suspended now that it is known that northern tansy mustard is a native species.

Similarly, previous annual reports have reported the non-native species, scentless chamomile (*Tripleurospermum inodorum*). Scentless chamomile is very similar to the native species sea mayweed (*Tripleurospermum maritima*). Upon closer inspection by WSP ecologists, the populations observed in previous years have been confirmed to be the native species, sea mayweed.

The populations of non-native species of lamb's quarters (*Chenopodium album*) and alsike clover (*Trifolium hybridum*) were observed in 2020. There have been no observations of these species in the years since 2020.

Furthermore to the study detailed above, Agnico Eagle continued to implement in 2022, in accordance with the TEMP, a protocol to ensure that all equipment and bulk supplies must arrive to the mine site free of soil or plant debris to minimize the risk of invasive plant introduction. Invasive plant inspection surveys was completed on cargo in Becancour, prior to being loaded onto shipping vessel. Carrier had closely follow the procedure and have confirmed that each equipment/sea can was free of invasive plant.

## 8.19 COUNTRY FOOD

**As required by NIRB Project Certificate No.004 Condition 67: *Develop and implement a program to monitor contaminant levels in country foods in consultation with HC; a copy of the plan shall be submitted to NIRB's Monitoring Officer.***

Agnico Eagle monitors risk to both wildlife receptors and humans from consumption of country foods under the Wildlife and HHRA Country Foods Screening Level Risk Assessment Plan (a component of the Terrestrial Ecosystem Management Plan). Following the last plan submission to the NIRB (Version 6; April 2022 – Appendix 48 of the 2021 Annual Report) this plan has been updated to Version 7 in August 2022 (submitted to NIRB along with Agnico Eagle's response to the 2021 Annual Report comments) and Version 8 January 2023 (Appendix 48 of this report) to address ECCC comments received in June 2022 on shorebird diet (% obtained from the TSF increased from 13% to 100%; as further discussed below) and to add methods for collection and analysis of tailings sediment samples for use in the shorebird risk assessment.

The last Wildlife and Country Foods Screening Level Risk Assessment report was completed in 2021 (scheduled every 3 years during mine operation) and was provided as Appendix 46 of the 2021 Annual Report. In response to ECCC comments on this report received June 2022, Agnico Eagle provided a technical memorandum in December, 2022, summarized as follows:

As part of the 2021 Wildlife and Country Foods Screening Level Risk Assessment (WSLRA) for the Meadowbank Complex (Appendix 46 of the 2021 Annual Report to the NIRB), a risk characterization for Semi-Palmated Sandpiper was conducted to understand potential risk for shorebirds making use of the tailings storage facility (TSF) as habitat.

In that 2021 assessment, the exposure characterization assumed birds spend two weeks of the year in the vicinity of the TSF, and during this time obtain 13% of their food and 100% of their water from the TSF. As detailed in the 2021 WSLRA Report, these assumptions were based on recorded observations of bird presence in the TSF from the site's Wildlife Monitoring Summary Reports (2016 – 2021), and 2021 analysis of benthic invertebrate density in TSF sediment samples (approximately 13% of reference levels).

However, in their June 2022 comments on the 2021 WSLRA Report, ECCC requested that Agnico Eagle re-calculate risk using more conservative exposure assumptions of 100% of food (benthic invertebrates) obtained from the TSF during a 1-month time-in-area. This re-analysis was provided to ECCC in August, 2022, as part of the Agnico Eagle's response to Meadowbank Complex annual report comments received via the NIRB process. With the revised exposure assumptions, three contaminants of potential concern (COPCs) showed potential for non-negligible risk requiring further analysis (hazard quotient (HQ)>1): arsenic, chromium, and cyanide. To further refine this risk characterization, Agnico Eagle committed to providing a follow-up calculation incorporating analysis of COPCs directly in tailings beach sediment, since the 2021 WSLRA Report and August 2022 re-calculation instead made use of mill effluent analyses collected for operational purposes. This re-analysis provides a more representative assessment, since TSF sediment is the actual media that birds and benthic invertebrates are exposed to, rather than direct mill effluent.

In July and September 2022, tailings beach surface sediment samples were collected from the North and South Cells. For all COPCs except arsenic, HQs were less than the risk threshold of 1, so risk to Semi-Palmated Sandpiper is classified as negligible for those COPCs. Because of the conservative assumptions included at this level of assessment, there is generally considered to be a high degree of certainty associated with results indicating negligible risk.

The risk estimate for arsenic marginally exceeded 1 (HQ = 1.1), so a further exploration of the risk characterization may be warranted for this COPC. In this case, the risk estimate marginally exceeded the threshold for negligible risk, and certain assumptions are likely contributing to an over-estimate of exposure - in particular, the assumption that 100% of food is obtained from the TSF over a one-month period, despite active use of deterrents and reduced densities of invertebrates in TSF sediment. Risk to Semi-Palmated Sandpiper is still considered improbable, however, Agnico Eagle will conduct follow-up testing in 2023 including sampling for sediment chemistry and benthic invertebrate density to better characterize exposure.

## 8.20 ARCHAEOLOGY

### 8.20.1 Meadowbank and Whale Tail Sites

**As required by NIRB Project Certificate No.004 Condition 69:** ***carry out the Project to minimize the impacts on archeological sites, including conducting proper archeological surveys of the Project area (including the all-weather road and all quarry sites); [Cumberland] shall provide to the GN an updated baseline report for archeological sites in the Project area.***

And

**As required by NIRB Project Certificate No.004 Condition 70:** ***shall report any archeological site discovered during the course of construction, including a burial site, immediately and concurrently to the GN and KivIA. Upon discovering an archeological site, Cumberland shall take all reasonable precautions necessary to protect the site until further direction is received from the GN. In the event that it becomes necessary to disturb an***

***archaeological site, Cumberland shall consult with Elders, GN and KivIA to establish a site specific mitigation plan, and obtain all necessary authorizations and comply with all applicable laws.***

And

**As required by CIRNAC Land Lease 66H/8-1-4 Condition 66:** ***If an archaeological site is discovered with the Land, the lessee shall immediately advise the Minister and the Territorial Archaeologist in writing.***

And

**As required by NIRB Project Certificate No.008 Condition 55:** ***The Proponent shall conduct archaeological surveys prior to land disturbance related to the Project and report survey results to applicable parties, including the Government of Nunavut – Department of Culture and Heritage. Evidence of meeting the requirements of this term and condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board.***

And

**As required by NIRB Project Certificate No.008 Condition 56:** ***The Proponent shall report any archaeological site discovered during the construction, operation, and closure phases to the Government of Nunavut – Department of Culture and Heritage and the Kivalliq Inuit Association. Upon discovering an archeological site, the Proponent shall:***

- ***Take all reasonable precautions necessary to protect the site until further direction is received from the Government of Nunavut – Department of Culture and Heritage; and***
- ***If it becomes necessary to disturb an archaeological site, the Proponent shall consult with the Government of Nunavut – Department of Culture and Heritage, the Kivalliq Inuit Association, and potential impacted communities to establish a site specific mitigation plan, and obtain all necessary authorizations and comply with all applicable laws.***

***Evidence of meeting the requirements of this term and condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board.***

In 2022, Nunami Stantec conducted Archaeological Impact Assessment studies under Nunavut Archaeological Permit 2022-47A for different project components at the Meadowbank Complex: two areas along the AWAR and three proposed new/expanded quarries along the Whale Tail Haul Road between Meadowbank and Whale Tail. In addition, an archaeological site located along the AWAR between Baker Lake and Meadowbank was revisited to update the site status and acquire updated GPS locations of site features relative to an existing quarry. The archaeological studies were requested to identify archaeological sites that could potentially be impacted by development activities, to facilitate avoidance of archaeological sites.

During the assessment, four archaeological sites were investigated, including three previously recorded sites (two campsites, one inuksuk) and one newly recorded site (inuksuk).

Stantec has submitted to the GN Cultural and Heritage department the 2022 Archaeological Impact Assessment Report. This report and the information contained in it are confidential and therefore were submitted directly to the GN Cultural and Heritage department. Requests for information should be made directly to the GN.

## 8.21 CLIMATE MONITORING

### 8.21.1 Meadowbank Site

**As required by NIRB Project Certificate No.004 Condition 21:** ***shall fund and install a weather station at the mine site to collect atmospheric data, including air temperature and precipitation.***

During the technical meeting and pre-hearing conference held in Baker Lake on January 14 -15, 2015 regarding the NWB Water License renewal, CIRNAC mentioned that *climate data provide important input for interpreting site-specific geothermal aspects, such as the rate of mine waste freezeback and active layer thicknesses, for permafrost encapsulation of the mine wastes. In addition, the previous year's climate is useful for interpreting the hydrology and water balance for the site.*" It was recommended that the annual monitoring report summarize monthly climatic conditions at the Meadowbank site over a 12-month period. Table 8-87 includes average, minimum and maximum air temperatures, average and maximum wind speed as well as daily average, total and maximum volume of precipitation (rainfall / snowfall) on site. It should be noted that Agnico Eagle does not have a snow gauge but rather a rain gauge. For this reason, snow precipitations are reported as mm of rain.

In 2022, temperatures and winds recorded were similar to annual trends observed from 2009-2021. The coldest temperature was -42.07°C and warmest temperature was 27.87°C. The maximum wind speed recorded in 2022 was 30.40 m/s. Total precipitation in 2022 (226.30 mm) were lower than 2021 (355.48 mm) but remain within the annual precipitation range from previous years: 2020 (168.99 mm), 2019 (334.54 mm) 2018 (154.38 mm), 2017 (268.35 mm) and 2016 (299.45 mm). Figures 30, 31 and 32 below show, respectively, the temperature average, wind speed average and total precipitation data from 2009-2022.

**Table 8-87 Meadowbank 2022 monthly climate data**

| Month | Temperature Average | Temperature Max | Temperature Min | Wind Speed Average | Wind Speed Max | Total Precipitation | Daily average Precipitation | Max Precipitation |
|---|---|---|---|---|---|---|---|---|
| | ºC | ºC | ºC | m/s | m/s | mm | mm | mm |
| January | -30.96 | -19.24 | -37.85 | 5.85 | 18.40 | 3.35 | 0.11 | 0.80 |
| February | -34.70 | -24.67 | -42.07 | 5.75 | 18.29 | 1.95 | 0.07 | 0.90 |
| March | -24.77 | -9.38 | -38.39 | 5.92 | 16.91 | 0.00 | 0.00 | 0.00 |
| April | -18.50 | -4.66 | -30.47 | 4.25 | 15.78 | 5.40 | 0.18 | 3.85 |
| May | -5.21 | 5.22 | -19.68 | 6.20 | 18.15 | 6.90 | 0.22 | 3.10 |
| June | 8.68 | 22.73 | -0.43 | 4.98 | 17.76 | 26.25 | 0.88 | 8.25 |
| July | 15.54 | 27.87 | 4.51 | 4.52 | 18.72 | 15.90 | 0.51 | 3.50 |
| August | 10.82 | 27.58 | 0.99 | 5.90 | 21.32 | 22.65 | 0.73 | 6.50 |
| September | 4.53 | 15.11 | -3.76 | 6.68 | 24.19 | 80.35 | 2.68 | 35.50 |
| October | -4.48 | 8.83 | -20.81 | 7.65 | 30.40 | 46.75 | 1.51 | 15.40 |
| November | -20.71 | -8.13 | -33.21 | 4.53 | 17.52 | 7.15 | 0.24 | 2.70 |
| December | -27.07 | -9.58 | -36.89 | 5.23 | 19.70 | 9.65 | 0.31 | 2.85 |
| Total | N/A | N/A | N/A | N/A | N/A | 226.3 | N/A | N/A |
| Average | -10.57 | 2.64 | -21.50 | 5.62 | 19.76 | N/A | 0.62 | 6.95 |

**Figure 30 Meadowbank Site Temperature Average 2009-2022**

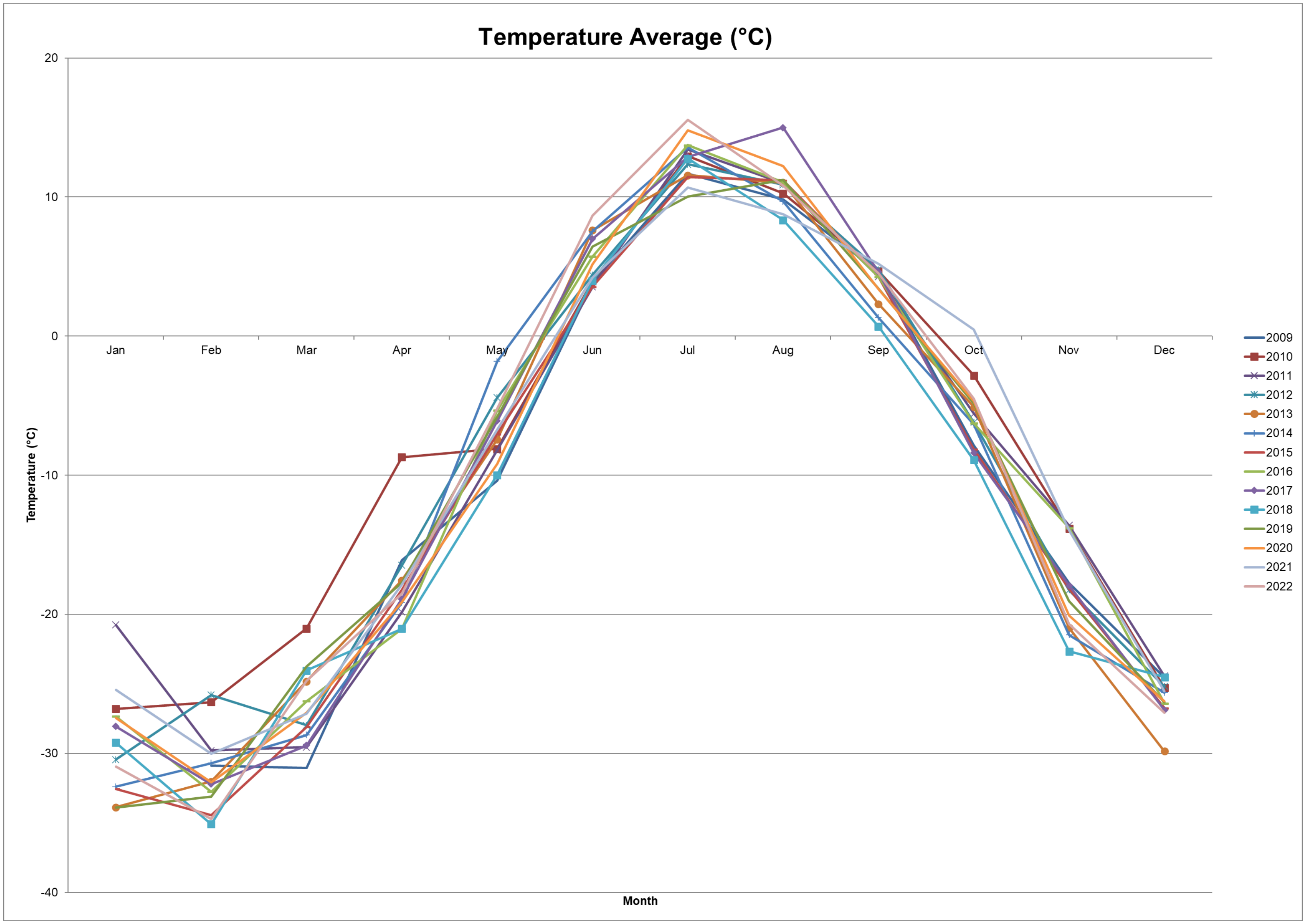


**Figure 31 Meadowbank Site Wind Speed Average 2009-2022**

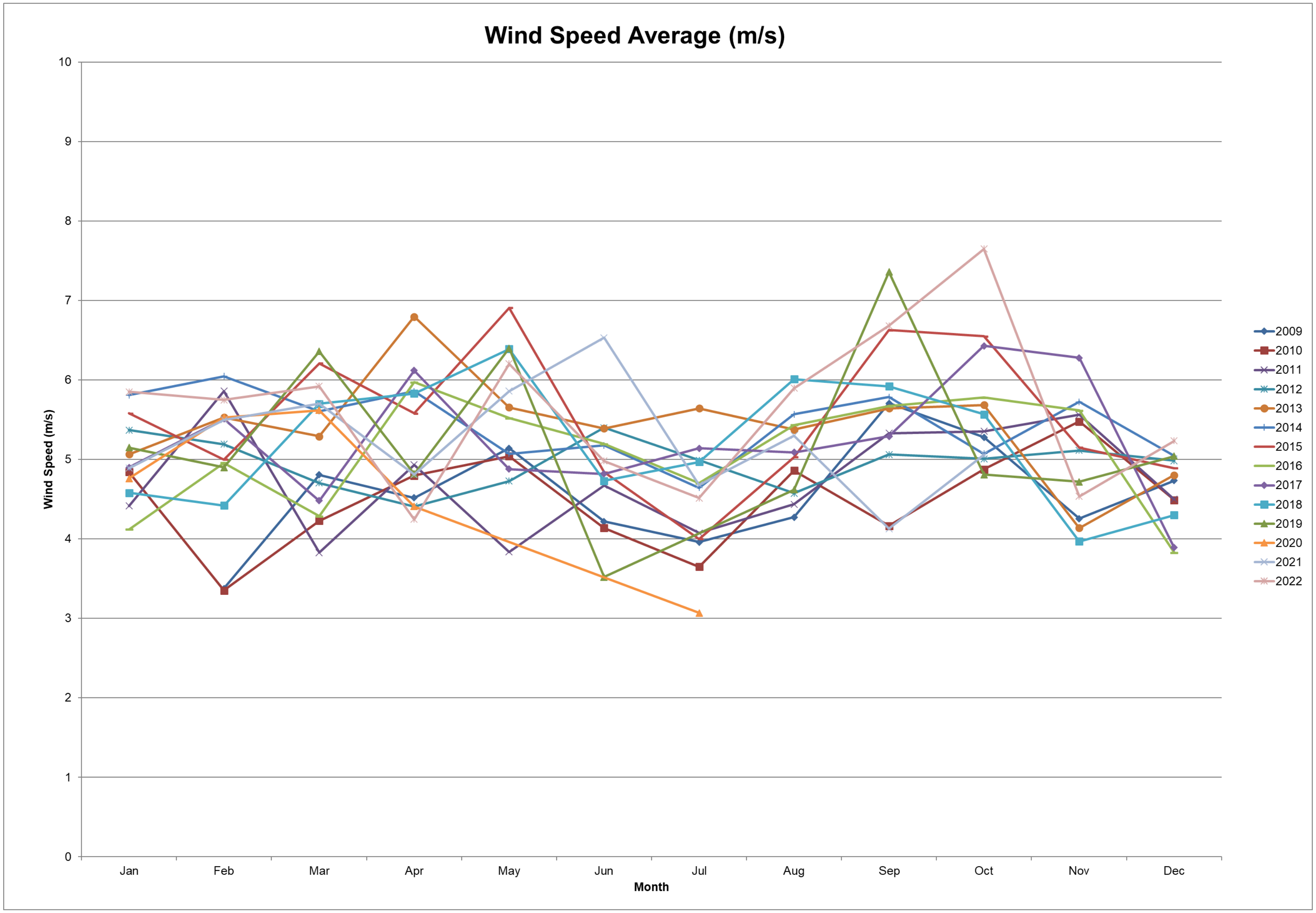
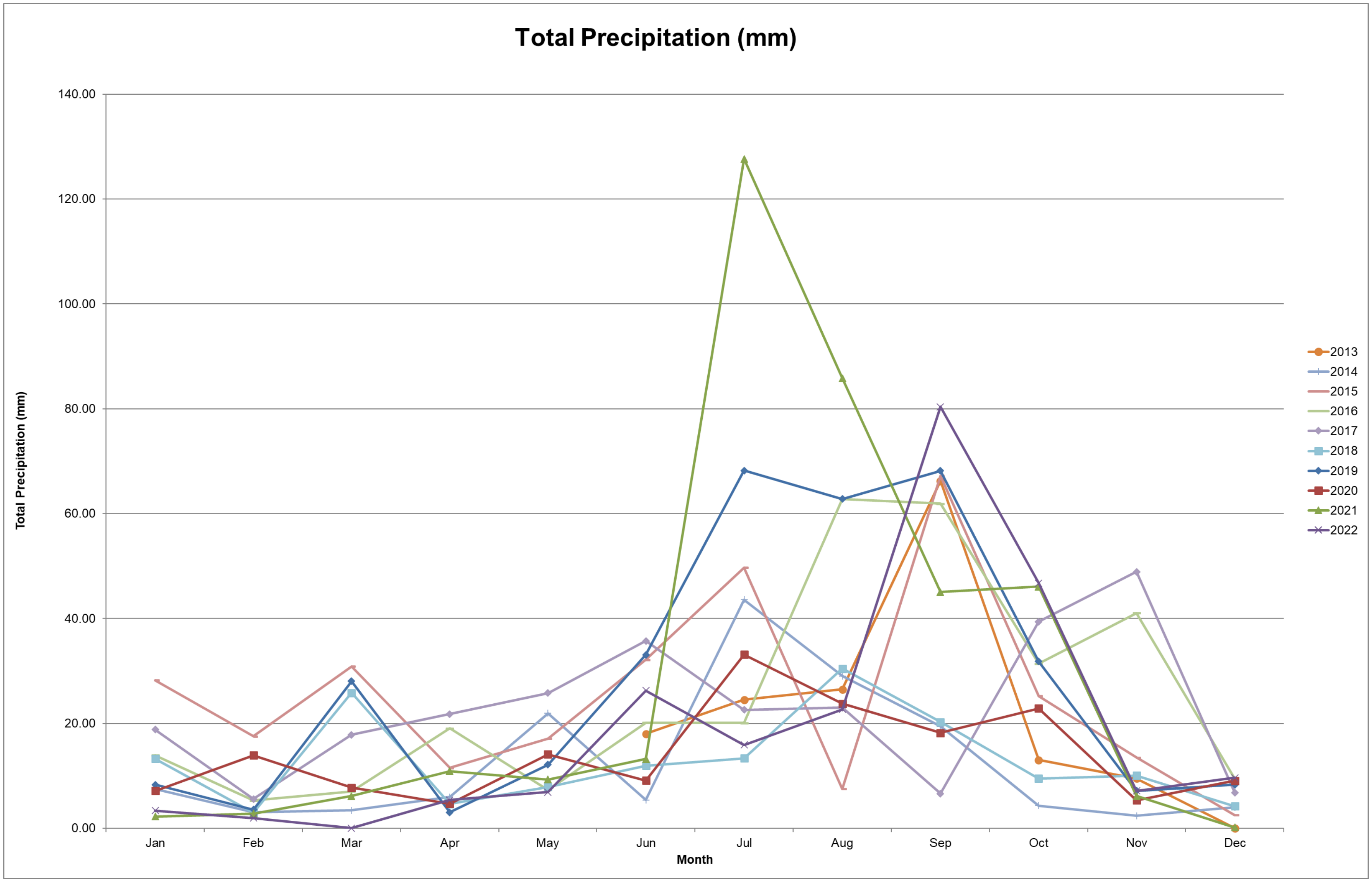


**Figure 32 Meadowbank Site Total Precipitation 2013-2022**



### 8.21.2 Whale Tail Site

The meteorological station at Whale Tail was functional for the whole year of 2022. Table 8-88 includes average, minimum and maximum air temperatures, average and maximum wind speed as well as daily average, total and maximum volume of precipitation (rainfall / snowfall) on site. It should be noted that Agnico Eagle does not have a snow gauge but rather a rain gauge. For this reason, snow precipitations are reported as mm of rain.

In 2022, temperatures, winds and precipitation recorded were similar to the data obtained for Meadowbank Site and to historic data from Meadowbank and Baker Lake from 2009-2021. Figure 33, 34 and 35 below show, respectively, the temperature average from 2018-2022, wind speed average from 2018-2022 and total precipitation data for 2019-2022. The coldest temperature for Whale Tail in 2022 was -42.61 °C and warmest temperature was 28.77°C. The maximum wind speed recorded in 2022 was 22.01 m/s. Total precipitation at Whale Tail site in 2022 (293.40mm) were lower than 2021 (325.90 mm) and 2019 (352.58 mm), but higher than 2020 (198.05 mm).

**Table 8-88 Whale Tail 2022 monthly climate data**

| Month | Temperature Average | Temperature Max | Temperature Min | Wind Speed Average | Wind Speed Max | Total Precipitation | Daily average Precipitation | Max Precipitation |
|---|---|---|---|---|---|---|---|---|
| | ºC | ºC | ºC | m/s | m/s | mm | mm | mm |
| January | -31.21 | -20.31 | -37.96 | 4.83 | 18.29 | 31.30 | 1.01 | 10.80 |
| February | -34.70 | -23.56 | -42.61 | 4.67 | 15.95 | 7.30 | 0.26 | 1.30 |
| March | -24.61 | -10.02 | -38.99 | 4.69 | 18.01 | 12.30 | 0.40 | 4.20 |
| April | -18.12 | -3.82 | -31.12 | 3.90 | 15.07 | 6.30 | 0.21 | 2.20 |
| May | -5.20 | 8.88 | -20.22 | 5.14 | 17.93 | 14.00 | 0.45 | 6.20 |
| June | 9.44 | 24.78 | -1.81 | 4.11 | 16.54 | 19.80 | 0.66 | 6.20 |
| July | 15.81 | 28.72 | 4.18 | 3.49 | 20.36 | 14.50 | 0.47 | 5.20 |
| August | 10.53 | 28.77 | 0.00 | 4.37 | 20.76 | 32.40 | 1.05 | 6.00 |
| September | 3.95 | 15.69 | -4.62 | 4.95 | 22.01 | 57.80 | 1.93 | 22.40 |
| October | -5.43 | 7.33 | -21.01 | 5.72 | 21.21 | 65.70 | 2.12 | 22.80 |
| November | -21.27 | -9.04 | -34.78 | 3.45 | 13.78 | 11.90 | 0.43 | 3.60 |
| December | -28.04 | -11.09 | -37.90 | 4.53 | 16.01 | 20.10 | 0.77 | 6.50 |
| Total | N/A | N/A | N/A | N/A | N/A | 293.4 | N/A | N/A |
| Average | -10.74 | 3.03 | -22.24 | 4.49 | 17.99 | N/A | 0.81 | 8.12 |

**Figure 33 Whale Tail Site Temperature Average 2018-2022**

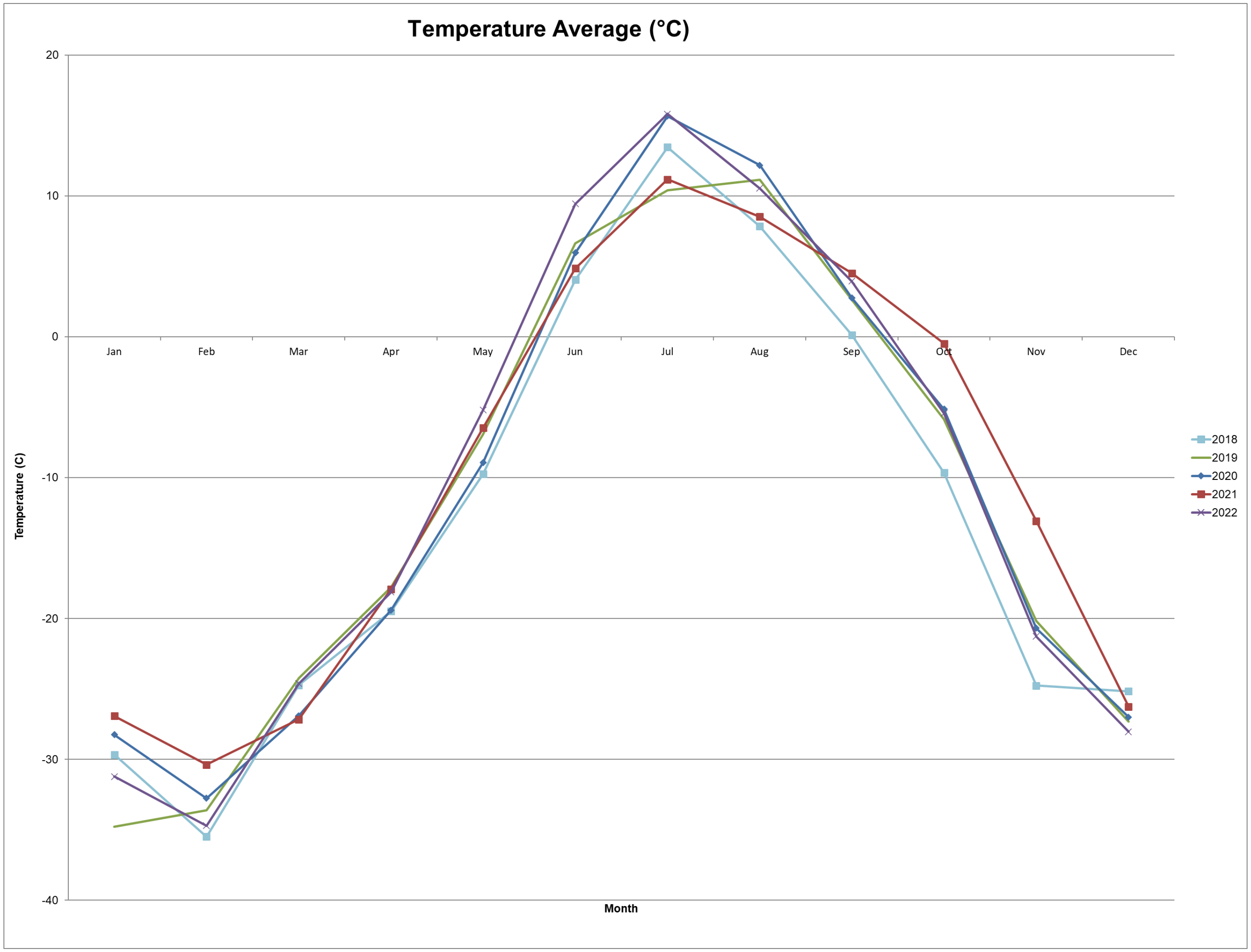


**Figure 34 Whale Tail Site Wind Speed Average 2018-2022**

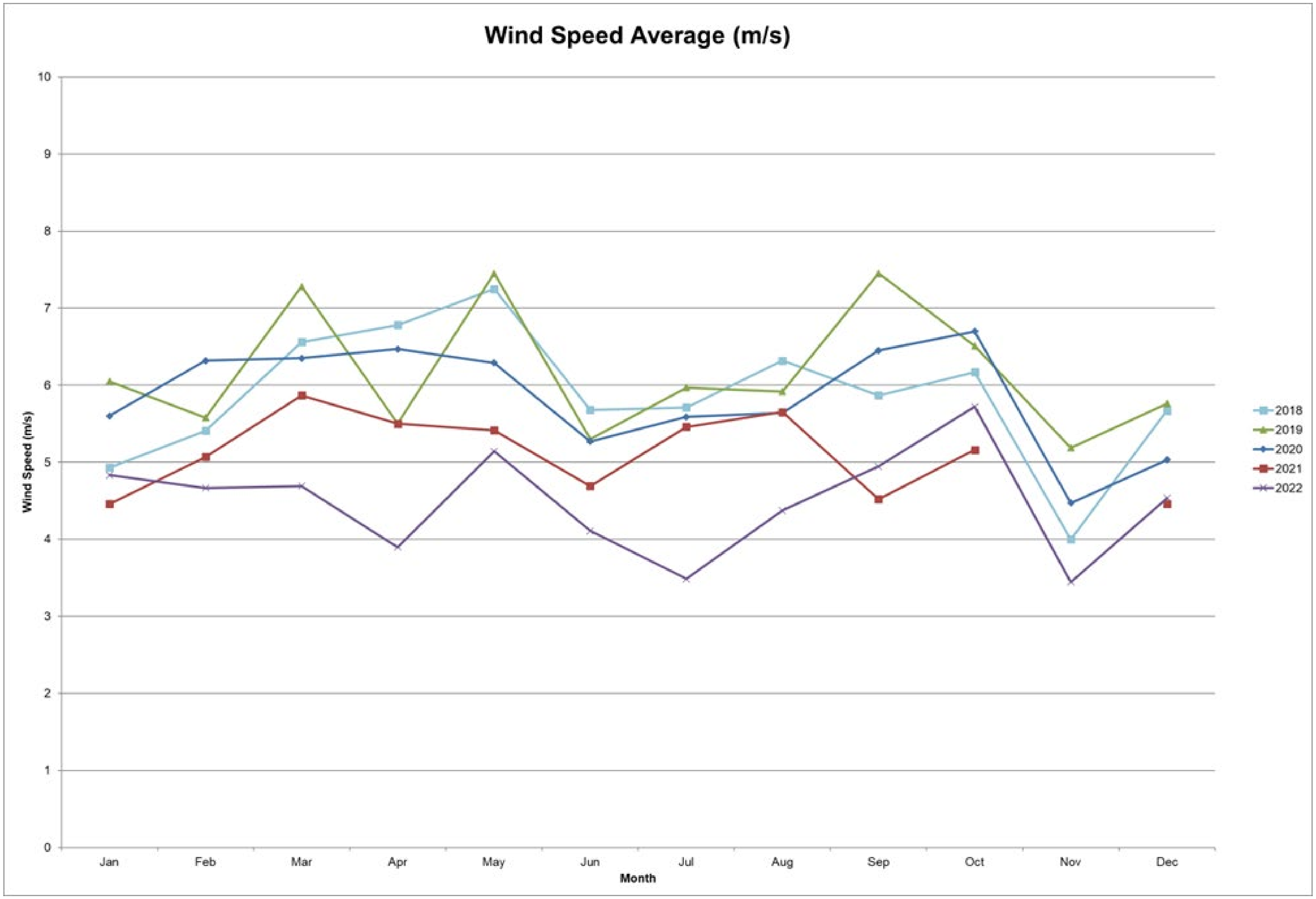
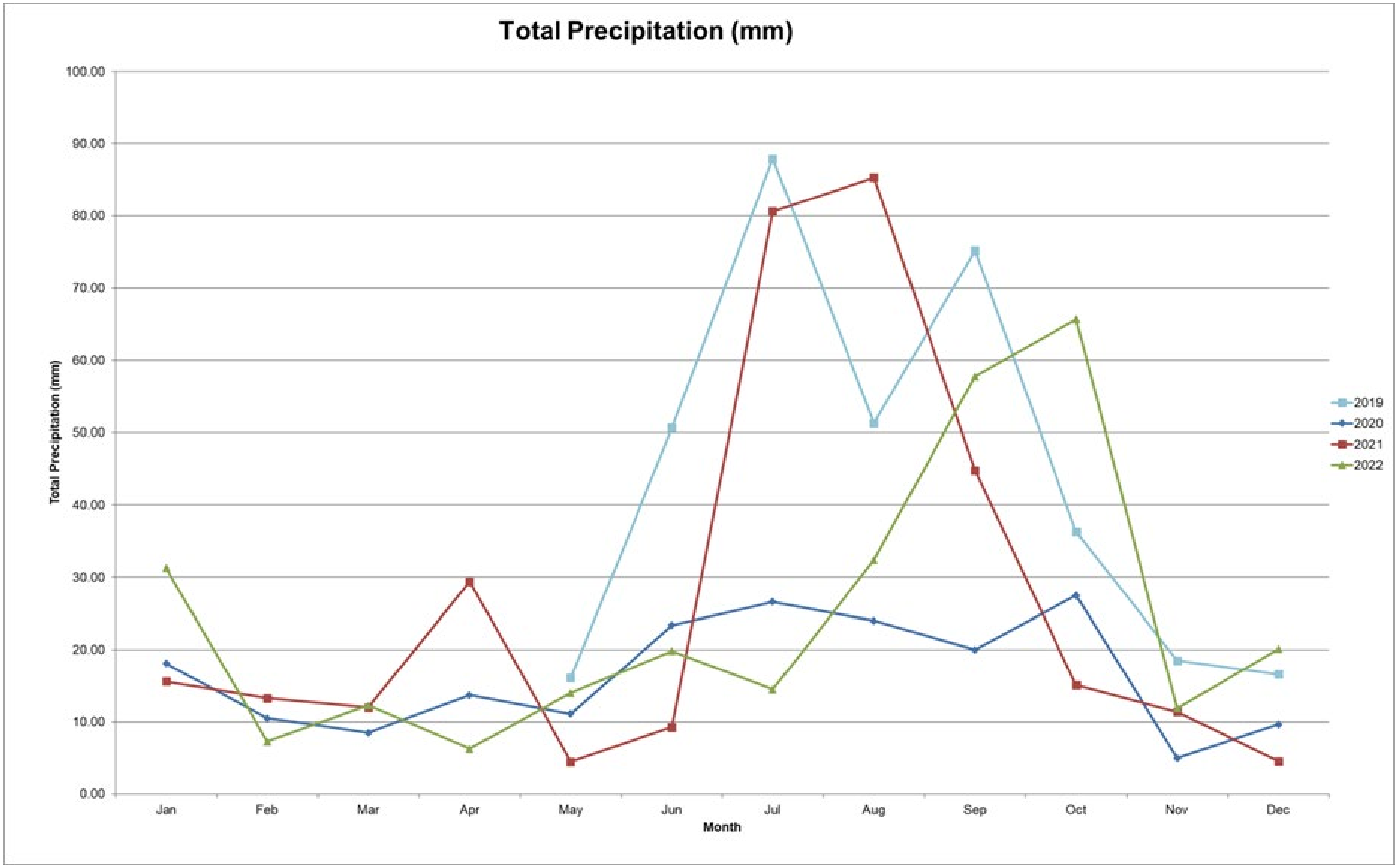


**Figure 35 Whale Tail Site Precipitation 2019-2022**



### 8.21.3 Historic Climate Data

Historic average is provided in Table 8-89 and Figures 36 to 38 below for temperature average, total precipitation and wind speed max. Temperature average were very similar for Meadowbank, Whale Tail and Baker Lake. Precipitation at Meadowbank and Baker show a similar trending. It is difficult to compare the historic data to Whale Tail for precipitation as the data started to be collected only in May 2019. Based on the information collected over three and a half years, Whale Tail has received more precipitation compared to Meadowbank and Baker Lake. For the wind speed max, Meadowbank and Whale Tail have similar trending as Baker Lake.

**Table 8-89 Historic Meadowbank, Whale Tail and Baker Lake monthly climate data**

| Date | Meadowbank (average 2009-2022) | | | Whale Tail (average 2018-2022) | | | Baker Lake (average 2009-2022) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Temperature Average | Wind Speed Max | Total Precipitation | Temperature Average | Wind Speed Max | Total Precipitation | Temperature Average | Wind Speed Max | Total Precipitation |
| | °C | m/s | mm | °C | m/s | mm | °C | m/s | mm |
| January | -29.16 | 19.22 | 11.42 | -30.16 | 20.58 | 21.67 | -29.07 | 22.56 | 9.70 |
| February | -31.42 | 18.37 | 6.30 | -33.39 | 18.00 | 10.37 | -30.32 | 21.49 | 8.34 |
| March | -26.69 | 19.18 | 14.10 | -25.53 | 22.38 | 10.93 | -25.70 | 21.83 | 9.81 |
| April | -17.88 | 19.46 | 9.67 | -18.54 | 18.87 | 16.47 | -16.96 | 21.79 | 15.76 |
| May | -6.84 | 18.57 | 13.60 | -7.46 | 18.78 | 11.43 | -6.16 | 19.80 | 16.17 |
| June | 5.40 | 17.86 | 20.50 | 6.19 | 18.80 | 25.80 | 5.78 | 19.16 | 23.03 |
| July | 12.67 | 18.07 | 41.87 | 13.30 | 20.12 | 52.40 | 12.25 | 18.69 | 28.54 |
| August | 10.81 | 18.40 | 37.43 | 10.05 | 20.14 | 48.25 | 11.03 | 19.84 | 36.10 |
| September | 3.75 | 21.53 | 45.34 | 2.80 | 20.55 | 49.45 | 4.22 | 21.13 | 45.97 |
| October | -5.65 | 20.86 | 27.03 | -5.31 | 22.33 | 36.15 | -5.20 | 21.65 | 27.21 |
| November | -18.02 | 19.98 | 15.12 | -19.99 | 15.92 | 11.70 | -17.81 | 21.21 | 21.55 |
| December | -26.04 | 18.67 | 6.01 | -26.75 | 17.91 | 12.74 | -25.35 | 21.71 | 13.30 |

**Figure 36 Historic Comparison Meadowbank, Whale Tail, Baker Lake Sites Temperature Average 2009-2022**

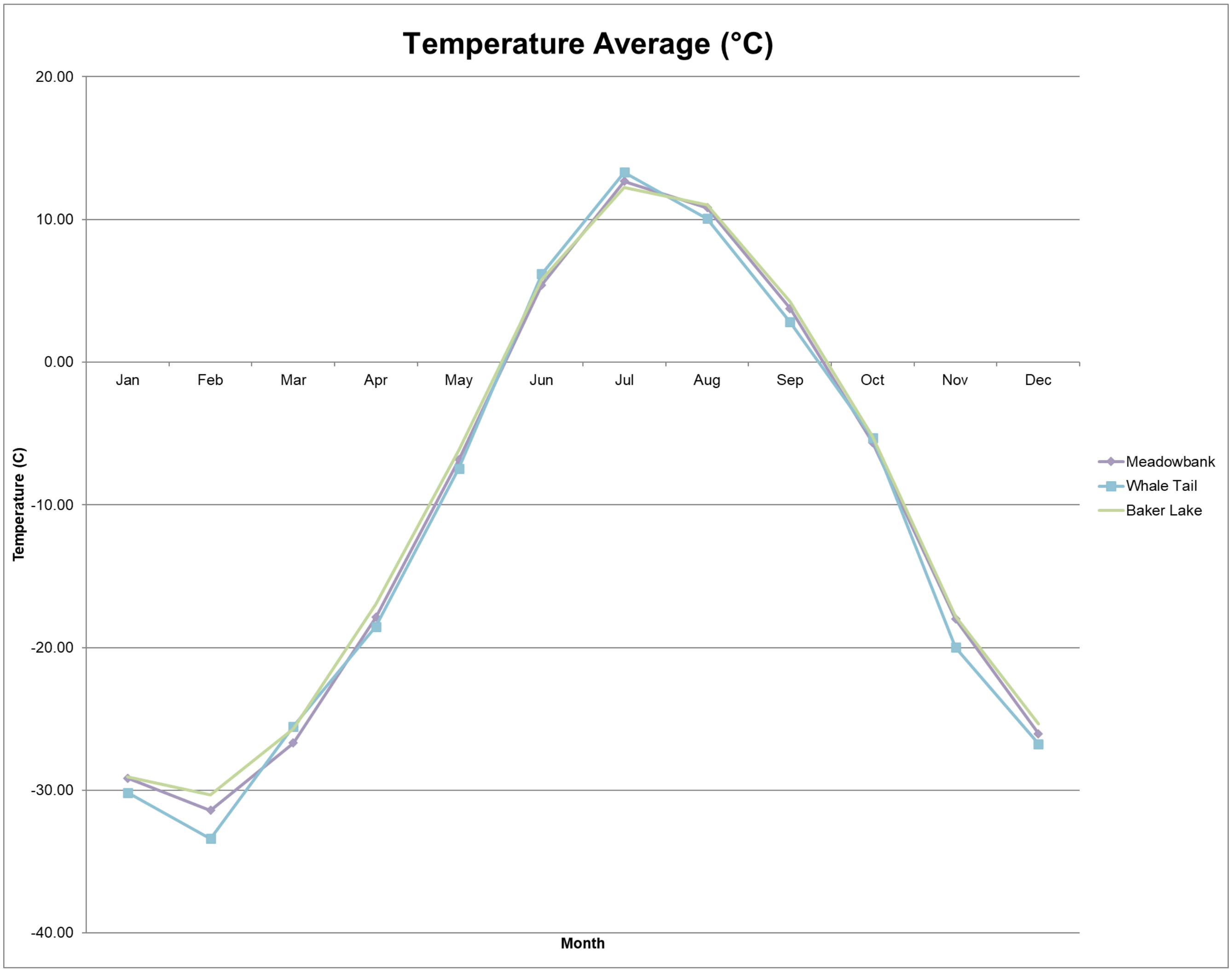


**Figure 37 Historic Comparison Meadowbank, Whale Tail, Baker Lake Sites Total Precipitation Average 2009-2022**

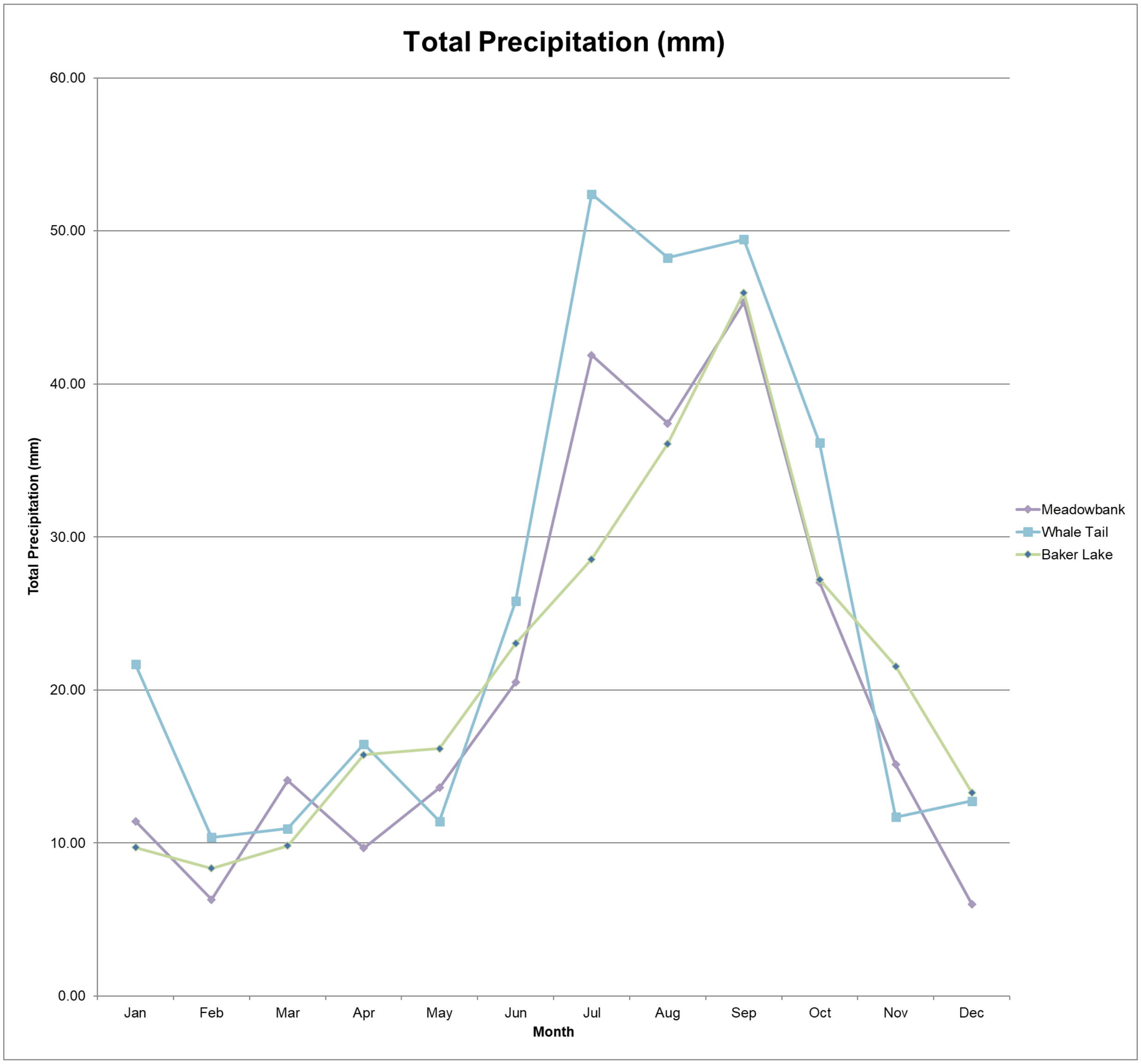
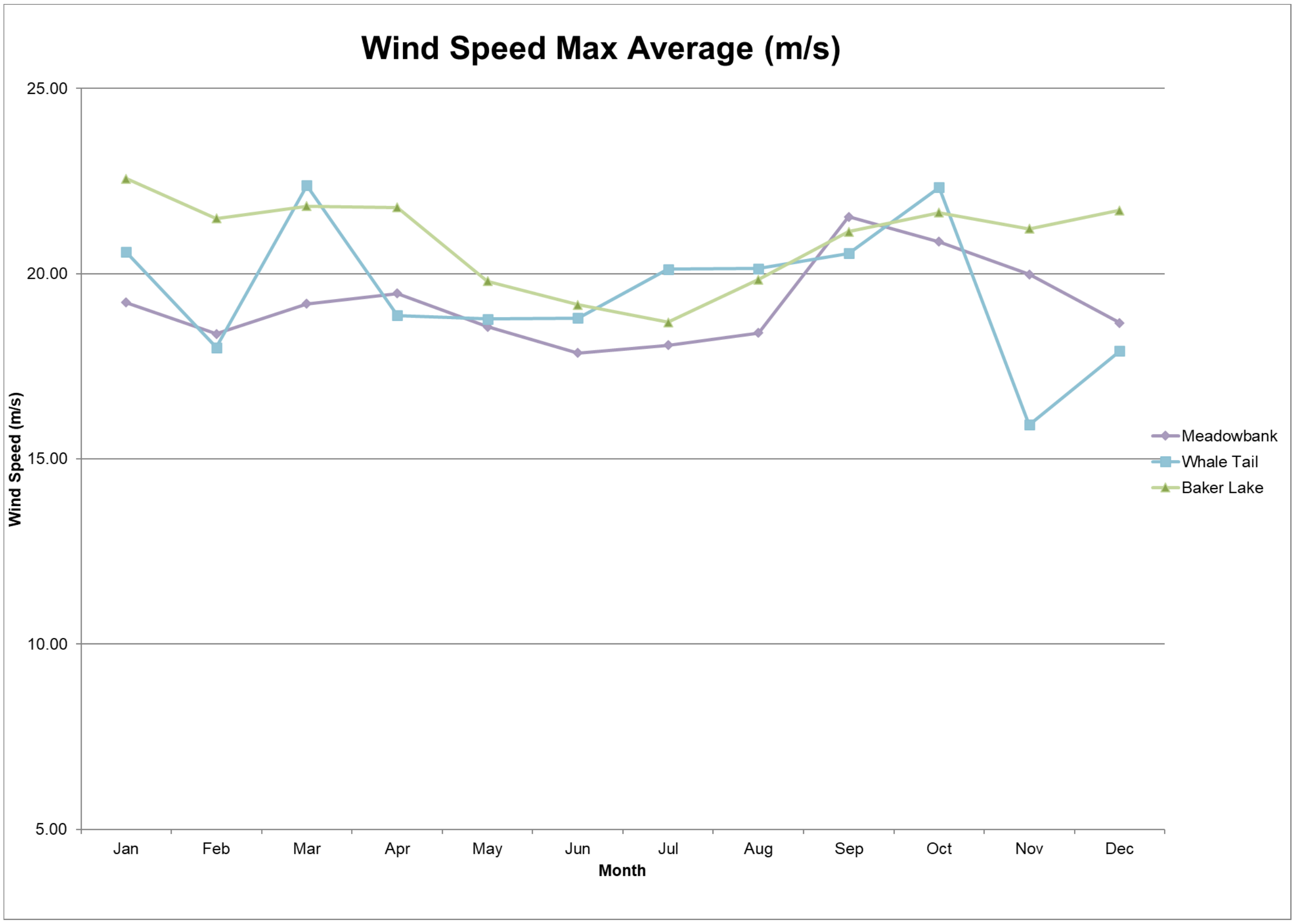


**Figure 38 Historic Comparison Meadowbank, Whale Tail, Baker Lake Sites Wind Speed Max Average 2009-2022**



# SECTION 9. CLOSURE

## 9.1 PROGRESSIVE RECLAMATION

### 9.1.1 Meadowbank Site

#### 9.1.1.1 *Mine Site*

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 17:** ***A summary of any progressive closure and reclamation work undertaken including photographic records of site conditions before and after completion of operations, and an outline of any work anticipated for the next year, including any changes to implementation and scheduling.***

And

**As required by KIA KVPL08D280 Production Lease Condition 6.01 (9):** ***Reclaim and remediate the Leased Land in accordance with the Closure and Reclamation Plan, on an ongoing basis through the Term and deliver to KIA, not later than March 31 of each year of the Term, beginning five years after the effective date, an amended C&R Plan detailing the activities taken in the last year and to be undertaken in the next year and planned for the balance of the Term, that includes, but is not limited to the proposed methods and procedures for progressive reclamation.***

Agnico Eagle submitted the Meadowbank Interim Closure and Reclamation Plan dated May 29th, 2019 to CIRNAC on June 7th, 2019 and on July 24th, 2019 to the NWB. On March 2020, Agnico Eagle made a revision to the Meadowbank Interim Closure and Reclamation Plan – Update 2019 (Appendix 55 of the 2019 Annual Report) to address action items identified by the NWB during the review of the 2018 Annual Report.

Best management practices, including progressive closure, have been incorporated in the Meadowbank operation period. The current mine plan includes progressive closure associated with the following components:

- Open pits;
- Portage WRSF;
- Tailings Storage Facilities;
- Water management infrastructures.

The key closure activities that have been identified for progressive reclamation are detailed in the ICRP Section 6.2 for each individual component of the Project. The progressive reclamations activities provided in this ICRP will be updated in future versions of the plan to include new opportunities for progressive reclamation identified during operations.

In 2022, no new progressive reclamation activity occurred at the Meadowbank Site.

The flooding of Vault and Phaser/BB Phaser pits with natural inflow began at the end of mining operation in the area in 2019 and continued. At closure the flooding of this area will be supplemented by mechanical flooding. More details on this can be found in the Meadowbank Water Management Report and Plan.

In 2022 work progressed on the development and implementation of the closure water treatment system for the Portage and Goose Pits water as a results of in-pit deposition. The following main activities occurred, and will continue in 2023:

- Continue bench scale laboratory to define the water treatment technologies and design required for closure.

- Environmental studies to assess receiving environment water quality to understand the conditions of the lake in order to develop protective site-specific water quality objectives for closure. Started the evaluation of discharge location.

Details on the closure water treatment system for the Portage and Goose Pits water will be provided in the Final Closure and Reclamation Plan.

Following conversion of the Portage Attenuation Pond into the Reclaim Pond (South Tailings Cell) in 2014, some of the dewatering equipment from the North Cell reclaim system (i.e. dewatering pipelines, reclaim barge, effluent diffuser pipelines, and pumps) has been dismantled and removed. This activity occurred in 2015. Some water management systems not required at Meadowbank were moved at Whale Tail Mine based on availability and needs on both sites. The clarifiers of the Water Treatment Plant (WTP) at Meadowbank was demobilized partially to be used at Vault WTP. The Vault water treatment plan was then demobilized to be installed at Whale Tail Mine. Water management facilities or equipment not used or deemed not necessary could be removed or transferred between sites during operations.

Closure and reclamation of the Portage WRSF occurred progressively during operations with the placement of the NPAG cover landform over the side slopes of the PAG WRSF. Refer to Section 5.2.5.4 (Appendix 55 of 2019 Annual Report) for cover design details. Approximately 90% of the Portage PAG WRSF has been covered. No additional work on this item is planned to occur before closure as it will not be possible to progressively reclaim the uppermost bench or the top surface of the Portage WRSF as the demolition landfill is planned to be located on the WRSF. A mandate was also started to review the landform design and assess its performance for the Portage WRSF. Further details can be found in Section 5.4.1 of this report.

The landfill located in the Portage WRSF will be in active use throughout the operation period and also during the closure period in order to receive debris from decommissioning. Operation landfills are progressively closed in the Portage WRSF during operation, but final closure of the demolition landfill will occur at the end of the active closure stage.

Progressive reclamation with the construction of the NPAG cover landform over the tailings in the North Cell was undertaken in winter of 2015 following the completion of the tailings deposition. The construction continued in 2016 to 2019. Based on operations, there may be some opportunities to complete some progressive closure on the South Cell and North Cell TSF. In 2022 Agnico Eagle initiated work to update the closure landform design of the TSF. Based on the design assessment and the site conditions, additional tailings deposition could be completed during 2023 in the North and South Cell, along with construction of internal rockfill structures required for water management and tailings deposition.

Progressive reclamation activities for the buildings and equipment at Vault has occurred during operation after the mining activities. To date, the emergency camp and office at Vault have been removed. Specific timeline for progressive reclamation activities on site during operation for the buildings and equipment will be eventually defined. Efforts are also made to reduce inventories of consumables on site leading up to the end of operations.

#### 9.1.1.2 *AWAR*

**As required by CIRNAC Land Lease 66A/8-71-3, Condition 35:** ***The Lessee shall file annually a progress report for the preceding year outlining the ongoing reclamation completed in conformance with the approved Closure and Reclamation Plan.***

And

**As required by KIA Right of Way KVRW06F04, Condition 28:** ***Agnico Eagle shall file annually, no later than March 31st of each year, a progress report for the preceding year, outlining any ongoing restoration completed, in conformity with the Closure and Reclamation Plan.***

No progressive reclamation has been completed on the AWAR or associated quarries in 2022 as none of the quarries are considered as no longer being required as borrow source for road maintenance.

Quarries and granular borrow sites are required for maintenance work on the AWAR. The AWAR is used in operation, but will also be used in closure. The road will be preserved as the main access to the site in a sufficient condition to allow access during closure for monitoring, inspection and maintenance activities. Material availability and proper maintenance are required to ensure the good state of the road. A review of the available material and the schedule of planned maintenance will be done during operation to define a specific timeline for quarries progressive reclamation, if possible with the operation of the road.

#### 9.1.1.3 *Quarries*

**As required by CIRNAC Land Lease 66A/8-72-6, Condition 33:** ***The lessee shall file annually a report for the preceding year, outlining ongoing restoration completed in conformity with C&R Plan, as well as any variations from the said Plan.***

As mentioned in Section 9.1.1.1, no progressive reclamation has been completed on the AWAR or associated quarries in 2022 as none of the quarries are considered as no longer being required as borrow source for road maintenance.

### 9.1.2 Whale Tail Site

#### 9.1.2.1 *Mine Site*

**As required by NWB Water License 2AM-WTP1830 Part J, Item 2:** ***The Licensee shall submit to the Board for approval within three (3) years of Operations, an updated Interim Whale Tail Pit Closure and Reclamation Plan prepared in accordance with the "Guidelines for the Closure and Reclamation of Advanced Mineral***

***Exploration and Mine Sites in the Northwest Territories", issued by the Mackenzie Valley Land and Water Board (MVLWB) and Aboriginal Affairs and Northern Development Canada (AANDC) in 2013 (MVLWB/AANDC 2013) and consistent with the Mine Site Reclamation Policy for Nunavut, 2002. The Plan shall include all mine related facilities and Whale Tail Pit Haul Road.***

And

**As required by NIRB Project Certificate 008 Condition 12:** ***The Proponent shall provide a summary of its progressive reclamation efforts and associated feedback received from communities with respect to aesthetic values solicited by the Proponent as part of its public engagement processes in its annual reporting to the NIRB. As part of the Closure and Reclamation Plan, the Proponent shall develop and implement a program to:***

- ***Progressively reclaim disturbed areas within the project footprint, with an emphasis on restoring the natural aesthetics of the area through re-contouring to the extent practicable; and***
- ***In a manner that demonstrates that the Proponent has considered the aesthetic values of local communities (e.g. information regarding the acceptability of the topography and landscape of the project areas following progressive reclamation efforts).***

And

**As required by NWB Water License 2AM-WTP1830 Schedule B, Item 20:** ***A summary of any progressive Closure and Reclamation work undertaken, including photographic records of site conditions before and after completion of operations, and an outline of any work anticipated for the next year, including any changes to implementation and scheduling.***

And

**As required by KIA Production Lease KVPL17D01 Condition 6.01 (10):** ***Deliver to KIA, not later than March 31, 2022 and not later than March 31st every three (3) years thereafter, a Conceptual Reclamation and Closure Plan and Reclamation Estimate, detailing the reclamation and remediation activities taken in the last three (3) years and to be undertaken in the next three (3) years and planned for the balance of the Term. That includes, but not is not limited to the proposed methods and procedure for the progressive […]***

Agnico Eagle submitted an updated version of the Whale Tail Interim Closure and Reclamation Plan (ICRP) on July 2020 to NWB. For details regarding the planned permanent and progressive reclamation, please refer to Section 5 and 6 of the Whale Tail ICRP provided in Appendix 51 of the 2020 Annual Report.

In 2022, progressive placement of the Whale Tail and IVR WRSF NPAG cover landform occurred over the side slopes of the facilities. In 2023, it is planned to continue the progressive placement of the NPAG cover on these facilities.

#### 9.1.2.2 *Whale Tail Haul Road*

**As required by CIRNAC Land Lease 66H/8-2-1, Condition 25:** ***The lessee shall file annually a report for the preceding year, outlining ongoing restoration completed in conformity with the approved Abandonment and Restoration Plan, as well as any variations from the said Plan.***

No reclamation work was undertaken at along the Whale Tail Haul Road in 2022.

#### 9.1.2.3 *Quarries*

**As required by KIA Quarry Lease KVCA15Q02, Condition 14:** ***AEM shall conduct reclamation activities until November 22, 2018, in accordance with the Reclamation Plan attached Schedule 3. AEM shall annually thereafter submit to KIA a Reclamation Plan detailing the proposed reclamation activities for the upcoming year.***

And

**As required by KIA Quarry Lease KVCA18Q01, Condition 20:** ***The permittee shall conduct reclamation activities during the first twelve months of the term of this Permit in accordance with the Reclamation Plan attached as Schedule 3. The permittee shall annually thereafter submit to the Association an Reclamation Plan detailing the proposed reclamation activities for the upcoming year.***

And

**As required by KIA Quarry Lease KVCA15Q01, Condition 13:** ***The permittee shall conduct reclamation activities during the first twelve months of the term of this Permit in accordance with the Reclamation Plan attached as Schedule 3. The permittee shall annually thereafter submit to the Association an Reclamation Plan detailing the proposed reclamation activities for the upcoming year.***

And

**As required by CIRNAC Land Lease 66H/8-1-4, Condition 35:** ***The lessee shall file annually a report for the preceding year, outlining ongoing restoration completed in conformity with the approved Abandonment and Restoration Plan, as well as any variations from the said Plan.***

No progressive reclamation work was completed in 2022. Quarries and eskers are required for maintenance work on the Whale Tail Haul Road. The road is used in operation but will also be used in closure and post-closure. The road will be preserved as the main access to the site in a sufficient condition to allow access during closure and post-closure for monitoring, inspection, and maintenance activities. Material availability and proper maintenance are required to ensure the good state of the road. A review of the available material and the schedule of planned maintenance will be done during operation to define a specific timeline for quarries progressive reclamation, if possible, with the operation of the road.

## 9.2 RECLAMATION COSTS

### 9.2.1 Meadowbank Site

#### 9.2.1.1 *Project Estimate*

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 19:** ***An updated estimate of the current restoration liability based on project development monitoring, results of restoration research and any changes or modifications to the Appurtenant Undertaking.***

And

**As required by NIRB Project Certificate No.004, Condition 80:** ***File annually with NIRB's Monitoring Officer an updated report on progressive reclamation and the amount of security posted, as required by KivIA, INAC, and/or the NWB.***

Refer to Section 9.1.1 for the progressive reclamation discussion.

A permanent closure and reclamation financial security cost estimate has been prepared with the present Project layout and infrastructure. The cost estimate covers the closure and reclamation of all Project facilities as described Meadowbank Interim Closure and Reclamation Plan – Update 2019 (V.01, Appendix 55 of the 2019 Annual Report) for permanent closure of the Project.

Agnico Eagle was required to submit the detailed financial security cost estimate to Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) and to the Kivalliq Inuit Association (KivIA) to support land use and water licensing requirements. RECLAIM Version 7.0 workbook (March 2014) has been used for this estimate, as per the Guidelines for Closure and Reclamation Cost Estimates for Mines, issued by Indigenous and Northern Affairs Canada, Mackenzie Valley Land and Water Board and the Government of the Northwest Territories (INAC, MVLWB, GNWT, 2017).

Reclamation of the Project facilities can be divided into the following three general stages, as presented in the integrated schedule of the expected closure activities presented in Appendix P of the ICRP (Appendix 55 of the 2019 Annual Report):

- Operations: during which time progressive rehabilitation measures may be undertaken;
- Active Closure: during which time the major reclamation measures are undertaken;
- Post Closure: all major construction activities have been completed and ongoing monitoring and maintenance is required, with minimal activity on-site.

The updated 2019 estimated closure and reclamation costs for the Meadowbank Project represent a total of C$ 89,427,746. This total includes C$ 62,269,580 of direct costs and C$ 27,158,166 of indirect costs. The financial security cost estimate assumptions and methodology used for the calculations, along with the complete RECLAIM 7.0 spreadsheets are presented in Appendix Q of the ICRP (Appendix 55 of 2019 Annual Report).

For the purpose of this financial security cost estimate, only progressive rehabilitation measures which have already been completed to date (up to 2017) are considered in the calculations.

#### 9.2.1.2 *AWAR and Quarries*

**As required by CIRNAC Land Lease 66A/8-71-3, Condition 23:** ***The Lessee shall submit to the Minister no later than November 1st, 2025, and every three (3) years thereafter, an updated Closure and Reclamation Plan and cost estimates thereof.***

And

**As required by CIRNAC Land Lease 66A/8-72-6, Condition 37:** ***The lessee shall submit to the Minister every 2 years after the commencement date of this lease (January 2007), a report describing cumulative variations from the C&R Plan with updated cost estimates.***

And

**As required by KIA Right of Way KVRW06F04, Condition 16:** ***Agnico Eagle shall submit to KIA on March 31, 2009, and no later than March 31st of every second year thereafter, a report describing any variations from the Closure and Reclamation Plan and updated cost estimates.***

As described in Sections 9.1.1.1 and 9.1.1.2, no progressive reclamation has been completed on the AWAR or associated quarries in 2022.

The cost estimate for the reclamation of the AWAR and quarries represents C$ 993,078 as per the calculation completed with Reclaim 7.0 (March 2014) in the Meadowbank Interim Closure and Reclamation Plan – Update 2019 (V.01, Appendix 55 of the 2019 Annual Report)

### 9.2.2 Whale Tail Site

#### 9.2.2.1 *Project Estimate*

**As required by NWB Water License 2AM-WTP1830 Schedule B, Item 22:** ***An updated estimate of the current restoration liability based on Project development monitoring, results of restoration research and any changes or modifications to the Appurtenant Undertaking.***

And

**As required by NWB Water License 2AM-WTP1830 Part C, Item 7:** ***The Licensee shall, within twelve (12) months following the commencement of Operations and when the Licensee files a Final Reclamation and Closure Plan as required under the License, submit to the Board for review an updated reclamation cost estimate, using the INAC RECLAIM Reclamation Cost Estimating Model (Version 7.0 or the most current version in use at the time the updated reclamation cost estimate is submitted to the Board).***

A permanent closure and reclamation financial security cost estimate has been prepared with the present Project layout and infrastructure. The cost estimate covers the closure and reclamation of all Project facilities as described in the Whale Tail Pit Project Interim Closure and Reclamation Plan (July 2020) (Appendix 51 of the 2020 Annual Report).

The cost estimate covers the closure and reclamation of all Project facilities as described in the ICRP and was prepared using RECLAIM Version 7.0 (March 2014), for permanent closure of the Project. The 2020 estimated closure and reclamation costs for the Whale Tail Project represent a total of C$50,663,508. This total includes C$30,714,735 of direct costs and C$19,948,773 of indirect costs.

As per NWB Water License Part C Item 1, Agnico has provided to both the Government of Canada (CIRNAC) and KivIA a Letter of Credit in the amount of C$ 25,331,754 for a total of C$ 50,663,508.

## 9.3 TOPSOIL/ORGANIC MATTER SALVAGE AND REVEGETATION

**As required by NIRB Project Certificate 008 Condition 13:** ***The Proponent shall explore the feasibility of topsoil/organic matter salvage as part of project development and provide updates to the Closure and Reclamation Plan based on this investigation. The Proponent shall provide a summary of its management of topsoil in annual reports to the NIRB.***

And

**As required by NIRB Project Certificate No.008 Condition 26:** ***The Proponent shall include revegetation strategies within its Mine Closure and Reclamation Plan that support progressive reclamation, and promote natural revegetation and recovery of disturbed areas compatible with the surrounding natural environment. These strategies should include exploration of the feasibility and practicality of topsoil/organic matter salvage through Project development. Consideration for the results of similar reclamation efforts at other northern projects, including the Meadowbank Gold Mine Project, must be demonstrated. Within three (3) years from the commencement of construction, information regarding the revegetation strategies developed and implemented by the Proponent in fulfillment of this Term and Condition shall be included in the Proponent's annual report to the NIRB. Subsequently, information regarding the Proponent's progress in fulfillment of this Term and Condition shall be provided annually in the Proponent's annual report to the NIRB.***

Natural revegetation is already promoted and included in the Whale Tail ICRP. As per the 2019 Whale Tail ICRP Revision 1, active revegetation has not been planned as part of the reclamation plan given the cold climate setting of the Project. During the project development, the overburden sporadic quantities were disposed in the WRSFs along with other material from stripping. The overburden material was not segregated due to the layer of overburden being too thin and the overall site conditions.

Agnico Eagle Meliadine Mine Site, as per the 11MN034 Project Certificate Condition 20 and 41, need to undertake a similar study than for the Whale Tail Mine. A study was conducted between 2018 and 2021 at Meliadine. No additional work was completed for the program in 2022. Results of the study conducted by Meliadine mine site has been shared with Meadowbank and Whale Tail in order to fulfill the current Project Certificate No. 008 obligations. For further details, refer to the Meliadine Annual Report.

Additional assessment is being completed at Meadowbank site to identify ways to promote natural revegetation during the closure activities. The details will be included in the Final Closure and Reclamation Plan for Meadowbank and Whale Tail.

## 9.4 TEMPORARY MINE CLOSURE WHALE TAIL SITE

**As required by NIRB Project Certificate No.008 Condition 47:** ***The Proponent should undertake an analysis of the risk of temporary mine closure, giving particular consideration to how communities in the Kivalliq region may be affected by temporary closure of the mine, including consideration of the measures that can be taken to mitigate the potential for adverse effects (e.g. development of programs that provide transferable skills, identification of employment options that can include transfers amongst Agnico Eagle operations, etc.) This analysis is required to be updated as necessary to reflect significant changes to the Project or the socio-economic conditions in the region that may increase the risks and potential effects of temporary mine closures. This initial results of the Proponent's analysis should be provided to the Nunavut Impact Review Board (NIRB) within six (6) months of the issuance of the Project Certificate. Any updates to the analyses should be provided to the NIRB within three (3) months following completion of updated analyses by the Proponent.***

Agnico Eagle submitted the analysis of risk of temporary mine closure on September 11th, 2018. There have not been any updates since the last submission. The Analysis of the Risk of Temporary Mine Closure is included in the Appendix 50 of the 2018 Annual Report.

## 9.5 SOCIO-ECONOMIC CLOSURE PLAN WHALE TAIL SITE

**As required by NIRB Project Certificate 008 Condition 51:** ***The Proponent shall develop a conceptual Socio-economic Closure Plan that:***

- ***Links the socio-economic closure plans for Meadowbank and Whale Tail;***
- ***Identifies regular update and multi-party review requirements;***
- ***Shows evidence of consideration of socio-economic lessons learned from other northern mine closure experiences;***
- ***Includes evidence of consultation with Kivalliq communities and governance bodies on socio-economic objectives/goals related to closure planning;***
- ***Emphasizes plans, policies, and programs to increase transferable skills of Inuit workers, including into trades and other skilled positions; and***
- ***Includes all plans, policies and programs related to socioeconomic factors in a temporary closure situation; and***
- ***Includes a Workforce Transition Plan between the Whale Tail Project and other production mines owned and operated by the Proponent in the Kivalliq region.***

***The Proponent shall advance the recommendations of the Conceptual Socio-economic Closure Plan through the development of a Final Socio-economic Closure Plan that will be part of the Whale Tail Pit Project Final Closure and Reclamation Plan.***

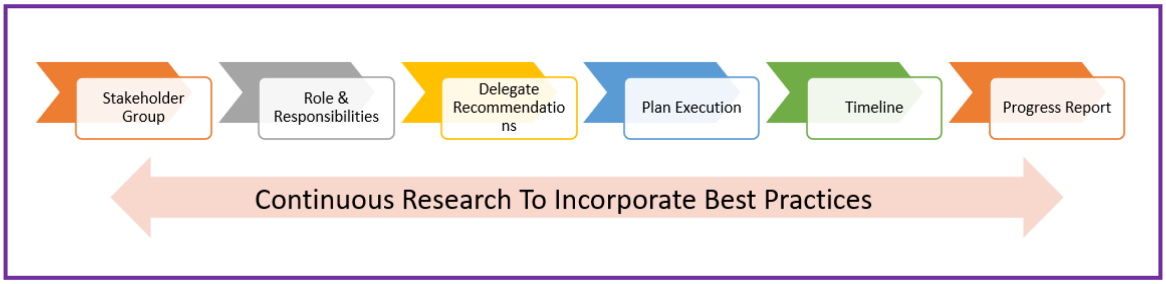
***The conceptual socio-economic closure plan will be provided to the Nunavut Impact Review Board within one (1) year of issuance of the Project Certificate, and updated as needed prior to closure with information provided in the Proponent's annual report to the Nunavut Impact Review Board.***

In 2022, as per the Whale Tail Project Certificate No. 008 Amended Terms and Conditions (TC) No. 51, Agnico Eagle advanced the recommendations of the Conceptual Socio-economic Closure Plan (CSECP).

Based on the framework (Figure 39) established in 2021 Agnico Eagle advanced the following items in Social Closure planning aligned with TC 51:

- Identifying social closure studies
- Detailing progressive social closure tasks and associated costs
- Developing stakeholder engagement plan and community consultation framework

**Figure 39 Progressive Social Closure Planning Framework**



# SECTION 10. PLANS / REPORTS / STUDIES

## 10.1SUMMARY OF STUDIES

### 10.1.1 Meadowbank Site

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 20:** ***A summary of any studies requested by the Board that relate to Water use, Waste disposal or Reclamation, and a brief description of any future studies planned.***

No studies were requested by the NWB in 2022.

### 10.1.2 Whale Tail Site

**As required by NWB Water License 2AM-WTP1830 Schedule B, Item 23:** ***A summary of any studies requested by the Board that relate to Water use, Waste disposal or Reclamation, and a brief description of any future studies planned.***

No studies were requested by the NWB in 2022.

## 10.2 SUMMARY OF REVISIONS

A list management plans for the Meadowbank and Whale Tail mines is included in Table 10-1. This table includes details on the latest version and submission date to regulators.

**Table 10-1 Active Management Plans for the Meadowbank and Whale Tail Mines**

| Meadowbank Mine | | |
|---|---|---|
| **Management Plan** | **Submission Date** | **Version** |
| Meadowbank No Net Loss Plan, Phaser Offsetting Plan addendum and In-Pit disposal addendum | February 2019 | 3 |
| Habitat Compensation Monitoring Plan | February 2017 | 4 |
| Groundwater Monitoring Plan | April 2020 | 11 |
| Water Quality Monitoring and Management Plan for Dike Construction and Dewatering + Addendum | July 2016 | 4 |
| Water Quality and Flow Monitoring Plan | March 2016 | 5 |
| Interim Closure and Reclamation Plan | April 2020 | Rev 1 |
| OPEP/OPPP | March 2023 | 16 |
| Baker Lake Bulk Fuel Storage Facility: Environmental Performance Monitoring Plan | March 2022 | 6.1 |
| Operational ARD-ML Sampling and Testing Plan | November 2013 | 2 |
| Incinerator Waste Management Plan | June 2022 | 10 |
| Landfarm Design and Management Plan | March 2017 | 4 |
| Landfill Design Management Plan | April 2021 | 5 |
| Dewatering Dike OMS | March 2023 | 10 |
| Freshet Action Plan | March 2023 | 11 |
| Tailings Storage Facility OMS | March 2023 | 11 |
| Waste Rock and Tailings Management Plan | March 2023 | 13 |

| Meadowbank Mine | | |
|---|---|---|
| **Management Plan** | **Submission Date** | **Version** |
| Pore Water Quality Management Plan | April 2020 | 2 |
| Water Management Report and Plan | March 2023 | 11 |
| Sewage Treatment Plant Management Plan | March 2017 | 6 |
| Transportation Management Plan: AWAR | October 2022 | 6 |

| Whale Tail Mine | | |
|---|---|---|
| **Management Plan** | **Submission Date** | **Version** |
| Mercury Monitoring Plan | March 2023 | 4 |
| Fish Habitat Offsetting Plan Whale Tail and Whale Tail expansion | June 2020 | 1 |
| Fish Habitat Offsetting Monitoring Plan (under DFO approval) | July 2021 | 2 |
| Groundwater Monitoring Plan | May 2019 | 3 |
| Arsenic Water Treatment Plan OMM | January 2019 | 2 |
| Water Quality Monitoring and Management Plan for Dike Construction and Dewatering | May 2020 | 3 |
| Water Quality and Flow Monitoring Plan | March 2019 | 6 |
| Interim Closure and Reclamation Plan | July 2020 | 4 |
| Operational ARD-ML Sampling and Testing Plan – Whale Tail Pit Addendum | February 2023 | 7.1 |
| Landfarm Design and Management Plan | April 2021 | 2 |
| Landfill Design Management Plan | April 2021 | 4 |
| Water Management Infrastructure OMS | March 2023 | 3 |
| Freshet Action Plan | March 2023 | 5 |
| Waste Rock Management Plan | March 2023 | 10 |
| Water Management Report and Plan | March 2023 | 10 |
| Sewage Treatment Plant OMM | February 2019 | 2 |
| Shipping Management Plan | April 2022 | 4 |
| Thermal Monitoring Plan | April 2022 | 4 |
| Migratory Bird Protection Plan | April 2020 | 3 |
| Whale Tail Haul Road Management Plan | March 2023 | 4 |
| Adaptive Management Plan | July 2021 | 1.5 |
| Erosion Management Plan | December 2018 | 2 |
| Incinerator and Composter Waste Management Plan | April 2019 | 1 |

| Meadowbank Mine & Whale Tail Mine (Combined) | | |
|---|---|---|
| **Management Plan** | **Submission Date** | **Version** |
| Air Quality and Dustfall Management Plan | April 2022 | 6 |
| Noise Monitoring and Abatement Plan | December 2018 | 4 |
| Aquatic Effects Management Program (AEMP) | April 2022 | 5 |
| Core Receiving Environment Monitoring Program Plan Update (CREMP) | April 2022 | 4 |
| QAQC Plan | March 2023 | 8 |
| Greenhouse Gas Reduction Plan | April 2020 | 3 |
| Emergency Response Plan | April 2022 | 17 |
| Hazardous Materials Management Plan | April 2022 | 7 |
| Spill Contingency Plan | March 2023 | 19 |
| Blast Monitoring Program | March 2023 | 8 |
| MBK and Whale Tail Bulk Fuel Storage Facility | June 2022 | 7 |
| Ammonia Management Plan | April 2022 | 4 |

| Meadowbank Mine & Whale Tail Mine (Combined) | | |
|---|---|---|
| **Management Plan** | **Submission Date** | **Version** |
| Occupational Health & Safety Plan | December 2018 | 3 |
| Wildlife Screening Level Risk Assessment Plan | January 2023 | 8 |
| Terrestrial Ecosystem Management Plan | June 2019 | 7 |
| Agnico Kivalliq Projects Socio-Economic Monitoring Program | April 2022 | 4 |

### 10.2.1 Meadowbank Site

**As required by NWB Water License 2AM-MEA1530 Part B, Item 16:** ***The Licensee shall review the Plans or Manuals referred to in this License as required by changes in operation and/or technology and modify the Plans or Manuals accordingly. Revisions to the Plans or Manuals are to be submitted in the form of an Addendum to be included with the Annual Report required by Part B, Item 2, complete with a revisions list detailing where significant content changes are made.***

And

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 21:** ***Where applicable, revisions will be completed as Addendums, with an indication of where changes have been made, for Plans, Reports, and Manuals.***

As per Water License 2AM-MEA1530 Part B, Item 16 : '*The Licensee shall review the Plans or Manuals referred to in this License as required by changes in operation and/or technology and modify the Plans or Manuals accordingly. Revisions to the Plans or Manuals are to be submitted in the form of an Addendum to be included with the Annual Report required by Part B, Item 2, complete with a revisions list detailing where significant content changes are made*.' Plan will be considered as approved unless a notification from the NWB requested the formal approval process.

The following monitoring and management plans were revised in 2022 and 2023 for submittal as part of the 2022 Annual Report. Plans submitted with the 2021 Annual Report are not included as part of this list.

The following monitoring and management plans were revised and apply to the Meadowbank Site:

- Oil Pollution Emergency Plan and Oil Pollution Prevention Plan (OPEP/OPPP), Version 16 (Appendix 32);
- Incinerator Waste Management Plan, Version 10 (Appendix 51);
- Meadowbank - Dewatering Dikes Operation, Maintenance and Surveillance Manual, Version 10 (Appendix 35);
- Meadowbank - Tailings Management Operation - Maintenance and Surveillance Manual, Version 11 (Appendix 36).
- Meadowbank Waste Rock and Tailings Management Plan, Version 13 (Appendix 22);
- Meadowbank Water Management Report and Plan Version 11 (Appendix 12); and

- AWAR Transportation Management Plan, Version 6 (Appendix 45);
- Meadowbank Freshet Action Plan, Version 11 (Appendix D of the Meadowbank Water Management Report and Plan in Appendix 12)

The following monitoring and management plans were revised and apply to both Meadowbank and Whale Tail sites:

- Core Receiving Environment Monitoring Program Plan Update (CREMP), Version 4 (Appendix 34);
- Quality Assurance / Quality Control (QA/QC) Plan, Version 8 (Appendix 8);
- Spill Contingency Plan, Version 19 (Appendix 27);
- Blast Monitoring Program, Version 8 (Appendix 40);
- Meadowbank and Whale Tail Bulk Fuel Storage Facility Management Plan, Version 7 (Appendix 17);
- Wildlife and HHRA Country Foods Screening Level Risk Assessment Plan, Version 8 (Appendix 48)

The above listed plans are in their respective appendix. A brief description of revisions made to each of plans is provided in the Control Document at the beginning of each plans.

In order to maintain ease of public access for important information, the Agnico Eagle Web Portal, https://aemnunavut.ca/media/documents/ has been updated with the 2020 and 2021 Annual Report, associated management plans, and other documents of interest. Moving forward, Agnico Eagle will commit to keeping the Web Portal updated for ease of public access.

### 10.2.2 Whale Tail Site

**As required by NWB Water License 2AM-WTP1830 Part B, Item 17:** ***The Licensee shall review the Plans or Manuals referred to in this License as required by changes in operation and/or technology and modify the Plans or Manuals accordingly. Revisions to the Plans or Manuals are to be submitted in the form of an Addendum to be included with the Annual Report required by Part B, Item 2, complete with a revisions list detailing where significant content changes are made.***

And

**As required by NWB Water License 2AM-WTP1830 Schedule B, Item 24:** ***Where applicable, revisions as Addenda, with an indication of where changes have been made, for Plans, Reports, and Manuals.***

And

**As required by NIRB Project Certificate 008 Item 13:** ***The Proponent is encouraged to provide on-going opportunities for consultation and comment on any substantive revisions to the Project-specific monitoring program, modelling, studies, management plans, management measures, and reporting under the Project Certificate.***

As per Water License 2AM-WTP1830 Part B, Item 16 : '*The Licensee shall review the Plans or Manuals referred to in this License as required by changes in operation and/or technology and modify the Plans or Manuals accordingly. Revisions to the Plans or Manuals are to be submitted in the form of an Addendum to be included with the Annual Report required by Part B, Item 2, complete with a revisions list detailing where significant content changes are made*.' Plan will be considered as approved unless a notification from the NWB requested the formal approval process.

The following monitoring and management plans were revised in 2022 and 2023 for submittal as part of the 2022 Annual Report. Plans submitted with the 2021 Annual Report are not included as part of this list.

The following monitoring and management plans were revised and apply to Whale Tail Mine:

- Whale Tail Mercury Monitoring Plan, Version 4 (Appendix 53);
- Whale Tail Mine Operational ARD-ML Sampling and Testing Plan, Version 7.1 (Appendix 31);
- Whale Tail Water Management Infrastructure Operation, Maintenance and Surveillance Manual, Version 3, (Appendix 37);
- Whale Tail Waste Rock Management Plan, Version 10 (Appendix 23); and
- Whale Tail Water Management Plan, Version 10 (Appendix 13).
- Whale Tail Haul Road Management Plan, Version 4 (Appendix 46);
- Whale Tail Freshet Action Plan, Version 4 (Appendix E of the Whale Tail Water Management Plan in Appendix 13);

The above listed plans are in their respective appendix. A brief description of revisions made to each of plans is provided in the Control Document at the beginning of each plans. Some plans detailed in Section 10.2.1 above apply to both Meadowbank and Whale Tail sites. Refer to this section for more details. In order to maintain ease of public access for important information, the Agnico Eagle Web Portal, https://aemnunavut.ca/media/documents/ has been updated with the 2020 and 2021 Annual Report, associated management plans, and other documents of interest. Moving forward, Agnico Eagle will commit to keeping the Web Portal updated for ease of public access.

The community also have the opportunity to comment and ask questions related to the mine during the different public consultations detailed in Section 11.9.

#### 10.2.2.1 *Occupational Health and Safety Plan*

**As required by NIRB Project Certificate 008 Condition 57:** ***The Proponent shall update its Occupational Health and Safety Plan to include sexual health and well-being information in its employee orientation***

***programming. In addition, the Proponent shall undertake an education program to inform workers of the range of health services available onsite. The updated plan shall be provided to the Nunavut Impact Review Board (NIRB), once completed within six (6) months of issuance of the Project Certificate. Summaries of the education programs undertaken and any future updates or modifications to the Occupational Health and Safety Plan and the education program shall be included in the Proponent's annual report to the NIRB.***

Agnico Eagle submitted the updated Occupational Health and Safety Plan on December 14th, 2018 to NIRB, which includes information on the inclusion of sexual health and well-being during employee orientation. The last updated Occupational Health and Safety Plan is included in the Appendix 51 of the 2018 Annual Report.

Agnico Eagle's education program on the range of health services on site includes:

- Introduction to clinic services on mandatory e-learning and onsite safety induction for all new employees;
- Visit to clinic during the general site orientation for all new employees;
- Dedicated bulletin board for health and wellness information; and
- General awareness communications: visits to departmental tool-box meetings, emails, Agnico Eagle TV, posters, brochures, etc. Since 2019, Agnico Eagle launched a site wide daily communicator being shared by the supervisors during the line-up meetings.

## 10.3EXECUTIVE SUMMARY TRANSLATIONS

### 10.3.1 Meadowbank Site

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 22:** ***An executive summary in English, Inuktitut and French of all plans, reports, or studies conducted under this License.***

Appendix 56 includes an executive summary in English, French and Inuktitut for the following documents:

- All monitoring and management plans listed in Section 10.2.1 above.
- Reports or studies submitted in 2022 for Meadowbank site:
    - 2022 Quarry 22 Report;
    - Portage Rock Storage Facility Closure Landform Design Report Revision 3;
    - 2022 Meadowbank Annual Open Pit Geomechanical Inspection;
    - 2022 Meadowbank Groundwater Monitoring Report;
    - 2022 Meadowbank Thermal Monitoring Report; and
    - 2022 Incinerator Air Emissions Testing Report.

- Reports or studies submitted in 2022 for both Meadowbank and Whale Tail sites:
  - 2022 Annual Report NIRB Screening Decision;
  - 2022 Annual Geotechnical Inspection;
  - Meadowbank and Whale Tail Dike Review Board Report 30;
  - 2022 Blast Monitoring Report;
  - 2022 Geomechanical Inspection - Implementation Plans;
  - 2022 Landfarm Report;
  - 2022 Core Receiving Environment Monitoring Program (CREMP) Report;
  - 2022 Noise Monitoring Report;
  - 2022 Air Quality and Dustfall Monitoring Report;
  - 2022 Marine Mammal and Seabird Observer (MMSO) Report;
  - 2022 Socio-Economic Monitoring Program Report; and
  - 2022 Wildlife Monitoring Summary Report.

### 10.3.2 Whale Tail Site

**As required by NWB Water License 2AM-WTP1830 Schedule B, Item 25:** ***An executive summary in English and Inuktitut of all plans, reports, or studies conducted under this License.***

And

**As required by NIRB Project certificate No.008 Item 9:** ***The Proponent shall make significant monitoring results and/or summaries of significant results available in English, Inuinnaqtun, and Inuktitut, to the extent feasible.***

Appendix 56 includes an executive summary in English, French and Inuktitut for the following documents. A summary in Inuinnaqtun is also provided for reports or studies of interest:

- All monitoring and management plans listed in Section 10.2.2 above.
- Reports or studies submitted in 2022 for Whale Tail site:
  - 2022 Thermal Monitoring Report;
  - 2022 Annual Open Pit Geomechanical Inspection;

- 2022 Whale Tail Groundwater Monitoring Report;
- 2022 Mercury Monitoring Program Report;
- 2022 Fish Habitat Offset Monitoring Report;
- 2022 Serious Harm To Fish Report

Some reports detailed in Section 10.4.1 above apply to both Meadowbank and Whale Tail sites. Refer to this section for more details.

## 10.4 ADAPTIVE MANAGEMENT

The primary objective of the Adaptive Management Plan (Version 1.5, July 2021) is to document specific mitigation measures and associated management actions to be taken when specified thresholds are exceeded for the following facilities and activities:

- Waste rock storage facility (WRSF)
- Receiver water quality
- Surface water quantity
- Underground mine water quantity

Table 10-2 presents the thresholds for the 2022 period for each of the components included in that plan.

**Table 10-2 Summary of Adaptive Plan Threshold**

| Item | Threshold for 2022 | Management Strategy |
|---|---|---|
| WRSF Permafrost Aggradation | Level 0 (normal operating condition) | Continue temperature monitoring of the WRSF |
| WRSF Surface Water Balance and Active Layer Development | Level 0 (normal operating condition) | Continue temperature monitoring of the WRSF |
| Receiver Water Quality Whale Tail South | Level 0 for total phosphorus (normal operating condition) | Continue monitoring as per Water Quality and Flow Monitoring Plan<br><br>Update water balance and water quality forecast as part of the Annual Report |
| | Level 0 for arsenic (normal operating condition) | Continue monitoring as per Water Quality and Flow Monitoring Plan<br><br>Update water balance and water quality forecast as part of the Annual Report |
| Receiver Water Quality Mammoth Lake | Level 0 for total phosphorus (normal operating condition) | Continue monitoring as per Water Quality and Flow Monitoring Plan<br><br>Update water balance and water quality forecast as part of the Annual Report |
| | Level 0 for arsenic (normal operating condition) | Continue monitoring as per Water Quality and Flow Monitoring Plan<br><br>Update water balance and water quality forecast |

| Item | Threshold for 2022 | Management Strategy |
|---|---|---|
| | | as part of the Annual Report. |
| Surface Water Quantity | Level 0 (normal operating condition) | Continue water monitoring as per water management plan.<br><br>Update water balance and water quality monitoring as part of Annual Report |
| Underground Water Quantity | Level 0 (normal operating condition) | Continue water monitoring as per water management plan<br><br>Update water balance and water quality monitoring as part of Annual Report |

The WRSF adaptive management threshold level was evaluated based on the review of the thermal data. This data are provided in the 2022 thermal monitoring report. Permafrost aggradation was observed in the foundation of the WRSF in 2022. Freeze-back within the first 7 m is currently aligned with the model prediction (model predicted an active layer up to 7 m which has not been observed so far in the monitoring data). Follow up of the monitoring data will continue.

For Whale Tail South and Mammoth Lake, the water quality data collected as part of the annual CREMP (Appendix 33) were used to assess adaptive management levels going into 2023. The mean concentrations of paired monthly sampling results were compared to Adaptive Management Plan thresholds. For Mammoth Lake (total phosphorus and arsenic) and Whale Tail South (total phosphorus and arsenic), the water quality was assess as Level 0 based on the results of the September 2022 sampling event. Monitoring as per the Water License will continue during 2023 along with the update of the water balance and water quality forecast as part of the Annual Report. Agnico Eagle will continue to tracked nutrients level in 2023, and additional measures outlined in the adaptive management plan will be implemented if warranted.

The surface and underground water quantity threshold in 2022 was at Level 0 as there was enough water storage capacity on site to manage water from these sources

# SECTION 11. MODIFICATIONS / GENERAL / OTHER

## 11.1MODIFICATIONS

### 11.1.1 Meadowbank Site

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 14:** ***A summary of modifications and/or major maintenance work carried out on all water and waste related structures and facilities.***

Minor maintenance occurred at the East Dike seepage station in 2022. Additional holes were added to the seepage collection culvert to increase seepage collection in the existing seepage station.

In 2022, material was added on the crest of Bay-Goose dike to fill historic depressions and ease observation of changing conditions.

### 11.1.2 Whale Tail Site

**As required by NWB Water License 2AM-WTP1830 Schedule B, Item 17:** ***A summary of Modifications and/or major maintenance work carried out on all Water and Waste-related structures and facilities.***

Maintenance activity occurred in 2022 at the saline ditches for the underground WRSF and underground ore stockpile to improve water flow through the ditch and restore flow capacity.

Remediation work was performed on the WTD Seepage Trench V-Notch. The V-Notch was leaking so it was re-installed further downstream to increase the accuracy of the seepage reading.

## 11.2 MINE EXPANSION

**As required by NIRB Project Certificate No.004 Condition 29:** ***report to NIRB if and when [Cumberland] develops plans for an expansion of the Meadowbank Gold Mine, and in particular if those plans affect the selection of Second Portage Lake as the preferred alternative for tailings management.***

No new permitting activities for mine expansion were undertaken in 2022 for the Meadowbank Complex.

However, Agnico Eagle proposed a Modification to the Meadowbank Mine; specifically, installing a new 3.3 ML fuel tank next to the existing tank on-site, as well as modifying the secondary containment area where the tanks would share the same space.

The project proposal was submitted to the NPC on May 20th, 2022. On June 22th, 2022 the NPC determined that the proposed Modification was exempt from screening by the NIRB, as the inclusion of the fuel tank did not change the general scope or previously amended activities.

On June 23rd, 2022, Agnico Eagle submitted a 60-day notice to the NWB for a Modification to Water License 2AM-MEA1530. The Modification package included a Design Report for the new 3.3 ML Fuel Tank and its containment facilities, as well as an updated Spill Contingency Plan, and updated Bulk Fuel Storage Facility Management Plan. The NWB sent an invitation for public comment on July 5th, 2022.

The NWB process was slightly delayed, as the NIRB initiated a public review of the Modification. On June 28th, 2022, Agnico Eagle submitted an operational update and associated updated monitoring plans regarding the proposed new fuel tank to the NIRB. On July 5, 2022, the NIRB requested further information regarding the proposed new fuel tank to determine how it may affect the project certificate and monitoring, to which Agnico Eagle responded on July 8th, 2022. No comments were received from parties through the NIRB process; subsequently on July 26th, 2022, the NIRB confirmed the Modification could move to the regulatory process.

When the NWB process reinitiated, one recommendation was provided by CIRNAC and Agnico Eagle provided responses on August 4th, 2022. The NWB provided its approval of the Modification on August 10th, 2022. The NWB also approved the Spill Contingency Plan, and the Meadowbank and Whale Tail Bulk Fuel Storage Facility Environmental Performance Management Plan submitted with the June 23rd, 2022 Modification package.

## 11.3 EXPLORATION WHALE TAIL SITE

### 11.3.1 Ongoing Exploration Programs

**As required by NIRB Project Certificate No.008, Condition 64:** ***Within its annual reporting, the Proponent is encouraged to include detailed updates on the status of ongoing exploration programs associated with the Project and associated implications for future phase developments of the Amaruq property. Status updates in fulfillment of this Term and Condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board.***

Diamond drilling completed by Agnico Eagle in 2022 on the Amaruq Property comprised delineation, conversion, exploration and geotechnical targets. Drill holes done on the Amaruq property in 2022 resulted in an improved geological model, a better understanding of the local geology and increased confidence in our resources and reserves. This work was based out of the Whale Tail camp, a satellite mining camp situated approximately 50 kilometers north-northwest of the Meadowbank mine site. The 2022 drilling campaign totalled 297 diamond drill holes totalling 59,109 meters.

A delineation drilling campaign was performed on IVR Phase 2 pit (3,510 m) to extend its resources and locally (1,583 m), to complete IVR phase 2 delineation.

Whale Tail (WT) pit was drilled (3,215 m) to delineate resources for all three-development phases (WT 1, 2 and 3). A total of 8,564 m were drilled from underground to delineate Whale Tail resources at this level. A conversion drilling campaign was done on the Whale Tail West pit pushback for future underground resources at Whale Tail (11,200 m), this includes 1,447 m drilled from underground infrastructures. Extension drilling of underground resources was completed in between IVR and WT deposits to bridge this deposit (5,710 m).

Exploration and extension drill holes targets were done in the Mammoth Zone area to test inventory and inferred underground stopes for a total of 5,835 m. This includes some near surface holes. A total of 11,965 m were drilled to defined underground potential at depth for both WT and IVR deposits. A condemnation drilling campaign was complete to sterilize ground under future waste dump development of WT stockpile (1,041 m). Three drill holes were done for hydrogeotechnical and exploration purposes at Amaruq and one hole for geotechnical study was completed along WT pit South Wall (2,271 m).

An exploration campaign was done in early winter over Goose deposit at Meadowbank. Three holes were completed for a total of 1,785 m.

In 2023, the drilling campaign will continue the delineation program for both open pit and underground operations. A conversion program of WT resources expansion will be continued in early 2023. Exploration drilling will occur to increase the resources at Amaruq mainly for underground resources. Regional Exploration will be conducted between Whale Tail and Meadowbank to find new near surface resources.

## 11.4 INTERNATIONAL CYANIDE MANAGEMENT CODE

**As required by NIRB Project Certificate No.004, Condition 28:** ***Cumberland shall become a signatory to the International Cyanide Management Code, communicate this to shippers, and do so prior to Cumberland storing or handling cyanide for the Project.***

In 2014 and 2015 audits and completion work were completed and assessed. A management of change process was implemented and put forward. From the status of Substantial Compliance in 2014, Agnico Eagle received full ICMC certification in March 2016 and again in January 2019. Agnico Eagle completed a self-audit of the ICMC principals and standards in 2020. A third-party recertification audit of the Meadowbank Complex and its Supply Chain was completed in 2021 and the official ICMC certificates were received in September 2022.

As in previous years, a cyanide information brochure was made available to employees and the public. Copies are available at the Agnico Eagle's office in Baker Lake and are also online www.aemnunavut.ca/documents/.

As per previous years shipments, the transport of cyanide in 2022 included a qualified nurse and an Emergency Response Team (ERT) member escorting the convoy of cyanide up to the Meadowbank mine site. In addition, they were present at the Baker Lake Marshalling facility for the removal of cyanide from the barge and the loading of the tractor trailers for hauling. As well, the road was completely closed for other traffic during cyanide transportation. Baker Lake community stakeholders were advised of scheduled transportation plans in September 2022, and the public was kept advised of road closures on radio and Facebook throughout the transportation process. In 2022, 5 days of convoys containing 87 sea cans of cyanide were needed during the barge season.

Agnico Eagle maintains its compliance with ICMC requirements. The full certification information can be found at: Agnico Eagle Mines Limited, Canada | The Cyanide Code

As part of the International Cyanide Management Code (ICMC), Agnico Eagle is required to inform the community of Baker Lake and Chesterfield, details regarding the cyanide shipping and transportation along the All Weather Access Road (AWAR), along with associated restrictions that apply to hamlet residences with regard to the usage of the AWAR.

On August 16$^{th}$, 2022, Agnico Eagle held an in-person meeting in Baker Lake to share Cyanide transportation procedure and safety measures. The 2022 Cyanide Transportation program was also presented in Rankin Inlet on August 4$^{th}$, 2022. Community members and first responders were invited to join the meeting. Feedbacks and comments were received during this in-person meeting from both the community members and first responders.

On May 3rd, 2022, during the Chesterfield Inlet shipping consultation the presentation covered transportation of dangerous goods. Participants were referred to Agnico Eagle Nunavut website where they can find Cyanide Transportation and Management pamphlet. During the transportation, the community of Chesterfield Inlet were kept informed about the Cyanide transportation through Meadowbank Complex Facebook page.

## 11.5 INSPECTIONS AND COMPLIANCE REPORTS

### 11.5.1 Meadowbank and Whale Tail

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 23:** ***A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector.***

And

**As required by NWB Water License 2AM-WTP1830 Schedule B, Item 26:** ***A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector.***

#### 11.5.1.1 *CIRNAC*

CIRNAC Inspectors conducted inspections of the Meadowbank and Whale Tail Water Licenses (2AM-MEA1530 and 2AM-WTP1830) on June 14th – 15th, 2022, September 12th- 14th 2022 and December 1st - 2nd, 2022. The purpose of these visits were to ensure compliance with the applicable terms and conditions of the Water Licenses. A summary is provided below and the report can be provided upon request.

- For the Meadowbank Site (Water License 2AM-MEA1530), the inspection reports contained actions such as :
  - Install signage at all monitoring stations;
  - Install signage at the fresh water facilities and water disposal facilities;
  - Develop a plan to address total suspended solids from flowing into Baker Lake from the Marshalling Facility;
  - Provide a commitment to the Inspector as to when the repairs to NP-2 to NP-1 culvert will be completed; and
  - Complete the remediation of the spill 2022-544 at km 87.

As of this report, the corrective actions were completed except the signage installation and the remediation of the spill 2022-544 that are on-going.

- For the Whale Tail Mine (Water License 2AM-WTP1830), the inspection reports contained actions such as :
  - Install signage at all monitoring stations;

- Install signage at the water intake facilities and waste disposal facilities;
- Clean up the debris from the surface of Nemo Lake; and
- Provide follow up to the Inspector for spill 2020-152.

As of this report, the signage installation is on-going, follow up for spill 2020-152 and the clean-up of debris was completed.

### 11.5.1.1 *Environment and Climate Change Canada*

ECCC did not conduct any inspections in 2022.

### 11.5.1.2 *Kivalliq Inuit Association*

KivIA conducted a site tour of the Meadowbank and Whale Tail site from August 9th – 11, 2022. KiVIA also came on site on December 31st, 2022 on the behalf of CIRNAC to inspect the spills. No inspection or site visit reports were received. Additionally, the KivIA Baker Lake Lands Officer was often patrolling the All Weater Access Road and the Whale Tail Haul Road to review and ensure application of TEMP measures.

### 11.5.1.3 *Nunavut Impact Review Board*

The annual NIRB inspection of the Meadowbank and Whale Tail site was conducted from July 22nd – 24th, 2022. The NIRB also conducted a site tour of the Meadowbank and Whale Tail site with the NWB on August 13th, 2022. The Inspection Report was received in October 2022. All documents can be found on the NIRB public registry.

Find below a list of the main subjects that were discussed in the main inspection report:

- Meadowbank Site
    - Lack of legal wildlife deterrence to deter carnivores and/or raptors at all landfill, waste storage areas and Quarry 22.
    - Lack of dust control along the AWAR.
- Whale Tail Mine
    - Ensure that safety barriers, berms, and designed crossings associated with project infrastructure, including the haul road, are constructed and operated as necessary to allow for the safe passage of caribou and other terrestrial wildlife.

### 11.5.1.4 *HTO*

HTO conducted surveys almost daily on the AWAR during caribou migration. No site visit was organized in 2022.

#### 11.5.1.5 *Government of Nunavut – Conservation Officer*

There were no onsite inspections conducted by the GN in 2022.

#### 11.5.1.6 *DFO*

DFO did not conduct any site inspections at Meadowbank and Whale Tail in 2022.

#### 11.5.1.7 *Transport Canada Marine Safety and Security*

Transport Canada Marine Safety and Security (TCMSS) conducted a regulatory inspection on October 5th, 2022, of the Class 2 Agnico Eagle Meadowbank to ensure that the Canada Shipping Act, 2001 (CSA 2001) and Environmental Response Regulations (ERR) requirements are met at the Baker Lake Facility.

Agnico Eagle sent on December 20th, 2022 its response to TCMSS Inspection Report. Find below a list of the main subjects that were discussed in the report.

- The plan content is missing the terminology for anticipated discharges.
- During transfer operations there should be a continual form of 2-Way communication.
- Responsibilities of the OHF operator and their role in the transfer with a third party (Intertek).

## 11.6 NON-COMPLIANCE ISSUES

### 11.6.1 Meadowbank Site

**As required by NIRB Project Certificate No.004 Condition 4:** ***Take prompt and appropriate action to remedy any noncompliance with environmental laws and regulations and/or regulatory instruments, and shall report any noncompliance as required by law immediately and report the same to NIRB annually.***

One (1) non-compliance related to the MDMER and Meadowbank Water License 2AM-MEA1530 regulation at Meadowbank occurred in 2022. This event was reported through to the GN Spill hotline and to the ECCC inspector and were included as part of the monthly NWB monitoring summaries. This non-compliance was associated with effluent discharge from East Dike to Second Portage Lake (ST-8 / ST-MMER-3):

- On April 9th, the level of Total Suspended Solids (TSS) from the East Dike Discharge (ST-MMER-3/ST-8) to Second Portage Lake exceeded the limits, set out in Water License Part F Item 7 and MDMER Schedule 4, of 30 mg/L for the maximum authorized concentration in a grab sample. This event was reported to the ECCC and CIRNAC inspector on April 25th and a follow-up report was submitted to the inspector on May 24th. The monthly TSS average did not exceed the maximum monthly average concentration permitted by the Water License and MDMER of 15 mg/L. More information on this exceedance can be found in Appendix 28.

Two (2) non-compliances related to Water License 2AM-MEA1530 regulation at Meadowbank occurred in 2022. These events were not reported through to the reported GN Spill hotline but were reported to

CIRNAC as part of the monthly NWB monitoring summaries. These non-compliances were associated with the non-contact water from Portage Area East (ST-5) and West (ST-6) diversion ditches:

- In June, TSS results for ST-5 did not exceed the maximum allowable grab sample concentration (30 mg/L) but exceeded the maximum monthly average concentration (15 mg/L), permitted by the Water License, Part F, Item 7, at 16 mg/L. A single monthly sample during open water season is required by the Water License, and thus, the average concentration is made only of this result on June 5th from the certified laboratory. Internal samples were collected daily, and based on these results, the average monthly TSS concentration was 4.7 mg/L.
- In June, there was no monthly sample associated to the West diversion ditch (ST-6) in June as the sample was not collected at the accurate location. Internal samples were collected daily, and based on these results, the average monthly TSS concentration was 10.6 mg/L.

There was one (1) exceedance of dioxins and furans as part of the 2022 incinerator stack testing program. Refer to Section 6.2.1.1 above for more details.

### 11.6.2 Whale Tail Site

**As required by NIRB Project Certificate No.008 Item 6:** ***The Proponent shall take prompt and appropriate action to remedy any occasion of non-compliance with environmental laws and regulations and/or regulatory instruments, and shall report any non-compliance as required by law immediately. A description of all instances of non-compliance and associated follow up is to be reported annually to the NIRB.***

Two (2) non-compliances related to the MDMER and Meadowbank Water License 2AM-WTP1830 regulation at Whale Tail occurred in 2022. This non-compliance was associated with effluent discharge from the IVR Attenuation Pond to Whale Tail South Lake via the WTP (ST-24 / ST-MDMER-11):

- During the month of April, the level of Total arsenic (As) concentrations from the treated discharge into Whale Tail South Lake (ST-MDMER-11/ST-WT-24) exceeded the maximum limits set out in 2AM-WTP1830 Part F Item 5 for maximum authorized concentration in a grab sample (0.20mg/L) and maximum authorized monthly mean concentration (0.10mg/L), and MDMER Schedule 4, Table 2, for the maximum authorized monthly mean concentration (0.30mg/L). This event was reported through to the GN Spill hotline and to the ECCC inspector and were included as part of the monthly NWB monitoring summaries. More information on this exceedance in included in the follow-up report found in Appendix 29
- The monthly acute toxicity test collected for ST-MDMER-11/ST-24 on May 23rd for rainbow trout as required by MDMER Section 14.1 and Water License 2AM-WTP1830 Part F Section 6 (a) was deemed invalid due to the mortality in the blank of the test exceeding the acceptable percentage (10% or less), thus invalidating the test according to the criteria of the reference method. The results for the *Daphnia magna* acute lethality test are valid and show that the effluent is not acutely lethal, while the results for Rainbow Trout show that the issue is related to the control sample and is not linked to the effluent. This event was reported to ECCC and CIRNAC on June 2nd and a follow-up report was submitted to the inspectors on June 23rd. A call between ECCC, CIRNAC, and Agnico Eagle was conducted on July 6th to discuss this event.

A total of two (2) PPV exceedances were recorded in 2022. The exceedances occurred on April 18th, 2022, and September 9th, 2022 (egg incubation period is from August 15 to June 30). The events were located at Nemo Lake Station following blast activities related to the IVR 2 pit. More information on these exceedances can be found in Appendix 41:

- April 18 - PPV exceedance of 17.27 mm/s (limit 13 mm/s)
- September 9 - PPV exceedance of 17.37 mm/s (limit 13 mm/s)

## 11.7 AWAR / WHALE TAIL HAUL ROAD USAGE REPORTS

### 11.7.1 Authorized and Unauthorized Non-Mine Use

#### 11.7.1.1 *AWAR Meadowbank Site*

**As required by NIRB Project Certificate No.004 Condition 32g:** ***Record all authorized non-mine use of the road, and require all mine personnel using the road to monitor and report unauthorized non-mine use of the road, and collect and report this data to NIRB one (1) year after the road is opened and annually thereafter.***

And

**As required by NIRB Project Certificate No.004 Condition 33:** ***Cumberland shall update the Access and Air Traffic Management Plan to: 1. Include an All-weather Private Access Road Management Plan, including a right-of-way policy developed in consultation with the KivIA, GN, INAC and the Hamlet of Baker Lake, for the safe operation of the all-weather private access road; and 2. To facilitate monitoring of the environmental and socio-economic impacts of the private road and undertake adaptive management practices as required, including responding to any concerns regarding the locked gates.***

The security department at the Meadowbank Complex maintains fully staffed security gatehouse at Baker Lake on a 24/7 schedule. The Security staff monitors the safety, traffic and security of all personnel and the public using the road. Agnico Eagle procedures for non-mine uses of the road require that any local users report to the Baker Lake Gatehouse and sign a form that describes the safety protocol while on the road. The road is used primarily by local hunters using ATV's and snowmobiles. Daily records are kept. A summary of the non-mine authorized road use for 2022 is provided in Table 11-1. In 2022, 2,352 non-mine authorized road uses were recorded (drivers and passengers) compared to 3,079 in 2021. Table 11-2 below show the ATVs and snowmobiles usage from 2012-2022.

In 2020, Baker Lake community members were informed of measures needed to be implemented to ensure the safety of all Nunavummiut regarding the use of the All-Weather Access Road during Covid-19. Since the AWAR is used by Nunavummiut for numerous reasons such as the practice of traditional activities, the decision was made that an employee from Baker Lake would work at the gatehouse as a dispatcher. Some specific measures related to the pandemic were implemented to ensure that the no-contact procedure was maintained between on-site employees and community members. In 2022, the no-contact procedure was removed, although, there was still a restricted policy in place between on-site employees and community members to limit interactions only to work-related tasks.

**Table 11-1 2022 Monthly AWAR ATVs and Snowmobile Usage Records**

| Month | Numbers of ATV's (drivers and passengers) |
|---|---|
| January | 0 |
| February | 0 |
| March | 0 |
| April | 7 |
| May | 60 |
| June | 486 |
| July | 317 |
| August | 580 |
| September | 543 |
| October | 357 |
| November | 2 |
| December | 0 |
| **Total** | **2,352** |

**Table 11-2 2012-2022 AWAR ATVs and Snowmobile Usage Records**

| Year | # of ATV's |
|---|---|
| 2012 | 1,456 |
| 2013 | 1,958 |
| 2014 | 1,319 |
| 2015 | 2,366 |
| 2016 | 1,504 |
| 2017 | 1,715 |
| 2018 | 1,091 |
| 2019 | 2,163 |
| 2020 | 2,223 |
| 2021 | 3,079 |
| 2022 | 2,352 |

Agnico Eagle's Project Certificate 004 was issued in 2006. Following the approval of the All Weather Access Road (AWAR) in 2007, the Project Certificate was revised in 2009 to address concerns regarding access to the AWAR. Pursuant to Condition 33, Agnico Eagle prepared the Transportation Management Plan: All weather Private Access Road in 2009. It was submitted and later approved by CIRNAC and GN. Therefore no revision of the 2005 Access and Air Traffic Management Plan was undertaken. Agnico Eagle is of the opinion that the Transportation Management Plan replaced the Access and Air Traffic

Management Plan in 2009. The AWAR Transportation Management Plan was last updated in October 2022 and can be found in Appendix 45.

#### 11.7.1.2 *Whale Tail Haul Road*

**As required by NIRB Project Certificate No.008, Condition 31:** ***The Proponent shall develop and implement a Road Access Management Plan and maintain traffic monitoring logs along the haul road between the Whale Tail Pit project and the Meadowbank mine. Where traffic exceeds levels predicted within the Environmental Impact Statement, the Proponent shall develop and implement appropriate modifications to its wildlife protection measures. The Road Access Management Plan shall be provided to the Nunavut Impact Review Board (NIRB) 90 days prior to operations commencing. An annual summary of the monthly maximum, minimum and average traffic levels shall be provided to the NIRB in the Proponent's annual report.***

And

**As required by CIRNAC Road lease 66H/8-2-1 Condition 60:** ***The lease shall before the first (1st) day of September in each and every year during the term of the lease, provide to the Minister, a report of that years road activities. The report shall include, but not limited to:***

1. ***total number of loads hauled in that year***
2. ***total road operating cost for that year***

And

**As required by CIRNAC Road lease 66H/8-2-1 Condition 63:** ***The lessee agrees to monitor and report unauthorized non-mine use of the road, and collect and report this data to the Minister, who shall make this report accessible to the Nunavut Impact Review board, one (1) year after the road is opened and annually thereafter.***

Agnico Eagle has provided and implemented the Whale Tail Haul Road Management Plan to meet Condition 31 of the NIRB Project Certificate No. 008. The Security staff monitors the safety, traffic and security of all personnel using the road. Table 11-3 below shows the traffic data for 2022 along the Whale Tail Haul Road. Total one-way traffic along the WTHR included 54,856 long-haul, 2,943 medium equipment, and 3,271 light equipment vehicles, for a total of 61,070 vehicles. Total traffic along WTHR was similar to 2021, with 62,037 vehicles and 21% higher than 2020, with 50,441 vehicles. The higher traffic in 2022 compare to 2020 may be explained in part by the reduce operation that occurred at the beginning of 2020 in response to the COVID-19 restrictions and the growth of the long-haul fleet to increase in hauling capacity. Lowest traffic rates were recorded in January, and highest rates were recorded in August when caribou are not as abundant.

**Table 11-3 Whale Tail Haul Road 2022 Traffic Data**

| Date | Long Haul | Medium Equipment | Light Equipment | Total |
|---|---|---|---|---|
| January | 1,944 | 163 | 278 | 2,385 |
| February | 3,890 | 194 | 272 | 4,356 |
| March | 4,316 | 257 | 254 | 4,827 |
| April | 3,126 | 192 | 236 | 3,554 |
| May | 5,278 | 336 | 205 | 5,819 |
| June | 5,392 | 345 | 304 | 6,041 |
| July | 6,098 | 283 | 286 | 6,667 |
| August | 6,238 | 319 | 235 | 6,792 |
| September | 5,270 | 206 | 228 | 5,704 |
| October | 3,572 | 191 | 467 | 4,230 |
| November | 4,630 | 243 | 332 | 5,205 |
| December | 5,102 | 214 | 174 | 5,490 |
| **Total** | **54,856** | **2,943** | **3,271** | **61,070** |

The haul road traffic volumes for the Mine are consistent with those applied to the Approved Project FEIS Volume 4, Appendix 4-B, Table 4-B-15 (Agnico Eagle 2016c). Table 11-4 below provides the FEIS daily vehicle traffic on the haul road based on an estimate that there will be traffic on the road 337 days in the year. In 2022, the WTHR was fully closed (i.e., 24-hour closure) on 15 days. On 63 days, the WTHR experience closures occurring for less than 24 hours and speed restrictions were applied on 93 days on the WTHR.

In order to make comparison to FEIS, explosive truck, fuel, cargo and oversize were categorized as medium equipment. Pickup and bus were categorized as light equipment. Based on data collected in 2022, there is no exceedance to the FEIS. The annual daily average traffic was 150 for long haul, 8.1 for medium equipment and 9.3 for the light equipment (Table 11-5).

**Table 11-4 FEIS Daily Vehicle Traffic on the Haul Road**

| Category | Lower 5% | Average | Upper 95% |
|---|---|---|---|
| Long Haul | 64 | 154 | 173 |
| Explosive | 2 | 4 | 5 |
| Fuel | 1 | 2 | 4 |
| Cargo | 4 | 7 | 10 |
| Pickup | 12 | 20 | 26 |
| Bus | 0 | 2 | 4 |
| Oversize | 0 | 1 | 4 |

**Table 11-5 2022 Daily WTHR Traffic Comparison to Average FEIS**

| Category | FEIS | 2022 Data |
|---|---|---|
| Long Haul | 154 | 150.3 |
| Medium Equipment | 14 | 8.1 |
| Light Equipment | 22 | 9.3 |

There is no non-mine use of the Whale Tail Haul Road by any local as the road is closed for public use. Two traditional land use crossing locations were identified during IQ/TK workshops and following meetings with the Hunters and Trappers Organization, a first location has been set at km 127 and is currently functional. Following consultation with HTO in 2019, it has been determined that no more locations for Traditional Land Use Crossings needed to be implemented along the WTHR.

Here is some specification regarding the crossing:

- Haul traffic from the Whale Tail Mine to Meadowbank Mill will have the right-of-way;
- Traditional land users (i.e. hunters on ATVs or snowmobiles) crossing the Whale Tail Haul Road on identified ramps must yield to Haul Road Traffic;
- Haul Road Traffic approaching traditional land use crossings must be vigilant of the potential use by ATVs or snowmobiles;
- Hunters and traditional land users on snowmobiles or ATVs have to stop, look both ways and yield to traffic before crossing the road; and
- Traditional land use marked signs were installed on the haul road to warn haul trucks and other vehicles on the road to ensure users protection and safety of traditional land users on ATVs or snowmobiles.

In 2022, no incidents involving non-mine authorized use occurred. Agnico Eagle is confident that the current procedures and protocols provide for the safety of the local public while using the road either for hunting access or for general recreational opportunities.

## 11.7.2 Safety Incidents

### 11.7.2.1 *AWAR Meadowbank Site*

**As required by NIRB Project Certificate No.004 Condition 32e:** ***Prior to opening of the road, and annually thereafter, advertise and hold at least one community meeting in the Hamlet of Baker Lake to explain to the community that the road is a private road with non-mine use of the road limited to approved, safe and controlled use by all-terrain-vehicles for the purpose of carrying out traditional Inuit activities.***

And

**As required by NIRB Project Certificate No.004 Condition 32f:** ***Place notices at least quarterly on the radio and television to explain to the community that the road is a private road with non-mine use of road limited to***

***authorized, safe and controlled use by all-terrain-vehicles for the purpose of carrying out traditional Inuit activities.***

And

**As required by NIRB Project Certificate No.004 Condition 32h:** ***Report all accidents or other safety incidents on the road, to the GN, KivIA [KIA], and the Hamlet immediately, and to NIRB annually.***

In 2022, the following meetings were held to review AWAR procedure and monitoring:

- One (1) meeting with Baker Lake Mayor
- One (1) meeting with HTO Manager
- Two (2) meetings with KivIA- Lands
- One (1) meeting with the Elders at Baker Lake

In 2022, Agnico Eagle continued to remain connected to communities via radio and Facebook. The Meadowbank Facebook page provided updates on the road closure throughout the year. The Baker Lake community was able to access the AWAR procedure via the Facebook Meadowbank Page or the website www.aemnunavut.ca/community/roads.

On August 16th, 2022, a Cyanide Transportation information session was held with Baker Lake Hamlet, Fire Department, HTO and the Health Center. During the meeting, the 2022 Cyanide Transportation safety and monitoring procedures were presented as well as the communication plans. In addition, Agnico Eagle collected feedback and comments from the attendees regarding the process.

In response to COVID-19, Agnico Eagle developed a ‘Gatehouse Isolation’ procedure in May 2020 to ensure Baker Lake gatehouse Nunavummiut employees maintain distance and isolation from mine employees. In 2022, the no-contact procedure was removed, although, there was still a restricted policy in place between on-site employees and community members to limit interactions only to work-related tasks. In 2022, there were no incidents reported involving non-mine authorized vehicles and no accidents to date involving mine related truck traffic and locals using ATV’s/snowmobiles.

In 2022, there were eight (8) environmental spills that occurred along the AWAR. Tables 7-2 and 7-3 provides details on these spills. These spills were managed and remediated appropriately according to Agnico Eagle’s Spill Contingency Plan. .

In 2022, there were five (5) project-related wildlife mortalities along the AWAR. Three (3) Arctic hares, one (1) wolverine and one (1) ptarmigan were killed due to vehicle interaction.

All the incident/mortality reports can be found in 2022 Wildlife Monitoring Summary Report (Appendix 47).

To continue avoiding further incidents, messages are continually provided to employees and contractors to reinforce the procedures for wildlife protection during road use. As well, reminders were given on reporting any issues or observations concerning wildlife to the AWAR road dispatch.

### 11.7.2.2 *Whale Tail Haul Road*

**As required by CIRNAC Road lease 66H/8-2-1 Condition 64:** ***The lessee agrees to report any information received, including accidents or others safety incidents on the road, including the locked gates, to the minister, who shall make this information accessible to the GN, KIA a, the Hamlet of Baker Lake immediately.***

And

**As required by NIRB Project Certificate No 008 Condition 66:** ***The Proponent shall operate the Whale Tail haul road as a private access road, implement any reasonable measures to limit public access to the road, and develop strategies that account for unauthorized use. These measures must include, but are not limited to, the following:***

> ***a) The posting of signs in English and Inuktitut at the gate, each major bridge crossing, and each 10 kilometres of road, stating that public use of the road is prohibited;***
>
> ***b) Annually advertise and hold at least one community meeting in the Hamlet of Baker Lake to explain to the community that the road is restricted to mine use only;***
>
> ***c) Place local notices (e.g., radio, television, social media) at least quarterly to explain to the community that the road is restricted to mine use only;***
>
> ***d) Record all unauthorized non-mine use of the road, and require all mine personnel using the road to monitor and report unauthorized non-mine use of the road; and,***
>
> ***e) Develop management strategies to ensure public and operator safety in the event of unauthorized public use.***

In 2022, the Baker Lake community members were kept informed about AWAR safety measures. Since the AWAR is used by Nunavummiut for numerous reasons such as the practice of traditional activities, the decision was made that an employee from Baker Lake would work at the gatehouse as a dispatcher. Some specific measures related to the pandemic were implemented to ensure that the no-contact procedure was maintained between on-site employees and community members.

Agnico Eagle relayed AWAR/WTHR safety information and procedure four (4) times a year via the Facebook page. Additionally, the community could access the procedure and road status via the website www.aemnunavut.ca/community/roads.

No incidents involving non-mine authorized use occurred in 2022.

There have been no accidents to date involving mine related truck traffic and locals using ATV's/snowmobiles.

A total of twenty (20) environmental spills occurred along the Whale Tail Haul Road in 2022. Table 7-4 and Table 7-5 provides details on each of these spills. All spills were managed and remediated appropriately according to Agnico Eagle's Spill Contingency Plan.

In 2022, there were five (5) project-related mortalities along the Whale Tail Haul Road. Four (4) Arctic Hares, and one (1) Arctic ground squirrel were killed due to vehicle interaction. To avoid incidents, messages are continually provided to employees and contractors to reinforce the procedures for wildlife protection during road use. As well, reminders were given on reporting any issues or observations concerning wildlife to the Whale Tail Haul Road dispatch.

##### *11.7.2.2.1 Road Closure*

**As required by CIRNAC Road lease 66H/8-2-1 Condition 65*: The lessee shall give notice of any closure of the road to the Minister and the reasons thereof, and post any notice of closure at the access point and along the road.***

There was no Whale Tail Haul Road closures in 2022 that may have impacted local usage as the road is not public. There were road closures in 2022 due to bad weather and wildlife migration (Wildlife Monitoring Summary Report Appendix 47) at various intervals throughout the year. When this situation occurred, the road status was provided to all Agnico Eagle and contractor employees, the GN, KivIA and BLHTO with regular updates.

## 11.8 SHIPPING MANAGEMENT

**As required by NIRB Project Certificate No.008, Condition 37: *The Proponent shall maintain a Shipping Management Plan in coordination and consultation with applicable regulatory authorities and the Kivalliq Inuit Association, and the Hunters and Trappers Organizations of the Kivalliq communities. The updated plan should be submitted to the Nunavut Impact Review Board at least 90 days prior to the start to commencement of shipping activities, with subsequent updates submitted annually thereafter in the Proponent's annual report or as may otherwise be required by the NIRB.***

Agnico Eagle has developed and maintained a Shipping Management Plan prior to 2018 shipping activities. In 2022, Agnico Eagle followed the approved Shipping Management Plan (Version 4, April 2022) that was submitted as part of Appendix 56 of the 2021 Annual Report.

### 11.8.1 Marine Shipping Routing

**As required by NIRB Project Certificate No.008 Condition 38: *The Proponent shall ensure that marine shipping activities avoid sensitive wildlife habitat and species along the shipping route and use a routing south of Coats Island as the primary shipping route, subject to vessel and human safety considerations. Confirmation that the requirements of this term and condition are being effectively implemented by shipping companies contracted by the Proponent should be submitted as part of annual reporting to the Nunavut Impact Review Board.***

And

**As required by NIRB Project Certificate No.008 Condition 39: *The Proponent shall ensure that, subject to vessel safety requirements, a setback distance of at least 500 metres is maintained from colonies and aggregations of seabirds and marine mammals during Project shipping transiting through Hudson Strait, Hudson Bay, and Chesterfield Inlet. Confirmation that the requirements of this term and condition are being effectively implemented by shipping companies contracted by the Proponent should be submitted as part of annual reporting to the Nunavut Impact Review Board.***

And

**As required by NIRB Project Certificate No.004 Condition 41:** ***Subject to vessel and human safety considerations, Cumberland shall require shippers carrying cargo to the Project through Chesterfield Inlet to follow the following mitigation procedures in the event that marine mammals are in the vicinity of the shipping activities:***

- ***Wildlife will be given right of way;***
- ***Ships will maintain a straight course, constant speed, and will avoid erratic behaviour; and***
- ***When marine mammals appear to be trapped or disturbed by vessel movements, the vessel will stop until the mammals have moved away from the area..***

For the third year, Agnico Eagle produced a joint MMSO report with Agnico Eagle Meliadine Mine. As the shipping company Groupe Desgagnés and Woodward ship equipment, supplies, and fuel to Meadowbank and Meliadine and sometimes vessel deserve both sites during the same trip, it was determined that it will be efficient to report all the observations into the same report while ensuring that the requirement from both sites are clearly identified. The below is a summary of the findings and Agnico Eagle will refer to the 2022 Marine Mammal and Seabird Annual Report presented in Appendix 39 for a complete review.

During the 2022 shipping season, a total of 27 Groupe Desgagnés and Woodward vessels serviced the Projects between July and November during the 2022 shipping season: 13 for Meadowbank, seven for Meliadine, and seven serviced both Meadowbank and Meliadine. No incidents with marine mammals or seabirds were reported for the 2022 shipping season.

Vessel Mitigation

Vessels are required to transit south of Coats Island whenever the weather is safe to do so. The majority (89%) of vessels servicing the Meadowbank and Meliadine projects in 2022 travelled south of Coats Island, with the exception of three occasions, one of which occurred in August due to windy conditions in Hudson Bay, and the other two occurred in October, both due to inclement weather.

Setbacks from Sensitive Habitats

In compliance with Whale Tail Mine Certificate No. 008, Term and Condition 39, project vessels must follow a setback distance of 500 m from colonies and aggregations of seabirds and marine mammals while transiting through the Hudson Strait, Hudson Bay, and Chesterfield Inlet. In addition, vessels must follow a setback distance of 2 km from Marble Island, as per Meliadine's Shipping Management Plan. Vessel tracks were mapped along with identified sensitive areas for wildlife; where detailed data was available, vessels were shown to avoid these areas where safe to do so. Groupe Desgagnés and/or Woodward had several occasions where tracks appeared to intersect with 500 m setback polygons, or the 2 km setback polygon around Marble Island. However, in all but one case (one point within the Marble Island polygon), no ship track point was located within a setback polygon. Track data is based on satellite AIS (Automatic Identification System); therefore, ship track intersections likely occurred due to lack of ship track resolution and the intersection of existing points to create a continuous shipping track. Agnico Eagle will continue to explore in 2023 the feasibility to increase accuracy of track data.

Updated training materials were also supplied to dedicated MMSO crew observers including detailed methods for marine mammal and seabird surveys (on moving vessels and stationary vessels), data sheets, and training videos. Training material distributed before the 2022 shipping season is presented in appendices A, B and C and discussed in Section 1.3 of the report presented in Appendix 39.

The 2022 MMSO program resulted in greater survey effort compared to 2021. Since the improvement in training in 2020, all years (2020 through 2022) have resulted in greater survey effort compared to previous years. Datasheets were obtained from 21 of the 27 vessels in 2022, which is similar to the last two years (23 of the 29 vessels in 2021, and 19 of the 25 vessels in 2020), all of which are greater than previous years.

### 11.8.2 Wildlife Monitoring on Vessel

**As required by NIRB Project Certificate No.008 Condition 40:** ***The Proponent shall develop and implement a ship-based marine mammal monitoring program, as part of a Marine Mammal Management and Monitoring Plan, in consultation with Fisheries and Oceans Canada, communities, and other interested parties. The Proponent shall report any accidental contact by project vessels with marine mammals or seabird colonies to applicable responsible authorities including Fisheries and Oceans Canada and Environment and Climate Change Canada. The Plan should be submitted to the Nunavut Impact Review Board at least 90 days prior to commencement of shipping activities, with subsequent updates submitted annually thereafter. Confirmation that the requirements of the Plan are being effectively implemented by shipping companies contracted by the Proponent should be provided with annual reporting.***

And

**As required by NIRB Project Certificate No.004, Condition 36:** ***ensure the placement of local area marine mammal monitors onboard all vessels transporting fuel or materials for the Project through Chesterfield Inlet***

And

**As required by NIRB Project Certificate No.004, Commitment 95:** ***Inuit observation and encounter reports for on-board vessels transporting goods and fuel through Chesterfield Inlet.***

The Marine Mammal Management and Monitoring Plan was provided as Appendix B of the Shipping Management Plan (Version 4, April 2022 – Appendix 56 of the 2021 Annual Report).

A complete report, 2022 Marine Mammal and Seabird Annual Report, detailing the 2022 mammal and seabird observations during the shipping season can be found in Appendix 39. Below is a summary of the report and Agnico Eagle will refer the reader to the report in Appendix for a complete review.

<u>Marine Mammal Monitoring</u>

In 2022, 92 transects were surveyed for marine mammals, and 47 stationary surveys were completed. There was a total of 32 sightings (19 during dedicated surveys and 13 incidentally) of marine mammals during the 2022 shipping season, compared to 35 (surveys and incidentally) in 2021, 12 (surveys and incidentally) in 2020, seven (all during surveys) in 2019, none in 2018, and six (all incidental) in 2017. The majority of all marine mammal sightings between 2017 and 2022 were recorded in the Hudson Strait or near Marble Island and Chesterfield Inlet. There is an insufficient number of marine mammal sightings recorded to conduct a density analysis. No marine mammal-vessel interactions (e.g., strikes) were recorded by Groupe Desgagnés or Woodward in 2022, or in previous years (2017 through 2021).

Seabird Monitoring

No interactions between vessels and seabirds were recorded during the MMSO in 2022, or in previous years. Seabird survey effort on moving vessels in 2022 was similar to 2021 and higher than early years, with 163 surveys completed. Over five years of moving vessel surveys for seabirds between 2018 and 2022, 49 species and 8,624 individual birds were recorded. No new species were recorded in 2022. The most common species recorded in 2022 were northern fulmar, razorbill, herring gull, and common murre. For the second year, common murre were reported in large numbers; while they can occur in the eastern portion of the shipping zone near Newfoundland, they are not common through the majority of the survey area. It is possible that identifications of common murre were actually thick-billed murre, which occur throughout the survey area. Across all years, thick-billed murre and northern fulmar are consistently among the most commonly recorded species.

Seabird detectability and density were estimated using models which account for lower detectability of birds with greater distance from survey transects. Detectability estimates were mostly consistent between years, with the highest estimate in 2022, followed by 2019 and 2021. Despite the higher detectability estimate, 2022 had the lowest predicted seabird density. The spatial effort of surveys in 2022 was higher than all previous years, but the number of seabirds recorded was similar to other years. The differences in estimated density are a reflection of variability in the effort and number of birds detected between years

Stationary vessel surveys in 2022 were frequently lacking records of survey time, creating a lower sample size of surveys which were used for analysis. A total of 2,592 individuals from 37 species were recorded during stationary vessel surveys from 2019 to 2022. Nearly 50% of records were from 2021, and the remaining records were almost all from 2022 and 2020. The detection rate for stationary vessel surveys is roughly half of that for moving vessel surveys. This result is generally consistent with the data, which indicate that both detections and number of birds recorded per survey were lower for stationary surveys compared to moving surveys.

Marine Wildlife Observations – Baker Lake

In compliance with Project Certificate No. 004 Condition 36, local area marine mammal monitors have conducted a program of community wildlife observers on barges ferrying supplies between Helicopter Island and Baker Lake within Chesterfield Inlet between 2008 and 2019. In 2020 and 2021, community members were not permitted to board vessels due to health and safety restrictions in place related to the COVID-19 pandemic. In 2022, Agnico Eagle hired three local monitors from the community of Baker Lake. In 2022, community wildlife observers record incidental sightings of wildlife rather than completing standardized surveys. There were 54 incidental observation sheets completed in 2022 by community members in July, August, and October. On seven of these sheets, observers noted that no birds were observed during a particular time. Wildlife were observed during 47 of the 54 “surveys” conducted in 2022. During these surveys, there were 45 separate sightings of birds (total of 117 individuals), one sighting of caribou (a group of five animals), and one sighting of a muskox group (eight animals). No marine mammals were observed. The most commonly observed birds were unknown gull species.

As established in 2020 and 2021, the shipping companies continued to record marine wildlife sightings while vessels were at anchor near Helicopter Island, or on the tugs/barges between Helicopter Island and Baker Lake to supplement the community observer effort. In 2022, the tugs recorded a total of 54 incidental sightings while transiting between Helicopter Island and Baker Lake over 27 separate days between July 13 and October 24. No marine mammals were recorded incidentally, and a total of 233 seabirds were recorded across 13 different species. In addition to the incidental sightings by the barges, vessels also completed stationary surveys while anchored at Helicopter Island and moving transect surveys when conditions allowed. In 2022 there were 34 stationary surveys for marine mammals completed at Helicopter Island, and one moving transect survey between Helicopter Island and Baker Lake. No marine mammals were observed during any of these surveys. For seabirds, 110 stationary surveys were completed (27 of which had temporal effort recorded) and 15 moving transect surveys. During stationary seabird surveys, 383 individuals across 15 different species were observed, and during moving transect surveys, 172 individual seabirds across 12 different species were observed.

In 2022, prior to the beginning of the barge season, Agnico Eagle toured the related communities, including Chesterfield Inlet, to advertise the need of having monitors available for the upcoming shipping season. This pre-shipping consultation is expected to be pursue in 2023. See Section 11.8.3 for more information.

For 2023, it is Agnico Eagle's intent to continue to hire local monitors in compliance with Term and Condition 36. Recruitment will be done with the community agents to find reliable and available monitors that are willing to board the vessels for a significant time period, as the vessels are travelling back and forth from the Inlet to the Baker community. Recruitment from the community has always proved to be challenging as multiple candidates first accepted the proposed work but declined and/or changed their minds at the last minute or decide to unboard the vessel on short notice and did not want to pursue this type of work any further.

Additional to the above and as an alternative to ensure data collection as per Condition 36, Agnico Eagle will continue to work with the shipping compagnies for the possibility to pursue, in the following years, the marine mammal monitoring from Helicopter Island to Baker Lake infrastructures.

Agnico Eagle will continue to improve the effectiveness of the MMSO Program in compliance with Whale Tail Project Certificate No. 008 Term and Conditions 38, 39, 40 and Meadowbank Project Certificate No. 004, Term and Condition 36. As discussed in previous section, the training material that summarizes and simplifies both the Marine Mammal Management and Monitoring Plan (MMMMP) and Shipping Management Plan (SMP) has continue to show there effectiveness in 2023.

### 11.8.3 Notification to Communities

**As required by NIRB Project Certificate No.008 Condition 41:** ***The Proponent shall provide notification to communities regarding scheduled ship transits throughout the regional study area, including Hudson Bay and Chesterfield Inlet. The Proponent shall provide a summary of public consultation undertaken to address this term and condition in its annual report to the Nunavut Impact Review Board.***

On May 3rd, 2022, an engagement session was held with Chesterfield Inlet hamlet representatives and on August 17th, 2022 a teleconference was held with Baker Lake Hamlet and Fisheries and Oceans Canada representatives. Both of these meetings were to present the 2022 Sealift Season schedule. During the session, the following topics were presented:

- Vessel routing from Quebec to Nunavut and routing to Baker Lake and Rankin Inlet;

- Monitoring of marine mammals and seabirds;
- All Weather Access Road (AWAR) closure process;
- Caribou Monitoring;
- Process to find live information about the vessel routing
- Process to ask questions and raise concerns via Tusaajugut 'We are Listening'

Nunavut Sealink & Supply Inc—Desganés Transarctik representatives and Agnico Eagle Environment team were present during the teleconference to answer any questions or concerns.

In 2022, prior to the beginning of the barge season, Agnico Eagle also toured the following communities: Arviat, Whale Cove, Coral Harbour, and Chesterfield Inlet, and held a teleconference with the Hamlet of Baker Lake.

Members of Agnico Eagle's Community Relations, Environment, and Logistics teams attended the meetings in addition to Nunavut Sealink & Supply Inc—Desgagnés Transarctik representatives. As per requirement, Agnico Eagle invited Fisheries and Oceans representatives to attend these meetings and teleconference. The main objectives of the tour were to present the upcoming shipping season and hear feedback and concerns from the communities that may assist in adaptive management practices. The agenda of each meeting was generally the same, where certain topics were either expanded or limited depending on the audience and their interests.

- Sealift Operations
- Proposed scenario – Baker Lake
- Routing from Quebec to Nunavut
- Routing to go to Baker Lake
- Proposed scenario – Rankin Inlet
- Routing to go to Rankin Inlet
- All-weather Access Road Management
- Caribou Migration
- Process to find live information about the vessel routing
- MMSO Program
- Process to ask questions and raise concerns via Tusaajugut 'We are Listening'

### 11.8.4 Ingress/Egress of Ship Cargo

**As required by NIRB Project Certificate No.004 Condition 82:** ***Monitor the ingress/egress of ship cargo at Baker Lake and report any accidents or spills immediately to the regulatory agencies as required by law and to NIRB's Monitoring Officer annually.***

And

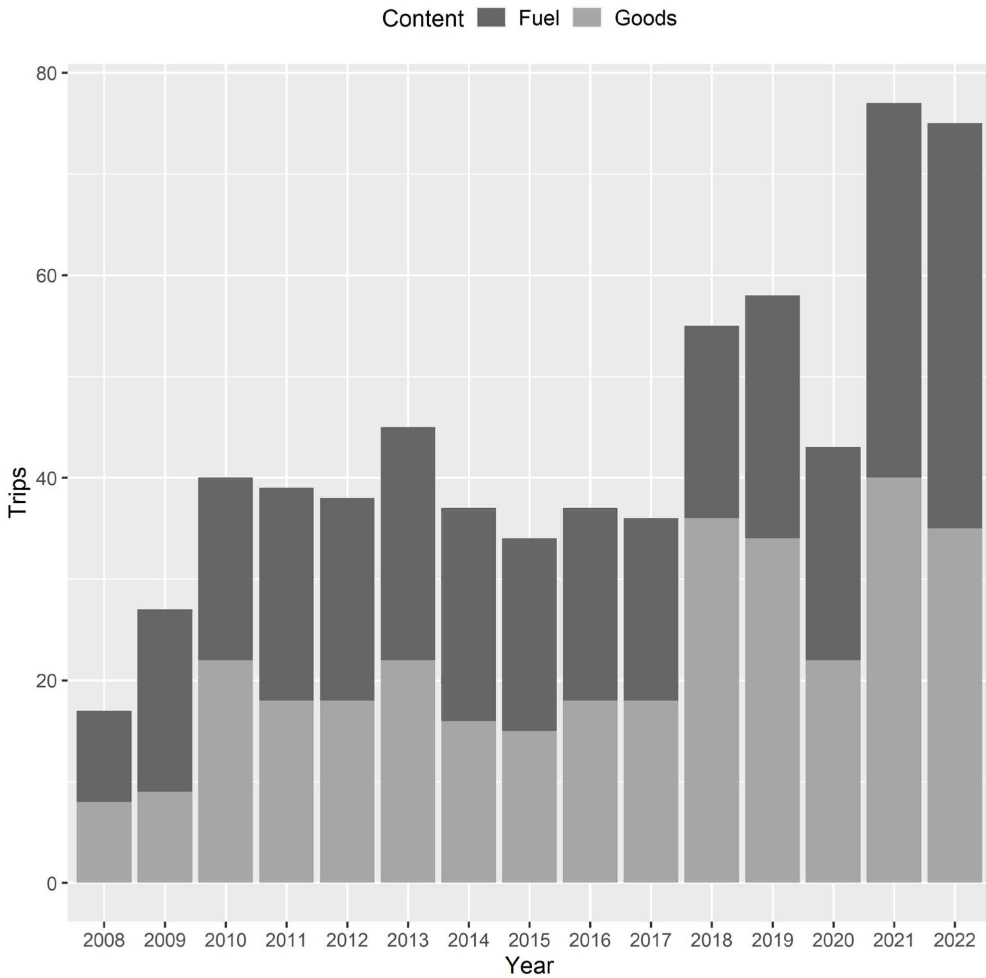
**As required by NIRB Project Certificate No.008 Condition 43:** ***The Proponent shall contract only certified vessels to carry cargo for the Project, and will ensure shippers are aware of the requirements of the Shipping Management Plan, the Risk Management and Emergency Response Plan, and the Oil Pollution Emergency Plan. Evidence of meeting the requirements of this term and condition should be submitted as part of annual reporting to the Nunavut Impact Review Board***

In 2022, Agnico Eagle did not observe any accidents or spills that occurred at Baker Lake during the Ingress/Egress of ship cargo.

In 2022, Agnico Eagle monitored the ingress/egress of ship cargo at Baker Lake and the results are summarized in the below Figure 40. Barge trips from Chesterfield Inlet in 2022 numbered 35 for general cargo and 40 for fuel. With the expansion at the Whale Tail site traffic increased in 2018 and 2019 compared to previous years (e.g., from < 40 in 2016 and 2017 to ~ 55 in 2018). In 2021, the number of trips increased for general cargo and fuel compared to 2020 and represented the highest reported number of trips since monitoring began in 2008. The number of trips in 2022 remained similar to 2021.

Only certified vessels were hired to carry the cargo at Meadowbank Complex. Annual meeting were held with the dry cargo and fuel carriers to review the shipping and emergency plan.

**Figure 40 Barge traffic (number of trips/year) arriving in Baker Lake from Chesterfield Inlet since 2008**




## 11.8.5 Insurance

**As required by NIRB Project Certificate No.004 Condition 45:** ***"[Cumberland] shall carry, and require contracted shippers to carry adequate insurance to fully compensate losses arising from a spill or accident, including but not limited to the loss of resources arising from the spill or accident; any claims are to be reported to proper officials with a copy to NIRB's Monitoring Officer"***

All shipping contractors have insurance to fully compensate losses arising from a spill or accident, including but not limited to the loss of resources arising from spill or accident for all marine transport vessels and vehicles travelling on the AWAR and WTHR.

In 2022, Agnico Eagle reported to the authorities a 29 000 L spill of diesel fuel at KM 87 on the AWAR. In 2023, Agnico Eagle will look into the possibility to claim the contractor, Arctic Fuel Services, concerning this incident. No claim was reported by the marine shippers in 2022.

## 11.9 CONSULTATION, ENGAGEMENT AND COMMUNICATION

**As required by NWB Water License 2AM-MEA1530 Schedule B, Item 24:** ***A summary of public consultation and participation with local organizations and the residents of the nearby communities, including a schedule of upcoming community events and information sessions.***

Refer to table in Appendix 5 for more information regarding the public consultation and participation with local organization and the residents of the nearby communities. Appendix 5 is also use as reference in the following sections.

### 11.9.1 Chesterfield Inlet

**As required by NIRB Project Certificate No.004, Condition 39:** ***annually advertise and hold a community information meeting in Chesterfield Inlet to report on the Project and to hear from Chesterfield Inlet residents and respond to concerns; a consultation report shall be submitted to NIRB's Monitoring Officer within one month of the meeting.***

And

**As required by NIRB Project Certificate No.004, Condition 40:** ***Gather Traditional Knowledge from the local HTOs and conduct a minimum of a one-day workshop with residents of Chesterfield Inlet to more fully gather Traditional Knowledge about the marine mammals, cabins, hunting, and other local activities in the Inlet. Report to the KIA and NIRB's Monitoring Officer annually on the Traditional Knowledge gathered including any operational changes that resulted from concerns shared at the workshop.***

And

**As required by NIRB Project Certificate No.008 Condition 42:** ***The Proponent shall design monitoring programs to ensure that local users of the marine area along the shipping route have the opportunity to provide feedback and input in relation to monitoring and evaluating potential project-induced impacts and changes in marine mammal distributions. The Proponent shall demonstrate how feedback received from community consultations has been incorporated into the most appropriate mitigation or management plans. The Proponent shall provide a summary of public consultation undertaken to address this term and condition in its annual report to the Nunavut Impact Review Board.***

Throughout 2022, Agnico Eagle ensured Chesterfield Inlet community members and key stakeholders are continuously informed and consulted on various topics. In 2022, the following community engagement activities took place in Chesterfield Inlet:

- One (1) support meeting with Chesterfield Inlet to discuss community development opportunities as well as the future of both Meadowbank and Meliadine.
- One (1) meeting with Chesterfield HTO to discuss on the future of both Meliadine and Meadowbank, as well as about donations program.
- One (1) consultation with Aqigiq (Chesterfield) HTO board for Whale Tail Extension.

- Two (2) employment information sessions to promote career opportunities at Agnico Eagle in the communities.
- One (1) event hosted by Agnico Eagle on Chesterfield Inlet: Nunavut Day On the Land Celebrations

The purpose and outcomes of the above engagement initiatives are summarized in the Engagement Table appended in Appendix 5 .

### 11.9.2 Hunters and Trappers Organizations

**As required by NIRB Project Certificate No.004, Condition 40:** ***Gather Traditional Knowledge from the local HTOs and conduct a minimum of a one-day workshop with residents of Chesterfield Inlet to more fully gather Traditional Knowledge about the marine mammals, cabins, hunting, and other local activities in the Inlet. Report to the KIA and NIRB's Monitoring Officer annually on the Traditional Knowledge gathered including any operational changes that resulted from concerns shared at the workshop.***

And

**As required by NIRB Project Certificate No.004, Condition 58: "*in consultation with Elders and the HTOs and subject to safety requirements, design the lighting and use of lights at the mine site to minimize the disturbance of lights on sensitive wildlife and birds*"**

And

**As required by NIRB Project Certificate No.004, Condition 59:** ***In consultation with Elders and the HTOs, design and implement means of deterring caribou from the tailing ponds, such as temporary ribbon placement or Inukshuks, with such designs not to include the use of fencing"***

And

**As required by NIRB Project Certificate No.004, Condition 68:** ***Cumberland shall, in consultation with Elders, local HTOs and the Meadowbank Gold Mine SEMC, demonstrate that they are working toward incorporating Inuit societal values into mine operation policies."***

In 2022, four (4) meetings and three (3) consultations were held with the Baker Lake and Chesterfield HTO. Agnico Eagle continued to have regular engagements on project activities throughout 2022, including regular communication between the Project Environment team and HTO.

Meeting topics included:

- Operation updates and presentation of fish out activities
- Discussion on future project at Whale Tail and support letter for fisheries work at Meadowbank
- AWAR measures and Caribou migration
- Discussion on Agnico Eagle Donation program
- Harvesting Budget
- Sponsorship and community activities

Consultation topics included:

- Discuss protecting traditional placenames and work on Inuit culture and community mapping
- Consultation with Aqigiq (Chesterfield) HTO board for Whale Tail Extension
- Present Fish Offset options around Whale Tail Mine
- Provide update on performed studies and answer questions and comments on upcoming offsetting activities.

The purpose and outcomes of the above engagement initiatives are summarized in the Engagement Table appended in Appendix 5.

### 11.9.3 Community Liaison Committees

In 2022, a new version of the Community Liaison Committee in Baker Lake was implemented to encourage a dialogue exchange between Agnico Eagle and the local sub-groups (youth, women, Elders, etc.). A newsletter, containing operational activities and achievements, including a section on how to reach out to the company for questions/ concerns/ suggestions, was produced and sent to the members of the Baker Lake Community Liaison Committee. Engagement with specific community sub-groups will allow better understanding of the issues and provide a venue for stakeholder sub-groups to advice Agnico Eagle management for solutions.

A copy of the 2022 newsletter can be found in Appendix 7.

### 11.9.4 Elders and IQ Validation

In 2021, Agnico Eagle developed a Kivalliq Elders' Advisory Committee (KEAC) comprised of 21 Elders from Baker Lake, Chesterfield Inlet, Rankin Inlet, Whale Cove and Arviat to integrate Inuit Qaujimajatuqangit (IQ), Inuit Societal Values (ISV) and community knowledge into our exploration, planning, workforce, wellness and operational plans. The selection of the committee members was led by Agnico Eagle's IQ Coordinator through extensive consultations with wildlife organizations and local leaders.

In 2022, engaging with Elders was ongoing – Agnico Eagle ensured to consult with Elders to collect and validate information. In 2022, following engagement initiatives took place with the Elders and members of the Kivalliq Elders Advisory Committee:

- One (1) introductory meeting between Agnico Eagle and Arviat Elders

- One (1) IQ consultation with Baker Lake Elders

- One (1) meeting with the Kivalliq Elders Advisory Committee to draft and approve the terms of reference for the committee

- Two (2) meeting with the Kivalliq Elders Advisory Committee on Meliadine and Whale Tail extension

- One (1) consultation with Kivalliq Elders Advisory Committee to identify an Inuktitut name for the Inuit Employment Strategy

The purpose and outcomes of the above engagement initiatives are summarized in the Engagement Table appended in Appendix 5.

**Application of Inuit Quajimajatuqangit (IQ) and Traditional Knowledge (TK) to Monitoring Plans**

In 2022, the Community Relations team implemented to use of the methodology. This process allows consistent collection and integration of Inuit Qaujimajatuqangit and Inuit Traditional Knowledge into Agnico Eagle project phases.

The Inuit Qaujimajatuqangit and Inuit Traditional Knowledge Methodology consists of four steps:

1. Collection
   Inuit Quajimajatuqangit and Inuit Traditional Knowledge are collected and validated through multiple engagement channels with Kivalliq individuals, communities, and community groups. Engagement channels includes one-on-one conversations, focus groups, public consultations and open house with field experts and knowledge holders.

2. Documentation
   The IQ and TK collected during engagement are documented in IQ/TK collection forms. The forms gather details such as the date, engagement purpose, engagement type, engagement leader, Agnico Eagle supporting team, community participants and their organization, meeting notes, questions, and comments. Furthermore, the form also documents outcomes of the engagement and commitments made by Agnico Eagle to the participants. Lastly, the IQ/TK form requires the participants to provide consent that allows Agnico Eagle to use the shared information on Inuit Qaujimajatuqangit and Inuit Traditional Knowledge.

3. Interpretation
   This step consists of two sub-steps:
   a. Cross-referencing—New IQ/TK collected are cross-referenced with past collected IQ/TK to avoid duplication.

   b. Linking Valued Components —Agnico Eagle Inuit knowledge holders and supporting staff links the collected IQ/TK to specific Environmental and Socio-Economic Valued Components.

4. Storing
   All collected and interpreted data are stored in an internal database software system that allows history tracking and reporting. The database tracks all the consented and validated IQ/TK as well as the integration into the operational management and monitoring plans.

In 2022, the Socio-Economic Monitoring Report identifies where specific ISVs have been used or are connected to the subjects being discussed. The purpose for this is to demonstrate Agnico Eagle's commitment to the use and implementation of IQ and ISVs and to begin to move toward more fulsome integration of IQ and ISVs in its monitoring and reporting. Throughout the 2022 report, the "**ISV**" symbol is used as an indicator and easy reference to one or more specific ISV.

### 11.9.5 Baker Lake

#### 11.9.5.1 *Community Meetings in Baker Lake*

A teleconference was held on August 17th, 2022 with Baker Lake Hamlet and Fisheries and Oceans Canada representatives to present the 2022 Sealift Season schedule. During the teleconference, the following topics were presented:

- Vessel routing from Quebec to Nunavut and routing to Baker Lake
- Monitoring of marine mammals and seabirds
- All Weather Access Road closure process
- Caribou Monitoring
- Process to find live information about the vessel routing
- Process to ask questions and raise concerns via Tusaajugut 'We are Listening'

On August 16th, 2022, a Cyanide Transportation information session was held with Baker Lake Hamlet, Fire Department, HTO and the Health Center. During the meeting, the 2022 Cyanide Transportation safety and monitoring procedures were presented as well as the communication plans. In addition, Agnico Eagle collected feedback and comments from the attendees regarding the process.

Throughout 2022, Agnico Eagle ensured Baker Lake community members and key stakeholders are continuously informed and consulted on various topics. In 2022, the following community engagement activities took place in Baker Lake

- 20 Meetings
- Five (5) Consultations
- Two (2) Employment Information Sessions including a Career Fair
- Two (2) Events - Festival by the Lake and Baker Lake Christmas Feast
- One use to (1) open house to promote and inform the community members about mining, our operations and the career opportunities

The purpose and outcomes of the above engagement initiatives are summarized in Appendix 5.

#### 11.9.5.2 *Site Tours for Baker Lake Residents*

Each year, Agnico Eagle offers a variety of ways for the residents of Baker Lake, as well as various other groups or individuals from the Kivalliq, to visit Meadowbank Complex. In 2022, due to COVID-19 and other precaution measures this initiative was cancelled.

### 11.9.6 Community Engagement Initiatives

Community engagement and consultation initiatives that Agnico Eagle held or participated in during 2022 are summarized in Appendix 5.

#### 11.9.6.1 *Community Coordinators Program*

The Community Coordinators program consists of full or part-time Agnico Eagle Officer in all Hamlets in the Kivalliq Region, including Agnico Eagle's offices in the communities of Rankin Inlet and Baker Lake.

The objective of the community based Agnico Eagle Officer is to provide a point of contact in each community to facilitate communications, provide services, and coordinate activities in the following areas:

- Support Human Resources (HR) department and the recruitment team.
- Assist HR and other Agnico Eagle departments to locate employees or potential employees as required.
- Provide advice and assistance to Agnico Eagle to organize and hold information sessions in the community on Agnico Eagle projects, initiatives, and engagement activities, including Labour Pool and business opportunities initiatives outlined in the Meadowbank and Whale Tail IIBA.
- Provide updates to the Hamlet Council and to other community stakeholders on Agnico Eagle activities.
- Distribute Agnico Eagle information and promotional materials.
- Participate in Agnico Eagle's Nunavut donation initiatives and processes.
- Participate in organization community events and education initiatives.

This increased community involvement by the Community Officers will allow Agnico Eagle to achieve recruitment goals and the obligations for the NIRB and IIBA; therefore, rendering this position essential to Agnico Eagle's Nunavut operations. In 2022, CLOs were present in six (6) communities most of the year. However, by the end of 2022, Agnico Eagle had four (4) CLOs present in the following communities—Rankin Inlet, Baker Lake, Arviat, Coral Harbour.

### 11.9.7 Communication

**As required by NIRB Project Certificate No.008 Item 12:** ***The Proponent shall establish a publicly-accessible Project-specific web portal or web page to make available in a central location all significant non-confidential monitoring and reporting information submitted to regulatory authorities pursuant to the Project Certificate and other territorial or federal permits issued for the Project. For clarity, posting on the Project-specific site does not replace any reporting obligation of the Proponent pursuant to the Project Certificate or any territorial or federal permit.***

In 2018, Agnico Eagle launched a Facebook page for Meadowbank Complex (Meadowbank and Whale Tail) which acts as another method with which it can inform the Kivalliq communities of important information, including road closures, recruitment information, and public meetings. This additional medium of communication was suggested by multiple stakeholder groups, including the Kivalliq Socio-Economic Monitoring Committee.

Agnico Eagle continues to use the Meadowbank Complex Facebook page as a key medium of communication with employees and Kivalliq communities. In 2022, the social media platform was used to keep communities of impact informed and build awareness on the following topics:

- COVID-19 related support available from Agnico Eagle during the pandemic
- Return to work information for employees at home

- Baker Lake and Rankin Inlet community office hours of operation
- Employment information Session dates in Kivalliq communities
- Business Opportunities Posts
- Job posting -- Sanajiksanut Program Launch
- Sealift Season & Cyanide transportation
- All Weather Access Road – Awareness and Road Rules
- Caribou Migration and related road closures

The above social media posts are outcomes of active management plans for example, the 'Sealift Season' posts are directly related to the Shipping Management Plan and the 'Caribou Migration' posts are product of Wildlife Management Plan. Social media posts were used to encourage engagement from community members. In 2022, Agnico Eagle Meadowbank Complex Facebook page made in total 156 posts.

In 2022, the Nunavut Agnico Eagle website had blog posts on the following topics:

- Hope Bay Project – Suspension of Production at the Doris Mine (1)
- COVID-19 Update – Nunavummiut Return to Work (1)
- Supporting an Active Lifestyle for Healthy Communities: Rankin Inlet's Agnico Eagle Arena
- Proud to support Ilitaqsiniq (Nunavut Literacy Council) in their efforts to grow Nunavut's literacy rates
- Meliadine Celebrates Million Ounce Milestone, Prepares for Potential Expansion
- Sanajiksanut Program
- Agnico Eagle Meadowbank Complex Reports Transportation Incident on the All-Weather Access Road from Baker Lake
- Agnico Eagle Baker Lake Career Day

All the blog posts were re-shared on the Nunavut Facebook pages to reach wider community audience and to encourage engagement from the community of impact.

In addition, in order to maintain ease of public access for important information, the Agnico Eagle Web Portal, https://aemnunavut.ca/media/documents/ has been updated with the 2020 and 2021 Annual Report, associated management plans, and other documents of interest. Moving forward, Agnico Eagle will commit to keeping the Web Portal updated for ease of public access.

## 11.10 SOCIO-ECONOMIC MONITORING PROGRAM (SEMP, SEMC, SEMWG, SEMR)

### 11.10.1 Meadowbank and Whale Tail Sites

**As required by NIRB Project Certificate No.004 Condition 63:** ***the GN and INAC shall form a Meadowbank Gold Mine Socio-Economic Monitoring Committee ("Meadowbank SEMC") to monitor the socio-economic impacts of the Project and the effectiveness of the Project's mitigation strategies; the monitoring shall supplement, not duplicate, the monitoring required pursuant to the IIBA negotiated for the Project, and on the request of Government or NPC, could assist in the coordination of data collection and tracking data trends in a comparable form to facilitate the analysis of cumulative effects; the terms of reference shall focus on the Project, include a plan for ongoing consultation with KivIA and affected local governments and a funding formula jointly submitted by GN, INAC and [Cumberland]; the terms of reference shall be submitted to NIRB for review and***

***subsequent direction within six (6) months of the issuance of a Project Certificate; [Cumberland] is entitled to be included in the Meadowbank SEMC.***

And

**As required by NIRB Project Certificate No.004, Condition 64:** ***[Cumberland] shall work with the GN and INAC to develop the terms of reference for a socio-economic monitoring program for the Meadowbank Project, including the carrying out of monitoring and research activities in a manner which will provide project specific data which will be useful in cumulative effects monitoring (upon request of Government or NPC) and consulting and cooperating with agencies undertaking such programs; [Cumberland] shall submit draft terms of reference for the socio-economic monitoring program to the Meadowbank SEMC for review and comment within six (6) months of the issuance of a Project Certificate, with a copy to NIRB's Monitoring Officer.***

And

**As required by NIRB Project Certificate No 008, Condition 44:** ***The Proponent is strongly encouraged to continue to participate in the work of the Kivalliq Socio-Economic Monitoring Committee along with other agencies and the communities of the Kivalliq region, and to identify areas of mutual interest and priority for inclusion into a collaborative monitoring framework that includes socio-economic priorities related to the Project, communities, and the Kivalliq region as a whole.***

And

**As required by NIRB Project Certificate No.008, Condition 54:** ***Proponent should ensure that the development of all project monitoring plans and associated reporting and updates are undertaken with active engagement of Kivalliq communities, land users, and harvesters. The Proponent should work with the Kivalliq Inuit Association, the local Hunters and Trappers Organizations and the Kivalliq Socio-Economic Monitoring Committee to report on the collection and integration of Inuit Qaujimaningit through its monitoring programs for the Project. To the extent that the sharing of such information is consistent with, and not limited by, any confidentiality or other agreements, summaries addressing the Proponent's fulfillment of this term and condition should be included in the Proponent's annual report to the Nunavut Impact Review Board.***

- The Socio-Economic Monitoring Program (SEMP) acts as a framework for the monitoring program. It outlines the indicators, metrics, units of measurements, etc., including those that are mandated by the Project Certificates. Agnico Eagle commits to reporting on the SEMP annually. In 2022, Agnico Eagle updated the program with new indicators for Cultural and Traditional Lifestyle and Individual and Community Wellness (Housing and Food Security) Valued Socio-Economic Component (VSECs). The motivation behind the review was to enhance Agnico Eagle's monitoring efforts and ensure subsequent community-based initiatives are based on immediate requirements. Based on the feedback from the SEMWG, the updated SEMP consists:
    - Two (2) new indicators under Cultural and Traditional Lifestyle VSEC
    - Four (4) new *housing* indicators under Individual and Community Wellness VSEC
    - Two (2) new *food security* indicators under Individual and Community Wellness VSEC

  The updated SEMP can be found in Appendix 4 of the 2022 Annual Report.

- The SEMWG traditionally included GN and CIRNAC, however, in 2020 KivIA has officially joined the SEMWG. The aim of this working group is to support Agnico Eagle's SEMP and the Kivalliq Socio-Economic Monitoring Committee (KvSEMC). In January 2022, Agnico Eagle organized one (1) teleconference with the SEMWG to propose and approve the new indicators and metrics for the SEMP, Socio-Economic Monitoring Report re-design, and to have an update on 2021-2022 Kivalliq SEMC from Government of Nunavut.

- The Kivalliq Socio-Economic Monitoring Committee (KvSEMC) meets annually to present data and consider socio-economic impacts and benefits of mining projects generally on the Kivalliq region. Members of the KvSEMC include Government of Nunavut (including specific departmental representation), Government of Canada, Kivalliq Inuit Association, Hunters and Trappers Organizations, Community representatives, community organizations and Project owners. The Government of Nunavut chairs the KvSEMC. Feedback provided in the KvSEMC informs the final Socio-Economic Monitoring Report. Additionally, the KvSEMC can recommend additional monitoring priorities. In 2022, Kivalliq Socio-Economic Monitoring Committee meeting was scheduled in December. Agnico Eagle participated the three (3) days committee meeting along with 24 organizations. During the meeting Agnico Eagle provided an overview of key results of the 2020 and 2021 Socio Economic Monitoring Reports. Additionally, other Kivalliq and Nunavut organizations provided update at the SEMC in 2020 and 2021 regional socio-economic results, social & cultural programs in place to support Nunavummiut, and upcoming projects related to infrastructure, housing, employment, and business support.

- The Socio-Economic Monitoring Report (SEMR) is the annual report on the SEMP. It is a comprehensive socio-economic monitoring report that contains Project-level data (data collected by Agnico Eagle at each Project site or regionally) and community-level data (data provided by or in communities), including data that is mandated by the Project Certificate. It is reviewed by the SEMWG prior to its submission, to allow for those groups to provide insight. In 2022, Agnico Eagle proposed a re-designed format of the SEMR to the SEMWG which was approved. In the formatted report, the sequencing of the Valued Socio-Economic Components (VSECs) has been re-ordered to enhance the flow from demographic through economic to social. Each VSEC section will be briefer and begin with a high-level summary, allowing sections to act as standalone documents. They will be written in more reader-friendly language, using simpler infographics and avoiding repetition or unnecessary technical detail. In the report, the data will be presented in singular graphs encompassing the sites to simplify information and improve document flow.

- Agnico Eagle is appending the 2022 Agnico Eagle Kivalliq Projects Socio-Economic Monitoring Report, in Appendix 4.

### 11.10.2 Whale Tail Site Updates

**As required by NIRB Project Certificate No.008, Condition 45:** ***The Proponent shall work in collaboration with other socio-economic stakeholders including, the Government of Nunavut, Indigenous and Northern Affairs Canada, the Kivalliq Inuit Association, and communities of the Kivalliq region, to establish a socio-economic working group for the Project to develop and oversee a Kivalliq Projects AEM Socio-Economic Monitoring Program. The working group will develop a Terms of Reference, which outlines each member's roles and responsibilities with regards to, where applicable, project specific socio-economic monitoring throughout the life of the projects. The Proponent shall work with the other parties to use the updated Kivalliq Projects Socio-***

***Economic Monitoring Program to monitor the predicted impacts outlined in the projects' respective environmental impact statements as well as regional concerns identified by the Kivalliq Socio-Economic Monitoring Committee. The Proponent shall work in collaboration with all other socio-economic stakeholders such as the Government of Nunavut, Indigenous and Northern Affairs Canada, Kivalliq Inuit Association, and the communities of the Kivalliq region in developing this program, which should include a process for adaptive management and mitigation in the event unanticipated impacts are identified. The Terms of Reference for this multi-party, multi-project Working Group are to be provided to the Nunavut Impact Review Board (NIRB) upon completion, and within one (1) year of issuance of the Project Certificate. The Proponent shall produce annual joint "AEM Kivalliq Projects" Socio-Economic Monitoring reports throughout the life of the Projects that are submitted to the NIRB and discussed with the wider Kivalliq Socio-Economic Monitoring Committee. Details of the Kivalliq Projects Socio-Economic Monitoring Program are to be provided to the NIRB upon finalization, and within one (1) year of issuance of the Project Certificate. Information regarding the Proponent's efforts in fulfillment of this term and condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board.***

And

**As required by NIRB Project Certificate No.008, Condition 53:** ***Provided the collection and sharing of such information is consistent with and not limited by any Inuit Impact and Benefit Agreement with the Kivalliq Inuit Association and that employees are willing to voluntarily provide this information, the Proponent should collect and provide project-specific data concerning employee community of residence and number of employees that relocated from the year prior (where available, to and from, for Arviat, Baker Lake, Chesterfield Inlet, Coral Harbour, Naujaat, Rankin Inlet and Whale Cove). The details of this process will be captured in the terms of reference for the project specific Whale Tail Pit Socio-Economic Monitoring Committee. Summaries of this information should be included in the annual Whale Tail Pit socio-economic monitoring reports submitted to the Nunavut Impact Review Board and shared with the wider Kivalliq Socio-Economic Monitoring Committee throughout the life of the Project.***

And

**As required by NIRB Project Certificate No 008, Condition 46:** ***The Proponent should develop a Project-specific Whale Tail Pit Socio-Economic Monitoring Program designed to:***

- ***Monitor for project-induced effects, including the impacts predicted in the Environmental Impact Statement through indicators presented in the Whale Tail Pit Socio-Economic Monitoring Plan;***
- ***Reflect regional socio-economic concerns identified by the Kivalliq Socio-Economic Monitoring Committee (KivSEMC);***
- ***Work in collaboration with all other socio-economic stakeholders such as the Kivalliq Inuit Association, the Government of Nunavut, and Indigenous and Northern Affairs Canada, and the communities of the Kivalliq region to develop the program;***
- ***Include a process for adaptive management and mitigation to respond if unanticipated impacts are identified; and***
- ***Monitor the success of existing and newly implemented gender-specific initiatives to determine their success and why they were considered successful or to identify any challenges to their implementation.***

***Details of the Whale Tail Pit Socio-Economic Monitoring Program should be submitted to the Nunavut Impact Review Board (NIRB) within one (1) year of issuance of the Project Certificate. The Proponent should produce***

***annual Whale Tail Pit socio-economic monitoring reports throughout the life of the Project that are submitted to the NIRB and shared with the wider KivSEMC.***

And

**As required by NIRB Project Certificate No 008, Condition 50:** ***The Terms of Reference for this multi-party, multi-project Working Group are to be provided to the Nunavut Impact Review Board (NIRB) upon completion, and within one (1) year of issuance of the Project Certificate. Details of the Kivalliq Projects Socio-Economic Monitoring Program are to be provided to the NIRB upon finalization, and within one (1) year of issuance of the Project Certificate. The Proponent shall produce annual joint "AEM Kivalliq Projects" Socio-Economic Monitoring reports throughout the life of the Projects that are to be submitted as part of the Proponent's annual report to the NIRB.***

Refer to Section 11.10.1 above.

### 11.10.3 Socio-Economic Monitoring Report

**As required by NIRB Project Certificate No.004, Condition 65:** ***Cumberland shall include in its socio-economic monitoring program for the Meadowbank Project the collection and reporting of data of community of origin of hired Nunavummiut.***

And

**As required by NIRB Project Certificate No.004, Commitment 18:** ***Observe, collect and maintain information on road-use to facilitate monitoring of the nonproject uses of the road***

And

**As required by NIRB Project Certificate No.004, Commitment 21:** ***Track the community of origin of hired Nunavimmiut to direct monitoring and followup activities***

And

**As required by NIRB Project Certificate No.004,** ***Commitment 104: Cumberland agrees with GN that labor force adjustments, any pressures on physical and social infrastructure (including by emergency response planning), socio-economic impacts of public use of the access road, and community physical and mental health are issues that should be included in socio-economic monitoring***

And

**As required by NIRB Project Certificate No.004, Commitment 108*****: Information made available by or to Cumberland under the terms of the IIBA in the areas of support to businesses in accessing project opportunities will be forwarded to the GN***

And

**As required by NIRB Project Certificate No.008, Condition 48:** ***The Proponent is strongly encouraged to submit staff schedule forecasts that should, at a minimum, include the following:***

- ***Title of positions required by department and division;***
- ***Quantity of positions available by project phase and year;***
- ***Transferable skills, both certified and uncertified which may be required for, or gained during, employment within each position;***
- ***The National Occupational Classification code for each individual position.***

***The Proponent should also identify and register all trades occupations, journeypersons, and apprentices working with the Project and make this information available to the Government of Nunavut to assist in delivery of training initiatives and programs. The Staff Schedule should be submitted to the Nunavut Impact Review Board six (6) months prior to each phase of the Project (construction, operations, closure).***

And

**As required by NIRB Project Certificate No.008, Condition 53:** ***Provided the collection and sharing of such information is consistent with and not limited by any Inuit Impact and Benefit Agreement with the Kivalliq Inuit Association and that employees are willing to voluntarily provide this information, the Proponent should collect and provide project-specific data concerning employee community of residence and number of employees that relocated from the year prior (where available, to and from, for Arviat, Baker Lake, Chesterfield Inlet, Coral Harbour, Naujaat, Rankin Inlet and Whale Cove). The details of this process will be captured in the terms of reference for the project specific Whale Tail Pit Socio-Economic Monitoring Committee. Summaries of this information should be included in the annual Whale Tail Pit socio-economic monitoring reports submitted to the Nunavut Impact Review Board and shared with the wider Kivalliq Socio-Economic Monitoring Committee throughout the life of the Project.***

And

**As required by NIRB Project Certificate No.008, Condition 61:** ***The Proponent, in collaboration with the Government of Nunavut and the Nunavut Housing Corporation, is encouraged to investigate measures and programs designed to assist Project employees with pursuing home ownership or accessing affordable housing options in the Kivalliq region. The Proponent should provide access to financial literacy, financial planning, and personal budgeting as part of the regular Life Skills Training and/or Career Path Program. Evidence of meeting the requirements of this term and condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board.***

And

**As required by NIRB Project Certificate No.008, Condition 59:** ***The Proponent is encouraged to work with the Kivalliq Inuit Association to establish cross-cultural training initiatives, which promote respect and consideration for the importance of Inuit Qaujimajatuqangit to the Inuit identity and to make this training available to Project employees and on-site sub-contractors. The Proponent should actively monitor the implementation of these initiatives, including the following items:***

- ***Descriptions of the goals of each program offered;***
- ***Language of instruction;***
- ***Schedules and location(s) of when each program was offered;***
- ***Uptake by employees and/or family members where relevant, noting Inuit and non-Inuit participation rates; and***

- ***Completion rates for enrolled participants, noting Inuit and non-Inuit participation rates.***

***Summaries of the cross-cultural training initiatives implemented by the Proponent in fulfilment of this term and condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board.***

And

**As required by NIRB Project Certificate No.008, Condition 62:** ***The Proponent should work with the Government of Nunavut to develop an effects monitoring program that identifies Project-related pressures to community infrastructure such as airport and transportation infrastructure, policing, health and social services, in Baker Lake and all the point-of-hire communities of the Kivalliq Region. Evidence of meeting the requirements of this term and condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board***

The section below summarizes key Agnico Eagle's socio-economic reporting, related primarily to employment and training. For the full report on the Project's socio-economic monitoring, please refer to the Appendix 4.

Reports can also be viewed on the Socio-Economic Monitoring Committee website
www.nunavutsemc.com or on Agnico Eagle's website http://aemnunavut.ca/media/documents/.

#### 11.10.3.1 *Workforce*

Agnico Eagle calculates the workforce based on headcount (snapshot of active employees taken at the end of the year, which includes full-time and part-time employees) and Full-Time Equivalents (FTE) (number of full-time positions based on hours worked, where one full time position is equivalent to 2,184 hours worked in a year).

The number of active Agnico Eagle employees working at Meadowbank and Whale Tail on December 31st, 2022, was 1,251, of which 245 employees were Inuit employees. The respective full-time equivalencies were 1,161 Agnico Eagle employees in total, of which 207 full-time equivalent (FTE) Inuit Agnico Eagle employees.

The number of contractors employed at the project is only calculated using full-time equivalents (FTEs) due to the cyclical nature of contractor work. Therefore, during 2022 there were 775 full time equivalent contractor positions, of which approximately 24 are filled by Inuit.

Taken together, there were 1,936 FTE employees (Agnico Eagle permanent, temporary, on-call, students, and contractors), working full- and part-time jobs, at the end of 2022.

Agnico Eagle defines job statuses as follows:

- Permanent employee: an employee whose current job is not specifically tied to a short-term project and the position is expected to be required throughout the life of mine (LOM).

- Temporary employee: an employee whose current job will not continue beyond a specified period.

- On-call employee: an employee who has an undefined contract and is called upon when the need arises. It is expected that on-call employees will move to temporary or permanent positions as they become available.

#### *11.10.3.1.1.1 Employment Demographics for Nunavut Based Employees*

Table 11-6 shows the employment demographics for community of hire by headcount.

**Table 11-6 Home communities of Agnico Eagle Inuit employees (by headcount)**

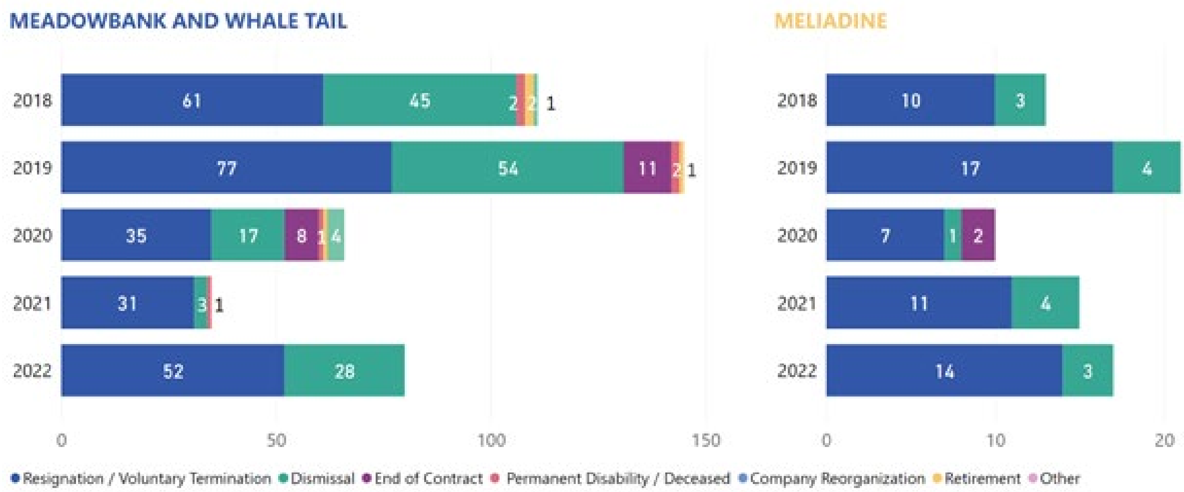
| Community of Hire | 2021 Agnico Eagle headcount | 2022 Agnico Eagle headcount |
|---|---|---|
| Arviat | 63 | 50 |
| Baker Lake | 144 | 138 |
| Naujaat | 15 | 9 |
| Rankin Inlet | 14 | 16 |
| Chesterfield Inlet | 4 | 2 |
| Whale Cove | 5 | 2 |
| Coral Harbour | 12 | 5 |
| Kitikmeot | 1 | 1 |
| Qikiqtani | 0 | 0 |
| Outside of Kivalliq | 28 | 22 |
| **Total** | **286** | **245** |

Agnico Eagle pays for the transportation of all Kivalliq-based employees from their home community to the mine for each work rotation. For employees coming from Arviat, Chesterfield Inlet, Rankin Inlet and/or Whale Cove, Agnico Eagle has a service contract with Calm Air to transport employees by charter plane from Rankin Inlet directly to and from the Meadowbank mine airstrip. For employees coming from Coral Harbour and/or Naujaat, a commercial ticket is bought from their home communities to the Baker Lake airport. Once in Baker Lake, they are transported by bus to and from the mine site via a daily ride similar to employees coming from Baker Lake. For all other employees not located in the Kivalliq region, transportation is provided from Mirabel and Val-d'Or via a charter flight operated by Nolinor Aviation.

#### *11.10.3.1.1.2 Employee Retention*

Figure 41 provides a breakdown of Inuit turnover (employees who leave Agnico Eagle's employment each year) by reason for leaving for Meadowbank/Whale and Meliadine.

**Figure 41 Breakdown of Inuit turnover 2018-2022**




In 2022, 97 Inuit employees departed, out of which 80 were from Meadowbank/Whale Tail and 17 from Meliadine. In total resignations / voluntary departure accounted for 66 out of 97 terminations of Inuit employees, with the remaining turnover (31 Inuit employees) attributed to dismissal. There was an increase in both resignations/voluntary departure and dismissals when compared to the previous year.

Agnico Eagle conducts one-on-one exit interviews to gather information on reasons for resignation and voluntary departure. Exit interviews collect qualitative information on common reasons why employees have left.

The most recent reasons for the 97 departures at Meadowbank / Whale Tail and Meliadine included:

- Moving to another job (14),
- Family situation (9),
- Not liking camp life and / or missing family (7),
- No professional advancement (2),
- Not liking the job (3),
- Conflict with an employee / supervisor (2),
- Lack of access to child support (3), and
- Other (57)

The turnover rate for Inuit employees at all Agnico Eagle projects is consistently higher than that for non-Inuit employees. At Meadowbank / Whale Tail, Inuit employee turnover was 29% in 2022 compared to 14% for non-Inuit. Overall, Inuit employee turnover was lower in 2022 compared to the historical high in past years.

The 2022 Inuit and Nunavummiut Employment Survey further revealed that both Inuit employees and their spouses find employment at the mine challenging, which likely contributes to the higher turnover rates for Inuit employees. Worrying about family and / or loneliness were mentioned by 62% of respondents when asked about the most difficult thing when being at work (mine site). Management of household (e.g., getting groceries, running errands, and household maintenance), taking care of children, or loneliness were mentioned by 63% respondents as being most difficult for their spouse when they are away for work.

Agnico Eagle is working to implement programs to address high Inuit turnover rates and exit interview concerns. These include:

- Improvement in the Rapid Inuit Specific Education (RISE) Program, which was created to prepare Inuit for future employment opportunities.
- Re-start of Nunavut Leadership Development Program (LDP) to allow Inuit professional advancement and development.
- Re-start of cultural and social activities on-site after brief pause due to COVID-19.

##### *11.10.3.1.1.3 Summer Student Employment Program*

Agnico Eagle offers two (2) summer employment programs that are accessible to students. One of them is from Agnico Eagle's company-wide policy that offers a summer employment program to the children of all Agnico Eagle employees (both Inuit and non-Inuit) that are undertaking post-secondary education. The other is the Inuit Summer Employment Program, initiated in 2019, targeting Inuit students in high school or post-secondary education. This program tries to match students to positions in their areas of interest.

In 2022, Agnico Eagle had four (4) Inuit Summer Students based in Rankin Inlet working with the Community Relations department, three (3) in Meliadine working with the Environment department, and one (1) working with the Maintenance department at Meliadine.

As per Agnico Eagle policies, students must be 18 years or over to work at the operation, and over 16 years old to work in the offices in Baker Lake or Rankin Inlet.

### 11.10.3.2 *Training*

Agnico Eagle's Training Management System (TMS) and the Learning Management System (LMS) tracks and reports on training activities. The list of training provided can be found in Appendix 6.

#### *11.10.3.2.1 Pre-employment training (Sanajiksanut Program)*

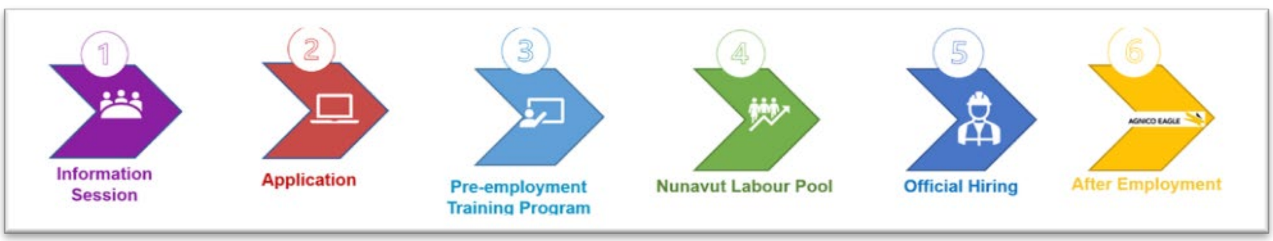
Sanajiksanut (or the Sanajiksanut Program) previously known as Labour Pool process or Pre-Employment Training program is the primary vehicle through which Agnico Eagle recruits and hires new Inuit employees. In 2021, Agnico Eagle and KivIA agreed to modify the existing process through a Memorandum of Understanding (MoU). As a result, the Work Readiness and the Mandatory Trainings were combined to become the Pre-employment Training Program (10-day community-based training). This change reduced the number of steps for applicants and decreased the delay in applicants gaining employment.

In 2022, the Sanajiksanut Program was redesigned and officially launched. The vision for the Sanajiksanut is to have a recruitment process and approach that is inclusive and accessible for Inuit candidates. The new recruitment process is forward looking to ensure that a new and qualified generation of Inuit employees excels in various positions at Agnico Eagle's mine sites. The Sanajiksanut Program is based on four (4) key principles:

1. **Partnership with Ilitaqsiniq (Nunavut Literacy Council)** – Agnico Eagle partnered with Ilitaqsiniq (Nunavut Literacy Council) to implement a community-based approach to the training and adapt the recruitment process to the Nunavummiut clientele. The revised pre-employment training is designed by Inuit for Inuit and delivered by an Inuit instructor from Ilitaqsiniq.
2. **Inuit workforce planning** – To facilitate access to employment and increase career opportunities and growth for the Inuit workforce the Inuit recruitment planning is conducted with the operational team.
3. **Recruitment process changes** – To meet the needs of the community members who are looking for employment at Agnico Eagle revised communication channels have been implemented to reach candidates when an opportunity arises.
4. **Mining Awareness** – Appeal younger generation who are the future of the Nunavut workforce by implementation career awareness programs in the Kivalliq schools and colleges.

The Sanajiksanut Program consists of four (4) steps, as presented in Figure 42:

**Figure 42 Sanajiksanut Program**




***Step 1: Employment Information Sessions***

In 2022, as part of the Sanajiksanut Program, employment information sessions were held in various communities to give information about the mines, the work lifestyle, and career opportunities as well as information about applying for jobs online. While sessions were canceled during Q1 of 2022 because of COVID-19, sessions resumed in May 2022. Agnico Eagle completed a total of 17 information sessions, attended by 78 people.

***Step 2: Online Application Process Facilitated by Employment Information Sessions***

To facilitate online applications, Agnico Eagle has a Community Liaison Officer (CLO) in each Kivalliq community who can deliver employment information sessions and provide one-to-one assistance to candidates interested in applying online. In 2022, CLOs were present in six (6) communities for most of the year, with four (4) CLOs remaining by end of 2022 in Rankin Inlet, Baker Lake, Arviat, Coral Harbour. A Labour Pool Coordinator at the Agnico Eagle Rankin Inlet Office supports CLOs as well as the applicants. The Labour Pool Coordinator and an Inuit Employment counselor travelled to the communities to conduct employment information sessions and to provide support to potential applicants. The Sanajiksanut Team was also available by phone to support applicants. In 2022, a centralized email address was created to facilitate communications between the applicants and the Sanajiksanut Team.

***Step 3: Pre-Employment Training Program***

In 2022, five (5) Pre-Employment Training programs were delivered, with a total of 40 participants. The training sessions re-started in May due to COVID-19 restrictions earlier in the year. Also, the Sanajiksanut Team provided five (5) follow up training sessions for participants who had done the first part of the previous training format (Work Readiness) before the pandemic. The follow up training sessions were held as follows: one (1) in Coral Harbour, two (2) in Arviat, one (1) in Rankin Inlet and one (1) in Naujaat. Including these 2-day follow-up training sessions provided by the Sanajiksanut Team, 40 additional participants completed the training program, for a total of 80 participants in 2022.

Agnico Eagle also organized 2-day ‘Career Days’ at Baker Lake on November 9 and 10, 2022. The Career Days informed community members of the Kivalliq about the mining activities, Agnico Eagle operations in Nunavut, the various career opportunities, and the future projects to come. The Sanajiksanut Team was there to meet with candidates and have them apply to potential job opportunities. Inuit employee Role Models also participated in the event and spoke about career paths and their experiences working at the Agnico Eagle mine site. In addition, Career Awareness Videos were presented and included Agnico Eagle Inuit employees who spoke about their position and why they like working for Agnico Eagle Mines. A total of 130 students participated and approximately 150 members of the community attended.

***Step 4: Labour Pool List Coordinated by the Labour Pool Coordinator***

The Labour Pool List is a list of candidates who have successfully completed the steps of the Sanajiksanut Program. These candidates are eligible for opportunities with Agnico Eagle or Agnico Eagle’s contractors. The list is managed by the Labour Pool Coordinator. In 2022, the Labour Pool List was updated, with candidates tracked against each step of the recruitment process. Since the changes in the recruitment process, Agnico Eagle was able to hire 160 Inuit employees.

In 2022, Agnico Eagle was able to add an additional member to the Sanajiksanut Team. This addition allowed Agnico Eagle to enhance the recruitment process by adding more career opportunities for Inuit employees. Furthermore, the Sanajiksanut Team was more present and visible in the communities and participated in different Inuit employment initiatives (such as Employment Information Sessions, Career Days, Events) and increased interest in employment.

#### *11.10.3.2.2 Training Hours*

The following categories of training are available:

- Mandatory: Mandatory training related to compliance with the Nunavut Mine Act, as well as training that is mandated according to Agnico Eagle Health and Safety policies. Many of these training sessions are offered via e-learning prior to employee's arrival on site.
- General: Training activities required at a departmental level and covers many employees working in different departments. General training includes training on light duty equipment as well as enterprise software systems and cross-cultural training.
- Specific: Focused on developing individual competencies related to a specific position. This training qualifies individual workers for promotion following their progression through the Career Path. These training programs are provided by in classroom (theory) learning as well as practical (one-on-one) learning.
- Emergency Response Training

Table 11-7 provides the training hours provided to Agnico Eagle employees at Meadowbank and Whale Tail (excluding contractors) in 2022.

**Table 11-7 2022 Training hours**

| Type of Training | Inuit | Non-Inuit | Total |
|---|---|---|---|
| Mandatory | 917 | 8,406 | 9,323 |
| General | 191 | 2,269 | 2,460 |
| Specific | 6,863 | 7,721 | 14,584 |
| Education | 163 | 0 | 163 |
| Specific Practical Evaluation | 48 | 524 | 572 |
| Specific Primary Evaluation | 18 | 30 | 48 |
| ERT | 268 | 4,147 | 4,415 |
| **Total** | **8,468** | **23,097** | **31,565** |

#### *11.10.3.2.3 Training Programs*

##### *11.10.3.2.3.1 E-Learning*

Before coming to an Agnico Eagle site for the first time, newly hired employees must complete their Mandatory Training online, which consists of six (6) modules: General Induction, WHMIS, Fire Suppression, Job Hazard Analysis and Work Card, Spill Response, and Occupational Health and Safety (Personal Protective Equipment, Ladder Safety, Surface Standard Operating Procedure). The General Induction chapter provides general information about Agnico Eagle and working life at the mines, waste management, as well as information on the IIBAs and archaeological awareness. The e-learning training material has been translated into English, French, and Inuktitut. In 2022, the Training Chart was deployed and implemented. The training chart is a tool used as part of the TMS to track compliance of training requirements based on employee position

#### *11.10.3.2.3.2 Cross-Cultural*

In 2022, the training content and delivery were reviewed, and the decision was made to put the training on hold until it could be revamped. The training did not enhance cultural awareness and was too Agnico Eagle-centric. Aqqiumavvik was selected as the partner to develop new content for the training to include IQ and ISV values and to be more interactive by adding to-do-activities. The delivery of the training is expected in 2023.

Prior to the pause, the Cross-Cultural Training Program was a 5 hour in-class training course. In 2022, Meadowbank Complex delivered total of 170 hours of cross-cultural training to Agnico Eagle and Contractor employees.

#### *11.10.3.2.3.3 Career Paths*

Agnico Eagle operates the Career Path program, which identifies the incremental steps that an employee must complete to advance in their chosen career of interest. The objective of the Career Path Program is to achieve 100% internal promotions for Inuit and no external candidates (southerners) hired to fill a position that is part of the program. In 2022, the Energy and Infrastructure Career Path and the Underground Career Path were reviewed at Meliadine and the Meadowbank Complex, and the Underground and Mine Operations Career Path were enhanced.

#### *11.10.3.2.3.4 Trainee Programs*

Agnico Eagle continues to support training efforts across projects. At Meadowbank / Whale Tail and Meliadine, specific training increased for Inuit employees

Training efforts for 2022 were as follows:

- Eight (8) trainees were enrolled in the **Underground Trainee Program**, and of those, seven (7) successfully completed the program in Meliadine.
- Eight (8) trainees completed the **Haul Truck Trainee Program** at Meadowbank.
- Three (3) trainees completed the **Long-Haul Truck Trainee Program** at Meadowbank.
- Agnico Eagle successfully reintegrated the **Process Plant Trainee Program** at Meliadine. At Meadowbank, Agnico Eagle had to delay this program twice due to a planned and unplanned shut down in the mill. A new trainee program will start in 2023. There were no graduates from this program in 2022.

**Table 11-8 Participants and/or graduates of a range of career and skills programs supported by Agnico Eagle Meadowbank Complex and Meliadine**

| *Program* | *2013* | *2014* | *2015* | *2016* | *2017* | *2018* | *2019* | *2020* | *2021* | *2022* |
|---|---|---|---|---|---|---|---|---|---|---|
| Arviat Diamond Drillers & Welders Program Graduates | *24* | *18* | *18* | *15* | *6* | *-* | *-* | *-* | *-* | *-* |
| Underground Trainee Program | | | | | | | | | | |
| *Participants* | *-* | *-* | *-* | *-* | *-* | *8* | *8* | *8* | *4** | *8* |
| *Graduates* | *-* | *-* | *-* | *-* | *-* | *-* | *8* | *4* | *4* | *7* |
| Haul Truck Trainee Program | | | | | | | | | | |
| *Participants* | *19* | *33* | *28* | *34* | *26* | *43* | *8* | *7* | *2** | *8* |
| *Graduates* | | | | | | | *6* | *4* | *2* | *8* |
| Process Plant Trainee Program | *-* | *-* | *-* | *-* | *-* | *-* | *-* | *-* | *-* | *-* |
| Long Haul Truck Trainee Program | *-* | *-* | *-* | *-* | *-* | *-* | *-* | *1* | *-* | *3* |

**continued training from prior year (Agnico Eagle Mines, 2022)*

The **Underground Trainee Program** at Meliadine is a 42-day (462-hour) program that has been managed by Nunavut Arctic College and supported by Agnico Eagle. The training program intends to develop skilled workers, who can, upon completion of the program, be hired by the Underground Department. At the Meadowbank Complex, Agnico Eagle created a trainee program affiliated with CMAC. This program is a 42 days (504-hour) program. Trainees go through the Underground Common Core, given by a CMAC Instructor on-site, followed by training by Agnico Eagle trainers. By the end of the program, the trainees have the knowledge, the practice, and the experience to work in general labor.

The **Haul Truck Trainee Program**, run at Meadowbank, is a 42-day (504-hour) program to certify haul truck operators, which includes training on a simulator, in the classroom, and on the job. The program is aimed at existing employees in entry-level positions (e.g., dishwashers, janitors, chambermaids.).

A **Process Plant Trainee Program** is a 28-day program provides employees with an understanding of the mining and milling process and trains them to be competent and certified to fill positions as a process plant helper or a utility person.

The **Long-Haul Truck Trainee Program** is a 28-day (336-hour) program to certify long haul truck operators, which includes training on a simulator, in the classroom, and on the job. The program is aimed at existing employees in the mining department. A maximum of four (4) trainees is permitted at a time with one (1) trainer to provide the best training possible.

A **Process Plant Trainee Program** is a 28-day program provides employees with an understanding of the mining and milling process and trains them to be competent and certified to fill positions as a process plant helper or a utility person.

#### *11.10.3.2.3.5 Apprenticeship Program*

The Apprenticeship Program combines on-the-job learning and in-school technical instruction to allow Inuit employees the opportunity to be educated and trained in the trade of their choice. By the end of the program, the apprentice is able to challenge their Certificate of Qualification (COQ) to become a Journeyperson and will have the opportunity to challenge their Red Seal Exam. Currently, Agnico Eagle offers (9) trades: baker, cook, carpenter, millwright, electrician, heavy duty equipment technician, welder, housing maintainer and plumber.

In 2019, the program was reviewed in order to substantially increase our support to apprentices while they are at school for their technical instruction. Logistical, material, educational and financial support is provided to our Apprentices.

In 2022, one (1) employee completed their apprenticeship training with Agnico Eagle, achieving a Millwright Red Seal. Two (2) apprentices went to technical training in Alberta.

- At Meadowbank one (1) pre-trades apprentice successfully passed their trades entrance exam. Meadowbank had a total of two (2) pre-apprentices (both terminated), and three (3) apprentices (one (1) terminated). In total, two (2) apprentices successfully completed the program.

#### *11.10.3.2.3.6 Adult Educator*

In 2018, Agnico Eagle started an on-site education strategy at its Nunavut sites, starting with a permanent Adult Educator at Meadowbank. The objective of the Adult Educator is to support Agnico Eagle employees to develop numeracy, literacy, and soft skills which will assist employees to access higher job positions and be successful in their apprenticeship journey. For employees who are pre-apprentices and apprentices, the Adult Educator works with the employees to improve maths skills based on the types of questions they will see in technical training, test taking skills, reading comprehension, and scientific concepts. The goal is for the apprentice to be well prepared to attend technical training. For relief supervisors and leaders, Adult Educators provided one-on-one support to build leadership skills such as communication, resilience, managerial courage, organization, leading your peers, and professionalism.

In 2022, a full-time Adult Educator was present at Meadowbank Complex from March until December (activities were paused from January to March due to COVID-19). The Adult Educator worked with four (4) Inuit employees in the apprenticeship program, as well as five (5) Inuit who were in relief supervisor or leader roles.

The Adult Educator is also tasked with planning and implementing school-based initiatives such as TASK (Trades Awareness, Skills and Knowledge) week. The goal of TASK week is to motivate the students to think about their future after graduation. In 2022, no TASK week was held in the community.

#### *11.10.3.2.3.7 Emergency Response Team (ERT) training*

At Agnico Eagle Mines Ltd., the most important priority is to keep employees safe. Meadowbank Complex Emergency Response Team (ERT) consists of internal employees that volunteers to respond to emergencies such as fire. The ERT practice takes place weekly, and each member must attend at least six (6) practices throughout the year. In 2022, Meadowbank Complex ERT consisted of 114 active

Emergency Response and Mine Rescue members, including six (6) Inuit team members. Eight (8) basic mine rescue courses were given in 2022 to onboard new ERT members for both Meadowbank and Whale Tail. In total, 75 training sessions were given, which included weekly practices, mock scenarios, and specialized trainings.

In 2022, Agnico Eagle hosted their own ERT competition with Meadowbank and Meliadine to promote training between the ERT teams, and to get both mines to share best practices related to emergency rescue.

## 11.11 GENERAL SOCIO-ECONOMIC PROVISIONS

### 11.11.1 Whale Tail Site

#### 11.11.1.1 *Staff Schedule*

**As required by NIRB Project Certificate No.008, Condition 48:** ***The Proponent is strongly encouraged to submit staff schedule forecasts that should, at a minimum, include the following:***

- ***Title of positions required by department and division;***
- ***Quantity of positions available by project phase and year;***
- ***Transferable skills, both certified and uncertified which may be required for, or gained during, employment within each position;***
- ***The National Occupational Classification code for each individual position.***

***The Proponent should also identify and register all trades occupations, journeypersons, and apprentices working with the Project and make this information available to the Government of Nunavut to assist in delivery of training initiatives and programs. The Staff Schedule should be submitted to the Nunavut Impact Review Board six (6) months prior to each phase of the Project (construction, operations, closure).***

Construction Phase staff schedules have been sent to NIRB on May 2$^{nd}$, 2018 and Operations Phase staff schedules have been sent to NIRB on April 25$^{th}$, 2019 with an updated Version on June 25$^{th}$, 2019 (Appendix 54 of the 2019 Annual Report).

#### 11.11.1.2 *Semi-Annual Call with Regulators*

**As required by NIRB Project Certificate No.008, Condition 49:** ***The Proponent shall make best efforts to collaborate with the Government of Nunavut's Career Development Officer, Regional Manager of Career Development, and Director of Career Development. Semi-annual calls, at a minimum, should be initiated by the Proponent to address:***

- ***Hiring procedures and policies***
- ***Issues regarding employee recruitment and retention***
- ***AEM policies regarding career pathways and opportunities for advancement***
- ***Internal and/or partnered training and development of employees***
- ***Long-term labour market plans to facilitate training in communities***

***Summary information addressing the Proponent's fulfillment of this term and condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board.***

In July of 2022, Agnico Eagle organized a teleconference with Government of Nunavut-Department of Family Services. Two (2) representatives joined the call: Career Development Clerk and Acting Regional Manager. Some of the topics discussed were:

- Partnership with candidates from Trades school level 1 and 2
- Employment Information Session with Nunavut Arctic College (NAC)
- Opportunities for 2-weeks practicum NAC students (Office Admin, Management studies & Adult Based Education)
- Information shared about Mining Awareness

### 11.11.1.3 *Listing of Formal Certificates and Licenses*

**As required by NIRB Project Certificate No.008, Condition 52:** ***The Proponent should develop and maintain an easily referenced listing of formal certificates and licenses that may be acquired via on-site training or training during project employment. The listing shall indicate which of these certifications and licenses would be transferable to a similar job site within Nunavut. The initial listing should be provided to the Nunavut Impact Review Board within six (6) months of the Project Certificate being issued. Updates to the list should be included in the Proponent's annual reports submitted to the Nunavut Impact Review Board and shared with the wider Kivalliq Socio-Economic Monitoring Committee throughout the life of the Project.***

The listing of formal certificates and licenses was sent to NIRB on December 14th, 2018. There have not been any updates since the last submission. The list can be found in Appendix 59 of the 2018 Annual Report.

### 11.11.1.4 *LMA and IWBS*

**As required by NIRB Project Certificate No.008, Condition 50:** ***The Proponent will report the results of its Labour Market Analysis (LMA) and Inuit Work Barrier Study (WBS) to the Kivalliq Socio-Economic Monitoring Committee upon completion in 2018, which should integrate the findings into its ongoing work identifying gaps between the Kivalliq labour market and mining market needs, and how to activate latent labour pool in the Kivalliq region to maximize labour "capture" from mining for the region. The Proponent shall report the results and implications of the LMA and WBS within its first year's Annual Report to the Nunavut Impact Review Board (NIRB), and show how the results have been integrated into an updated Socio-Economic Monitoring Plan for the Whale Tail Pit Project.***

In 2022, the Employment and Culture Committee (ECC) which includes representatives from KivIA and Agnico Eagle decided to review the frequency of IIBA KLMA obligations.

Whereas:

- ECC discussed on the relevance of conducting annual update of the KLMA knowing that most of the Kivalliq Labour supply data and information is only updated and made available every 5 years via Canada Census of population.

- Labour Demand information is available every year since it is mostly data generated by Agnico Eagle.

- Most recent KLMA (2021 edition) brought a new structure with Report Cards which facilitates updates.

- ECC needs time to analyze, prioritize, plan and implement KLMA recommendations. With current timeline, ECC has to restart its commission of a third party to conduct next year KLMA only 4 months after receiving latest version.

<u>Therefore:</u>

- ECC decided to adjust KLMA timeline updates to have enough time to work on recommendations and target specific matters to better understand Kivalliq Labour Market (ex.: Youth as the next workforce generation, Workforce willingness indicator, etc.).

- ECC decided to align KLMA updates with accessible data on Labour Supply.

- ECC decided to develop a MOU to IIBAs and change actual wording of Schedule C, Section 15.1.

- ECC recommended updating KLMA timeline to include time to conduct the analysis and 2 years to work on recommendations.

<u>Results:</u>

- Parties agreed to a *Memorandum of Understanding* (MOU). KLMA timeline is updated to include time to conduct analysis and work on recommendations. KLMA will be performed every three (3) years. Hence, the 2021 Kivalliq Labour Market Analysis (KLMA) is presented in Appendix 64 of the 2021 Annual Report.

The 2018 IWBS was submitted to NIRB on March 6th, 2019. The results for this study us incorporated into the 2022 Socio-Economic Monitoring Report.

#### 11.11.1.5 *Health Committee*

**As required by NIRB Project Certificate No.008, Condition 58:** ***The Proponent is encouraged to form a subcommittee which includes Government of Nunavut representatives to reach consensus decisions on health related issues that the Proponent or the Government of Nunavut bring forward (e.g. programs and services to address sexually transmitted infections, a process for the treatment and transport of workers that may require medical services beyond that which the mine provides, monitoring and reporting on the impacts of the Project on health services within the potentially impacted communities and particularly, Baker Lake. etc.). Information regarding the Proponent's fulfillment of this term and condition shall be included in the Proponent's annual report to the Nunavut Impact Review Board.***

And

**As required by NIRB Project Certificate No.008, Condition 60:** ***The Proponent shall engage with the Government of Nunavut to develop a process to ensure that any conditions first treated at the mine site and requiring ongoing care is appropriately accommodated in a timely manner at community health centres as required. Evidence of meeting the requirements of this term and condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board.***

A Memorandum of Understanding (MOU) was planned to be presented, which establishes the foundations of a greater collaboration and communication between the Agnico Eagle Nunavut clinics and the Kivalliq Health Centers. However, due to COVID-19 and other site priorities, this initiative was put on hold in 2022. The MOU includes the involvement of the Agnico Eagle Nunavut clinics in the diagnostic and initiation of treatment of Sexually Transmitted Diseases (STD) as well as the participation of the Agnico Eagle Nunavut clinics in STD prevention programs. Some other health prevention subjects were covered by this MOU, like flu and tuberculosis.

When required, Agnico Eagle Nunavut clinic nurses organize all the logistics around transportation and treatment of Nunavummiut down south. The appointments with the doctors are organized by the Agnico Eagle nurses. Agnico Eagle takes care of all the required booking and funds the whole transportation, which includes lodging, meals, and medical fees.

When a worker is treated on-site for a personal or a work-related condition and requires medical attention off-site, the worker is always provided with a ''Return to Work'' form. The form explains the worker's condition and the treatment provided thus far to the receiving healthcare professional. This form is also used to transmit information back to the Agnico Eagle Nunavut clinics. The Return-to-Work form is an effective form of communication as it prevents loss of key information between healthcare professionals. The care of the worker is fully documented via the form and the likelihood of miscommunication is minimized.

If an emergency is transferred to Baker Lake, the healthcare center is always contacted prior to initiating the transport to make sure they can receive the patient safely. Also, if a community healthcare center requires Agnico Eagle Nunavut clinics to continue some special treatment initiated in the community, they can call and email the respected clinics. Subsequently, necessary arrangements can be made between the clinics to ensure continuity of care.

#### 11.11.1.6 *Home Ownership*

**As required by NIRB Project Certificate No.008, Condition 61:** ***The Proponent, in collaboration with the Government of Nunavut and the Nunavut Housing Corporation, is encouraged to investigate measures and programs designed to assist Project employees with pursuing home ownership or accessing affordable housing options in the Kivalliq region. The Proponent should provide access to financial literacy, financial planning, and personal budgeting as part of the regular Life Skills Training and/or Career Path Program. Evidence of meeting the requirements of this term and condition should be submitted as part of the Proponent's annual reporting to the Nunavut Impact Review Board.***

In 2022, Agnico Eagle and its stakeholder collaborators completed its work pursuant to the Kivalliq Region Energy Efficient Worker Housing Program (Program), a Natural Resource Canada funded project. Having identified the main components behind the innovation gaps in Nunavut, Agnico Eagle undertook a closer examination of the housing challenges and opportunities in Nunavut with two objectives in mind:

What can be a sustainable approach to support the Nunavummiut, Inuit employees, and Inuit organizations in addressing the structural challenges associated with the housing crisis. The other objective is to consider housing options for recruitment and retention strategies of Inuit employees. This work will be defining the strategy by which Agnico Eagle will be supporting the path forward to addressing the systemic gaps in achieving more housing units in Nunavut.

## 11.12 STATUS OF COMMITMENTS

**As required by NIRB Project Certificate No.008, Condition 68:** ***The Proponent shall maintain an up-to-date listing of the status of implementation for its commitments made during the Nunavut Impact Review Board's (NIRB) assessment of the Whale Tail Pit Project Proposal and the Whale Tail Pit Expansion Project Proposal through engagement of parties and active monitoring of associated implementation.***

***The Proponent shall provide a status report on the implementation of all its commitments within three (3) months of issuance of the Project Certificate for the Whale Tail Pit Expansion Proposal and annually thereafter within its annual report to the NIRB***

An up to date listing of the status of implementation for commitments made during the NIRB assessment is provided in Appendix 2 .

# SECTION 12. POST-ENVIRONMENTAL ASSESSMENT MONITORING PROGRAM (PEAMP) – EVALUATION OF IMPACT PREDICTIONS

## 12.1 PURPOSE

According to Appendix D of Meadowbank's NIRB Project Certificate No. 004, the Post-Environmental Assessment Monitoring Program (PEAMP) is a conceptual program designed "*to work as an instrument of the proponent's overall monitoring efforts and should provide feedback to the NIRB and other agencies regarding ongoing project monitoring*." The goal of the PEAMP is to provide the NIRB and other regulatory agencies information on how actual environmental and socioeconomic effects of the Meadowbank mine site compare to impacts predicted in the Final Environmental Impact Statement (FEIS; Cumberland, 2005).

The objectives of the PEAMP as specified in Appendix D of the Project Certificate are to:

a) Measure the relevant effects of the project on the ecosystemic and socioeconomic environment(s). These effects may be measured through biophysical and socioeconomic monitoring programs undertaken by the Proponent or by other means as described in the Project Certificate;
b) Assess the accuracy of the predictions made within the FEIS;
c) Evaluate the effectiveness of project monitoring procedures and plans;
d) Identify impacts requiring additional mitigation or adaptive management; and
e) Provide relevant data and information to support regional monitoring initiatives where feasible.

Based on comments from the NIRB on Agnico Eagle's 2017 and 2018 PEAMP reports, and discussions by phone with NIRB representatives in November 2019, Agnico Eagle has revised the PEAMP to also more specifically address the following NIRB recommendations to:

1) Include a discussion that references the baseline and previous years' monitoring data and identifies any trends for each valued ecosystem component where an effect has been observed. Include this information in table and graphic format in order to clearly demonstrate what is being observed.

2) Identify instances where original and/or amended impact predictions can no longer be supported based on project experience to date and include an analysis of the effectiveness of management and mitigation strategies currently employed;

Agnico Eagle recognizes the following recommendation, but asserts at this time that it is not a requirement of the PEAMP according to the Project Certificate:

3) Include a summary of lessons learned from the Project to date which can be applied to both updating existing project plans and to any of Agnico Eagle's other planned or ongoing projects as applicable.

Beginning in 2019, Agnico Eagle extended the PEAMP to include the Whale Tail Mine. Measured impacts are compared to those described in the *FEIS for the Whale Tail Pit Project* (Agnico Eagle, 2016) and the *FEIS Addendum for the Whale Tail Pit – Expansion Project* (Agnico Eagle, 2018), as appropriate.

Per NIRB comments on the 2021 PEAMP, this 2022 evaluation incorporates a brief overview of results where FEIS predictions are not met or where further discussion is required, directly in summary tables, rather than just a reference to the full discussion section (to facilitate the review process).

## 12.2 PEAMP EVALUATION

To fulfill Items A through D described in Appendix D of the Meadowbank Project Certificate No. 004, and in support of NIRB Recommendations 1 and 2 described above, a PEAMP evaluation has been carried out for each valued ecosystem or socioeconomic component (VC) identified in the FEIS documents for the Meadowbank Mine and the Whale Tail Mine (Cumberland, 2005; Agnico Eagle, 2016; Agnico Eagle, 2018). A conceptual model of the PEAMP evaluation process is provided in Figure 43. This process involves five components, described below. After an initial review of the FEIS to identify and summarize impact predictions for the current project phase (Part 1), Parts 2 – 5 are repeated on an annual basis to form the evaluation.

**Part 1:** For each VC, predicted residual impacts are summarized for the current project phase. Residual impacts are those occurring after planned mitigation measures are implemented (a summary of the FEIS-planned mitigation measures for each VC is provided Part 5, along with a description of implementation in the current monitoring year). Only predicted residual impacts for which monitoring was recommended in the FEIS are summarized, since the PEAMP program focuses on evaluating monitoring results in relation to impact predictions.

**Part 2:** For each predicted impact, current-year results of the associated monitoring programs are reviewed and summarized. Future results will be added to these tables to ensure historical trends can be observed, even when predicted impacts are not exceeded in a given year.

**Part 3:** When current monitoring results do not support an impact prediction (i.e. current-year measured impacts are outside of the range of predicted impacts), a trend analysis is conducted to review baseline and all monitoring data to date. A discussion of those results is provided.

**Part 4:** Previously reported trend analyses are updated, regardless of current year monitoring results. In this way, discussions and trend analyses will be presented in the PEAMP moving forward for all instances where impact predictions have historically been exceeded on one or more occasions.

**Part 5:** Effectiveness of the monitoring programs at assessing impact predictions is discussed. A summary of the FEIS-planned mitigation measures for each VC is provided, along with a description of implementation in the current monitoring year. Where monitoring results indicate that impact predictions can no longer be supported, a description will be provided of the proposed adaptive management approaches.

It should be noted that the monitoring programs as described in the FEIS were developed at a conceptual level to assist in evaluating the overall potential impacts of the project. These were supporting documents in the FEIS and assisted in informing predictions, establishing regulatory limits, and forecasting management and mitigation actions to assist in the impact prediction process. Monitoring plans and sampling locations have since undergone changes and revisions to reflect actual mine operations. These differences are taken into account and identified when making comparisons to FEIS predictions.

**Figure 43 Conceptual model of the PEAMP evaluation process.**

**1. Review Impact Predictions**

Summarize EIS impact predictions for which monitoring was recommended. *Example:*

| Potential Impact | Potential Cause | Predicted Impact |
|---|---|---|
| Altered water levels | Discharge | 133.1 – 133.9 masl (annual avg) |
| | Consumption | |
| | Seepage | |

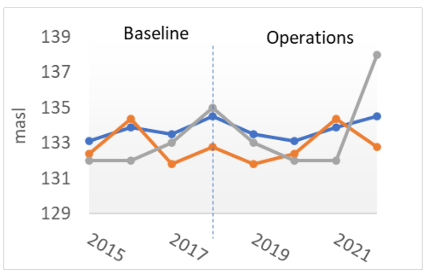
**2. Review Monitoring Results**

For each impact prediction, review current-year measured impacts. *Example:*

| 2022 Measured Impact |
|---|
| 138 masl (annual avg) |

**3. Conduct Trend Analysis**

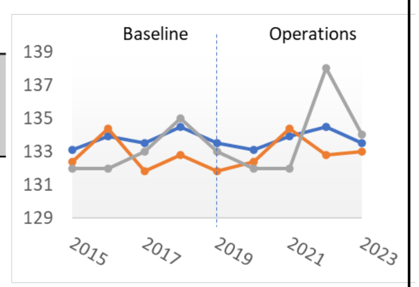
When an impact prediction is exceeded, review all monitoring data collected to date. *Example:*




**4. Update Previous Trend Analyses**

Clearly demonstrate whether exceedances continue to occur. *Example:*

| 2023 Measured Impact |
|---|
| 133.5 masl (annual avg) |




**5. Adaptive Management**

Where trend analyses indicate impact predictions can no longer be supported, review mitigation & monitoring and discuss plans for adaptive management. *Example:*

Current Mitigation & Monitoring
- Discussion of current mitigation.
- Discussion of current monitoring.

Adaptive Management
- Discussion of adaptive management actions to be implemented.

## 12.3 SUMMARY OF IMPACTS

A summary of the predicted potential impacts for the Meadowbank Mine with references to the FEIS (Cumberland, 2005) are provided in Table 12-1.

A summary of the predicted potential impacts (primary effect pathways) for the Whale Tail Mine with references to the Project FEIS or FEIS Addendum (Agnico Eagle, 2016 or 2018) are provided in Table 12-2. Primary effect pathways are those pathways likely to result in a measurable change to measurement indicators that could contribute to residual effects on a VC relative to the Baseline Case or guideline values. Any change in quantitative impact predictions for the Meadowbank Mine as a result of Whale Tail Mine development is described in the PEAMP evaluation sections below.

**Table 12-1 Summary of FEIS VECs, potential impacts, and references for impact predictions for the Meadowbank Mine (as in Cumberland, 2005).**

| VEC | Summary of Potential Impacts | Reference (in Cumberland, 2005) |
|---|---|---|
| **Surface water quantity** | Reduced water level and flow in receiving lakes | FEIS, Section 4.21.2.3<br>FEIS App B, Table B4 |
| **Surface water quality** | Contamination of receiving lakes | FEIS, Section 4.21.2.3<br>FEIS App B, Table B5<br>FEIS App E<br>FEIS - WQ |
| **Fish populations** | Direct impacts through blasting.<br>Indirect impacts through habitat changes. | FEIS, Section 4.21.2.7<br>FEIS App B, Table B13 |
| **Fish habitat** | Direct impacts through habitat destruction or alteration.<br>Indirect impacts through introduction of contaminants. | FEIS, Section 4.21.2.7<br>FEIS App B, Table B14 |
| **Vegetation (wildlife habitat)** | Removal of plant cover, abrasion/grading, salt, dust, grey water release | FEIS, Section 4.21.2.4<br>FEIS App B, Table B6 |
| **Ungulates** | Habitat loss, mortality | FEIS, Section 4.21.2.5<br>FEIS App B, Table B7 |
| **Predatory mammals** | Habitat loss, mortality | FEIS, Section 4.21.2.5<br>FEIS App B, Table B8 |
| **Small mammals** | Habitat loss, mortality | FEIS, Table 4.24<br>FEIS App B, Table B9 |
| **Raptors** | Habitat loss, mortality | FEIS, Section 4.21.2.6<br>FEIS App B, Table B10 |
| **Waterfowl** | Habitat loss, ingestion of contaminants, mortality | FEIS, Section 4.21.2.6<br>FEIS App B, Table B11 |
| **Other breeding birds** | Habitat loss, mortality | FEIS, Section 4.21.2.6<br>FEIS App B, Table B12 |
| **Air Quality** | Contamination of aquatic environment by dust.<br>Contamination of terrestrial environment by dust.<br>Poor air quality.<br>Odours may attract scavengers.<br>Production of greenhouse gases, other gaseous contaminants and particulate matter. | FEIS, Section 4.21.2.2<br>FEIS App B, Table B2 |
| **Noise** | General disturbance of wildlife as a result of regular noises (behavioural changes, displacement).<br>Reduced habitat effectiveness. | FEIS, Section 4.21.2.2<br>FEIS App B, Table B3 |

| VEC | Summary of Potential Impacts | Reference (in Cumberland, 2005) |
|---|---|---|
| **Permafrost** | Thaw instability.<br>Changes in permafrost depth in various areas (increase/decrease).<br>Ice entrapment in tailings/reclaim. | FEIS, Section 4.21.2.1<br>FEIS App B, Table B1 |
| **Traditional Ways of Life (personal and community)** | Reduced access to land.<br>Reduction in traditional activities including harvesting.<br>Undervaluing traditional ways and loss of knowledge. | FEIS Section 4.21.4.4<br>FEIS App B, Table B15 |
| **Employment, Training, and Business Opportunities** | Financial expenditures of $23 million annually for 10 years.<br>Employment of at least 60 workers.<br>Goods and services contracts for local businesses.<br>Overall increased economic activity, including indirect and induced effects.<br>Increased capacity of local labour force to participate in formal economy.<br>Increase in interest of school on part of youth.<br>Increased individual, family, and community wellness. | FEIS Section 4.21.4.3<br>FEIS App B, Table B15 |
| **Wellness (personal and community)** | Poor financial decision making.<br>Increased income disparity.<br>Increased public health and safety risks.<br>Stress from rotational employment.<br>Increased traffic accidents and emergencies.<br>Disturbance by project activities. | FEIS Section 4.21.4.5<br>FEIS App B, Table B15 |
| **Infrastructure and social services** | Shortage of housing and other infrastructure.<br>Increased demand for social services. | FEIS Section 4.21.4.6<br>FEIS App B, Table B15 |
| **Sites of heritage significance** | Potential degradation of historically significant sites. | FEIS Section 4.21.4.7<br>FEIS App B, Table B15 |
| **Contributions to economy of Nunavut and Canada** | $92M annually during operations phase. | FEIS Section 4.21.4.8 |

**Table 12-2 Summary of VCs and primary effects pathways (potential impacts) assessed in the *FEIS Addendum for the Whale Tail Pit – Expansion Project* (Agnico Eagle, 2018). In some cases (where indicated), pathways were carried over from the *FEIS for the Whale Tail Pit Project* (Agnico Eagle, 2016) and were not re-assessed in the FEIS Addendum. *Reference in Agnico Eagle (2018) unless indicated.**

| VC | Primary Effect Pathways (Volume 3, Appendix 3-C) | Reference* |
|---|---|---|
| **Surface Water Quantity** | Project footprint, which will physically alter watershed areas and drainage patterns, may change downstream discharge, water levels, and channel/bank stability in streams, and affect water quality, fish habitat, and fish | Section 6.3.3.1 |
| | Dewatering of lakes may change discharges, water levels, and channel/bank stability in receiving and downstream waterbodies, and affect water quality, fish and fish habitat | |
| | Alteration of watershed flow paths may change flows, water levels, and channel/bank stability in diverted and receiving waterbodies, and affect water quantity, water quality, fish and fish habitat | |
| **Water Quality** | Project footprint, which will physically alter watershed areas and drainage patterns, rates and quantities of diverted non-contact water to new watersheds, change downstream flows through | Section 6.2.3 |

| VC | Primary Effect Pathways (Volume 3, Appendix 3-C) | Reference* |
|---|---|---|
| | flooding and dewatering, water levels, channel/bank stability in streams, and disturb lakes and may affect water quality and sediment quality | |
| | Water management activities (dams, drainage, diversion, discharge, and dewatering) that will alter natural drainage paths and create a reservoir may cause a change in mercury cycling and bioaccumulation | |
| | Activities from construction activities and mining operations (e.g., equipment, vehicles, buildings, open-pit mining, blasting) can create fugitive dust emissions and subsequent dust deposition may cause a change in water quality | |
| | Activities from construction activities and mining operations (e.g., equipment, vehicles, buildings, open-pit mining, blasting) can alter air and dust emissions ( including Sulphur dioxide, nitrogen oxides, and particulate matter) and subsequent deposition may cause a change in water quality | |
| | Release of treated mine effluent (including sources from sewage, WRSF pond, and attenuation pond contact) may cause changes to surface water quality and sediment quality (i.e., nutrient and metal concentrations) in Mammoth Lake in operations and closure. | |
| | Dewatering of waterbodies may change flows, water levels, channel/bank stability, and water quality (e.g., suspended sediments, nutrients, metals) in receiving and downstream waterbodies. | |
| **Hydrogeology & Groundwater** | (No primary pathways were identified) | NA |
| **Fish and Fish Habitat** | The construction of the Northeast, Whale Tail, and Mammoth dikes, Whale Tail, and IVR Pit and WRSF for the Expansion Project, dewatering of the diked area in Lake A17 (Whale Tail Lake) and Lake A16 (Mammoth Lake), (and dewatering and use of Lake A53 as the IVR Attenuation Pond for the Expansion Project, will result in the direct loss or alteration of fish habitat. | Section 6.5.4.2.2 |
| | The construction of the North-East, Whale Tail, and Mammoth dikes will alter access to tributary streams and lakes (i.e., habitat connectivity) in the LSA, and may result in habitat loss for Lake Trout, Arctic Char, and Round Whitefish. | FEIS Volume 6, Section 6.5.3.2.2 (Agnico Eagle, 2016) |
| | During the construction and operations of the Whale Tail, Mammoth, and WRSF dikes, water diversions will result in a reduction of water levels in Lake A16 (Mammoth Lake) and downstream locations, affecting fish and fish habitat. | Fish and Fish Habitat Section 6.5.4.2.2. and Surface Water Hydrology Section 6.3.3.1.2.2 |
| | Water diversions for the Whale Tail and Northeast dikes during construction and operations will flood tributary lakes and streams, and will result in the alteration of habitat | FEIS Volume 6, Section 6.5.3.2.2 (Agnico Eagle, 2016)<br><br>Whale Tail Pit Fish Habitat Offsetting Plan, Table B-2 |
| | The dewatering of the diked area in Lake A17 (Whale Tail Lake) and Lake A16 (Mammoth Lake), and smaller waterbodies in the northeast area for the Expansion Project, will result in the removal and subsequent mortality of fish from the area during the proposed fish-out | Section 6.5.4.2.2 |
| | Release of treated mine effluent (including sources from sewage, WRSF pond, and attenuation pond contact) may cause changes to surface water quality and sediment quality (i.e., nutrient and metal concentrations) in receiving environment lakes in operations and closure. | FEIS Volume 6, Section 6.4.3.3 (water & sediment) and Section 6.5.3.3.2 (lower trophic levels & fish) (Agnico |

| VC | Primary Effect Pathways (Volume 3, Appendix 3-C) | Reference* |
|---|---|---|
| | | Eagle, 2016) and Section 6.5.4.3 |
| **Terrestrial Wildlife and Birds** | **Ungulates and Upland Birds:** Sensory disturbance from vehicles, on-site equipment, human presence and vibrations, can change the amount of different quality habitats, and alter wildlife movement and behaviour | Section 5.5.3 |
| | **Ungulates and Upland Birds:** Direct loss and fragmentation of wildlife habitat from the Project footprint | |
| | **Ungulates:** Barriers to migration, which may affect population connectivity and distribution | |
| | **Upland and Waterbirds:** Destruction of nests and flooding from construction activities including increased flows or water levels can increase risk of mortality to individual birds, which can affect population sizes | |
| **Noise** | Noise emissions from vehicles on the haul road can increase ambient noise levels. | Section 4.4.3 |
| | Noise emissions from mining equipment can increase ambient noise levels. Blasting can result in ground vibration and increase ambient noise levels. | |
| **Air Quality and Climate** | **Air Quality**: Vehicle emissions and fugitive dust from traffic on the haul road can affect air quality | Section 4.4.3 |
| | **Air Quality:** Blasting, stationary and mobile combustion sources, and fugitive dust from mining activities in the Whale Tail Pit can affect air quality. | Section 4.4.3 |
| | **Climate**: Additional 3 years of processing and use of supporting infrastructure at the Meadowbank mine site and the existing AWAR for delivery of materials can produce greenhouse gas emissions that contribute to climate change | Whale Tail Site: FEIS Addendum Section 4.2.3.1<br><br>Meadowbank Mill: FEIS Section 4.2.3.1 (Agnico Eagle, 2016) |
| **Vegetation, Terrain, Permafrost & Soils** | **Vegetation:** Physical loss of plants and vegetation communities due to project footprint or alteration of drainage patterns. | Section 5.4.3 |
| | **Vegetation:** Dewatering of lakes and diversion of water may change downstream flows and water levels, affecting permafrost, soils, vegetation, and wildlife habitat | |
| | **Vegetation:** Air emissions, dust deposition, or chemical contamination on terrain, soils, and vegetation can potentially change the quality and/or chemical properties of soil and affecting vegetation. Dust deposition may cover vegetation and lead to physical and/or physiological damage. | |
| | **Soil:** Physical loss or alteration of terrain and soil from the Project footprint , impacting vegetation and available wildlife habitat. | Section 5.3.3.1 |
| | **Soil:** Soil disturbance, stockpiling and transport can change physical, biological, and chemical properties of soils. Site clearing, contouring, excavation and decommissioning can cause admixing, compaction, and soil erosion and change soil quality. | |
| | **Terrain and Soil:** Physical changes, including degradation to the permafrost, terrain and soils in the area of the mine site footprint and supporting infrastructure (i.e., haul roads) | |
| | **Terrain and Permafrost**: Open Pit mining result in physical loss or permanent alteration of terrain, soils, and permafrost within the mined out areas. Permafrost degradation and retreat due to excavation of open pits and potential groundwater inflows to the open pit during operations if depth extends below the base of permafrost. | |
| | **Permafrost:** Underground mining resulting in physical loss or | |

| VC | Primary Effect Pathways (Volume 3, Appendix 3-C) | Reference* |
|---|---|---|
| | permanent alteration of permafrost within the mined out areas. Permafrost degradation and retreat due to excavation of the mined out areas coupled with the inflow of groundwater to the underground operations, as the proposed underground operation will extend below the permafrost. | |
| **Heritage Sites** | (No primary pathways identified) | NA |
| **Traditional Land Use** | **Wildlife Harvesting**: Project activities may affect continued opportunities for traditional wildlife harvesting | FEIS Section 7.3.3.2 (Agnico Eagle, 2016) |
| | **Fishing**: Project activities Primary may affect continued opportunities for traditional fishing | Section 7.3.2.1.2 |
| | **Plant Gathering**: Project activities may affect continued opportunities for traditional plant harvesting | FEIS Section 7.3.3.2 (Agnico Eagle, 2016) |
| | **Culturally Important Sites:** Project activities may affect continued opportunities for the use of culturally important sites | FEIS Section 7.3.3.2 (Agnico Eagle, 2016) |
| | **Marine Resource Harvesting:** Project activities may affect continued opportunities for traditional marine resource harvesting | Section 7.3.2.1.5 |
| **Socio-Economics** | The Project will contribute to territorial economic activity via expenditures, procurement and Gross Domestic Product contributions | Appendix 7-B, Section 7-B-1.4.2 |
| | The Project will contribute to government revenues through the payment of taxes and royalties | |
| | The Project will contribute to local business development through procurement and contacting | |
| | The Project will result in direct, indirect and induced employment opportunities | Appendix 7-B, Section 7-B-1.4.3 |
| | The Project will result in direct, indirect and induced incomes | |
| | The Project will provide training opportunities for its workforce | |
| | The Project will contribute to community education | |
| | Project incomes may enhance individual and community wellness by providing access to education, nutritious food, and recreation, and by reducing poverty | Appendix 7-B, Section 7-B-1.4.4 |
| | The Project may enhance individual and community wellness by continuing community contributions and the IIBA | |
| | The Project will continue existing individual and family wellness programming (e.g., EFAP) | |
| | The Project may improve health and safety awareness amongst employees, their families, and their communities | |
| | The Project may result in accidental injury or emergencies | |
| | Project incomes may adversely affect family and community cohesion through social ills (e.g., substance abuse, sexual misconduct, family violence, crime) | |
| | Project incomes may exacerbate income inequality, social disparity, and, potentially, related conflict in families and crime in communities | |
| | Project rotational employment may adversely affect family and community cohesion related to extended time away from family and community | |
| | Population growth and demographic change | Appendix 7-B, Section 7-B-1.4.5 |
| | Change in demand for and availability of housing | |
| | Change in demand for and capacity of services and infrastructure | |

## 12.4 MEADOWBANK PEAMP EVALUATION

For each VC, the completed PEAMP evaluation is presented in Sections 12.4.1 – 12.4.6, below, according to the six categories of assessment included in the FEIS (Aquatic Environment, Wildlife and Terrestrial Environment, Noise Quality, Air Quality, Permafrost, and Socio-Economics).

### 12.4.1 Aquatic Environment

Key mine development activities that were identified as having the potential to result in changes to the aquatic receiving environment for the Meadowbank Mine include: East Dike construction (2008), Bay-Goose Dike construction (2009-10), Vault Dike construction (2013), dewatering of lakes and impoundments (2009-2011, 2013, 2016), effluent discharge (2012 to present), and dust-generating activities (e.g., roads, tailings storage, rock crushing, blasting, hauling; generally 2008 to present, though blasting ceased in 2019).

Within the FEIS, impacts to the aquatic environment potentially caused by these activities are described for water quantity, water quality, and fish/fish habitat. Predicted and measured residual impacts for each of these VCs are described below.

#### 12.4.1.1 *Water Quantity*

##### *12.4.1.1.1 Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

A summary of predictions for impacts to surface water quantity (Cumberland, 2005; Table B4.2) and the assessed accuracy of these predictions in 2018 - 2022 (measured impacts) is provided in Table 12-3. Cells are highlighted in grey when measured impacts exceed predictions for the current year. A historical trend analysis and discussion are provided for those observations in Section 12.4.1.1.2. Future results will be added to that section to ensure historical trends can be observed, even when predicted impacts are not exceeded in a given year.

**Table 12-3 Predicted and measured impacts to water quantity during the Operations period. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.4.1.1.2.**

| Potential Impact | Potential Cause(s) | Proposed Monitoring | Actual Monitoring | Predicted Impact | Measured Impact | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2018 | 2019 | 2020 | 2021 | 2022 |
| Altered (reduced) water levels in Third Portage Lake | Potentially high seepage rates (from lakes into pits); Water diverted from Second Portage Lake drainage into TPL | Monitor pit seepage rates<br>Monitor discharge volumes of non-contact water | Third Portage Lake levels monitored | No change in lake level (FEIS modeled range = 133.82 – 134.19 masl) | 133.55 – 133.86 masl | 133.46 – 133.74 masl | 133.63 – 133.75 masl | 133.68 – 133.84 masl | 133.63 – 133.73 masl |
| | | | | | *FEIS prediction exceeded but no change from baseline - see discussion, Section 12.4.1.1.2* | | | | |
| | Freshwater consumption (Third Portage Lake) | Monitor freshwater use | Freshwater use monitored | FEIS: 0.53 M $m^3$/yr (Year 5 – 8)<br>NWB Water License 2AM-MEA1530 Part E, Item 1: 4,935,000 $m^3$ | 1,027,159 $m^3$ | 2,229,589 $m^3$ | 2,182,836 $m^3$ | 1,113,897 $m^3$ | 993,806 $m^3$ |
| | Discharge from Portage Attenuation Pond | Monitor discharge volumes and timing | Discharge volumes monitored | 458,400 $m^3$/yr (max) | No discharge | | | | |
| Altered water levels in Second Portage Lake | Potentially high seepage rates (from lakes into pits); Non-contact water diverted from Second Portage Lake drainage | Monitor pit seepage rates<br>Monitor discharge volumes of non-contact water | Lake levels monitored | Minor effect on lake level (baseline = 133.1 masl) | 132.86 – 133.10 masl | 132.75 – 133.07 masl | 132.84 – 133.17 masl | 133.00 – 133.35 masl | 132.87 – 133.07 masl |
| | | | | | *FEIS prediction not well defined – see discussion, Section 12.4.1.1.2* | | | | |
| Increased water levels in Wally Lake | Discharge from Vault Attenuation Pond | Monitor discharge rates | Monitored discharge rates and lake levels | Minimal increase in water levels.<br>Total average annual discharge: ~456,450 $m^3$ | No discharge; 139.25 - 139.66 masl | No discharge; 139.34 – 139.65 masl | No discharge; 139.31 – 139.64 masl | No discharge; 139.32 – 139.78 masl | No discharge; 139.48 masl (June 30) |
| | | | | | *FEIS prediction not well defined – see discussion, Section 12.4.1.1.2* | | | | |
| Altered water levels in Turn Lake | Discharge from Phaser Lake for water management purposes during mining of Vault Pit | Monitor outflows at Turn Lake | Turn Lake water levels (2019+) | No significant impact | - | No discharge; 139.00 – 139.36 masl | No discharge; 139.01 – 139.31 masl | No discharge; 139.54 – 139.64 masl | No discharge; 139.20 masl (June 23) |
| | | | | | *FEIS prediction not well defined – see discussion, Section 12.4.1.1.2* | | | | |

#### *12.4.1.1.2 Parts 3 & 4: Discussion*

Where impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion is provided here.

##### *12.4.1.1.2.1 Changes in Lake Levels*

***FEIS Prediction:***

Third Portage Lake - no change in lake levels (modeled range = 133.82 – 134.19 masl)

Second Portage Lake – minor change in lake levels (not quantitative)

Wally Lake – minor change in lake levels (not quantitative)

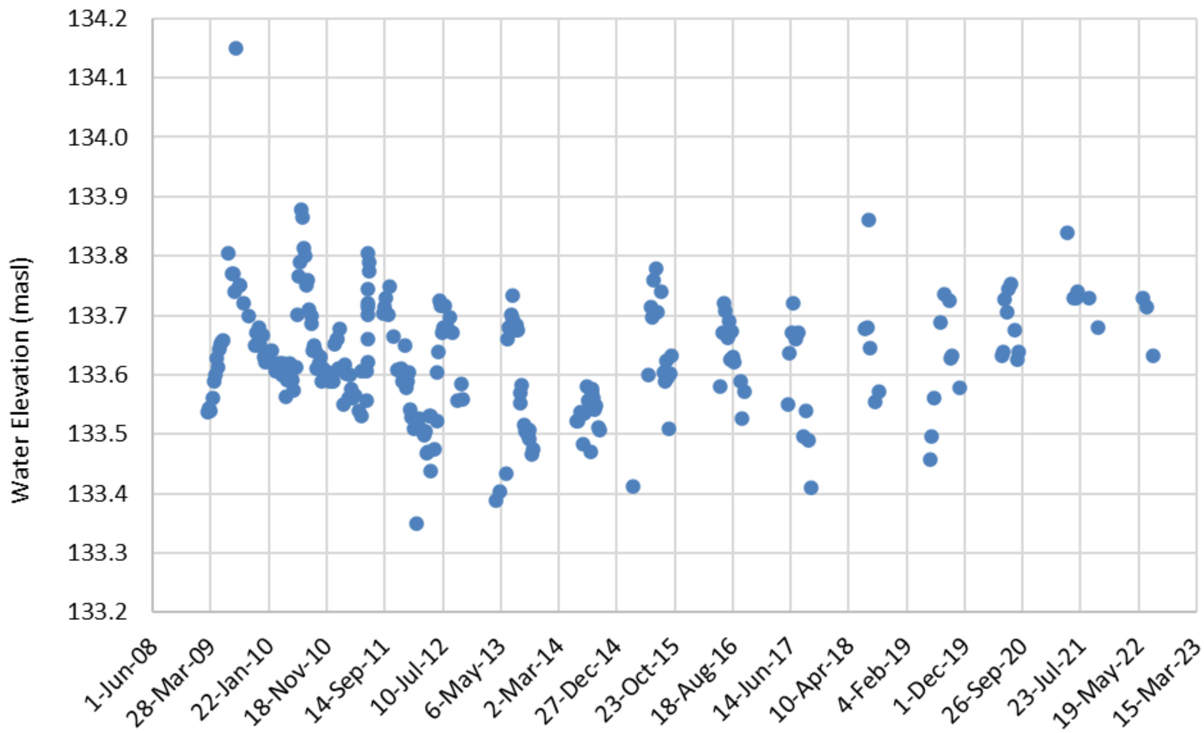
Turn Lake – no significant impact (not quantitative)

***Discussion:***

**Third Portage Lake**

Water usage predictions were made during the FEIS to predict potential impacts to water levels in Third Portage Lake, Second Portage Lake, and Wally Lake. Modeling predicted the natural range of water levels in Third Portage Lake to be 133.82 – 134.19 masl, and the impact assessment indicated that this range would not be exceeded (Physical Environment Impact Assessment Report, 2005). Although these values accounted for 1-in-100 yr precipitation or drought events, prior to operation, water levels were already below this range when monitoring began (prior to any significant freshwater consumption or discharge) on March 14$^{th}$, 2009 (133.54 masl). Pumping rates of freshwater from Third Portage Lake have remained well within license limits, and water levels do not appear to have changed significantly since monitoring began (2009) (see Figure 44). Therefore, the Project does not appear to be having a significant impact on water quantity, rather baseline water levels may not have been well defined in the initial impact assessment.

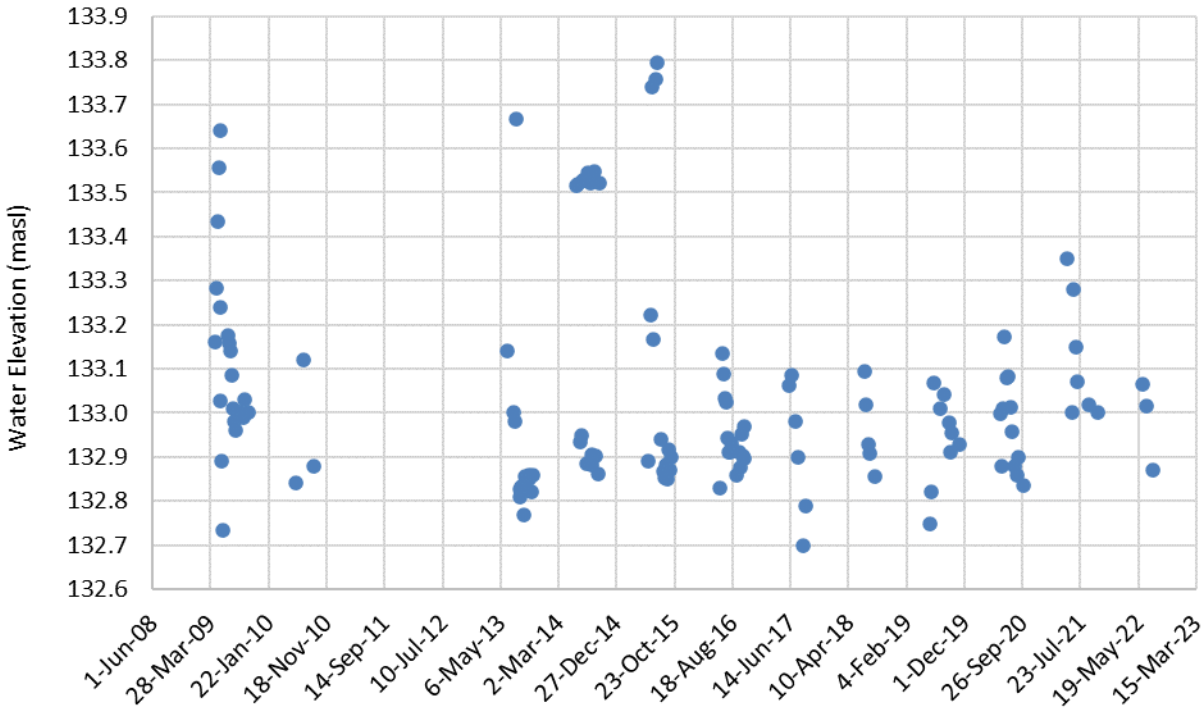
**Figure 44 Measured water levels in Third Portage Lake (2009 – 2022).**




## Second Portage Lake

For Second Portage Lake, the FEIS predicted a "minor" effect on water levels. Since that prediction is not quantitative, historical measurements are reviewed here to identify any apparent trends that might arise. Although only one measurement of baseline water levels in Second Portage Lake was reported from 2005 in the FEIS (133.1 masl), making comparisons difficult, measured water levels since 2009 (when monitoring began) appear to be within this range (Figure 45).

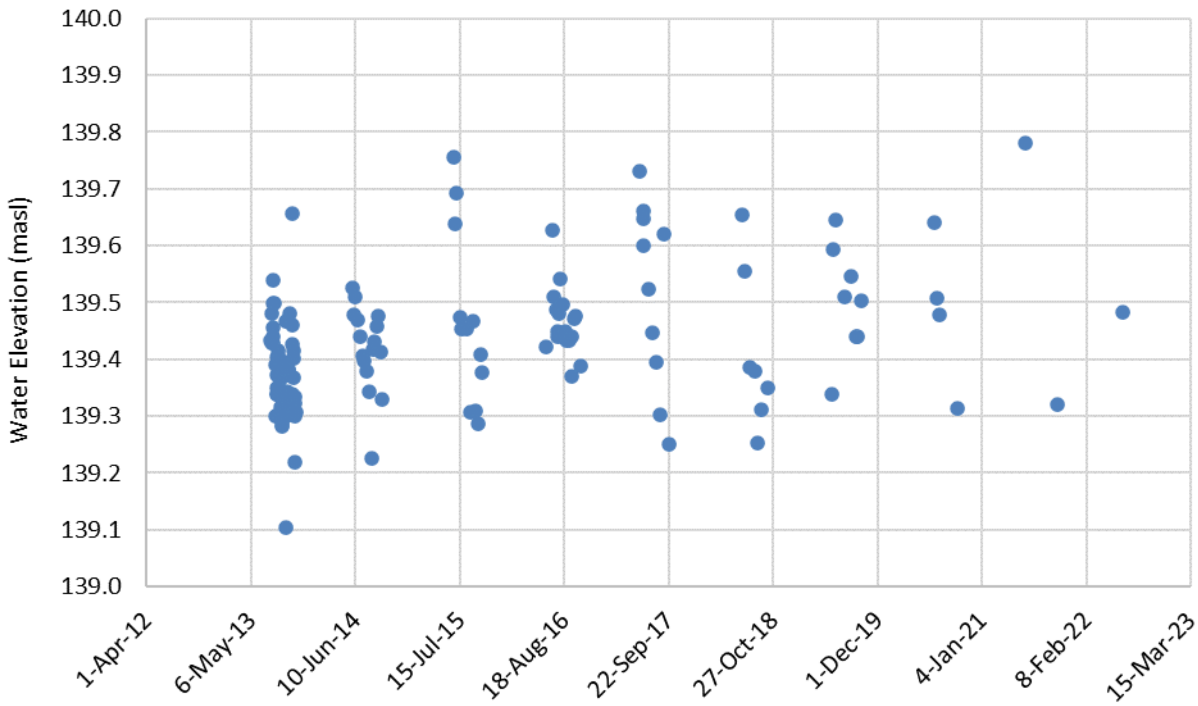
**Figure 45 Measured water levels in Second Portage Lake (2013-2022).**




**Wally Lake**

For Wally Lake, the FEIS predicted a "minimal" increase in water levels. Since that prediction is not quantitative, historical measurements are reviewed here to identify any apparent trends that might arise. No baseline measurements are available for Wally Lake, but since monitoring was required to begin in 2013, no clear upward or downward trends are observed (Figure 46).

**Figure 46 Measured water levels in Wally Lake (2013-2022).**



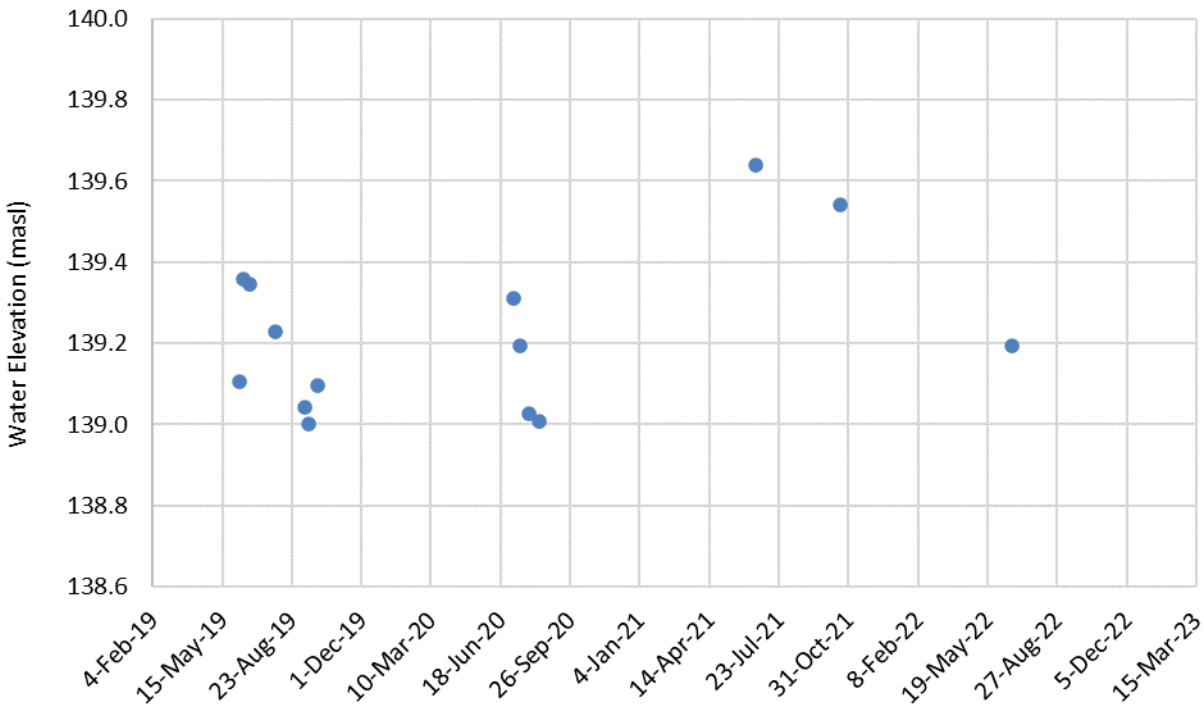

**Turn Lake**

In the original site FEIS (Cumberland, 2005) water management plans called for discharge from Phaser Lake to Turn Lake during mining of the Vault Pit. No significant impacts on water levels in Turn Lake were anticipated, but monitoring of outflows was recommended. However, in 2015, an FEIS Addendum was submitted to NWB as part of the permitting process for the Vault Pit expansion into Phaser Lake. Under that mine and water management plan, discharge to Turn Lake was no longer required, eliminating the potential residual impact of that activity and requirements for monitoring in Turn Lake.

However, in 2019, following recommendation from CIRNAC regarding the 2018 Annual Report, Turn Lake water level monitoring in the next open water season was completed, reported and compared to predictions.

No baseline water levels were provided in the 2005 FEIS or 2015 FEIS Addendum for Turn Lake so 2019 was the first year for which measurements are available (Figure 47). Similar water levels were observed in 2022.

**Figure 47 Measured water levels in Turn Lake (2019-2022).**




#### *12.4.1.1.3 Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

*Effectiveness of Monitoring*

Although FEIS predictions for changes to surface water quantity were rarely quantitative, the monitoring programs being implemented at the Meadowbank Mine are able to measure changes in receiving environment water levels. Monitoring programs are therefore considered effective.

*Effectiveness of Mitigation*

A summary of the FEIS-planned mitigation measures for surface water quantity along with a commentary on implementation in 2022 is provided in Table 12-4. Mitigation measures related to water quality and fish and fish habitat are provided in Section 12.4.1.2 and 12.4.1.3, respectively.

Since no exceedances of FEIS predictions, baseline values, or updated license limits (where applicable) occurred, existing mitigation measures are considered to be effective as designed.

**Table 12-4 Mitigation measures described in the FEIS to reduce impacts of the project to water quantity and commentary on current implementation.**

| Planned Mitigation Measure (FEIS, Section 4.24.2.5) | Implementation (2022) |
|---|---|
| Reducing the intake of fresh water from the neighbouring lakes by recycling and reusing water where practicable | **Yes** - Meadowbank continues to recycle reclaim water for mill usage. |

<u>*Adaptive Management*</u>

Since existing mitigation measures are considered to be effective as designed, no adaptive management measures are proposed for 2023.

### 12.4.1.2 *Water Quality*

#### *12.4.1.2.1 Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

Aspects of the mine that were identified in the FEIS as potentially leading to significant impacts to water quality during operations (Cumberland, 2005; Table B5.2) are summarized Table 12-5, along with results of the monitoring programs aimed at assessing these impacts. This assessment focuses on comparing current measured effects with predicted impacts described in the Physical Environment Impact Assessment Report (2005) for receiving environment water quality. Associated monitoring programs are the CREMP and effluent monitoring under the MDMER.

The 2022 CREMP report (Appendix 33) provides a comprehensive assessment of water quality monitoring for the receiving environment, with analysis of inter-annual trends, and a comparison to site-specific trigger values and FEIS predictions. Those results are summarized and referenced here. Complete results of effluent monitoring under the MDMER are provided in Section 8.3 above.

Overall, the FEIS predicted a “low” impact on the receiving environment water quality, which was designated by <1x change in CCME Water Quality Guidelines (CWQG), and no exceedances of MDMER/NWB Water License criteria. Monitoring results are compared to those predictions in Table 12-5 below. If exceedances occurred, cells are highlighted in grey and a discussion is provided in Section 12.4.1.2.2.

In addition, annual mean Meadowbank CREMP water chemistry results were compared to the maximum whole-lake average water quality modelling predictions for Third Portage, Second Portage, and Wally Lakes made in the FEIS (see 2022 CREMP report; Appendix 33). Exceedances of these model predictions are noted in Table 12-5, and a full discussion is provided in Section 12.4.1.2.2.

**Table 12-5 Predicted and measured impacts to water quality. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.4.1.2.2. Potential impacts as described in Cumberland, 2005; Table B5.2 and the Physical Environment Impact Assessment Report (2005) for receiving environment water quality.**

<table>
<tr><th rowspan="2">Potential Impact</th><th rowspan="2">Potential Cause(s)</th><th rowspan="2">Proposed Monitoring</th><th rowspan="2">Actual Monitoring</th><th rowspan="2">Predicted Impact</th><th colspan="5">Measured Impact</th></tr>
<tr><th>2018</th><th>2019</th><th>2020</th><th>2021</th><th>2022</th></tr>
<tr><td rowspan="3">Impaired Wally Lake water quality</td><td rowspan="3">Vault attenuation pond effluent discharge; dike leaching</td><td rowspan="3">Effluent and receiving environment monitoring</td><td rowspan="2">Receiving environment: CREMP water quality monitoring</td><td>CREMP results <CWQG except arsenic and cadmium.</td><td colspan="5">CREMP results all <CWQG</td></tr>
<tr><td>Measured concentrations within model predictions</td><td colspan="5">Some exceedances of specific model predictions for parameters without CWQG have occurred, but still “low” significance of impact - see discussion Section 12.4.1.2.2</td></tr>
<tr><td>Effluent monitored under MDMER, NWB Water License</td><td>Effluent: <MDMER</td><td colspan="5">No effluent discharged.</td></tr>
<tr><td rowspan="4">Impaired Second Portage Lake water quality</td><td rowspan="4">Portage Attenuation pond effluent discharge; dike leaching (East Dike seepage)</td><td rowspan="4">Effluent and receiving environment monitoring</td><td rowspan="2">Receiving environment: CREMP water quality monitoring</td><td>CREMP results <CWQG except cadmium</td><td colspan="5">CREMP results all <CWQG</td></tr>
<tr><td>Measured concentrations within model predictions</td><td colspan="5">Some exceedances of specific model predictions for parameters without CWQG have occurred, but still “low” significance of impact - see discussion Section 12.4.1.2.2</td></tr>
<tr><td rowspan="2">Effluent monitored under MDMER, NWB Water License</td><td rowspan="2"><MDMER, NWB Water License</td><td colspan="3">All effluent <MDMER and NWB Criteria</td><td>TSS - Two marginal exceedances (17.5 and 16 mg/L) of MDMER max. monthly avg. for TSS (15 mg/L)</td><td>TSS - One exceedance (49 mg/L) of grab sample limit (30 mg/L) but within monthly limit.</td></tr>
<tr><td colspan="5">Three results above criteria since at least 2018 are not viewed as a significant departure from FEIS predictions – discussed in Section 12.4.1.2.2</td></tr>
<tr><td rowspan="2">Impaired Third Portage Lake water quality</td><td rowspan="2">Portage Attenuation pond effluent; dike leaching</td><td rowspan="2">Effluent and receiving environment monitoring</td><td rowspan="2">Receiving environment: CREMP water quality monitoring<br><br>No effluent monitoring required.</td><td>CREMP results <CWQG except cadmium</td><td colspan="5">CREMP results all <CWQG</td></tr>
<tr><td>Measured concentrations within model predictions</td><td colspan="5">Some exceedances of specific model predictions for parameters without CWQG have occurred, but still “low” significance of impact - see discussion Section 12.4.1.2.2</td></tr>
</table>

#### *12.4.1.2.2 Parts 3 & 4: Discussion*

Where impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion is provided here.

##### *12.4.1.2.2.1 FEIS Model Predictions for Water Quality*

***FEIS Prediction:*** Concentrations <CCME water quality guidelines; "low" magnitude of effects.

***Discussion:*** As described in the 2018 - 2022 CREMP Reports, a number of measured parameters have exceeded FEIS water quality model predictions when these individual values are compared directly. However, the difference in spatial focus (i.e., the CREMP at the basin scale and the water quality model at the whole-lake scale) warrants caution interpreting any differences. To that end, the assessment criteria outlined in the FEIS for defining the predicted magnitude of impacts to water quality was used to provide the appropriate context for interpreting measured water quality results in comparison to FEIS water quality model predictions as follows:

- **Negligible**: water quality concentrations are similar to baseline
- **Low**: concentrations are < 1x the CCME Water quality guideline (WQG)
- **Medium**: concentrations are between 1 and 10-times the CCME guidelines
- **High**: concentrations are less than MDMER but greater than 10-times the CCME guidelines
- **Very High**: concentrations exceed MDMER standards

Where CREMP monitoring results have exceeded FEIS water quality model predictions but did not exceed CCME water quality guidelines, CREMP thresholds, or otherwise determined adverse effects levels (as detailed below), they were still considered to have a "low" magnitude of impact, consistent with general FEIS predictions. Beginning in 2020, annual means have been formally screened against FEIS predictions, rather than comparisons for all individual monthly samples.

Similar to previous years, parameters with annual means exceeding concentrations predicted in the FEIS water quality model in 2022 were: ionic compounds (calcium and magnesium), hardness, and total alkalinity. Concentrations for these parameters in 2022 along with FEIS predictions are shown in Table 4-6 of the 2022 CREMP Report (Appendix 33), and results are further discussed with historical figures, below.

Measured values of these parameters (calcium, magnesium, hardness, total alkalinity) also regularly exceeded specific FEIS predictions from 2018 - 2021. Historical results for these constituents are shown in Figures 48 – 51 below, from the 2022 CREMP Report (Appendix 33). These water quality constituents do not have CCME guidelines and therefore the magnitude of significance was not explicitly predicted in the FEIS. A thorough review of the literature (2019 CREMP Report) suggests that the observed concentrations of these parameters are well below levels of concern for aquatic life. Therefore, following the intent of the FEIS magnitude ratings, these constituents would be considered consistent with a "low" magnitude of impact, because measured values regularly exceed baseline concentrations but are below concentrations associated with adverse effects.

Additional historical exceedances of FEIS predictions include annual means for chloride, fluoride, and sulphate, and individual samples of ammonia, nitrate, and total phosphorus for Third Portage Lake, Second Portage Lake, and Wally Lake in 2020. These same parameters had occasional exceedances in 2018 and 2019. For chloride, fluoride, and sulphate, historical results are shown in Figures 52 - 54, from the 2022 CREMP Report. In 2021 and 2022, results (annual means) for these parameters did not exceed CREMP triggers (95$^{th}$ percentile of baseline) indicating current concentrations are representative of pre-development conditions so these constituents are also considered to represent a “low” magnitude of impact. Consistent with the CREMP methods for FEIS comparison, the historical isolated exceedances for ammonia, nitrate, and total phosphorus are not explored further, because mean annual concentrations were below FEIS predictions in all years. Historical results for these parameters are provided in the 2022 CREMP Report.

Most metals have been measured at concentrations less than the FEIS model’s predicted concentrations except for silicon (all three lakes, 2018 – 2021; Second Portage only in 2022), strontium (Third Portage Lake, 2018 - 2020) and isolated instances of aluminum, copper, iron, manganese (2018 and 2019), silver (2018) and chromium (2019). As discussed in the 2019 -2022 CREMP reports, silicon and strontium are not suitable for evaluating the accuracy of the FEIS predictions, and are therefore both excluded from the FEIS assessment. Consistent with the CREMP methods for FEIS comparison, the isolated instances of exceedances for other metals are not explored further, because mean annual concentrations were below FEIS predictions.

Based on these analyses, overall, CREMP water quality results were determined to be consistent with the “low” significance (i.e., <1x CCME WQG) rating applied to model predictions in the FEIS.

Historical results for all other water quality parameters measured under the CREMP are provided in the 2022 CREMP Report (Appendix 33).

**Figure 48 Total calcium (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value and blue dashed line = FEIS screening prediction.**

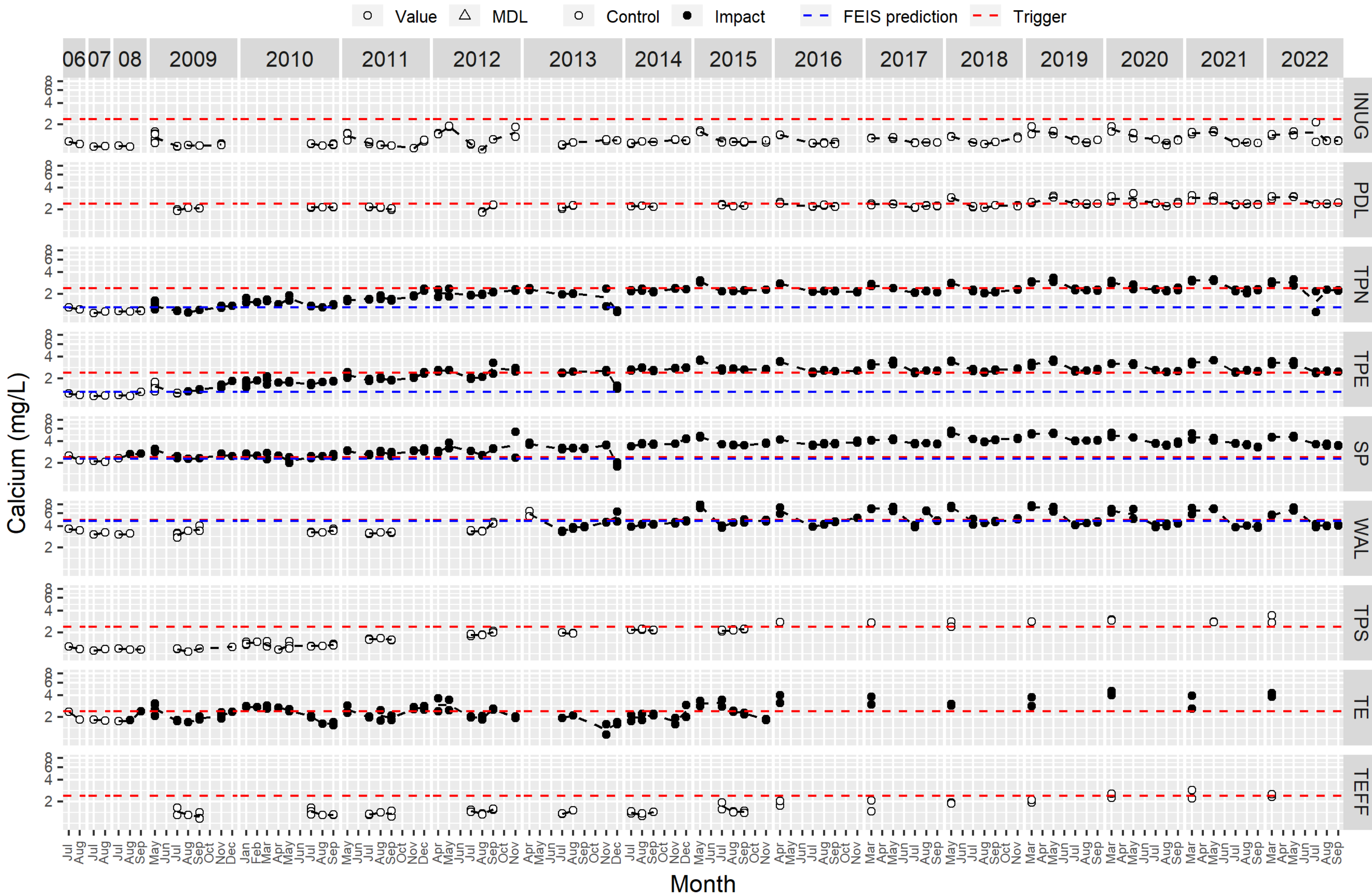


**Figure 49 Total magnesium (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value and blue dashed line = FEIS screening prediction.**

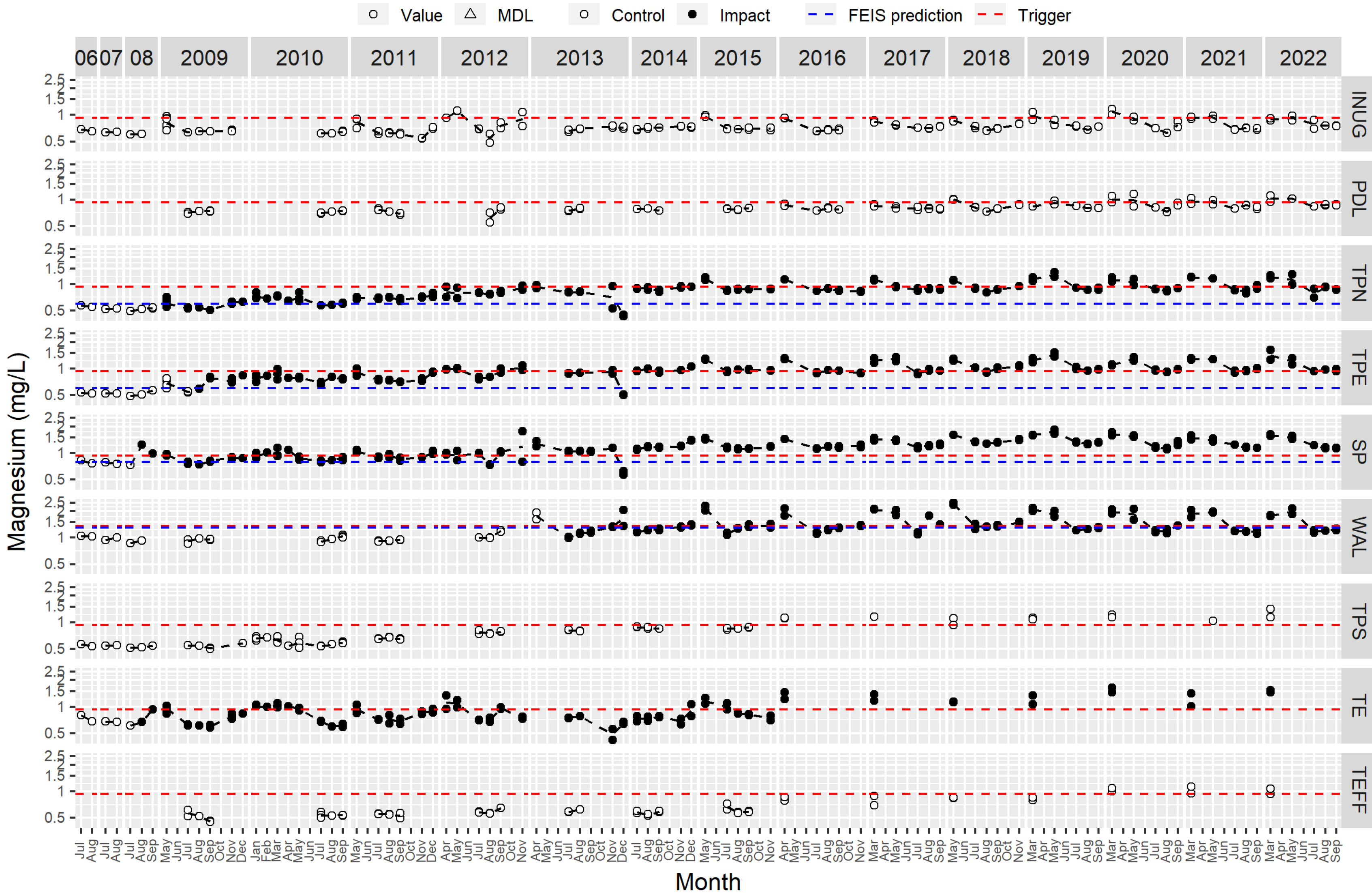


**Figure 50 Laboratory-measured hardness (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value and blue dashed line = FEIS screening prediction.**

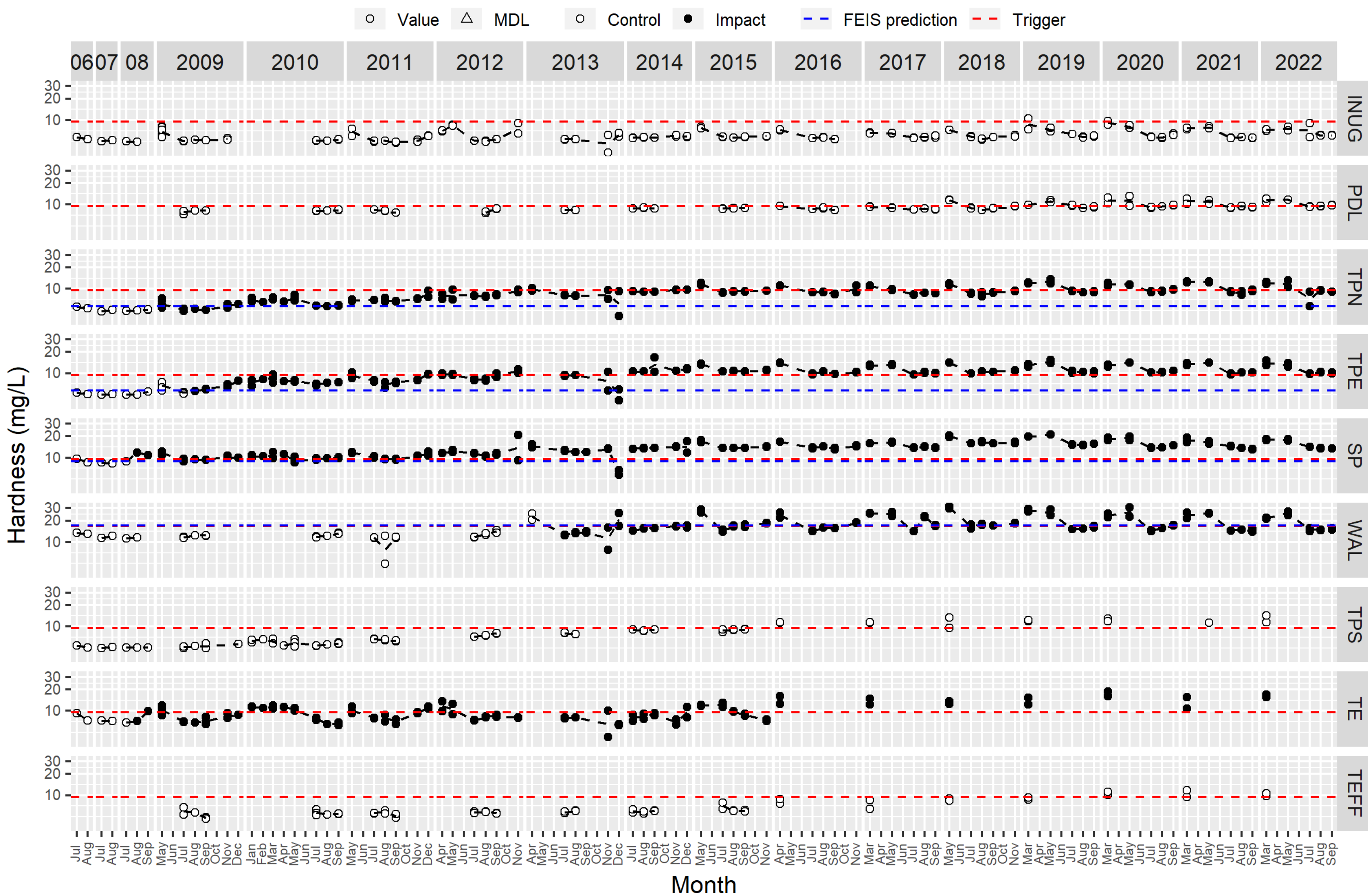


**Figure 51 Total alkalinity (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value and blue dashed line = FEIS screening prediction.**

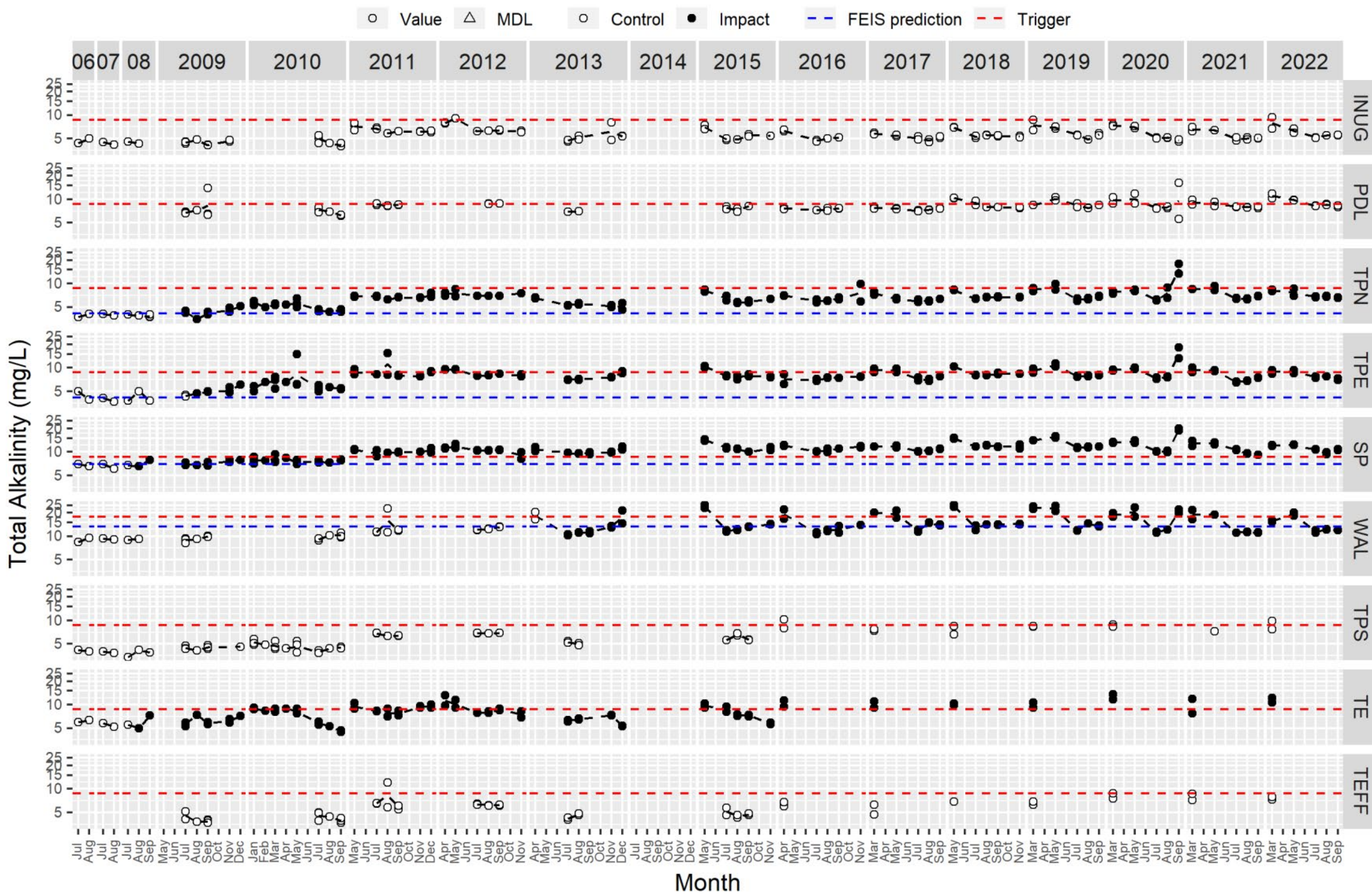


**Figure 52 Chloride (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value and blue dashed line = FEIS screening prediction.**

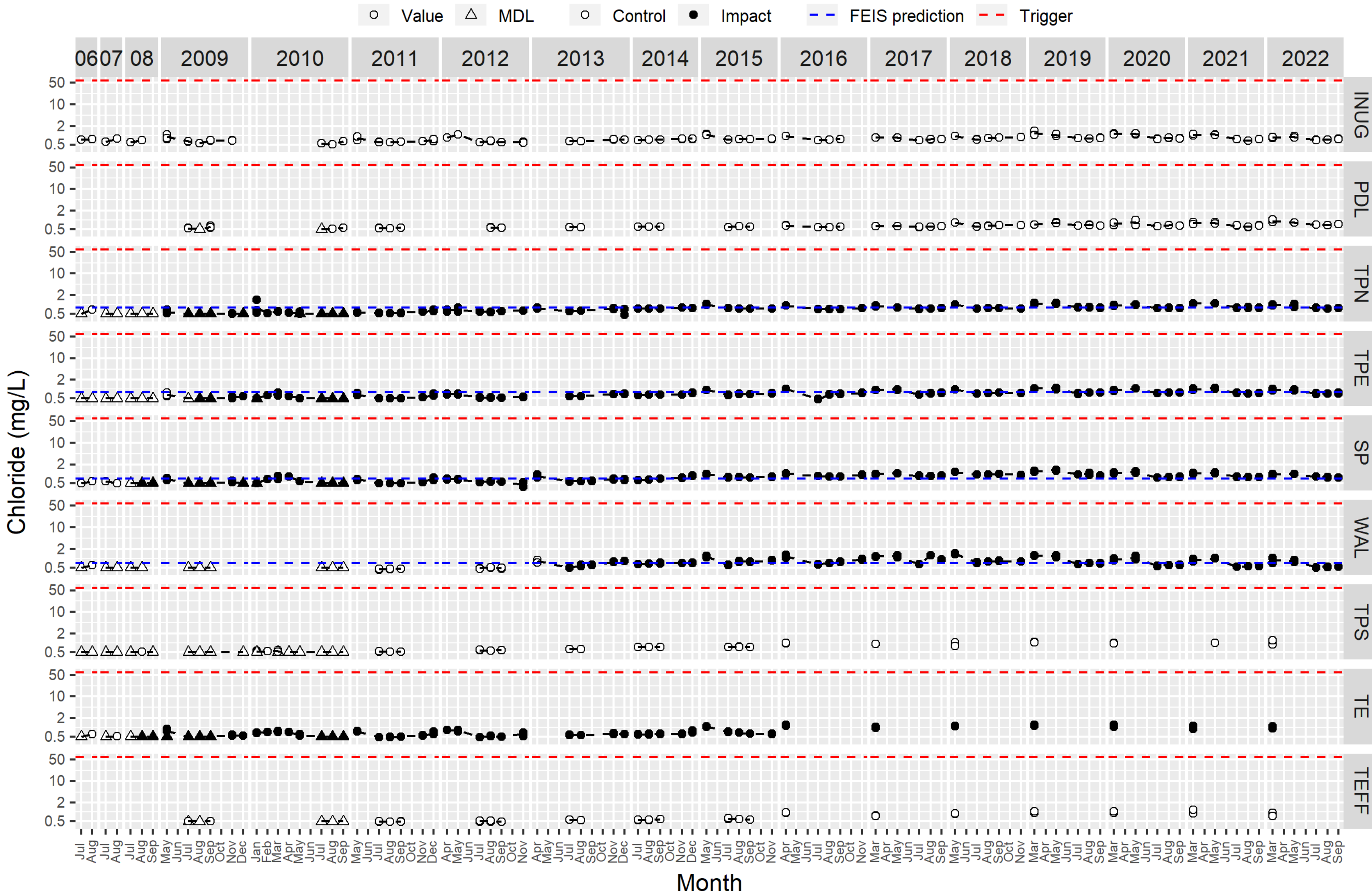


**Figure 53 Fluoride (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value and blue dashed line = FEIS screening value**

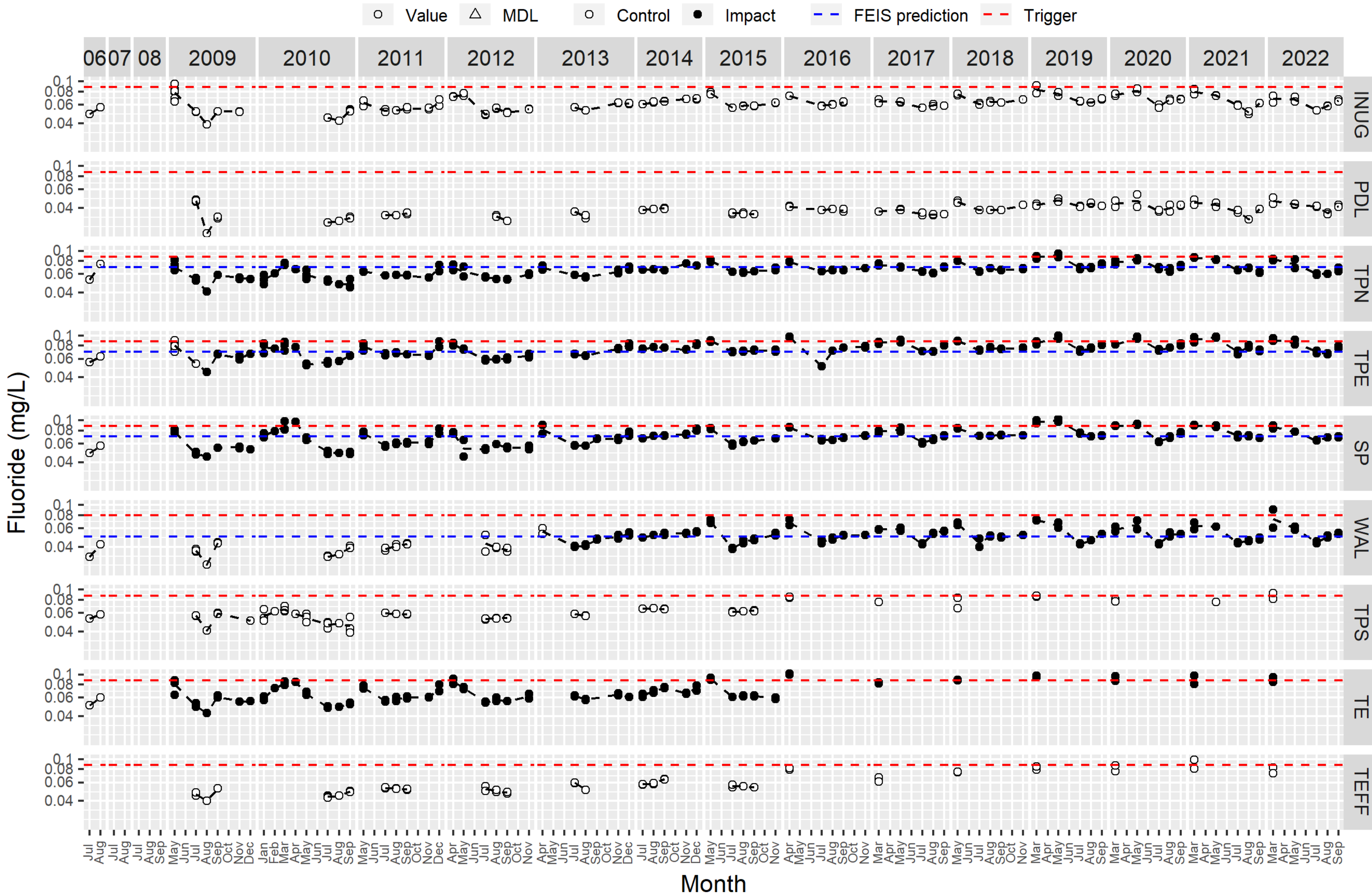
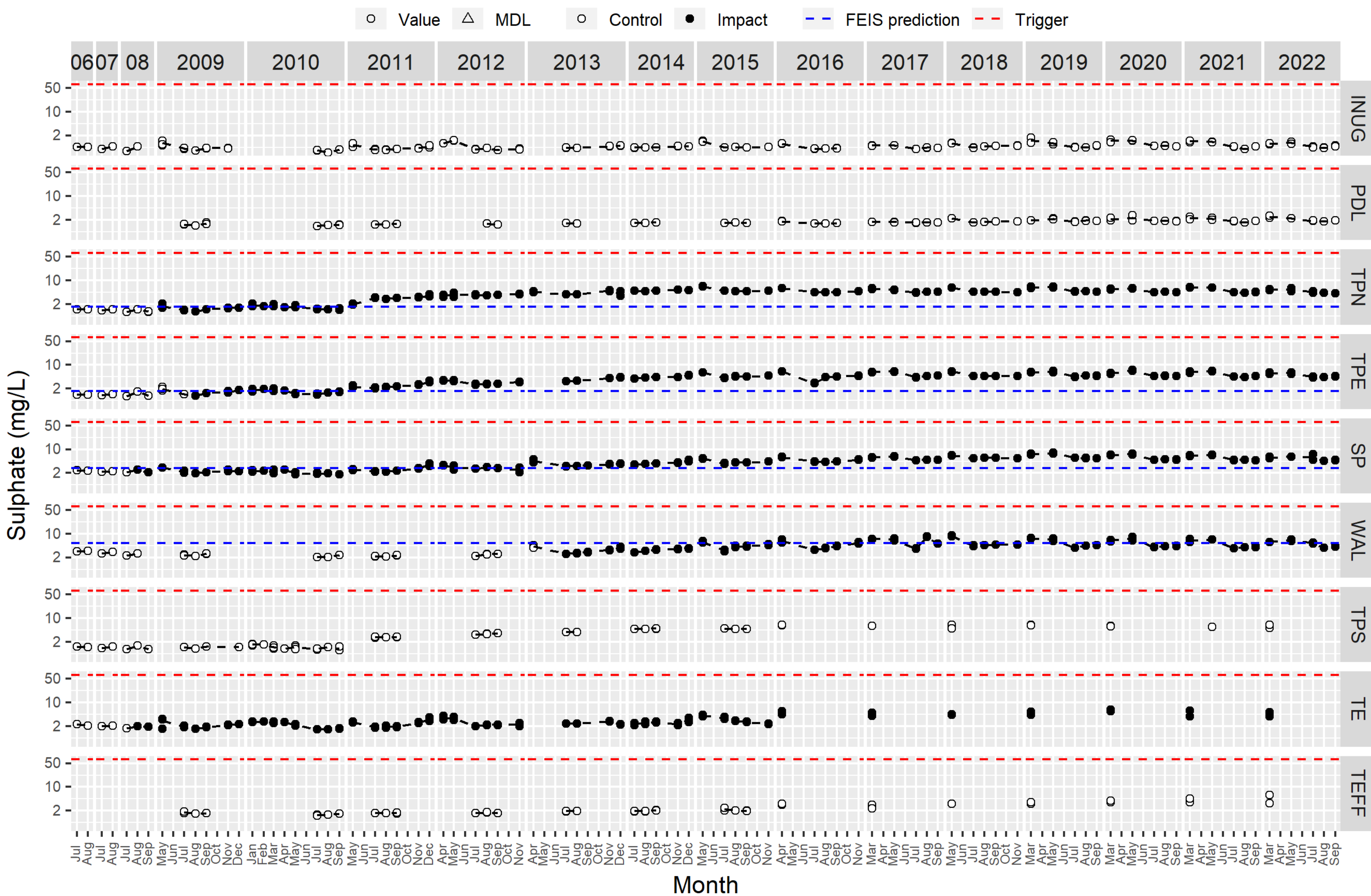


**Figure 54 Sulphate (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value and blue dashed line = FEIS screening value**



#### *12.4.1.2.2.2 MDMER Criteria for TSS*

Effluent discharge for the Meadowbank Mine in 2022 only consisted of East Dike seepage discharge as non-contact water (station ST-8/ST-MMER-3) to Second Portage Lake. Discharge occurred in January, April, November, and December, 2022. On April 9th, the Total Suspended Solids (TSS) result exceeded the limits set out in MDMER Schedule 4, Table 2 and the NWB Water License, for the maximum authorized concentration in a grab sample (30 mg/L), at 49 mg/L. The monthly TSS average did not exceed the maximum monthly average concentration of 15 mg/L.

Based on the infrequency of MDMER TSS exceedances (three samples since at least 2018), no exceedances of TSS triggers in the broader receiving environment of Second Portage Lake (CREMP Report, Appendix 33), and no reported detection of TSS in EEM exposure area monitoring for this effluent discharge location (Section EEM), this incident is not viewed as a significant departure from impact predictions.

### *12.4.1.2.3 Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

*Effectiveness of Monitoring*

Based on the results in Table 12-5, current monitoring programs are able to address all FEIS impacts for which monitoring was recommended (i.e. monitoring is considered effective).

*Effectiveness of Mitigation*

A summary of the FEIS-planned mitigation measures for surface water quality, along with a commentary on implementation in 2022 is provided in Table 12-6. Mitigation measures related to water quantity, and fish and fish habitat are provided in Section 12.4.1.1 and 12.4.1.3, respectively, though some overlap may occur.

While some water quality parameters without CWQG exceeded specific FEIS predictions, they were still considered to have a "low" magnitude of impact, consistent with general FEIS predictions, and existing mitigation measures are therefore considered to be generally effective as designed. Nevertheless, adaptive management in response to the observed monitoring results is described below.

**Table 12-6 Mitigation measures described in the FEIS to reduce impacts of the project to water quality, and commentary on current implementation.**

| Planned Mitigation Measure (FEIS, Section 4.24.2.5) | Implementation (2022) |
|---|---|
| Implementing measures to avoid the contact of clean runoff water with areas affected by the mine or mining activities | **Yes** - Management of non-contact water occurs through use of established diversion ditches, which are monitored according to NWB Water License requirements. |
| Collecting, transporting, and treating mine water, camp sewage, and runoff water that comes into contact with project activities, as necessary | **Yes** - A comprehensive management program for site contact water and sewage is ongoing as described in Section 8.5.3. Monitoring occurs according to NWB Water License requirements. |
| Managing potentially acid-generating or metal-leaching materials | **Yes** – Waste rock analysis and management according to acid-generating and metal-leaching potential is described in Section 5.1. |
| Monitoring quality of discharges | **Yes** – Minesite effluent is monitored according to NWB/MDMER criteria, as described in Section 8.3. |
| Adjusting management practices if monitoring results indicate discharge quality does not meet | **Yes** – In cases where discharge criteria are not met, discharge is ceased until results are within acceptable limits. E.g. Section |

| Planned Mitigation Measure (FEIS, Section 4.24.2.5) | Implementation (2022) |
|---|---|
| discharge criteria | 8.3.1. |
| Winter culvert installation | **N/A** – No new construction in 2022 |
| Sediment control (e.g. use of geotextile for Baker Lake marine barge landing facility) | **Yes - D**eployment of sediment control measures as needed |
| Use of riprap to stabilize shorelines around culverts and anchor pipes | **N/A** – No new construction in 2022 |
| Treatment of effluent discharge | **Yes** – Minesite effluent is monitored according to NWB/MDMER criteria, as described in Section 8.3. No treatment required for TSS prior to release for East Dike discharge |
| Discharge only during open water, not under ice (Attenuation Pond discharge to Third Portage Lake) | **N/A** - Attenuation pond discharge is no longer occurring |

*Adaptive Management*

**FEIS Water Quality Model Prediction Exceedances:** Historically and in 2022, a number of water quality parameters without regulatory guidelines exceeded CREMP trigger values. As an adaptive management measure described in the 2018 PEAMP, a more detailed assessment of the significance of changes in these water quality parameters was conducted in the 2019 CREMP Report (Appendix 35 of the 2019 Annual Report to the NIRB). In general, it was found that these parameters all represent essential elements, and adverse effects are more commonly associated with deficiency, rather than enrichment. The 2019 CREMP analysis therefore supported the ongoing assertion that water quality results continue to represent a "low" magnitude of impact and no exceedance of overall FEIS predictions is occurring. As an additional adaptive management measure, Agnico Eagle committed in 2018 to developing CREMP triggers for those elements which are exceeding FEIS water quality model predictions (e.g. silicon in 2018), but for which no CCME guidelines or CREMP triggers already exist. This task was completed and is described in the 2019 CREMP report. No supplemental mitigation is planned at this time.

**MDMER TSS Exceedances:** As discussed above, current management for effluent includes onsite TSS testing to inform the need to stop discharge prior to receiving results from the analytical laboratory. As a further proactive management measure, effluent discharge is stopped prior to freshet to prevent TSS release to the receiving environment. Since exceedances in 2022 only occurred in one individual grab sample, and since EEM water quality testing indicated no TSS detections in exposure area monitoring, no changes to management actions related to East Dike effluent discharge are planned at this time.

### 12.4.1.3 *Fish and Fish Habitat*

#### *12.4.1.3.1 Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

In addition to water quality and quantity, monitoring programs were developed to address the impacts of mining activities to fish and fish habitat. These are primarily guided by Fish Habitat Offsetting Plans and No Net Loss Plans (NNLP) and associated aquatics monitoring (e.g. CREMP, Habitat Compensation Monitoring Plan, Blast Monitoring Plan). Results of these programs are summarized in relation to FEIS predictions for impacts to fish and fish habitat (Cumberland, 2005; Table B13.2) in Table 12-7, below.

**Table 12-7 Predicted and measured impacts to fish and fish habitat. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.4.1.3.2. Potential impacts according to Cumberland, 2005; Table B13.2. NM indicates not required to be measured.**

| Potential Impact | Potential Cause(s) | Proposed Monitoring | Monitoring Conducted | Predicted Impact in FEIS | Measured Impacts | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2018 | 2019 | 2020 | 2021 | 2022 |
| Loss/ impairment of fish habitat | Construction of temporary and permanent in-water features (e.g. TSF, dikes, pits). | Monitoring of compensation features per NNLP (targeted studies under AEMP for dike “pore water” (interstitial water) quality, periphyton growth, fish use). | Structure, interstitial water quality, periphyton growth, fish use under HCMP | Dikes will provide a medium for lower trophic growth; habitat for non-spawning life functions except Goose Island dike where spawning may occur. | NM | Compensation features appear to be functioning as intended (continuing periphyton growth, fish presence around dikes). Interstitial water quality not assessed in 2019. | NM | Compensation features appear to be functioning as intended (water quality <CCME; continuing periphyton growth; fish presence around dikes). | NM |
| | Construction of barge facility in Baker Lake | Annual monitoring of shoreline stability and integrity (proposed 2016) | CREMP monitoring at Baker Lake barge dock | Negligible impact | No impacts of barge activity on water quality, sediment quality, phytoplankton, benthic invertebrates observed to date. | | | | |
| Reduced fish egg survival | Metals and particulates from dike leachate, effluent, and road dust.<br><br>Blasting | Dike leachate: Targeted studies under AEMP (“pore water” (interstitial water) sampling during year 1<br><br>Effluent: Water quality monitoring under MDMER.<br><br>Dust: Whole-lake water quality under CREMP<br><br>Blasting: Blast monitoring | Dike leachate: Interstitial water quality under HCMP<br><br>Effluent: MDMER monitoring<br><br>Dust: Whole-lake water quality under CREMP<br><br>Blasting: Blast monitoring | Dike leachate: Dissolved metals may reduce fish egg survival and larval development during overwinter incubation.<br><br>Effluent: <MDMER regulations<br><br>Dust (whole-lake water quality under CREMP): negligible ecological effect, <CWQG for aquatic life (CCME) except cadmium (TPL), and arsenic and cadmium (Wally Lake)<br><br>Blasting: Most blasts will not exceed DFO overpressure | Dike leachate: NM<br><br>Effluent: < MDMER<br><br>Dust: CREMP results <CWQG<br><br>Blasting: No exceedances of DFO overpressure guideline (50 kPa); no exceedances of PPV guideline (13 mm/s) | | Dike leachate: NM<br><br>Effluent: < MDMER<br><br>Dust: CREMP results <CWQG<br><br>Blasting: NM - mining operations ceased in 2019 | Dike leachate (interstitial water quality): <CCME<br><br>Effluent: <MDMER except April & May (marginal exceedance for TSS)<br><br>Dust: CREMP results <CWQG<br><br>Blasting: NM - mining operations ceased in 2019 | Dike leachate: NM<br><br>Effluent: < MDMER except single TSS grab sample– Section 12.4.1.2.2.2 above<br><br>Dust: CREMP results <CWQG<br><br>Blasting: NM - mining operations ceased in 2019 |

| Potential Impact | Potential Cause(s) | Proposed Monitoring | Monitoring Conducted | Predicted Impact in FEIS | Measured Impacts | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2018 | 2019 | 2020 | 2021 | 2022 |
| | | | | guideline (50 kPa); no exceedances of PPV guideline (13 mm/s) | | | | | |
| Mortality of fish and fish eggs | Blasting | Blast monitoring | Blast monitoring | Most blasts will not exceed DFO overpressure guideline (50 kPa); no exceedances of PPV guideline (13 mm/s) | No exceedances of DFO overpressure guideline (50 kPa); no exceedances of PPV guideline (13 mm/s) | | NM - mining operations ceased in 2019 | | |
| | Worker fishing in project area, despite no-fishing policy; increased fishing in area due to AWAR | Worker fishing: Staff interviews<br><br>AWAR fishing: Creel survey | Worker fishing: Workers are not allowed to bring up to site fishing equipment. Luggage inspection to ensure policy is followed.<br><br>AWAR fishing: Creel survey resumed 2021 | Unknown | Worker fishing: No recreational fishing<br><br>AWAR fishing: N/A | | | Worker fishing: No recreational fishing<br><br>AWAR fishing: No increase in fishing pressure due to AWAR or WTHR | Worker fishing: No recreational fishing<br><br>AWAR fishing: No increase in fishing pressure due to AWAR or WTHR |
| | Accidental spills (e.g. fuel) | Event-based monitoring; spill emergency response plan | Spill Contingency Plan: All spills reported to Environment Department; monitoring spills during site inspections | Not defined | *Impacts not defined in FEIS so not suitable for PEAMP evaluation. See Section 7 for spills reporting.* | | | | |
| Fish stress, behavioral changes, avoidance | Increased concentrations of dissolved metals and TSS from dust and effluent discharge | Dust: Whole-lake water quality monitoring under CREMP<br><br>Effluent: Monitoring under MDMER program | Dust: Whole-lake water quality under CREMP<br><br>Effluent: MDMER monitoring | Dust (whole-lake water quality under CREMP): negligible ecological effect; <CWQG for aquatic life (CCME) except cadmium (TPL), and arsenic and cadmium (Wally | Dust: CREMP results <CWQG, no exceedance of TSS trigger.<br><br>Effluent: < MDMER | | | Dust: CREMP results <CWQG, no mine-related exceedance of TSS trigger.<br><br>Effluent: <MDMER except April & | Dust: CREMP results <CWQG, no exceedance of TSS trigger.<br><br>Effluent: < MDMER except single |

| Potential Impact | Potential Cause(s) | Proposed Monitoring | Monitoring Conducted | Predicted Impact in FEIS | Measured Impacts | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2018 | 2019 | 2020 | 2021 | 2022 |
| | | | | Lake)<br><br>Effluent: < MDMER criteria | | | | May (marginal exceedance for TSS) | TSS grab sample–Section 12.4.1.2.2.2 above |
| Impaired lower trophic levels (incl. loss of phytoplankton, periphyton and benthos) | Leaching of metals (from dikes) | Targeted studies under AEMP ("pore water" sampling; periphyton sampling) during year 1 | Interstitial water quality under HCMP | Dike faces will provide a medium for periphyton growth | NM | Not sampled in 2019 | NM | Dike leachate (interstitial water quality): <CWQG | NM |
| | Sedimentation through dust/particulate dispersion (road dust, wind dispersal, terrain disturbance) and effluent discharge | Water quality monitoring through CREMP | CREMP (water quality, sediment, and lower trophic level monitoring) | Negligible ecological effect; CREMP results <CWQG for aquatic life (CCME) except cadmium (TPL), and arsenic and cadmium (Wally Lake) | CREMP results <CWQG, no mine-related impairment of phytoplankton, benthic invertebrate communities. Some exceedances of CREMP sediment threshold for Cr. See discussion, Section 12.4.1.3.2. | | | | |
| | | Effluent MDMER monitoring | Effluent MDMER monitoring | Settling of TSS and altered sediment chemistry may impact benthos. | Effluent < MDMER | | | Effluent: <MDMER except April & May (marginal exceedance for TSS) | Effluent: < MDMER except single grab sample–Section 12.4.1.2.2.2 above |
| Increased fish biomass | Release of nutrients in treated sewage | Nutrients, chlorophyll a, and phytoplankton monitoring through CREMP in TPL | Nutrients, chlorophyll a, and phytoplankton monitoring through CREMP in TPL | Increase in nitrogen concentrations; change in phytoplankton species in TPL | *NM - Treated sewage is now disposed of in TSF, so potential for impact is removed.* | | | | |
| Impaired fish passage along AWAR streams | Culvert installation | AWAR Fish Monitoring Report: (targeted monitoring study under AEMP - hoopnets at culvert crossings only; 1 year minimum) | Hoopnet and flow monitoring under AWAR Fisheries Monitoring Plan (complete in 2011 after 5 years) | Negligible residual impact on fish and their movements within streams and channels | Program complete in 2011. No impairment of fish passage was observed. | | | | |

#### *12.4.1.3.2 Parts 3 & 4: Discussion*

Where impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion is provided here.

##### *12.4.1.3.2.1 Exceedance of CREMP sediment thresholds*

***FEIS Prediction:*** Sedimentation through dust/particulate dispersion (road dust, wind dispersal, terrain disturbance) and effluent discharge would result in negligible ecological effect on lower trophic levels.

***Discussion:*** While to date TSS monitoring results do not indicate potential for sedimentation, historical CREMP results have indicated mine-related increases in chromium in sediment for one receiving environment location (TPE). As a result, targeted studies assessing the ecological significance (potential for impact to lower trophic levels) of chromium increases in TPE occurred in 2015, 2018, and 2019. At the conclusion of the 2019 studies, results were determined to clearly demonstrate that the increase in sediment chromium at TPE is not adversely affecting the benthos at TPE (i.e. there is negligible ecological effect on lower trophic levels, and FEIS predictions are not being exceeded). No further targeted studies are planned at this time other than annual monitoring of the benthos community as part of the routine CREMP, along with annual sediment grab samples and a sediment coring program every 3 years**.** A complete description of the chromium investigation is provided in the 2019 CREMP Report.

For reference, historical results for chromium in sediment (through 2021, not measured in 2022) at TPE and benthic invertebrate abundance are shown in Figures 55 and 56, from the 2021 and 2022 CREMP reports. Sediment chemistry was not required to be analyzed in 2022, and benthos communities at TPE were comparable to baseline/reference values.

**Figure 55 Total chromium (mg/kg) in sediment samples (grabs and cores) from Meadowbank project lakes since 2006. The red dashed line – CREMP trigger value.**

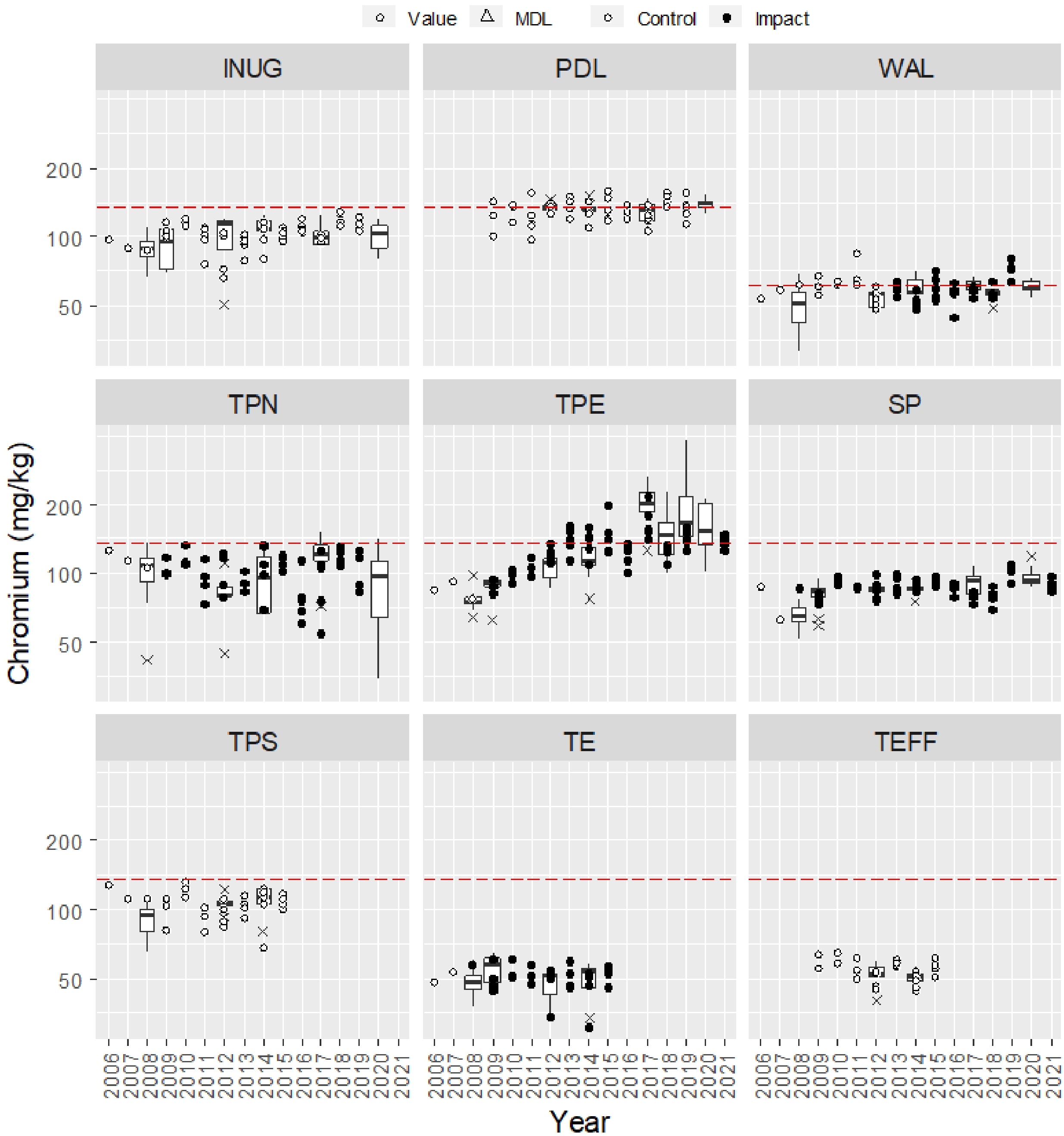
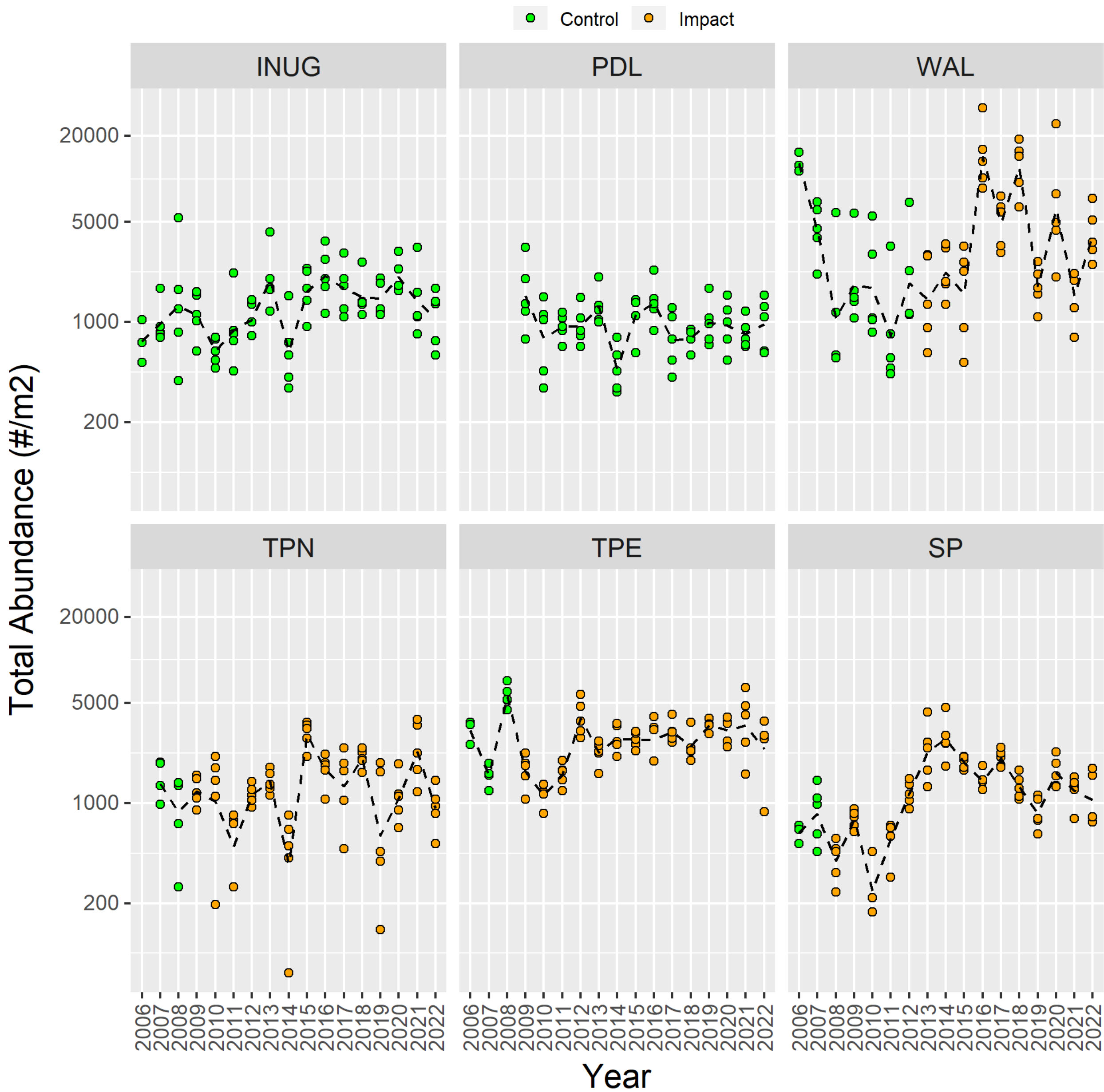


**Figure 56 Benthic invertebrate total abundance (#/m²) from Meadowbank project lakes since 2006.**



#### *12.4.1.3.3 Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

*Effectiveness of Monitoring*

In 2022, monitoring was able to address all potential causes of impacts identified in the FEIS (i.e. monitoring was considered effective), except worker fishing.

While the FEIS proposed staff interviews to assess any fishing being conducted despite a strict no-fishing policy onsite, in practice it has become evident that interviews are not required. To the best of knowledge, no cases of fishing by workers in contravention to the policy have ever been observed or reported. Despite the lack of formal monitoring, it is clear that this is not a significant source of potential impacts to area fish populations.

*Effectiveness of Mitigation*

A summary of the FEIS-planned mitigation measures related to fish and fish habitat, along with a commentary on implementation in 2022 is provided in Table 12-8. Mitigation measured specifically related to water quantity and water quality are provided in Sections 12.4.1.1.3 and 12.4.1.2.3, respectively, though some overlap may occur.

Since no consistent exceedances of FEIS predictions have occurred, existing mitigation measures for the protection of fish and fish habitat are considered to be effective as designed.

**Table 12-8 Mitigation measures described in the FEIS to reduce impacts of the project to fish and fish habitat, and commentary on current implementation.**

| Planned Mitigation Measure (FEIS, Section 4.24.2.5) | Implementation (2022) |
|---|---|
| Winter culvert installation | **N/A –** No new construction in 2022 |
| Sediment control (e.g. use of geotextile for Baker Lake marine barge landing facility) | **Yes –** Deployment of sediment control measures |
| Use of properly sized screens for freshwater intake | **N/A –** No new construction in 2022 |
| Use of riprap to stabilize shorelines around culverts and anchor pipes | **N/A –** No new construction in 2022 |
| Modification of the external surface of containment dikes | **Yes** - As described in the 2006 NNLP, dike faces below the water surface are constructed from low metal leaching iron formation rock. Dikes are capped with ultramafic rock above the water surface to minimize the potential for metals leaching. |
| Enhancement and improvement of connecting channels between lakes to enhance fish movement | No longer planned under updated DFO Fisheries Act Authorization NU-03-0191.3 (2013) |
| Treatment of effluent discharge | **Yes** – mine site effluent is monitored according to NWB/MDMER criteria, as described in Section 8.3. No treatment required for TSS prior to release for East Dike discharge |
| Discharge only during open water, not under ice (Attenuation Pond discharge to Third Portage Lake) | **N/A** - Attenuation pond discharge is no longer occurring |
| Construction of fish habitat compensation features (according to DFO Fisheries Act Authorization NU-03-0191.3, 2013) | **Yes** – construction of fish habitat compensation features as described in this document is ongoing. Monitoring is described in Section 8.8. |

*Adaptive Management*

Since existing mitigation measures for the protection of fish and fish habitat are considered to be effective, no specific adaptive management actions are planned based on this PEAMP analysis for the Meadowbank Mine in 2023.

### 12.4.2 Vegetation, Terrestrial Wildlife, and Birds

#### 12.4.2.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

The 2022 Wildlife Monitoring Summary Report (Appendix 47) provides a complete assessment of wildlife monitoring programs including a comparison to monitoring thresholds detailed in the Terrestrial Ecosystem Management Plan (TEMP Version 7; 2019) and FEIS impact predictions (Cumberland, 2005), where available. Results are summarized here in the PEAMP format.

For each terrestrial VC, a summary of predicted impacts and the accuracy of those predictions (observed impacts) as determined through various monitoring programs conducted under the TEMP is provided in Table 12-9. Thresholds for the implementation of adaptive management, as developed in the Terrestrial Ecosystem Management Plan were used in this comparison because most impact predictions in the Terrestrial Ecosystem Impact Assessment of the FEIS (Cumberland, 2005) were qualitative only. The TEMP thresholds were developed in consultation with the Terrestrial Advisory Group (TAG), and represent quantitative measurement endpoints that trigger management action.

In the 2018 TEMP (Version 5), a Caribou Management Decision Tree replaced most thresholds previously associated with caribou monitoring through various TEMP programs. An objective of the decision chart approach is to reduce sensory disturbance to Caribou approaching the project. The objective is not linked to an impact prediction as the monitoring is in place to trigger mitigation rather than to test a threshold. Quantitative thresholds are still in place for most other potential impacts – habitat loss, project- and vehicle-related mortalities, hunting by Baker Lake residents, disturbance of nesting raptors and waterfowl, and exposure to contaminated water or vegetation.

Overall, no Terrestrial Ecosystem Monitoring Program thresholds were exceeded for the Meadowbank Mine and AWAR in 2022.

**Table 12-9 Predicted and measured impacts to terrestrial VECs, according to the Wildlife Monitoring Summary Report (Appendix 47). Measured impacts exceeding or potentially exceeding impact predictions/thresholds are shaded grey and further discussed in Section 12.4.2.2. NM = not required to be measured in the identified year. NA = no threshold or impact no longer assessed. *Potential impact and associated monitoring identified in the TEMP, but not the original Meadowbank FEIS. ^Threshold for Meadowbank Complex (Meadowbank + Whale Tail sites combined).**

| Potential Impact | Potential Cause(s) | Proposed Monitoring | Current Monitoring | Threshold/ Prediction | Measured Impact | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2018 | 2019 | 2020 | 2021 | 2022 |
| ***VEGETATION (WILDLIFE HABITAT)*** | | | | | | | | | |
| Habitat Loss | Mine site footprint, pits, roads, water management and collection systems | Pit and mine-site ground surveys, Mapping, GIS Analysis | Pit and mine-site ground surveys, Mapping, GIS Analysis | Predicted/Permitted Area + threshold over prediction:<br><br>Mine Site – 867/1532 ha + 5%<br><br>AWAR/Vault Haul Road – 348/455 ha + 5% | Mine Site - 1,129 ha<br><br>AWAR – 173 ha | NM | | Mine Site - 1130 ha<br><br>AWAR – 180 ha | NM |
| Habitat Degradation by Contamination | Dust from roads, TSF, airstrip | Vegetation and Soil Samples (SLRA) | Vegetation and Soil Samples (SLRA) | No excess mine-related risk (or measured concentrations <screening values) | NM | NM | NM (2020 assessment postponed to 2021) | No excess mine-related risk (or measured concentrations <screening values) | NM |
| ***UNGULATES*** | | | | | | | | | |
| Sensory Disturbance | Avoidance due to noise and activity (roads, airstrip, mine site) | Pit and mine-site ground surveys, Satellite-collaring | Satellite-collaring data; Road surveys; Pit and mine-site ground surveys; Remote cameras | No threshold beginning in 2019 – Caribou Management Decision Tree in place | Potential exceedance of threshold (avoidance of habitat will not occur more than 500 m from site; 1000 m from AWAR) See discussion, Section 12.4.2.2. | NA (no threshold) | | | |
| Project-related Mortality | Mine-related activities (e.g., falling into pits, tailing, sludge | Pit and mine-site ground surveys | Pit and mine-site ground surveys | Two (2) Caribou or Muskoxen mortalities per year^ | None | None | None | None | None |

| Potential Impact | Potential Cause(s) | Proposed Monitoring | Current Monitoring | Threshold/ Prediction | Measured Impact | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2018 | 2019 | 2020 | 2021 | 2022 |
| | or other means) | | | | | | | | |
| Vehicle Collisions | Vehicular collisions | Pit and mine-site ground surveys, Incidence reports | Pit and mine-site ground surveys, Incidence reports, road surveys | Two (2) Caribou or Muskoxen mortalities per year^ | None | None | 1 caribou mortality from assumed vehicle strike | None | None |
| Habitat Loss and Degradation | Mine site footprint, pits, roads, water management and collection systems | Pit and mine-site ground surveys, Mapping, GIS Analysis | Pit and mine-site ground surveys, Mapping, GIS Analysis | High Suitability Habitat Predicted/Permitted Area + threshold over prediction:<br><br>Growing – 240/531 ha + 10%<br><br>Winter – 191/407 ha + 10% | Growing – 372 ha (70%)<br><br>Winter – 280 ha (68.8%) | NM | | Growing – 372 ha (70%)<br><br>Winter – 280 ha (68.8%) | NM |
| Hunting by Baker Lake Residents | Improved access to hunting along the AWAR | Hunter Harvest Study | Hunter Harvest Study | < 20% increase of historical harvest activities within the RSA; no significant impact to herds | NM | 64% of harvest in RSA in 2019 compared to 67% baseline | Threshold not exceeded | | |
| Exposure to Contaminated Water or Vegetation | Consumption of contaminated dust deposited on vegetation | Vegetation and Soil Samples (SLRA) | Vegetation and Soil Samples (SLRA) | No excess mine-related risk (or measured concentrations <screening values) | NM | NM | NM (2020 assessment postponed to 2021) | No excess mine-related risk (or measured concentrations <screening values) | NM |
| ***PREDATORY MAMMALS*** | | | | | | | | | |
| Project-related Mortality | Mine-related mortality (falling into pits, TSF or other means) | Pit and mine-site ground surveys, Incidence reports | Pit and mine-site ground surveys, Road Surveys, Incidence reports | Destruction of two (2) problem Grizzly Bear, Wolverine, or Wolf per year^ | One wolverine dispatched | One wolverine dispatched at Amaruq Camp | Two wolverine dispatched | One wolverine dispatched | One wolverine dispatched |

| Potential Impact | Potential Cause(s) | Proposed Monitoring | Current Monitoring | Threshold/ Prediction | Measured Impact | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2018 | 2019 | 2020 | 2021 | 2022 |
| | Vehicular collisions | Pit and mine-site ground surveys, Incidence reports | Road surveys; Security surveys | Two mortalities of Grizzly Bear, Wolverine, or Wolf per year due to vehicle collisions^ | - | None | None | None | One wolverine |
| Sensory Disturbance to Denning Predators* | Blasting, vehicles, and ground personnel near active dens | Active den site surveys (WT FEIS) | Ground surveys, vehicle surveys, and Viewshed surveys. Active den sites identified during baseline studies will also be monitored. | 1 den failure | NA | NA (not conducted in 2019 - no potential for impacts identified) | No dens observed or monitored | | |
| ***SMALL MAMMALS*** | | | | | | | | | |
| Project-related Mortality | Vehicular or air traffic collisions, falling into pits, TSF or other means | Pit and mine-site ground surveys, Road Surveys, Incidence reports | Pit and mine-site ground surveys, Road Surveys, Incidence reports | No threshold beginning in 2019 | Two artic hare mortalities along the AWAR | NA (no threshold) | | | |
| Habitat Loss and Degradation | Mine site footprint, pits, roads, water management and collection systems | Ground Surveys, Mapping, GIS Analysis | No monitoring as of 2018 | No threshold beginning in 2018 | NA (no threshold) | | | | |
| Exposure to Contaminated Water or Vegetation | Consumption of contaminated dust deposited on vegetation | Vegetation and Soil Samples (SLRA) | Vegetation and Soil Samples (SLRA) | No excess mine-related risk (or measured concentrations <screening values) | NM | NM | NM (2020 assessment postponed to 2021) | No excess mine-related risk (or measured concentrations <screening values) | NM |
| ***RAPTORS*** | | | | | | | | | |

<table>
<tr><th rowspan="2">Potential Impact</th><th rowspan="2">Potential Cause(s)</th><th rowspan="2">Proposed Monitoring</th><th rowspan="2">Current Monitoring</th><th rowspan="2">Threshold/ Prediction</th><th colspan="5">Measured Impact</th></tr>
<tr><th>2018</th><th>2019</th><th>2020</th><th>2021</th><th>2022</th></tr>
<tr><td>Healthy Prey Populations</td><td>Mine Footprint, dust and exhaust, noise (road, airstrip, mine site, Baker Lake barge area)</td><td>Vegetation and Soil Samples; PRISM plot surveys; ELC habitat mapping</td><td>Vegetation and Soil Samples</td><td>Thresholds are qualitative, and can be achieved through management and maintenance of vegetation and healthy prey communities.</td><td colspan="5">NA (no threshold)</td></tr>
<tr><td rowspan="2">Disturbance of Nesting Raptors</td><td rowspan="2">Noise and Activity</td><td rowspan="2">Active Nest Monitoring</td><td rowspan="2">Pit and mine site ground surveys; Incidental wildlife reporting; Dedicated raptor nest surveys; Road surveys</td><td rowspan="2">One nest failure per year^</td><td colspan="3">Threshold not exceeded</td><td colspan="2">No confirmed mine-related nest failures</td></tr>
<tr><td colspan="5">Note - limited data on nesting success in 2018 – 2020. Further discussion provided in Section 12.4.2.3.</td></tr>
<tr><td>Project-related Mortality</td><td>Vehicle collisions</td><td>Road/Ground Surveys, Incidence reports</td><td>Road surveys, Incidence reports</td><td>One mortality per year^</td><td>Threshold not exceeded</td><td>None</td><td>None</td><td>None</td><td>None</td></tr>
<tr><td colspan="10">WATERBIRDS</td></tr>
<tr><td>Disturbance of Nesting Waterfowl</td><td>Noise and Activity; dewatering</td><td>Waterfowl Nest Surveys</td><td>Waterbird Nest Surveys (ended 2019); Pit and mine site ground surveys</td><td>One nest failure per year^</td><td>Threshold not exceeded</td><td colspan="2">Waterbird Nest Survey program ended 2019. Replaced for the Whale Tail site with Migratory Bird Protection Plan (Section 12.5.2)<br>Threshold for nest failure not exceeded in pit and mine site ground surveys.</td><td colspan="2">Threshold not exceeded</td></tr>
<tr><td>Habitat Loss and Degradation</td><td>Mine site footprint, pits, roads, water management and collection systems</td><td>Ground Surveys, Mapping, GIS Analysis</td><td>Ground Surveys, Mapping, GIS Analysis</td><td>High Suitability Habitat Predicted/Permitted Area + threshold over prediction:<br><br>Mine Site – 518/417 ha + 10%</td><td>NM</td><td colspan="2">NM</td><td>Mine Site - 274 ha</td><td>NM</td></tr>
</table>

| Potential Impact | Potential Cause(s) | Proposed Monitoring | Current Monitoring | Threshold/ Prediction | Measured Impact | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | **2018** | **2019** | **2020** | **2021** | **2022** |
| Exposure to Contaminated Water or Vegetation | Mine site dust; Secondary containment structures and tailings storage facilities | Vegetation and Soil Samples (SLRA) | Vegetation and Soil Samples (SLRA) | No excess mine-related risk (or measured concentrations <screening values) | NM | NM | NM (2020 assessment postponed to 2021) | No excess mine-related risk (or measured concentrations <screening values) | NM |
| Project-related Mortality | Vehicle collisions | Road Surveys, Incidence reports | Road Surveys, Incidence reports | One mortality per year due to vehicle collision^ | Threshold not exceeded | None | None | None | None |
| Project-related Mortality | Mine site-related mortality | Pit and mine-site ground surveys | Pit and mine-site ground surveys | One mortality per year due to mine activity other than vehicle collisions^ | Two Long-tailed ducks found dead onsite. See Section 12.4.2.2. | None | None | None | None |
| ***OTHER BREEDING BIRDS*** | | | | | | | | | |
| Project-related Mortality | Vehicle/ bird collisions | Pit and mine-site ground surveys, Incidence reports | Pit and mine-site ground surveys, Road Surveys, Incidence reports | No threshold beginning in 2019 | Threshold not exceeded (50 mortalities) | NA (no threshold) | | | |
| Habitat Loss and Degradation | Mine site footprint, pits, roads, water management and collection systems | Pit and mine-site ground surveys, Mapping, GIS Analysis | Pit and mine-site ground surveys, Mapping, GIS Analysis | High Suitability Habitat Predicted/Permitted Area + threshold over prediction:<br><br>Mine Site – 322/736 ha + 10% | - | NM | | 594 ha | NM |
| Exposure to Contaminated Water or Vegetation | Mine site dust | Vegetation and Soil Samples (SLRA) | Vegetation and Soil Samples (SLRA) | No excess mine-related risk (or measured concentrations <screening values) | NM | NM (next assessed in 2020) | NM (2020 assessment postponed to 2021) | No excess mine-related risk (or measured concentrations <screening values) | NM |
| Changes in Breeding Bird Populations | Mine Footprint, dewatering | Breeding Bird Prism Plots and | Suspended in 2015. Resumed | 2022+: None | NA | Analytical report to be completed for | Analytical report provided to | NA – Agnico Eagle /ECCC agreement for PRISM and | Surveys started but not completed |

| Potential Impact | Potential Cause(s) | Proposed Monitoring | Current Monitoring | Threshold/ Prediction | Measured Impact | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2018 | 2019 | 2020 | 2021 | 2022 |
| | dust and exhaust, noise (road, airstrip, mine site, Baker Lake barge area) | Transects | in 2022. | | | CWS in 2020 to determine ongoing monitoring requirements. | CWS in 2020. | BBS to begin in 2022. There will be no threshold. | due to medical issue. |

### 12.4.2.2 *Parts 3 & 4: Discussion*

Where impacts are exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion is provided here. In 2022, no thresholds were exceeded. The discussions below are retained from previous years.

**1. Sensory Disturbance of Ungulates (2018)**

***TEMP Threshold (2018):*** Avoidance of habitat will not occur more than 500 m from site; 1000 m from AWAR (threshold replaced with Caribou Management Decision Tree in TEMP Version 5, June 2018).

***Discussion***: In 2018, review of caribou data also lead to a TAG project to explore the link between caribou road crossings and road closures. Most 2018 Caribou activity was observed during the spring migration requiring numerous road closures and restrictions along the Meadowbank AWAR and the haul roads. Although 2017 collar data showed fewer road-related effects, 2015 and 2016 collar data also observed that the AWAR appeared to be altering natural movement patterns of collared Caribou. Results of this study were presented to the TAG in 2019, and the goal is to incorporate them into monitoring and management plans moving forward.

Through discussions with the TAG, the Caribou Management Decision Tree replaced most thresholds related to caribou in Version 5 of the TEMP (June, 2018). As a result, caribou monitoring results are no longer compared to the 500 m/1000 m avoidance threshold. Decisions and outcomes resulting from the use of the decision tree approach will be analyzed and discussed in TAG meetings annually to determine whether adjustments to the program need to be made. In this way, Caribou monitoring endpoints assessed through TEMP programs are linked directly to management actions rather than a single threshold of impacts.

**2. Project-Related Mortality of Waterbirds (2018)**

***TEMP Threshold (ongoing):*** No more than 1 mortality/year.

**Discussion:** Since onsite waterbird mortality occurred beyond FEIS thresholds in 2018 (death of two ducks after apparently flying into a building), an assessment of historical trends for this component was conducted (see Table 12-10). Based on this data, there is no clear trend towards increasing mortalities of waterbirds on the Meadowbank site. Since the threshold of one mortality per year has only been exceeded twice in ten years (two mortalities each time), and on average, annual mortalities do not exceed the threshold, these results do not represent a significant departure from impact predictions.

**Table 12-10 Historical waterbird mortalities at the Meadowbank site. The annual threshold is one mortality**

| Year | Waterbird Mortalities | Cause/Notes |
|---|---|---|
| 2011 | 0 | - |
| 2012 | 0 | - |
| 2013 | 0 | - |
| 2014 | 0 | - |
| 2015 | 2 | Dead duck found outside a building.<br>Dead Canada Goose found in the tailings pond. |
| 2016 | 1 | Dead juvenile Merganser duck was caught in gill nets during the Phaser Lake fish-out program. |

| Year | Waterbird Mortalities | Cause/Notes |
|---|---|---|
| 2017 | 0 | - |
| 2018 | 2 | Two ducks killed after apparently flying into a building. |
| 2019 | 0 | - |
| 2020 | 0 | - |
| 2021 | 0 | - |
| 2022 | 0 | - |

#### 12.4.2.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

*Effectiveness of Monitoring*

As indicated in Table 12-9, some monitoring requirements have been eliminated in the TEMP since the FEIS was developed, in consultation with regulators (e.g. habitat loss for small mammals, waterbird surveys outside of the Whale Tail flood zone).

Based on the results in Table 12-9, current TEMP monitoring programs are able to address most other FEIS impacts for which monitoring was recommended (i.e. monitoring is considered effective), with the exception of individual raptor nesting success. Monitoring programs are in place to assess impacts to raptors, but the structure of the monitoring and mitigation program and small number of nests observed in recent years do not allow analysts to confirm specifically whether potential nest failures are mine-related. Although compliance with the existing raptor TEMP threshold has been difficult to assess, management and mitigation approaches are enacted to protect nesting raptors according to the ‘Peregrine Falcon Management and Protection Plan on the Meadowbank Gold Project Site' (see Appendix E of the 2019 TEMP). Further, Agnico Eagle has engaged Arctic Raptors beginning in 2021[7] to conduct a more complete analysis of mine-related impacts on raptors, including statistical analysis of nest occupancy (population). Through this analysis in 2022, there is no evidence of mine-related disturbance for rough-legged hawk occupancy (population size). The peregrine falcon population has declined marginally, but this may be the result of inconsistent monitoring (without disturbing birds) and lack of statistical power. Raptor population analyses will continue in 2023.

*Effectiveness of Mitigation*

FEIS-planned mitigation measures to limit impacts of the Project on terrestrial wildlife were originally described in the Terrestrial Ecosystem Management Plan (Version 1, October 2005), a component of the Project FEIS (Cumberland, 2005). This plan is regularly updated, and a mitigation audit is a component of the current plan. The audit is to be undertaken annually, with results summarized in the annual Wildlife Monitoring Summary report.

The audit evaluates:

- What mitigation has been implemented;
- Which mitigation is perceived to be, or shown to be successful;

[7] Arctic Raptors has been conducting surveys on the Meadowbank site since 2015, but generally only once per year, which does not allow statistical determination of nest success or occupancy. Starting 2021, surveys are performed twice per year.

- If new mitigation has been implemented in response to new issues; and
- If some mitigation is redundant.

However, in the context of the PEAMP evaluation, mitigation is considered effective if impact predictions (or in this case, TEMP thresholds) are not being exceeded. Therefore, since no TEMP thresholds were exceeded for the Meadowbank Mine in 2022, mitigation is considered effective.

*Adaptive Management*

Although no TEMP thresholds were exceeded in 2022, several management recommendations are planned to be implemented in 2023 along with continued implementation of all TEMP monitoring and management programs. As described in the 2022 Wildlife Monitoring Summary Report (Appendix 47), new management recommendations consist of:

- Pit and Mine Site Ground Surveys
    - Complete wildlife incident reports, according to the TEMP Version 7, including deterrence events
    - Monitor tailings ponds daily during the waterbird migration period, beginning in mid-May. Increase the frequency of deterrent use if required.
    - Gather detailed information (e.g., sex, age, photos) on deceased animals and include in incident reports, when possible.
- Blast monitoring
    - Behaviour monitoring could aim to monitor caribou for a longer period of time following blasting to determine the time taken for response behaviours to return to pre-blast levels. Future analyses using more behaviour monitoring sessions could account for other factors such as caribou group size and presence of other disturbances (e.g., vehicle traffic).
- Breeding bird monitoring
    - A minimum of 12 PRISM plots and both BBS routes be surveyed in June 2023. The four PRISM plots completed in 2022 will need to be revisited to take photographs of the plots from the plot corners.
- Snow study
    - To assess differences in snow hardness for smaller effect sizes (e.g., 25%) for both study questions, snow data should be collected at a minimum of 65 locations, with six plots completed at each locations as per the study design.
    - For future snow data collection, a full suite of snow characteristics data (snow depth, snow hardness, slope) will be collected for each plot type to facilitate comparisons.

- Additionally, caribou track depth information will be collected in both the use plot and in the non-managed control plot to facilitate comparison between the snow conditions within the berm area and beyond the berm area.
- Agnico Eagle will communicate data recording improvements to field crews, including protocols for post-field data sheet checks for quality assurance.
- In 2023 Agnico Eagle will explore the possibility for HTO wildlife monitors to report fresh caribou crossing tracks along the roads (WTHR/AWAR) to Agnico Eagle.

### 12.4.3 Noise

#### 12.4.3.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

While noise generation was predicted in the FEIS for many minesite components, a significant environmental effect of noise (disturbance of wildlife; reduced habitat effectiveness) requiring monitoring was determined in association with pit development, tailings handling and the mill (Cumberland, 2005; Table B3.2). Monitoring sites were established around the site and along access roads, as described in the current Noise Monitoring and Abatement Plan (V4, December, 2018).

Table 12-11, below, compares FEIS predictions for area sound levels (Cumberland, 2005 – Noise Impact Assessment) with the results of noise surveys (measured sound levels) conducted since 2018 when this PEAMP evaluation process began. Since the potential impacts of Project-related noise were all identified as wildlife disturbance, the accuracy of these predictions is also monitored through the terrestrial environment monitoring programs, as discussed in Section 12.4.2.

No exceedances of FEIS predictions occurred from 2020 through 2022. Only one impact prediction was exceeded in 2018 & 2019 (monitoring station R5). A discussion and historical trend analysis of noise levels is provided in Section 12.4.3.2.

**Table 12-11 Predicted and measured sound levels for the Meadowbank Mine. *Values estimated from sound level contour plots in Cumberland, 2005 – Noise Impact Assessment. **For the R5 location (all-weather access road station), predictions were made in the FEIS regarding the maximum 1-hr $L_{eq}$ value only. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.4.3.2.**

| Project Component | Potential Impact | Proposed Monitoring | Monitoring Station | FEIS Predicted Value (dBA)* | Measured Value $L_{eq,\ 24\text{-}h}$ (dBA) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2018 | 2019 | 2020 | 2021 | 2022 |
| Portage Pit | Moderate and high noise levels from blasting, drilling, TSF berm construction and material handling will disturb wildlife and result in reduced habitat effectiveness | Monitor noise levels and behavioral responses of wildlife | R1 | 58-63 | 37.2 | 47.6 | 35.5 | 35.8 | 45.6 |
| Goose Island Pit | | | | | 43.4 | NL | 37.2 | 36.7 | - |
| Vault Pit | | | R2 | 58-63 | 40.7 | 36.8 | 32.0 | 48.5 | 34.6 |
| Borrow Pits | | | | | 37.5 | 34.1 | - | 44.2 | - |
| Tailings Facilities | | | R3 | 49-53 | 38.8 | - | 34.0 | 36.1 | - |
| | | | | | | 38.9 | 39.4 | 37.4 | - |
| Mine Plant & Facilities | | | R4 | 58-63 | 57.3 | - | 34.3 | - | 34.0 |
| | | | | | 36.7 | - | 32.1 | 34.0 | - |
| | | | R5 | Max 1 hr $L_{eq}$ of 57** | 1 hr $L_{eq}$ <57 | 1 hr $L_{eq}$ <57 | 1 hr $L_{eq}$ <57 | - | 1 hr $L_{eq}$ <57 |
| | | | | | 1/22 @ 58 | 1/32 @ 58 | 1 hr $L_{eq}$ <57 | - | - |

### 12.4.3.2 *Parts 3 & 4: Discussion*

Where impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion is provided here.

#### *12.4.3.2.1.1 Noise Levels at R5*

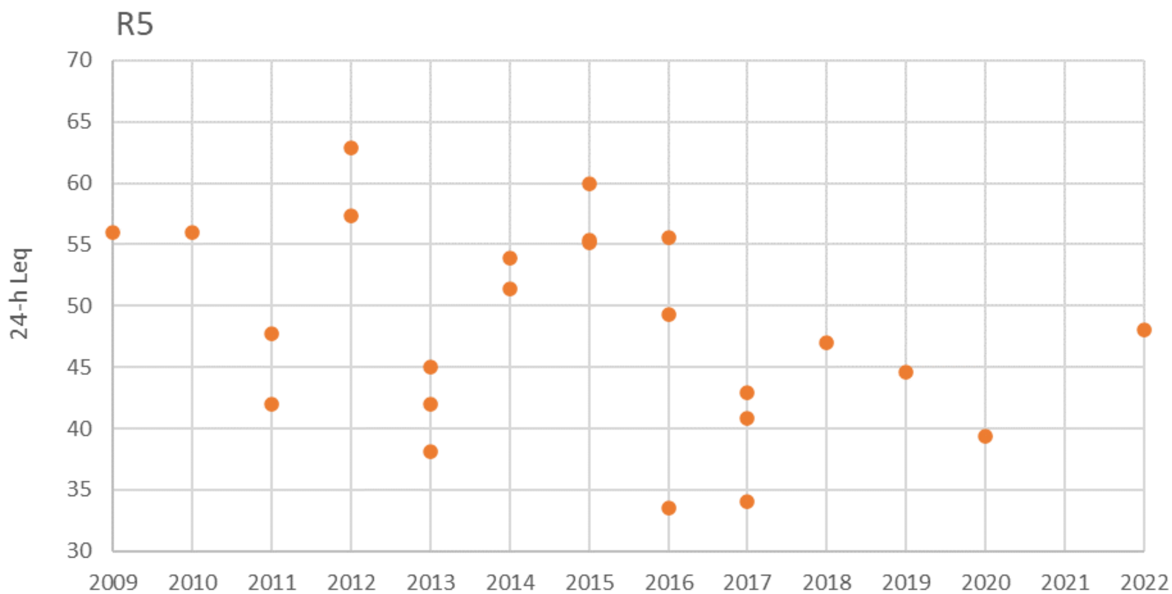
***FEIS Prediction***: For station R5, FEIS predictions assumed that all one-hour $L_{eq}$ values would not exceed 57 dBA.

***Discussion***: In 2018 and 2019, this prediction was exceeded for one hour, with an $L_{eq}$ of 58 dBA in both years (4-5pm hour, July 16th, 2018 and 11 am – 12 pm hour, August 8th, 2019). In both cases, the datasets were reviewed, and sound levels were generally well below 57 dBA during the monitoring period ($L_{eq}$ daytime values of 49.5 dBA and 45.8 dBA, respectively). In 2018, two peaks above the predicted hourly $L_{eq}$ value of 57 dBA occurred, lasting a total of 6 minutes. It is possible these were due to animal interference or a helicopter fly-over. Similarly in 2019, review of sound recordings indicated the exceedance occurred due to an aircraft flyover, lasting 2.5 min. Since the exceedances only occurred for single time-points and were not audibly different from the predicted value (<3 dBA difference), the events were not investigated further and no supplemental mitigation was planned. The prediction was not exceeded in 2020 or 2022. In 2021, no data was available for R5 due to unacceptable weather conditions or technical difficulties (e.g. fallen noise meter) despite three monitoring attempts.

In the 2022 Noise Monitoring Report (Appendix 49) 24-h $L_{eq}$ measurements since 2009 were reviewed for all monitoring stations to understand if any trends towards increasing noise levels above FEIS predictions are occurring for any location on site. Results for station R5 are shown in Figure 57. There is no clear trend towards increasing sound levels at any site. Although no predictions were made regarding the 24-h $L_{eq}$ for R5, a decreasing trend is seen for noise levels at this station since 2012.

Complete results of noise monitoring in the current year are provided in Appendix 49.

**Figure 57 Historical 24-h $L_{eq}$ values for monitoring station R5 at the Meadowbank site. No valid surveys were obtained in 2021 despite three attempts, primarily due to unacceptable weather conditions.**



#### 12.4.3.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

*Effectiveness of Monitoring*

Based on the results in Table 12-11, current monitoring programs are able to address all FEIS impacts for which monitoring was recommended (i.e. monitoring is considered effective). While only one noise survey was able to be conducted for most stations in 2022, this was caused by mechanical difficulties with the monitoring equipment, and Agnico Eagle has now purchased additional spare parts to help ensure this doesn't occur again.

*Effectiveness of Mitigation*

FEIS-planned mitigation measures to limit impacts of the Project on area noise levels were originally described in the Air Quality and Noise Management Plan (October 2005). This Noise monitoring plan was most recently updated in December 2018. A summary of the mitigation measures in place to ensure impacts to area noise levels are minimized is provided in Table 12-12, with a commentary on implementation in 2022.

Since no consistent exceedances of FEIS predictions has occurred, existing mitigation measures for noise are considered to be effective.

**Table 12-12 Mitigation measures described in the Noise Abatement and Monitoring Plan (December, 2018) to reduce impacts of the project on area noise levels, and implementation in the current year. NA = not applicable.**

| Noise Source | Planned Mitigation Measure (Noise Abatement and Monitoring Plan, December 2018) | Implementation (2022) |
|---|---|---|
| Whale Tail Haul Road Construction and Widening | Operate construction equipment within specification and capacity (i.e. don't overload machines) | **NA** |
| | Adequate equipment maintenance | **NA** |
| | Avoid operating numerous pneumatic tools at the same time, and spread operation throughout working periods | **NA** |
| | Avoid prolonged idling | **NA** |
| | If blasting is required, preference for daytime blasting | **NA** |
| Road traffic (mine site, AWAR) and Haul Roads operation | During maintenance, check that noise abatement devices are in good order (e.g., brakes, exhaust mufflers, engine hoods) | **Yes –**Maintenance logs |
| | Enforce speed limits | **Yes –** Ongoing |
| | Use shallow slopes for haul road | **Yes –** Ongoing |
| | Educate truck drivers about the characteristics of diesel engines (i.e., that the flat torque characteristic allows ascending an incline in a higher gear, which is a less noisy operation) | **Yes –**SOP and best practices |
| | Keep road surfaces in good repair to reduce tire noise | **Yes –**Road maintenance |
| | Avoid prolonged idling | **Yes –**No Idling Policy |
| | Avoid trucking operation during night time on access road, when possible | **Yes –** When possible |
| Air traffic (Meadowbank) | Avoid low altitude flights (not lower than 610 m in sensitive bird/wildlife areas), except on take-off and landing | **Yes –** Ongoing |
| | Restrict air traffic to daytime hours except for emergencies | **Yes –** Ongoing |
| Impact equipment (pile drivers, jack hammers, drills, pneumatic | Avoid operating numerous pneumatic tools at the same time, | **Yes –**Best practices |

| Noise Source | Planned Mitigation Measure (Noise Abatement and Monitoring Plan, December 2018) | Implementation (2022) |
|---|---|---|
| tools) | and spread operation throughout working periods | |
| Stationary equipment (compressors, generators, pumps) | Keep equipment in good condition | **Yes –** Preventive maintenance |
| Blasting | Use delays, both surface and down hole | **Yes –** Blast monitoring program |
| | Preference for daytime blasting | **Yes –** Blast monitoring program |
| | Blasting in depressed pits (normal production practice) | **Yes –** Blast monitoring program |
| Outdoor material handling equipment (crushers, concrete mixers, cranes) | Place crushers in sheltered/enclosed locations if possible | **Completed** |
| | Maintain equipment in good working condition | **Yes –** Ongoing |
| | Turn equipment off when not in use if practicable | **Yes –** Ongoing |
| Earth moving equipment (trucks, loaders, dozers, scrapers) | Aim to restrict equipment age so only newer, more efficient machinery will operate onsite | **Yes –** Maintenance logs |
| | Operate equipment within specification and capacity (i.e., don't overload machines) | **Yes –** Maintenance logs |
| | Use noise abatement accessories such as sound hood and mufflers | **Yes –** Maintenance logs |
| Primary plant facilities (gyratory primary crusher, SAG mill, ball mill, power plant) | Provide building with walls absorbing noise | **Completed** |
| | Maintain equipment on a regular basis, replace worn parts, lubricate as required | **Yes –** Preventive maintenance |
| | Provide diesel plant units with efficient intakes and exhaust silencers | **Yes –** Preventive maintenance |
| | Use conveyor system with low noise output, paying particular attention to rollers | **Completed** |
| | Enclose conveyors where necessary | **Completed** |
| Utilities and services | Ensure that a rotating biological contactor treatment system operates quietly | **Completed** |
| | Dump solid waste behind barriers | **NA** |

*Adaptive Management*

Since existing mitigation measures are considered to be effective, and there are no clear trends towards increasing noise levels around the Meadowbank Mine, no adaptive management actions are planned in 2023 based on this PEAMP analysis.

### 12.4.4 Air Quality

#### 12.4.4.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

In order to estimate potential impacts of the Meadowbank Mine on air quality, modeling exercises were conducted as a component of the original project FEIS to determine emission rates and dispersion of various criteria air contaminants from different sources (Air Quality Impact Assessment, Cumberland, 2005)[8]. This included modeling emissions for three size fractions of suspended particulates ($PM_{2.5}$, $PM_{10}$ and TSP) originating from the TSF, WRSF, and ore stockpile, for 24 h and annual averaging times.

[8] As part of the FEIS for the Whale Tail Project (Agnico Eagle, 2016), qualitative assessments were performed for ongoing use of the Meadowbank mill and AWAR, but no quantitative changes to original FEIS predictions were included.

Deposition rates for dust from these sources were also calculated ($g/m^2/30d$). While maximum ground level concentrations were described in the FEIS document for all size fractions, contour plots showing predicted concentrations at the current monitoring stations were only provided for TSP and deposition rates (Air Quality Impact Assessment, Cumberland, 2005). In addition, modeling was conducted for criteria pollutants (CO, $NO_2$, $SO_2$, $PM_{10}$, and $PM_{2.5}$) emitted from the power plant and mobile sources for 1 h, 24 h and annual averaging times, and concentration contour plots were provided for these analyses.

The main monitoring program for air quality recommended in the FEIS was only static dustfall, which is being continuously monitored at four locations around the minesite. In addition, Agnico Eagle conducts monitoring of TSP, $PM_{10}$, $PM_{2.5}$ and $NO_2$, in accordance with the current Air Quality and Dustfall Monitoring Plan. Carbon monoxide and sulphur dioxide are not required to be monitored as part of the program developed by Agnico Eagle in consultation with regulatory agencies.

Among FEIS modelling results available for the current monitoring stations, the following predicted values were considered relatively suitable as a conservative benchmark for comparison to measured values: $NO_2$ (annual average), $PM_{2.5}$ (24-h and annual average), and $PM_{10}$ (24-h average). However it is noted that the available FEIS model predictions for these parameters only include power plant and mobile sources. FEIS predictions for the other parameters with contour plots (TSP and dust deposition) were not considered suitable for comparison to field measurements since only emissions from three specific point sources were required to be modeled (TSF, WRSF, ore stockpile) and due to differences in particle size fractions included in models and field measurements. For reference, all monitoring results for TSP and dustfall monitoring are provided in the 2022 Air Quality and Dustfall Monitoring Report (Appendix 50), along with comparisons to regulatory guidelines and historical measurements.

Even for those measured parameters which are considered relatively suitable for comparison to FEIS predictions here ($NO_2$, $PM_{2.5}$, $PM_{10}$), it should still be noted that while field monitoring captures emissions from all mine-related sources, as well as background sources, the FEIS presents modeled outputs from combinations of specific sources as described above. Therefore, accuracy of these quantitative predictions cannot specifically be assessed through field monitoring. However, if measured concentrations or deposition rates are less than predicted values, it can be concluded that FEIS predictions are not being exceeded. In some cases, as described below, measured or estimated background concentrations were able to be added to predicted values to improve the comparison.

The following specific methods were used to identify FEIS prediction values for comparison to monitoring results:

- Modeled values for suspended particulates ($PM_{2.5}$ and $PM_{10}$) were obtained for the two monitoring locations (DF-1 and DF-2) from the FEIS Air Quality Impact Assessment Figures 6.2 – 6.24. $PM_{10}$ values were derived from Figures 6.7 and 6.8, based on references in the text (Table 6.1), although these figures are labelled as SP. Model values for a TSF size of 960x560m were used in the comparison.

- The recent impact assessment for the Whale Tail Mine at Meadowbank calculated background values for $PM_{2.5}$ of 6.7 and 3.6 $\mu g/m^3$ for 24-h and annual averaging times, respectively (Whale Tail Pit FEIS, Appendix 4-A). No background data was available for other size classes of suspended particulates, but these $PM_{2.5}$ values were added to predicted concentrations of $PM_{2.5}$ and $PM_{10}$ for the comparison, since $PM_{2.5}$ forms a subset of $PM_{10}$.

- For $NO_2$, modeling results were only provided in the FEIS for the maximum predicted ground-level concentration, which occurred adjacent to the power plant. The closest $NO_2$ monitoring station (DF-2) is at a distance of approximately 1 km southwest (cross-wind) from this location.

Table 12-13 summarizes the predicted residual impacts to air quality and results of the FEIS-comparable monitoring conducted in 2018 - 2022. In 2022, some results exceeded FEIS predictions for $PM_{2.5}$ and/or $PM_{10}$, as further discussed in Section 12.4.4.2.1.

GHG emissions are assessed collectively for the Meadowbank and Whale Tail Mines in Section 12.5.4.

**Table 12-13 Predicted and measured impacts to air quality for the Meadowbank Mine. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.4.4.2. Predicted impacts according to the Air Quality Impact Assessment, Cumberland, 2005. *Addition of background values described above in Section 12.4.4.1.**

| Project Component | Potential Impact | Proposed Monitoring (FEIS) | Monitoring Conducted | Max. Predicted Value (FEIS) + Est. Partial Background* | Measured Value | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2018 | 2019 | 2020 | 2021 | 2022 |
| Dike construction | Generation of dust during placement of dike material | Static dustfall | N/A (no dikes constructed) | - | - | - | - | - | - |
| Dewatering | Generation of dust from exposed lake sediment | Static dustfall | Static dustfall, $NO_2$ (four locations) and suspended particulates (two locations) under Air Quality Monitoring Plan | $NO_2$ (ppb; annual avg.) = 4.97<br><br>$PM_{2.5}$ (µg/m$^3$; 24 h avg.): DF-1: 20+6.7 = 26.7 DF-2: 10+6.7 = 16.7<br><br>$PM_{2.5}$ (µg/m$^3$; annual avg.) DF-1: 1+3.6 = 4.6 DF-2: 0.5+3.6 = 4.1<br><br>$PM_{10}$ (µg/m$^3$; 24 h avg.): DF-1: 20+6.7 = 26.7 DF-2: 40+6.7 = 46.7 | Results are presented in Figures 58 – 60 and Table 12-14, below. | | | | |
| Pits | Generation of dust and gases from blasting, excavation etc. | Static dustfall | | | | | | | |
| Waste Rock Facility and Tailings Storage Facility | Generation of dust from material deposited on waste rock pile or tailings | Static dustfall | | | | | | | |
| Onsite Roads and Traffic, Airstrip | Generation of dust and emissions from use of roads and airstrip | Static dustfall | | | <FEIS predictions | <FEIS predictions | <FEIS predictions | <FEIS predictions | Some results for suspended particulate matter exceeded FEIS predictions. |
| Mine Plant and | Release of pollutants | Report emissions | GHG emissions | Updated for Whale Tail | - | - | - | - | - |

| Project Component | Potential Impact | Proposed Monitoring (FEIS) | Monitoring Conducted | Max. Predicted Value (FEIS) + Est. Partial Background* | Measured Value | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | 2018 | 2019 | 2020 | 2021 | 2022 |
| Facilities | from incineration | | reported | Project – see Section 12.5.4 | | | | | |
| All Weather Access Road | Generation of dust and emissions from frequent activity by service and vehicles accessing staging facility | Static dustfall | Static dustfall (52 locations) | < Vault Haul Road results | - | < Vault Haul Road results; See discussion, Section 12.4.4.2 | | | |

**Figure 58 Monthly average concentration of NO2 at DF-1 and DF-2. Dashed line indicates the GN standard for the annual average, which does not apply specifically to monthly averages but is provided for reference.**

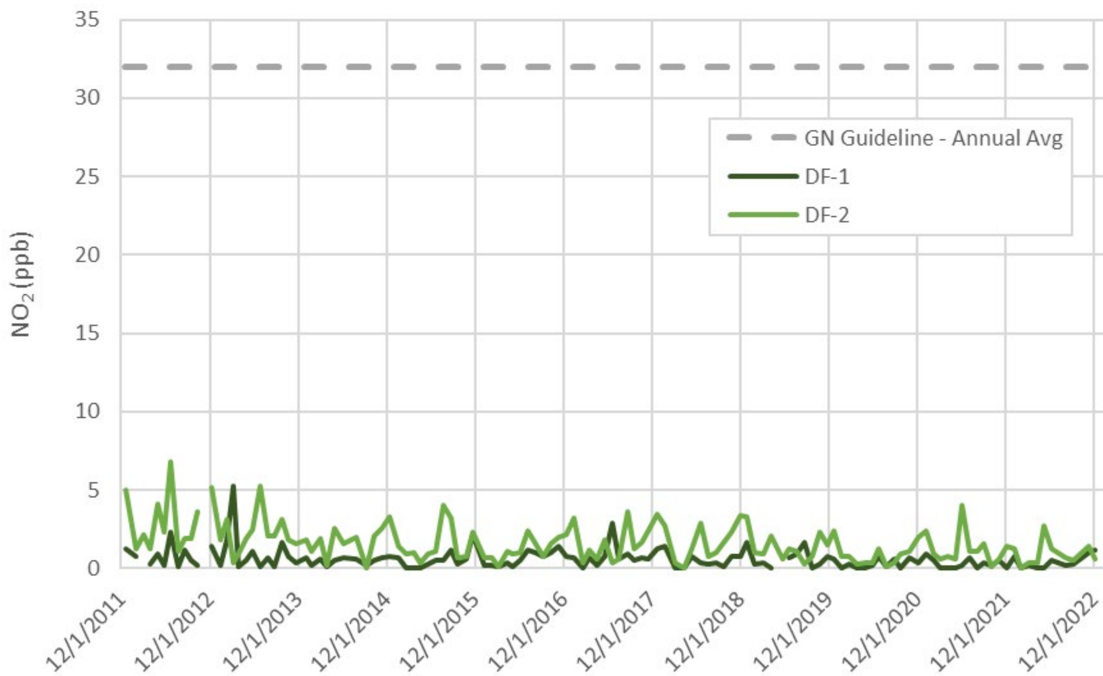



**Figure 59 Monthly average concentration of NO2 at DF-1 and DF-2. Dashed line indicates the GN standard for the annual average, which does not apply specifically to monthly averages but is provided for reference.**

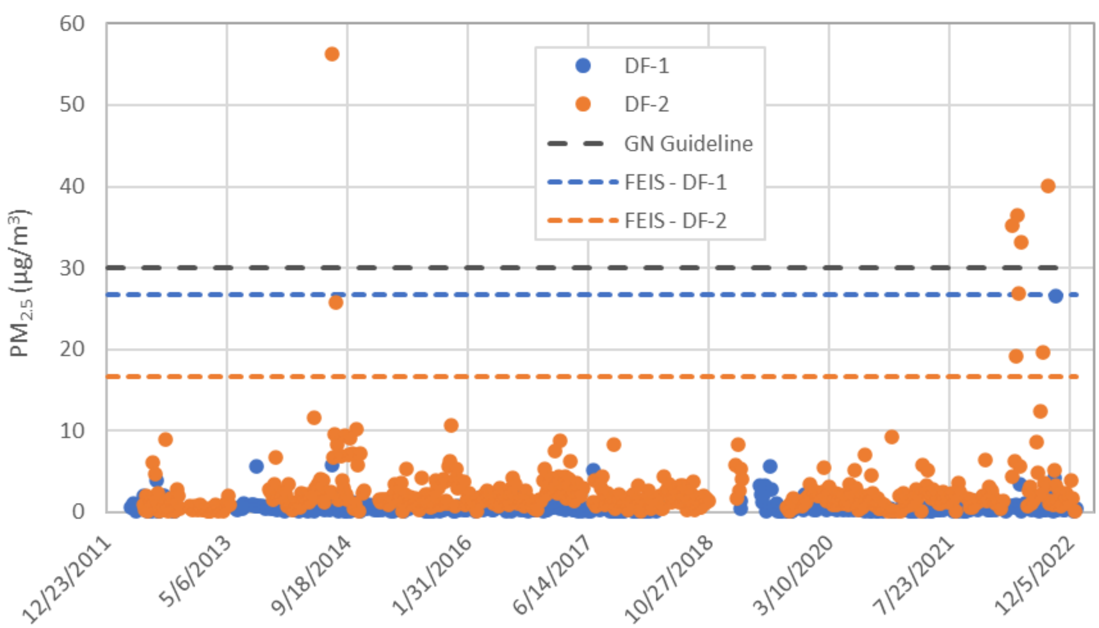


**Figure 60 average concentration of airborne particulate matter less than 10 microns (PM10) at Meadowbank stations DF-1 and DF-2. Dashed lines indicate the BC Air Quality Objective and FEIS predictions for the 24-h averaging time.**

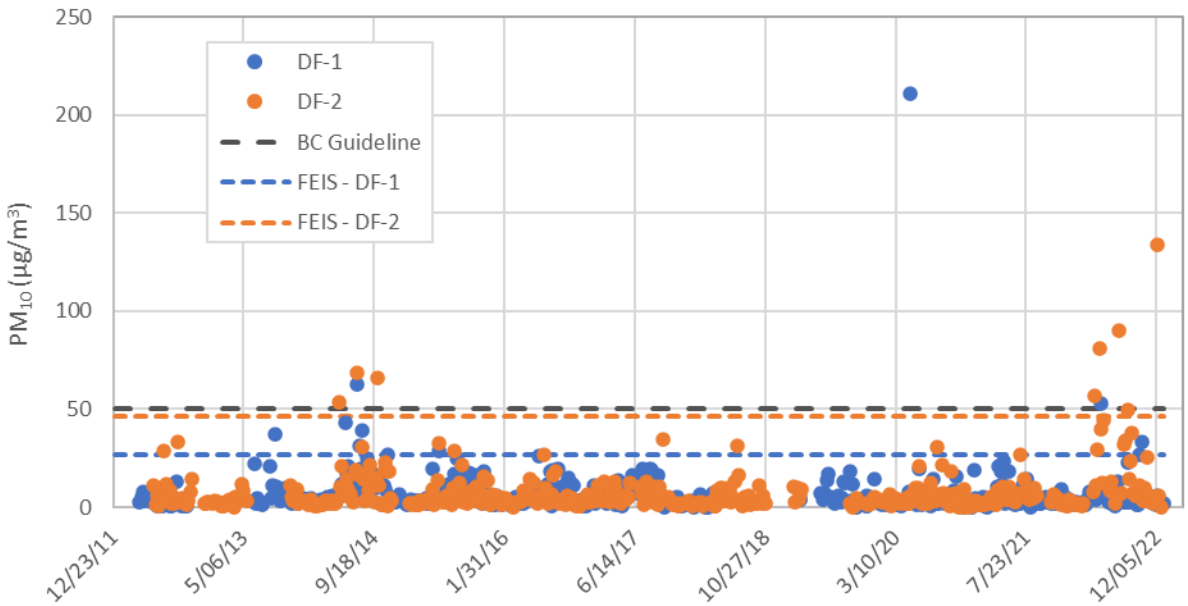



**Table 12-14 Arithmetic mean of the measured 24-h concentrations and FEIS-modeled maximum annual average concentrations of $PM_{2.5}$ for monitoring stations DF-1 and DF-2 at the Meadowbank Mine (Cumberland, 2005) since 2018.**

| Year | CAAQS | DF-1 | | DF-2 | |
|---|---|---|---|---|---|
| | $PM_{2.5}$ (µg/m³) | $PM_{2.5}$ (µg/m³) | | $PM_{2.5}$ (µg/m³) | |
| | | Measured | FEIS | Measured | FEIS |
| 2018 | 10 | 0.2 | 4.6 | 1.4 | 4.1 |
| 2019 | 10 | 0.5 | | 1.5 | |
| 2020 | 8.8 | 0.6 | | 1.5 | |
| 2021 | 8.8 | 0.5 | | 1.9 | |
| 2022 | 8.8 | 1.1 | | **6.5** | |

### 12.4.4.2 *Parts 3 & 4: Discussion*

If air quality impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion is provided here.

#### *12.4.4.2.1 $PM_{2.5}$ and $PM_{10}$*

While this PEAMP evaluation format began in 2018, all $PM_{2.5}$ and $PM_{10}$ results since monitoring began in 2012 are shown above in Figures 59 and 60. Since 2014, 2022 was the first year with multiple samples exceeding FEIS predictions for the 24-h averaging time, and the first year an exceedance of the FEIS prediction for annual average $PM_{2.5}$ has occurred (station DF-2 only). These results are likely associated with a large structure fire that occurred adjacent to the DF-2 location in March 2022, and the subsequent re-construction activities, resulting in a significant new source of particulate matter in that vicinity. Since this is an isolated event and the annual average were less than regulatory guidelines for that time period (Table 12-14), these results in 2022 are not expected to represent a trend towards increasing air quality concerns.

#### *12.4.4.2.2 AWAR Dustfall*

In their *2018-2019 Annual Monitoring Report for the Meadowbank Gold Project and the Whale Tail Pit Project*, the NIRB requested a discussion of whether the predictions in the FEIS may have potentially underestimated the amount of dust produced on the mine site including along the all weather access road (AWAR). In the 2019 Annual Report, Agnico Eagle provided this review of FEIS modelling, and supplemental comparisons of dustfall results. While the full discussion is not re-visited here, the comparison of Vault Haul Road dustfall and AWAR dustfall is carried forward along with 2022 results.

Within the FEIS, air quality modeling was completed for the Vault Haul Road. That modeling indicated that the worst case level of air pollution (mainly due to fugitive dust) would be in the range of, or less than, air quality objectives. Since traffic rates along the AWAR were predicted to be lower than the Vault Haul Road, air quality modeling was not specifically conducted for the AWAR - i.e., impacts of the AWAR on air quality were assumed to be lower than impacts of the Vault Haul Road.

To validate this assumption of the FEIS, dustfall monitoring results from the Vault Haul Road area were compared with those collected along the AWAR, to determine whether air quality impacts (as measured through this FEIS-recommended monitoring method) are similar.

Dustfall results for DF-4 (500 m west of the Vault Haul Road) and the most comparable location with respect to the AWAR (km 18 and 78; 300 m west of the road) are provided in Figure 61. The following differences in sample collection methods are kept in mind while interpreting this data:

- Samples collected along the Vault Haul Road are collected on a 2 m stand (ASTM method), while those collected historically (prior to 2020) along the AWAR are at ground level, due to logistical constraints. As described in the 2019 Air Quality and Dustfall Monitoring Report, results for ground level samples have always been higher than results for associated samples at 2-m height.

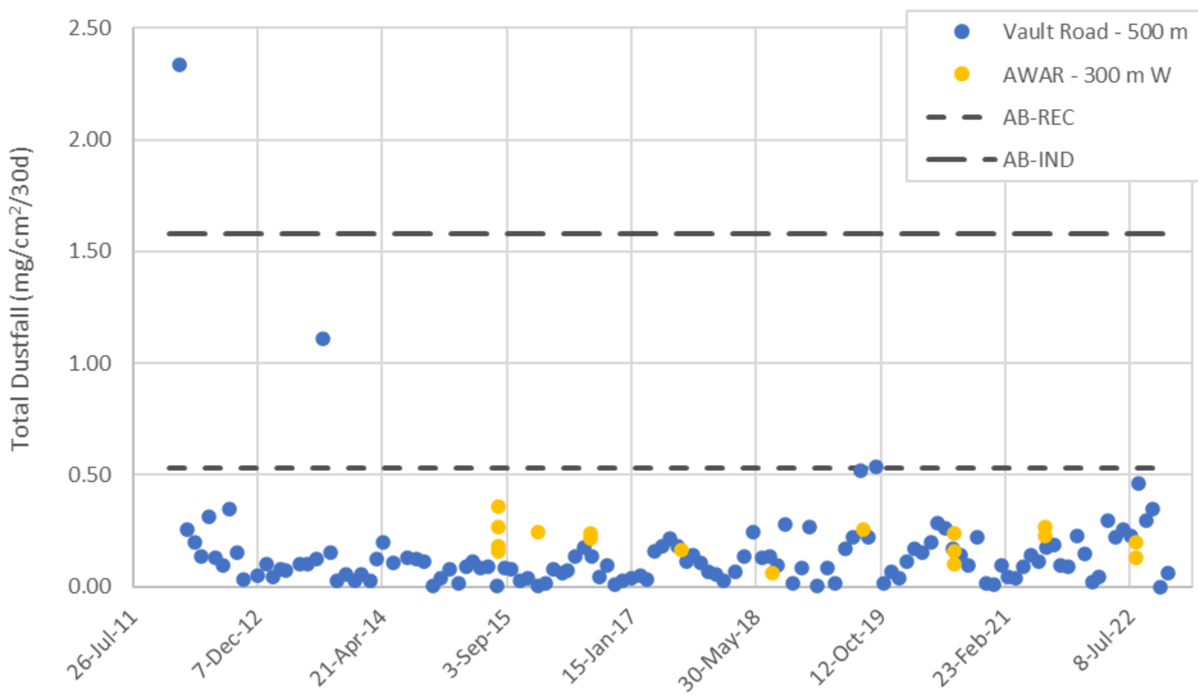
- Samples collected along the Vault Haul Road are at a distance of approximately 500 m from the road, while those used in this comparison for the AWAR are at a distance of 300 m. No samples have been collected at 500 m from the AWAR, and results at 300 m are expected to provide a conservatively high comparison.

- Results for the AWAR are only available for the summer season, when higher traffic rates and dry road conditions prevail. Results used in historical comparisons are from the August sampling event only. These results can therefore be considered peak values, and averages based on these are likely inflated compared to the true annual average (as calculated for the Vault Haul Road dataset).

- AWAR samples provided here are collected in locations where dust suppression is not applied, whereas the Vault Haul Road is watered near-continuously in the snow-free season.

While these differences generally result in a conservative estimate of dustfall rates along the AWAR compared to the Vault Haul Road, dustfall results for both locations are similar historically. While the AWAR dataset for this purpose is limited, these results suggest that the FEIS assumption that air quality impacts along the AWAR would be less than the Vault Haul Road was appropriate.

**Figure 61 30-d rates of total dustfall measured at monitoring station DF-4 (500 m west of the Vault Haul Road) and along the AWAR (km 18, 78; 300 m west). Alberta Environment dustfall guidelines for recreational areas (AB-Rec) and industrial areas (AB-Ind) are shown.**




### 12.4.4.3 *Effectiveness of Monitoring and Mitigation, and Adaptive Management*

*Effectiveness of Monitoring*

As described in Section 12.4.4.1, only a subset of FEIS air quality predictions are available as a conservative benchmark for comparison to monitoring results. However, the air quality monitoring program at the Meadowbank Mine was designed in consultation with regulators (ECCC) for the purpose of monitoring changes in ambient air quality at the site and for comparisons to regulatory guidelines, and is therefore considered effective as designed. A complete analysis of air quality monitoring results in comparison to regulatory criteria is provided in the 2022 Air Quality and Dustfall Monitoring Report (Appendix 50).

*Effectiveness of Mitigation*

A summary of the planned mitigation measures for air quality (per Air Quality and Noise Management Plan, 2005) is provided in Table 12-15, along with a commentary on current implementation.

As described in the Air Quality and Dustfall Monitoring Report (Appendix 50), monitoring thresholds were established within the current Air Quality and Dustfall Monitoring Plan to confirm effectiveness of existing mitigation. For the Meadowbank Mine, thresholds relate to dustfall measurements for onsite and AWAR locations. In 2022, the onsite dustfall threshold was exceeded in one of 49 samples, and in two of 30 AWAR dustfall samples. Based on analysis of each situation (as further described in the Air Quality and Dustfall Monitoring Report, Appendix 50), these were determined to be isolated events and/or not mine-related, and current mitigation measures are considered effective.

While exceedances of FEIS predictions occurred in 2022 for particulate matter, these predictions are considered screening-level benchmarks only, and the observed results are expected to have been associated with an isolated event (fire). Since regulatory standards for the 24-h averaging time were only exceeded in a limited subset of samples, and standards for the annual average were not exceeded, current mitigation practices are still considered effective.

**Table 12-15 Mitigation measures described in the Air Quality and Noise Management Plan (October, 2005) to reduce impacts of the project on area air quality, and commentary on current implementation.**

| **Emission Source** | **Planned Mitigation Measure** (Air Quality and Noise Management Plan, 2005) | **Implementation (2022)** |
|---|---|---|
| Plant Production Facilities | Select the diesel power plant engines with low NOx emissions to prevent ozone formation and with low hydrocarbon emissions to lower GHG emissions | **N/A** |
| | Use low sulphur content diesel fuel to mitigate SO2 emissions | **Yes -** Use of summer fuel |
| | Collect and vent any process emissions (flotation, CIP circuit, carbon treatment, gold refining, and cyanide detoxification) into the atmosphere | **Yes -** All process enclosed in the mill facility except leach tank |
| | Design all stacks using good engineering practice (including accessible sampling ports and Adequate height) to ensure the required dispersion to meet ambient air quality objectives | **Yes -** Design to meet engineering practice |
| | Implement fleet maintenance program to ensure that all diesel-powered equipment will operate efficiently, thereby reducing air emissions | **Yes-** Preventive maintenance per manufacture recommendation |
| | Install dust filters at the primary crusher building and at fine grinding facilities (SAG mill and ball mill) and provide dust suppression equipment (dust covers, sonic sprays, etc.) | **Yes -** Filter installed at major dust generating equipment |
| | Install enclosure of feed conveyor to avoid fugitive emissions during windy weather | **Yes -** All conveyer are enclosed |
| | Provide crushed ore stockpile enclosure to limit any dust to indoor environment | **Yes -** Enclosed in a dome |
| Transportation | Impose vehicle speed limit on Vault haul road to mitigate fugitive dust and reduce engine emissions | **Yes** - Speed limit enforcement on Vault Haul Road and AWAR |
| | Apply dust suppressants (water, calcium chloride) to haul and service roads during dry weather to mitigate fugitive dust | **Yes -** Dust suppressant applied on mine site and roads |
| | To reduce vehicle emissions, do not let motors idle, | **Yes -** No idle policy implemented. |

| **Emission Source** | **Planned Mitigation Measure** (Air Quality and Noise Management Plan, 2005) | **Implementation (2022)** |
|---|---|---|
| | except when necessary | Application of the policy followed by Environment Department. Reminder of the policy sent as needed to all employees. |
| | Upgrade road-surfacing materials using local coarse rocky aggregates | **Yes -** Mine site road surfaced with NPAG waste rock material |
| Blasting & Waste Disposal | Limit blasting to calm days or use delay blasting technique; natural mitigation to take place when mining pits are from 85 to 175 m below the ground level; ore and waste to be coarse run-of-mine muck not prone to generating excessive dust | **N/A -** No blasting occurred in 2022 at the Meadowbank site |
| | Cover dewatered tailings with non-potentially acid-generating (non-PAG) aggregates to control wind erosion | **N/A -** No cover was added in 2022 |
| Miscellaneous | Provide pressure valves to control fuel vapour fugitive emissions from the storage tanks | **Yes -** Installed at all locations |
| | Use water spray instead of pneumatic flushing while cleaning equipment and working areas when temperature is above the freezing point | All machine cleaning is done inside shop (wash bay) |
| | Use site-generated mineral material (dirt, aggregate, etc.) to cover disposed solid waste at the waste dump | **Yes -** Waste dump is located in the Portage Waste Rock Facility and is covered with waste rock created by mining activities |
| | Select waste incinerator with build-in emission control system (secondary combustion chamber, catalytic converter, etc.) and install a stack to disperse emissions to concentrations below ambient air quality objectives | **Yes -** Construction of the incinerator included a secondary combustion chamber. |
| | Apply vegetation cover on stripped areas and long-term stockpiles | **N/A -** Natural revegetation to occur during the reclamation phase. Revegetation option to be considered in the final Closure Plan. |

<u>*Adaptive Management*</u>

Since current mitigation is considered to have been effective, no changes to management actions with regards to ambient air quality are planned for 2023 for the Meadowbank Mine as a result of this PEAMP analysis.

### 12.4.5 Permafrost

#### 12.4.5.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

A summary of predicted residual impacts to permafrost (after mitigation), as described in the FEIS (Cumberland, 2005; Table B1.2), and results of monitoring being conducted to assess the accuracy of these predictions is provided in Table 12-16 below. A complete description of monitoring results is provided in the 2022 Geotechnical Inspection Report (Appendix 9), which reviewed instrument data for the 2021-2022 period.

In general, degradation of permafrost was predicted in association with the construction of mine buildings, and development of permafrost was predicted in association with dikes, TSF, and WRSF construction. Predictions are typically related to closure-phase impacts. Therefore, results of monitoring to date are presented here to demonstrate progress, but validity of the prediction (i.e. whether or not the prediction is supported by the monitoring data) cannot be determined at this time.

**Table 12-16 Predicted and measured impacts to permafrost for the Meadowbank site. Predicted impacts according to Cumberland, 2005, Table B1.2. Measured impacts according to the 2022 Geotechnical Inspection Report (Appendix 9)**

| Potential Impact | Potential Cause(s) | Proposed Monitoring | Monitoring Conducted | Predicted Impact in FEIS | Measured Impacts | | |
|---|---|---|---|---|---|---|---|
| | | | | | 2018 | 2019 | 2020 - 2022 |
| Permafrost aggradation and stabilization of new active layer in dikes | Dike design | Monitor ground temperatures; monitor slopes; monitor sub-permafrost pore pressures (tailings dike) | Ground temperature monitoring (thermistors) | Net increase in permafrost distribution and/or decrease in ground temperatures. | East Dike, Bay-Goose Dike, South Camp Dike: similar to historical trends, partially frozen foundations.<br>Vault Dike: frozen foundation<br>Central Dike: similar to historical trends, partially frozen foundation<br><br>SD1&2: frozen foundations;<br>SD3,4,5: partially frozen foundations;<br>Stormwater Dike: partially frozen foundation | | East Dike, Bay-Goose Dike, South Camp Dike: similar to historical trends, partially frozen foundations with cooling trends at edges of seepage zones.<br>Vault Dike: frozen foundation<br>Central Dike: similar to historical trends, partially frozen foundation<br><br>SD1&2, 4&5: frozen foundations;<br>SD3: partially frozen foundations;<br>Stormwater Dike: partially frozen foundation |
| Permafrost changes in Second Portage Lake (2PL) NW arm area | Dewatering, reclaim and attenuation pond filling, and tailings deposition | Representative monitoring of ground temperatures; assessment of anticipated ice entrapment (i.e. ground ice development) | Thermistor monitoring in TSF (thermistors NC-T1, NC-T2, NC-17-01 through 08) | Net increase in permafrost distribution and/or decrease in ground temperatures | Thermistors indicate tailings are not completely frozen. | Thermistors indicate tailings are not completely frozen. Freezeback and progression of freezing front is occurring in the North Cell in section not entirely frozen. Data are showing quicker freezeback than anticipated | |
| Permafrost changes in Third Portage Lake (TPL) north central shoreline and Portage Pit area | Portage pit development | Assessment of suspected ground ice development in conjunction with permafrost aggradation. Assessment of ground ice content of select shoreline polygons. | None | Net increase in permafrost distribution and/or decrease in ground temperatures | General increase in permafrost aggradation due to structures; permafrost is developed in part of the Portage Pit and Goose Pit walls, under the Goose Dike. | | |
| Permafrost changes in waste rock area | Construction of waste rock facility | Internal and foundation temperatures to be monitored | Thermistor monitoring of internal and foundation temperatures | Fall, winter and spring placement will continue to bury the natural ground surface and permafrost will aggrade into the waste rock where a new and temporary active layer will form. Placement of lifts on natural ground in the summer may continue to cause temporary and localized deepening of the active layer, warming of near surface permafrost and possible subsidence, | Frozen ground conditions under the Portage WRSF for all thermistor locations. Rockfill temperature below 0 °C for at least 10m above ground surface for all instruments.<br>Decreasing trends in active zone depth are recorded at most thermistor locations. Temperature trends in the structure are becoming more consistent with predicted temperature over time. | | |

| Potential Impact | Potential Cause(s) | Proposed Monitoring | Monitoring Conducted | Predicted Impact in FEIS | Measured Impacts | | |
|---|---|---|---|---|---|---|---|
| | | | | | 2018 | 2019 | 2020 - 2022 |
| | | | | particularly in low lying areas. | | | |
| Potential settlement of buildings | Loss of permafrost under heated structures | Ground temperature measurements where there is a need to monitor foundation temperatures | None | Net decrease in permafrost distribution and/or increase in ground temperatures | No ground temperature measurements have been undertaken at or near buildings on site. To date there has been no observed thawing of foundations. | | |
| Permafrost changes below pipelines | Stabilization of permafrost temperature and active layer thickness | Monitor pipeline alignment for potential permafrost degradation | None | Minor any undifferentiated net gain or loss of permafrost | No ground temperature measurements but no observations of thawing due to pipelines. | | |

#### 12.4.5.2 *Parts 3 & 4: Discussion*

Permafrost conditions continue to be monitored, but since final impact predictions relate to the closure/post-closure phase, no commentary on potential exceedances is made at this time.

Nevertheless, to help demonstrate the current status towards achieving these predictions, historical trends for all thermal monitoring results are provided in the 2022 Thermal Monitoring Report (Appendix 24).

#### 12.4.5.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

*Effectiveness of Monitoring*

Based on Table 12-16, all FEIS predictions for which monitoring was recommended are being addressed through current programs. Monitoring is therefore considered effective.

*Effectiveness of Mitigation*

A summary of the planned mitigation measures for permafrost during the current operations phase of the project (FEIS Physical Environment Impact Assessment Report (2005), Table C.2) along with implementation in 2022 is provided in Table 12-17. Mitigation measures proposed for operations-phase components which have already occurred (e.g. dewatering) or those associated with design-phase planning are not included.

**Table 12-17 Mitigation measures described in the FEIS, Appendix B (October, 2005) to reduce impacts of the project on permafrost, and commentary on current implementation**

| Project Component | Planned Mitigation Measure (FEIS Section 4.24.2.4) | Implementation (2022) |
|---|---|---|
| Waste Rock Storage | Schedule placement of waste rock on thaw-sensitive polygons during winter months, possibly in conjunction with proactive measures to enhance ground chilling prior to placement (e.g. snow removal and/or compaction); use flatter side slopes | **Yes -** Annual geotechnical inspection completed by third party<br><br>Annual revision of the Waste Rock and Tailings Management Plan |
| Tailings Storage Facility | Management of ice entrapment | **Yes -** Follow up done on ice entrapment and best practices |
| Ditches (roads, airstrip, contact water) | Silt fences as required to manage sediment loss; rock aprons as required to slow the rate of thaw penetration and stabilize the underlying soils | **N/A -** Silt fences not required as of yet |
| Freshwater intake & pipeline | Use insulated pipe with heat tracing; elevate pipeline across thaw sensitive terrain | **Yes -** Insulated pipe and elevated (freshwater line) |
| Discharge facilities & pipeline | Use insulated pipe with heat tracing; elevate pipeline across thaw sensitive terrain | **Yes -** Insulated pipe and elevated |
| Non-contact diversion facilities | Silt fences as required to manage sediment loss; rock aprons as required to slow the rate of thaw penetration and stabilize the underlying soils | **N/A -** Silt fences not required as of yet |
| Vault access road culverts (Turn Lake) | Maintenance, as required, to restore smooth grade where thaw settlement is a problem; avoid culverts in areas susceptible to thaw settlement | **N/A -** No maintenance as yet required |

<u>*Adaptive Management*</u>
No changes to permafrost monitoring or management programs are planned in 2023, based on this PEAMP analysis.

### 12.4.6 Socio-Economic Impacts

A comprehensive assessment of socio-economic indicators, comparison to FEIS predictions, and review of management/mitigation measures is provided in the 2022 Socio-Economic Monitoring Report (Appendix 4) and summarized here in the PEAMP format. Since, in many cases, is it not possible to distinguish impacts of the Meadowbank mine from those of the Whale Tail mine, the PEAMP evaluation is combined for this sector.

#### 12.4.6.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

Based on results of the 2022 Socio-Economic Monitoring Report (SEMR), the accuracy of Project impacts as predicted in the FEIS documents (Cumberland, 2005 - Table B15.2; Golder, 2018) is assessed for each identified valued socio-economic component in Table 12-18, below. When specific impact predictions are not being met, further discussion is provided in Section 12.4.6.2.

**Table 12-18 Summary of FEIS predictions for VSECs, observed trends, and interpretation of monitoring results in comparison to FEIS predictions (Cumberland, 2006; Golder, 2018). Measured impacts that are trending in a negative manner outside of predictions are further discussed in Section 12.4.6.2.**

| Sector and Overarching FEIS Prediction | Metric | 2022 Overview | Specific FEIS Prediction | Accuracy of the FEIS Prediction |
|---|---|---|---|---|
| **1. Employment** | **1.1 Total project employment (Agnico Eagle & contractors)** | | | |
| **MEADOWBANK:**<br>"The potential impacts of employment are likely to take some time to gain full momentum, and overall are considered of high magnitude, positive, long term and of high significance, specifically to those individuals and their families who are able to benefit" (Cumberland Resources, 2006, p. 120)<br>**WHALE TAIL:**<br>"The Expansion Project will create direct, indirect and induced employment opportunities." (Golder Associates, 2018, p. 9) | **Project employment (permanent, temporary & contractor)** | Employment at Meadowbank / Whale Tail decreased by 2.1% in 2022 to 2,026. Contractors account for 38% of Meadowbank / Whale Tail employment. | MEADOWBANK<br>"It is expected that the construction phase workforce will average 160 and peak at 310, and the operation phase workforce is estimated at 370." (Cumberland Resources, 2006, p. 119)<br>WHALE TAIL<br>"Direct average operational employment is expected to be 1,166 positions." (Golder Associates, 2018, p. 9) | MEADOWBANK – Prediction is exceeded<br>WHALE TAIL – Prediction is exceeded |
| | **1.2 Project Inuit employment (Agnico Eagle and contractors)** | | | |
| | **Project employment (Inuit & non-Inuit)**<br>*Inuit FTEs*<br>*Inuit FTE rate* | Inuit employment at Meadowbank / Whale Tail remined relatively stable in 2022 at 207 FTEs (decrease by 33 FTEs over 2021 levels).<br>Inuit employment as a proportion of total was 18% in 2022, representing a decrease from 22% in 2021. | MEADOWBANK – none<br>WHALE TAIL[9] (inc. contractors)<br>*"Excluding the final year of operations when Project employment ramps down, direct average operational employment is expected to be 1,166 […] Of these, nearly half (491 or 42%) are expected to be filled by Nunavummiut, the majority of which are employed at the Meadowbank Mine and will move over to the Expansion Project."* (Golder Associates, 2018, p. 9) | MEADOWBANK – TBD (cannot be determined at this time)<br>WHALE TAIL – Prediction is not supported |
| | **Project contractor employment (Inuit & non-Inuit)**<br>*Inuit FTEs*<br>*Inuit FTE rate* | At Meadowbank / Whale Tail, Inuit contractor employment increased by 7 FTEs to 24 FTEs in 2022.<br>Inuit FTE for contractors was 3% in 2022, up from 2% in 2021. | | |
| | **1.3 Project employment by Kivalliq community** | | | |
| | **Project employment by Kivalliq community (Inuit & non-Inuit)** | The number of Kivalliq-based employees generally trended downward year-over-year at Meadowbank / Whale Tail, decreasing by 14% in 2022, and reaching 223 employees in 2022. In 2022, 62% of Meadowbank / Whale Tail's Kivalliq-based employees were from Baker Lake, for a total of 139. | MEADOWBANK – none<br>WHALE TAIL<br>Baker Lake is expected to fill 3 management jobs, 16 skilled jobs, 187 semi-skilled jobs, and 66 entry level jobs, for a total of 272 jobs (Golder Associates, 2018, p.10-11). | MEADOWBANK – TBD (cannot be determined at this time)<br>WHALE TAIL – Prediction is not supported |
| | **Project contractor employment by Kivalliq community (Inuit & non-Inuit)** | In 2022, a total of 23 contractor employees were hired from Kivalliq communities (a decrease from 51 in 2021), of which 21 contractors were hired from Baker Lake. | | |
| | **1.4 Employee turnover** | | | |
| | **Agnico Eagle Inuit turnover by reason**<br>Turnover rates (Inuit & non-Inuit)<br>*Inuit rates*<br>*Non-Inuit rates*<br>**Turnover rate by Kivalliq community** | Resignation / voluntary departures accounted for the majority (52 or 65%) of reasons for turnover among Agnico Eagle Inuit employee in 2022. In 2022, there were 80 departures in total, compared to 35 in 2021.<br>Inuit turnover rates at Meadowbank / Whale Tail increased from 18% in 2021 to 29% in 2022.<br>Turnover rates for non-Inuit employees also increased, from 11% in 2021 to 14% in 2022.<br>By community, turnover rates increased in most communities with the exception of Whale Cove. | MEADOWBANK – none<br>WHALE TAIL – none | MEADOWBANK – TBD (cannot be determined at this time)<br>WHALE TAIL – TBD (cannot be determined at this time) |
| **2. Gender** | **2.1 Gender-specific initiatives** | | | |
| None | **Overview and assessment of gender-specific initiatives** | Agnico Eagle is continuing to develop its policy and programs to encourage greater gender equality. At present, 13 programs are active. | MEADOWBANK – none<br>WHALE TAIL – none | MEADOWBANK – TBD (cannot be determined at this time)<br>WHALE TAIL – TBD (cannot be determined at this time) |
| | **2.2 Project employment by gender** | | | |
| | **Project and contractor employment (gender; Inuit & non-Inuit) – FTE** | There were 190 Agnico female FTEs at Meadowbank / Whale Tail in 2022, up from 178 in 2021.<br>There were 57 female contractor FTEs at Meadowbank / Whale Tail in 2022, down from 60 in 2021. | MEADOWBANK – none<br>WHALE TAIL – none | MEADOWBANK – TBD (cannot be determined at this time)<br>WHALE TAIL – TBD (cannot be determined at this time) |
| | **Project and contractor employment (gender; Inuit & non-Inuit) – rate** | The proportion of Agnico female employment at Meadowbank / Whale Tail in 2022 remained stable at 16%.<br>The proportion of contractor female employment at Meadowbank / Whale Tail in 2022 was unchanged at 7%. | | |
| | **2.3 Project employment by gender and skill level** | | | |
| | **Agnico Eagle female employment by skill level** | For Meadowbank / Whale Tail, 66 female employees were in management & professional roles (compared to 49 in 2021), 24 in skilled positions (compared to 18 in 2021), 57 in semi-skilled positions (compared to 59 in 2021), and 44 in unskilled positions (compared to 51 in 2021). | MEADOWBANK – none<br>WHALE TAIL – none | MEADOWBANK – TBD (cannot be determined at this time)<br>WHALE TAIL – TBD (cannot be determined at this time) |
| | **Proportion of skills levels held by female employees** | In 2022, female employees held 42% of all unskilled jobs (down from 44% in 2021). In all other categories, females held less than one- | | |

[9] This includes 1,229 Agnico Eagle employees, 775 contractors, eight (8) students & co-op and 14 on-call employees.

| Sector and Overarching FEIS Prediction | Metric | 2022 Overview | Specific FEIS Prediction | Accuracy of the FEIS Prediction |
|---|---|---|---|---|
| | | fifth of the available positions in 2022: 20% for management and professional (compared to 18% in 2021), 12% for semi-skilled (as in 2021), and 9% for skilled (compared to 8% in 2021). | | |
| **3. Income** | **3.1 Income paid to projects' Inuit employees** | | | |
| **MEADOWBANK:**<br>"The potential impacts of increased income are considered of high magnitude, positive, long-term and of high significance, particularly to those individuals and their families who are able to benefit. It is expected that overall community effects, moderate in significance, are likely to be most experienced in Baker Lake, as most direct employment will occur here." (Cumberland Resources Ltd., 2006, p. 121)<br><br>**WHALE TAIL:**<br>"The Expansion Project will generate direct, indirect and induced incomes." (Golder Associates, 2018, p. 12) | **Income paid to Agnico Eagle project Inuit employees** | Total income paid to Meadowbank /Whale Tail Inuit employees (excluding contractors) in 2022 was $22M, (compared to $19.1M in 2021). | MEADOWBANK<br>"Direct project wages paid to people in Kivalliq Region, primarily Baker Lake, could exceed $4M annually." (Cumberland Resources, 2006, p. 121).<br><br>WHALE TAIL<br>"During operations, the Expansion Project is projected to generate $421.1 million (cumulatively) in direct labour income in Nunavut, and $509.3 million in total territorial labour income." (Golder Associates, 2018, p. 12) | MEADOWBANK – Prediction is exceeded<br><br>WHALE TAIL – Prediction is not supported |
| | **3.2 Income by Kivalliq community** | | | |
| | **Median employment income of tax filers by Kivalliq community** | Baker Lake and Rankin Inlet have had the highest median incomes in the Kivalliq region up to 2017, but more recent data is unavailable. | MEADOWBANK<br>The Meadowbank FEIS makes no specific predictions regarding changes in the median income of Kivalliq communities but does predict that Baker Lake will experience the most positive effects of increased income.<br><br>WHALE TAIL – none | MEADOWBANK – Prediction is supported<br><br>WHALE TAIL – TBD (cannot be determined at this time) |
| **4. Education and Training** | **4.1 Investment in education-based initiatives** | | | |
| **MEADOWBANK:**<br>"The potential impacts of education and training are considered of medium magnitude, positive, long term and of high significance, specifically to those individuals and their families who are able to benefit." (Cumberland Resources Ltd., 2006, p. 121)<br><br>**WHALE TAIL:**<br>"The Expansion Project will provide workforce training and support community education" (Golder Associates, 2018, p. 12). | **Agnico Eagle investments in education-based initiatives** | In 2022, Agnico Eagle made $638,196 in contributions to education-based initiatives, up from $275,000 in 2021. | MEADOWBANK<br>"Cumberland and KIA will address the need for a broader based project education and training initiatives [sic] to assist those who wish to develop skills that will position them for project employment." (Cumberland Resources Ltd., 2006, p. 121)<br><br>WHALE TAIL<br>"The Expansion Project will provide workforce training and support community education" (Golder Associates, 2018, p. 12) | MEADOWBANK – Prediction is supported<br><br>WHALE TAIL – Prediction is supported |
| | **Enrolment in Agnico Eagle summer student program (Inuit & non-Inuit)** | In 2022, Agnico Eagle had four (4) Inuit Summer Students based in Rankin Inlet working with the Community Relations department (up from 1 in 2021). | MEADOWBANK – none<br>WHALE TAIL – none | MEADOWBANK – TBD (cannot be determined at this time)<br><br>WHALE TAIL – TBD (cannot be determined at this time) |
| | **4.2 Secondary school graduation by region** | | | |
| | **Secondary school graduation rate by region** | In 2017, graduation rates in the Kivalliq region were at an all-time high, being consistently higher than those in the other two regions (since 2010). However, in 2018, there was a general decrease in graduation rates in Nunavut. More recent data on secondary school graduations is not available. | MEADOWBANK – none<br>WHALE TAIL – none | MEADOWBANK – TBD (cannot be determined at this time)<br><br>WHALE TAIL – TBD (cannot be determined at this time) |
| | **4.3 Project training and education** | | | |
| | **Agnico Eagle investments in mine training and education initiatives**<br>Average specific training hours (Inuit & non-Inuit)<br>Participation in career and skills programs<br>Inuit Participation in pre-apprenticeship and apprenticeship programs by type | Investments in externally delivered training programs have dropped substantially since 2016 due to the discontinuation of the Kivalliq Mine Training Society (KMTS) and the suspension of the Arviat Community Training Program in 2019. In 2022, Agnico Eagle spent above the allocated $3.6M as per IIBA (total of $4,070,106)<br>There was an increase in specific training provided at Meadowbank /Whale Tail for Inuit employees from 19 hours in 2021 to 33 in 2022 and a decrease from 11 hours in 2021 to 8 in 2022 for non-Inuit employees.<br>There was an increase in participation in skills programs (across all Project), from 6 participants in 2021 to 19 participants in 2022. Of the 19 trainees, 11 were at Meadowbank / Whale Tail.<br><br>There were 6 active Inuit apprentices in 2022 (across all Projects, of which 2 were at Meadowbank / Whale Tail), down from 7 in 2021. | MEADOWBANK<br>"Cumberland and KIA will address the need for broader based project education and training initiatives to assist those who wish to develop skills that will position them for project employment." (Cumberland Resources Ltd., 2006, p. 121)<br>WHALE TAIL<br>"The Project will continue the workforce training programs in place at Meadowbank Mine" (Golder Associates, 2018, p. 12) | MEADOWABNK – Prediction is supported<br><br>WHALE TAIL – Prediction is supported |
| | **4.4 Project employment by skill level** | | | |
| | **Agnico Eagle Inuit employees by skill level**<br><br>**Agnico Eagle FTE/employment by skill level (Inuit & non-Inuit)** | In 2022, the number of Inuit employees in unskilled roles decreased to 117 from 152 in 2021, and in semi-skilled roles to 125 from 129 in 2021. Numbers in management and professional roles remained constant (1 position) and decreased for skilled roles (from 4 in 2021 to 2 in 2022), both where Inuit employees continue to be underrepresented.<br><br>By skill level (and for Agnico Eagle employees), 100 of employees are in unskilled positions, 483 in semi-skilled skilled, 259 in skilled, and 319 in management & professional. | MEADOWBANK – none<br>WHALE TAIL<br>"As Nunavummiut employees achieve further training and education, it is expected that they will be better poised to advance to more skilled positions as they arise, thereby increasing representation of Nunavut residents in the skilled, professional and management employment categories" (Golder Associates, 2018, p. 12)<br>Total composition of employment includes 154 entry level jobs, 493 semi-skilled jobs, 323 skilled jobs, and 202 professional and management jobs. Workers from Nunavut are expected to fill 154 entry level positions, 305 | MEADOWBANK – TBD (cannot be determined at this time)<br><br>WHALE TAIL –<br>Prediction is not supported |

| Sector and Overarching FEIS Prediction | Metric | 2022 Overview | Specific FEIS Prediction | Accuracy of the FEIS Prediction |
|---|---|---|---|---|
| | | | semi-skilled positions, 29 skilled positions, and 4 management positions (Golder Associates, 2018, p.10-11). | |
| | **4.5 Trade certificates / apprenticeships in Nunavut** | | | |
| | **Trade certificates / apprenticeships by community** | At the time of this report, data on trade certificates / apprenticeships by Kivalliq community was not available. | MEADOWBANK – none<br>WHALE TAIL – none | MEADOWBANK– TBD (cannot be determined at this time)<br>WHALE TAIL– TBD (cannot be determined at this time) |
| **5. Contracting and Business Opportunities** | **5.1 Contract expenditures** | | | |
| **MEADOWBANK:**<br>"The potential impacts of employment are likely to take some time to gain full momentum, and overall are considered of high magnitude, positive, long term and of high significance, specifically to those individuals and their families who are able to benefit." (Cumberland Resources Ltd., 2006, p. 120)<br><br>**WHALE TAIL:**<br>The Project will generate "continued local economic activity" (Golder Associates, 2018, p. 6).<br>"The Expansion Project will sustain local business development and contracting" (Golder Associates, 2018, p. 8). | **Contract expenditures on NTI-registered businesses**<br>*NTI expenditures*<br>*Proportion NTI* | In 2022, Meadowbank / Whale Tail procurement from NTI registered businesses was $477M as in 2021.<br><br>NTI expenditures, as a proportion of total spend, also remained at 69% in 2022. | MEADOWBANK<br>"With continuing preferential contracting, local business participation in the project is expected to grow with time." (Cumberland Resources Ltd., 2006, p. 7)<br>WHALE TAIL<br>"…about $271 million procured from Nunavut-registered companies. Of this, roughly 84% ($223 million) will be through Kivalliq-registered businesses… [of which] …67% is expected to accrue to those in Rankin Inlet, with 32% accruing to those in Baker Lake." (Golder Associates, 2018, p. 19) | MEADOWBANK – Prediction is supported<br><br>WHALE TAIL – Prediction is partially supported |
| | **NTI-registered business expenditures by Nunavut community** | Procurement from NTI-registered businesses (across all Projects) located in Baker Lake increased to $50M in 2022 (from $45M in 2021). Expenditures in Rankin Inlet increased in 2022 to $580M (from $567M in 2021). Expenditures in Arviat increased to $35M in 2022 (from $8M in 2021). Other NTI spend decreased to $143M in 2022 (from $163M in 2021). | | |
| | **Contract expenditures on Nunavut-based businesses**<br>*Nunavut-based expenditures*<br>*Proportion Nunavut-based* | Meadowbank / Whale Tail contract expenditures on Nunavut-based businesses (including NTI-registered businesses) decreased to $497M in 2022 from $509M in 2021.<br>As a proportion of total expenditures, this decreased slightly from 73% in 2021 to 71% in 2022. | | |
| | **Project contract expenditures on Nunavut-based businesses by business location** | Meadowbank / Whale Tail contract expenditures at Baker Lake businesses increased to $36M in 2022 from $31M in 2021. | | |
| **6. Health and Safety** | **6.1 Health and safety training** | | | |
| **MEADOWBANK:**<br>"Health and safety of workers and the population at large is subject to legislation and perhaps more importantly to best practices. Health and safety training also has applications in personal life – workers often not only use new health and safety training on-the-job, but also at home in the course of daily tasks." (Cumberland Resources Ltd., 2006, p. 126)<br><br>**WHALE TAIL:**<br>"The Expansion Project may improve worker and public health and safety." (Golder Associates, 2018, p. 13) | **Average mandatory training hours provided to Agnico Eagle employees (Inuit & non-Inuit)** | Mandatory training hours at Meadowbank / Whale Tail decreased from 12 hours in 2021 to 7 hours in 2022 for Inuit employees, and from 21 hours in 2021 to 16 hours in 2022 for non-Inuit employees. | MEADOWBANK – none<br>WHALE TAIL "The Expansion Project may improve worker and public health and safety." (Golder Associates, 2018, p. 13) | MEADOWBANK – TBD (cannot be determined at this time)<br><br>WHALE TAIL – Prediction is supported |
| | **6.2 Health and safety on-site** | | | |
| | Visits by project employees to Agnico Eagle clinic for work-related and other reasons | Visits by Agnico Eagle employees to Meadowbank / Whale Tail on-site clinics declined from 2.3 in 2021 to 2.2 in 2022 for non-work-related visits, and from 0.8 in 2021 to 0.7 in 2022 for work-related visits. | MEADOWBANK – none<br>WHALE TAIL<br>While the Expansion project's planned activities are expected to yield an overall positive effect on worker and public health and safety, there remains "potential risks associated with accidents and emergencies." (Golder Associates, 2018, p. 13) | MEADOWBANK – TBD (cannot be determined at this time)<br><br>WHALE TAIL – Prediction is supported |
| | **Project combined lost-time and light duty accident frequency (per 200,000 person-hours)** | **Project combined lost-time and light duty accident frequency decreased from 1.71 in 2021 to 0.81 in 2022.** | | |
| **7. Population Demographics** | **7.1 Employee Migration** | | | |
| **MEADOWBANK:**<br>"The potential impacts of migration are complex and are likely to have both positive and negative components, but of low magnitude. Any effects of migration are long term but are likely to be low significance. It is not likely that migration to any other community than Baker Lake would be significant." (Cumberland Resources Ltd., 2006, p. 126)<br><br>**WHALE TAIL:**<br>"Expansion Project employment opportunities could spur migration to Baker Lake and Rankin Inlet…dependent on scale of speculative migration." (Golder Associates, 2018, p. 18) | **Project Agnico Eagle Inuit employees residing outside Nunavut**<br>*Total Inuit employees*<br>*Proportion of Inuit employees residing outside Nunavut* | At Meadowbank / Whale Tail, the number of Inuit employees residing outside Nunavut decreased from 28 in 2021 to 22 in 2022.<br><br>As a proportion of total Inuit employees residing outside Nunavut, this was 10% in 2021 and 9% in 2022. | MEADOWBANK<br>The Meadowbank FEIS suggests that in-migration of Southerners to Baker Lake would be the primary concern.<br><br>WHALE TAIL<br>"Project employment opportunities could spur migration to Baker Lake and Rankin Inlet." (Golder Associates, 2018, p. 15). | MEADOWBANK – Prediction is not supported<br><br>WHALE TAIL – Prediction is not supported |
| | **Project contractor Inuit employees residing outside Nunavut**<br>*Total Inuit contractors*<br>*Proportion of Inuit contractors residing outside Nunavut* | This is a new indicator for this VSEC, and therefore no data is available for 2021.<br><br>In 2022, 7 Inuit employees employed by contractors (total 1.2 FTE count) resided outside Nunavut, representing 5% of total Inuit employment that year. | | |
| | **7.2 Population estimates in Kivalliq communities** | | | |
| | **Population estimates in Kivalliq communities (Inuit & non-Inuit)**<br>*Estimates in communities*<br>*Annual percent change* | Data regarding Inuit to non-Inuit residents in Rankin Inlet and Baker Lake is not available sine 2016.<br><br>Population changes in Kivalliq communities in 2022 were on par with those in previous years. | MEADOWBANK<br>"It is not likely that migration to any other community than Baker Lake would be significant," but does not provide any specific predictions on changes to populations in Kivalliq communities. (Cumberland Resources, 2006, p. 126)<br><br>WHALE TAIL | MEADOWBANK – Prediction is not supported<br><br>WHALE TAIL – Prediction is not supported |

| Sector and Overarching FEIS Prediction | Metric | 2022 Overview | Specific FEIS Prediction | Accuracy of the FEIS Prediction |
|---|---|---|---|---|
| | | | "Project employment opportunities could spur migration to Baker Lake and Rankin Inlet." (Golder Associates, 2018, p. 15). | |
| **8. Community Infrastructure and Services** | **8.1 Use of GN health services** | | | |
| **MEADOWBANK:**<br>"The impacts on social services and infrastructure, of low to medium magnitude, are considered largely positive in the medium term and of moderate significance. There is some potential for closure to have a negative impact on social service delivery." (Cumberland Resources Ltd., 2006, p. 128)<br><br>**WHALE TAIL:**<br>"Project-induced in-migration could increase demand for services and infrastructure in Baker Lake and Rankin Inlet." (Golder Associates, 2018, p. 17-18). | **Kivalliq community health centre visits per capita** | Data on Kivalliq community health centre visits has not been available since 2016. | MEADOWBANK<br>"Increased employment and business opportunities will result in increased income, a measure of economic security, capacity building that will contribute to employability over the long term, and improved self-image of employees and their families. This could result in reducing dependence on government social services." (Cumberland Resources Ltd., 2006, p. 128)<br>WHALE TAIL<br>"Project-induced in-migration could increase demand for services and infrastructure in Baker Lake and Rankin Inlet … [including] healthcare services." (Golder Associates, 2018, p. 17) | MEADOWBANK – TBD (cannot be determined at this time)<br><br>WHALE TAIL – TBD (cannot be determined at this time) |
| | **Employees referred to community health care centre for personal or work-related reasons** | In 2022, 20 Meadowbank / Whale Tail employees were referred to community health care centres as in 2021. | | |
| | **Incidents requiring use of GN health services** | Incidents requiring use of GN health services decreased at Meadowbank / Whale Tail from 14 in 2021 to 7 in 2022. | | |
| | **8.2 Use of public infrastructure** | | | |
| | **Estimates of use of public physical infrastructure directly related to Project (airports, port, meeting facilities, roads)** | In 2022, there was limited use of Baker Lake Airport to access commercial flights, 10 vessels were received in Baker Lake for 154,123 m$^3$, and the Meadowbank AWAR was used 2,323 times compared to 3,079 times in 2021. | MEADOWBANK<br>"The impacts on social services and infrastructure, of low to medium magnitude, are considered largely positive in the medium term and of moderate significance. There is some potential for closure to have a negative impact on social service delivery." (Cumberland Resources Ltd., 2006, p. 128)<br><br>WHALE TAIL<br>"Project-induced in-migration could increase demand for services and infrastructure in Baker Lake and Rankin Inlet." (Golder Associates, 2018, p. 17) | MEADOWBANK – TBD (cannot be determined at this time)<br><br>WHALE TAIL – TBD (cannot be determined at this time) |
| | **8.3 Social assistance** | | | |
| | **Per capita social assistance expenditures by Kivalliq community** | Data for capita social assistance expenditures and percentage of households receiving social assistance is not available since 2018. | MEADOWBANK<br>"The impacts on social services and infrastructure, of low to medium magnitude, are considered largely positive in the medium term and of moderate significance. There is some potential for closure to have a negative impact on social service delivery." (Cumberland Resources Ltd., 2006, p. 128)<br><br>WHALE TAIL – none | MEADOWBANK – TBD (cannot be determined at this time)<br><br>WHALE TAIL – TBD (cannot be determined at this time) |
| | **Percentage of households receiving social assistance by Kivalliq community** | | | |
| **9. Individual and Community Wellness** | **9.1 Agnico Eagle's Programs** | | | |
| **MEADOWBANK:**<br>"Individual and community wellness is intimately associated with potential impacts on traditional ways of life as discussed above. In addition, however, individual decisions on the use of increased income, household management in relation to rotational employment, migration, public health and safety, disturbance particularly during the construction phase, and Cumberland's support for community initiatives are being negotiated in the IIBA are [sic] the other drivers that have the potential to effect [sic] individual and community wellness." (Cumberland Resources Ltd., 2006, p. 123)<br><br>**WHALE TAIL:**<br>"The Expansion Project is not expected to change the impacts on community health and cohesion stemming from additional incomes predicted in the Approved Project FEIS, including: Substance abuse, Sexual misconduct, Family violence, Crime, Income disparity, Social disparity." (Golder Associates, 2018, p. 14) "Expansion Project-induced in-migration could increase demand for housing in Baker Lake and Rankin Inlet… dependant on scale of speculative migration." (Golder Associates, 2018, p. 18) | **Agnico Eagle wellness programs offerings & utilization by project employees and community members** | Agnico Eagle continues to provide individual and family wellness planning, financial investments to support mental health and prenatal nutrition, and vaccination campaigns. | MEADOWBANK – none<br><br>WHALE TAIL<br>"The Expansion Project continues the benefits [positive wellness effects] to communities predicted in the Approved Project FEIS" (Golder Associates, 2018, p. 18). | MEADOWBANK – TBD (cannot be determined at this time)<br><br>WHALE TAIL – Prediction is supported |
| | **9.2 Perceptions of health & wellness** | | | |
| | **Self-reported effect of project on health & wellness** | The results of the 2022 Inuit and Nunavummiut Employment Survey show that while personal relationships have improved or remained the same among those who responded to the survey, respondents often worried about families when on-site, felt lonely, and/or worried about keeping their job. Many also struggled with their financial situation and often find it challenging to pay all bills and debt. | MEADOWBANK – none<br>WHALE TAIL<br>"Project incomes [and rotational employment] may affect family and community health and cohesion." (Golder Associates, 2018, p. 14-15). | MEADOWBANK – TBD (cannot be determined at this time)<br><br>WHALE TAIL – TBD (cannot be determined at this time) |
| | **9.3 Criminal violations** | | | |
| | **Criminal violations per hundred people by community** | In 2021, the latest year for which data is available, crime rates across the Kivalliq region averaged 30 violations per 100 people, a slight increase from 28 in 2020.<br><br>Crime rates tend to be higher in Rankin Inlet and Baker Lake. By category, mischief, disturbing the peace, and assault tend to be more common in Rankin Inlet, Baker Lake, and Chesterfield Inlet, noting that mischief has declined annually since 2017 in Chesterfield Inlet. | MEADOWBANK – none<br><br>WHALE TAIL<br>"Project incomes may affect family and community health and cohesion [crime]." (Golder Associates, 2018, p. 14). | MEADOWBANK – TBD (cannot be determined at this time)<br><br>WHALE TAIL – TBD (cannot be determined at this time) |
| | **Criminal violations per hundred people by type and community** | | | |
| | *Baker Lake* | | | |
| | *Rankin Inlet* | | | |
| | *Chesterfield Inlet* | | | |
| | **9.4 Health centre visits** | | | |
| | **Kivalliq community health centre visits by reason** | Data for this indicator has not been available since 2016. | MEADOWBANK<br>"The potential public health and safety impacts of the project, of unknown magnitude, are negative, and, because there is such high impact at the individual level in the event that a risk is realized, the effects must be considered long term and of high significance." (Cumberland Resources Ltd., 2006, p. 126)<br><br>WHALE TAIL<br>"Project-induced in-migration could increase demand for services and infrastructure in Baker Lake and Rankin Inlet [health care]." (Golder Associates, 2018, p. 17). | MEADOWBANK – TBD (cannot be determined at this time)<br><br>WHALE TAIL – TBD (cannot be determined at this time) |
| | **9.5 Housing** | | | |
| | **Persons on waitlist for public** | In 2022, 1,023 people were on a public housing | MEADOWBANK – none | MEADOWBANK – TBD |

| Sector and Overarching FEIS Prediction | Metric | 2022 Overview | Specific FEIS Prediction | Accuracy of the FEIS Prediction |
|---|---|---|---|---|
| | **housing by community** | waitlist in the Kivalliq region, representing a 1.7% increase over 2021 demand. | WHALE TAIL<br>“Project-induced in-migration could increase demand for housing in Baker Lake and Rankin Inlet.” (Golder Associates, 2018, p. 16). | (cannot be determined at this time)<br><br>WHALE TAIL – TBD (cannot be determined at this time) |
| | **Housing needs by community as a percentage of housing stock** | In 2022, Kivalliq communities with the highest needs are Rankin Inlet (70%), Naujaat (69%), Arviat (62%), Coral Harbour (61%), Whale Cove (47%), and Baker Lake (40%) (all rated as ‘critical need’), and Chesterfield Inlet (31%, rated as ‘serious’). | | |
| | **Number of people in core housing need by type and community** | The most recent year for which this data is available is 2016. | | |
| | **Self-reported home ownership aspirations by community** | In the 2022 Inuit and Nunavummiut Employment Survey, 74% of respondents indicated they wished to own a home in the last 12 months and 81% answered they want to buy a house / condo in the future. | | |
| | **9.6 Food security** | | | |
| | **Self-reported concerns on food availability by community** | The 2022 Inuit and Nunavummiut Employment Survey showed that two-thirds of respondents were worried about food running out, representing an increase in this metrics over 2019 results. Further, the share of respondents not worried about food also decreased in 2022, pointing to a growing share of employees concerned about food security. | MEADOWBANK – none<br>WHALE TAIL<br>“Regular incomes can help lift or keep people out of poverty; provide access to nutritious food.” (Golder Associates, 2018, p. 20). | MEADOWBANK – TBD (cannot be determined at this time)<br><br>WHALE TAIL – Prediction is supported |
| | **Cost of the Revised Northern Food Basket (RNFB)** | There was an overall increase in the cost of the RNFB in 2021, in line with the high inflation experienced overall in Canada. Annual changes range from a decrease of 2% in Chesterfield Inlet to a rise of 13% in Coral Harbour over 2020 costs. Information for 2022 was not available at the time of PEAMP preparation. | | |
| | **Agnico Eagle investments in food security initiatives** | In 2022, Agnico Eagle contributed $197,900 to community-based organizations that support food security issues (compared to $214,000 in 2021). | | |
| | **9.7 Suicide** | | | |
| | **Suicides per 10,000 people by region** | The Kivalliq region had the lowest suicide rate in Nunavut, but only marginally, and despite a drop in 2020 (the latest year for which data is available), suicide rates remain at crisis levels, being 6 times the rate of suicide in Canada in 2020. Information for 2021 and 2022 was not available. | MEADOWBANK – none<br>WHALE TAIL – none | MEADOWBANK – TBD (cannot be determined at this time)<br><br>WHALE TAIL – TBD (cannot be determined at this time) |
| **10. Culture and Traditional Lifestyle** | **10.1 Perceptions of culture and traditional lifestyle** | | | |
| **MEADOWBANK:**<br>“There is potential for both negative and positive impacts, of any magnitude, on traditional ways of life, which could be of high significance. Any net impact, since it would be an impact of cultural change, would be long term and continue beyond the life of the project. The impact would be experienced primarily in Baker Lake.” (Cumberland Resources Ltd., 2006, p. 123)<br><br>**WHALE TAIL:**<br>“Rotational employment can […] have negative effects on cohesion, taking workers away from their communities and families for extended periods of time, and can erode traditional values” (Golder Associates, 2018, p. 12) | **Self-reported effect of project on overall communities and on cultural and traditional activities** | According to the 2022 Inuit and Nunavummiut Employment Survey, Inuit employees indicated that Agnico Eagle has had a positive (48%), neutral (43%) and negative (8%) impacts on their community. In comparison with 2019 results, employees’ participation in cultural activities has decreased according to the 2022 results; while 3% indicated they participated more in traditional activities, 39% stated that their participation had not changed, and 25% indicated that their participation had decreased. Similar to 2019 results, nearly all survey participants indicated they had participated in some form of traditional and cultural activities in the last 12 months. | MEADOWBANK – none<br>WHALE TAIL<br>“Rotational employment can […] have negative effects on cohesion, taking workers away from their communities and families for extended periods of time, and can erode traditional values” (Golder Associates, 2016, p. 12). | MEADOWBANK – TBD (cannot be determined at this time)<br><br>WHALE TAIL – Prediction is supported |
| | **10.2 Culture and traditional lifestyle** | | | |
| | **Population identifying Inuktitut as their mother tongue, by Kivalliq community** | The proportion of the population that identified Inuktitut as their mother tongue declined in all communities from 2006 to 2021. | MEADOWBANK<br>“The project will not significantly restrict access to, or productivity of lands used for traditional activity.” (Cumberland Resources Ltd., 2006, p. 122)<br><br>WHALE TAIL<br>“Rotational employment can […] have negative effects on cohesion, taking workers away from their communities and families for extended periods of time, and can erode traditional values” (Golder Associates, 2018, p. 12). | MEADOWBANK – TBD (cannot be determined at this time)<br><br>WHALE TAIL – TBD (cannot be determined at this time) |
| | **Number of Agnico employees identifying Inuktitut as their first language** | The number of Agnico Inuit employees at Meadowbank / Whale Tail with Inuktitut as a first language fell from 177 (55%) in 2020 to 118 (48%) in 2022 (data for 2021 was not available). | | |
| | **Self-reported effect of project on use of Inuktitut** | The 2022 Inuit and Nunavummiut Employment Survey results indicate that it is important to Inuit employees that they can speak Inuktitut at the mine site and that, for most, working at the mine had not impacted their use of Inuktitut at home. However, 16% of respondents indicated that they felt they spoke Inuktitut now less at home as a result of working at the mine. | | |
| | **Use of AWAR by community** | There was a decrease in usage of the Meadowbank AWAR in 2022 to 2,323 from 3,079 uses in 2021. | | |
| | **Number of consultations with Elder’s Advisory Committee on integrating Inuit knowledge** | Three (3) meetings of the KEAC took place in 2022 (an increase from 2 in 2021). | | |
| | **Agnico Eagle investments to support community and traditional activities** | In total, $129,186 was invested to support community traditional activities. This metric was not available for prior years. | | |
| | **10.3 Country food use at project** | | | |
| | **Country food kitchen usage** | In 2022, country food kitchens were accessed by 20 employees (they were not used in 2021 due to COVID-19). | MEADOWBANK – none<br>WHALE TAIL – none | MEADOWBANK – TBD (cannot be determined at this time)<br><br>WHALE TAIL – TBD (cannot be determined at this time) |
| | **Country food night events attendance** | There were six country food nights hosted in 2022, with approximately 30 individuals participating in total (there were no events in 2021 due to COVID-19). | | |

| Sector and Overarching FEIS Prediction | Metric | 2022 Overview | Specific FEIS Prediction | Accuracy of the FEIS Prediction |
|---|---|---|---|---|
| **11. Nunavut Economy** | **11.1 Royalties and taxes** | | | |
| **MEADOWBANK:**<br>"The economic impacts on the economy of Nunavut, of high magnitude, are positive over the medium term and of high significance, particularly during the construction phase." (Cumberland Resources Ltd., 2006, p. 129)<br><br>**WHALE TAIL:**<br>"The Expansion Project will continue to contribute to territorial economic activity." (Golder Associates, 2018, p. 7) | **Project payments, royalties and taxes** | In 2022, for Meadowbank / Whale Tail, payments from taxes, royalties, and IIBA commitments to the NTI and KIA increased from $99.3M in 2021 to $112.1M in 2022. | MEADOWBANK – none<br>WHALE TAIL<br>"The Project's operational government revenue impact from taxes is projected to be approximately $307 million, of which 14% ($41.5 million) would accrue to Nunavut." (Golder Associates, 2018, p. 8). | MEADOWBANK – TBD (cannot be determined at this time)<br><br>WHALE TAIL – Prediction is supported |
| | **11.2 Trade Balance** | | | |
| | **Nunavut trade balance** | In 2021, the trade deficit was $479M, the lowest levels on record since 2002 (compared to the average of $1,076M from 2010 to 2017). Information for 2022 was not available at the time of PEAMP preparation. | MEADOWBANK – none<br>WHALE TAIL – none | MEADOWBANK– TBD (cannot be determined at this time)<br><br>WHALE TAIL – TBD (cannot be determined at this time) |
| | **11.3 Nunavut GDP** | | | |
| | **Nunavut GDP (all industries), Nunavut GDP (mining, quarrying and oil & gas)** | Nunavut's GDP has been trending upwards since 2010. In 2021, mining accounted for approximately $1,259M or 36% of total GDP ($3,454M). Information for 2022 was not available at the time of PEAMP preparation. | MEADOWBANK – "The results indicate that during the construction phase, the project would contribute $120.3 M to the GDP of Nunavut … During the operations phase, the annual contribution to GDP would be $35.5M…" (Cumberland Resources, 2006, p. 119)<br>WHALE TAIL<br>"During operations, the Expansion Project will represent a contribution to the territorial economy, with total annual GDP contributions of $100 million to $120 million annually." (Golder Associates, 2018, p. 7) | MEADOWBANK – TBD (cannot be determined at this time)<br><br>WHALE TAIL – TBD (cannot be determined at this time) |

### 12.4.6.2 *Parts 3 & 4: Discussion*

For each metric with a specific FEIS prediction that is not supported (as identified in Table 12-18), a trend analysis and discussion is provided here from the 2022 Socio-Economic Monitoring Report (Appendix 4). That report further provides trend analyses and discussions for every metric assessed in Table 12-18, above.

#### *12.4.6.2.1 Project Inuit Employment (Agnico Eagle and Contractors)*

A complete discussion of this issue is provided in Section 1.2 of the 2022 SEMR (Appendix 4), as summarized below.

***FEIS Prediction:***

> MEADOWBANK – none
>
> WHALE TAIL (inc. contractors) – "Excluding the final year of operations when Project employment ramps down, direct average operational employment is expected to be 1,166 […] Of these, nearly half (491 or 42%) are expected to be filled by Nunavummiut, the majority of which are employed at the Meadowbank Mine and will move over to the Expansion Project." (Golder Associates, 2018, p. 9)

***Discussion***: Trends in Agnico Eagle and contractor employment numbers are provided in Figures 62 and 63. In 2022, Agnico Eagle's Inuit employment decreased at Meadowbank / Whale Tail by 33 FTEs and Contractors' Inuit employment increased by 7 FTEs at Meadowbank / Whale Tail. At Meadowbank / Whale Tail, Agnico Eagle's Inuit FTEs comprised 18% of the total employee base in 2022, down from 22% in 2021, and significantly lower than the prediction of 42%; for contractors, Inuit FTEs were 3% in 2022, compared to 2% in 2021.

In 2022, Agnico Eagle started to track missed work hours for Inuit employees as a retention initiative. The aim is to better support employee well-being and prioritize work-life balance. In 2022, Meadowbank / Whale Tail had 55 FTEs in missed hours. The reason for missed hours varies but the most common reasons include no-show, calling in sick, and family reasons. This greatly impacts the overall Inuit FTE count annually.

The level of Inuit employment at Agnico Eagle is explored in detail in the Kivalliq Labour Market Analysis (KLMA). The 2021 KLMA repeats findings of previous analyses that the Kivalliq Inuit labour supply does not meet Agnico Eagle's labour demands due to a combination of factors related to demographics, education and skills, and willingness to work. The Inuit Workforce Barriers and Strategies (IWBS) Study identified two other unintended barriers to the recruitment and hiring of Inuit employees.

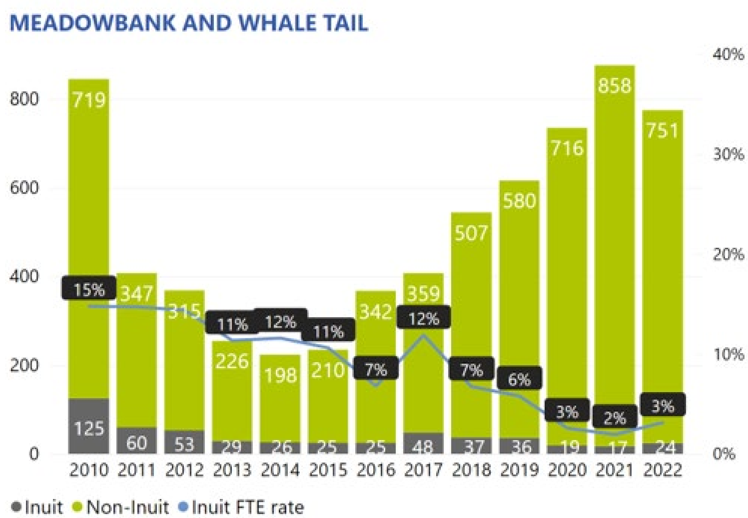
The first is the challenge of navigating the recruitment process itself. Agnico Eagle has made efforts to address this barrier through the Sanajiksanut Program, formerly known as the Labour Pool Process, described below. The second challenge relates to the negative perceptions of the process, such as the perception that the skills of individual applicants are not considered (Mining Industry Human Resources Council (MiHR), 2018a). Other barriers to employment mentioned in the IWBS include rental price increases and the lack of housing.

Sanajiksanut (or the Sanajiksanut Program) is the primary vehicle through which Agnico Eagle recruits and hires new Inuit employees. In 2021, Agnico Eagle and KIA agreed to modify the existing process through a Memorandum of Understanding (MoU). As a result, the Work Readiness and the Mandatory

Trainings were combined to become the Pre-employment Training Program (10-day community-based training). This change reduced the number of steps for applicants and decreased the delay in applicants gaining employment.

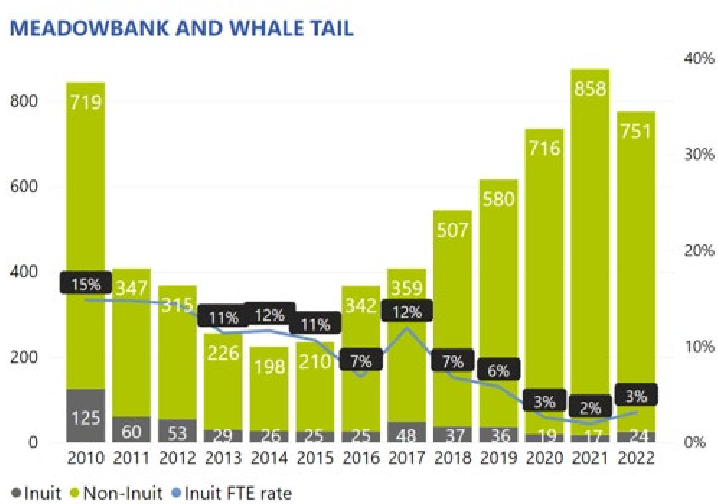
In 2022, the Sanajiksanut Program was redesigned and officially launched. The vision for the Sanajiksanut is to have a recruitment process and approach that is inclusive and accessible for Inuit candidates. The new recruitment process is forward looking to ensure that a new and qualified generation of Inuit employees excels in various positions at Agnico Eagle's mine sites.

**Figure 62 Project Agnico Eagle employment (Inuit & non-Inuit)**




(Agnico Eagle Mines, 2022)

**Figure 63 Project contractor employment (Inuit & non-Inuit) [10]**




(Agnico Eagle Mines, 2022)

[10] Due to data availability, post 2017 Meadowbank / Whale Tail contractor data and all Meliadine contractor data represent full time equivalents (FTEs), derived based on person-hours worked. The remainder of data points (Meadowbank 2010 to 2016) represent the number of employees as a snapshot at one time of year. Trends between these years should be interpreted with caution.

##### *12.4.6.2.2 Project Agnico Eagle Employment by Kivalliq Community*

A complete discussion is provided in Section 1.3 of the 2022 SEMR (Appendix 4), and the issue is summarized below.

***FEIS Prediction*:**

MEADOWBANK – none

WHALE TAIL - Baker Lake is expected to fill 3 management jobs, 16 skilled jobs, 187 semi-skilled jobs, and 66 entry level jobs, for a total of 272 jobs (Golder Associates, 2018, p.10-11).

***Discussion:*** The number of Agnico Eagle's Kivalliq-based employees generally trended downward year-over-year at Meadowbank / Whale Tail, decreasing by 10% in 2020, 14% in 2021 and 14% in 2022, and reaching 223 employees in 2022. Contractors' employment of Kivalliq-based employees also decreased from 51 in 2021 to 23 in 2022. As such, there were 246 Kivalliq-based employees at Meadowbank / Whale Tail. Whale Tail prediction of 272 employees from Baker Lake is not currently being achieved. The new Sanajiksanut Program is a step towards increasing the employment of Inuit from Kivalliq communities

##### *12.4.6.2.3 Income Paid to Projects' Inuit Employees*

A complete discussion is provided in Section 3.1 of the 2022 SEMR (Appendix 4), and the issue is summarized below.

***FEIS Prediction*:**

MEADOWBANK - "Direct project wages paid to people in Kivalliq Region, primarily Baker Lake, could exceed $4M annually." (Cumberland Resources, 2006, p. 121).

WHALE TAIL - "During operations, the Expansion Project is projected to generate $421.1 million (cumulatively) in direct labour income in Nunavut, and $509.3 million in total territorial labour income." (Golder Associates, 2018, p. 12)

***Discussion:***

Total income paid to Inuit employees (excluding contractors) in 2022 was $32.6M, representing an 18% increase since 2021. Income paid to Inuit workers represented 12% of total income paid to Agnico Eagle employees on both sites in 2022. With 85% of Inuit employees residing in the Kivalliq region, there continues to be a significant and positive impact on the personal income of people in the region.

Differing skill and education level requirements influences average income of Inuit across projects. While many Inuit earn substantial income with Agnico Eagle, many still struggle attaining higher income level due to lack of personal educational advancement.

Agnico Eagle supports programs and initiatives intended to increase educational and skills attainment, as well as training, career development, and upward mobility programs for existing employees. Some of these includes Apprenticeship, Career path and Trainee Programs.

##### *12.4.6.2.4 Project Employment by Skill Level*

A complete discussion of this issue is provided in Section 4.4 of the 2022 SEMR (Appendix 4), as summarized below.

***FEIS Prediction*:**

MEADOWBANK - none

WHALE TAIL - "As Nunavummiut employees achieve further training and education, it is expected that they will be better poised to advance to more skilled positions as they arise, thereby increasing representation of Nunavut residents in the skilled, professional and management employment categories" (Golder Associates, 2018, p. 12)

Total composition of employment includes 154 entry level jobs, 493 semi-skilled jobs, 323 skilled jobs, and 202 professional and management jobs. Workers from Nunavut are expected to fill 154 entry level positions, 305 semi-skilled positions, 29 skilled positions, and 4 management positions (Golder Associates, 2018, p.10-11).

***Discussion*:**

Figure 64 shows the number of Inuit employees at each skill level between 2014 and 2022. Agnico Eagle changed how various skill levels are classified in 2013 and 2014, and consequently year-over-year trends of Inuit employment by skill level cannot be drawn pre-2014.

In 2022, the number of Inuit employees continued to decrease in semi-skilled and unskilled job categories at Meadowbank / Whale Tail, but remained constant for management & professional, and decreased for skilled positions. For overall employment by skill level, Meadowbank / Whale Tail had 100 FTEs in unskilled roles, 483 in semi-skilled, 259 in skilled, and 319 in management and professional

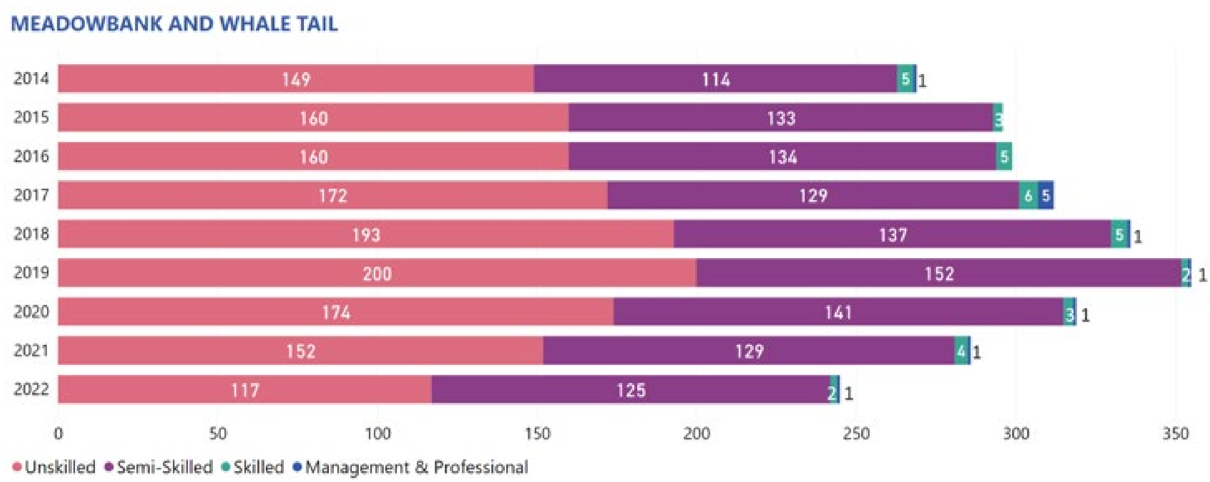
The COVID-19 pandemic impacted the delivery of training and career advancement programs to Nunavut-based workers. Nunavut-based employees were therefore not able to participate in existing and newly developed career paths or other programs that would allow skill and career advancements in 2020 and 2021 that reduced the progress towards those commitments.

There are several longer-term barriers identified in the KLMA to retention and advancement of Inuit in the workplace. These include family needs, cultural priorities, language barriers, and access to support programs. Ultimately, there are three (3) pathways through which higher skilled employment can be achieved: (1) direct hiring, (2) greater retention, or (3) internal career progression. The IWBS Study (Mining Industry Human Resources Council (MiHR), 2018a) also identified several challenges to increasing Inuit representation in higher-skilled positions through internal advancement programs, including inadequate skillsets, high absentee rates, impact of cultural norms, and lack of adequate time and space for training.

Overall, despite the investments Agnico Eagle has been making since project initiation, as well as COVID-19 challenges in recent years, the data point to limited success at growing the number of Kivalliq Inuit labour in higher-skilled positions. It should be noted that the metrics in this section focus on Agnico Eagle employees, however, the FEIS predictions for Whale Tail are for the total direct operational workforce, including Agnico Eagle and contractor employees. As such, based on total employment:

- The FEIS prediction for Whale Tail for total employment by skill level is exceeded.
- The FEIS prediction for Whale Tail for Inuit employment by skill level is not met.

**Figure 64 Project Agnico Eagle Inuit employees by skill-level**




### *12.4.6.2.5 Employee Migration and Population estimated in Kivalliq communities*

A complete discussion of this issue is provided in Section 7.1 of the 2022 SEMR (Appendix 4) as summarized below.

***FEIS Prediction*:**

Employee Migration:

> MEADOWBANK - The Meadowbank FEIS suggests that in-migration of Southerners to Baker Lake would be the primary concern.
>
> WHALE TAIL- “Project employment opportunities could spur migration to Baker Lake and Rankin Inlet.” (Golder Associates, 2018, p. 15).

Population estimated in Kivalliq communities:

> MEADOWBANK- “It is not likely that migration to any other community than Baker Lake would be significant,” but does not provide any specific predictions on changes to populations in Kivalliq communities. (Cumberland Resources, 2006, p. 126)
>
> WHALE TAIL - “Project employment opportunities could spur migration to Baker Lake and Rankin Inlet.” (Golder Associates, 2018, p. 15)

***Discussion*:**

Agnico Eagle monitors the movement of employees into- and out of Nunavut. In 2022, net employee movements included:

- Eight (8) Inuit employees moving out of Nunavut.
- No employees moving into Nunavut.

- No net migration impacts were reported for Baker Lake or Rankin Inlet.

The number of Inuit and non-Inuit employees moving into and out of Nunavut – and between Baker Lake and Rankin Inlet remains minimal. Employment at Agnico Eagle's projects provides Inuit employees with income and skills that may facilitate moving out of the territory. Other factors unrelated to the mines, such as the housing shortage in Nunavut, and the lower cost of living and educational and job opportunities elsewhere in Canada, may also contribute to out-migration.

### 12.4.6.3 *Part 5: Effectiveness of Monitoring*

*Effectiveness of Monitoring*

Existing monitoring programs are able to address most FEIS predictions (Table 12-18), so these monitoring measures are considered to be effective. In some cases, existing monitoring programs (mainly those run at the community- or territory-level) cannot specifically determine the impact of Agnico Eagle's operations on observed changes. Namely these metrics include: health centre visits, social assistance use, and health and safety awareness among families and communities.

*Effectiveness of Mitigation*

A summary of the planned mitigation measures for socio-economic impacts for the Meadowbank operations phase (per FEIS, Appendix B, Table B.15-2) along with implementation in 2022 is provided in Table 12-19.

A summary of the planned mitigation measures for socio-economic impacts for the Whale Tail construction and operations phase (per FEIS, Volume 3, Table 3-C-8, Table 3-C-9, Table 3-C-10) along with implementation in 2022 is provided in Table 12-20.

Overall, the only potentially significant departures from FEIS predictions identified in Section 12.4.6.1 are regarding Project Inuit employment, and Project employment by skill level. Agnico Eagle continues to recognize and address these gaps through new management and mitigation initiatives such as the new Sanajiksanut Program launch to recruit greater number of Inuit employees as part of the Agnico Eagle operation, which is described in the 2022 SEMR.

**Table 12-19 Mitigation measures described in the Meadowbank Project FEIS to reduce impacts of the project on socio-economic VECs (sub-headings in italics), and commentary on current implementation.**

| Planned Mitigation Measure (FEIS, Appendix A, Table B.15-2) | Implementation (unless indicated, reference to 2022 Socio-Economic Monitoring Report, Appendix 4) |
|---|---|
| ***Employment, training, and business opportunities*** | |
| Preferential employment and contracting | **Yes -** See Section 1.1, 5.1 and "Existing Management and Mitigation" |
| Preferential hiring | **Yes -** See Section 1.1, 5.1 and "Existing Management and Mitigation" |
| Preferential procurement | **Yes** - see Section 5.1 |
| Education and training initiatives | **Yes –** Section 4 |
| Education initiatives directed at specific concern around youth and their future in a mixed economy | **Yes –** Section 4.1 and 4.2 and "Existing Management and Mitigation" |
| ***Traditional ways of life*** | |
| Allowing use of project winter road to traditional land users | **Yes** – Section 10.2 |
| Income and workforce management practices that value and provide opportunity for traditional activity | **Yes** – Section 3 |
| Workforce management and community | **Yes** – Section 10 |

| **Planned Mitigation Measure (FEIS, Appendix A, Table B.15-2)** | **Implementation (unless indicated, reference to 2022 Socio-Economic Monitoring Report, Appendix 4)** |
|---|---|
| initiatives in support of traditional activity | |
| ***Individual and community wellness*** | |
| Assistance to individuals experiencing problems and their families, zero tolerance policies | **Yes** – Section 9 |
| Short rotations | **Yes –** Inuit Workforce Barriers and Strategies (IWBS) report (Appendix 61 of the 2018 Annual Report) |
| Workforce management best practice, including codes of conduct, rotation to point of hire, etc. | **Yes –** Inuit Workforce Barriers and Strategies (IWBS) report (Appendix 61 of the 2018 Annual Report) |
| Driver training, public education to reduce potential for traffic accidents | **Yes** - Driver training is part of Mandatory Training, public education to reduce potential for traffic accidents is done through annual AWAR public meetings |
| Operations best practice to minimize emergencies, emergency response planning in the event of an emergency | **Yes** – e.g. Emergency Response Team (ERT) Training, Crisis Management Plan, Emergency Response Plan |
| Support for community wellness initiatives | **Yes** – Section 9 |
| ***Infrastructure and social services*** | |
| Employment at good wages | **Yes** – Section 1 and 3 |
| Avoidance of sites of heritage significance, protocol in place in event that new sites are identified | **Yes** – Socioeconomic and Archaeology Management Plan: Always conduct archeology studies or consultation of previous archaeology studies before construction to confirm present or not of heritage sites. Mitigation measure to be implemented as per the consultant recommendation and Government of Nunavut. |

**Table 12-20 Mitigation measures described in the Whale Tail Project FEIS to reduce impacts of the project on socio-economic valued components (sub-headings in italics), and commentary on current implementation. Excludes environmental design features, as these are a component of completed design plans and not ongoing mitigation. TEMP = Terrestrial Ecosystem Management Plan.**

| **Planned Mitigation Measure** (FEIS Table 3-C-1) | **Implementation (2022)** |
|---|---|
| ***Heritage Sites*** | |
| Complete heritage assessment for the Project footprint to identify archaeological sites present. | **Yes** – Socioeconomic and Archaeology Management Plan - Always conduct archeology studies or consultation of previous archaeology studies before construction to confirm present or not of heritage sites. Mitigation measure to be implemented as per the consultant recommendation and Government of Nunavut. |
| Alter or adjust the location of a Project component or activity to fully avoid impacts on culturally important sites such as graves; otherwise mitigate and conduct heritage resource surveys in accordance with the GN department of Culture and Heritage. | |
| For archaeological sites that will be adversely affected by the Project, and where more passive mitigation strategies (e.g., capping, relocation) are not viable for those locations, preservation by systematic recording (i.e., excavation or documentation) is an option. | |
| Complete additional heritage baseline assessment for any changes to the Project footprint in areas considered to have potential to contain heritage resources. | |
| Agnico Eagle will mark the perimeter of heritage sites to be avoided with flagged stakes or similar, will erect "no work zone" signage, and, if in a potentially high traffic area, will erect snow fencing or similar barrier to prevent entry. Agnico Eagle will monitor condition of site barriers. | **NA** |
| Agnico Eagle will include no work areas on project drawings. | **Yes** – Socioeconomic and Archaeology Management Plan |
| Provide awareness training for Agnico Eagle and Contractors that includes general guidelines for the appropriate response to the inadvertent discovery of known or suspected archaeological materials. | **Yes** – Socioeconomic and Archaeology Management Plan |
| ***Traditional Land Use – Wildlife Harvesting*** | |
| Surveys of proposed granular sources for dens and nests will take place prior to construction. | **Yes** – TEMP |
| Wildlife will have the right-of-way and vehicle traffic will be minimized according to the TEMP. Maximum speed limits of 50 km/hr will be enforced. | **Yes** – TEMP |
| Traffic volumes will be managed and roads closed when large numbers of caribou are present, in consultation with the HTO, GN, and KIA according to the TEMP. | **Yes** – TEMP |
| All employees will be provided with wildlife environmental awareness training. | **Yes** – TEMP |
| Drivers will be alerted when caribou are observed near the haul road. | **Yes** – TEMP |
| Littering and feeding of wildlife will be prohibited. | **Yes** – TEMP |
| Employees will be notified when caribou, muskox and predatory mammals are observed in the local study area. | **Yes** – TEMP |
| Land will be cleared outside the breeding season (June 1 to August 1). Mitigation to reduce impacts to nesting birds will be discussed with Environment Canada. | **Yes** – TEMP |
| All spills will be immediately reported, cleaned up and/or isolated from the receiving environment. Ready access to emergency spill kits. Regular maintenance of equipment to reduce oil leakage. Training in refueling procedures for site staff. Hazardous materials and fuel will be stored according to regulatory requirements. | **Yes -** Detailed mitigation is provided in the Emergency Response Plan, Hazardous Materials Management Plan, Whale Tail Haul Road Management Plan and Spill Contingency Plan. |
| Monitoring for bird nesting activity. Birds showing nesting activity will be discouraged from nesting and roosting on site infrastructure. | **Yes -** Detailed mitigation is described in the TEMP. |
| Attenuation Ponds will be monitored for use by water birds. Deterrents will be used if required. Attenuation Ponds will be monitored for water quality. | **Yes -**Detailed mitigation is described in the TEMP. |
| Enforce no hunting, trapping, harvesting or fishing policy for employees and contractors. Hunter harvest survey, consistent with the Meadowbank Mine will continue. Access to the Project will be controlled (gated at Meadowbank); Restricting public vehicle access beyond km 85 of Meadowbank All-weather Access Road. All efforts will be made to enforce a no shooting zone for the public along the road and around the Project site. | **Yes -** Detailed mitigation is provided in the Whale Tail Haul Road Management Plan, Interim Closure Plan and Reclamation Plan and TEMP. |
| Any PAG or high metal leaching waste rock will be segregated at source and placed into designated areas within waste rock storage facilities to control acid generating reactions and the migration of contaminants. Leachate from the waste rock piles will be monitored and controlled and not released to the natural environment. | **Yes -** Detailed mitigation is provided in the Operational ARD-ML Sampling and Testing Plan, Landfarm Design and Management Plan, Landfill Design and Management Plan, and Mine Waste Rock and Tailings Management Plan, Air Quality and Dustfall Monitoring Plan, Road Management Plan, Water Management Plan, AEMP, CREMP and the TEMP. |
| ***Traditional Land Use – Fishing*** | |
| Best management practices for erosion and sedimentation control (e.g., ground cover, silt fences and curtains, runoff management), where needed. | **Yes –** Water Management Plan |
| Quarries will be inspected on a regular basis to monitor water ponding, particularly at spring melt; when there is flow from a quarry that could enter a waterbody, a water quality sample will be collected and analyzed. | **Yes –** Water Quality and Flow Monitoring Plan |
| The dike will be constructed using non- potentially acid-generating rock or low potential for metal leaching material | **Yes** – Construction Design Report, ARD-ML Sampling and Testing Plan |
| In-stream works will be constructed in winter, when possible, to avoid increased TSS and turbidity, and changes to water and sediment quality. | **Yes** - Best practices |
| Mining staff will not be allowed to hunt or fish while on their work rotation; Agnico Eagle will develop and enforce "no hunting, trapping, harvesting or fishing policy" for employees and contractors, which will be consistent with the Meadowbank Mine. | **Yes** |
| Runoff and seepage from the Project site will be diverted to sumps and attenuation ponds (and treated if required), prior to release. | **Yes –** Water Management Plan, Water Quality and Flow Monitoring Plan |
| Water quality in attenuation ponds will be monitored and managed such that the discharge meets discharge limits. | **Yes –** Water Quality and Flow Monitoring Plan |
| Any potentially acid generating (PAG) or high metal leaching waste rock will be segregated at source and placed into designated areas within the waste rock storage facility. | **Yes –** Operational ARD-ML sampling and testing plan |
| ***Traditional Land Use – Plant Gathering*** | |
| Implement the spill plan for potential chemical spills, including hydrocarbons. | **Yes -** Spill Contingency Plan |
| Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks, sloping of banks), where needed. | **Yes –** Erosion Management Plan |
| Use of non-acid generating materials for road bed and fills. | **Yes –** Operational ARD-ML sampling and testing plan |
| Implement dust control measures on mine roads, when required, including enforcing speed limits. | **Yes –** Air Quality and Dustfall Monitoring Plan, Road Management Plan |
| Road surfaces will be maintained through grading and the addition of granular material. | **Yes –** Road Management Plan |
| Equipment and vehicles will comply with relevant non-road emission criteria at that time of purchase. | **Yes** |
| Waste rock management procedures developed for potentially problematic waste rock/overburden material. Implement the Mine Waste Rock and Tailings Management Plan. | **Yes** - Mine Waste Rock and Tailings Management Plan. |
| Hazardous materials and fuel will be stored according to regulatory requirements to protect the environment and workers. | **Yes –** Hazardous Management Plan |
| Adherence to the AWAR and Whale Tail Pit Haul Road Dustfall Monitoring Plan (Appendix B of the TEMP). | **Yes** – Air Quality and Dustfall Management Plan |
| ***Traditional Land Use – Culturally Important Sites*** | |
| See measures listed under Heritage Resources, above. | **N/A** |
| Provide ongoing consultation with the community of Baker Lake (specifically Elders and the HTO Members), and provide opportunities for participation in heritage resource surveys and mitigation measures. | **Yes** |

| **Planned Mitigation Measure**<br>(FEIS Table 3-C-1) | **Implementation (2022)** |
|---|---|
| Best Management practices for controlling equipment noise emissions, including:<br>• Use of silencers on all trucks<br>• Enforcing speed limits<br>• Regular maintenance will be implemented for equipment and vehicles | **Yes –** Noise monitoring and abatement plan |
| Implement the mitigation measures outlined in the Noise Monitoring and Abatement Plan that was developed for the Meadowbank mine site in 2009 (Agnico Eagle 2009) and refined in 2013 (Agnico Eagle 2013). | **Yes –** Noise report |
| ***Traditional Land Use Access*** | |
| The haul road will be closed to the public. Access to the Project will be controlled (gated at Meadowbank); Restricting public vehicle access beyond km 85 of Meadowbank All-weather Access Road. | **Yes** |
| Enforce no hunting, trapping, harvesting or fishing policy for employees and contractors. | **Yes** |
| Hunter harvest survey, consistent with the Meadowbank Mine will continue. | **Yes -** TEMP |
| Agnico Eagle will work with local wildlife harvesters to ensure the preferred ATV and snowmobile crossing areas are well identified for both hunters and operators on the road. | **Yes** – HTO/Elders consultation |
| ***Socio-Economics*** | |
| Use of existing Meadowbank Mine workforce. | **Yes** |
| Continue existing training initiatives for the Project's workforce. | **Yes –** see 2022 Socio-Economic Monitoring Program Report section "Existing Management and Mitigation" |
| Housing out-of-area workers in on-site camp; Fly-in/fly-out to and from Kivalliq communities | **Yes** |
| Continue social management approach identified in the Socio-Economic Management and Monitoring Plan (Appendix 8-E.6). | **Yes** |
| Implement noise and air quality mitigations including:<br>Adherence to the<br>• Air Quality Monitoring Plan.<br>• Enclosures are used to reduce fugitive emissions at the processing facility.<br>• Adherence to the Incinerator Waste Management Plan<br>•Adherence to the AWAR and Whale Tail Pit Haul Road Dustfall Monitoring Plan (Appendix B of the TEMP).<br>• Best Management practices for controlling equipment noise emissions, including use of silencers on all trucks<br>• Enforcing speed limits.<br>• Regular maintenance will be implemented for equipment and vehicle. | **Yes-** Air and Noise reports |

*Adaptive Management*

Existing management and mitigation related to VSECs are described in the 2022 SEMR (Appendix 4), with any comments for changes to implementation in 2022. These include, for example:

- Sanajiksanut Program official launch
- Aqqiumavvik was selected as the partner to develop new content for the cross-cultural training to include IQ and ISV values and to be more interactive by adding to-do-activities
- A newsletter, containing operational activities and achievements, including a section on how to reach out to the company for questions/ concerns/ suggestions, was produced and sent to the members of the Baker Lake Community Liaison Committee.

## 12.5 WHALE TAIL PEAMP EVALUATION

For each valued component (VC) in the FEIS Addendum for the Whale Tail Pit – Expansion Project (Agnico Eagle, 2018), a summary of the primary effects pathways that were evaluated is provided in Section 12.3, above. The completed PEAMP evaluation for residual effects associated with those pathways is presented in Sections 12.5.1 – 12.5.6, below.

VCs in this FEIS Addendum include Climate, Air Quality, Noise, Permafrost, Terrestrial Environment (vegetation, wildlife and birds), Aquatic Environment (surface water quantity, surface water quality, hydrogeology and groundwater, fish and fish habitat), Heritage Resources, Traditional Land Use, and Socio-Economics. These are generally the same VCs as identified and assessed for the original Meadowbank FEIS (Cumberland, 2005). For two VCs (hydrogeology and groundwater, heritage resources) no primary effects pathways or residual impacts were identified. For the remaining VCs, predicted residual impacts and measured residual impacts are examined here.

### 12.5.1 Aquatic Environment

Key mine development activities that could result in changes to the aquatic receiving environment for the Whale Tail Mine include: Whale Tail and Mammoth Dike construction, dewatering of Whale Tail Lake – North Basin and the IVR area waterbodies, effluent discharge, and dust generated through onsite activities including roads.

Within the FEIS Addendum (Agnico Eagle, 2018), impacts to the aquatic environment potentially generated through these activities are identified for water quantity, water quality, and fish/fish habitat. Predicted and measured residual impacts for each of these VCs are described below.

#### 12.5.1.1 *Water Quantity*

##### *12.5.1.1.1 Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

A summary of predictions for impacts to surface water quantity (FEIS Addendum, Section 6.3, as summarized in Table 3-C-5) and the accuracy of these predictions since 2019 (measured impacts) are provided in Table 12-21. Cells are highlighted in grey when measured impacts exceed predictions for the current year. Future results will be added to that section to ensure historical trends can be observed, even when predicted impacts are not exceeded in a given year.

**Table 12-21 Predicted and measured impacts to surface water quantity for the Whale Tail Site during the construction and operations period (primary pathways according to FEIS Addendum, Table 3-C-5). Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.5.1.1.2.**

| Primary Effect Pathways | Residual Impact | Proposed Monitoring | Key Monitoring Parameters | Key Predicted Impact | Measured Impact | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2019 | 2020 | 2021 | 2022 |
| Project footprint, which will physically alter watershed areas and drainage patterns, may change downstream discharge, water levels, and channel/bank stability in streams, and affect water quality, fish habitat, and fish | Change in discharge rate and the spatial distribution of water | Monitoring of flows and water levels at key locations<br><br>All piped and/or pumped discharges to waterbodies will be monitored continuously<br><br>Climate monitoring, including continuous measurements of rainfall and temperature, will be performed to allow validation of the hydrological model, assessment of seasonal conditions and to provide input to water management.<br><br>Whale Tail Pit Haul Road Management Plan | Whale Tail South water level | Dewatering (2019): peak 155.7 masl<br><br>Operations (2020+): 156.0 masl | Peak: 155.8 masl | Peak: 155.8 masl | Peak: 155.6 masl | Peak: 155.6 masl |
| | | | | | *2019 flood peak was slightly higher than predicted for that year, but did not exceed peak flood level prediction.<br>2020+ flood peaks are slightly lower than predicted due to infrastructure design changes. See discussion, Section 12.5.1.1.2.1* | | | |
| Dewatering of lakes may change discharges, water levels, and channel/bank stability in receiving and downstream waterbodies, and affect water quality, fish and fish habitat | | | Mammoth Lake water level | Dewatering (2019): Slight decrease from baseline<br><br>Operations (2020-2026): Slight increase from baseline | Mammoth Lake levels similar to or slightly greater than predictions. | | | Mammoth Lake levels similar to or slightly less than predictions. See discussion, Section 12.5.1.1.2.2 |
| | | | Northeast Diversion water level | Dewatering in 2020 to permit construction of the IVR Pit | Flooded in 2019 and dewatered in 2020. See discussion in 2020 PEAMP. | | N/A | |
| | | | Nemo Lake water level | Operations (2020+): similar to or slight decrease from baseline | Nemo Lake levels similar to baseline. See discussion, Section 12.5.1.1.2.3. | | | |
| Alteration of watershed | | | Whale Tail | Total | 4,940,198 | 741,620 | No dewatering | |

| Primary Effect Pathways | Residual Impact | Proposed Monitoring | Key Monitoring Parameters | Key Predicted Impact | Measured Impact | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2019 | 2020 | 2021 | 2022 |
| flow paths may change flows, water levels, and channel/bank stability in diverted and receiving waterbodies, and affect water quantity, water quality, fish and fish habitat | | | Lake dewatering discharge monitoring | discharge will occur in 2019, with a volume of 4,643,712 $m^3$ | $m^3$ | $m^3$ | | |
| | | | | | *Some discharge was ongoing until 2020 instead of completion in 2019. Discussed in 2020 and 2021 PEAMP Evaluation.* | | | |
| | | | Freshwater withdrawal monitoring (Nemo Lake) | Operations – 2020+: 125,143 $m^3$/year<br><br>NWB Water License 2AM-WTP1830: 209,544 $m^3$ | 50,559 $m^3$ | 43,252 $m^3$ | 67,816$m^3$ | 75,408 $m^3$ |

#### *12.5.1.1.2 Parts 3 & 4: Discussion*

Where impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion is provided here.

##### *12.5.1.1.2.1 Whale Tail Lake Water Levels*

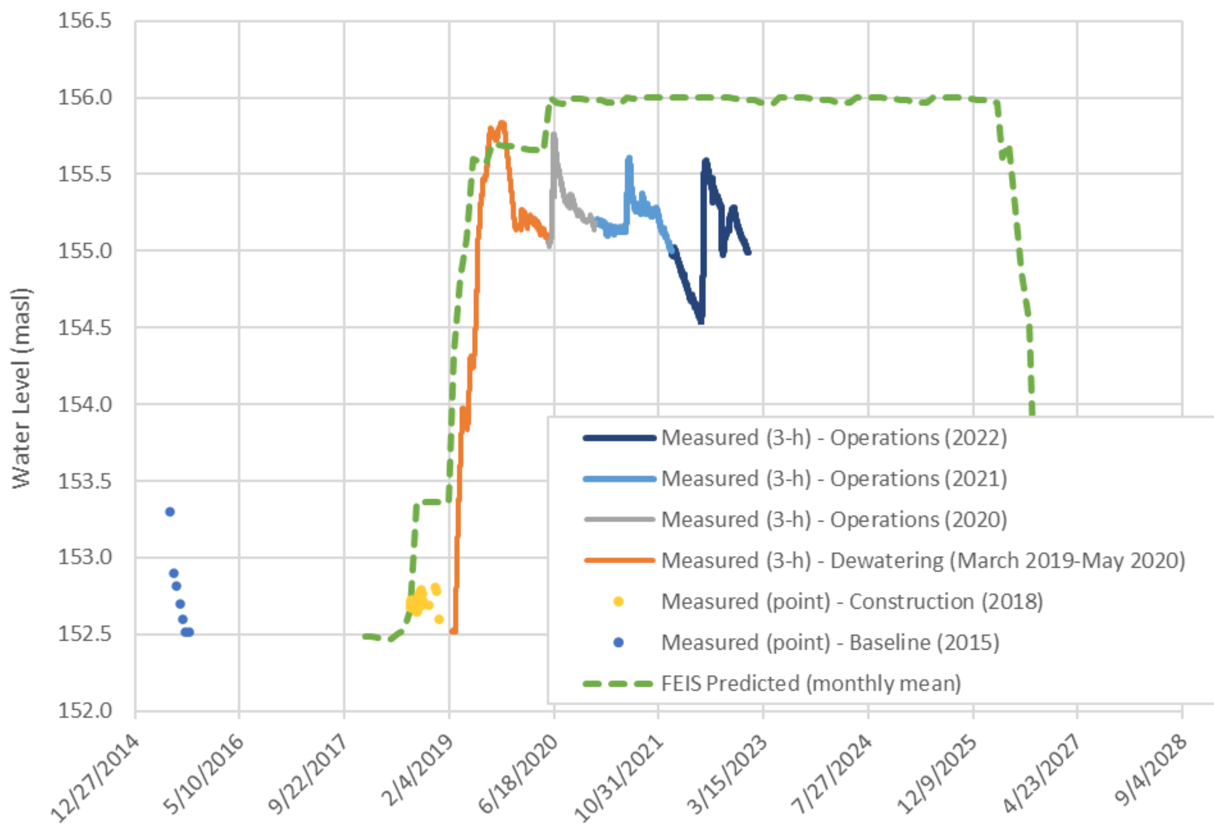
Water levels in Whale Tail Lake South Basin as measured from 2019 - 2022 using piezometric data are shown in Figure 65, below, along with measurements during the construction phase (2018; measured by GPS survey), available baseline measurements (2015), and FEIS Addendum predictions (from FEIS Appendix 6-F). Figure 65 shows the long-term trend in predicted water levels in relation to available baseline, dewatering- and operations-phase measurements. However, it is noted that FEIS-predicted water levels were calculated as monthly timesteps in a mean annual water balance, whereas measured water levels are assessed every 3 hours. Measured values may therefore be expected to vary around the prediction, due to both inter-annual climate variability and scale of measurement.

Due to record rainfall, peak water levels in 2019 exceeded predictions in July (up to 155.8 masl), but did not reach the maximum predicted final flood level of 156.0 masl, which was planned to occur in 2020. Following discussions with NWB, Agnico Eagle pumped non-contact water from the Whale Tail South flood zone directly to Mammoth Lake beginning in October, 2019. This activity temporarily substituted for the passive flow which now (since freshet 2020) occurs through the Whale Tail South Channel.

Beginning in 2020, water levels in Whale Tail South in 2020 were lower than FEIS Addendum models, which predicted a mean level of 156.0 masl would be maintained throughout the operations period. This change follows an amendment to the final design[11] of the Whale Tail South Channel, which included a decrease in the original inlet elevation by 0.5 m, to 155.3 masl. Operational water levels moving forward are therefore expected to be lower than the 156.0 masl mark. As shown in Figure 65, over-winter water levels declined by about 0.5 m more than previous years. The cause of this decline is being assessed. Water levels in WTS now vary from approximately 154.55 – 155.58 masl over the course of a year.

[11] The completed construction summary report for the South Whale Tail Channel is available through the NWB public registry here: ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-WTP1830%20Agnico/3%20TECH/D%20CONSTRUCTION/D16/South%20Channel/

**Figure 65. Measured (3-h interval and monthly mean, as indicated) and predicted water levels in the Whale Tail South flood zone. Predicted water levels from FEIS Addendum for the Whale Tail Pit Expansion Project, Appendix 6-O, Table D-14. Monthly mean water levels are plotted by the month start date.**




### *12.5.1.1.2.2 Mammoth Lake Water Levels*

Water levels in Mammoth Lake as measured primarily throughout the open water seasons of 2018 (construction period) and 2019 (dewatering period) by GPS survey are shown in Figure 66 along with available baseline measurements (2015), 2020-2022 piezometer results, and FEIS predictions for the operations period (months of June – September, annually; from data in FEIS Addendum Section 6.3.3.1.4.2 and ERM, 2020-App. I).

As shown in Table 12-21, FEIS predictions (Agnico Eagle, 2016 - Appendix 6-E) indicated that mean monthly water levels in Mammoth Lake would decline up to 12 cm below baseline values during the dewatering phase. Predictions for the operations phase were updated in the FEIS Addendum (Section 6.3.3.1.4.2, Table 6.3-3) and indicated that mean monthly water levels may increase up to 5 cm from baseline.

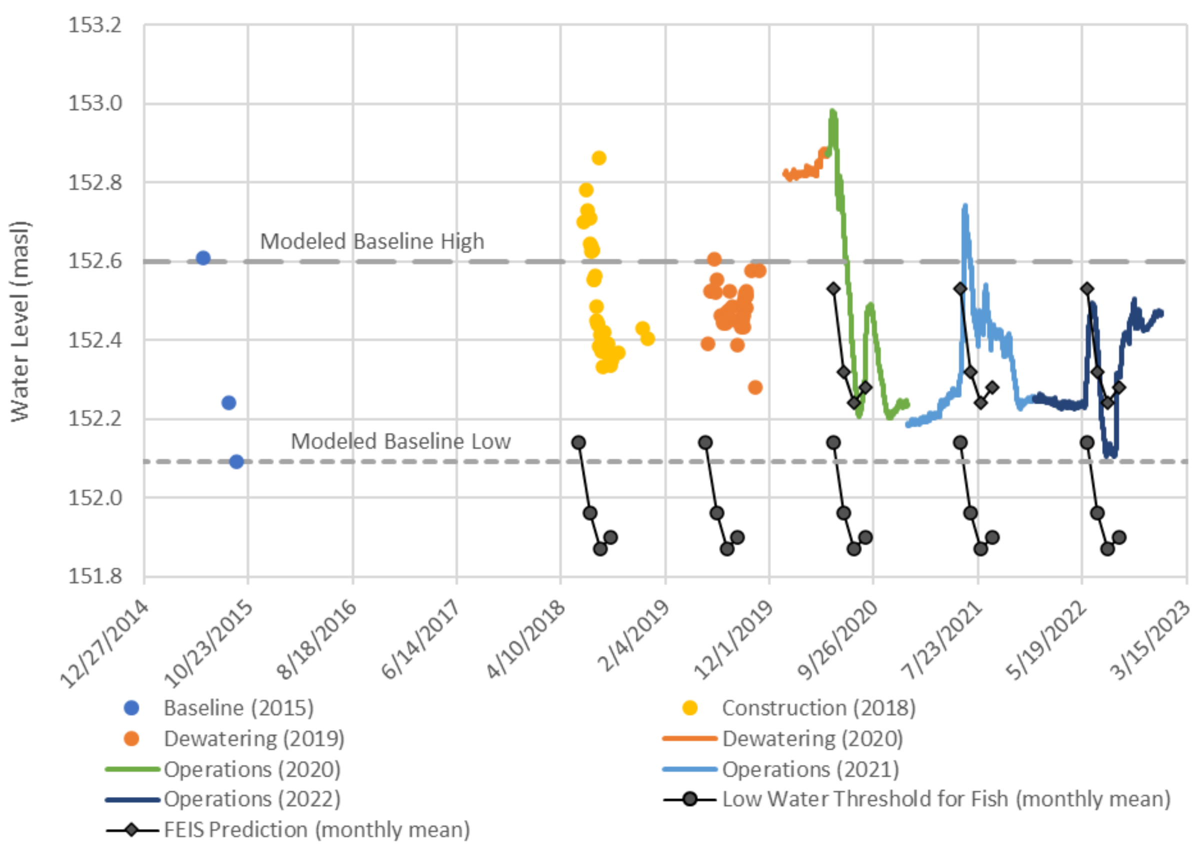
Median, low-flow year, and high-flow year modeled baseline water levels were provided in ERM (2020) – Appendix I, facilitating comparison to FEIS Addendum predictions for changes. Low-water thresholds for ensuring non-measurable residual impacts to fish habitat are also provided in that document. In ERM (2020), predicted water levels were compared to modeled baseline water levels for a low-flow year, as well as modeled baseline median water levels values minus 10%, and the water elevation change associated with a 10% under-ice withdrawal volume (for Mammoth Lake, median water level minus 0.34 m, as shown in Figure 66).

In 2020 and 2021, measured water levels were similar to or higher than the predicted monthly means, and in 2022, measured water levels were similar to or slightly lower than predicted monthly means. The late-summer drop in water levels recorded at Mammoth Lake in 2022 was anecdotally observed in area reference lakes as well (as described in the Fish Habitat Offsets Monitoring Report, Appendix 44), and likely represents natural inter-annual variability. To date, water levels have not declined below measured baseline values or impact thresholds for fish.

**Table 12-22 Predicted change in water levels from baseline in Mammoth Lake during the construction and dewatering phases (from FEIS Appendix 6-E) and operations phase (from FEIS Addendum Section 6.3.3.1.4.2, Table 6.3-3) under mean monthly discharge scenarios.**

| Project Phase | Year (approx.) | June | July | August | September | October |
|---|---|---|---|---|---|---|
| Construction (m) | 2018 | -0.16 | -0.16 | -0.11 | -0.14 | -0.13 |
| Dewatering (m) | 2019 | -0.12 | -0.04 | -0.05 | -0.09 | -0.10 |
| Operations (m) | 2020 – 2026 | +0.05 | +0.02 | +0.03 | +0.04 | +0.03 |
| Closure (m) | 2026+ | -0.20 | -0.20 | -0.14 | -0.14 | -0.13 |

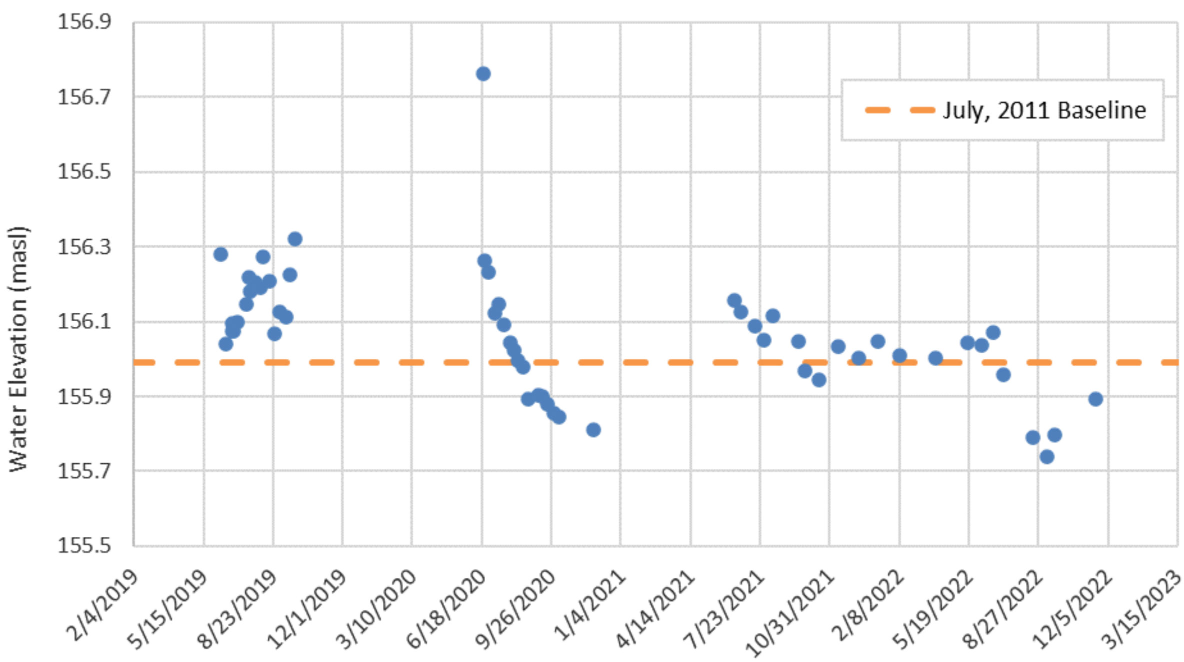
**Figure 66 FEIS predictions (monthly mean for June – September annually; operations phase predictions shown (2020, 2021), from data in FEIS Addendum Section 6.3.3.1.4.2 and ERM, 2020-App. I) and measured water levels in Mammoth Lake. Results from 2015 – 2019 are by GPS survey, and results for 2020+ are piezometric data (3-h intervals). Low water threshold for fish from App. I of ERM (2020) (median baseline water level minus 0.34 m). Dashed grey lines show modeled baseline low-flow and high-flow water levels (ERM, 2020 – Appendix I).**



#### *12.5.1.1.2.3 Nemo Lake Water Levels*

In the FEIS Addendum (Agnico Eagle, 2018), impacts to Nemo Lake water levels were assessed as a result of freshwater intake and changes to discharge patterns as a result of the IVR Diversion. During the operations phase, mean monthly water levels are expected to remain similar to baseline values in May and decrease by 0.07 m in June, 0.09 m in July, 0.08 m in August, 0.07 m in September, and 0.04 m in October, from the baseline values. Measured water levels are shown in Figure 67. Since only a single baseline water level estimate is available (from July, 2011 imagery – C. Portt and Associates, 2018), a quantitative comparison to FEIS Addendum predictions of change is not feasible. However, water levels have generally remained similar to baseline.

**Figure 67. Measured water levels in Nemo Lake. A single baseline water level estimate from July, 2011 imagery is available and water levels may be expected to vary about that point.**




#### *12.5.1.1.3 Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

*Effectiveness of Monitoring*

Although FEIS recommendations for monitoring related to surface water quantity were not always specific, and comparisons of measured results to quantitative FEIS predictions was not always feasible, the monitoring programs being implemented at the Whale Tail Mine are able to measure changes in receiving environment water levels in key locations. Monitoring programs are therefore considered effective.

*Effectiveness of Mitigation*

A summary of the FEIS-planned mitigation measures for surface water quantity along with a commentary on implementation in 2022 is provided in Table 12-23. This summary excludes Environmental Design

Features, which are incorporated into construction plans but are not ongoing mitigation measures included in this annual review.

Since water levels are generally within the range of FEIS predictions accounting for design changes, baseline levels, and/or above low-water thresholds for fish, existing mitigation measures are considered effective at this time.

Mitigation measures related to water quality and fish and fish habitat are provided in Sections 12.5.1.2.3 and 12.5.1.3.3, respectively.

**Table 12-23 Mitigation measures described in the Whale Tail FEIS Addendum (Agnico Eagle, 2018) to reduce impacts of the project to water quantity during the construction and operations phases, and commentary on current implementation.**

| Project Activity | Planned Mitigation Measure<br>(FEIS Addendum, Section 3, Table 3-C-5) | Implementation (2022) |
|---|---|---|
| Mine Infrastructure Footprint (e.g. open pits, site roads, access roads) | Best management practices for erosion and sedimentation control (e.g., ground cover, silt fences and curtains, runoff management), where needed. | **Yes** – Erosion Management Plan |
| Site Water Management: Dewatering of Project Footprint Lakes to Downstream Receiving Lakes | Pumped discharge will be directed to the lake environment, and not directly to outlets, to attenuate flow changes. | **Yes** – Water Management Plan |
| | If feasible, pumped discharge to the receiving environment will cease during the winter. | **Yes –** As feasible |
| Site Water Management: Watershed Modification by Diversion of Water | Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks, sloping of banks), where needed. | **Yes** – Erosion Management Plan |
| | Where practical, natural drainage patterns will be used to reduce the use of ditches or diversion berms. | **Yes** – Erosion Management Plan |
| General construction and operation of the Whale Tail Haul Road | Where deemed appropriate, use of staggered culvert configuration, and removal of snow at the culvert inlet and outlet prior to the freshet to promote drainage during spring thaw and freshet. | **Yes** |
| | Inspection prior to spring melt period to identify build-up of snow or ice, and take remedial action. | **Yes** – Freshet Action Plan |
| | Regular inspection of the road to identify any areas where ponding of water along the road represents a risk, and installing additional culverts or drains to alleviate the risk. | **Yes** – Freshet Action Plan |
| Open Pits | Mined-out pit flooding will be augmented by active fresh water diversion active flooding will reduce the period required to flood the pits, and the period of time with increased hydraulic gradients between waterbodies. | **Yes** – Water Management Plan |
| Existing Meadowbank Infrastructure | See Meadowbank site PEAMP for water quantity | - |

*<u>Adaptive Management</u>*

Since mitigation measures are considered to have been effective, no adaptive management measures for water quantity are proposed for 2023 at this time, based on results of the above PEAMP analysis.

### 12.5.1.2 *Water Quality*

#### *12.5.1.2.1 Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

A summary of predictions for residual impacts to surface water quality (FEIS Addendum, Section 6.2, as summarized in Table 3-C-6) and the accuracy of these predictions in 2019 - 2022 (measured impacts) are provided in Table 12-24. Cells are highlighted in grey when measured impacts exceed predictions for the current year. Future results will be added to that section to ensure historical trends can be observed, even when predicted impacts are not exceeded in a given year.

To assess impacts of the Whale Tail Mine on water quality, site-wide water quality modeling was conducted for the full suite of parameters (nutrients, metals, major ions) for the operations and closure phases as part of the FEIS Addendum (Agnico Eagle, 2018). Water quality predictions were developed for locations within the mine footprint (attenuation ponds [Whale Tail and IVR], flooded Whale Tail Pit, flooded IVR Pit) and the downstream receiving environment (Mammoth Lake, Lake A15, Lake A12, Lake A76, Downstream Node 1, and Downstream Node 2) (FEIS Addendum Table 6.2-3 and Figure 6.2-1).

This PEAMP evaluation focuses on a comparison of general water quality predictions for effluent and receiving environment locations with monitoring results from the Water Quality Monitoring Plan for Dike Construction and Dewatering, the Water Quality and Flow Monitoring Plan, and the Core Receiving Environment Monitoring Program. Water quality monitoring results for onsite locations are not specifically included in this review, since any discharge from those locations to the receiving environment is assessed under effluent monitoring.

Given the uncertainties associated with the FEIS Addendum water quality modelling exercise (i.e., the development stage of the Project, laboratory-based input values, assumptions where data do not exist and consideration of an average climate year), the predicted concentrations are considered by the modellers to be order-of-magnitude estimates (FEIS Addendum Section 6.2.3.3.1). This uncertainty is considered in comparisons of annual water quality monitoring data with FEIS predictions.

The 2022 CREMP report (Appendix 33) provides a comprehensive assessment of water quality monitoring for the receiving environment, with analysis of inter-annual trends, and a comparison to site-specific trigger values and FEIS predictions. For 2020 and onwards, water chemistry data (monthly measured concentrations for each parameter) from Whale Tail South (WTS) and Mammoth Lake are compared to water quality predictions in the 2018 Whale Tail FEIS Addendum. These are the only downstream lakes for which both model predictions and monitoring results are available. In previous CREMP/PEAMP assessments (2019), model results were only available for Mammoth Lake, according to the 2016 FEIS.

Exceedances of FEIS water quality model predictions are noted in Table 12-24, and a full discussion is provided in Section 12.5.1.2.2.

**Table 12-24 Predicted and measured impacts to surface water quality for the Whale Tail Site during the construction and operations period (primary pathways according to FEIS Addendum Section 3, Table 3-C-6). Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.5.1.2.2. *FEIS Addendum, Appendix 6-H – as described in Section 6.2.3.3.1, these are expected to be accurate within an order of magnitude. **Appendix G of the 2021 CREMP Report. *** FEIS Addendum Section 6.2.3.3.2.1**

| Effects Pathway | FEIS/FEIS Addendum Proposed Monitoring | Current Monitoring | Predicted Impact | Measured Impact | | | |
|---|---|---|---|---|---|---|---|
| | | | | 2019 | 2020 | 2021 | 2022 |
| Project footprint, which will physically alter watershed areas and drainage patterns, rates and quantities of diverted non-contact water to new watersheds, change downstream flows through flooding and dewatering, water levels, channel/bank stability in streams, and disturb lakes and **may affect water quality and sediment quality** | Dike Construction and Monitoring Plan (FEIS Addendum – Construction Phase only) | Water Quality Monitoring Plan for Dike Construction and Dewatering | Dewatering effluent: <NWB criteria*** | Dewatering effluent: mostly < NWB criteria. Four exceedances for TSS occurred – see discussion, Section 12.5.1.2.2.1 | Dewatering effluent: < NWB criteria | N/A (no lake dewatering) | |
| Water management activities (dams, drainage, diversion, discharge, and dewatering) that will alter natural drainage paths and create a reservoir may cause a **change in mercury cycling and bioaccumulation** | | | | | | | |
| Activities from construction activities and mining operations (e.g., equipment, vehicles, buildings, open-pit mining, blasting) can create fugitive dust emissions and subsequent dust deposition may cause a **change in water quality** | CREMP | CREMP (inc. Mercury Monitoring Plan) | Receiving environment comparable to FEIS water quality model predictions* | Water quality results to date are consistent with the predicted magnitude of impact (*low* or *medium*). See discussion, Section 12.5.1.2.2 | | | |
| Activities from construction activities and mining operations (e.g., equipment, vehicles, buildings, open-pit mining, blasting) can alter air and dust emissions (including sulphur dioxide, nitrogen oxides, and particulate matter) and subsequent deposition may cause **a change in water quality** | | | | | | | |

| Effects Pathway | FEIS/FEIS Addendum Proposed Monitoring | Current Monitoring | Predicted Impact | Measured Impact | | | |
|---|---|---|---|---|---|---|---|
| | | | | 2019 | 2020 | 2021 | 2022 |
| | | | Total Mercury** - WTS: 5.21 ng/L<br>MAM: 8.43 ng/L | NM (see 2019 CREMP Report) | WTS: <5.21 ng/L<br>MAM: <8.43 ng/L | | |
| Release of treated mine effluent (including sources from sewage, WRSF pond, and attenuation pond contact) may cause **changes to surface water quality and sediment quality (i.e., nutrient and metal concentrations)** in Mammoth Lake in operations and closure.<br>Dewatering of waterbodies may **change** flows, water levels, channel/bank stability, and **water quality (e.g., suspended sediments, nutrients, metals)** in receiving and downstream waterbodies. | Water Quality and Flow Monitoring Plan | Water Quality and Flow Monitoring Plan | Effluent <NWB criteria*** | Effluent <NWB criteria | | | Effluent mostly < NWB criteria except one sample and the monthly mean for total arsenic in April (discharge to WTS) – see discussion, Section 12.5.1.2.2.2 |

#### *12.5.1.2.2 Parts 3 & 4: Discussion*

Where impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), or require further explanation, a discussion is provided here.

##### *12.5.1.2.2.1 Dewatering Effluent*

In 2019, water quality compliance monitoring in accordance with MDMER and NWB criteria was conducted for effluent discharge and dike construction. Among these programs, four water quality samples exceeded MDMER and/or NWB Water License criteria. All were for TSS or turbidity in dewatering effluent from Whale Tail North basin. This low number of exceedances is not expected to constitute a significant departure from overall FEIS predictions of water quality. Whale Tail North basin dewatering occurred between March and December, 2019, with discharge to Whale Tail South basin and Mammoth Lake. During daily water quality monitoring, four isolated incidents arose when individual TSS or turbidity concentrations exceeded the MDMER grab sample maximum and/or NWB Type A Water License criteria for the short-term maximum (STM). The NWB Maximum Monthly Mean (MMM) was not exceeded for any parameter. Based on standard operating procedures identified in the Water Quality Monitoring for Dike Construction and Dewatering Plan, supplemental management actions were not required.

In 2020, dewatering of the Whale Tail North basin to Whale Tail South continued from January – May, Quarry 1 was discharged to Mammoth Lake in April, Attenuation Pond discharge to Mammoth Lake occurred in June – October, and to Whale Tail South in November and December. No exceedances of MDMER/NWB water license criteria occurred.

No lake dewatering occurred in 2021 or 2022.

##### *12.5.1.2.2.2 Receiving Environment Water Quality Predictions*

Within the receiving environment where water quality monitoring is conducted, impact predictions in the form of water quality models are available for Mammoth Lake (2019 onwards), and WTS (2020 onwards). Overall, the FEIS Addendum analysis predicted the magnitude of potential effect on water quality in each of the lakes would be *low* (<1x CCME Water Quality Guidelines for the Protection of Aquatic Life) for all parameters with CCME guidelines, except for total phosphorus which was *medium* (1 to 10x CCME WQGs).

In the 2022 CREMP Report (Appendix 33), monthly mean results for water quality parameters were screened against monthly FEIS Addendum predictions for Mammoth Lake and WTS. This is the same process as 2020 and 2021, but different to 2019 when annual means were compared. As described in Section 6.4.3.3.1 of the FEIS Addendum, these model predictions are estimated to be accurate within an order of magnitude.

In total, 22 parameters exceeded specific monthly predictions for at least one month in 2022 (Table 5-10 of the 2022 CREMP Report (Appendix 33)). None exceeded the 10x range of prediction uncertainty.

Historically, individual monthly concentrations of nitrate and manganese have exceeded that range of uncertainty in a small subset of samples for WTS (March and May, 2020 and/or 2021). No measurements have exceeded 10x the FEIS monthly prediction in Mammoth Lake. These parameters do not have CCME WQGs, and concentrations did not exceed CREMP trigger values (set as the 95th centile of baseline concentrations), and therefore, following the intent of the FEIS magnitude ratings, results would be considered consistent with a “low” magnitude of impact, because measured values exceed average baseline concentrations but are below concentrations associated with adverse effects.

Overall, measured water quality results to date indicate that the magnitude of impact predictions (low, or medium for TP) for Whale Tail South and Mammoth Lake are not being exceeded.

##### *12.5.1.2.2.3 IVR Attenuation Pond Effluent*

Discharge from the IVR Attenuation Pond occurred through this Whale Tail South Diffuser periodically in January, February, April, May, June, and October, 2022. Effluent samples were collected weekly for water chemistry analysis and comparison to NWB Water License limits (station ST-WT-24) and MDMER criteria (station ST-MDMER-11). Complete results are provided in Sections 8.5.3.2.15 and 8.3.2). For samples collected in April, exceedances of MDMER and NWB limits for total arsenic occurred. Specifically, total arsenic (As) concentrations from the treated discharge exceeded the maximum limits set out in MDMER Schedule 4, Table 2, for the maximum authorized monthly mean concentration (0.30mg/L) at 0.3145 mg/L (mean of two samples: 0.4480 mg/L on April 3 and 0.1850 mg/L on April 25). This event was reported to the Spill Hot Line ECCC Inspector on April 29th and a follow-up report was submitted to the inspector on May 27th. There was no exceedance of the MDMER maximum authorized concentration in a grab sample (0.6 mg/L).

The NWB Water License short-term limit for total arsenic (0.2 mg/L) was also exceeded in one sample (April 3, 2022) and the NWB Water License monthly mean limit for arsenic (0.1 mg/L) was exceeded for April with the average of the two results of 0.4480 mg/L on April 3 and 0.1850 mg/L on April 25.

Under MDMER requirements, acute lethality tests for Rainbow Trout and *Daphnia magna* were conducted in association with effluent water quality sampling. The acute toxicity test conducted with samples collected April 3 (coinciding with the maximum measured concentration of total arsenic) showed 0% mortality in both species.

Since arsenic results declined below NWB/MDMER effluent limits after the single exceedance was recorded, no further management action than the actual mitigation measures implemented at the WTP was required.

#### *12.5.1.2.3 Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

*<u>Effectiveness of Monitoring</u>*

Based on the results in Table 12-24 and discussed above in Section 12.5.1.2.2, current monitoring programs are able to address all FEIS impacts for which monitoring was recommended (i.e. monitoring is considered effective).

*<u>Effectiveness of Mitigation</u>*

A summary of the FEIS-planned mitigation measures for surface water quality, along with a commentary on implementation in 2022 is provided in Table 12-25. Since receiving environment water quality to date is within the range of FEIS predictions (specific monthly values or predicted magnitude of effects), and any exceedances of effluent quality limits have been isolated, existing mitigation measures are considered effective at this time.

Mitigation measured related to water quantity, and fish and fish habitat are provided in Sections 12.5.1.1.3 and 12.5.1.3.3, respectively, though some overlap may occur.

**Table 12-25 Mitigation measures described in the Whale Tail FEIS Addendum to reduce impacts of the project on surface water quality during the construction and operations phases, and commentary on current implementation.**

| Project Activity | Planned Mitigation Measure (FEIS Addendum, Section 3, Table 3-C-6) | Implementation (2022) |
|---|---|---|
| Whale Tail Pit Infrastructure Footprint (e.g. open pits, site roads, access roads) | Erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks, sloping of banks), where needed. | **Yes** – Erosion Management Plan |
| | Regular road inspections to check for ponding. | **Yes** – Site inspections |
| | Monitoring during activities and use of adaptive management where necessary. | **Yes** – Site inspections |
| | Pumped water from the dewatered waterbodies will be directed through properly designed structures to the lake environment, and not to lake outlets, to prevent erosion in the receiving waterbodies and to attenuate flows. | **Yes** – Water Management Plan |
| | During dewatering activities, TSS will be monitored, and if necessary, treated before release downstream. | **Yes** – No dewatering in 2022 |
| Site Water Management (drainage and diversions) | Water that does not meet discharge criteria will be treated prior to discharge into Mammoth Lake. | **Yes** – Water Management Plan |
| | A Water Management Plan has been developed and describes designs to reduce changes to local flows, drainage patterns, and drainage areas (adherence to Water Management Plan) | **Yes** – Water Management Plan |
| | Use of turbidity curtains during dike construction to limit disturbance to lakes and waterbodies | **Yes** – Dike Construction and Dewatering Management Plan |
| | Monitoring during activities and use of adaptive management where necessary. | **Yes** – Water Management Plan |
| | Use of the Dewatering Dikes, Operations, Maintenance and Surveillance Manual developed by Agnico Eagle. | **Yes** – OMS Manuels |
| Earthworks: Drilling, blasting and excavation (includes Quarry/Borrow Pit) and Crushing activities for the haul road and Whale Tail Pit development | Where possible, stockpiling of rock and fill from quarries and borrow sites will be placed such that surface water is not diverted through the piles with runoff to surface waterbodies; drainage from quarries will not flow directly into any waterbodies or watercourses. | **Yes** – Erosion Management Plan |
| | When there is seepage from a quarry that could enter a waterbody, a water quality sample will be collected and analyzed. | **Yes** – Site inspections |
| | Quarries will be inspected on a regular basis to monitor water ponding, particularly at spring melt. | **Yes** – Site inspections |
| | Best management practices for erosion and sediment control. | **Yes** – Erosion Management Plan |
| Site Water Management along the road (seepage and runoff) | Use of non-acid generating material at any watercourse crossings. Testing will verify lack of acid rock drainage and metal leaching potential. Testing will continue on new sources identified for road building. | **Yes** – Operational ARD-ML sampling and testing plan |

| Project Activity | Planned Mitigation Measure (FEIS Addendum, Section 3, Table 3-C-6) | Implementation (2022) |
| --- | --- | --- |
| | Road contact water will be monitored during construction. | **Yes** – Construction Design Report |
| Mining and supporting infrastructure for the Whale Tail Pit and haul road | Implement dust control measures, if needed on mine roads. | **Yes** – Air Quality and Dustfall Monitoring Plan |
| | Equipment and vehicles will comply with relevant non-road emission criteria at the time of purchase | **Yes** |
| | Enforcing speed limits (maximum speed 50 km/h) to suppress dust production. | **Yes** – Road logs |
| | If deemed necessary through monitoring, dust from roads will be managed through use of dust suppressant. | **Yes** – Air Quality and Dustfall Monitoring Plan |
| | The running surface of the road will be maintained thereby reducing the generation of dust. | **Yes** – Road maintenance |
| | Adherence to the Air Quality and Dustfall Monitoring Plan | **Yes** – Air Quality and Dustfall Monitoring Plan |
| | Most personnel arriving at or leaving the site will be transported by bus, thereby reducing the amount of traffic (and dust). | **Yes** |
| | Construction equipment and trucks will be equipped with industry-standard emission control systems. | **Yes** |
| | Equipment and vehicles will comply with relevant non-road emission criteria at the time of purchase | **Yes** – Air Quality and Dustfall Monitoring Plan |
| | Exhaust emissions from non-road vehicles will be managed through regular and routine maintenance of vehicles. | **Yes** – Air Quality and Dustfall Monitoring Plan |
| | SO2 emissions from non-road vehicles and stationary equipment will be reduced through the use of low emission diesel fuel. | **Yes** |
| | Adherence to existing air quality monitoring plan to detect changes in air quality | **Yes** – Air Quality and Dustfall Monitoring Plan |
| | Adherence to water quality monitoring and adaptive management in the CREMP to detect changes in water quality | **Yes** - CREMP |
| Dike Construction | Erosion and sediment control measures will be implemented during dike construction, where appropriate (e.g., installation of silt curtains for turbidity control) | **Yes** – Water Quality Monitoring and Management Plan for Dike Construction and Dewatering |
| | The dike will be constructed using non-potentially acid-generating rock or low potential for metal leaching material | **Yes** – Construction design report |
| | Adherence to the Water Quality Monitoring and Management Plan for Dike Construction and Dewatering, including installation of turbidity curtains and monitoring. | **Yes** - Water Quality Monitoring and Management Plan for Dike Construction and Dewatering |
| Development of Supporting Infrastructure for Whale Tail Pit and the haul road | Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks), where needed to limit disturbance to lakes. | **Yes** – Erosion Management Plan, site inspection |
| | In-stream works will be constructed in winter, when possible, to avoid increased TSS and turbidity, and changes to water and sediment quality. | **Yes** - Water Quality Monitoring and Management Plan for Dike Construction and Dewatering, best practices |
| | Where applicable, construction runoff will be captured and managed to minimize suspended | **Yes** – Erosion Management Plan |

| Project Activity | Planned Mitigation Measure (FEIS Addendum, Section 3, Table 3-C-6) | Implementation (2022) |
|---|---|---|
| | solids. | |
| | Regular road inspections to check for ponding. | **Yes** – Site Inspections |
| Mine Site Operations and Maintenance, including the use of existing infrastructure at Meadowbank Mine and the haul road | Best management practices for erosion and sediment control (e.g., silt curtains, runoff management) will be implemented, as needed to limit disturbance to lakes. | **Yes** – Erosion Management Plan, site inspection |
| | Water Management Plan is approved and adhered to at existing facilities and Water Management Plan specific to the Whale Tail Pit areas has been developed and these plans have considered the containment and management of contact site water | **Yes** – Water Management Plan |
| | Runoff and seepage from the Project site will be diverted to sumps and attenuation ponds (and treated if required), prior to release | **Yes** – Water Management Plan |
| | Water quality in attenuation ponds will be monitored and managed such that the discharge meets discharge limits | **Yes** – Water Management Plan |
| | Any potentially acid generating (PAG) or high metal leaching waste rock will be segregated at source and placed into designated areas within the waste rock storage facility | **Yes** - Mine Waste Rock Management Plan, Operational ARD-ML sampling and testing plan |
| | Adherence to the Operational ARD/ML Testing and Sampling Plan and the Mine Waste Rock and Tailings Management Plan | **Yes** - Operational ARD/ML Testing and Sampling Plan |
| Construction and operation of roads | Regular road inspections to check for ponding | **Yes** – Site Inspections |
| | Removal of snow at the culvert inlet prior to freshet. | **Yes** – Freshet Action Plan |
| Development of Supporting Infrastructure for Whale Tail Pit and the haul road | Regular inspection of the road to identify any areas where ponding of water along the road represents a risk, and installing additional culverts to alleviate the risk. | **Yes** – Freshet Action Plan |
| Site Water management: Seepage and Runoff | A Water Management Plan has been developed and describes the containment and management of contact water on-site | **Yes** – Water Management Plan |
| | Seepage will be captured at sumps and diverted to the Attenuation Pond. | **Yes** – Water Management Plan |
| | Facility discharge water will be monitored for water quality, and treated as required, prior to discharge | **Yes** – Water Management Plan |
| | Performance of the dikes will be monitored and appropriate remediation applied, if required | **Yes** – Water Management Plan |
| Fuel Storage and use (includes Chemical and Hazardous material Storage and Explosives Storage Area) | The Spill Contingency Plan will be implemented, including ready access to an emergency spill clean-up kit for cleaning up any spills. | **Yes** – Spill Contingency Plan |
| | Hazardous materials and fuel will be stored according to regulatory requirements to protect the environment and workers and will be stored at the Meadowbank Mine. | **Yes** – Hazardous Management Plan |
| | Storage tanks (e.g., fuel, engine oil, hydraulic oil, and waste oil and coolant) will be double walled, or located in lined and bermed containment areas | **Yes** – Best practices, site inspection |
| | Hazardous wastes will be temporarily stored at Whale Tail Pit and then transported to the Meadowbank Mine in appropriate containers to prevent exposure until they are shipped off site to an approved facility. | **Yes** – Hazardous Management Plan |
| | Individuals working on site and handling | **Yes** – Hazardous |

| **Project Activity** | **Planned Mitigation Measure** (FEIS Addendum, Section 3, Table 3-C-6) | **Implementation (2022)** |
|---|---|---|
| | hazardous materials will have appropriate training (e.g. WHMIS) | Management Plan |
| | Soils from petroleum spill areas will be deposited at the Meadowbank Mine Landfarm | **Yes** – Landfarm Management Plan |
| | Equipment will be re-fueled, serviced, or washed away from the watercourse crossings | **Yes** – BEst practices |
| | Fuel, lubricants, hydraulic fluids, and other chemicals will be stored at least 31 m away from the high water mark of any waterbody. | **Yes** – Hazardous Management Plan |
| | Construction equipment will be regularly maintained | **Yes** – Maintenance logs |
| | Emergency spill kits will be available wherever toxic materials or fuel are stored and transferred | **Yes** – Spill Contingency Plan |
| | Enforced speed limits | **Yes** - Ongoing |
| Mining Activities and Water Management | Adherence to Water Management Plan | **Yes** – Water Management Plan |
| | Treated sewage will be piped to the attenuation pond | **Completed** |
| | Water quality in attenuation ponds will be monitored and managed such that the discharge entering Mammoth Lake meets Type A Water License discharge limits. If water quality does not meet discharge limits, it will be circulated and re-treated. | **Yes** – Water Management Plan |
| | Other applicable design features and mitigation, as outlined in the Interim Closure and Reclamation Plan | **Yes** - Interim Closure and Reclamation Plan |
| Water Management Infrastructure, including existing infrastructure that will be used the Meadowbank Mine site, the haul road, and the Whale Tail Pit | Manage pumping rates so total annual discharge from Whale Tail and Nemo Lake does not drop below the 10-year dry condition | **Yes** – Water Management Plan |
| | Water withdrawal rate(s) will be controlled to avoid effects on the source water lake(s). | **Yes** – Water Management Plan |
| | Capture and reuse site water to reduce fresh water requirements | **Yes** – Water Management Plan |
| | During dewatering activities, TSS will be monitored, and if necessary, treated before release downstream | **Yes** – No dewatering in 2022 |
| | Pumped water from the dewatered waterbodies will be directed through properly designed structures to the lake environment, and not to lake outlets, to prevent erosion in the receiving waterbodies and to attenuate flows. | **Yes** – No dewatering in 2022 |
| | Erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks, sloping of banks), where needed | **Yes** – Construction design report, Freshet Action Plan, site inspection |
| Open Pits | Groundwater inflow to the pits or other dewatered areas will not be directly released to local watersheds | **Yes** – Groundwater Management plan |
| | All pit water will be pumped to the Attenuation Pond for management and treated prior to release | **Yes** – Water Management Plan |
| | Mined-out pit flooding will be augmented by fresh water diversion | **Yes** – Water Management Plan |

*Adaptive Management*

Since no ongoing exceedances of FEIS predictions occurred for water quality programs in 2022, no new adaptive management measures are planned at this time based on this PEAMP analysis.

### 12.5.1.3 *Fish and Fish Habitat*

#### *12.5.1.3.1 Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

The FEIS documents for the Whale Tail Mine assessed potential direct and indirect effects to fish and fish habitat as a result of Project activities. Residual impacts were associated with dewatering dike construction, lake dewatering, water diversion (flooding), pit re-flooding, and effluent discharge. A summary of predictions for residual impacts to fish and fish habitat (FEIS Volume 6, Section 6.5, as summarized in Volume 3, Table 3-C-7; FEIS Addendum Section 6.5, as summarized in Table 3-C-7) and the accuracy of these predictions in 2019 - 2022 (measured impacts) are provided in Table 12-26. Cells are highlighted in grey when measured impacts exceed predictions for the current year. Future results will be added to that section to ensure historical trends can be observed, even when predicted impacts are not exceeded in a given year.

**Table 12-26 Predicted and measured impacts to fish and fish habitat for the Whale Tail Site during the construction and operations period (primary pathways according to FEIS and FEIS Addendum Tables 3-C-7). *Effects Pathways added for the Expansion Project are in italics.* NA = not assessed. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.5.1.3.2. *FEIS values differ slightly from those calculated under the Whale Tail Pit Fish Habitat Offsetting Plan (March, 2018).**

| Effects Pathway | FEIS Proposed Monitoring | Current Monitoring | Predicted Impact | | Measured Impact | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | 2019 | 2020 | 2021 | 2022 |
| **DIRECT EFFECTS** | | | | | | | | |
| The construction of the Northeast, Whale Tail, and Mammoth dikes, and Whale Tail Pit, and the dewatering of the diked area in Lake A17 (Whale Tail Lake) and Lake A16 (Mammoth Lake) will result in the direct loss or alteration of fish habitat. | None | As-built Reports for Mammoth and Whale Tail Dike | *FEIS values* (in-water footprints during operations phase, with assumed baseline water elevations)*:<br><br>Mammoth Dike: 0.07 ha Mammoth Lake dewatering: 0.93 ha (TBD masl)<br><br>Whale Tail Dike: 3.98 ha Whale Tail dewatering: 64.58 ha (152.5 masl) | *Offsetting Plan values* (Portt & Associates, 2018; footprints during operations phase, with baseline water elevations)*:<br><br>Mammoth Dike area above water + dewatering: 1.2 ha (152.57 masl)<br><br>Whale Tail Dike area above water + dewatering: 69.5 ha (153.02 masl) | NA – to be calculated following completion of the as-built reports (est. 2020) | NA – to be calculated in 2021. | NA – per updated FHOMP (June, 2021) to be calculated following offset construction (est. 2026 for WTS and Lake A18, est. 2043 for WTN). See discussion Section 12.5.1.3.2.1. | |
| The dewatering of smaller waterbodies and watercourses in the northeast area to permit construction of the IVR Pit and WRSF for the Expansion Project, and the dewatering of and use of Lake A53 as the IVR Attenuation Pond for the Expansion Project, will result in the direct loss or alteration of fish habitat. | None | As-built Reports for IVR Pit, WRSF, Attenuation Pond | *FEIS Addendum values* (Section 6.5.4.2.2): total losses of 7.9 ha of lake/pond area; 1,155 m of stream length | *Offsetting Plan values* (ERM, 2020 – Table 7-1): Total area of 26.01 ha (inc. watercourses, excl. Whale Tail Lake) | NA | NA – to be calculated following completion of the as-built reports (est. 2026). | | |
| Water diversions for the Whale Tail and Northeast dikes during construction and operations will flood tributary lakes and streams, and will result in access to new habitat.<br><br>*Extension of flooding period for Whale Tail South due to the Expansion Project.* | None | Water level monitoring & surface area calculation<br><br>Fish Habitat Offsets Monitoring Plan (inc. Productivity Study) | ***Northeast Flood Zone*** *FEIS operations phase prediction (2019):*<br><br>Lake A46: +3.5 m to 34 ha, consuming lakes A47, A48, A113, Pond A-P38, and Pond A-P68 including 412 m of flooded streams.<br><br>*FEIS Addendum operations phase prediction (2020+):*<br><br>Dewatered to permit construction of IVR Pit | ***Northeast Flood Zone*** *Offsetting Plan(s) operations phase assumption:*<br><br>Northeast flood zone is assumed lost fish habitat. | Flooded to +3.5 m prior to pumping. | Dewatered in 2020 to permit construction of IVR Pit. | | |

| Effects Pathway | FEIS Proposed Monitoring | Current Monitoring | Predicted Impact | Measured Impact | | | |
|---|---|---|---|---|---|---|---|
| | | | | 2019 | 2020 | 2021 | 2022 |
| | | | ***Whale Tail South Flood Zone*** <br>*FEIS Operations phase assumption:*<br><br>+3.5m to 156 masl (from July 2011 baseline), resulting in 131 ha of flooding, access to new habitat and potential increase in population productivity.<br><br>(Not assumed to provide habitat until after construction of the A18 Sill and drawdown, est. 2026) | NA – flooding not complete in 2019 (peak 155.84 masl) | Annual range of approx. 154.6 – 155.6 masl, and approx. 117 ha of flooding at peak.<br>See full discussion, Section 12.5.1.3.2.2<br><br>Since the flood zone is not considered offsetting habitat prior to permanent sill construction (est. 2026), final flood zone habitat area will be calculated at that time. | | |
| The dewatering of the diked area in Lake A17 (Whale Tail Lake) and Lake A16 (Mammoth Lake) *and smaller waterbodies in the northeast area for the Expansion Project* will result in the removal and subsequent mortality of fish from the area during the proposed fish-out. | None | 2018 Whale Tail Lake Fishout Report<br><br>2020 Whale Tail Expansion Project Fishout Report | ***Whale Tail Lake est. loss:***<br>870 kg or 3346 fish<br><br>***IVR area waterbodies est. loss:***<br>A46 – 2.9 kg<br>A47 – 43.2 kg<br>A48 – 1.2 kg<br>A49 – 23.5 kg<br>A53 – 125.5 kg<br>A0 – 0.4 kg<br>A-P38 – 1.2 kg<br>**TOTAL = 197.9 kg** | ***Whale Tail Lake loss:***<br>776.6 kg or 3078 fish | ***IVR area waterbodies loss:***<br>A46 – 0.56 kg<br>A47 – 2.4 kg<br>A48 – 4.3 kg<br>A49 – 6.5 kg<br>A53 – 55.7 kg<br>A0 – 0.30 kg<br>A-P38 – 0 kg<br>A50 = 0 kg<br>A51 = 0 kg<br>A52 = 0 kg<br>**TOTAL = 69.8 kg** | NA (no fish-out) | |
| **INDIRECT EFFECTS** | | | | | | | |
| The construction of the North-East, Whale Tail, and Mammoth dikes will alter access to tributary streams and lakes (i.e., habitat connectivity) in the LSA, and may result in habitat loss for Lake Trout, Arctic Char, and Round Whitefish. | None | Fish Habitat Offsetting Plan – Complementary Measures | Minor effect on fish populations (not quantified). | NA - post-flooding surveys planned prior to drawdown (est. 2026) under FHOMP | | | |
| Water diversions will result in a reduction of water levels in Mammoth Lake and downstream locations during some project phases, affecting fish and fish habitat. | Water level monitoring | Water level monitoring | No measurable residual impacts to fish (App. I - 2020 Fish Habitat Offsetting Plan for the Whale Tail Pit Expansion Project) | Mammoth Lake levels above baseline and low water level thresholds for fish. See discussion, Section 12.5.1.1.2.3 | | | |
| Release of treated mine effluent (including sources from sewage, WRSF pond, and attenuation pond contact) may change trophic status in Mammoth Lake, *Whale Tail Lake, and downstream waterbodies* in operations and closure. | Total phosphorus (CREMP) | CREMP | **Total phosphorus:**<br>>mesotrophic trigger (10-20 µg/L) in Mammoth Lake, to a max. of 29 µg/L (2021).<br><br>Within mesotrophic trigger range (10-20 µg/L) in WTS to a max. of 20 µg/L (2026). | Below predicted concentrations. | Some exceedances of specific monthly predictions but within or below predicted trophic range. | | |
| | | CREMP | **Phytoplankton**: Increase in phytoplankton biomass and possibly altered species composition in Mammoth Lake, Whale Tail Lake, A15, A12, A76 and potentially further downstream to DS1. | Increase in phytoplankton biomass. | Non-significant increases and decreases in phytoplankton biomass. Significant reduction in taxa richness in WTS. | Increase in phytoplankton biomass (significant in A20 only), no change in species composition. | Non-significant increases in phytoplankton biomass, no change in species composition. |
| | | None | **Zooplankton**: Increase in secondary production (zooplankton) and altered species composition in Mammoth Lake and downstream lakes. | NA (not measured) | | | |
| | | CREMP | **Benthic Invertebrates**: Possible delayed increase in benthic invertebrate abundance and biomass. | No mine-related impacts on benthic invertebrate community. | | | |
| | | Fish Habitat Offsetting Plan – Complementary Measures | **Fish**: Possible increase in forage fish abundance; possible minor increase in growth and reproduction rates for large-bodied fish (not measurable). | Research study underway as described in the 2021 Fish Habitat Offset Monitoring Report (Appendix 44) (complete results planned for 2023) | | | |
| | | *Discussion:* | | *Since in many cases FEIS predictions for impacts of effluent release were not quantitative, further discussion is provided in Section 12.5.1.3.2.4, below.* | | | |

##### *12.5.1.3.2 Parts 3 & 4: Discussion*

Where impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), or for pathways where further details are warranted, a discussion is provided here.

Most quantitative FEIS and FEIS Addendum predictions for impacts to fish and fish habitat were for changes to habitat areas and direct loss of biomass as a result of the dewatering and fish-out of Whale Tail Lake North and the IVR Pit area.

###### *12.5.1.3.2.1 Habitat Losses*

Predicted direct habitat losses for the Whale Tail North area were calculated as the in-water footprints of the Mammoth and Whale Tail Dikes. The validity of these predictions can be assessed by comparing as-built dike footprint area to the footprint from FEIS and offsetting plan designs, taking the assumed baseline water level into account. Construction summary reports (as-built designs) were finalized in November, 2020, and these comparisons were planned to be completed in 2021. In general, the final constructed footprint of these dikes was similar to FEIS-phase designs. However according to the updated Fish Habitat Offsets Monitoring Plan (June, 2021), full structural assessments in the context of fish habitat losses will be conducted once after construction of the final habitat offsets – i.e. for offsets obtained through flooding, this will occur once final post-closure water elevations are reached (est. 2026 for Whale Tail South and Lake A18, and 2044 for Whale Tail North). At that time, structural assessments will confirm the total area of the losses and offsets, and compare these to offsetting plans, including losses related to the footprints of the Mammoth and Whale Tail Dikes.

For the IVR area, habitat losses were calculated in the FEIS Addendum as the area of affected waterbodies and length of affected watercourses. For the associated offsetting plan (ERM, 2020), losses were calculated as a total area, including waterbodies and watercourses. Eventual as-builts for the IVR Pit, IVR WRSF and IVR Attenuation Pond will be reviewed to generally confirm the footprint of those facilities impacts waterbodies as predicted (est. 2026).

###### *12.5.1.3.2.2 Whale Tail South Flooding*

FEIS (2016) predictions indicated that during operations, water levels in Whale Tail South would increase in elevation by 3.5 m (from 152.5 to 156.0 masl) and increase in surface area from 369 ha to 513 ha, resulting in 144 ha of flooding (Volume 6, Section 6.5.3.2). Refined water level modelling in the FEIS Addendum predicted 148.5 ha of flooding at elevation 156.0 masl (FEIS Addendum, Appendix 6-F, Table 6-F-1). The resulting impacts on fish were only assumed to occur at the individual level (access to new habitat). No population-level changes were assumed as a result of this additional aquatic habitat.

Within the Fish Habitat Offsetting Plan for Whale Tail Pit (March, 2018), the calculated expansion of aquatic habitat during operations was 131 ha, which is smaller than FEIS calculations. This is due to differences in assumed baseline water levels (152.5 masl in the FEIS, 153.02 masl in the offsetting plan). Although a potential increase in fish population productivity during the operations phase was noted in this Plan, the flooded terrestrial zone was not assumed to provide fish habitat for offsetting purposes until after drawdown to +1 m above baseline (154.02 masl, from a baseline of 153.02 masl), during the closure phase. This drawdown was planned to occur from 2022 – 2026, and the permanent flooded habitat would occur in Whale Tail Lake only.

No change to these assumptions was presented in the Whale Tail Pit Expansion Project's Fish Habitat Offsetting Plan (ERM, 2020), except the drawdown will not begin until 2026, but will still be completed within the same year. Under this plan, a sill will be constructed between Lake A18 and Whale Tail Lake (South Basin) in 2026 to maintain some of the flooding in upstream areas. The new permanent water level throughout this area would be 155.3 masl, which is 1.3 m above baseline in A18, and 0.3 m above baseline in A22.

Measured water levels in the Whale Tail South flood zone to date are shown in Figure 65. To help preserve integrity of the Whale Tail Dike, construction designs for the South Whale Tail Channel were changed prior to construction in early 2020. The inlet invert elevation was decreased by 0.5 m from original plans, to an elevation of 155.3 masl. As a result, operational water levels in the Whale Tail South area have been lower than the FEIS prediction of 156.0 masl (generally 154.6 – 155.75 masl). These water levels correspond to a terrestrial flood zone range of approximately 50 - 117 ha (FEIS Addendum, Appendix 6-F, Table 6-F-1) which is 14 – 81 ha smaller than the 2018 offsetting plan calculation for the operations period (131 ha). However, as noted above, no offsetting habitat was associated with temporary operations-phase flooding, and the assumptions for permanent habitat creation (post-closure habitat) in both the 2018 and 2020 offsetting plans are still expected to be met once the South Whale Tail Channel is decommissioned, since peak flood levels currently exceed 155.3 masl.

##### *12.5.1.3.2.3 Mammoth Lake and Downstream Water Levels*

FEIS and FEIS Addendum predictions indicated that "*during the construction and operation of the Whale Tail, Mammoth, and WRSF dikes, water diversions will result in a reduction of water levels in Mammoth Lake and downstream locations, affecting fish and fish habitat*" (FEIS Addendum, Section 6.5.4.3). The predicted change in water levels is summarized in Section 12.5.1.1.2.2 (Mammoth Lake Water Level). Discharges and water levels were expected to be slightly reduced at Lake A5, and changes were not expected to be measurable at Lake DS1, so the evaluation focused on Mammoth Lake. Modelled declines in water levels during the construction and closure phases (up to 0.2 m reduction in mean monthly lake level) were predicted to result in a "*moderate effect to population abundance and distribution*" of VC fish species.

However, as part of offset planning for the Whale Tail Pit Expansion Project (Appendix I in ERM, 2020), potential impacts of water level changes in Mammoth and downstream lakes on fish habitat were assessed in more detail. Predicted water levels were compared to modeled baseline water levels for a low-flow year, as well as modeled baseline median water levels values minus 10%, and finally, the water elevation change associated with a 10% under-ice withdrawal volume (for Mammoth Lake, median water level minus 0.34 m – low flow threshold for fish, as shown in Figure 66). Based on this comparison, predicted changes (including up to a 20 cm decline in Mammoth Lake water levels during the closure phase) were expected to have *"a low probability of detectable residual impacts on the downstream aquatic ecosystem"*. Monitoring of water levels in Lake A16 (Mammoth Lake), and if required, in Lakes A12, A15, and A76 during closure was recommended to confirm predictions.

Under the existing water management strategy and as described in the Project FEIS Addendum – Whale Tail Pit Expansion Project (December, 2018; Section 6.3.3.1.4, Table 6.3-3, copied below), no flow reduction is predicted for Mammoth Lake and downstream lakes under the current Operational Phase of the Project (2020 – 2026). During this Project phase, there is no significant water storage strategy onsite and no diversion of water out of the Whale Tail watershed. While the inflow location for Whale Tail Lake to Mammoth Lake has changed from the eastern inlet to the newly constructed Whale Tail South Channel, all flows still fully report to Mammoth Lake. The combined effect of all permitted Operational Phase project activities (including effluent discharge to Whale Tail South and Mammoth Lake) is a minor increase in mean monthly water levels for Mammoth Lake (up to +5 cm above baseline was predicted) during this Project phase.

Although no decline in water levels is predicted for the current operations phase, and monitoring was not specifically recommended until the closure phase, Agnico Eagle has measured water levels in Mammoth Lake since 2018. Monitoring by GPS survey occurred in 2018 – 2019, at which time piezometers were installed in the Mammoth Dike (with 3-h data logging). These measured water levels along with FEIS predictions for the operations period (months of June – September, annually; from data in FEIS Addendum Section 6.3.3.1.4.2 and ERM, 2020-App. I), modeled baseline low flow conditions (ERM, 2020), and the identified low flow threshold for fish (median water level minus 34 cm for June – September; ERM, 2020 – App. I) are shown in Figure 66.

To date, measured water levels have varied about the predicted monthly means on an inter-annual basis. While a late-summer decline was observed in 2022 compared to previous years, this was also anecdotally observed in other area reference lakes in 2022 (as described in the Fish Habitat Offsets Monitoring Report; Appendix 44), and is expected to be a result of natural climatic variability. Water levels did not decline below baseline low-flow levels, nor below low-water impact thresholds for fish.

#### *12.5.1.3.2.4 Lake Ecosystem Productivity*

Since residual impacts on fish and fish habitat due to changes in lower trophic levels were predicted, but those predictions were not quantitative, a discussion is provided here.

Predicted impacts to fish and fish habitat associated with changes in lower trophic levels stem from a predicted increase in nutrient concentrations due to effluent discharge. Increased phytoplankton biomass and possibly altered species composition was predicted but not quantified for Mammoth Lake, Whale Tail Lake, A15, A12, A76 and potentially further downstream to DS1.

For Mammoth Lake, phosphorus concentrations were predicted to increase briefly beyond the CCME mesotrophic range (10 - 20 µg/L) during the operations phase, to a maximum of 29 µg/L (in 2021; Figure 68). Measured concentrations of total phosphorus in Mammoth Lake are shown in Figure 69, and have generally remained below predictions to date with the exception of one individual sample.

For Whale Tail South, concentrations in 2019 – 2022 were predicted to be in the oligotrophic range, or 4 – 10 µg/L, followed by a period in the mesotrophic range during operations (2022 – 2028; 10 – 20 µg/L). Peak concentrations were expected to reach a maximum of 20 µg/L, in 2026 (Figure 68). Predicted and measured values to date are shown in Figure 69. While some measured concentrations of phosphorus have exceeded monthly FEIS predictions in WTS (particularly in 2020), all were within an order of magnitude (the level of uncertainty assigned to these predictions in the FEIS), and average concentrations have been within predicted trophic levels to date.

**Figure 68 Predicted concentrations of phosphorus for various receiving environment locations (from FEIS Addendum for Whale Tail Pit Expansion Project – Appendix 6-H, Section 4.1.3).**

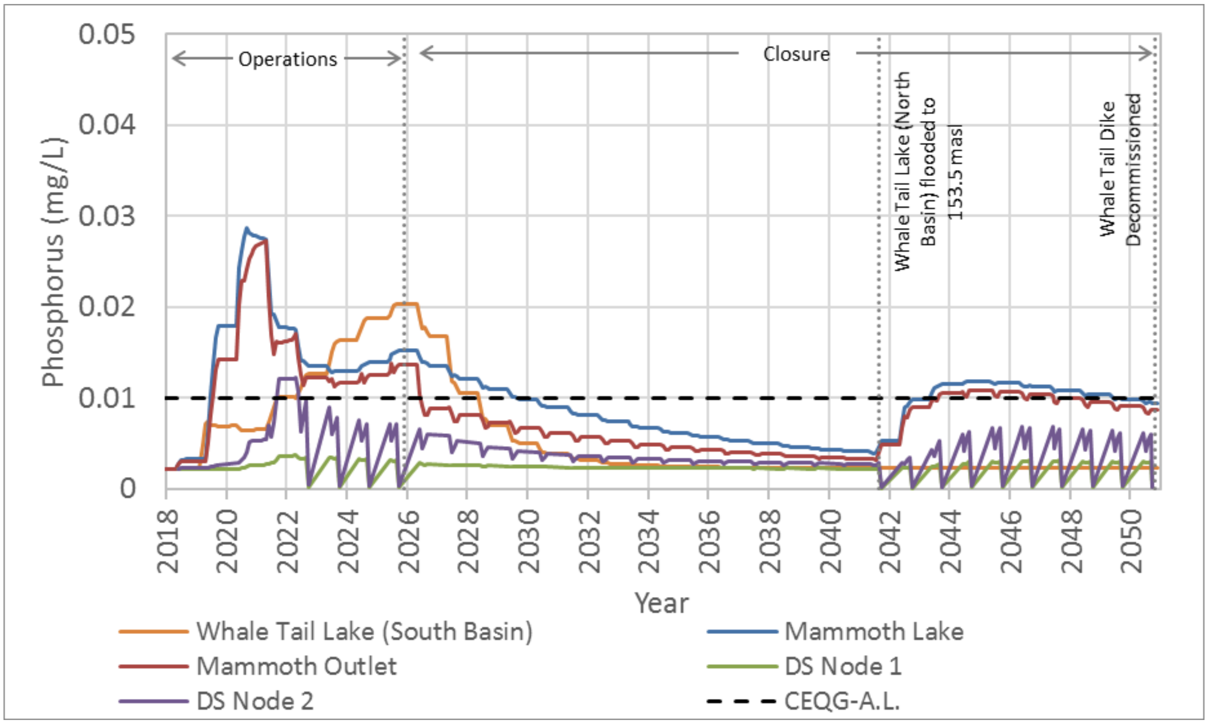
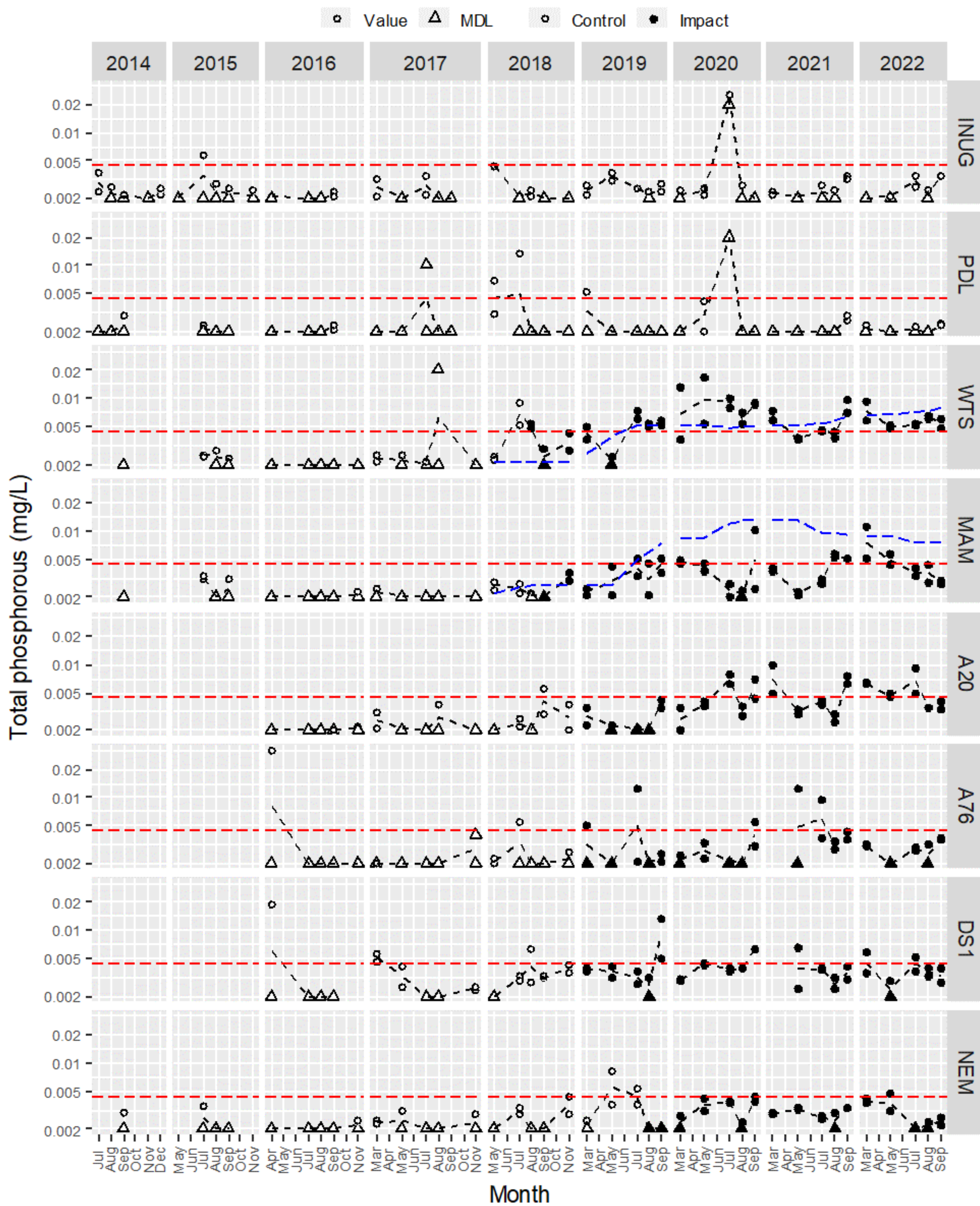
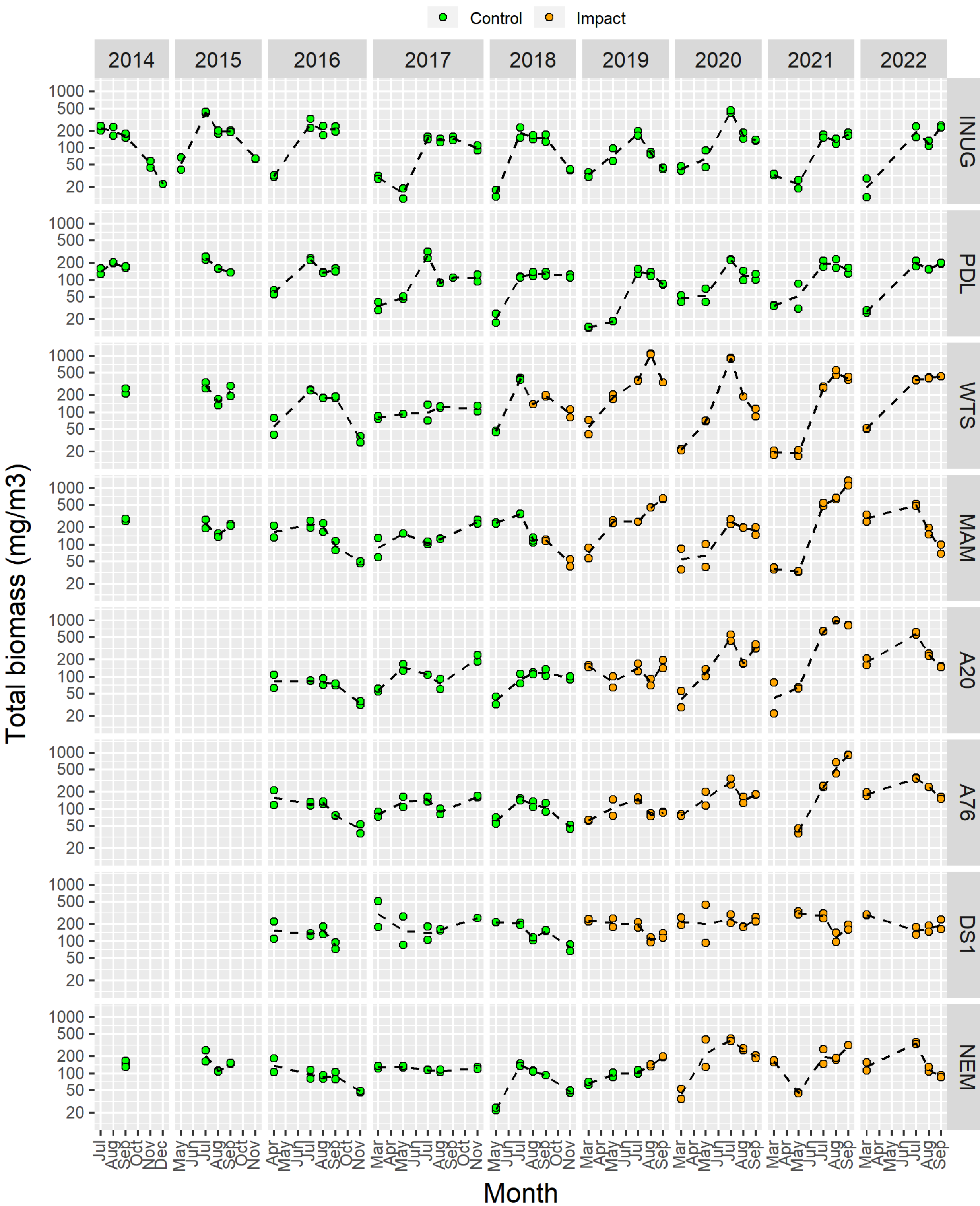


**Figure 69 Total phosphorus in water samples from Whale Tail study area lakes since 2014. Red dashed line indicates CREMP trigger value. Blue dashed line indicates FEIS Addendum model prediction. The detection limit was adjusted for some July 2020 samples from 0.002 mg/L to 0.010 mg/L or 0.020 mg/L.**



In 2019, there was a statistically significant increase in annual average phytoplankton biomass in Whale Tail South and a notable, but not statistically significant, increase in Mammoth Lake (Figure 70, below), relative to baseline/reference conditions. While biomass was higher than seen during baseline monitoring, the apparent increases were also driven by lower biomass at the reference area (INUG) relative to previous years. Thus, the biomass results for 2019 appeared due to the combined influence of natural variability and mining-related activities. In 2020, there were no statistically significant changes to phytoplankton biomass, but in 2021 a statistically significant increase (compared to baseline/reference) was see in A20, along with notable but not statistically significant increases in other near- and mid-field lakes (Mammoth, WTS, A76). In 2022, all near- and mid-field impacted lakes experienced an apparent but not statistically significant increase in phytoplankton biomass. To date, species composition has only been affected (reduced) in WTS in 2020, and not since, suggesting the 2020 observation was due to natural variation. An impact on taxa richness was predicted in the FEIS.

**Figure 70. Total phytoplankton biomass (mg/m³) from the Whale Tail Pit study lakes since 2015.**



No significant mine-related changes in benthic invertebrates have been observed to date, although FEIS predictions indicated impacts may be delayed.

Potential impacts on forage fish that were also predicted to occur are being assessed through a research study agreement with the University of Waterloo (Section 8.10). While early indications suggest increased population abundance in flood zone habitat, differences related to nutrient inputs have not yet been explored. Final results of this study are expected in 2023.

Overall, FEIS predictions for changes to lower trophic levels were not quantitative, but nutrient concentrations have increased for near-field lakes and associated primary production shifts may be occurring, as anticipated.

#### *12.5.1.3.3 Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

*Effectiveness of Monitoring*

Based on the results in Table 12-26, existing monitoring is able to effectively address all FEIS predictions for changes to fish and fish habitat, with the exception of predicted impacts to zooplankton. The rationale for omitting zooplankton is discussed in the 2019 PEAMP.

*Effectiveness of Mitigation*

A summary of the FEIS planned mitigation measures related to fish and fish habitat, along with a commentary on implementation in 2022 is provided in Table 12-27. Since any impacts related to fish and fish habitat to date are within the range of FEIS predictions, existing mitigation measures are considered effective at this time.

Mitigation measured specifically related to water quantity and water quality are provided in Sections 12.5.1.1.2 and 12.5.1.2.2, respectively, though some overlap may occur.

**Table 12-27 Mitigation measures described in the Whale Tail FEIS Addendum to reduce impacts of the project to fish and fish habitat, and commentary on current implementation.**

| Project Activity | Planned Mitigation Measure (FEIS Addendum, Table 3-C-7) | Implementation (2022) |
|---|---|---|
| Mine infrastructure footprint | Best management practices for erosion and sedimentation control (e.g., ground cover, silt fences and curtains, runoff management), where needed. | **Yes** – Freshet Action Plan |
| Site water management (road infrastructure) and Whale Tail Haul Road operation | Where possible, in-stream works will be constructed in winter when watercourses are frozen. In-stream works will be conducted according to DFO timing windows to avoid critical periods for fish. | **N/A** (no construction in fish-bearing watercourses in 2022) |
| | Mining staff will not be allowed to hunt or fish while on their work rotation; Agnico Eagle will develop and enforce “no hunting, trapping, harvesting or fishing policy” for employees and contractors, which will be consistent with the Meadowbank Mine. | **Yes** |
| | Watercourses will be inspected upstream and downstream of the crossings for, erosion, scour, and flow blockages | **Yes** – Road Inspection |
| | Regular inspection of the road to identify any areas where ponding of water along the road represents a risk, and installing additional culverts or drains to alleviate risk, where required. | **Yes** – Road Inspection |
| | Rock aprons at culvert inlets and outlets will provide erosion protection and prevent localized erosion from concentrated high velocity flows above the peak 1:10 year rainfall event. | **Yes** – Road Inspection |
| | Use of staggered culvert configuration, and removal of snow at the culvert inlet and outlet prior to the freshet to promote drainage and increased conveyance of flow during spring thaw and freshet. | **Yes** – Road Inspection |
| Earthworks: Drilling, blasting and excavation (includes Quarry/Borrow Pit) and Crushing activities | Only the required amount of explosive will be used as necessary for the amount of rock or borrow material to be blasted | **Yes** – Blast monitoring Program |
| | Applicable guidelines for set-back distances and quantities of explosives will be followed. | **Yes** – Blast monitoring Program |
| | Where possible, stockpiling of rock and fill from quarries and borrow sites will be placed such that surface water is not diverted through the piles with runoff to surface waterbodies; drainage from quarries will not flow directly into any waterbodies or watercourses. | **Yes** - Mine Waste Rock Management Plan |
| | Borrow and rock quarry activity will be at least 31 m from the high water mark of any waterbody | **Yes** - Mine Waste Rock Management Plan |
| | Borrow pits and quarry will be excavated and sloped for positive drainage | **Yes** - Mine Waste Rock Management Plan |
| | Quarries will be inspected on a regular basis to monitor water ponding, particularly at spring melt. | **Yes** - Mine Waste Rock Management Plan |
| | Drainage from borrow pits and quarry will not flow directly into any waterbodies or watercourses. | **Yes** - Mine Waste Rock Management Plan |
| | When there is ponded water in the rock quarry or borrow pits that could enter a waterbody or watercourse, a water quality sample will be collected and analyzed, and the results used to determine appropriate mitigation measures (e.g., prevent runoff from entering waterbody or watercourse). | **Yes** - Mine Waste Rock Management Plan |
| | To avoid and mitigate Serious Harm to Fish, Agnico Eagle will continue to adhere to blasting requirements and will continue to use practices consistent with those used at the Meadowbank Mine. Agnico Eagle will engage with DFO, when required. | **Yes** – Blast monitoring Program |
| | Use of non-acid generating material at watercourse crossings; testing will verify lack of acid rock drainage and metal leaching potential. | **Yes** - Mine Waste Rock Management Plan |
| | Any PAG or high metal leaching waste rock will be segregated at source and placed into designated areas within the waste rock storage facilities. | **Yes** - Mine Waste Rock Management Plan |
| General Construction /Decommissioning Activities | Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks), where needed to limit disturbance to lakes and streams. | **Yes** - Mine Waste Rock Management Plan |
| | In-stream works will be in winter, when possible, to avoid increased TSS and turbidity, and changes to water quality | **Yes** |
| | Where applicable, runoff from construction / decommissioning activities will be captured and managed to minimize suspended solids (e.g., discharged into an attenuation pond to settle out suspended sediments) | **Yes** – Design report |
| | Where possible, in-stream works will be constructed in winter when watercourses are frozen. In-stream works will be conducted according to DFO timing windows to avoid critical periods for fish. | **Yes** |
| | Bridge abutment installation will span majority of the active channel (i.e., outside of the high-water mark), and if feasible, construction will occur in winter | **N/A** – no bridge installation in 2022 |
| | Disturbed areas along the streambanks will be stabilized and allowed to revegetate upon completion of work | **Yes** – streambanks allowed to revegetate |
| Site Water Management | A Surface Water Management Plan will be implemented | **Yes** – Water Management Plan |
| Dike Construction / Decommissioning causing release of sediment | Use of the Dewatering Dikes, Operations, Maintenance and Surveillance Manual developed by Agnico Eagle. | **Yes** - Water management infrastructure OMS |
| | Best management practices for erosion and sedimentation control (e.g., ground cover, silt fences and curtains, runoff management), where needed. | **Yes** – Water Quality Monitoring Plan for Dike Construction and Dewatering + Freshet Action Plan |
| | During summer construction, turbidity curtains will be installed near the portion of the alignment where dike construction will occur, which is an approach demonstrated at other northern mining projects | **Yes** – Water Quality Monitoring Plan for Dike Construction and Dewatering |
| | Non- potentially acid generating, chemically inert material (i.e., granite) will be used to construct the dike to prevent leaching of metals into water. | **Yes** – Design construction report |
| | Turbidity monitoring will be conducted at designated locations throughout open water and under-ice conditions, within and outside of the zone of the turbidity curtains. In the event that TSS concentrations approach monitoring thresholds, a review of local conditions and activities will be conducted. | **Yes** – Water Quality Monitoring Plan for Dike Construction and Dewatering |
| General mining activities and use of vehicles causing fugitive dust & other air emissions | Implement dust control measures, if needed on mine roads. | **Yes –** Air Quality and Dustfall Monitoring Plan |
| | Equipment and vehicles will comply with relevant non-road emission criteria at the time of purchase | **Yes –** Air Quality and Dustfall Monitoring Plan |
| | Enforcing speed limits (maximum speed 50 km/h) to suppress dust production. | **Yes –** Whale Tail Transportation Management Plan |
| | If deemed necessary through monitoring, dust from roads will be managed through use of dust suppressant | **Yes –** Air Quality and Dustfall Monitoring Plan |
| | The running surface of the road will be maintained thereby reducing the generation of dust. | **Yes –** Air Quality and Dustfall Monitoring Plan |
| | Adherence to the Air Quality and Dustfall Monitoring Plan | **Yes –** Air Quality and Dustfall Monitoring Plan |
| | Most personnel arriving at or leaving the site will be transported by bus, thereby reducing the amount of traffic (and dust). | **Yes** |
| | Adherence to water quality monitoring and adaptive management in the | **Yes** - CREMP |

| Project Activity | Planned Mitigation Measure (FEIS Addendum, Table 3-C-7) | Implementation (2022) |
|---|---|---|
| | CREMP to detect changes in water quality | |
| | Construction equipment and trucks will be equipped with industry-standard emission control systems. | **Yes** |
| | Compliance with regulatory emission requirements will be met. | **Yes –** FEIS air quality impact assessment |
| | Exhaust emissions from non-road vehicles will be managed through regular and routine maintenance of vehicles | **Yes** – Maintenance logs |
| | $SO_2$ emissions from non-road vehicles and stationary equipment will be reduced through the use of low emission diesel fuel. | **Yes** |
| Waste Rock Storage Areas and Stockpiles | A Water Management Plan has been developed and describes the containment and management of contact water on-site. | **Yes** – Water Management Plan |
| | Contact water will be monitored and managed through the Storage and Attenuation Ponds. The IVR Diversion will divert clean runoff from the upper watershed of the IVR Pit to the Nemo Lake watershed. | **Yes** – Water Management Plan |
| | Seepage will be captured at sumps and diverted to the Attenuation Pond. | **Yes** – Water Management Plan |
| | Facility discharge water will be monitored for water quality, and treated as required, prior to discharge | **Yes** – Water Management Plan |
| | Performance of the dikes will be monitored throughout their construction and operating life. | **Yes** – Water Management Plan |
| Site Water Management | Manage pumping rates so total annual discharge from Whale Tail and Nemo Lake does not drop below the 10-year dry condition | **Yes** – Water Management Plan |
| | Water withdrawal rate(s) will be controlled to avoid effects on the source water lake(s). | **Yes** – Water Management Plan |
| | Capture and reuse site water to reduce freshwater requirements | **Yes** – Water Management Plan |
| | Pumped water from the dewatered lakes will be directed through properly designed structures to prevent erosion in the receiving waterbodies | **Yes** – Water Management Plan |
| | Pumped discharge will be directed to the lake environment, and not directly to outlets, to attenuate flow changes | **Yes** – Water Management Plan |
| | Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks, sloping of banks), where needed | **Yes** – Water Management Plan |
| | Water Management Plan will be implemented | **Yes** – Water Management Plan |
| | A fish-out of the diked area of Whale Tail and Mammoth lakes, and smaller waterbodies in the northeast area for the Expansion Project, will be conducted before and during dewatering phase; the fish-out plan will be designed and implemented in consultation with DFO and local Inuit communities, and will consider recommendations in Tyson et al. (2011). | **NA -** fish-out complete |
| | Appropriately sized fish screens, which meet DFO guidelines, will be fitted to pumps to limit fish access and to limit fish entrained to the smaller species and life stages | **Yes** – Water Management Plan |
| | Runoff and seepage from the Project site will be diverted to sumps and the attenuation pond (and treated if required) prior to release. | **Yes** – Water Management Plan |
| | Water quality in attenuation ponds will be monitored and managed such that the discharge meets discharge limits. | **Yes** – Water Management Plan |
| | Potential acid generating rock and metal leaching waste rock will be segregated at source and placed into designated areas within waste rock locations | **Yes** - Mine Waste Rock Management Plan |
| Fuel Storage and use (includes Chemical and Hazardous material Storage and Explosives Storage Area) | The Spill Contingency Plan will be implemented, including ready access to an emergency spill clean-up kit for cleaning up any spills | **Yes** - Spill Contingency Plan |
| | Hazardous materials and fuel will be stored according to regulatory requirements to protect the environment and workers and will be stored at the Meadowbank Mine. | **Yes** – Hazardous Management Plan |
| | Storage tanks (e.g., fuel, engine oil, hydraulic oil, and waste oil and coolant) will be double walled, or located in lined and bermed containment areas | **Yes** – Hazardous Management Plan |
| | Hazardous wastes will be temporarily stored at Whale Tail Pit site and then transported to the Meadowbank Mine in appropriate containers to prevent exposure until they are shipped off site to an approved facility | **Yes** – Hazardous Management Plan |
| | Individuals working on site and handling hazardous materials will have appropriate training (e.g. WHMIS) | **Yes** – Hazardous Management Plan |
| | Soils from petroleum spill areas will be deposited at the Meadowbank Mine Landfarm | **Yes** – Landfarm Management Plan |
| | Equipment will be re-fueled, serviced, or washed away from the watercourse crossings. | **Yes** – best practices |
| | Fuel, lubricants, hydraulic fluids, and other chemicals will be stored at least 31 m away from the high water mark of any waterbody. | **Yes** – Weekly Inspection |
| | Construction equipment will be regularly maintained | **Yes** – Maintenance Logs |
| | Emergency spill kits will be available wherever toxic materials or fuel are stored and transferred | **Yes** – Spill Contingency Plan |
| | Enforced speed limits | **Yes** |
| Mining Activities and Water Management – effluent release | Adherence to Water Management Plan | **Yes** – Water Management Plan |
| | Runoff and seepage from the Project site will be diverted to sumps and the attenuation pond | **Yes** – Water Management Plan |
| | Treated sewage will be piped to the attenuation pond | **Yes** - Completed |
| | Water quality in Attenuation Ponds will be monitored and managed such that the discharge entering Mammoth Lake, Whale Tail Lake, or the alternative discharge locations (Lake 1 or Lake 5) meets discharge limits. If water quality does not meet discharge limits, it will be circulated and re-treated. | **Yes** – Water Management Plan |

*Adaptive Management*

Since existing mitigation measures are considered effective at this time, no adaptive management actions are planned as a result of this 2022 PEAMP evaluation.

### 12.5.2 Vegetation, Terrestrial Wildlife, and Birds

#### 12.5.2.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

The 2022 Wildlife Monitoring Summary Report (Appendix 47) provides a complete assessment of wildlife monitoring programs including a comparison to monitoring thresholds detailed in the Terrestrial Ecosystem Management Plan (TEMP Version 7; 2019) and impacts predicted in the *FEIS for the Whale Tail Pit Project* (Agnico Eagle, 2016) and *FEIS Addendum for the Whale Tail Pit Expansion Project* (Agnico Eagle, 2018). Results are summarized here in the PEAMP format.

For each wildlife VC, a summary of residual predicted impacts and the accuracy of those predictions (observed impacts) as determined through various monitoring programs conducted under the TEMP is provided in Table 12-28. Thresholds for the implementation of adaptive management, as developed in the TEMP were used in this comparison because most impact predictions in the Terrestrial Ecosystem Impact Assessment of the FEIS (Agnico Eagle, 2016) and FEIS Addendum (Agnico Eagle, 2018) were qualitative only. The TEMP thresholds were developed in consultation with the Terrestrial Advisory Group (TAG), and represent quantitative measurement endpoints that trigger management action.

Of note is that Table 12-28 below presents only TEMP results for monitoring conducted in relation to predicted residual impacts for the Whale Tail Mine. Results for all additional TEMP monitoring endpoints have thresholds that were developed for the Meadowbank Complex as a whole, and these results are described in the Meadowbank Mine PEAMP evaluation, Section 12.4.2.

Overall, no TEMP thresholds were exceeded for the Whale Tail Mine in 2022.

**Table 12-28 Predicted residual impacts to terrestrial environment and wildlife VCs for the Whale Tail Site during the construction and operations period (primary pathways according to FEIS Volume 5, and updated to reflect FEIS Addendum, Section 5.4 and 5.5 as indicated); thresholds according to the Terrestrial Ecosystem Management Plan (Version 7; 2019); and measured impacts according to the annual Wildlife Monitoring Summary Report (Appendix 47). NM = not required to be measured in the identified year. NA = no threshold.**

| Effect Pathway | Proposed Monitoring | Current Monitoring | Threshold/ Prediction | Measured Impact | | | |
|---|---|---|---|---|---|---|---|
| | | | | 2019 | 2020 | 2021 | 2022 |
| **VEGETATION (WILDLIFE HABITAT)** | | | | | | | |
| Direct loss and fragmentation of vegetation habitat from the Project footprint | TEMP | TEMP - Ground Surveys, Mapping, GIS Analysis | Predicted/Permitted area + threshold over prediction (Whale Tail site and haul road):<br><br>1188/1505 ha + 5% | NM | | 775 ha | NM |
| Loss or alteration of local flows, drainage patterns (distribution), and drainage areas from the Project footprint and haul road that can cause changes to vegetation | None | TEMP - Ground Surveys, Mapping, GIS Analysis | *FEIS Addendum, Section 5.4.3.1.2:* Localized and temporary effects to vegetation habitat quality through decreased species abundance. | NA (no threshold) | | | |
| Dust deposition on vegetation from haul roads and mining activities (air emissions, dust deposition, or chemical contamination on terrain, soils, and vegetation can potentially change the quality and/or chemical properties of soil and effecting vegetation) | TEMP | TEMP (Screening Level Risk Assessment) | *Prediction (Proponent Response to IRs for the Whale Tail Pit Expansion Project FEIS Addendum, "Human Health and Ecological Risk Assessment – Whale Tail Pit Expansion Project" – Golder, May 2019):* All soil concentrations <CCME guidelines or max. baseline + 10%. All water concentrations <screening values. | NM | NM (2020 assessment postponed to 2021) | All soil concentrations <CCME guidelines or max. baseline + 10%, or exceedances not mine-related. All water concentrations <screening values. | NM |
| **UNGULATES** | | | | | | | |
| Sensory disturbance from vehicles, on-site equipment, human presence and vibrations, can change the amount of different quality habitats, and alter wildlife movement and behaviour | Satellite-collaring data; Road surveys; Pit and mine-site ground surveys; Incidence reports, HOL surveys | Satellite-collaring data; Road surveys; Pit and mine-site ground surveys; Remote cameras; HOL surveys | No threshold as of 2019 – Caribou Management Decision Tree in place | NA (no threshold) | | | |
| Direct loss and fragmentation of wildlife habitat from the Project footprint | Ground Surveys, Mapping, GIS Analysis | Ground Surveys, Mapping, GIS Analysis | High Suitability Habitat Predicted/Permitted Area + threshold over prediction:<br><br>Growing – 38/56 ha + 10%<br><br>Winter – 613/1057 ha + 10% | NM | | Growing – 21 ha<br><br>Winter – 561 ha | NM |
| Barriers to migration, which may affect population connectivity and distribution | - | Remote camera | None | NA (no threshold) | | | |
| **PREDATORY MAMMALS** | | | | | | | |
| *NONE* | - | - | - | - | - | - | - |
| **SMALL MAMMALS** | | | | | | | |
| *NONE* | - | - | - | - | - | - | - |
| **RAPTORS** | | | | | | | |
| *NONE* | - | - | - | - | - | - | - |
| **WATERBIRDS** | | | | | | | |
| Destruction of nests and flooding from construction activities including increased flows or water levels can increase risk of mortality to individual birds, which can affect population sizes | None | Trent University/ECCC migratory bird deterrent studies (2018 – 2020); Migratory Bird Protection Report (Appendix 47) | *Prediction (FEIS Section 5, Table 5.5-11)*: Total 89 nests displaced (waterbirds and upland birds) | Prelim est. 32 – 62 nests displaced | | Final estimate: 31 – 50 nests lost through flooding | - |
| ***UPLAND BREEDING BIRDS*** | | | | | | | |
| Sensory disturbance from vehicles, on-site equipment, human presence and vibrations, can change the amount of different quality habitats, and alter wildlife movement and behaviour | None | PRISM Plots and BBS (resumed 2022) | *Threshold: None*<br><br>*Prediction (FEIS Volume 5, Section 5.5.3.3):* Upland bird density will decrease by 50% within 200 m of project facilities. At 1.41 birds/ha, 6000 birds may be impacted.<br><br>*Prediction (FEIS Addendum, Section 5.5.3.3):* Additional 419 birds impacted. Changes in density or productivity are unlikely to be detectable. | NA – program suspended pending ongoing regulatory review. | | NA – Agnico Eagle/ECCC agreement for PRISM and BBS to begin in 2022. There will be no threshold. | Surveys initiated. |
| Destruction of nests and flooding from construction activities including increased flows or water levels can increase risk of mortality to individual birds, which can affect population sizes | None | Trent University/ECCC migratory bird deterrent studies (2018 – 2020); Migratory Bird Protection Report (Appendix 47) | See Waterbirds section, above. | See Waterbirds section, above. | | | |

#### 12.5.2.2 *Parts 3 & 4: Discussion*

Where impacts are exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion is provided here. To date, no thresholds have been exceeded.

#### 12.5.2.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

*Effectiveness of Monitoring*

Based on the results in Table 12-28, current TEMP monitoring programs are able to address all FEIS impacts for which TEMP monitoring was recommended (i.e. monitoring is considered effective).

*Effectiveness of Mitigation*

FEIS-planned mitigation measures to limit impacts of the Whale Tail Pit Project on terrestrial wildlife were originally described in the Terrestrial Ecosystem Management Plan (Version 2, June 2016), a component of the FEIS (Agnico Eagle, 2016). This plan is updated regularly and the current version includes a mitigation audit. The audit is to be undertaken annually with results summarized in the annual Wildlife Monitoring Summary report.

The audit evaluates:

- What mitigation has been implemented;
- Which mitigation is perceived to be, or shown to be successful;
- If new mitigation has been implemented in response to new issues; and
- If some mitigation is redundant.

However, in the context of the PEAMP evaluation, mitigation is considered effective if impact predictions (or in this case, TEMP thresholds) are not being exceeded. Therefore, since no TEMP thresholds were exceeded for the Whale Tail Mine in 2022, mitigation is considered effective.

*Adaptive Management*

Although no TEMP thresholds were exceeded in 2022, several management recommendations are planned to be implemented in 2023 along with continued implementation of all TEMP monitoring and management programs. These management recommendations are summarized in the PEAMP for the Meadowbank site, above (Section 12.4.2.3).

### 12.5.3 Noise

#### 12.5.3.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

In the initial FEIS (Agnico Eagle, 2016), noise impacts were modeled and assessed for three primary pathways: construction of the Whale Tail Haul Road, operation of the Whale Tail Haul Road, and operation of the Whale Tail Pit. In the FEIS Addendum for the Whale Tail Pit Expansion Project (Agnico

Eagle, 2018), no new primary pathways were identified but updated noise modeling for the Project incorporated new activities (haul road widening, surface and underground mine operations) and modeling approaches (modeling for the full length of the haul road during operation). Modeling reflects mining activities during the year 2022, which is planned to be the year of highest production for the Project, and anticipated highest sound emissions.

In the FEIS noise assessment, modeled Project sound levels at the local study area (LSA) boundary were compared with Permissible Sound Levels from AER Directive 038 (40 dBA night-time, 50 dBA daytime) to provide a reference for Project impacts. However, residual impacts were not specified or classified as significant or non-significant because noise does not have an assessment endpoint. Any potential effects associated with the primary pathways are captured in the assessment of potential effects to other VCs (e.g. wildlife and the aquatic environment).

Monitoring sites were established around the site and along the Whale Tail Haul Road, as described in the Noise Monitoring and Abatement Plan. For the purposes of this PEAMP, measured sound levels in those locations are compared to model predictions for ambient noise levels in the FEIS Addendum (Agnico Eagle, 2018). In accordance with noise mitigation measures listed in the FEIS Addendum (Volume 3, Appendix 3-C, Table 3-C-1 and see below Table 12-29), periodic far-field monitoring was conducted in 2022 to validate modeling and confirm adherence with the PSL.

Table 12-29, below, compares FEIS predictions for area sound levels with the results of noise monitoring conducted under the current Noise Monitoring and Abatement Plan. For all monitoring stations, FEIS predictions were derived from the maximum sound emissions scenario: summertime, haul road widening plus surface and underground operations (Agnico Eagle, 2018 - Volume 4, Figure 4.4-3). Measured background sound levels (Agnico Eagle, 2016 - Volume 4, Appendix 4-D) were added to all predictions.

No exceedances of FEIS-modeled maximum sound levels have occurred to date.

**Table 12-29 Predicted and measured sound levels for the Whale Tail Site and Haul Road. *Values identified from sound level contours in Agnico Eagle, 2018; Section 4, Figure 4.4-3 plus measured background levels (Agnico Eagle, 2016; Appendix 4-D). Measured impacts exceeding predictions are shaded grey and further discussed in Section 12.4.3.2. ^Value for 2019 from the FEIS (Agnico Eagle, 2016; Volume 4). **Adjusted from values incorrectly reported in 2020.**

| Effect Pathway | Monitoring Station | FEIS Addendum Predicted Max. Value (dBA)* | Measured Values $L_{eq,\ 24\text{-}h}$ (dBA) | | | |
|---|---|---|---|---|---|---|
| | | | 2019 | 2020 | 2021 | 2022 |
| Noise emissions from vehicles on the haul road can increase ambient noise levels. | R6 | 2019^: 50.0<br>2020+: 42.5 | 41.8 | 33.1 | - | 33.4 |
| | | | - | 28.2 | 34.2 | - |
| | R7 | 40.4 | - | 36.8 | 37.9 | - |
| Noise emissions from mining equipment can increase ambient noise levels. Blasting can result in ground vibration and increase ambient noise levels. | R8 | 45.1** | - | 32.8 | 39.3 | - |
| | | | - | - | 40.6 | - |
| | | | - | - | 41.4 | - |
| | R8a | 40.4 | - | - | - | 29.5 |
| | R9 | 45.1 | - | 35.5 | 39.8 | - |
| | | | - | 30.9 | 35.5 | - |
| | R9a | 45.1 | - | - | - | 34.0 |
| | R10 | 50.0** | - | - | 41.3 | - |
| | R10a | 40.4 | - | - | - | 29.9 |
| | R11 | 50.0 | - | 38.8 | - | - |
| | | | - | 34.7 | - | - |
| | R11a | 50.0 | - | - | 37.4 | - |
| | | | - | - | 35.0 | - |
| PSL check (far field station) | R12 | 35 | - | - | - | 31.0 |

#### 12.5.3.2 *Parts 3 & 4: Discussion*

Where impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion will be provided here.

No exceedances of FEIS-modeled maximum sound levels has occurred to date.

#### 12.5.3.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

*Effectiveness of Monitoring*

The noise monitoring program that was implemented in 2022 at the Whale Tail site was conducted in accordance with the approved Noise Monitoring and Abatement Plan (December, 2018), which was designed in conjunction with the FEIS Addendum's noise impact assessment. This monitoring program is therefore considered effective and suitable to confirm noise impact predictions.

*Effectiveness of Mitigation*

FEIS-planned mitigation measures to limit impacts of the Project on area noise levels were described in the FEIS Addendum Volume 3, Table 3-C-1 and the associated Noise Monitoring and Abatement Plan for the Project (Version 4, December 2018). This Plan includes noise mitigation measures for both the Meadowbank and Whale Tail sites, and implementation of the planned abatement measures in the current year is detailed in Section 12.4.3.

Since no exceedances of FEIS predictions have occurred for the Whale Tail site, existing mitigation measures are considered to be effective.

*Adaptive Management*

In 2022, two noise surveys could not be completed for all stations due to mechanical failure of the noise monitoring equipment and lack of spare parts onsite. Actions to ensure more complete noise data collection in 2023 are planned, including in-house testing of the equipment prior to field deployment. Spare parts are now available onsite in the event of equipment failure and all monitoring equipment calibrations have been completed.

No other adaptive management actions are planned for 2023 since monitoring results indicate that sound levels onsite are not exceeding impact predictions and all planned mitigation practices are in place.

### 12.5.4 Air Quality and Climate

#### 12.5.4.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

In the Whale Tail Mine FEIS documents, residual impacts were not classified for air quality as a VC, because air quality does not have an assessment endpoint, only measurement endpoints (i.e., comparison to relevant ambient air quality guidelines or standards). Any potential effects associated with the primary pathways are captured in the assessment of potential effects to, and residual impact classifications for, other VCs. Nevertheless, quantitative predictions were made in relation to air quality guidelines, so the validity of those predictions is assessed here, where feasible using results from approved monitoring programs.

In order to estimate potential impacts of the Project on air quality, modeling exercises were conducted as a component of the FEIS Addendum to determine emission rates and dispersion of various criteria air contaminants (CACs) from different Project sources (Agnico Eagle, 2018; Section 4). These included assessments for the Whale Tail Site and the Whale Tail Haul Road.

For the Whale Tail Haul Road, calculation of CAC emissions included the following sources:

- Exhaust from vehicles operating on the haul road; and
- Road dust from the un-paved haul road.

Air quality dispersion modelling of a representative 1 km section of the haul road oriented northeast to southwest was used to predict the following:

- Maximum plus background concentrations of CACs as a function of distance from the haul road;
- Maximum dust deposition as a function of distance from the haul road.

For the Whale Tail Site, calculation of CAC emissions included the following sources:

a) Whale Tail Pit activities, including:
   - in pit and underground drilling and blasting;
   - in pit and underground material handling;
   - un-paved road dust from mining operations; and
   - exhaust from off-road equipment operating in the Whale Tail Mining area;

b) Wind erosion from ore pad and waste storage pile;

c) Stationary combustion emissions from the camp heating and camp power; and

d) Un-paved road dust and vehicle exhaust from the section of haul road within the Property boundary; and

e) Emissions from an incinerator.

Air quality dispersion modelling was then conducted to predict maximum plus background concentrations of CACs at the Property boundary. Associated monitoring was recommended and is conducted according to the Air Quality and Dustfall Monitoring Plan (March, 2022), as follows:

**Table 12-30. Air quality monitoring locations and parameters for the Whale Tail Site and Haul Road (Air Quality and Dustfall Monitoring Plan, March 2022). ^Installed in 2021.**

| Monitoring Location | Measured Parameters |
|---|---|
| DF-6a or b | TSP, $PM_{10}$, $PM_{2.5}$, passive $NO_2$, dustfall |
| DF-7^ | Continuous active $NO_2$ |
| DF-8 (co-located with DF-7) ^ | Passive $NO_2$ |
| Whale Tail Haul Road km 134 | Dustfall transect |
| DF-9^/Whale Tail Haul Road km 151 | Passive $NO_2$, dustfall transect |
| Whale Tail Haul Road km 169 | Dustfall transect |

For the Whale Tail Haul Road, dust deposition is measured over three transects using static dustfall collectors that are deployed in the field for a 30-d period. However, due to differences in particle sizes collected by static dustfall monitors (typically < 0.85 mm) and those assessed through air quality emissions and dispersion modelling (typically < 30 µm), these are considered screening-level comparisons only. Since dustfall canisters collect particles across a much wider range of sizes than included in standard modeling, they are very likely to measure higher rates of total dustfall than those specified in the FEIS. However, if measured dustfall is lower than predicted dustfall, model results can be verified as conservative. To improve the comparison, maximum measured background rates of static dustfall in this area during baseline studies (0.27 $mg/cm^2/30d$) are added to FEIS predicted deposition rates (see 2022 Air Quality and Dustfall Monitoring Report in Appendix 50 for further details).

For the Whale Tail Mine, concentrations of suspended particulates are assessed using automated air samplers (Partisol 2025 Sequential Air Samplers). These samplers measure concentrations of suspended particulates over a 24-h period every 6 days. Again, field-measured suspended particulate matter concentrations are considered appropriate for comparison with model predictions for screening purposes only, for various reasons.  For example, models incorporate emissions from specific sources, under set meteorological conditions, and terrain considerations. Further, much like dustfall, differences in size fractions between modeled and measured values are a consideration for TSP. Finally, for the Whale Tail Mine, the suspended particulate monitoring station is located near the centre of project activity, close to sources and adjacent to various buildings where power is available, and model results in these conditions are generally considered particularly variable from field measurements, compared to assessments at the property line or further receptor locations. As a result, total suspended particulate monitors at the Whale Tail Mine are most appropriate for assessing trends over time and comparisons to management thresholds, rather than specific impact predictions.

Onsite concentrations of $NO_2$ by volume (ppb) are analyzed over one month periods using a passive sampling device provided by an accredited laboratory. A continuous (active) $NO_2$ monitoring station was installed in 2021, sited in consultation with ECCC. Dustfall (deposition of particulate matter) onsite is measured using the static dustfall collectors described for the Whale Tail Haul Road, above.

For reference, all results for air quality and dustfall monitoring are provided in the 2022 Air Quality and Dustfall Monitoring Report (Appendix 50), along with comparisons to regulatory guidelines, FEIS predictions, and historical measurements.

Impact predictions associated with these air contaminants and monitoring locations are summarized in Table 12-31, along with measured results from 2019 - 2022. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.5.4.2.

**Table 12-31 Predicted and measured impacts to air quality and climate for the Whale Tail site and haul road. 2019 measurements are compared to predictions from the FEIS for the Whale Tail Pit Project (Agnico Eagle, 2016). 2020 measurements are compared to predictions from the FEIS Addendum for the Whale Tail Pit – Expansion Project (Agnico Eagle, 2018). NM = not measured. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.5.4.2. *Addition of background values described above. ^Predictions for the 24-h average are open-ended (> 120 µg/m³ or >50 µg/m³) and therefore not compared to measured values. **Updated in 2022.**

| Effect Pathway | Proposed Monitoring (FEIS) | Monitoring Conducted | FEIS Prediction + Background* | Measured Value | FEIS Addendum Prediction + Background* | Measured Value | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 2019 | | 2020 | 2021 | 2022 |
| Vehicle emissions and fugitive dust from traffic on the haul road can affect air quality | Static dustfall | Static dustfall | Max. deposition rate* ($mg/cm^2/30d$)<br><br>25 m: 1.46<br>100 m: 0.83<br>300 m: 0.53<br>1000 m: 0.38 | Max. dustfall ($mg/cm^2/30d$)<br><br>25 m: 8.04<br>100 m: 2.24<br>300 m: 1.42<br>1000 m: 0.46 | Max. deposition rate* ($mg/cm^2/30d$)<br><br>25 m: 3.67<br>100 m: 2.17<br>300 m: 0.86<br>1000 m: 0.38 | Max. dustfall ($mg/cm^2/30d$)<br><br>25 m: <3.67<br>100 m: <2.17<br>300 m: <0.86<br>1000 m: <0.38 | Max. dustfall ($mg/cm^2/30d$)<br><br>25 m: 10.08<br>100 m: <2.17<br>300 m: <0.86<br>1000 m: <0.38 | Max. dustfall ($mg/cm^2/30d$)<br><br>25 m: 10.93<br>100 m: <2.17<br>300 m: 1.26 (*not mine-related*)<br>1000 m: <0.38 |
| Blasting, stationary and mobile combustion sources, and fugitive dust from mining activities in the Whale Tail Pit can affect air quality. | TSP, $PM_{10}$, $PM_{2.5}$, $NO_2$, dustfall | TSP, $PM_{10}$, $PM_{2.5}$, $NO_2$, dustfall | $NO_2$: 4.4 ppb (annual average) | 1.46 ppb | $NO_2$: 8 - 16 ppb (annual average) | 1.29 ppb | 1.66 ppb | 2.17 ppb |
| | | | TSP:<br>24-h: 174 µg/m³<br>Annual: 16.9 µg/m³ | NM | TSP^:<br>Annual: 30 - 45 µg/m³ | 35.0 µg/m³ | 24.3 µg/m³ | 64.9 µg/m³ |
| | | | $PM_{10}$<br>24-h: 52.4 µg/m³ | NM | $PM_{10}$: NA^ | - | - | - |
| | | | $PM_{2.5}$<br>24-h: 20.1 µg/m³<br><br>Annual: 4.3 µg/m³ | NM | $PM_{2.5}$<br>24-h: 21 - 28 µg/m³<br><br>Annual: 5 – 7.5 µg/m³ | 24-h: < 28 µg/m³<br><br>Annual: 1.44 µg/m³ | 24-h: < 28 µg/m³<br><br>Annual: 1.82 µg/m³ | 24-h: < 28 µg/m³<br><br>Annual: 3.9 µg/m³ |
| Additional 3 years of processing and use of supporting infrastructure at the Meadowbank mine site and the existing AWAR for delivery of materials can continue to affect air quality | Assessed under Meadowbank PEAMP | - | - | - | - | - | - | - |
| Greenhouse gas emissions from the Project can contribute to climate change. | Report emissions | GHG emissions reported | Whale Tail Site: 64.2 kt $C0_2e$/yr<br>Meadowbank Mill: 180 kt $CO_2e$/yr | 189,867 t $CO_2e$ total (2020 recalc. = 195,564 t $CO_2e$ total) | Whale Tail Site: 164.2 kt $C0_2e$/yr<br>Meadowbank Mill: 180 kt $CO_2e$/yr | 225,385 t $CO_2e$ total** | 243,893 t $CO_2e$ total** | 248,921 t $CO_2e$ total (prelim.) |

### 12.5.4.2 *Parts 3 & 4: Discussion*

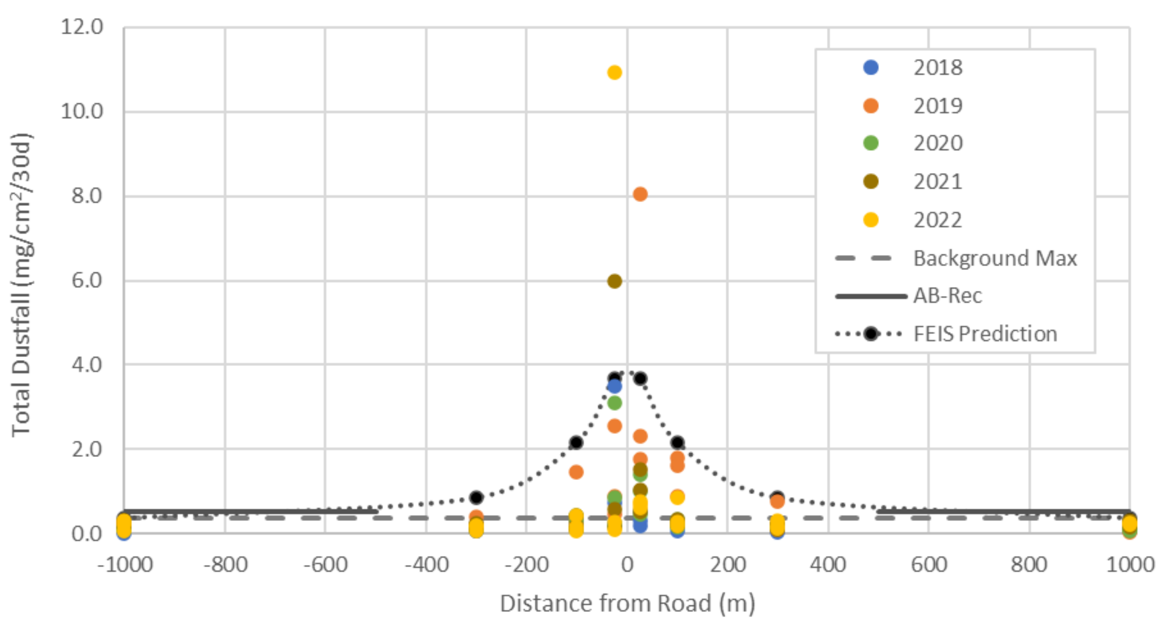
Where air quality impacts are exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion is provided here.

#### *12.5.4.2.1.1 Whale Tail Haul Road Dustfall*

Because rates of dustfall for the Whale Tail Haul Road exceeded FEIS predictions historically (2019) and for one or two stations in 2021 and 2022, a discussion is provided here.

In 2019, measured rates of dustfall along the Whale Tail Haul Road commonly exceeded FEIS-predicted rates of dust deposition. This was likely a result of three factors: differences in particle size between deposition modeling and dustfall measurements, sampling at ground level as opposed to 2-m height, and limited dust suppressant application in 2019. As further described in the 2022 Air Quality and Dustfall Monitoring Report (Appendix 50), sampling beginning in 2020 was conducted on stands, dust suppressant was applied to the full length of the WTHR along with intermittent watering, and FEIS predictions were updated according to the assessment for the Whale Tail Expansion Project. All dustfall monitoring results for the WTHR in 2020 were below FEIS Addendum predictions, and one or two samples across all transects exceeded predictions in 2021 and 2022. As discussed above, field dustfall monitoring represents a very conservative comparison to FEIS predictions, so isolated exceedances are anticipated. Historical results for August (the time period with the driest conditions and generally highest rates of traffic) are shown in Figure 71.

**Figure 71. Total dustfall rates (mg/cm²/30d) for all samples collected in August along the Whale Tail Haul Road to date. 2018 and 2019 data was collected at ground level, while all 2020+ samples were collected on stands. Negative distances represent the east side of the road, and positive distances represent the west side. FEIS Prediction values are from the FEIS Addendum Appendix 4C, Table 4-C-24 (Agnico Eagle, 2018).**



#### *12.5.4.2.1.2 Total Suspended Particulates*

Annual average TSP measured at Whale Tail Mine onsite location DF-6b (65 µg/m$^3$) in 2022 exceeded the maximum FEIS Addendum prediction for this location (45 µg/m$^3$). Historical recorded 24-h TSP values are shown in Figure 72. As discussed above, TSP monitoring provides a conservative comparison to model predictions, due to a variety of differences in methodology. The DF-6b monitoring station is located near the centre of the project footprint (adjacent to and downwind of the camp facility), so it is likely that measured suspended particulate concentrations were influenced by larger particle sizes, potentially from nearby construction activities, that are not included in air quality modelling. Typically, modeled TSP only includes particles with an aerodynamic diameter <30 µm, whereas Partisol TSP units are not size-selective. It is noted that annual average TSP did not exceed the GN regulatory guideline, and FEIS Addendum predictions were not exceeded for other size fractions. Further, 30-d dustfall measurements at the nearby station (DF-6a) were well below management thresholds and similar to previous years (Figure 73). Nevertheless, an upward trend in suspended particulate matter for this monitoring location was observed in 2022. This was planned to be the year of highest production in the FEIS Addendum, and the increase is likely due to a general rise in site activity. Onsite air quality management measures are being reviewed to help minimize future emissions.

**Figure 72 24-h average concentrations of total suspended particulates (TSP) at Whale Tail Mine station DF-6b. Dashed line indicates the GN guideline for 24-hr average TSP.**

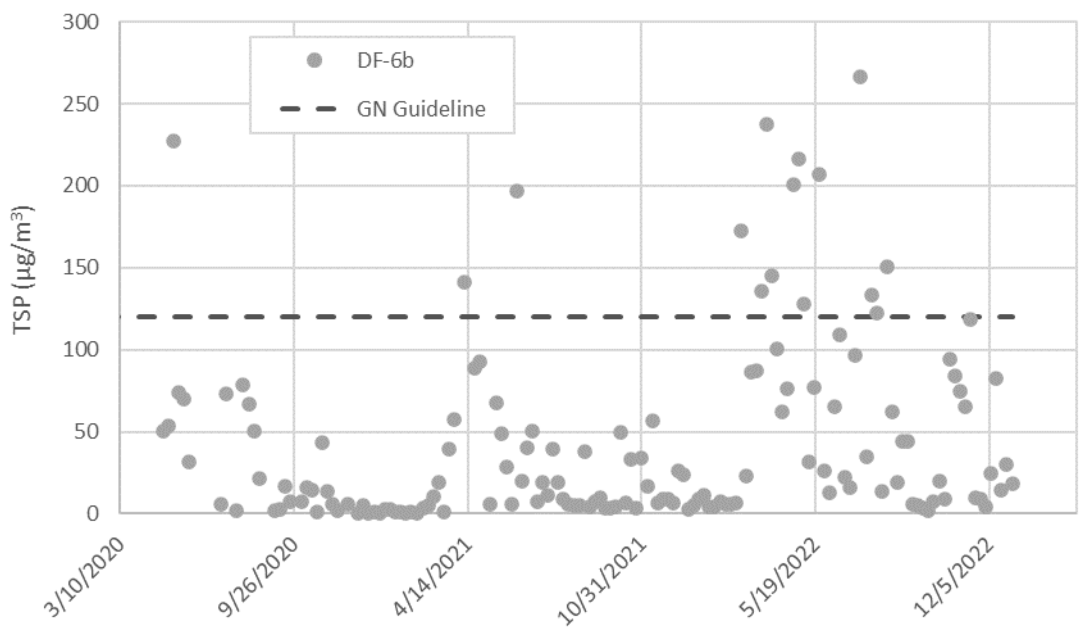
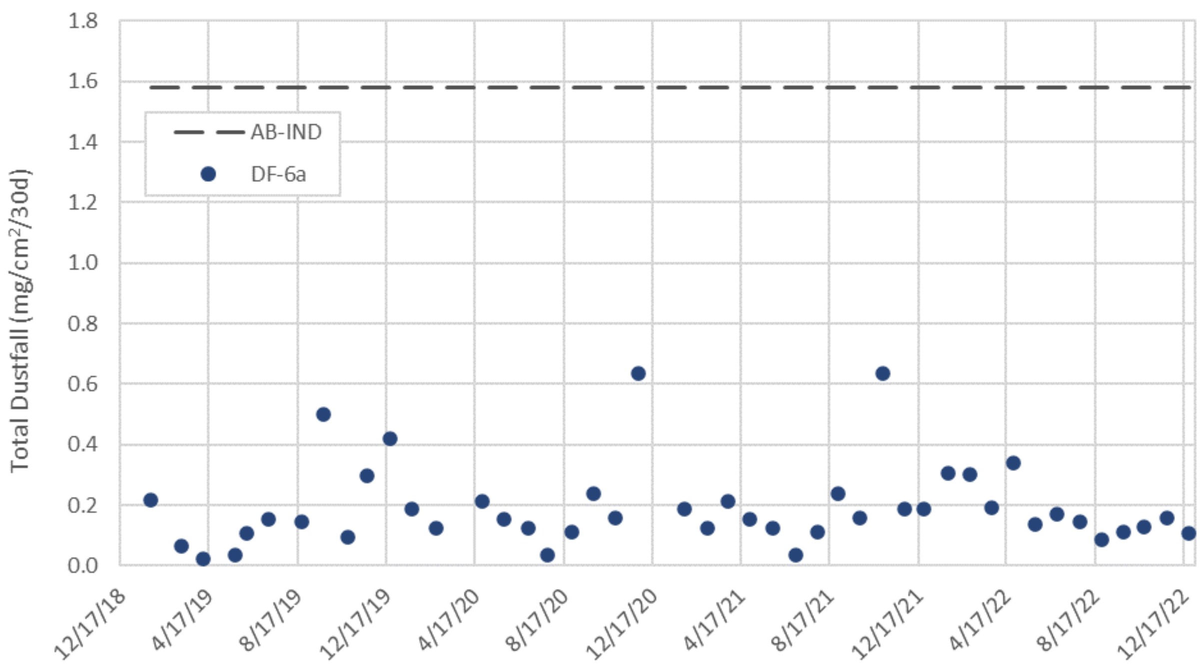


**Figure 73 30-day-normalized rates of total dustfall at Whale Tail Mine station DF-6a.**




### 12.5.4.3 *Effectiveness of Monitoring and Mitigation, and Adaptive Management*

*Effectiveness of Monitoring*

With the installation of the continuous $NO_2$ analyzer in 2021, all monitoring recommended in the FEIS to assess air quality impacts is being conducted according to the Air Quality and Dustfall Monitoring Plan (March, 2022).

Overall, it is considered difficult to compare air quality model outputs with specific monitoring results. Air quality modelling is a statistical exercise which captures the maximum and average concentrations expected from an emissions source, under specific meteorological conditions, and terrain factors. Additionally, air quality modelling considers only the sources in the model which typically does not include transboundary transport or other background sources of contaminants.

However, air quality monitoring at the Whale Tail site is able to effectively measure ambient concentrations of CACs, and compare with regulatory guidelines and management thresholds. When field-measured values are lower than model results, those predictions can be confirmed as conservative.

*Effectiveness of Mitigation*

A summary of the planned mitigation measures for air quality during the construction and operations phases is provided in Table 12-32, along with a commentary on current implementation.

As described in the Air Quality and Dustfall Monitoring Report (Appendix 50), monitoring thresholds were established within the Air Quality and Dustfall Monitoring Plan (March, 2022) to confirm effectiveness of existing mitigation. Thresholds relate to dustfall and suspended particulate measurements. In 2022, thresholds related to dustfall were met for the Whale Tail site and WTHR. The threshold for total suspended particulate matter is equivalent to the FEIS prediction (annual average), and was exceeded in 2022. Adaptive management is described further below.

**Table 12-32. Mitigation measures described in the Project FEIS Addendum (Table 3-C-1) to reduce impacts of the project on area air quality and climate, and commentary on current implementation.**

| Project Activity | Planned Mitigation Measure (FEIS Addendum Volume 3, Table 3-C-1) | Implementation (2022) |
|---|---|---|
| General construction, operations, and decommissioning activities associated with the Whale Tail Pit and the haul road; and Mining of the Whale Tail Pit | All vehicles will adhere to the 50 km/h speed limit. | **Yes** - Ongoing |
| | Regular maintenance will be implemented for equipment and vehicles. | **Yes** – Maintenance logs |
| Upgrading of the haul road from the Whale Tail Pit to the Meadowbank Mine | Implement dust control measures, if needed on mine roads. | **Yes** – Air Quality and Dustfall Monitoring Plan |
| | Equipment and vehicles will comply with relevant non-road emission criteria at the time of purchase. | **Yes** – Air Quality and Dustfall Monitoring Plan |
| | Regular maintenance will be implemented for equipment and vehicles. | **Yes** – Maintenance logs |
| Traffic on the haul road from the Whale Tail Pit to the Meadowbank Mine | Watering of roads and enforcing speed limits to suppress dust production. | **Yes** – Air Quality and Dustfall Monitoring Plan |
| | Equipment and vehicles will comply with relevant non-road emission criteria at the time of purchase | **Yes** |
| | Regular maintenance will be implemented for equipment and vehicles | **Yes** – Maintenance logs |
| Construction of the Whale Tail Pit | Best Management practices for controlling fugitive dust from construction activities | **Yes** – Air Quality and Dustfall Monitoring Plan |
| | Equipment and vehicles will comply with relevant non-road emission criteria at the time of purchase | **Yes** |
| | Regular maintenance will be implemented for equipment and vehicles | **Yes** – Maintenance Logs |
| Mining of the Whale Tail Pit | Watering of pit roads and enforcing speed limits to suppress dust production. | **Yes** – Air Quality and Dustfall Monitoring Plan |
| | Equipment and vehicles will comply with relevant non-road emission criteria at the time of purchase. | **Yes** |
| | Regular maintenance will be implemented for equipment and vehicles. | **Yes** – Maintenance logs |
| | Enclosures are used to reduce fugitive emissions at the processing facility | **Yes** – Air Quality and Dustfall Monitoring Plan |
| | Adherence to the Incinerator Waste Management Plan | **Yes** - Incinerator Waste Management Plan |

*Adaptive Management*

Since the adaptive management threshold for TSP was exceeded in 2022, Agnico Eagle is reviewing the supplemental mitigation options identified in the Air Quality and Dustfall Management Plan for controlling fugitive dust. These will be discussed with the relevant departments ahead of the 2023 dry season to determine the optimal approach. An thorough mid-year review of TSP results will be conducted for internal purposes to inform ongoing management.

### 12.5.5 Soil, Terrain, and Permafrost

#### 12.5.5.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

Although primary pathways of effects were identified for soil, terrain, and permafrost, no residual impact predictions were made because soil, terrain, and permafrost do not themselves have measurable effects endpoints. Any potential effects associated with the primary pathways for soil, terrain, and permafrost are captured in the assessment of the potential effects to, and residual impact classifications for other VCs

#### 12.5.5.2 *Parts 3 & 4: Discussion*

N/A – residual impacts are not measured for permafrost directly. Potential effects are captured in the assessment of other VCs.

#### 12.5.5.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

*Effectiveness of Monitoring*

Soil, terrain, and permafrost conditions will be continuously monitored and inspected during all phases of the Project to ensure the effectiveness of the design criteria. Where required, adaptive management strategies will be implemented. Full details on management plans and monitoring for the waste rock pile, dewatering of the dikes, and haul road are provided in the Mine Waste Rock and Tailings Management Plan, Water Management Plan, and Whale Tail Pit and Haul Road Management Plan, respectively.

However, since no predictions were made with respect to residual impacts of permafrost directly, these programs are not designed to validate any predictions. Rather, impacts of permafrost are measured through measurement indicators for other VCs and effectiveness of those monitoring programs are assessed in the relevant sections of this report.

*Effectiveness of Mitigation*

A summary of the planned mitigation measures for permafrost according to the FEIS Volume 3, Table 3-C-2 is provided in Table 12-33, along with a commentary on current implementation. Similarly, planned mitigation measures for soil and terrain are provided in Table 12-34, along with current implementation. If impacts to other VCs are occurring beyond FEIS predictions and those effects are potentially due to impacts on soil, terrain, or permafrost, this record of mitigation can be reviewed. For the purposes of this annual review, the mitigation summary does not include Environmental Design Features, which are incorporated into construction plans but are not ongoing mitigation measures.

**Table 12-33 Mitigation measures described in the Whale Tail FEIS (Table 3-C-2) to reduce impacts of the project on permafrost during the construction and operations phases, and commentary on current implementation. Mitigation measures listed here do not include Environmental Design Features that are factored into construction plans.**

| Project Activity | Planned Mitigation Measure (FEIS Table 3-C-2) | Implementation (2022) |
|---|---|---|
| Mine infrastructure footprint | Implement slope stability criteria to manage erosion. | **Yes -** Slopes were designed and built to angle of repose to minimize erosion.<br>Slopes were built using properly graded material to minimize erosion. |
| | Best management practices for erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks, sloping of banks), where needed. | **Yes -** Silt curtains not required as of yet.<br>Infrastructure was designed and built with erosion and sedimentation control as needed (such as channels and dikes).<br>Turbidity barriers installed at the outlet of South Whale Tail Channel during commissioning. |
| Earthworks: Drilling, blasting, grading, trenching, excavation and backfilling, crushing activities, and dike construction | Minimize footprint areas for stripping and removal of material. Use appropriately designed structural fill and thickness to maintain and promote permafrost conditions. | **Yes -** All footprint areas were minimized as much as possible. Fill thicknesses were designed with maintaining permafrost in mind. |
| | Where possible, stockpiling of rock and fill from quarries and borrow sites will be placed such that surface water is not diverted through the piles. | **Yes -** Stockpiles were placed in areas away from surface water flow. Location planning for stockpiles considers the topography and watersheds. |
| | Minimum setback distance of 31 m from the ordinary high water mark of waterbodies. | **Yes -** The minimum setback distance of 31m from the high water mark was respected. |
| | Thick drifted snow greater than 1 m thick will be removed before the road fills are placed. | **Yes -** Snow removal took place before any fill was placed. |
| | Minimize depth of excavations to limit impact on active layer. | **Yes -** Excavation of any kind was avoided when possible and the depth was minimized as much as possible. |
| | Monitoring of the Whale Tail Dike will be undertaken to understand the hydraulic and thermal behaviour of the dike during filling Whale Tail (South Basin) | **Yes -** Regular instrument monitoring continues. |
| | Minimize depth of quarrying to limit impact on active layer. Maximum quarry depths of 3 m are currently planned. | **Yes -** Quarry depths were limited as much as possible. |
| | Appropriate design of quarry walls to promote stability, and to minimize annual slope degradation. | **Yes -** All quarry walls were designed and built to slope angles that would minimize slope degradation. |
| | Appropriate design of quarries to manage water and minimize ponding of water within the quarries which would result in a deeper active layer. | **Yes -** All quarries were designed and built with floors sloped to promote drainage. |
| | Where possible, stockpiling of rock and fill from quarries and borrow sites will be placed such that surface water is not diverted through the piles with runoff to surface waterbodies. | **Yes -** Stockpiles were placed in areas away from surface water flow. Location planning for stockpiles considers the topography and watersheds. |
| | Minimum setback distance of 31 m from the ordinary high water mark of waterbodies. | **Yes -** The minimum setback distance of 31m from the high water mark was respected. |
| | Drainage from quarries will not flow directly into any waterbodies or watercourses | **Yes -** It was ensured that drainage from quarries would not go into any waterbodies or watercourses. |
| Mine Site Facilities Construction | Submission of all design drawings to the Nunavut Water Board for approval, prior to construction. | **Yes -** Design drawings were submitted to the Nunavut Water Board for approval prior to construction. |
| | Where possible, use thaw-stable road fills for construction. | **Yes -** Very few options are available for road fills but placement and design are always done with maintaining permafrost in mind. |
| | Road fill material will be placed directly over the existing soil layer without cutting, stripping, or grubbing to avoid disturbing the subgrade soils. | **Yes -** Road fill material was always placed directly over the existing soil layer. |
| | Placement of the road construction materials during winter will minimize disturbance to the permafrost. | **Yes -** Roads were constructed during the winter whenever possible. |
| | Thick drifted snow greater than 1 m thick will be removed before the road fills are placed. | **Yes -** Snow removal took place before any road fill was placed. |
| Mine Site Operations and Maintenance, including use of existing facilities and AWAR | Stockpile snow on thaw-stable materials, or in areas that are insensitive to thaw settlement. | **Yes -** Snow was placed in designated snow dump areas on pads made of rockfill. |
| | Use appropriate drainage and water diversion structures to minimize water ponding during thaw. | **Yes -** Water ponding was minimized through pumping during the spring thaw. |
| | Stock pile snow on thaw-stable materials. | **Yes -** Snow was placed in designated snow dump areas on pads made of rockfill. |
| | Use snow fencing where appropriate to minimize snow clearing requirements. | **Yes -** Snow fencing was not required yet. |
| | Annual road maintenance as required. | **Yes -** All roads are maintained and inspected frequently. |
| | Continue to use appropriate facilities management methods to reduce the amount of ice trapped within the facility. | **Yes -** At the Meadowbank TSF tailing deposition planning was done to reduce ice entrapment as much as possible. |
| | Use appropriate deposition planning ( i.e., tailings placed in layers to promote freezing). | **Yes -** During in-pit deposition, one deposition point is used in each pit. The method of tailings discharge ensures that ice forms on the wall but not within the tailings body in the pit. |
| Waste Rock Storage Areas and Stockpiles | Where possible begin construction during winter months, when active layer is frozen. | **Yes -** Starting construction of the WRSF and stockpiles was planned for winter months whenever possible. |
| | Place waste rock in lifts to promote freezing of pile. | **Yes -** Waste rock was always placed in lifts to promote freezing. |
| Water Management Infrastructure | Use appropriate water management methods to avoid water ponding and to control high volume potentially erosive flows. | **Yes -** Water ponding and erosive flows were minimized through pumping during the spring thaw. |
| | Manage snow accumulation locally | **Yes -** Snow removal was performed according to a plan with designated snow dump areas. |
| | Regular inspection of the road to identify any areas where ponding of water along the road represents a risk, and installing additional culverts or drains to alleviate the risk. | **Yes -** Regular inspection of the road was performed to identify the spots where water may pond or was ponding. Culverts were inspected and if they were frozen or plugged they were fixed. If culverts could not be fixed they were replaced. |
| | Pumped discharge to receiving lake will only occur while water quality discharge criteria are met. | **Yes -** Frequent testing of all water pumped to the receiving environment was performed. If water quality discharge criteria were not met the water was treated by the WTP and only pumped once the criteria was met. |
| | Pumped discharge will be directed to the lake environment, and not directly to outlets, to attenuate flow changes. | **Yes -** Pumped discharge was only directed to approved area and not directly to outlet |
| | Shoreline areas susceptible to extensive erosion will be addressed by appropriate erosion protection measures, mitigation measures based on adaptive management, or a combination of both, to reduce erosion and associated re-suspension of fine sediment. | **Yes -** Water management was planned and executed in order to avoid causing erosion on shorelines. Examples include using sunken diffusers, discharging water only on boulder pads, and discharging water to lakes at low enough rates to prevent quick rises in water elevation. |
| Open Pits | Use appropriate back filling methods for the placement of fill material. Initial permafrost retreat that may occur during the placement of backfill may be replaced by permafrost re-establishing within the backfilled areas. | **Yes -** Fill material was placed in thin lifts and compacted to promote the establishment of permafrost. |
| | Water inflows to the pit will require sumps and be pumped to the Attenuation Pond. | **Yes -** Water inflows to the pit were directed to sumps and pumped to approved location (Whale Tail and IVR Attenuation Ponds) |
| Underground Mining | Insulate water lines as they produce heat and can thaw adjacent frozen ground. | **NA** |

| Project Activity | Planned Mitigation Measure (FEIS Table 3-C-2) | Implementation (2022) |
|---|---|---|
| | Water inflows to the underground excavations will require sumps and be pumped to the Attenuation Pond. | **NA** |
| Fuel Storage and use (includes Chemical and Hazardous material Storage and Explosives Storage Area) | Appropriate operations and maintenance procedures in place for the operation of the fuel tank farm. | **Yes -** To prevent fuel spills procedures were put in place to safely operate the fuel tank farm. These procedures include fuel spill protocols, inspections, and maintenance practices. |
| | Appropriate re-fueling areas and procedures to minimize and capture spills. | **Yes -** All re-fueling areas are equipped with safeguards to prevent and capture spills. Re-fueling procedures are in place and employees are trained how to re-fuel before operating vehicles. |
| | Implement the spill plan for potential chemical spills, including hydrocarbons | **Yes -** Spill plans are in place for all types of chemical spills. Employees are trained on how to apply the spill plan to their work. |
| Waste Management: Landfill, Landfarm, Sewage Treatment | Minimize ground disturbance. | **Yes -** Ground disturbance was minimized as much as possible. |
| | Use appropriate waste management methods to operate the facilities within the proposed waste rock piles, to promote permafrost growth. | **Yes -** Waste management methods are in place and followed closely to promote permafrost growth, including the creation of small sub-landfills which are encapsulated by waste rock. Inspections and surveys are performed to ensure the landfill is being constructed properly. |

**Table 12-34. Additional mitigation measures (beyond those in Table 12-33 above) described in the FEIS Addendum for the Whale Tail Pit Expansion Project (Table 3-C-2) to reduce impacts of the project on soil and terrain during the construction and operations phases, and commentary on current implementation. Mitigation measures listed here do not include Environmental Design Features that are factored into construction plans.**

| Project Activity | Planned Mitigation Measure (FEIS Addendum Table 3-C-2) | Implementation (2022) |
|---|---|---|
| Mine Infrastructure Footprint (e.g. open pits, site roads, access roads) | Locating borrow sites as close to the haul road as practical. | **Yes** |
| | Minimizing borrow areas by using suitable waste rock (e.g., Vault Pit waste rock) to the greatest extent practicable | **Yes** |
| | Avoid new disturbances by using existing ones where possible | **Yes** |
| Earthworks: Drilling, blasting, grading, trenching, excavation and backfilling, crushing activities, and dike construction | Most of the overburden will be placed in the Waste Rock Storage Facility, except for a small amount used in operations, which will only be temporarily stockpiled. Overburden will be piled at the base of the Whale Tail WRSF and surrounded with waste rock to stabilize the material and then all the overburden stockpiled in the Whale Tail WRSF will be eventually covered with waste rock. | **Yes** - Mine Waste Rock Management Plan |
| | Erosion control practices on steep slopes to limit wind and water erosion. | **Yes** – site inspection, design construction, best practices |
| Mine Site Facilities Construction | Use of non-acid generating material for road construction | **Yes -** Operational ARD/ML Testing and Sampling Plan, design construction |
| Mine Site Operations and Maintenance, including use of existing facilities and AWAR | Implement dust control measures on mine roads, when required | **Yes** - Air Quality and Dustfall Monitoring Plan |
| | Road surfaces will be maintained through grading and the addition of granular material. | **Yes** - Air Quality and Dustfall Monitoring Plan |
| | Equipment and vehicles will comply with relevant non-road emission criteria at that time of purchase | **Yes -** Operational ARD/ML Testing and Sampling Plan, design construction |
| | Use of non-acid generating materials for road bed and fill | **Yes -** Operational ARD/ML Testing and Sampling Plan, design construction |
| | Enforcing speed limits will assist in reducing dust emissions | **Yes** |
| | Implement the spill plan for potential chemical spills, including hydrocarbons | **Yes** – Spill Contingency Plan |
| | Adherence to the Air Quality and Dustfall Monitoring Plan | **Yes** - Air Quality and Dustfall Monitoring Plan |
| | Complete a Wildlife Screening Level Risk Assessment every 3 years | **Yes** - TEMP |
| | Water Management Plan is approved and adhered to at existing facilities and Water Management Plan specific to the Whale Tail Pit areas has been developed and these plans have considered the containment and management of contact site water. | **Yes** – Water Management Plan |
| | Natural construction materials will be tested before they are used to confirm that they are not potential acid draining or potential sources of metal leaching | **Yes -** Operational ARD/ML Testing and Sampling Plan |
| Waste Rock Storage Areas and Stockpiles | (see Fish and Fish Habitat section, above) | **NA** |
| Water Management Infrastructure | (see Water Quantity, Water Quality, and Fish and Fish Habitat sections above) | **NA** |
| Fuel Storage and use (includes Chemical and Hazardous material Storage and Explosives Storage Area) | (see Water Quality section above) | **NA** |

*Adaptive Management*

Adaptive management consists of changes to permafrost, soil and terrain mitigation methods in response to results of monitoring programs which indicate exceedances or potential exceedances of impact predictions. In this case, the validity of impact predictions related to permafrost, soil and terrain are measured through effects on other VCs. If impacts to other VCs are exceeding predictions as a result of permafrost changes, adaptive management will be considered and reported here.

No adaptive management has been required to date.

### 12.5.6 Archaeology, Traditional Land Use, and Socio-Economics

Since, in many cases, is it not possible to distinguish impacts of the Meadowbank project from those of the Whale Tail project on Archaeology, Traditional Land Use, and Socio-Economics, the PEAMP evaluation is combined for this section and provided under Section 12.4.6.

## 12.6 Contributions to Regional Monitoring

In fulfillment of Item E in Appendix D of the Project Certificate, a description of Meadowbank's investments in regional monitoring initiatives, academic research studies and ongoing data sharing programs is provided in Table 12-35. These are programs in addition to publication of compliance-related onsite monitoring results. They contribute to the general advancement of environmental management in the North, and help ensure continued optimization of environmental mitigation and monitoring programs at Meadowbank and elsewhere.

**Table 12-35 Contributions of the Meadowbank Complex to regional monitoring initiatives, academic research studies, and ongoing data sharing programs. Any related changes to Meadowbank's onsite monitoring and mitigation plans are described.**

| Program Type | Program Title | Contribution/Program Summary | Dates |
|---|---|---|---|
| Multi-Stakeholder Advisory Groups | Terrestrial Advisory Group | To reach consensus on research projects, needs for future monitoring and research, gain approval and ensure consistent endpoints of success, a Terrestrial Advisory Group (TAG) was created. | 2017 - present |
| | Meadowbank Fisheries Research Advisory Group | Created to oversee the implementation of fisheries research projects related to offsetting for Whale Tail Pit, the Meadowbank Fisheries Research Advisory Group (MFRAG) meets annually and provides a forum for input and recommendations on these studies. Members are: DFO, HTO, KivIA, appointed external advisor, and Agnico Eagle. | 2019 - present |
| Regional Monitoring Studies | GN Caribou Collaring Program | Meadowbank continues to contribute to the GN DOE caribou collaring program which started in 2008. The satellite-collaring program, along with GN DOE regional data, is an important monitoring and management tool that provides a regional perspective on caribou activity near Mine operations. Another key objective of the program is to provide timely information for the caribou management and monitoring strategy at the Meadowbank and Whale Tail sites. | 2008 – present |
| | ZOI Study | In 2017, in collaboration with Agnico Eagle staff, Golder biologists and statisticians worked to determine a zone of influence (ZOI) for the Meadowbank mine, or evaluate if it is affecting a large number of individuals. It is predicted that reduced use of preferred habitats should reduce herd size (from lower survival and reproduction). Data analysis was completed and hypotheses were tested, documents were provided to regulators and reviewed, presentations were made at the GeoScience Forum. | 2017 – 2021 |
| | Caribou Behaviour Studies – road crossings and blast responses | In 2018, review of caribou data lead to a TAG project to explore the link between caribou road crossings and road closures. Results were presented to the TAG in 2019, and used to inform ongoing monitoring and mitigation. Studies to inform caribou behaviour around road crossings and blasts are ongoing. | 2018 - present |
| | Snow Study | Per Whale Tail Expansion Project commitment 9 from the TAG Meeting held in Baker Lake June 11 – 13, 2019, Agnico Eagle committed to complete a 3-year snow monitoring program as part of the TEMP to measure snow conditions adjacent to the WTHR, with the goal of determining whether changes to snow resulting from snow removal along the WTHR result in conditions that potentially inhibit caribou movements. | 2020 – 2021 (pilot study) 2022 – 2024 (full study) |
| Academic Research Programs | Whale Tail Complementary Measures Suite | Suite of six research programs related to fish and fish habitat in the Meadowbank region. Included in Agnico Eagle's Fish Habitat Offsetting Plan for the Whale Tail Pit project. Further information in: Fish Habitat Offsetting Plan for Whale Tail Pit, Appendix C (May, 2018). | 2018 – 2034 (est). |
| | Baker Lake Wastewater Study | Industry partner in NSERC CRD project "Validating Environmental and Human Health Improvements Associated with Wastewater Treatment Upgrades in Arctic Communities". | 2019 – 2026 |
| | Arctic Raptors | Collaboration with Dr. Alastair Franke/Arctic Raptors to conduct annual raptor monitoring at the Meadowbank and Meliadine sites. The Arctic Raptors program has been monitoring raptor populations in the Arctic since the 1980s. | 2015 - present |
| | Migratory Bird Ecology and Effectiveness of Deterrents | As part of commitments made during the permitting process for Whale Tail Pit, Agnico is funding and facilitating a study on effectiveness of deterrents for minimizing impacts of flooding on nesting waterbirds in the Amaruq area (Dr. Erica Nol, Trent University; Dr. Paul Smith, ECCC). Total contributions from Agnico are $120,000 plus in kind support.<br>As part of these contributions, Agnico has also agreed to support a study on ecology and nest site selection factors for area waterbirds (Dr. Erica Nol, Trent University).<br>Finally, results of these studies will also contribute to the ArcticNet funded study "Modernizing Ecosystem Monitoring to Support Sustainable Development in the Eastern Canadian Arctic" (Dr. Paul Smith, ECCC; Dr. Christina Semeniuk, University of Windsor). This project uses advanced technology to track birds' movements across the Eastern Arctic, and behaviour in relation to human development and disturbance. Results will inform environmental impact mitigation efforts by industry, and simultaneously, contribute to national and international efforts to conserve Arctic biodiversity. | 2018 – 2021 |
| Other Information Sharing Programs | DFO Fishout Database | Agnico contributes raw data files from all fishout programs to DFO's Fishout Database. | 2009 – 2020 (last fishout program) |

## SECTION 13. REFERENCES

Agnico Eagle Meadowbank Division, 2013. Meadowbank Gold Project - 2013 Annual Report.

Agnico Eagle Meadowbank Division, 2014. Meadowbank Gold Project - 2014 Annual Report.

Agnico Eagle Meadowbank Division, 2015. Meadowbank Gold Project - 2015 Annual Report.

Agnico Eagle Meadowbank Division, 2016. Meadowbank Gold Project - 2016 Annual Report.

Agnico Eagle Meadowbank Division, 2017. Meadowbank Gold Project - 2017 Annual Report.

Agnico Eagle Meadowbank Division, 2018. Meadowbank Gold Project - 2018 Annual Report.

Agnico Eagle Meadowbank Division, 2019. Meadowbank Gold Project - 2019 Annual Report.

Agnico Eagle Meadowbank Division, 2020. Meadowbank Gold Project - 2020 Annual Report.

Agnico Eagle Meadowbank Complex, 2021. Meadowbank Complex - 2021 Annual Report.

Agnico Eagle Mines Ltd. (Agnico Eagle) 2018. FEIS Addendum for the Whale Tail Pit – Expansion Project. December, 2018.

Azimuth. (Azimuth Consulting Group Inc.). 2019. Technical Memorandum: Whale Tail Permitting Support – Revised Predictions of Fish Mercury Concentrations in Whale Tail Lake (South Basin) FINAL. Prepared for Agnico Eagle Mines Ltd., Baker Lake, NU. August 2019.

CCME. Water Quality Guidelines for the Protection of Aquatic Life. Canadian Environmental Quality Guidelines Summary Table. <http://st-ts.ccme.ca/?chems=all&chapters=1>. Accessed on March 2023.

C. Portt and Associates, 2018. Whale Tail Pit - Fish Habitat Offsetting Plan. Version 1. March, 2018.

Cumberland, 2005. Meadowbank Gold Project Final Environmental Impact Statement (FEIS). Cumberland Resources Ltd. October, 2005.

Ellenor, J.R., P.A. Cott and H.K. Swanson (2021). Occupancy of young-of-year Artic grayling (Thymallus arcticus) in Barrenland streams. Hydrobiologia (published online 15 November 2021). Available at: https://link.springer.com/article/10.1007%2Fs10750-021-04742-3

ERM, 2020. Whale Tail Pit Expansion Project – Fish Habitat Offsetting Plan. Project No.: 0459286-0108. Prepared for Agnico Eagle Mines Ltd. March, 2020.

Fancy SG and White RG. 1987. Energy expenditures for locomotion by barren-ground caribou. Canadian Journal of Zoology. 65: 122-128.

Golder. 2007. 06-1122-336-2500 - Water Quality Predictions Meadowbank Gold Project Nunavut.

Golder Associates. (2018). Whale Tail Pit Expansion Project, 7-B: Socio-Economic Assessment Update

Golder Associates Ltd. 2019c. Mine Site and Downstream Receiving Water Quality Predictions. Whale Tail Pit – Expansion Project. Report Submitted to Agnico Eagle Mines Ltd, Meadowbank Division, May 2019.

Golder Associates Ltd. 2020. Whale Tail Expansion Project Commitment 9: Proposed Haul Road Snow Study. Unpublished Technical Memorandum prepared for Agnico Eagle Mines Ltd. 9 pp.

Holmes, G. I. (2022) Assessing and Mitigating the Impacts of Mining-Induced Flooding on Arctic-Nesting Birds. Trent University MSc Thesis. Available at: http://digitalcollections.trentu.ca/objects/etd-976

Mining Industry Human Resources Council (MiHR). (2018a). *Inuit Workforce Barriers Strategy (IWBS) Study.*

SNC (SNC Lavalin Inc.). 2020. Design Report of the IVR Attenuation Pond Dike D-1 (Reference 668284-5000-4GER-0001).

Wilson Scientific Consulting Inc. (Wilson). 2006. Human Health Risk Assessment of Consumption of Country Foods for the Meadowbank Gold Project. Prepared for Cumberland Resources Ltd.