MEADOWBANK GOLD PROJECT

2019 Annual Report
61-000-100-REP-002

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:
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ABBREVIATION

ABA	Acid base accounting
AEMP	Aquatic Ecosystem Monitoring Program
AP	Acid potential
ARD	Acid Rock Drainage
AWAR	All Weather Access Road
BA	Before after
BL	Baker Lake
CCBE	Cover with capillary barrier effects
CCME	Canadian Council of Ministers of the Environment
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
CREMP	Core Receiving Environmental Monitoring Program
CSM	Conceptual Site Model
CWS	Canada-Wide Standard
DFO	Fisheries and Oceans Canada
ECCC	Environment and Climate Changes Canada
EEM	Environmental Effect Monitoring
El.	Elevation
ERT	Emergency Response Team
FEIS	Final Environmental Impact Statement
FET	Full-time equivalent
F/T	Freeze/Thaw
GEMSS	Generalized environmental modelling system for surface water
GN	Government of Nunavut
GWMP	Groundwater monitoring plan
HCMP	Habitat Compensation Monitoring Plan
HHRA	Human Risk Assessment
HHS	Hunter Harvest Study
HTO	Hunter Trapping Organization
INUG	Innuguguayalik Lake
IPC	Instantaneous pressure change
IOL	Inuit owned land
IWBS	Inuit work barrier study
KIA / KivIA	Kivalliq Inuit Association
KvSEMC	Kivalliq Socio-economic monitoring committee
LMA	Labour market analysis
LSA	Local Study Area
LSM	Learning Management System
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
MMP	Mercury monitoring plan
MPA	Maximum Potential Acidity
MDMER	Metal and Diamond Mining Effluent Regulations
NC	North Cell
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
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
PPE	Protective personnel equipment
PRSF	Portage Waste Rock Storage Facility
PVV	Peak particle velocity
QAQC	Quality Assurance Quality Control
RDP	Relative Percent Difference
RIME	Research Institute in Mine and Environment
RSA	Regional Study Area
RSF	Rock Storage Facility
SSWQO	Site specific water quality objective
TAG	Terrestrial Advisory Group
TAP	Technical Advisory Panel
TARP:	Trigger Action Response Plan
TDS	Total Dissolved Solids
TMS	Training Management System
TPL, TPN, TPE	Third Portage Lake
TS	Total Sulphur
TSF	Tailings Storage Facility
TSS	Total Suspended Solids
RIME	Research Institute of Mine and Environment
RSF	Rock Storage Facility
S	Total Sulphur
SC	South Cell

SEMP	Socio-economic monitoring program
SMP	Stormwater Management Pond
SEMR	Socio-economic monitoring report
SEMWG	Socio-economic monitoring working group
SPL, SP	Second Portage Lake
SPLE	Second Portage Lake Exposure
Sta.	Station
STP	Sewage Treatment Plan
SWD	Stormwater dike
VECs	Valued Ecosystem Components
VRWF	Vault Rock Storage Facility
WAL	Wally Lake
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	2020/04/21	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: 

Nancy Duquet Harvey
Environmental 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 Amaruq satellite deposit, which is located 50 kilometres northwest of the Meadowbank mine. The Meadowbank mine achieved commercial production in March 2010, and most mining activities were completed in the fourth quarter of 2019.

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 licence 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 associated ore processing at the Meadowbank mine site from Agnico Eagle's new mining undertaking at the Whale Tail Pit site. The Project is governed by current Water Licence No: 2AM-MEA1526 (the Licence). 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.

At present, the project components included in the scope of the Licence 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. Starting on July 5th. 2019, tailings deposition started in Goose pit. Waste rock is placed in separate Portage and Vault Waste Rock Storage Facilities. In 2019, commercial production occurred at the Vault and BB Phaser pits, until exhaustion of mineral reserves in June 2019 and until October 2019 in Portage Pit. There is no current plan to continue mining in this area in the future.

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

The project was submitted to the NPC and on June 17th, 2016, the review process was completed: previous conformity determinations provided still apply but as the project proposal is a significant modification, it was forwarded to NIRB for screening. On August 16th, 2016, the NIRB issued a Screening Decision Report with the determination that the proposed project required further assessment best facilitated through a full environmental review. The NIRB technical assessment stage was initiated on November 25th, 2016. In parallel with this, Agnico Eagle submitted its Project application to the NWB on July 8th, 2016. The NWB technical assessment stage commenced on November 3rd, 2016.

A NIRB-NWB joint technical meeting and pre-hearing conference were held April 27th to May 2nd, 2017 and final hearing and community roundtable were held September 19 to 22, 2017. NIRB's positive final hearing report was issued on November 6th , 2017 and positive Ministerial Decision was received on February 15th, 2018. On May 29th, 2018, the NWB issued its Water Licence and Reasons for decision report and on July 11th, 2018, positive Ministerial decision was received. On July 23rd, 2018, DFO's Fisheries' Act Authorization was provided to Agnico Eagle. This completed the permitting process for the Whale Tail Pit Project.

The Amaruq Phase 2 expansion started in October 2018 with the application to NPC. The permitting process to amend the Whale Tail Project Certificate and Type A Water Licence to include the Amaruq Phase 2 expansion is ongoing. As part of this process, the NIRB held public hearings on the proposed expansion from August 26th to 29th, 2019 in Baker Lake. 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 project 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 (October 18 decision) on January 20th, 2020, completing the NIRB process. The NWB water licence amendment process has been ongoing and public hearings have occurred on February 12th-13th, 2020.

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), the 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 2019 annual reporting requirements of the project under these authorizations:

Meadowbank

- NWB Type A Water License 2AM-MEA1526;
- NIRB Project Certificate No. 004;
- DFO HADD Authorization NU-03-190 AWAR;
- DFO HADD Authorization NU-03-191 Mine Site;
- DFO Authorization NU-14-1046 Phaser Lake;
- CIRNAC Land Leases 66A/8-71-2 (AWAR) and 66A/8-72-5 (AWAR Quarries);
- KivIA Production Lease KVPL08D280; and
- KivIA Right of Way KVRW06F04.

Whale Tail

- NWB Type A Water License 2AM-WTP1826;
- NWB Type B Water License 2BB-MEA1828;
- NIRB Project Certificate N0. 008;
- DFO HADD Authorization 16HCAA-00370;
- 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-MEA1526 and 2AM-WTP1826 and Part J of Water License 2BB-MEA1828. Appendix 1 provide a list of commitment done by Agnico, following review by regulators of the 2018 Annual Report, to be incorporated in the 2019 Annual Report.

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

MEADOWBANK GOLD PROJECT		
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 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	11.2
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; and2. 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.	11.9.1/11.9 .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: a. Wildlife will be given right of way; b. Ships will maintain a straight course, constant speed, and will avoid erratic behaviour; and 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 and Vault 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

NIRB Project Certificate No.004 Condition 54	a. Updated terrestrial ecosystem baseline data; 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; 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. 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.	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.	8.18.1.7
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] 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	11.10.1
NIRB Project Certificate No.004	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

Condition 65		
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. 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 licence, shall be provided to the NIRB in Agnico Eagle's Annual Report for the project.	5.3.2
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	11.10.3

NIRB Project Certificate No.004, Commitment 21	Track the community of origin of hired Nunavimmiut to direct monitoring and followup 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-MEA1526 Schedule B-1	Construction Details for dikes and dams.	3.1.1.1
NWB 2AM-MEA1526 Schedule B-2	Monthly and annual volume of fresh Water obtained from Third Portage Lake.	4.1.1.1
NWB 2AM-MEA1526 Schedule B-3	Monthly and annual volume of fresh Water obtained from Wally Lake.	4.1.1.2
NWB 2AM-MEA1526 Schedule B-4	Results of lake level monitoring conducted under the protocol developed as per Part D Item 5.	4.2.1
NWB 2AM-MEA1526 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-MEA1526 Schedule B-6	The bathymetric survey(s) conducted prior to each year of shipping at the Baker Lake Marshalling Facility.	4.3
NWB 2AM-MEA1526 Schedule B-7	Geochemical monitoring results.	5.1.1
NWB 2AM-MEA1525 Schedule B-8	Volumes of waste rock used in construction and placed in the Rock Storage Facilities.	5.2.1
NWB 2AM-MEA1526 Schedule B-9	An update on the remaining capacity of the Tailings Storage Facility.	5.3.1
NWB 2AM-MEA1526 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-MEA1526 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-MEA1526 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-MEA1526 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-MEA1526 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-MEA1526 Schedule B-15	The results and interpretation of the Monitoring Program in accordance with Part I and Schedule I.	8.5
NWB 2AM-MEA1526 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-MEA1526 Schedule B-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.	9.1.1.1
NWB 2AM-MEA1526 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-MEA1526 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-MEA1526 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-MEA1526 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-MEA1526 Schedule B-22	An executive summary in English, Inuktitut and French of all plans, reports, or studies conducted under this Licence.	10.4.1
NWB 2AM-MEA1526 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-MEA1526 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-MEA1526 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-MEA1526 Part B, Item 16	The Licensee shall review the Plans or Manuals referred to in this Licence 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-MEA1526 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-MEA1526 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-MEA1526 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-MEA1526 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-MEA1526 Part I	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	3.2.1

Item 12	Expert Review Panel.	
NWB 2AM-MEA1526 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-MEA1526 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
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 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/8-71-2 Condition 19	The lessee shall submit to the Minister every two years after the commencement date of this lease, a report describing any variations from the Abandonment and Restoration Plan and updated cost estimates.	9.2.1.2
CIRNAC Land Lease 66A/8-71-2 Condition 33	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.	9.1.1.2
CIRNAC Land Lease 66A/8-72-5 Condition 8	The lessee shall file a report, annually ... i. Quantity of material removed and location of removal, for the immediately preceding calendar year ii. Such other data as are reasonably required by the Minister from time to time.	3.4.1.1
CIRNAC Land Lease 66A/8-72-5 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/8-72-5 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/8-72-5	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	9.2.1.2

Condition 37	estimates.	
KIA ROW KVRW06F04 Condition 14	Submit to KIA every two years on each anniversary of the commencement date, a report describing any variations from the Abandonment and Restoration Plan and updated cost estimates.	9.2.1.2
KIA ROW KVRW06F04 Condition 26	File annually a progress report for the preceding year, outlining any ongoing restoration completed, in conformity with the Abandonment and Restoration plan.	9.1.1.2
KIA ROW KVRW06F04 Schedule E - Condition 8	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
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 PROJECT		
Authorization Reference	**Reporting Requirement**	**Report Section**
NIRB Project Certificate No.008 Condition 1	The Proponent shall:	8.14.2
	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)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	
	d) 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.	
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:	8.14.2
	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.	
NIRB Project Certificate No.008 Condition 3	The Proponent shall maintain a Greenhouse Gas Emissions (GHG) Reduction Plan which includes:	8.15.2
	· 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.	
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	8.13.2

	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.	
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.	4.5
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.	5.2.2.2
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.	5.1.2
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: ▪ 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	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.	8.5.3.2.11

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: 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).	9.1.2.1
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.	9.3
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: ▪ 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.	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: 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.	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: 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	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	SECTION 8

	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.	
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.	8.1.2
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: 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	8.10
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: 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	8.18.7

	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
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, 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 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.	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 collect additional data on caribou group sizes in proximity to the Project, and shall work with the Terrestrial Advisory Group to refine appropriate caribou group size thresholds that trigger additional mitigation. Initially, the group size thresholds should be set at 110 (fall), 25 (winter and summer), and 12 (spring). The Proponent shall ensure modifications to the group size thresholds are incorporated into the Terrestrial Ecosystem Management Plan 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.	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 provide wildlife incident reports to the appropriate authorities in a timely fashion. Wildlife incident reports should include the following information:	8.18.4

	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: · 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.	8.18.5
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.	8.18.1.9
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
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	11.8.3

	condition in its annual report to the Nunavut Impact Review Board.	
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: · 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; and · Include a process for adaptive management and mitigation to respond if unanticipated impacts are identified. 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.	11.10.2

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: 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).	11.10.3/11.11.1.1
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: 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	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: · 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.	9.5

NIRB Project Certificate No.008, Condition 52	The Proponent should develop and maintain an easily referenced listing of formal certificates and licences that may be acquired via on-site training or training during project employment. The listing shall indicate which of these certifications and licences 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.	11.10.2/11.10.3
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: 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.	8.20.1
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.	10.2.2.1
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: · 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.	11.10.3
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.	11.10.3/11.11.1.6
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
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: 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	SECTION 8

	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.	10.4.2
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-WTP1826, Schedule B, Item 1	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-WTP1826 Schedule B, Item 2	Monthly and annual volume of fresh Water obtained from Nemo Lake.	4.1.2.1
NWB 2AM-WTP1826 Schedule B, Item 3	Monthly and annual volume of fresh Water obtained from Whale Tail Lake.	4.1.2.2
NWB 2AM-WTP1826 Schedule B, Item 4	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-WTP18266 Schedule B, Item 5	Results of lake level monitoring conducted under the protocol developed as per Part D Item 5 for Whale Tail Lake (South Basin).	4.2.2
NWB 2AM-WTP1826 Schedule B, Item 6	Summary of reporting results for the Water Balance and Water Quality model and any calibrations as required in Part E Items 7-9.	4.4.2.2
NWB 2AM-WTP1826 Schedule B, Item 7	Geochemical monitoring results	5.1.2
NWB 2AM-WTP1826 Schedule B, Item 8	Volumes of Waste Rock used in construction and placed in the Waste Rock Storage Facility.	5.2.2.1
NWB 2AM-WTP1826 Schedule B, Item 9	Volumes of ore stockpiled and overburden stored at Whale Tail Pit site.	5.2.2.1
NWB 2AM-WTP1826 Schedule B, Item 10	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-WTP1826 Schedule B, Item 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	6.1.2
NWB 2AM-	Reporting of Incinerator test results including the materials burned and the efficiency of the	6.2.2

WTP1826 Schedule B, Item 12	Incinerator in relation to effects on Water and the potential Deposit of Waste into Water	
NWB 2AM-WTP1826 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.	7.1.2
NWB 2AM-WTP1826 Schedule B, Item 14	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-WTP1826 Schedule B, Item 15	The results and interpretation of the Monitoring Program in accordance with Part I and Schedule I.	8.5
NWB 2AM-WTP1826 Schedule B, Item 16	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-WTP1826 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.	9.1.2.1
NWB 2AM-WTP1826 Schedule B, Item 18	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-WTP1826 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.	9.2.2.1
NWB 2AM-WTP1826 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.	10.1.2
NWB 2AM-WTP1826 Schedule B, Item 21	Where applicable, revisions as Addenda, with an indication of where changes have been made, for Plans, Reports, and Manuals.	10.2.2
NWB 2AM-WTP1826 Schedule B, Item 22	An executive summary in English and Inuktitut of all plans, reports, or studies conducted under this Licence.	10.4.2
NWB 2AM-WTP1826 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.	11.5.1
NWB 2AM-WTP1826 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.	4.6.2/6.3.2
NWB 2AM-WTP1826 Part B, Item 17	The Licensee shall review the Plans or Manuals referred to in this Licence 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-WTP1826 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 Licence, 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-WTP1826 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: a. Water works, including: Water Intake and causeway, Water control structures (dikes, berms, jetties, channels) and Water crossings (culverts, bridges); b. Waste disposal facilities including: Wastewater Treatment Plant, Sewage Treatment Plant, Discharge Diffuser, Waste Rock Storage Facility, Overburden stockpiles, and Landfill; and c. Whale Tail Bulk Fuel Storage Facility	3.5.2.1
NWB 2AM-WTP1826 Part D,	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	3.5.2.2

Item 15	construction phase, a Construction Summary Report prepared by a qualified Engineer(s) in accordance with Schedule D, Item 1.	
NWB 2AM-WTP1826 Part D, Item 16	The Licensee shall submit to the Board for review, within ninety (90) days of completion of the Whale Tail Haul Road, a Construction Summary Report prepared by a qualified Engineer(s) in accordance with Schedule D, Item 1	3.5.2.2
NWB 2AM-WTP1826 Part E, Item 7	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	4.4.2.2
NWB 2AM-WTP1826 Part E, Item 8	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-WTP1826 Part E, Item 9	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-WTP1826 Part E, Item 11	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-WTP1826 Part I, Item 3	The Licensee shall submit for Board approval, at least ninety (90) days prior to Operations an updated CREMP. The Program shall include all comments provided during the technical review of Application and shall include a comparison of monitoring results for receiving waters to model predictions (including base case predictions) and to thresholds identified for management actions, should trends indicate water quality objectives may be exceeded	8.1.2
NWB 2AM-WTP1826 Part I, Item 5	The Licensee shall submit to the Board for approval and implementation, within sixty (60) days of the approval of the Licence by the Minister, a Mercury Monitoring Studies Program. The Program shall include all comments and recommendations provided during the technical review of Application.	8.2
NWB 2AM-WTP1826 Part I, Item 13	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-WTP1826 Part I, Item 14	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-WTP1826 Part I, Item 16	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
NWB 2AM-WTP1826 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
NWB 2AM-WTP1826 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 16HCAA-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 16HCAA-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	8.6.2

	to construction for approval, and shall adhere to the guidance provided in the Monitoring Explosive-Based Winter Seismic Exploration in Waterbodies, NWT 2000-2002	
DFO Authorization 16HCAA-00370 Condition 2.4	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 16HCAA-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 16HCAA-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	8.5.1.2
DFO Authorization 16HCAA-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 16HCAA-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.	8.5.1.2
DFO Authorization 16HCAA-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 16HCAA-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.	8.5.1.2
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	8.11.2
DFO Authorization 16HCAA-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 16HCAA-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	8.8.2.4.5
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.	8.9
DFO Authorization 16HCAA-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 16HCAA-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,	8.8.2.2

	frequency of monitoring, sampling location and criteria for success.	
DFO Authorization 16HCAA-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 16HCAA-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 16HCAA-00370 Condition 5.1.1.5	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	8.8.2.2
DFO Authorization 16HCAA-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 16HCAA-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 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	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: 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.	3.4.2.1
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.	9.1.2.2
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: (a) total number of loads hauled in that year (b) total road operating cost for that year	11.7.1.2
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	The lessee agrees to report any information received, including accidents or others safety	11.7.2.2

lease 66H/8-2-1 Condition 64	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.	
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 ROW KVRW15F01 Item 54	AEM shall provide to KIA a detailed 'As Built Drawings' of all aspects of the Road within six (6) months after the date of final completion of the Construction, as determined in the certificates of final completion of such Construction work issued by the supervising engineer or other professional in charge of the Construction work.	3.5.2.2
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 […]	9.1.2.1
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
EXPLORATION WHALE TAIL PROJECT		
Authorization Reference	**Reporting Requirement**	**Report Section**
NWB 2BB-MEA1828 Part B, Item 6a	The daily, monthly and annual quantities in cubic metres of all freshwater obtained for all purposes	4.1.3.1
NWB 2BB-MEA1828 Part B, Item 6b	The daily, monthly and annual quantities in cubic metres of water pumped from the underground.	4.1.3.2
NWB 2BB-MEA1828 Part B, Item 6c	An estimate of the current volume of waste rock and ore stockpiled on site	5.2.3
NWB 2BB-MEA1828 Part B, Item 6d	Tabular summary of all data generated under the Monitoring Program, Part J	8.5.3.3
NWB 2BB-MEA1828 Part B, Item 6e	A summary of modification and/or major maintenance work carried out on the Water Supply Facilities, Bulk Fuel Storage and Containment Facilities, and Wastewater Treatment Facility, including all associated structures, and an outline of any work anticipated for the next year	3.5.3
NWB 2BB-MEA1828 Part B, Item 6f	A list of unauthorized discharges and a summary of follow-up actions taken	11.6.3
NWB 2BB-MEA1828 Part B, Item 6g	Any revisions to the Spill Contingency Plan, Water Management Plan, Waste Management Plan, Quarry Management Plan, Abandonment and Restoration Plan, as required by Part B, Item 12, submitted in the form of an Addendum	10.3
NWB 2BB-MEA1828 Part B, Item 6h	An updated estimate of the current Meadowbank Advanced Exploration Project restoration and liability, as required under Part B, Item 2, based upon the results of the restoration research, project development monitoring, and any modifications to the site plan	9.2.3
NWB 2BB-MEA1828 Part B, Item 6i	A summary of drilling/trenching activities and progressive reclamation of drill/trench sites.	9.1.3
NWB 2BB-MEA1828 Part B, Item 6j	Report all artesian flow occurrences as required under Part F, Item 7.	4.1.3.3

NWB 2BB-MEA1828 Part B, Item 6k	A description of all progressive and or final reclamation work undertaken, including photographic records of site conditions before, during and after completion of operations.	9.1.3
NWB 2BB-MEA1828 Part B, Item 6l	A summary of any specific studies or reports requested by the Board, and a brief description of any future studies planned or proposed.	10.1.3
NWB 2BB-MEA1828 Part B, Item 6m	A summary of public consultation/participation, describing consultation with local organizations and residents of the nearby communities, if any were conducted	11.9.8
NWB 2BB-MEA1828 Part B, Item 6n	Any other details on water use or waste disposal requested by the Board by the 1st of November of the year being reported.	4.6.3/6.3.3
NWB 2BB-MEA1828 Part G, Item 3	The Licensee shall provide as-built plans and drawings of the Modifications referred to in this Licence within ninety (90) days of completion of the Modification. These plans and drawings shall be stamped by an Engineer.	11.1.3
NWB 2BB-MEA1828 Part J, Item 6	The Licensee shall provide the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations where sources of water are utilized for all purposes.	4.1.3.4
NWB 2BB-MEA1828 Part J, Item 7	The Licensee shall provide the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations where wastes associated with camp operations and exploration activities are deposited including sump locations associated with drilling and drill casings left as stuck and cut off and for further drilling in casings	6.1.3
NWB 2BB-MEA1828 Part J, Item 8	The Licensee shall determine the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all drill holes located within thirty-one (31) metres of the ordinary High Water Mark, as per Part F, Item 2, and provide these locations on a map of suitable scale for review as part of the annual report.	11.3.2
NWB 2BB-MEA1828 Part J, Item 9	The Licensee shall establish background and post drilling water quality for pH, conductivity, temperature and dissolved oxygen at the nearest downstream water body to drill locations. Monitoring is to be done just prior to commencement of drilling and weekly thereafter, concluding one week after drilling has been completed and the site restored	8.5.3.3
NWB 2BB-MEA1828 Part J, Item 10	The Licensee shall obtain representative samples of the water column below any ice where required under Part F, Items 9 and 10. Monitoring shall include, at a minimum, the following Physical Parameters (pH, electrical conductivity, total suspended: solids), Major Ions (Calcium, chloride, magnesium, potassium, sodium, sulphate), Total Metals (Aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, titanium, uranium, vanadium and zinc).	8.5.3.3
NWB 2BB-MEA1828 Part J, Item 11	he Licensee shall establish baseline water quality conditions prior to drilling within thirty-one (31) metres of the ordinary High Water Mark as per Part F, Items 2 and 3. Monitoring shall include the following: Physical Parameters (pH, electrical conductivity, total suspended solids, turbidity). Major Ions (Calcium, chloride, magnesium, potassium, sodium, sulphate) Total Metals (Aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, titanium, uranium, vanadium and zinc)	8.5.3.3
NWB 2BB-MEA1828 Part J, Item 12	The Licensee shall, where turbidity is observed in adjacent waters or waters immediately downstream of any drilling program conducted within thirty-one (31) metres of the ordinary High Water Mark of any water body, during summer following any such drilling program as per Part F, Item 5 (c), conduct additional monitoring of the parameters listed in Part J, Item 10 to determine whether any further mitigation is required.)	8.5.3.3
NWB 2BB-MEA1828 Part J, Item 13	The Licensee shall monitor runoff and/or discharge from the quarry sites to receiving environment, during blasting activities, during periods of flow and following significant precipitation events, on a monthly basis	8.5.6.3
NWB 2BB-MEA1828 Part J, Item 14	The Licensee shall, during periods of flow and just after a major rainfall event, conduct water quality testing immediately upstream and downstream of the water crossings, any significant water seeps in contact with the road and any flows originating from borrow pits or rock quarries on a monthly basis prior to construction, during the construction and upon completion for the parameters listed under Part J, Item 11	8.5.6.3
NWB 2BB-MEA1828 Part J,	The Licensee shall implement a water crossings visual inspection and maintenance program prior to, during spring freshet and after heavy rainfall events to identify issues related to	8.5.6.3

Item 15	watercourse crossings structural integrity and hydraulic function	
NWB 2BB-MEA1828 Part J, Item 16	The Licensee shall annually review the approved by accredited laboratory Quality Assurance/Quality Control plan and modify it as necessary. Proposed changes shall be submitted to an accredited laboratory for approval	10.3
NWB 2BB-MEA1828 Part J, Item 19	The Licensee shall include in the Annual Report required under Part B, Item 2 and in Construction Summary Report required under Part E, Item 8 all data, monitoring results and information required by this Part	3.5.3

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

MEADOWBANK GOLD PROJECT			
NWB Station	**Description**	**Phase**	**2019 Reporting Status**
ST-DC-1 to TBD	Monitoring stations during Dike Construction as defined in Part D Item 5	Construction	Not applicable in 2019
ST-DD-1 to TBD	Monitoring stations during Dike Dewatering as defined in Part D Item 5	Construction	Not applicable in 2019
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 2019
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	Not applicable in 2019
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 2019
ST-10	Vault Attenuation Pond prior to discharge through Wally Lake Outfall Diffuser	Late operation	Not applicable in 2019
ST-11	Tailings Storage Facility	Post closure	Not applicable in 2019
ST-12	Portage/ Goose Pit Lake	Post closure	Not applicable in 2019
ST-13	Vault Pit Lake	Post closure	Not applicable in 2019
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	Section 8.5.3.1.8
ST-19	South Portage Pit Sump	Early operations	Section 8.5.3.1.9
	Portage Pit Lake	Late operations	Section 8.5.3.1.9
ST-20	Goose Island Pit Sump	Early operations	Section 8.5.3.1.10
	Goose Island Pit Lake	Late operations, closure	Section 8.5.3.1.10
ST-21	Tailings Reclaim Pond	Late operations	Section 8.5.3.1.11
ST-22	Tailings Storage Facility	Closure (drainage run-off)	Not Applicable in 2019

ST-23	Vault Pit Sump	Late operations	Section 8.5.3.1.12
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	Not Applicable in 2019
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 8.5.3.1.17/8.5.3.1.18
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 (MEA-4)	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 (MEA-4)	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-41	Phaser Pit Sump	Late operations	Section 8.5.3.1.19
ST-42	BB Phaser Pit Sump	Late operations	Section 8.5.3.1.20
ST-43	Phaser Attenuation Pond	Late operations	Section 8.5.3.1.21
WHALE TAIL PROJECT			
NWB Station	**Description**	**Phase**	**2019 Reporting Status**
ST-WT-DC-1 to TBD	Monitoring stations during Dike Construction as defined in Part D Item 5	Construction	Section 8.5.2.2 and Appendix 19
ST-WT-DD-1 to TBD	Monitoring stations during Dike Dewatering as defined in Part D Item 5	Construction	Section 8.5.2.2 and Appendix 19
ST-WT-S-1 to TBD	Seeps (to be determined)	Operations	Section 8.5.3.2.7
		Closure	Not applicable in 2019
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 2019
ST-WT-1	Attenuation Pond, pre-treatment	Operations	Not applicable in 2019
ST-WT-2	Attenuation Pond, post-treatment; last point of control before discharge	Operations	Not applicable in 2019
ST-WT-3	Waste Rock Storage Facility (WRSF) Pond prior to pumping to Attenuation Pond	Operations Closure	Sections 8.5.3.2.1
	Waste Rock Storage Facility (WRSF) Pond prior to discharge to Mammoth Lake	Post-Closure	Not applicable in 2019
ST-WT-4	Whale Tail Pit or pit sump	Operations	Section 8.5.3.2.2
ST-WT-5	Water Intake from Nemo Lake	Construction Operations	Sections 4.1.2.1
ST-WT-6	Lake A47	Construction Operations	Sections 8.5.3.2.3

		Closure	
ST-WT-7	East diversion channel	Operations	Not applicable in 2019
ST-WT-8	Water Intake from Whale Tail Lake	Closure	Not applicable in 2019
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 2019
ST-WT-10	Pit Lake (as the Pit fills)	Closure Post-Closure	Not applicable in 2019
ST-WT-11	Sewage Treatment Plant	Operations Closure	Section 8.5.4.2
ST-WT-12	Secondary containment at Whale Tail Bulk Fuel Storage Facility	Operations Closure	Section 8.5.5.3
ST-WT-13	Lake A45	Operations Closure	Section 8.5.3.2.4
ST-WT-14	Lake A16 outlet	Construction Operations Closure	Section 8.5.3.2.5
ST-WT-15	Lake A15	Construction Operations Closure	Section 8.5.3.2.6
ST-WT-16	Secondary containment at Whale Tail Bulk Fuel Storage Facility Power Plant	Operations Closure	Section 8.5.5.3
ST-WT-17	Whale Tail Dike Seepage	Operations Closure	Section 8.5.3.2.7
ST-WT-25	Whale Tail South Water Transfer	Operations	Section 8.5.3.2.8
Quarry 1	Quarry 1 discharge to Mammoth Lake	Operations	Section 8.5.3.2.10
NE Pond	NE Pond discharge towards Nemo Lake	Operations	Section 8.5.3.2.9
EXPLORATION WHALE TAIL PROJECT			
NWB Station	**Description**	**Phase**	**2019 Reporting Status**
MEA-1	Amaruq (IVR) Camp Water Intake and sources for industrial/drilling	Construction Operations Closure	Not applicable in 2019
MEA-2	Effluent discharged from the Wastewater Treatment System “Bionest” (WWTS)	Construction Operations Closure	Section8.5.4.3
MEA-3	Effluent discharged from the Bulk Fuel Storage Facilities	Construction Operations Closure	Not applicable in 2019
MEA-4	Effluent discharged from Stormwater Management Pond A-P5 and Trench-water containment ponds	Construction Operations Closure	Section 8.5.3.2.12

SECTION 2. SUMMARY OF ACTIVITIES

2.1 2019 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.

For the full year 2019, payable gold production was a record 1,782,147 ounces, which includes the pre-commercial production ounces at the Meliadine mine, the Amaruq satellite deposit and the Barnat deposit. Excluding the pre-commercial production ounces, payable gold production was 1,696,443 ounces, compared to 1,626,669 ounces in 2018. The higher level of gold production in the fourth quarter of 2019 and the full year 2019, when compared with the prior-year periods, was primarily due to the start of production at the Meliadine mine in 2019. Production costs per ounce for the full year 2019 were $735, compared to $713 in the prior-year period. Total cash costs per ounce for the full year 2019 were $673, compared to $637 in the prior-year period.

The 2019 highlights for the Meadowbank Gold Project and Whale Tail Project include:

- The Meadowbank mine achieved commercial production in March 2010, and most mining activities were completed in the fourth quarter of 2019
- The Amaruq satellite deposit achieved commercial production on September 30th, 2019.
- During 2019, payable gold production at Meadowbank totaled 158,208 ounces at a production cost per ounce of $1,152.
- Gold production for the full year 2019 decreased when compared to the prior-year period as expected due to anticipated lower grades from the processing of the marginal ore stockpile at Meadowbank as the mine transitioned through the last few months of mining at the Meadowbank site.

Quarterly progress reports, providing further details of activities throughout the 2019 year, were prepared for the Kivalliq Inuit Association as required by Production Lease KVPL08D280 and KVPL17D01.

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

Figure 1 Meadowbank Site 2019Sampling Locations

Figure 2 EEM Receiving Environment 2019 Sampling Locations

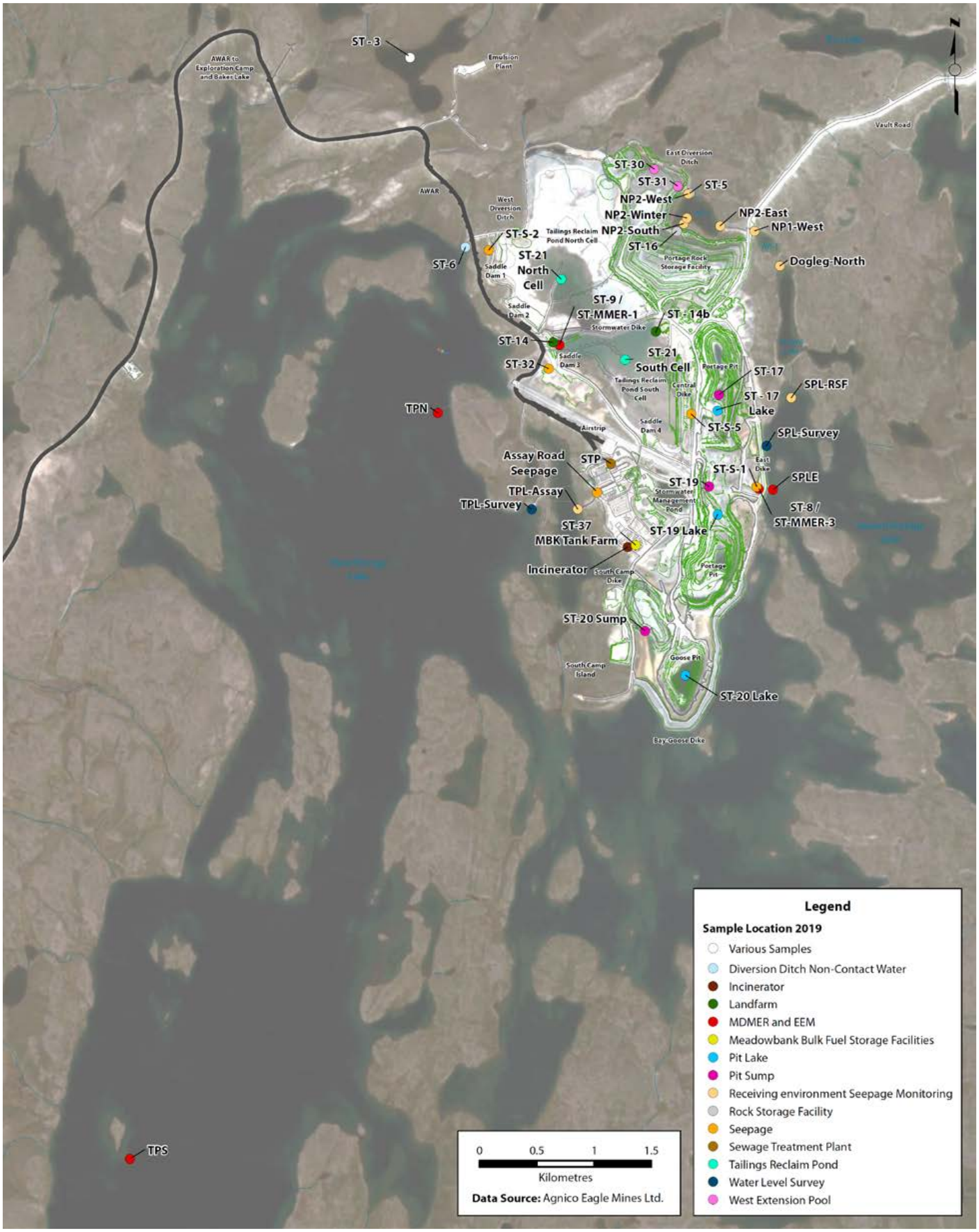


Figure 3 Vault Area 2019 Sampling Locations

Figure 4 Whale Tail Area 2019 Sampling Locations

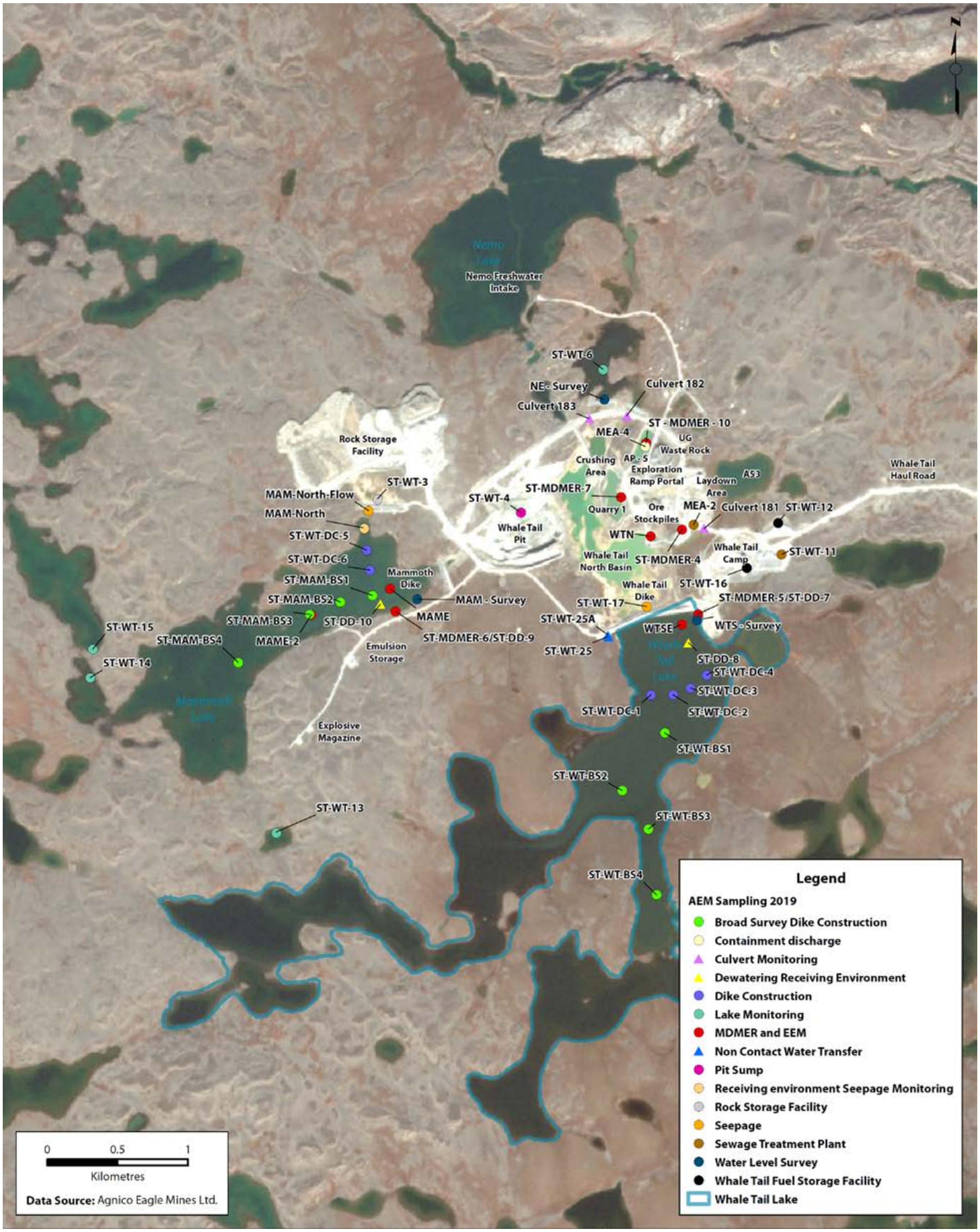


Figure 5 General View from Baker Lake to Whale Tail Project

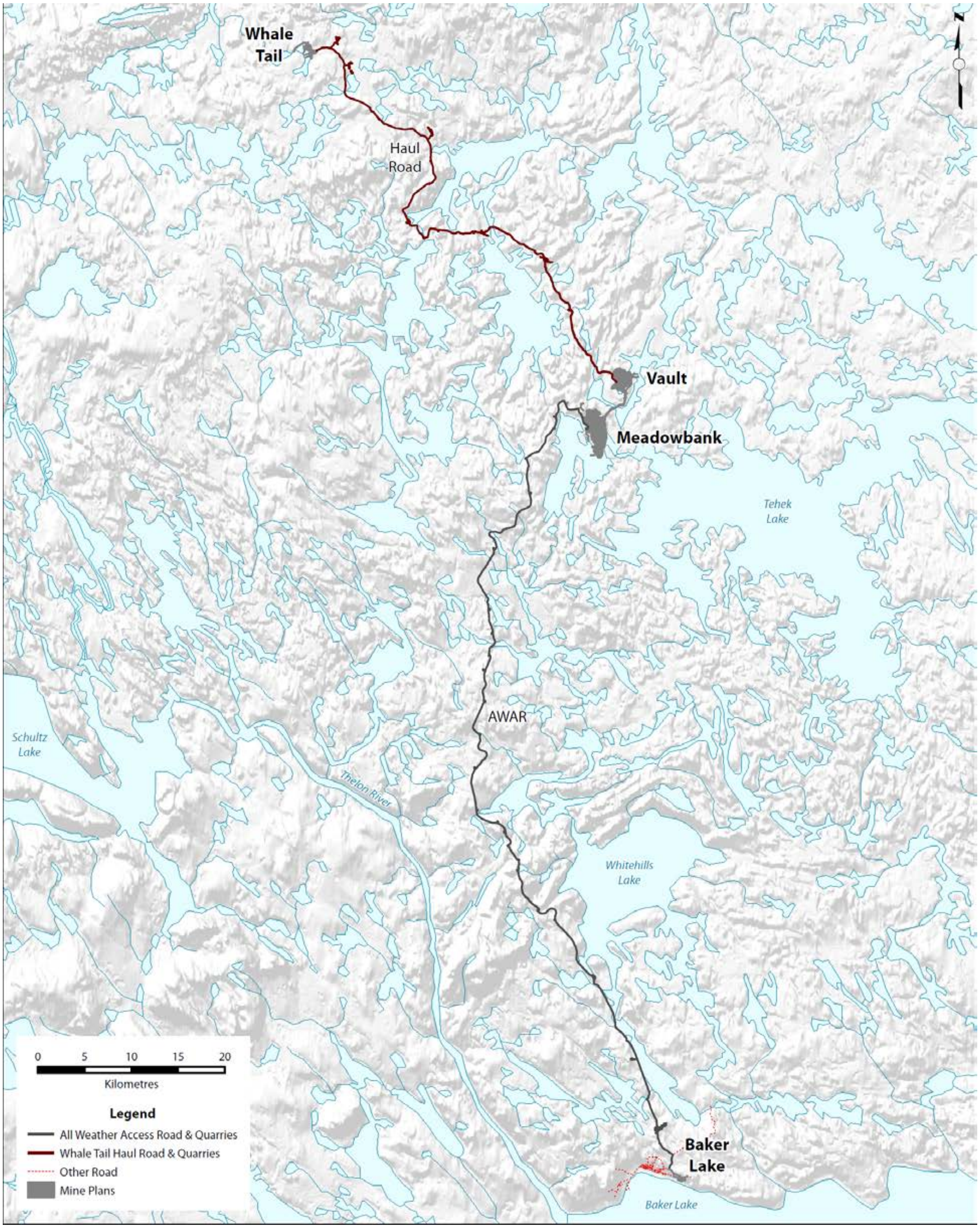


Figure 6 Baker Lake Marshalling Area 2019 Sampling Locations

2.2 2020 MINE PLAN / WORK PLAN

2.2.1 2020 Mine Plan Meadowbank Site

The “2020 Mine Plan” for the Meadowbank Gold Project, prepared for the Kivalliq Inuit Association as required by Production Lease KVPL08D280, is attached in Appendix 2. This report was submitted to the KivIA on January 6th, 2020, and outlines the activities planned for the project throughout the 2020 year.

The Meadowbank gold mine began the operation phase of the project in February 2010, and thus, is entering its eleventh year of operations. In addition to routine activities throughout the 2020 season, a number of secondary construction/modification projects will be undertaken near the main mine site area and Vault area. Tailings will be mainly deposited in the Portage and Goose Pits. Some tailings deposition might occur in the North and South Cell to optimize the landform.

In 2020, no mining activity is planned to occur at Meadowbank as all the pits 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 2020 in support of all operational undertakings at the Meadowbank site as required by the NWB Type A Water License 2AM-MEA1526, NIRB Project Certificate No.004, DFO authorizations and MDMER regulations.

2.2.2 2020 Work Plan Whale Tail Site

The “2020 Work Plan” for the Whale Tail Pit Project, prepared for the Kivalliq Inuit Association as required by Production Lease KVPL17D01, is attached in Appendix 3. This report was submitted to the KivIA on January 6th, 2020, and outlines the activities planned for the project throughout the 2020 year. This work plan will be amended appropriately if the Whale Tail Pit Expansion Project is approved.

The Whale Tail Project mine began the commercial production on September 2019, and thus, will be completing its first year of production in 2020. In addition to routine activities throughout the 2020 season, 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 2020 Work Plan’, prepared for the KivIA as required by Lease KVRW15F01, is attached in Appendix 4. This report was submitted to the KivIA on January 6th, 2020, and detailed planned road maintenance and operation activities along the Whale Tail Haul Road throughout the 2020 year. Environmental monitoring (wildlife, dust suppression, waste management, air and water quality) will continue through 2020.

On January 6th, 2020, Agnico submitted to KivIA the ‘2020 Work Plan’ for Quarry/Esker Permits KVCA15Q01, KVCA15Q02, KVCA18Q01 (Appendix 5, 6 and 7 respectively). This Work Plan detailed planned activities for the quarry/esker along the Whale Tail Haul Road throughout the 2020 year. As per the Work Plan, Agnico is currently not planning to remove esker and quarry material in 2020. Environmental monitoring (wildlife, water quality and archeology) will continue through 2020.

2.2.3 NIRB Screening Decision No. 11EN010

As requested by NIRB in the screening decision NIRB File No.11EN010, Agnico included within this annual report (Appendix 8), a comprehensive annual report of the activities associated with the project.

SECTION 3. CONSTRUCTION / EARTHWORKS

The following section 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-MEA1526, 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 TSF Operation Maintenance and Surveillance (OMS) Manual and in the Dewatering Dike OMS Manual in Appendix 51 of the 2018 Annual Report.

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 (usually monthly during normal operating conditions) and targeting specific activities

- Dike safety inspection (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 dam safety review – review of all aspects of the design, construction, operation, maintenance, processes, and other systems affecting the dams' safety, including the safety management system. Done annually by the Engineer of Record

- 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 (vary from monthly to quarterly)

b. A comparison of measured versus predicted performance;

A detailed comparison and analysis of the measured versus predicted performance can be found in the 2019 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)	
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 high seepage rate through bedrock foundation

On October 2019 the Stormwater Dike TARP level was decreased from Yellow to Green following the MDRB recommendation since the deformation mechanisms in the dike are well understood and the surveillance program is efficiently monitoring any movement that can occur. The structure was in Yellow since May 2016.

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 and is still ongoing on 2019, but to a much lesser extent. Further discussion on the risk and mitigation measures is included in Section C below.

More details are available in the 2019 Annual Geotechnical Inspection available in Appendix 9 and in the 2019 Water Management Report and Plan Version 8 (Appendix 11).

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 elevation. 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 Lavallin (SNC) and Agnico 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 has been 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 occur 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. This value is similar to the value from the 2017 seepage modelling done by Golder in closure condition for the South Cell.

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 and 2019.

The current mitigation strategy to reduce the risk related to seepage include the following :

- increased surveillance frequency (instrumentation review, site observation)
- presence of a backup pumping unit in the downstream area to maintain enough pumping capacity in case of a sudden seepage increase
- revised tailings & water management strategy to minimize the amount of water stored in the South Cell by promoting in-pit tailings deposition and redirecting the Central Dike seepage in Portage Pit when feasible.

Recommendation from the 2019 Annual Geotechnical Inspection and MDRB 25 on Central Dike Situation:

No new recommendations were made in 2019 on this subject

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

No mitigation work was performed on any dikes in 2019.

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 2019. In February 2019 an internal structure was built within the South Cell TSF to prevent tailings from entering the reclaim pond. In April 2019, a permeable berm was built in the North Cell to secure the pond from tailings entering. More details regarding these structures within the TSFs can be found in the Water Management Report and Plan Version 8 (Appendix 11). Please refer to Section 3.1.5 for a summary of dike construction in 2019.

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

Section 5.0 of the 2019 Annual Geotechnical Inspection by Golder, provided in Appendix 9, presents the instrumentation data collected in 2019.

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

No major remediation work on the structures was undertaken in 2019.

Table 3-2 presents the monthly quantities of seepage from dikes. More information can be found in the 2019 Water Management Report and Plan Version 8 (Appendix 11).

Table 3-2 Monthly volume of seepage (m^3) pumped at Meadowbank in 2019

Seepage	Central Dike	East Dike	East Dike
Discharge	**South Cell/Pit A**	**Second Portage Lake**	**Portage Pit**
January	171,003	6,657	2,207
February	154,560	0	5,761
March	183,072	6,294	3,363
April	180,898	0	10,288
May	168,080 (Pit A)	0	11,148
June	157,162 (Pit A)	0	12,631
July	405,888 (Pit A)	0	19,937
August	233,389 (Pit A)	0	17,083
September	214,232 (Pit A)	0	12,962
October	138,549 (Pit A)	0	14,317
November	51,376 (Pit A) / 10,708 (SC)	7,239	5,363
December	54,105	12,837	0
Total	**754,347 (SC) / 1,368,676 (Pit A)**	**33,027**	**115,060**

3.1.2 Whale Tail Site

3.1.2.1 *Performance Evaluation*

As required by NWB Water License 2AM-WTP1826 Part I, Item 16: ***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***

And

As required by Water License 2AM-WTP1826, 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 include 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 in Appendix 51 of the 2018 Annual Report.

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 (usually monthly during normal operating conditions) and targeting specific activities
- Dike safety inspection (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 dam safety review – review of all aspects of the design, construction, operation, maintenance, processes, and other systems affecting the dams' safety, including the safety management system. Done annually by the Engineer of Record (EOR)

- 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 (vary from monthly to quarterly)

b. A comparison of measured versus predicted performance;

A detailed comparison and analysis of the measured versus predicted performance can be found in the 2019 Annual Geotechnical Inspection report presented in Appendix 10. This assessment is based on visual inspection and analysis of instrumentation monitoring.

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

Structure	Type	TARP Level	Comments
Mammoth Dike	Dewatering Dike	Yellow (deviation from normal operating condition)	Water level in Mammoth Lake was over normal dike operating level in Q4 2019
North East 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	Yellow (deviation from normal operating condition)	Due to seepage observed in summer 2019

At Mammoth Dike, the performance of the structure is deviating from normal operating condition due to the water level in Mammoth Lake being over the normal dike operating level. This condition started in December 2019. Further discussion on the risk and mitigation measures is included in Section c) below.

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 is deviating from normal operating condition due to seepage observed during a high water level event. This condition started in August 2019. Further discussion on the risk and mitigation measures is included in Section C below.

More details are available in the 2019 Annual Geotechnical Inspection available in Appendix 10 and in the 2019 Water Management Report Version 4 (Appendix 12).

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

Mammoth Dike

In December 2019 the TARP level of Mammoth Dike was increased to yellow due to the water level in Mammoth Lake being over the normal dike operating level. The water level increase was due to pumping of water from Whale Tail Lake South to Mammoth Lake while Mammoth Lake outlet was frozen preventing water from flowing to the nearby lakes. The risk associated with this event is overtopping of the dike liner, possibly causing damage to the dike and allowing water to flow to the Whale Tail Pit area.

The current mitigation strategy to reduce the risks related to overtopping the dike liner include the following:

- The pumping of water from Whale Tail Lake South to Mammoth Lake was halted
- Increased surveillance frequency (instrumentation review, site observation)
- The hydrology was reviewed to understand the impact of having higher starting water level in Mammoth lake at freshet. This action led to a re-evaluation of the operating level at Mammoth Dike
- Preparation of an action plan linked to a decision tree if the water level are higher than those expected at freshet

Whale Tail Dike

In May 2019 the TARP level of Whale Tail Dike was increased to yellow due to due to indications of a high seepage rate underneath the embankments in the foundation. Indicators of the seepage during the summer of 2019 included:

- Cracks, settlement and circular depression were observed on the structure
- Some thermistor were showing warming sign inferring seepage through the foundation
- Seepage streams were observed on the downstream side of the structure
- As a results of the seepage the TARP level was increased and the following action were taken :
- Seepage streams were cleared from boulders and two (2) V-notch weirs were installed to monitor the flow. A trench was installed to gather the seepage streams

- Temporary thermistor were installed on the structure
- Increased frequency of visual observation and seepage measurement using V Notch
- Increase monitoring of water quality in seepage stream
- Grout committee was formed to develop mitigation measure
- Investigation campaign (Willowstick) was done to increase understanding of potential seepage pathway

The risk associated with the Whale Tail Dike seepage is unmanageable inflow of water to the site leading to flooding of the Whale Tail Pit area. The current mitigation strategy to reduce the risks related to damage to the dike and allowing water to flow to the Whale Tail Pit area include the following:

- Initiation of additional grouting of the dike to reduce the seepage flow (initiated in Q4 2019, expected completion in Q3 2020). A technical committee was formed to advise on this work.
- Increased surveillance frequency (instrumentation review, site observation)
- Installation of a permanent seepage collection and pumping system (ongoing, to be operational in Q2 2020)
- Installation of additional instrumentations to monitor seepage (to be done after grouting is complete)

<u>WRSF Dike</u>

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 indicate 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. The risk associated with this event is contaminant release to Mammoth Lake and the area downstream of the dike as well as possible damage to the dike.

The current mitigation strategy to reduce the risks related to contaminant release to Mammoth Lake and the area downstream of the dike as well as possible damage to the dike include the following:

- Increased surveillance frequency (instrumentation review, site observation)
- Review the operating level of the structure to minimize water ponding over the key trench and ensure sufficient pumping capacity to comply to the operating level
- Build an upstream berm to mitigate the risk of foundation thawing (to be ready prior to freshet 2020)

- Install a seepage interception system on the downstream side of the structure (to be ready in Q3 2020)

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

Mitigation work was initiated in 2019 on Whale Tail Dike (grouting, seepage collection system). This mitigation is ongoing in 2020 and will be reported on in the 2020 Annual Report. No as-built were submitted in 2019 as per this requirement

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 a summary of dike construction in 2019.

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

Section 4.0 of the 2019 Annual Geotechnical Inspection by SNC Lavalin, provided in Appendix 10, presents the instrumentation data collected in 2019.

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

Remediation work was initiated in 2019 on Whale Tail Dike (grouting, seepage collection system). This mitigation is ongoing in 2020 will be reported on in the 2020 Annual Report.

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

Table 3-4 presents the monthly quantities of seepage from dikes. More information can be found in the Water Management Plan Version 4 (Appendix 12). Seepage was visually confirmed at Whale Tail Dike in July 2019 but was not pumped separately until October. Visual and v-notch weir seepage rate estimates were used to fill in Table 3-4 for July until September.

The total seepage flow at the downstream was estimated at 288-310 m^3/h during the summer of 2019.

Table 3-4 Monthly volume of seepage (m^3) pumped at Whale Tail site in 2019

Seepage	Whale Tail Dike
Discharge	**Whale Tail South**
January	0
February	0
March	0
April	0
May	0
June	0
July	214,272 (estimated)
August	214,272 (estimated)
September	207,360

	(estimated)
October	186,230
November	77,610
December	0
Total	**263,840**

3.2 MEADOWBANK DIKE REVIEW BOARD

3.2.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 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 November 2019 (MDRB 25). The MDRB No.25A report, along with Agnico's response to the recommendations are included in Appendix 13. This Appendix 13 includes a summary table of all recommendations and the Agnico implementation plan.

3.2.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1826 Part I, Item 14: ***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.***

During MDRB 25 the design, construction, and operation of the Whale Tail Project water management structures were discussed. These aspects are presented in a separate report (MDRB No. 25B). This report, along with Agnico's response to the recommendations are included in Appendix 14. This Appendix 14 includes a summary table of all recommendations and the Agnico implementation plan.

3.3 GEOTECHNICAL ENGINEER'S INSPECTION REPORT

3.3.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 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 2019 annual geotechnical inspection was performed by Golder in July 2019. The report, along with Agnico's response to the recommendations are included in Appendix 9 and 15. In order to keep the whole interpretation and understanding of the recommendations and responses, Agnico will refer the reader to the Appendix 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-WTP1826 Part I, Item 13: ***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 2019 annual geotechnical inspection was performed by SNC Lavalin in July 2019. The report, along with Agnico's response to the recommendations are included in Appendix 10 and 16. In order to keep the whole interpretation and understanding of the recommendations and responses, Agnico will refer the reader to the Appendix 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 72-5, 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 72-5, 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.***

And

As required by KIA Right of Way Authorization KVRW06F04, Schedule E, Condition 8: ***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 2019, Agnico blasted 19,840 m^3 of NPAG material from Quarry 2 (Parcel A) and 14,580 m^3 of NPAG material from Quarry 11 (Parcel G) along the Meadowbank All Weather Access Road situated on CIRNAC leased land. The 2019 Annual Quarry Report was sent to CIRNAC on February 28th, 2020. The material removed was used on the AWAR for maintenance and Baker Lake diesel tank no.7 infrastructure construction. No material was blasted in other quarries situated on CIRNAC and KivIA leased land.

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 2019.

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. The contaminated material from these quarries last excavated in 2016 (see Q22 2016 report – 2016 Annual report). The contaminated material was transported to the Meadowbank Landfarm. From 2017 to 2019, the presence of falcon and safety concerns prevented the campaign from being completed.

Taking into consideration the results from the 2014 to 2016 work plan, Agnico Eagle intended to continue to scarify the surface of Quarry 22 in 2019, as in previous years, with the back-end of a grader, allowing ground surface to be aerated thus increasing degradation of PHC. However, because of repeated observation of Peregrine Falcon activity and nesting during quarry inspections, as it was the case in 2017-2018, Agnico decided to limit all activity within the area, including scarification. This decision was taken to minimize impact on potential success of nesting for this species and therefore ensure proper conditions of nesting activity.

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

In 2020, according to the peregrine falcon activity and nesting observation during the weekly quarry inspections, Agnico will evaluate if the work could be completed without disturbance to wildlife. Deterrents will be installed before the 2020 next nesting season in Quarry 22 at Meadowbank in order to continue the soil decontamination. If the use of deterrents are successful in Quarry 22, Agnico will continue the work previously initiated in this area. However, If needed, the area could be limited to any activity in order to ensure adequate bird protection and management. If no repeated peregrine falcon presences are observed, Agnico proposes to continue scarifying the surface areas in Q22 during the summer of 2020. According to the last sampling campaign, the main focus should be on fraction 3 and efforts should be deployed especially in section Q22-1 and Q22-2 as they are the only two results above the CCME criteria. However, if a peregrine falcon family establish their nest in the quarry, Agnico will simply postpone the scarification in late September before the freeze up season in order to let the birds leave the nest without disturbance.

Another round of sampling is planned in late fall in 2020. Results will then be compared to the previous data (2014, 2016 and 2018) to monitor the level of degradation. Based on the soil sampling campaign, Agnico will analyze the next actions to be taken. If needed, further course of action could include removal of additional material. Nonetheless, Agnico considers the actual methodology to be a satisfactory solution to the remediation of the quarry.

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 2019, no new material was taken from the Whale Tail Haul Road eskers/quarries on Crown Land. All material required for construction / maintenance activities in 2019 were from previous material already paid in previous year. The 2019 Annual Quarry Report was sent to CIRNAC on February 28th, 2020.

Agnico also removed, in 2019, 900 m^3 of NPAG gravel material from esker 5 and 1,935 m^3 of NPAG gravel material from esker 6 along the Whale Tail Haul Road situated on KivIA leased land. The material removed was used for the Whale Tail Haul maintenance and Whale Tail site construction. As required by permit KVCA15Q01, KVCA15Q02 and KVCA18Q01, a report was submitted to KivIA prior to the tenth day of each month indicating the quantity of material removed from the Lands during the prior month along with the applicable fees.

During peak flow of freshet 2019, daily inspection of eskers and quarries along the Whale Tail Haul Road were performed to ensure that runoff, if any, would be free of any visible sheen and would not impact the environment. Freshet leaders were hired in 2019 and were dedicated to the inspection of Whale Tail Haul Road including the esker, quarries, culvert and bridges. If needed, mitigation measures, as straw boom or turbidity barrier, were put in place as prevention measures. No issues with runoff water inside the eskers/quarries to any waterbodies were noted in 2019.

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 metre setback distance.

3.5 2019 CONSTRUCTION

3.5.1 Meadowbank Site

In 2019, the construction activities at the Meadowbank site consisted of the In-Pit Tailings Deposition Project, the South Cell internal structure, and the North Cell permeable berm. For the In-Pit Tailings Deposition Project the construction is ongoing in 2020 and will be reported on in the 2020 Annual Report and in a construction summary report.

In February 2019 an internal structure was built within the South Cell TSF to prevent tailings from entering the reclaim pond. A construction summary report was completed and submitted for this structure in May 2019 (Appendix 17). In April 2019, a permeable berm was built in the North Cell to secure the pond from tailings entering. More details regarding these structures within the TSFs can be found in the 2019 Water Management Plan Version 8 (Appendix 11).

In 2018, Agnico submitted to the NWB the design report for the construction of two (2) additional 10 ML fuel tank at the Baker Lake Marshalling Facility. This report was submitted during the amendment process of the Water License 2AM-MEA1626 as describe in Section 11.2.4. The design report was approved on January 29th, 2019. The construction of one (1) tank was completed in September 2019. As required by the Water License 2AM-MEA1526 Part D Item 14 and Part G Item 4, Agnico needed to provide within 90 days of completion a construction summary report. Agnico respectfully requested an extension to January 17th, 2020 for the submission of the Construction Summary Report. This extension was granted by the NWB. The Construction Summary Report was submitted to NWB on January 16th, 2020. As required by the approbation of this modification to the Water License, Agnico also submitted at the same time the updated Baker Lake Bulk Fuel Storage Facility: Environmental Performance Monitoring Plan (Appendix 18).

3.5.2 Whale Tail Site

In 2019, the construction activity of the water management infrastructure at the Whale Tail Project included completion of the construction work on the North East Dike, WRSF Dike, Mammoth Dike, Whale Tail Dike (WTD), WTN temporary dewatering infrastructure (ramp, piping, diffuser), alternative conveyance system for water from Lake A53 and NE Pond and the Pad D Saline Protection ditches system. The following construction project were also initiated: South Whale Tail Channel construction, remedial grouting of WTD, seepage collection system at WTD, attenuation pond water management infrastructure (diffuser, ramp). Construction was completed in accordance with the requirements of the Design and Technical Specifications developed for each structure. As-built reports have been submitted after completion of construction as required by the Water License 2AM-WTP1826.

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 the geosynthetics.

North East Dike is the structure required to prevent run-off from the northeast watershed to the Whale Tail pit area. In 2019, construction of North East Dike was completed and construction activity included key trench excavation, foundation preparation, fill placement (rockfill, coarse filter, fine filter, and fine filter amended with bentonite), and liner installation.

WRSF Dike is the structure built to contain contact water generated by snow melt and runoff from direct precipitation on the waste rock stockpile that has the potential to be acid generating. In 2019, construction of WRSF Dike was completed and construction activity included key trench excavation, foundation preparation, fill placement (rockfill, coarse filter, fine filter, and fine filter amended with bentonite), and liner installation.

Mammoth Dike is the structure built to prevent flooding of the Whale Tail Pit area by Mammoth Lake. In 2019, construction of Mammoth Dike was completed and construction activity included key trench excavation, foundation preparation, fill placement (rockfill, coarse filter, fine filter, and fine filter amended with bentonite), and liner installation.

Whale Tail Dike is the structure to isolate the North portion of Whale Tail Lake for dewatering and provides access to the Whale Tail pit area. In Q3 of 2019, the initial construction activity of Whale Tail Dike was completed including grouting, instrument installation and placement of the thermal capping layer. In Q4 2019, additional work was initiated on Whale Tail Dike (additional grouting, seepage collection system construction) to mitigate the seepage that was higher than expected. This work is planned to extend into 2020 and the construction will be reported on in the 2020 Annual Report and in an as-built report.

The dewatering infrastructure of WTN included construction of temporary diffuser in Mammoth Lake, installation of piping and pumping system and the construction of a temporary dewatering ramp in WTN. These infrastructure were constructed in 2019 and commissioned in Q3 2019. They will be used until the dewatering of WTN is completed in 2020.

The South Whale Tail Channel is a Channel that will ensure that water is able to flow from Whale Tail South to Mammoth Lake. Work started on this in Q4 of 2019 with construction of access road.

The objective of the Pad D saline protection ditches is to direct the contact saline water from the underground waste rock pad (Pad D) toward the underground mine attenuation pond (AP-5).The construction of the Pad D Saline Protection system at Whale Tail was completed with the installation of the cover protection of the saline ditches in 2019.

Please refer to Section 3.5.2.2 below for summary of the construction summary reports submitted in 2019. As-built reports will be submitted in 2020 when construction is complete for the following projects: Mammoth Lake Diffuser, Whale Tail North Dewatering Pumping System, South Whale Tail Channel, Whale Tail Dike, A53 to Whale Tail South Pumping System, Whale Tail Dewatering Ramp, and any other construction projects that takes place at Whale Tail Site in 2020.

The construction of the permanent camp and associated sewage treatment plant, the Arsenic Water Treatment Plan and the Whale Tail Fuel Storage Facility were majors infrastructure that were finalized in 2019.

3.5.2.1 *Design Report and Construction Drawings*

As required by NWB Water License 2AM-WTP1826 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 DFO Authorization 16HCAA-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.***

And

As required by DFO Authorization 16HCAA-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.***

As mentioned above in Section 3.5.2, 2019 was an other important year in the construction of the Whale Tail Project. Table 3-5 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's response 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/).

To address DFO Authorization 16HCAA-00370 Condition 2.3.5 and 2.4.1, in 2019, designs for the East Diversion Channel including culvert construction designs for roads 1 and 13 were submitted to NWB and were available for DFO review between March 6th and 27th. No comments from DFO were received, and on May 3rd the NWB approved the Design Report. Similarly, design reports were submitted to the NWB for the South Whale Tail Channel and road 24 culvert and were available for DFO review. DFO comments were submitted on August 21st, and Agnico's responses were provided on August 29th. On September 9th, DFO confirmed that their concerns were addressed. On September 12th, 2019 the NWB approved the Design Report. As-built reports for culvert construction, including photographs, will be provided to NWB 90 days after the construction completion, as required according to the Project's Type A Water License (2AM-WTP1826) Part D Item 15. DFO has the opportunity to comment all design reports submitted to the NWB for approval. Agnico 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 3-5 Whale Tail 2019 List of Design Report Submitted

Design Report	60-day notice Submission to NWB	NWB Design Report Approval
Arsenic Water Treatment Plan	2018-11-29	2019-01-14
Sewage Treatment Plant	2018-12-21	2018-01-24
Mammoth Lake Summer / Winter Diffuser	2019-01-31	2019-02-15
Whale Tail Attenuation Pond Ramp	2019-02-22	2019-04-24
East diversion channel / culvert road no.1 and no.13	2019-03-06	2019-05-03
Whale Tail Landfill	2019-04-19	2019-06-18
South Whale Tail Diversion Channel and Road 24	2019-07-25	2019-09-12

3.5.2.2 *Construction Summary Report*

As required by NWB Water License 2AM-WTP1826 Part D, Item 15: ***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.***

And

As required by NWB Water License 2AM-WTP1826 Part D, Item 16: ***The Licensee shall submit to the Board for review, within ninety (90) days of completion of the Whale Tail Haul Road, a Construction Summary Report prepared by a qualified Engineer(s) in accordance with Schedule D, Item 1.***

And

As required by KIA KVRW15F01 Item 54: ***AEM shall provide to KIA a detailed 'As Built Drawings' of all aspects of the Road within six (6) months after the date of final completion of the Construction, as determined in the certificates of final completion of such Construction work issued by the supervising engineer or other professional in charge of the Construction work.***

Table 3-6 below provided a list of the 2019 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 3-6 Whale Tail 2019 List of Construction Summary Report Submitted

Design Report	Submission to NWB
Nemo Freshwater Intake	2019-02-01
Whale Tail Haul Road	2019-03-27
North East Dike	2019-06-10
Waste Rock Storage Facility (WRSF) Dike	2019-06-10
Mammoth Dike	2019-06-10
Sewage Treatment Plan	2019-07-23
Construction Water Treatment Plan	2019-10-04
Arsenic Water Treatment Plan	2019-10-04
Whale Tail Fuel Storage Facility	2019-11-11
Road 11 Culvert	2019-11-29

3.5.3 Exploration Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part B, Item 6e: ***A summary of modification and/or major maintenance work carried out on the Water Supply Facilities, Bulk Fuel Storage and Containment Facilities, and Wastewater Treatment Facility, including all associated structures, and an outline of any work anticipated for the next year.***

And

As required by NWB Water License 2BB-MEA1828 Part J, Item 19***: The Licensee shall include in the Annual Report required under Part B, Item 2 and in Construction Summary Report required under Part E, Item 8 all data, monitoring results and information required by this Part.***

In 2015, the exploration group was relocated to the Amaruq satellite deposit at Meadowbank to a separate camp with a 125 person capacity. As of December 2018, the camp's capacity had been increased to hold up to 300 people. In April 2018, the Bionest wastewater treatment plan (STP) was replaced by a Newterra system (which became the wastewater treatment plan for the permanent camp in April 2019). With the ongoing increase for the project and in order to accommodate more people, in January 2019 the Bionest was restarted and was operating jointly with the Newterra wastewater treatment plan at the exploration camp. In April 2019, the Newterra system were dismantled from the exploration camp and installed at the permanent camp. With the upcoming closure of the exploration camp, the Bionest system was permanently stopped in November 2019. Sewage produced by the exploration camp is transferred by truck to the Newterra to be treated. There was no other modification to the STP in 2019.

On October 28th, 2018, the water source was changed from the Whale Tail Lake, approval source during the exploration phase as per Water License 2BB-MEA1828, to Nemo Lake, water source approved as per Water License 2AM-WTP1826. In order to accommodate more people to the exploration camp during the construction phase, a more performant water treatment plan (which will become the water treatment plan for the permanent camp) has replaced the one currently used with the exploration camp. In Q1 2019, the more performant water treatment plan was dismantled from the exploration camp and installed at the permanent camp. The original water treatment plan associated with Water License 2BB is still in operation at the exploration camp. There was no other modification bring to the WTP in 2019.

The exploration camp is planned to be closed and dismantled in 2020.

The bulk fuel storage authorized by the Water License 2BB-MEA1828 was never constructed so there is no maintenance or modification to report for 2019.

No construction summary reported were provided in 2019 related to Water License 2BB-MEA1828.

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-MEA1526 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 Licence approval data to December 21, 2017 followed by 9,120,000 m^3 per year in 2018 through to the expiry of the Licence.*"

Section 4.1.1.1 to 4.1.1.3 and Table 4-1 below detailed the freshwater consumption per sources. The total volume of freshwater pumped from the surrounding lakes and used for the Meadowbank Gold Project in 2019 was 2,230,280 m^3.

The volume of reclaim water used in the mill in 2019 was 608,435 m^3. The volume of freshwater that is contained in the ore to the mill in 2019 was 57,566 m^3.

Table 4-1 Meadowbank 2019 Freshwater Usage

Water Location	Source Lake	Jan	Feb	March	April	May	June
Camp	Third Portage Lake	3,577	3,238	3,539	3,188	3,624	3,418
Mill (freshwater tank)	Third Portage Lake	214,981	182,096	112,326	142,405	147,851	218,935
Emulsion plant	Unnamed Lake	50	13	48	57	83	16
Total Freshwater Usage (m^3)		**218,608**	**185,347**	**115,913**	**145,650**	**151,558**	**222,369**
Ore Water (m^3)	Ore	4,610	3,045	2,727	4,539	6,203	6,927
Reclaim Water Usage (m^3)	Tailings Pond	7,180	29,023	91,207	69,216	82,018	17,693

Water Location	Source Lake	July	Aug	Sept	Oct	Nov	Dec	Total
Camp	Third Portage Lake	3,194	3,197	3,193	3,236	3,363	3,455	**40,222**
Mill (freshwater tank)	Third Portage Lake	220,398	76,341	209,339	148,008	238,530	278,157	**2,189,367**
Emulsion plant	Unnamed Lake	64	52	78	97.1	67.4	65.5	**691**
Total Freshwater Usage (m^3)		**223,656**	**79,590**	**212,610**	**151,341**	**241,960**	**281,678**	**2,230,280**
Ore Water (m^3)	Ore	7,251	5,992	2,454	4,430	3,901	5,487	**57,566**
Reclaim Water Usage (m^3)	Tailings Pond	41,309	157,510	6,706	105,372	1,042	159	**608,435**

4.1.1.1 *Third Portage Lake*

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 2: *Monthly and annual volume of fresh Water obtained from Third Portage Lake*.

A total volume of 2,229,589 m^3 of freshwater was used from Third Portage Lake for the project in 2019, which was in compliance with the Water License Freshwater maximum usage volume of 4,935,000 m^3 (Water License 2AM-MEA1526 Part E, Item1). The monthly breakdown usage is provided in Table 4-1 above.

4.1.1.2 *Wally Lake*

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 3: *Monthly and annual volume of fresh Water obtained from Wally Lake*.

As per Type A Water License 2AM-MEA1526 Part E Item 2, Agnico 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 in 2019.

4.1.1.3 *Unnamed Lake*

Water used from unnamed lake was for the explosive mixing. In 2019, the total of freshwater obtained from unnamed lake was 691 m^3. This was compliant with the Water License 2AM-MEA1526 Part E Item 2 which allows for a maximum usage of 2,400 m^3. The monthly breakdown usage is provided in Table 4-1 above.

4.1.2 Whale Tail Site

Section 4.1.2.1 to 4.1.2.3 and Table 4-2 below detailed the freshwater consumption per sources. The total volume of freshwater pumped from the surrounding lakes and used for the Whale Tail Project in 2019, under Water License 2AM-WTP1826, was 50,559 m^3.

4.1.2.1 *Nemo Lake*

As required by NWB Water License 2AM-WTP1826 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-WTP1826 to intake water from Nemo Lake for a total year during operation of 237,500 m^3. From this amount, 191,750 m^3 are for the domestic, operation, construction and associated use, and 45,750 m^3 for the dust suppression.

Total freshwater consumption in 2019 from Nemo Lake was 50,559 m^3.

4.1.2.2 *Whale Tail Lake*

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 3: *Monthly and annual volume of fresh Water obtained from Whale Tail Lake.*

No freshwater obtained from Whale Tail Lake in 2019.

4.1.2.3 *Unnamed Lake*

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 4: *Monthly and annual volume of fresh Water obtained from unnamed water bodies for Whale Tail Haul Road dust suppressant and for the Emulsion plant.*

Following approval of the Water License 2AM-WTP1826, the Water Licence 8BC-AEA1525 (Amaruq Exploration Access Road Project) was cancelled on November 9th, 2018. Water usage from pond along the Whale Tail Haul Road is now include in the Water License 2AM-WTP1826 and include in the 47,750 m^3 allowed for dust suppression. No water was used in 2019.

Agnico Eagle is authorized as per Part E Item 4 of the Water License 2AM-WTP1826 to intake water from unnamed lake, for explosive mixing and associated use, for a total per of 2,500 m^3/year. In 2019, no water was withdrawn at Whale Tail Site for explosive mixing purpose.

Table 4-2 Whale Tail 2019 Freshwater Usage – License 2AM-WTP1826

Water Location	Source Lake	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Camp	Nemo Lake	1,306	1,396	1,179	1,192	1,806	1,940	1,882	1,825	1,760	2,051	2,068	2,136	**20,541**
Construction/Operation	Nemo Lake	1,283	2,188	3,076	2,206	2,831	2,829	3,431	3,094	2,445	3,337	2,456	842	**30,018**
Dust suppression	Nemo Lake/WTHR Pond	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Total Freshwater Usage (m^3)		**2,589**	**3,584**	**4,255**	**3,398**	**4,637**	**4,769**	**5,313**	**4,919**	**4,205**	**5,388**	**4,524**	**2,978**	**50,559**

Table 4-3 Whale Tail 2019 Freshwater Usage – License 2BB-MEA1828

Water Location	Source Lake	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Camp	Whale Tail Lake	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Construction	Whale Tail Lake	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Dust Suppression	Whale Tail Lake	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Drill	Pond at proximity drilling site	2,334	5,933	2,612	3,944	5,138	5,156	5,812	5,687	3,859	1,274	301	0	**42,051**
Total Freshwater Usage (m^3)		**2,334**	**5,933**	**2,612**	**3,944**	**5,138**	**5,156**	**5,812**	**5,687**	**3,859**	**1,274**	**301**	**0**	**42,051**

4.1.3 Exploration Whale Tail Site

4.1.3.1 *Exploration Activities*

As required by NWB Water License 2BB-MEA1828 Part B, Item 6a: *The daily, monthly and annual quantities in cubic metres of all freshwater obtained for all purposes.*

Agnico Eagle is authorized as per Part C Item 1 of the Water License 2BB-MEA1828 to intake water from Whale Tail Lake and pond in proximity of the drilling sites for a volume of 299 m^3/day. Total year to date water usage was 42,051 m^3. Since October 2018, all water to supply the camp and construction activities was taken from Nemo Lake – refer to Section 4.1.2.1. Table 4-3 above detailed the freshwater consumption.

4.1.3.2 *Underground Activities*

As required by NWB Water License 2BB-MEA1828 Part B, Item 6b: *The daily, monthly and annual quantities in cubic metres of water pumped from the underground.*

In 2019, a total volume of 2,670 m^3 was discharged from the underground to the AP5 Pond.

4.1.3.3 *Artesian Flow*

As required by NWB Water License 2BB-MEA1828 Part B, Item 6j: *Report all artesian flow occurrences as required under Part F, Item 7.*

No artesian flow occurrences encountered in 2019.

4.1.3.4 *Location Water Sources*

As required by NWB Water License 2BB-MEA1828 Part J, Item 6: *The Licensee shall provide the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations where sources of water are utilized for all purposes.*

Table 4-4 below provide the location of all sources of water used in 2019 for drilling purpose.

Table 4-4 Whale Tail 2019 Exploration Drilling Water Sources Locations

Usage	Longitude	Latitude
Drilling	96° 6' 17.578" W	64° 56' 51.735" N
Drilling	96° 5' 22.727" W	64° 57' 26.445" N
Drilling	95° 53' 14.210" W	65° 5' 18.237" N
Drilling	95° 53' 45.400" W	65° 8' 31.959" N
Drilling	95° 48' 33.323" W	65° 10' 22.825" N
Drilling	95° 50' 24.813" W	65° 10' 38.603" N
Drilling	96° 3' 57.729" W	65° 8' 43.171" N
Drilling	96° 54' 22.218" W	65° 29' 12.479" N

Drilling	96° 57' 56.836" W	65° 28' 46.221" N
Drilling	96° 49' 20.212" W	65° 23' 30.192" N
Drilling	96° 47' 3.342" W	65° 24' 17.517" N
Drilling	96° 47' 3.831" W	65° 23' 4.931" N
Drilling	96° 46' 31.195" W	65° 23' 22.069" N
Drilling	96° 44' 48.798" W	65° 23' 51.377" N
Drilling	96° 41' 51.057" W	65° 24' 18.004" N
Drilling	96° 47' 46.018" W	65° 23' 14.158" N
Drilling	96° 40' 27.306" W	65° 24' 24.537" N
Drilling	96° 41' 40.883" W	65° 24' 49.008" N

4.2 LAKE LEVEL MONITORING

4.2.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 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)*.

As of November 19th, 2014 when tailings deposition began in the South Cell, the Portage Attenuation Pond ceased operation and became the South Cell TSF. There is no discharge from the Portage Attenuation Pond into Third Portage Lake since July 5th, 2014. The elevation, in metres above sea level (masl), of Third Portage Lake continued to be monitored in 2019. 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 4-5 and Figure 7 the lake level remained within the range of naturally occurring levels.

Water from the East Dike Seepage was discharged into Second Portage Lake in 2019. The elevation, in metres above sea level, of Second Portage Lake continued to be monitored in 2019. 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 4-5 and Figure 7; the lake level remained within the range of naturally occurring levels.

No water was discharged from the Vault Attenuation Pond (contact water) in 2019. When discharge occurred, water from Vault attenuation Pond is discharged into Wally Lake through the diffuser as effluent. The elevation measurement, in metres above sea level, of Wally Lake was ongoing in 2019. 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 4-5 and Figure 7; the lake level remained within the range of naturally occurring levels.

Following recommendation from CIRNAC regarding the 2018 Annual Report, starting 2019, Turn Lake water level monitoring in the next open water season was completed, reported and compared to predictions. The lake level monitoring results are presented in Table 4-5 and Figure 7.

In 2019, Agnico comes to the same conclusion as presented in reports from 2015 to 2018; lake level for Third Portage, Second Portage and Wally lakes remained within the range of naturally occurring levels. Refer to PEAMP Section 12.3.1.1 and Table 12-1 for a complete discussion of the impacts of discharge on water level in the receiving environment. Figure 40 - 42 in Section 12 presents historical trending up to 2019. Overall, modeling predicted the natural range of water levels in Third Portage Lake to be 133.82 – 134.19 masl. (2019 measured value range from 133.46 – 133.74 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. Although rates of dewatering (i.e. pumping rates) were underestimated during the FEIS, water levels have not significantly changed at monitoring stations since monitoring began. The average water level for TPL in 2019 is 133.61 masl which is between the natural variation of the lake.

In 2019, there is no discharge from the Vault Attenuation Pond to Wally Lake. Wally Lake 2019 Water level monitoring range from 139.34 – 139.65 masl. with an average of 139.50 masl. Impacts to water levels in Wally Lake have not been observed.

For Second Portage Lake, the baseline level is 133.1 masl. The average for 2019 is 132.94 masl (values range from 132.75 – 133.07). Since that prediction is not quantitative, as the FEIS predicted a “minor” effect on water levels, historical measurements are reviewed here to identify any apparent trends that might arise. The trend appears to be within the range from previous year is considered as a minor impact on lake level.

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. Trends will begin to be assessed after at least two years of monitoring.

Following this analysis, Agnico 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 4-6 below provide the 2013 -2019 water level monitoring average.

Table 4-5 Meadowbank 2019 Lake Water Level Monitoring

Date	Wally Lake (masl)	Second Portage Lake (masl)	Third Portage Lake (masl)	Turn Lake (masl)
Code Identification	**WL-Survey**	**SPL-Survey**	**TPL-Survey**	**Turn Lake-Survey**
2019-06-08	139.34	132.75	133.46	139.11
2019-06-15	139.59	132.82	133.50	139.36
2019-06-23	139.65	133.07	133.56	139.34
2019-07-30	139.51	133.01	133.69	139.23
2019-08-20	139.55	133.04	133.74	
2019-09-10	139.44	132.98	133.72	139.04
2019-09-17	139.44	132.91	133.63	139.00
2019-09-29	139.50	132.95	133.63	139.10
2019-11-07	139.34	132.93	133.58	

Figure 7 Meadowbank 2019 Lake Water Level Monitoring

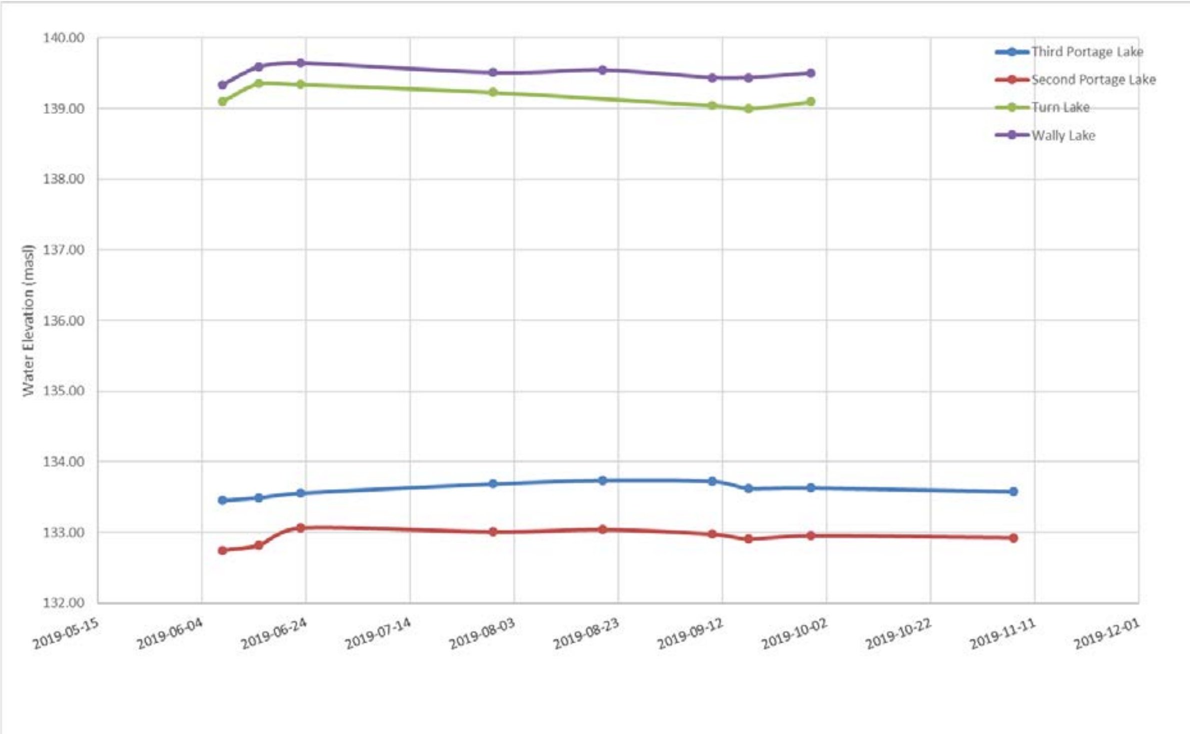


Table 4-6 Meadowbank 2013-2019 Lake Water Level Monitoring Average

Date	Wally Lake (masl)	Second Portage Lake (masl)	Third Portage Lake (masl)	Turn Lake (masl)
Code Identification	**WL-Survey**	**SPL-Survey**	**TPL-Survey**	**Turn Lake-Survey**
2013	139.38	132.94	133.57	NA
2014	139.42	133.26	133.53	NA
2015	139.47	133.12	133.65	NA
2016	139.47	132.95	133.64	NA
2017	139.52	132.92	133.58	NA
2018	139.41	132.96	133.67	NA
2019	139.50	132.94	133.61	139.17

4.2.2 Whale Tail Site

As required by NWB Water License 2AM-WTP18266 Schedule B, Item 5: *Results of lake level monitoring conducted under the protocol developed as per Part D Item 5 for Whale Tail Lake (South Basin).*

The elevation, in metres above sea level, of Whale Tail Lake South Basin (range from 152.51 – 155.84), Mammoth Lake (range from 152.39 – 152.61) and NE-Pond (range from 155.92 – 156.66) were monitored minimally on a weekly basis, during open water season and, weather permitting. Results are presented in Table 4-7 and Figure 8. The location of the lake level survey monitoring is identified as

WTS-Survey, MAM-Survey and NE-Survey, respectively, on Figure 4. The lake level average results 2018-2019 are presented in Table 4-8. A complete discussion of measured and predicted water levels in the Whale Tail South flood zone is provided in the 2019 Water Quality Monitoring for Dike Construction and Dewatering Report (Appendix 19) More discussion regarding the flooding of the Whale Tail South, North-East Pond are provided in the 2019 Migratory Bird Protection Plan (Appendix M of the Wildlife Monitoring Summary Report in Appendix 52). Comparison to FEIS are provided in Section 12.3.1. Agnico will refer to these reports for a complete discussion of the results in 2019.

Table 4-7 Whale Tail 2019 Lake Water Level Monitoring

Date	Whale Tail South (masl)	Mammoth Lake (masl.)	NE Pond (masl)	Date	Whale Tail South (masl)	Mammoth Lake (masl.)	NE Pond (masl)	Date	Whale Tail South (masl)	Mammoth Lake (masl.)	NE Pond (masl)
Code Identification	**WTS-Survey**	**MAM-Survey**	**NE-Survey**	**Code Identification**	**WTS-Survey**	**MAM-Survey**	**NE-Survey**	**Code Identification**	**WTS-Survey**	**MAM-Survey**	**NE-Survey**
2019-02-19	152.52			2019-06-05	154.35			2019-09-18	155.73	152.49	156.243
2019-02-20	152.52			2019-06-06	154.37			2019-09-19	155.74	152.50	156.222
2019-02-21	152.53			2019-06-07	154.40			2019-09-20	155.74	152.48	156.212
2019-02-22	152.52			2019-06-08	154.42	152.39		2019-09-21	155.75	152.51	156.231
2019-02-23	152.52			2019-06-09	154.46			2019-09-22	155.76	152.51	156.109
2019-02-24	152.52			2019-06-10	154.51			2019-09-23	155.76	152.52	155.989
2019-02-25	152.52			2019-06-11	154.54			2019-09-24	155.75	152.51	155.936
2019-02-26	152.52			2019-06-12	154.57			2019-09-25	155.76	152.53	155.916
2019-02-27	152.52			2019-06-13	154.60			2019-09-26	155.77	152.51	156.044
2019-02-28	152.52			2019-06-14	154.63	152.52	156.324	2019-09-27	155.79	152.48	156.114
2019-03-01	152.53			2019-06-15	154.67			2019-09-28	155.80		
2019-03-02	152.52			2019-06-16	154.75	152.53	156.337	2019-09-29	155.80		
2019-03-03	152.51			2019-06-17	154.73			2019-09-30	155.80		
2019-03-04	152.52			2019-06-18	154.90			2019-10-01	155.80		
2019-03-05	152.53			2019-06-19	154.93	152.52	156.333	2019-10-02	155.80		
2019-03-06	152.55			2019-06-20	154.99			2019-10-03	155.80		
2019-03-07	152.61			2019-06-21	155.04		156.32	2019-10-04	155.80		
2019-03-08	152.67			2019-06-22	155.08			2019-10-05	155.81		
2019-03-09	152.74			2019-06-23	155.11			2019-10-06	155.81		
2019-03-10	152.80			2019-06-24	155.12		156.387	2019-10-07	155.82		
2019-03-11	152.86			2019-06-25	155.13			2019-10-08	155.82		
2019-03-12	152.90			2019-06-26	155.14	152.61	156.421	2019-10-09	155.82	152.58	
2019-03-13	152.96			2019-06-27	155.15			2019-10-10	155.84		
2019-03-14	153.02			2019-06-28	155.16	152.52	156.431	2019-10-11	155.83		
2019-03-15	153.07			2019-06-29	155.16			2019-10-12	155.83		
2019-03-16	153.13			2019-06-30	155.18			2019-10-13	155.83		
2019-03-17	153.19			2019-07-01	155.22		156.43	2019-10-14	155.83		

Date	Whale Tail South (masl)	Mammoth Lake (masl.)	NE Pond (masl)	Date	Whale Tail South (masl)	Mammoth Lake (masl.)	NE Pond (masl)	Date	Whale Tail South (masl)	Mammoth Lake (masl.)	NE Pond (masl)
2019-03-18	153.27			2019-07-02	155.27			2019-10-15	155.83		
2019-03-19	153.28			2019-07-03	155.29	152.55	156.606	2019-10-16	155.83		
2019-03-20	153.29			2019-07-04	155.31			2019-10-17	155.83		
2019-03-21	153.33			2019-07-05	155.32		156.663	2019-10-18	155.83		
2019-03-22	153.36			2019-07-06	155.33		156.628	2019-10-19	155.83		
2019-03-23	153.41			2019-07-07	155.31		156.613	2019-10-20	155.83		
2019-03-24	153.45			2019-07-08	155.36		156.588	2019-10-21	155.84		
2019-03-25	153.49			2019-07-09	155.35		156.581	2019-10-22	155.83		
2019-03-26	153.52			2019-07-10	155.36		156.557	2019-10-23	155.82		
2019-03-27	153.55			2019-07-11	155.37		156.535	2019-10-24	155.82		
2019-03-28	153.60			2019-07-12	155.39		156.514	2019-10-25	155.82		
2019-03-29	153.63			2019-07-13	155.42		156.508	2019-10-26	155.80		
2019-03-30	153.67			2019-07-14	155.42		156.474	2019-10-27	155.79		
2019-03-31	153.70			2019-07-15	155.43	152.46	156.427	2019-10-28	155.78		
2019-04-01	153.73			2019-07-16	155.45		156.446	2019-10-29	155.76		
2019-04-02	153.77			2019-07-17	155.46		156.457	2019-10-30	155.75		
2019-04-03	153.79			2019-07-18	155.45		156.462	2019-10-31	155.74		
2019-04-04	153.83			2019-07-19	155.46	152.45	156.301	2019-11-01	155.73		
2019-04-05	153.86			2019-07-20	155.46		156.433	2019-11-02	155.71	152.58	
2019-04-06	153.91			2019-07-21	155.46		156.432	2019-11-03	155.70		
2019-04-07	153.93			2019-07-22	155.47	152.44	156.417	2019-11-04	155.69		
2019-04-08	153.96			2019-07-23	155.47		156.19	2019-11-05	155.67		
2019-04-09	153.97			2019-07-24	155.47		156.382	2019-11-06	155.65		
2019-04-10	153.97			2019-07-25	155.47			2019-11-07	155.64		
2019-04-11	153.96			2019-07-26	155.46		156.349	2019-11-08	155.63		
2019-04-12	153.95			2019-07-27	155.48	152.44	156.343	2019-11-09	155.62		
2019-04-13	153.95			2019-07-28	155.48		156.338	2019-11-10	155.61		
2019-04-15	153.94			2019-07-29	155.49	152.47	156.362	2019-11-11	155.60		
2019-04-16	153.93			2019-07-30	155.49		156.348	2019-11-12	155.59		
2019-04-17	153.93			2019-07-31	155.51		156.375	2019-11-13	155.57		
2019-04-18	153.92			2019-08-01	155.51		156.41	2019-11-14	155.55		
2019-04-19	153.92			2019-08-02	155.52		156.372	2019-11-15	155.55		
2019-04-20	153.91			2019-08-03	155.55		156.408	2019-11-16	155.53		
2019-04-21	153.91			2019-08-04	155.56	152.48	156.443	2019-11-17	155.52		
2019-04-22	153.90			2019-08-05	155.61			2019-11-18	155.51		
2019-04-23	153.90			2019-08-06	155.63		156.561	2019-11-19	155.50		
2019-04-24	153.89			2019-08-07	155.65		156.557	2019-11-20	155.49		

Date	Whale Tail South (masl)	Mammoth Lake (masl.)	NE Pond (masl)	Date	Whale Tail South (masl)	Mammoth Lake (masl.)	NE Pond (masl)	Date	Whale Tail South (masl)	Mammoth Lake (masl.)	NE Pond (masl)
2019-04-25	153.88			2019-08-08	155.66			2019-11-21	155.47		
2019-04-26	153.88			2019-08-09	155.66	152.52	156.543	2019-11-22	155.46		
2019-04-27	153.87			2019-08-10	155.68		156.537	2019-11-23	155.44		
2019-04-28	153.86			2019-08-11	155.69		156.58	2019-11-24	155.43		
2019-04-29	153.86			2019-08-12	155.72		156.581	2019-11-25	155.43		
2019-04-30	153.86			2019-08-13	155.72		156.557	2019-11-26	155.41		
2019-05-01	153.85			2019-08-14	155.74		156.567	2019-11-27	155.40		
2019-05-02	153.85			2019-08-15	155.76		156.571	2019-11-28	155.39		
2019-05-03	153.84			2019-08-16	155.76		156.591	2019-11-29	155.38		
2019-05-04	153.87			2019-08-17	155.77	152.48	156.601	2019-11-30	155.36		
2019-05-05	153.89			2019-08-18	155.76		156.578	2019-12-01	155.36		
2019-05-06	153.94			2019-08-19	155.77		156.572	2019-12-02	155.34		
2019-05-07	153.98			2019-08-20	155.77		156.55	2019-12-03	155.33		
2019-05-08	154.02			2019-08-21	155.78		156.531	2019-12-04	155.31		
2019-05-09	154.06			2019-08-22	155.80			2019-12-05	155.30		
2019-05-10	154.08			2019-08-23	155.79		156.529	2019-12-06	155.29		
2019-05-11	154.11			2019-08-24	155.79			2019-12-07	155.27		
2019-05-12	154.14			2019-08-25	155.77	152.45	156.545	2019-12-08	155.25		
2019-05-13	154.18			2019-08-26	155.78			2019-12-09	155.24		
2019-05-14	154.21			2019-08-27	155.77		156.416	2019-12-10	155.22		
2019-05-15	154.25			2019-08-28	155.77			2019-12-11	155.20		
2019-05-16	154.30			2019-08-29	155.77		156.497	2019-12-12	155.18		
2019-05-17	154.31			2019-08-30	155.77			2019-12-13	155.17		
2019-05-18	154.29			2019-08-31	155.77		156.509	2019-12-14	155.17		
2019-05-19	154.26			2019-09-01	155.77	152.39	156.567	2019-12-15	155.16		
2019-05-20	154.25			2019-09-02	155.76		156.542	2019-12-16	155.15		
2019-05-21	154.25			2019-09-03	155.76		156.527	2019-12-17	155.14		
2019-05-22	154.24			2019-09-04	155.75		156.521	2019-12-18	155.14		
2019-05-23	154.24			2019-09-05	155.75		156.5	2019-12-19	155.14		
2019-05-24	154.23			2019-09-06	155.75			2019-12-20	155.16		
2019-05-25	154.24			2019-09-07	155.74			2019-12-21	155.15		
2019-05-26	154.24			2019-09-08	155.74		156.394	2019-12-22	155.15		
2019-05-27	154.24			2019-09-09	155.74		156.39	2019-12-23	155.15		
2019-05-28	154.24			2019-09-10	155.73		156.314	2019-12-24	155.16		
2019-05-29	154.24			2019-09-11	155.73	152.43	156.316	2019-12-25	155.15		
2019-05-30	154.24			2019-09-12	155.73	152.46	156.269	2019-12-26	155.16		
2019-05-31	154.24			2019-09-13	155.72			2019-12-27	155.16		

Date	Whale Tail South (masl)	Mammoth Lake (masl.)	NE Pond (masl)	Date	Whale Tail South (masl)	Mammoth Lake (masl.)	NE Pond (masl)	Date	Whale Tail South (masl)	Mammoth Lake (masl.)	NE Pond (masl)
2019-06-01	154.25			2019-09-14	155.72	152.45	156.246	2019-12-28	155.16		
2019-06-02	154.28			2019-09-15	155.73	152.48	156.252	2019-12-29	155.16		
2019-06-03	154.30			2019-09-16	155.73	152.46	156.235	2019-12-30	155.16		
2019-06-04	154.33			2019-09-17	155.72	152.43	156.244	2019-12-31	155.17		

Figure 8 Whale Tail 2019 Lake Water Level Monitoring

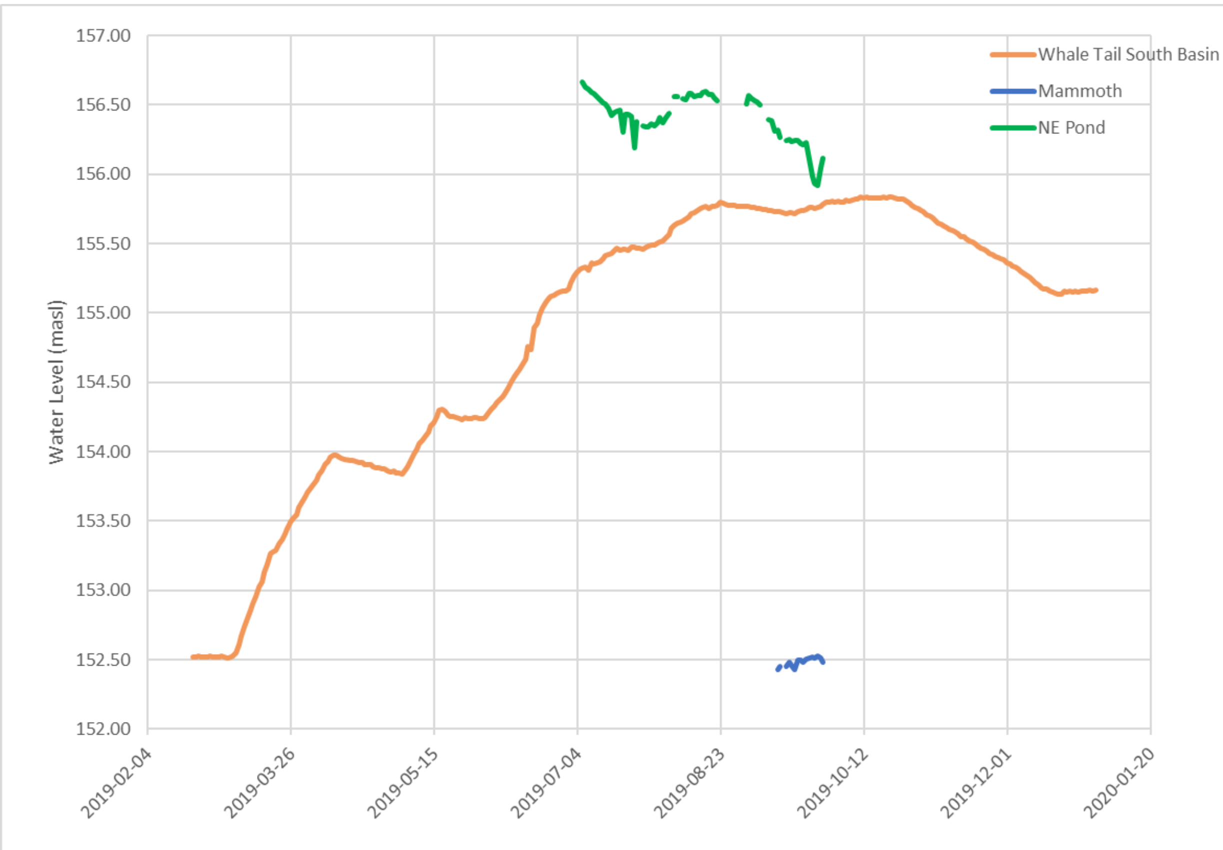


Table 4-8 Whale Tail 2018-2019 Lake Water Level Average

Date	Whale Tail Lake South Basin (masl)	Mammoth Lake (masl)	NE-Pond (masl)
Code Identification	WTS-Survey	MAM-Survey	NE-Survey
2018	152.71	152.53	152.53
2019	154.85	152.49	156.41

4.3 BATHYMETRIC SURVEYS BAKER LAKE MARSHALLING FACILITY

As required by NWB Water License 2AM-MEA1526 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 18, 2019 and is included in Appendix 21. 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-MEA1526 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 has an inspection program in place to inspect the water management infrastructures. Site inspections on the dewatering dikes and tailings facility are performed every week and are documented if changing conditions are observed. Detailed visual inspections are performed and documented on a monthly basis. This inspection program has been reviewed and approved by the structure designer and the Meadowbank Dike Review Board.

More information is presented in the water management plan and in the dewatering dike and tailings facility OMS manuals (Appendix 51 of the 2018 Annual Report).

Agnico also conducted weekly inspections for seepage sump and contact and non-contact water ditches and documented the inspections. During freshet period, inspection frequency is increased as detailed in the Freshet Action Plan (Appendix D of the 2019 Water Management Report and Plan Version 8 (Appendix 11 of the 2019 Annual Report).

4.4.1.2 *Whale Tail Site*

As required by NWB Water License 2AM-WTP1826 Part E, Item 11: ***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 has an inspection program in place to inspect the water management infrastructures. Site inspections on the dewatering dikes are performed every week and are documented if changing conditions are observed. Detailed visual inspections are performed and documented on a monthly basis. This inspection program has been reviewed and approved by the structure designer and the Meadowbank Dike Review Board.

More information is presented in the Water Management Plan Version 4 (Appendix 12) and in the Water Management Infrastructures OMS manual (Appendix 51 of the 2018 Annual Report).

Agnico also conducted weekly inspections for sumps and ditches on a weekly basis and documented the inspections. During freshet period, inspection frequency is increased as detailed in the Freshet Action Plan (Appendix D of the 2019 Water Management Plan Version 4 (Appendix 12 of the 2019 Annual Report)).

4.4.2 Water Balance Water Quality Model Reporting Summary

4.4.2.1 *Meadowbank Site*

As required by NWB Water License 2AM-MEA1526 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-MEA1526 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 and water management report and plan update for 2019 was completed. The technical report 2019 Water Management Report and Plan Version 8 is included in Appendix 11.

The 2019 water management plan for the Meadowbank mine site update consisted of:

- The validation and update of the site hydrology, including the revision of drainage areas and the update of meteorological conditions when required.
- The update of the water management plan, taking into account changes to the following elements:
    - Mining schedule;
    - Mill operation rate;
    - Mine pits layout;
    - Rock storage strategy; and
    - Tailings management strategy, including In-Pit Tailings Deposition.
- The development of a water balance model for the entire site and for the complete duration of the mining activities until final site closure.
- A comparison of the predicted and recently remodeled pit water quality (Meadowbank Water Quality Forecasting Update – Based on the 2019 Water Management Plan, SNC, 2020) forecast to assist in water treatment options development for closure planning.

The life-of-mine (LOM) considered for the water balance reflects the mining plan summarized in the 2019 Water Management Plan, as it pertains to the activities within the current approved license for the Meadowbank mine.

In 2019, in addition to the changes in the LOM, revisions/modifications were made to the Water Balance for optimization purposes including:

- Fresh water consumption revision;
- Total daily mill water consumption update;
- Update of the tailings deposition plan, including In-Pit Tailings Deposition;
- Flooding sequence and volumes update to take into account the updated pit inflows;
- Seepage flow update;
- Water transfer flow update based on new water management plan;
- Tailings dry density and ice entrapment update based on latest bathymetric analysis.

Revisions and modifications to the Water Balance are discussed in detail in the 2019 Water Management Report and Plan Version 8 (Appendix 11) and is summarized below:

- Freshwater pumped from Third Portage Lake was mainly used at the mill (average of 182,225 m^3/month in 2019) and the camp (average of 3,352 m^3/month in 2019);
- In 2019, a total of 606,807 m^3 was reused by the Mill. The fresh water utilization (Mill and Camp) will vary from 9.7 Mm^3 to 2.1 Mm^3 per year for 2020 to 2022, and will then decrease to 34,675 m^3 in 2023 once mill operation stops. This does not include pit flooding;
- The freshwater consumption at the process plant in 2019 is higher compared to previous years due to higher ice entrapment in the South Cell, turbid reclaim water exceeding mill criteria, and no water being reclaimed during in-pit tailings disposal since the reclaim system is still under construction;
- The Water Quality Forecast 2019 (SNC, 2020) provides water quality modelling with updated parameters (including dissolved) to determine the need for potential treatment at closure. The updated water quality forecast model applies to the North and South Cell TSF Reclaim Ponds, and the Portage, Goose, Vault and Phaser Pits. A review of the available water quality data measured in 2019 was undertaken. Treatment may be required for aluminium, arsenic, cadmium, chromium, copper, iron, lead, nickel, selenium, thallium, chloride, fluoride, sulphate, and total ammonia/total nitrogen equivalent, as the pit water quality may exceed CCME limits if the water is not treated, based on the completely mixed assumption. For the Vault area, ammonia and nitrate are the parameters of concern, but no actual or forecasted concentration exceeds the Type A Water License discharge requirements for this area.

The following recommendations are presented in the 2019 Water Management Report and Plan in order to improve on the current water management strategies and water balance:

- Continue to monitor and include any new flow monitoring locations/devices for any additional or new inflows observed in 2020.
- Continue to update the deposition plans of the In-Pit Deposition areas and TSF as needed to maximize water use and availability as well as increasing the accuracy of the models including but not limited to bathymetric readings.
- Validate new tailings parameters with 2020 In-Pit Deposition area and TSF bathymetries.
- Conduct the water quality modelling analysis on a yearly basis based on updated water quality results and water balance through the life of mine.
- Continue development of the sediment flux model to evaluate erosion of geotechnical structures on site for the closure, primarily for TSS control: diversion ditches, rock storage facilities, capping of the tailings storage facilities, dikes and dams.
- Evaluate opportunities to reduce contaminants concentration in the reclaim pond prior to closure.
- Continue follow up of the Central Dike seepage flow and adjust pumping station capacity in function of the decreasing flow.
- Implement 2019 Meadowbank Water Quality Forecasting (SNC, 2020) recommendations.

4.4.2.2 *Whale Tail Site*

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 6: ***Summary of reporting results for the Water Balance and Water Quality model and any calibrations as required in Part E Items 7-9.***

And

As required by NWB Water License 2AM-WTP1826 Part E, Item 7: ***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-WTP1826 Part E, Item 8: ***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 and water management report and plan update for 2019 was completed. The technical report 2019 Water Management Plan Version 4 is included in Appendix 12.

The 2019 Water Management Plan for the Whale Tail mine site update consisted of:

- The validation and update of the site hydrology, including the revision of drainage areas and the update of meteorological conditions when required.
- The update of the water management plan, taking into account changes to the following elements:
    - Mining schedule;
    - Mine pits layout; and
    - Rock storage strategy.
- The development of a water balance model for the entire site and for the complete duration of the mining activities until final site closure.
- A comparison of the predicted and recently remodeled pit water quality (Whale Tail Water Quality Forecasting Update – Based on the 2019 Water Management Plan, Golder, 2020) forecast to assist in water treatment options development for closure planning.

The life-of-mine (LOM) considered for the water balance reflects the mining plan summarized in the 2019 Water Management Plan, as it pertains to the activities within the current approved license for the Whale Tail mine.

In 2019, in addition to the changes in the LOM, revisions/modifications were made to the Water Balance for optimization purposes including:

- Fresh water consumption revision;
- Flooding sequence and volumes update to take into account the updated pit inflows; and
- Water transfer flow update based on new water management plan.

Revisions and modifications to the Water Balance are discussed in detail in the 2019 Water Management Plan Version 4 (Appendix 12) and is summarized below:

- In 2019 additional water management system components were put in place at the Whale Tail mine in order to adapt effectively to the site conditions and to manage non contact water adequately.
- Water management strategy updates were communicated in August and September 2019 to the Nunavut Water Board regarding changes to the management of non-contact water for specific areas of the project.
- The Water Quality Forecast 2019 provides water quality modelling with updated parameters (including dissolved) to determine the need for potential treatment at closure. A review of the available water quality data measured in 2019 was undertaken. At closure and post-closure, flooded pit water quality is predicted to meet receiving water quality criteria when flooding is complete, allowing reconnection with the downstream receiving environment. Arsenic release

from the submerged Whale Tail Pit walls is anticipated once pit-flooding commences, but is expected to be a relatively short-lived source to the flooded pit lake.

The following recommendations are made in order to improve on the current water management strategies and water balance:

- Continue to monitor and include any new flow monitoring locations/devices for any additional or new inflows observed in 2020.
- Conduct the water quality modelling analysis on a yearly basis based on updated water quality results and water balance through the life of mine.
- Implement 2019 Whale Tail Water Quality Forecasting (Golder, 2020) recommendations.

4.4.3 Predicted Vs Measured Water Quality

4.4.3.1 *Meadowbank Site*

As required by NWB Water License 2AM-MEA1526 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-MEA1526 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 2019. 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 22 provides a comparison between predicted (originally predicted in support of the NWB license) and measured water quantity within Portage, Goose and Vault Pit. The appendix includes the measured data for 2019, and also from 2012 to 2018. The information is summarized in Figure 9 below.

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

Water Quantity

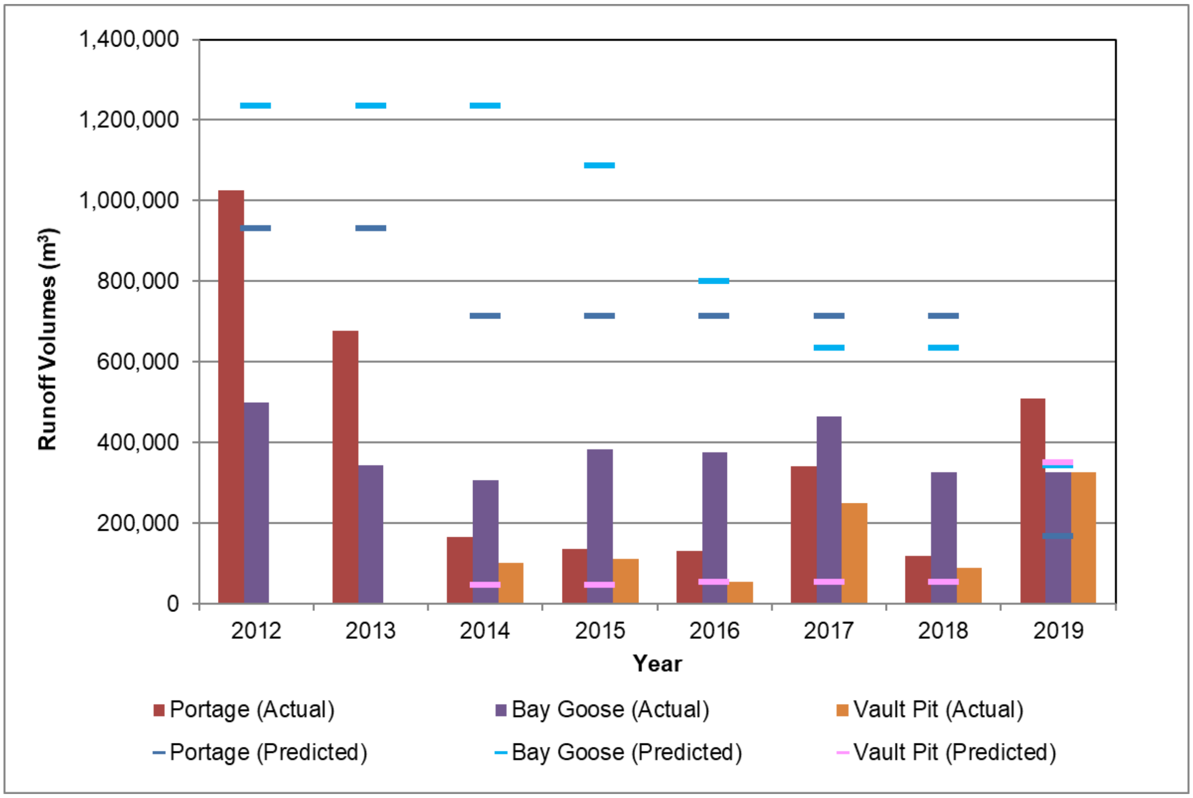
For Portage Pit, as presented in Appendix 22, the % difference between water volume predicted in Golder (2007) and water volume measured were less than predicted by more than 20% from 2013 to 2018. For 2012, the volume was slightly higher than predicted (+10%). This indicates that the seepage and groundwater sources and volumes predicted that collectively make up the water in the pits from 2013 to 2018, are less than what was originally predicted for operations. More specifically for 2018, Portage Pit was -84% less than the predicted value. Before 2014, seepage water from East Dike was pumped to the Portage Pit sump. However, as of January 2014, water from the East Dike Seepage has been pumped back to Second Portage Lake which contributes to significantly decrease the water quantity in Portage Pit between 2014 and 2018. For 2019, the % difference between water volume predicted in Golder (2007) and water volume measured was more than predicted by more than 20 % for 2019. More precisely, the measured water volume in 2019 in Portage Pit is 204 % higher than the predicted water volume. This can be explained in part by the higher precipitation observed in 2019 at the site and the transfer of the runoff volumes toward Portage Pit.

For Goose Pit, the % difference between water volume predicted in Golder (2007) and water volume measured in Goose Pit were less than predicted by more the 20% from 2012 to 2018. More specifically for 2018, Goose Pit was -49% less than the predicted value. This indicates that since 2012, the seepage and groundwater sources and volumes predicted that collectively make up the water in the Goose pit are less than what was originally predicted for operations. As the mining activity ceased in 2015 in Goose Pit, runoff, groundwater and seepage will contribute to the natural reflooding of the pit. The % difference between water volume predicted in Golder (2007) and water volume measured in Goose Pit was not significant in 2019 (i.e. -5%).

For Vault Pit, the % differences were higher by 120% in 2014 (commencement of mining operations) and 142% in 2015 between water volume predicted in Golder (2007) and water volume measured. This can be explained by the fact that there was more precipitation including larger freshet and rainfalls in 2015. In 2016, there was no significant difference between the predicted and measured volume (i.e. -1%). In 2017 however, the % difference was higher by 363% when comparing the predicted and measured volume, which could be caused by a larger freshet and rainfall flowing to Vault and Phaser Pits, as well as higher accumulation of snow in the area. In 2018, the estimated runoff volume reporting to Vault and Phaser Pits is 64% above the predicted value. 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, which in turn translated to a higher consumption of diesel fuel to operate the pumps. In 2019, there was no significant difference between the predicted and measured volume (i.e. -7%).

The following figure summarizes the runoff to the different pits measured from 2012 to 2019 and compares them against the forecasted values.

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 2019 are summarized in Appendix 22. The yearly mean and lower 25th 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 Phaser Pits (ST-41 and ST-42) were compared to the predicted values where data were available. The lower 25th percentile values were calculated and compared to the predicted values when 3 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. For 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 2019 since in-pit deposition has started in Goose Pit. In addition, the measured values of 2019 were also compared to the predicted values obtained in the water quality prediction model developed in 2007 to ensure continuity with previous years analysis.

Furthermore, 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. 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 Licence, 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 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.

The following observations can be made for each year:

In 2012 (year 3 of the Life of Mine):

- For the Third Portage Pit sump:
    - Except for ammonia nitrogen (0%), dissolved barium (14%) and Sulphate (-6%) under Possible Poor End scenario, all the parameters exceeded +/-20% of difference between the predicted and mean measured values. For the lower 25th percentile, all parameters measured exceeded the predicted in the Probable scenario, except dissolved arsenic (4%), dissolved nickel (-14%) and nitrate (14%). The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, copper, fluoride, lead, cadmium, mercury, selenium, thallium and nitrate. Only cadmium exceeded the Water License criteria. No parameters exceeded the MMER criteria.
- For Goose Pit:
    - All the parameters exceeded +/-20% of difference between the predicted (Probable and Possible Poor End scenarios) and mean measured values except for dissolved manganese (14%). For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor End scenarios), except dissolved barium (13% for both scenarios) and dissolved manganese (-15% for both scenarios).
    - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, arsenic, copper, fluoride, lead, cadmium, mercury, selenium, thallium and nitrate. Cadmium and mercury exceeded the Water License criteria. No parameters exceeded the MMER criteria.

In 2013 (year 4 of the Life of Mine):

- For the Third Portage Pit sump:
    - Except for ammonia nitrogen (+2%) and dissolved mercury (-7%) under Possible Poor End scenario, all the parameters exceeded +/-20% of difference between the predicted and mean measured values. All parameters exceed for the Probable Scenario, except

pH (19%). For the lower 25th percentile, limited data are available, but available parameters measured exceeded the predicted in the Probable scenario and Possible Poor End scenario, except for pH (14% and 18% respectively).

- The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, arsenic, copper, fluoride, lead, mercury and thallium. No parameters exceeded the MMER and Water License criteria.

- For Goose Pit:
  - All the parameters exceeded +/-20% of difference between the predicted (Probable and Possible Poor End scenarios) and mean measured values except hardness (2% for both scenarios) and dissolved cadmium (-12% for both scenarios). For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor End scenarios).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, copper, fluoride, nickel, cadmium, mercury, selenium, thallium and nitrate. Nitrate exceeded the Water License criteria. No parameters exceeded the MMER criteria.

In 2014 (year 5 of the Life of Mine):

- For Vault Pit:
  - Exceedances of greater than +/-20% percent difference between predicted (Probable and Possible Poor scenarios) versus the mean of measured values in Vault Pit were found for all of the parameters except for pH (-11% for both scenarios).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, arsenic, copper, fluoride, nickel, cadmium, mercury, molybdenum, selenium, thallium and nitrate. No parameters exceeded the MMER and Water Licence criteria.
  - Sulphate concentration was higher than the threshold value.
- For Goose Pit:
  - The mean water quality concentrations measured in the Goose Pit sump exceeded 20% predicted concentrations for all the parameters except for dissolved barium (4% for both scenarios) and dissolved copper (5% for both scenarios). For the lower 25th percentile, all available parameters measured exceeded the predicted (Probable and Possible Poor End scenarios).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, fluoride, mercury, thallium and nitrate. No parameters exceeded the MMER and Water Licence criteria.
  - It should be noted that in 2014 no water from South Portage Pit sump was sampled because the access to the sump presented health and safety issues for the technicians and water was pumped only for 3 months (August to October). All sump water was pumped to the South Cell TSF for use as reclaim water in the mill.

In 2015 (year 6 of the Life of Mine):

- For Vault Pit:
  - Exceedances of greater than +/-20% percent difference between predicted (Probable and Possible Poor End scenarios) versus the mean of measured values in Vault Pit were found for all of the parameters except for pH (-11% for both scenarios) and nitrate (-8%, Probable scenario).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, fluoride, iron, molybdenum, selenium, thallium and nitrate. Ammonia nitrogen exceeded the Water License criteria. No parameters exceeded the MMER criteria.
- For Goose Pit:
  - The mean water quality concentrations measured in the Goose Pit sump exceeded +/-20% predicted concentrations for Probable and Possible Poor End scenarios for all the parameters except for dissolved molybdenum (16%). For the lower 25th percentile, all available parameters measured exceeded the predicted (Probable and Possible Poor End scenarios), except for pH (16% for both scenarios) and dissolved molybdenum (3% for both scenarios).
  - The following measured parameters were found to be higher than the CCME guidelines: fluoride, nickel, selenium, thallium and nitrate. No parameters exceeded the MMER and Water Licence criteria.
- For Third Portage Pit:
  - The mean water quality concentrations measured in the Third Portage Pit sump exceeded 20% predicted concentrations for Probable and Possible Poor End scenarios for all the parameters except for pH (6% and 9% respectively) and the fluoride (10% for Possible Poor End). For the lower 25th percentile, all available parameters measured exceeded the predicted values for both scenarios, except for pH (1% and 4% respectively).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, arsenic, fluoride, selenium, thallium and nitrate. No parameters exceeded the MMER and Water License criteria.
  - Sulphate concentration was higher than the threshold value.
- For North Portage pit:
  - The mean water quality concentrations measured in the North Portage Pit sump exceeded +/-20% predicted concentrations for Probable and Possible Poor End scenario for all the parameters except for nitrate (-8% and 19% respectively). For the lower 25th percentile, all available parameters measured exceeded the predicted value except for pH (18% for Probable scenario) and sulphate (-3%, for Possible Poor End scenario).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, arsenic, fluoride, nickel, thallium and nitrate. No parameters exceeded the MMER and Water License criteria.
  - Sulphate concentration was higher than the threshold value.

In 2016 (year 7 of the Life of Mine):

- For Vault Pit:
  - Exceedances of greater than +/-20% percent difference between predicted (Probable and Possible Poor End scenarios) versus the mean of measured values in Vault Pit were found for all of the parameters except for pH (-3% for both scenarios) and dissolved barium and molybdenum (9% and -10% respectively for Possible Poor End scenario). For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor End scenarios), except for pH.
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, copper, fluoride, cadmium, selenium and nitrate. No parameters exceeded the MMER and Water License criteria.
  - Sulphate concentration was higher than the threshold value.
- For Goose Pit:
  - The mean water quality concentrations measured in the Goose Pit sump exceeded +/-20% predicted concentrations for Probable and Possible Poor End scenarios for all the parameters except for dissolved copper (-7%) and nitrate (-7%). For the lower 25th percentile, all available parameters measured exceeded the predicted (Probable and Possible Poor End scenarios), except for nitrate (-11% for both scenarios).
  - The following measured parameters were found to be higher than the CCME guidelines: fluoride, nickel and nitrate. No parameters exceeded the MMER and Water Licence criteria.
- For Third Portage Pit:
  - The mean water quality concentrations measured in the Third Portage Pit sump exceeded 20% predicted concentrations for Probable and Possible Poor End scenarios for all the parameters except for hardness (-9% and -12% respectively), dissolved cadmium, mercury and magnesium (-11%, -7%, -11% respectively for Possible Poor End) and nitrate (9% for Possible Poor End). For the lower 25th percentile, all available parameters measured exceeded the predicted values for both scenarios.
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, fluoride, cadmium, mercury, molybdenum, selenium and nitrate. No parameters exceeded the MMER and Water License criteria.
  - Sulphate concentration was higher than the threshold value.
- For North Portage Pit:
  - The mean water quality concentrations measured in the North Portage Pit sump exceeded +/-20% predicted concentrations for Probable and Possible Poor End scenario for all the parameters except for nitrate (-2% for Probable scenario). For the lower 25th percentile, all available parameters measured exceeded the predicted value except for dissolved barium (15% for Possible Poor End scenario) and nitrate (-3% for Probable scenario).

- The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, arsenic, fluoride, nickel, cadmium, molybdenum, selenium and nitrate. No parameters exceeded the MMER and Water License criteria.
- Sulphate concentration was higher than the threshold value.

In 2017 (year 8 of the Life of Mine):

- For Vault Pit:
  - Exceedances of greater than +/-20% percent difference between predicted (Probable and Possible Poor End scenarios) versus the mean of measured values in Vault Pit were found for all of the parameters except for pH (-4% for both scenarios) and dissolved barium (-3% for Possible Poor End scenario). For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor End scenarios), except for pH and selenium.
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, fluoride, iron, selenium and nitrate. No parameters exceeded the MMER and Water License criteria.
  - Sulphate concentration was higher than the threshold value.
- For Goose Pit:
  - The mean water quality concentrations measured in the Goose Pit sump exceeded +/-20% predicted concentrations for Probable and Possible Poor End scenarios for all the parameters except for dissolved copper (-9%), hardness (+8%) and molybdenum (-19%). For the lower 25th percentile, all available parameters measured exceeded the predicted (Probable and Possible Poor End scenarios), except for hardness (-1% for both scenarios).
  - The following measured parameters were found to be higher than the CCME guidelines: unionized ammonia (mean value of 0.018 vs CCME guideline of 0.016), fluoride, nickel, selenium and nitrate. No parameters exceeded the MMER and Water Licence criteria.
  - Sulphate concentration was higher than the threshold value.
- For Third Portage Pit:
  - The mean water quality concentrations measured in the Third Portage Pit sump were equal or exceeded 20% predicted concentrations for Probable and Possible Poor End scenarios for all the parameters. For the lower 25th percentile, all available parameters measured exceeded the predicted values for both scenarios, except for ammonia nitrogen and selenium.
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, fluoride, mercury, selenium and nitrate. No parameters exceeded the MMER and Water License criteria.
  - Sulphate concentration was higher than the threshold value.
- For North Portage Pit:

- The mean water quality concentrations measured in the North Portage Pit sump were equal or exceeded +/-20% predicted concentrations for Probable and Possible Poor End scenario for all the parameters except for nitrate (-12% for Possible Poor End scenario). For the lower 25th percentile, all available parameters measured exceeded the predicted value except for dissolved barium (0% for Possible Poor End scenario) and nitrate (-14% for Possible Poor End scenario).
- The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia, ammonia nitrogen, arsenic, fluoride, nickel, cadmium and nitrate. No parameters exceeded the MMER and Water License criteria.
- Sulphate concentration was higher than the threshold value.

In 2018 (year 9 of the Life of Mine):

- For Vault Pit:
  - Exceedances of greater than +/-20% percent difference between predicted (Probable and Possible Poor End scenarios) versus the mean of measured values in Vault Pit were found for all of the parameters except for pH (-6% for both scenarios), dissolved barium (-10% for Possible Poor End scenario), and for dissolved Molybdenum (-18% for Possible Poor End scenario). For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor End scenarios), except for pH (-8% for both scenarios), and dissolved cadmium (+11% for Possible Poor End scenario).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia (mean value of 0.07 mg/L vs CCME guideline of 0.016 mg/L), ammonia nitrogen (mean value of 3.1 mg/L vs CCME guideline of 1.83 mg/L), fluoride (mean value of 0.2 mg/L vs CCME guideline of 0.12 mg/L), dissolved cadmium (mean value of 0.000162 mg/L vs CCME guideline of 0.00004 mg/L), and nitrate (mean value of 4.9 mg/L vs CCME guideline of 2.94 mg/L). No parameters exceeded the MDMER and Water Licence criteria.
  - Sulphate concentration was higher than the threshold value.
  - During re-flooding of Vault Pit, no treatment is expected to be required because the pit will be flooded with natural runoff and with water coming from the Wally Lake. With a significant inflow volume of clean water, the parameters that exceed CCME guidelines will be attenuated. Water quality will be monitored during pit re-flooding and the dike will only be breached if the water quality meets the final closure discharge criteria.
- For Phaser Pit:
  - Exceedances of greater than +/-20% percent difference between predicted (Probable and Possible Poor End scenarios) versus the mean of measured values in Phaser Pit were found for all of the parameters except for pH (-6% for both scenarios). For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor End scenarios), except for dissolved iron (+4% for Possible Poor End scenario) and dissolved zinc (+15% for Possible Poor End scenario).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia (mean value of 0.14 mg/L vs CCME guideline of 0.016 mg/L), ammonia nitrogen (mean value of 8.0 mg/L vs CCME guideline of 1.83 mg/L), dissolved

copper (mean value of 0.0088 vs CCME guidelines of 0.002 mg/L), fluoride (mean value of 0.18 mg/L vs CCME guideline of 0.12 mg/L), dissolved cadmium (mean value of 0.00005 mg/L vs CCME guideline of 0.00004 mg/L) and nitrate (mean value of 15.8 mg/L vs CCME guideline of 2.94 mg/L). No parameters exceeded the MDMER and Water Licence criteria.

 - Sulphate concentration was slightly higher than the threshold value.

- For Goose Pit:
  - The mean water quality concentrations measured in the Goose Pit sump exceeded +/- 20% predicted concentrations for Probable and Possible Poor End scenarios for all the parameters except for hardness (-18%), dissolved barium (9%), dissolved cadmium (18%), and dissolved manganese (-4%). 25th percentile couldn't be calculated due to insufficient data (less than 3 measurements).
  - The following measured parameters were found to be higher than the CCME guidelines: unionized ammonia (mean value of 0.03 mg/L vs CCME guideline of 0.016 mg/L), fluoride (mean value of 0.25 mg/L vs CCME guideline of 0.12 mg/L), dissolved cadmium (mean value of 0.00005 mg/L vs CCME guideline of 0.00004 mg/L), and nitrate (mean value of 6.03 mg/L vs CCME guideline of 2.94 mg/L). No parameters exceeded the MDMER and Water Licence criteria.
  - Sulphate concentration was higher than the threshold value.
- For Third Portage Pit:
  - The mean water quality concentrations measured in the Third Portage Pit sump were equal or exceeded 20% predicted concentrations for Probable and Possible Poor End scenarios for all the parameters, except for ammonia nitrogen (probable -1%), dissolved mercury (probable -15%), and dissolved selenium (possible poor -17%). 25th percentile couldn't be calculated due to insufficient data (less than 3 measurements).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia (mean value of 0.04 mg/L vs CCME guideline of 0.016 mg/L), ammonia nitrogen (mean value of 2.1 mg/L vs CCME guideline of 1.83 mg/L), fluoride (mean value of 0.29 mg/L vs CCME guideline of 0.12 mg/L), dissolved cadmium (mean value of 0.00006 mg/L vs CCME guideline of 0.00004 mg/L), and nitrate (mean value of 6.88 mg/L vs CCME guideline of 2.94 mg/L). No parameters exceeded the MDMER and Water License criteria.
  - Sulphate concentration was higher than the threshold value.
- For North Portage Pit:
  - The mean water quality concentrations measured in the North Portage Pit sump were equal or exceeded 20% predicted concentrations for Probable and Possible Poor End scenarios for all the parameters. 25th percentile couldn't be calculated due to insufficient data (less than 3 measurements).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia (mean value of 0.03 mg/L vs CCME guideline of 0.016 mg/L), fluoride (mean value of 0.25 mg/L vs CCME guideline of 0.12 mg/L), dissolved cadmium

(mean value of 0.00005 mg/L vs CCME guideline of 0.00004 mg/L), and nitrate (mean value of 6.03 mg/L vs CCME guideline of 2.94 mg/L). No parameters exceeded the MDMER and Water License criteria.

- Sulphate concentration was higher than the threshold value.

In 2019 (year 10 of the Life of Mine):

- For Vault Pit:
  - Exceedances of greater than +/-20% percent difference between predicted (Probable and Possible Poor End scenarios of year 7) versus the mean of measured values in Vault Pit were found for all of the parameters except for pH (0% for both scenarios), dissolved barium (-11% for Possible Poor End scenario), for dissolved Iron (+4% for Possible Poor End scenario) and for dissolved zinc (-3% for Possible Poor End scenario). For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor End scenarios of year 7), except for pH (0% for both scenarios), for dissolved copper (+8% for Possible Poor End scenario), for dissolved barium (-17% for Possible Poor End scenario) and for dissolved Iron (+4% for Possible Poor End scenario).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia (mean value of 0.03 mg/L vs CCME guideline of 0.016 mg/L), dissolved copper (mean value 0.0023 mg/L vs CCME guideline of 0.002 mg/L), fluoride (mean value of 0.17 mg/L vs CCME guideline of 0.12 mg/L) and nitrate (mean value of 7.45 mg/L vs CCME guideline of 2.74 mg/L) . No parameters exceeded the MDMER and Water Licence criteria.
  - Sulphate concentration was higher than the threshold value.
- For Phaser Pit:
  - Exceedances of greater than +/-20% percent difference between predicted (Probable and Possible Poor End scenarios of year 7) versus the mean of measured values in Phaser Pit were found for all of the parameters except for pH (-6% for both scenarios) and total dissolved solids (-17% for Possible Poor End scenario). For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor End scenarios of year 7), except for pH (-11% for both scenarios), dissolved iron (+4% for Possible Poor End scenario) and total dissolved solids (-18% for Possible Poor End scenario).
  - The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia (mean value of 0.028 mg/L vs CCME guideline of 0.016 mg/L), dissolved copper (mean value of 0.0045 vs CCME guideline of 0.002 mg/L), fluoride (mean value of 0.13 mg/L vs CCME guideline of 0.12 mg/L) and nitrate (mean value of 3.3 mg/L vs CCME guideline of 2.94 mg/L). No parameters exceeded the MDMER and Water Licence criteria.
  - Sulphate concentration was below the threshold value.
- For Goose Pit:
  - Comparison Based on In-Pit Deposition Water Quality Model (Interim Closure and Reclamation Plan, 2019):

- The mean water quality concentrations measured in the Goose Pit Lake exceeded +/-20% predicted concentrations for Annual Average and Lower 25th centile scenarios of year 10 for all the parameters except for alkalinity (-16% for Annual Average and -15% for Lower 25th centile scenarios), fluoride (-14% for Annual Average and -12% for Lower 25th centile scenarios) and dissolved nickel (-2% for Annual Average and 0% for Lower 25th centile scenarios). 25th percentile couldn't be calculated due to insufficient data (less than 3 measurements). Note that the measured values were generally lower than the forecasted values.

- Comparison Based on Initial Model, Year 3 (Golder, 2007):
  - The mean water quality concentrations measured in the Goose Pit sump exceeded +/-20% predicted concentrations for Probable and Possible Poor scenarios of year 3 for all the parameters except for dissolved barium (+12 % for both Probable and Possible Poor scenarios) and total dissolved solids (+20 % for both Probable and Possible Poor scenarios). 25th percentile couldn't be calculated due to insufficient data (less than 3 measurements).
  - The measured values in Goose Pit are generally higher than the prediction of year 3. This can be explained by the in-pit deposition in Goose Pit that started in 2019 that added contaminants into water accumulated into the pit.
- The following measured parameters were found to be higher than the CCME guidelines: unionized ammonia (mean value of 0.032 mg/L vs CCME guideline of 0.016 mg/L), ammonia nitrogen (mean value of 10.5 mg/L vs CCME guideline of 1.83 mg/L), dissolved arsenic (mean value of 0.0146 mg/L vs CCME guideline of 0.005 mg/L), dissolved copper (mean value of 0.354 mg/L vs CCME guideline of 0.002 mg/L), fluoride (mean value of 0.54 mg/L vs CCME guideline of 0.12 mg/L), dissolved molybdenum (mean value of 0.1025 mg/L vs CCME guideline of 0.073 mg/L), dissolved selenium (mean value of 0.0015 mg/L vs CCME guideline of 0.001 mg/L). Dissolved copper was higher than MDMER criteria (mean value of 0.354 mg/L vs MDMER criteria of 0.3 mg/L) and higher than Water Licence criteria (mean value of 0.354 mg/L vs Water Licence criteria of 0.1 mg/L).
- Sulphate concentration was higher than the threshold value.

- For Third Portage Pit:
  - Comparison Based on In-Pit Deposition Water Quality Model (Interim Closure and Reclamation Plan, 2019):
    - The mean water quality concentrations measured in the Third Portage Pit sump exceeded +/-20% predicted concentrations for Annual Average and Lower 25th centile scenarios of year 10 for all the parameters, except for ammonia nitrogen (+20% for Lower 25th centile scenario), chloride (-3% for Lower 25th centile scenario), nitrate (+2% for Annual Average scenario), sulphate (-5% for Lower 25th centile scenario) and total dissolved solids (-18% for Lower 25th centile). For the lower 25th percentile, all parameters measured exceeded the predicted (Average Annual and Lower 25th centile scenarios of year 10), except for chloride (-14% for Lower 25th centile scenario), nitrate (-8% for Lower 25th centile scenario) and

sulphate (-4% for Lower 25th centile scenario). Note that the measured values were generally lower than the forecasted values.

- Comparison Based on Initial Model, Year 4 (Golder, 2007):
  - The mean water quality concentrations measured in the Third Portage Pit sump exceeded +/-20% predicted concentrations for Probable and Possible Poor scenarios of year 4 for all the parameters, except for dissolved arsenic (+1% for Probable scenario), hardness (-7% for Probable and -10% Possible Poor scenarios), dissolved mercury (-15% for Probable scenario) and dissolved thallium (-17% for Possible Poor scenario). For the lower 25th percentile, all parameters measured exceeded the predicted (Probable and Possible Poor scenarios of year 4), except for alkalinity (+15% for Probable and +7% for Possible Poor scenarios), ammonia nitrogen (+16% for Probable scenario), dissolved arsenic (-17% for Probable scenario), hardness (-7% for Probable and -10% for Possible Poor scenarios), dissolved mercury (-15% for Probable scenario), dissolved selenium (-14% for Probable scenario) and dissolved thallium (-17% for Possible Poor scenario).
  - The measured value of ammonia (unionized) is significantly higher than the prediction of year 4.
- The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia (mean value of 0.11 mg/L vs CCME guideline of 0.016 mg/L), ammonia nitrogen (mean value of 5.44 mg/L vs CCME guideline of 1.83 mg/L), fluoride (mean value of 0.39 mg/L vs CCME guideline of 0.12 mg/L) and nitrate (mean value 10.6 mg/L vs CCME guideline of 2.94 mg/L). No parameters exceeded the MDMER and Water License criteria.
- Sulphate concentration was higher than the threshold value.
- It is important to note that pH and unionized ammonia were not forecasted for year 10.

- For North Portage Pit:
  - Comparison Based on In-Pit Deposition Water Quality Model (Interim Closure and Reclamation Plan, 2019):
    - The mean water quality concentrations measured in the North Portage Pit sump exceeded +/-20% predicted concentrations for Annual Average and Lower 25th centile scenarios of year 10 for all the parameters except for fluoride (-7% for Annual Average and +15% for Lower 25th centile scenarios), dissolved barium (-14% for Annual Average and +4% for Lower 25th centile scenarios), dissolved cadmium (+4% for Annual Average scenario), dissolved molybdenum (-14% for Annual Average and +5% for Lower 25th centile scenarios) and total dissolved solids (+1% for Annual Average and +12% Lower 25th centile scenarios). 25th percentile couldn't be calculated due to insufficient data (less than 3 measurements).
  - Comparison Based on Initial Model, Year 4 (Golder, 2007):
    - The mean water quality concentrations measured in the North Portage Pit exceeded +/-20% predicted concentrations for Probable and Possible Poor

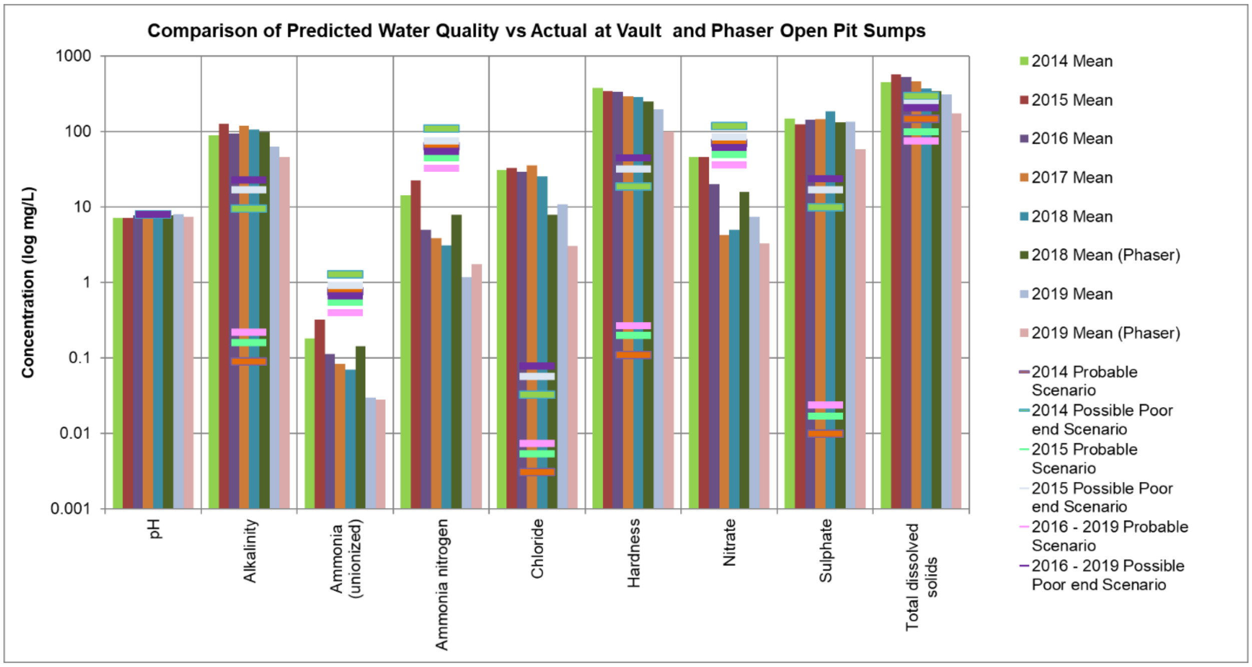
scenarios of year 4 for all the parameters except for dissolved cadmium (+11 % for Possible Poor scenario). 25th percentile couldn't be calculated due to insufficient data (less than 3 measurements).

- The measured values in North Portage Pit are generally higher than the prediction of year 4. This can be explained by the transferred reclaim water from Central Downstream Pond to North Portage Pit that added contaminants into the pit water.

- The following measured parameters were found to be higher than the CCME guidelines: un-ionized ammonia (mean value of 0.105 mg/L vs CCME guideline of 0.016 mg/L), ammonia nitrogen (mean value of 6.7 mg/L vs CCME guideline of 1.83 mg/L), dissolved arsenic (mean value of 0.2721 mg/L vs CCME guideline of 0.005 mg/L), chloride (mean value of 162 mg/L vs CCME guideline of 120 mg/L), dissolved copper (mean value of 0.0249 mg/L vs CCME guideline of 0.002 mg/L), fluoride (mean value of 0.38 mg/L vs CCME guideline of 0.12 mg/L), dissolved nickel (mean value 0.0640 mg/L vs CCME guideline of 0.025 mg/L), dissolved cadmium (mean value of 0.0001 mg/L vs CCME guideline of 0.00004 mg/L), dissolved molybdenum (mean value of 0.1533 mg/L vs CCME guideline of 0.073 mg/L). dissolved selenium (mean value of 0.0075 mg/L vs CCME guideline of 0.001 mg/L) and nitrate (mean value of 4.59 mg/L vs CCME guideline of 2.94 mg/L). No parameters exceeded the MDMER and Water License criteria.
- Sulphate concentration was higher than the threshold value.
- It is important to note that pH and unionized ammonia were not forecasted for year 10.

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 years 2012 to 2019, or annual average and lower 25th centile scenarios for year 2019 (represented by horizontal lines). Graphics for the 25th percentile data were not plotted since there are years where not enough samples were taken to statistically evaluate this value.

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



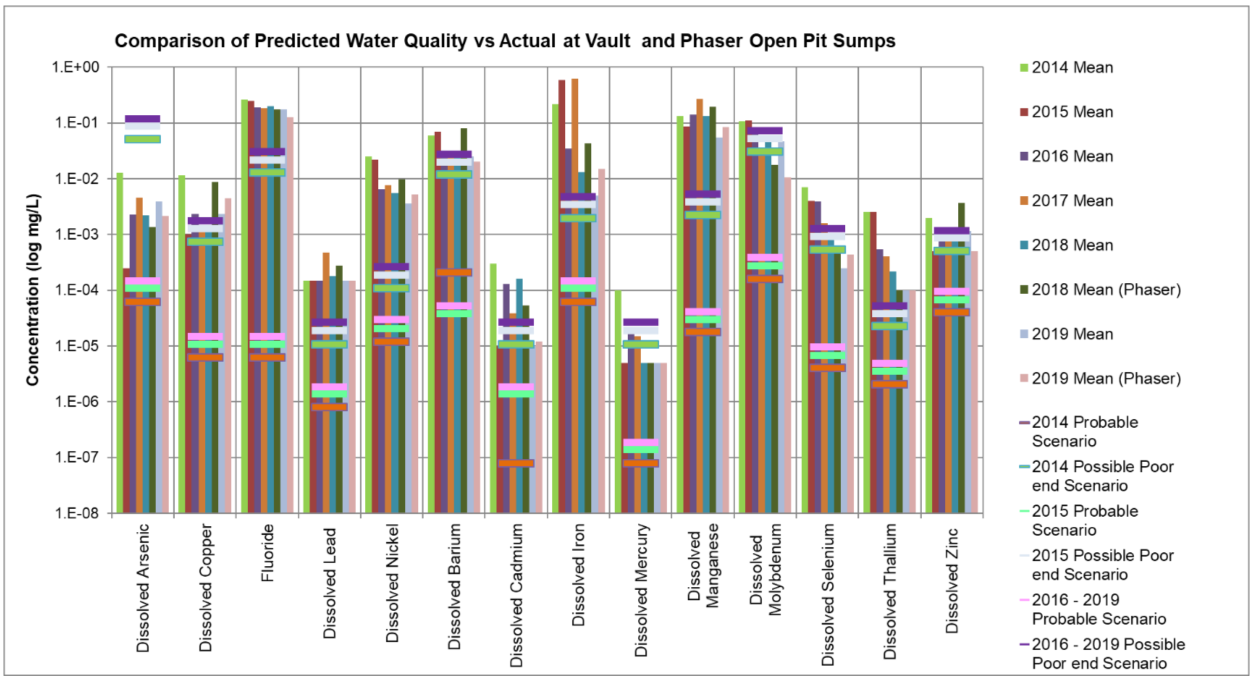
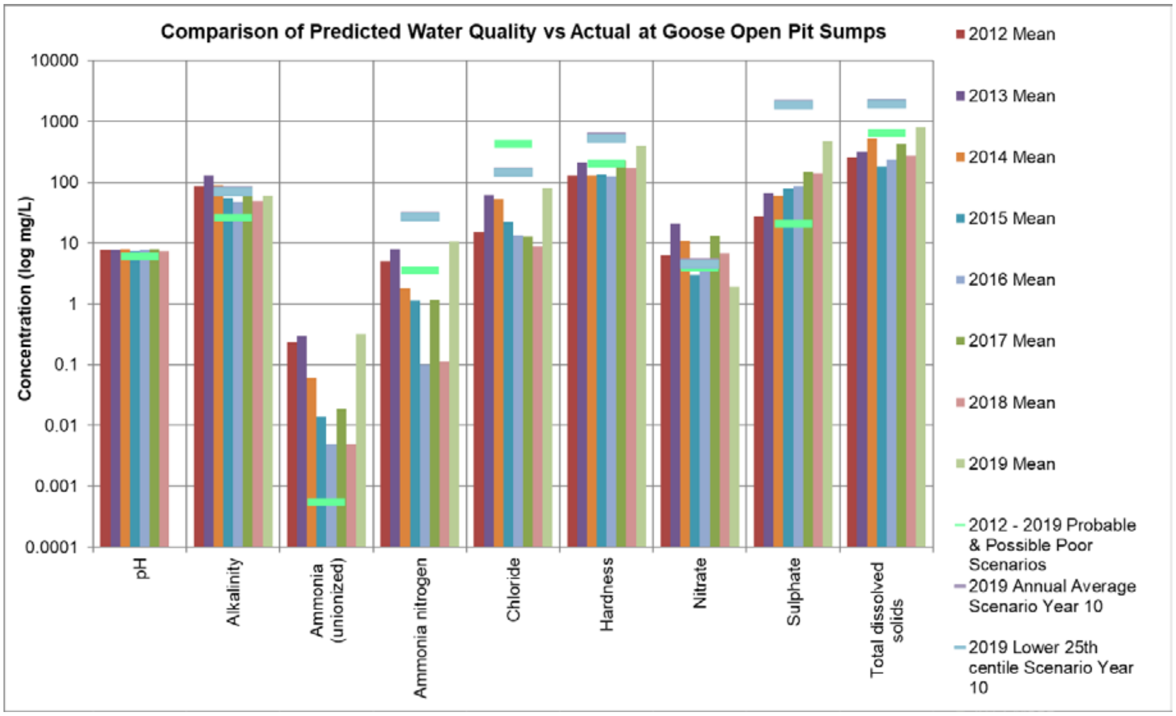


Figure 11 Meadowbank Mean Annual Water Quality – Goose Open Pit Sumps



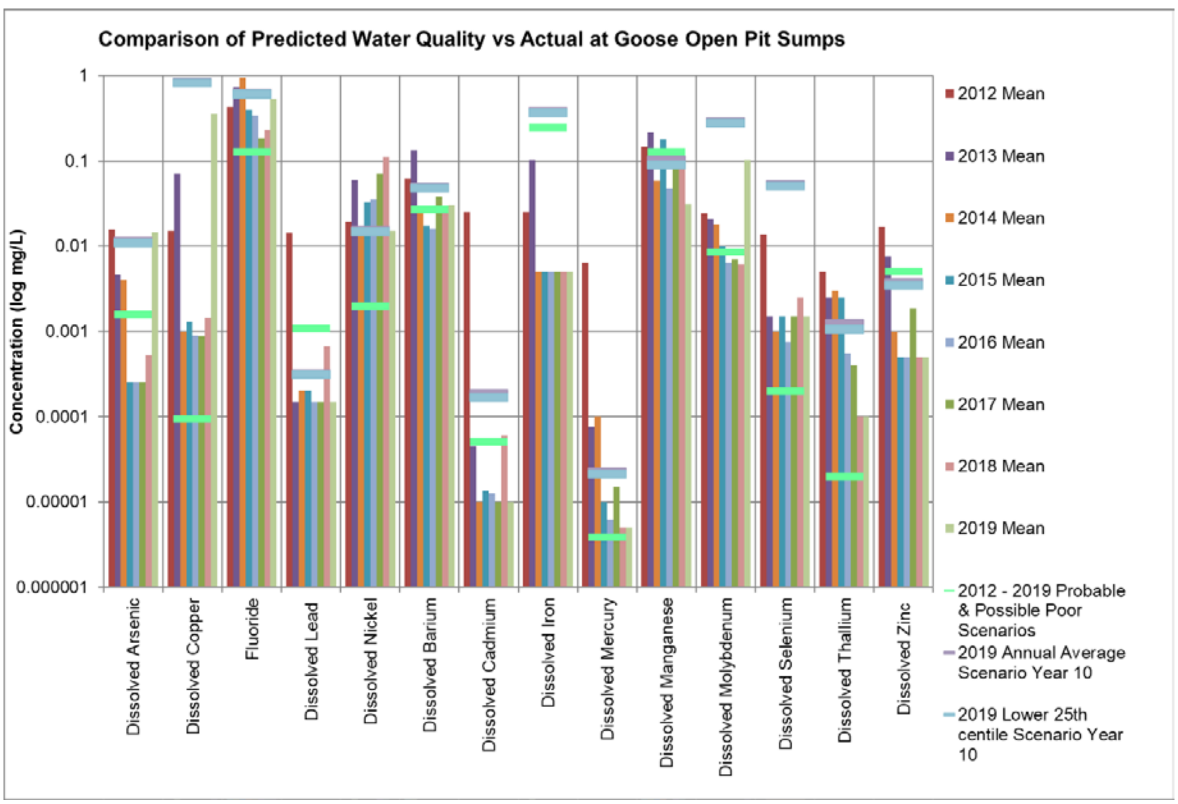
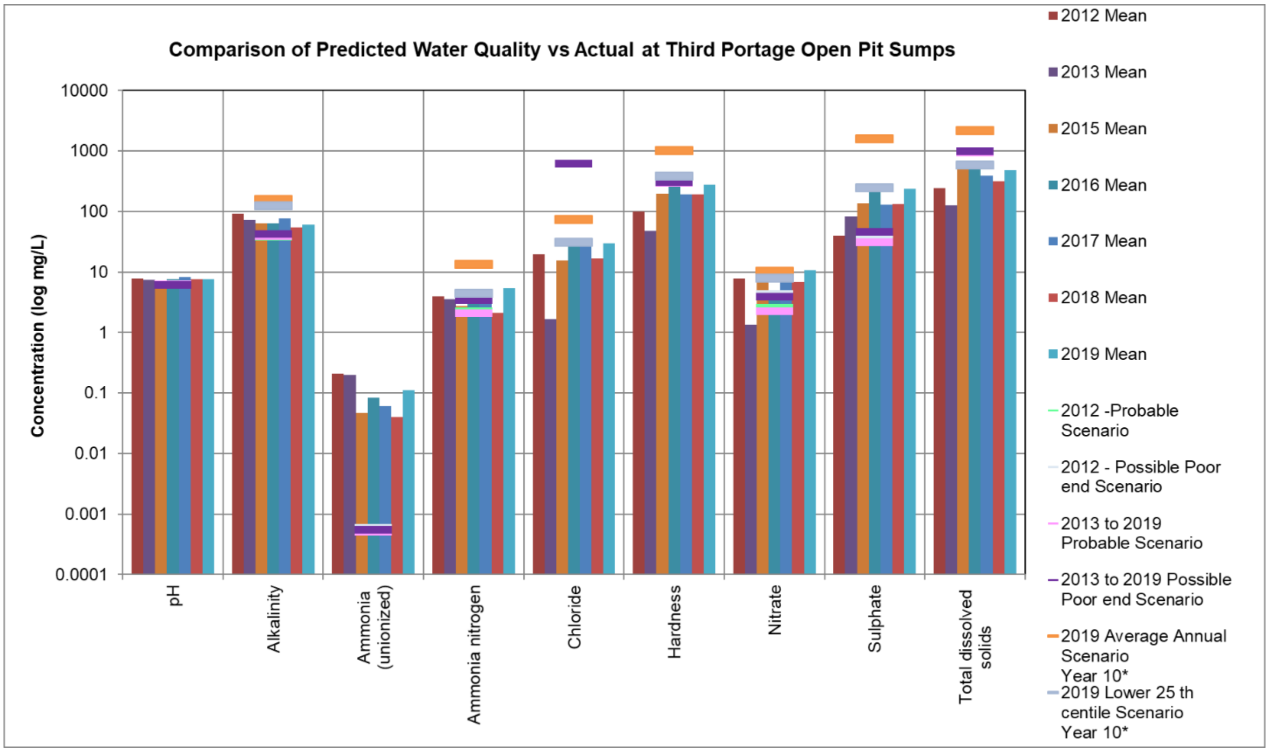


Figure 12 Meadowbank Mean Annual Water Quality – Third Portage Pit Sumps



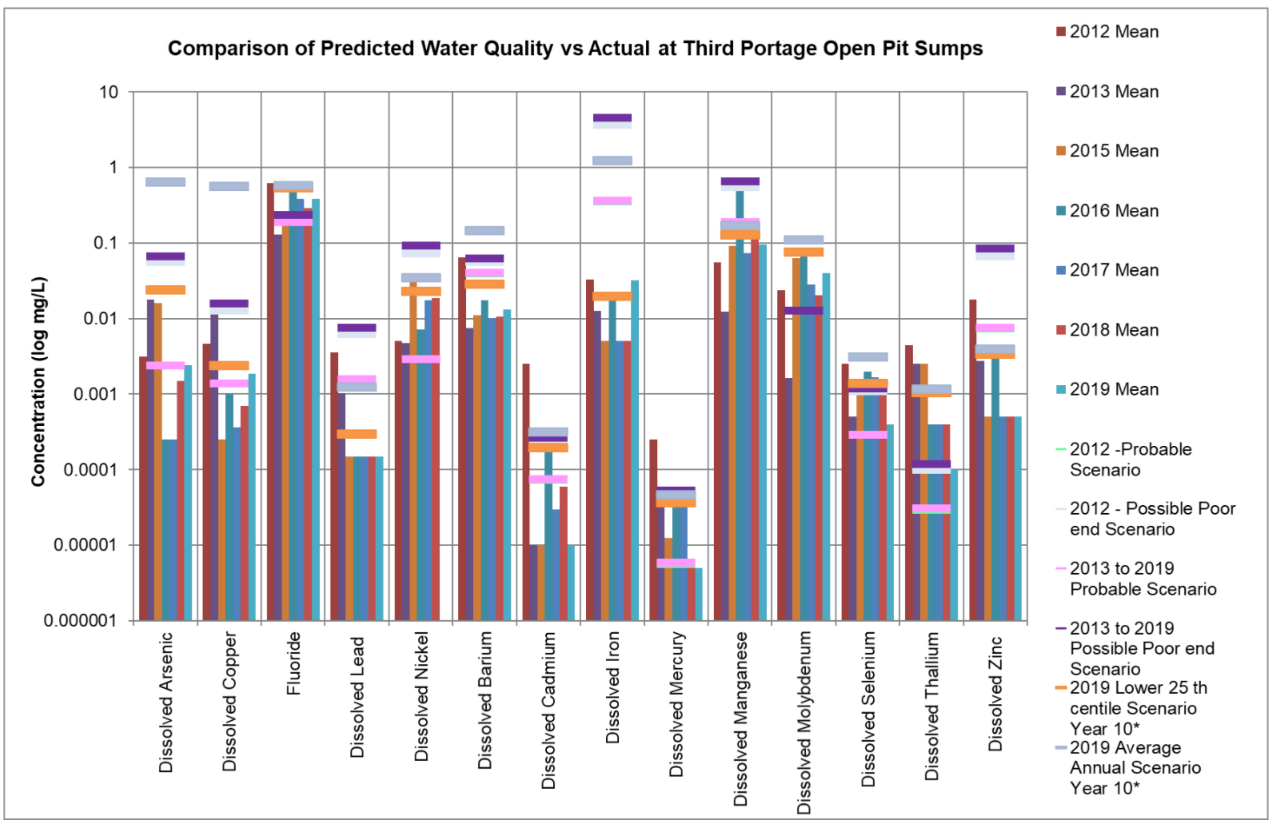
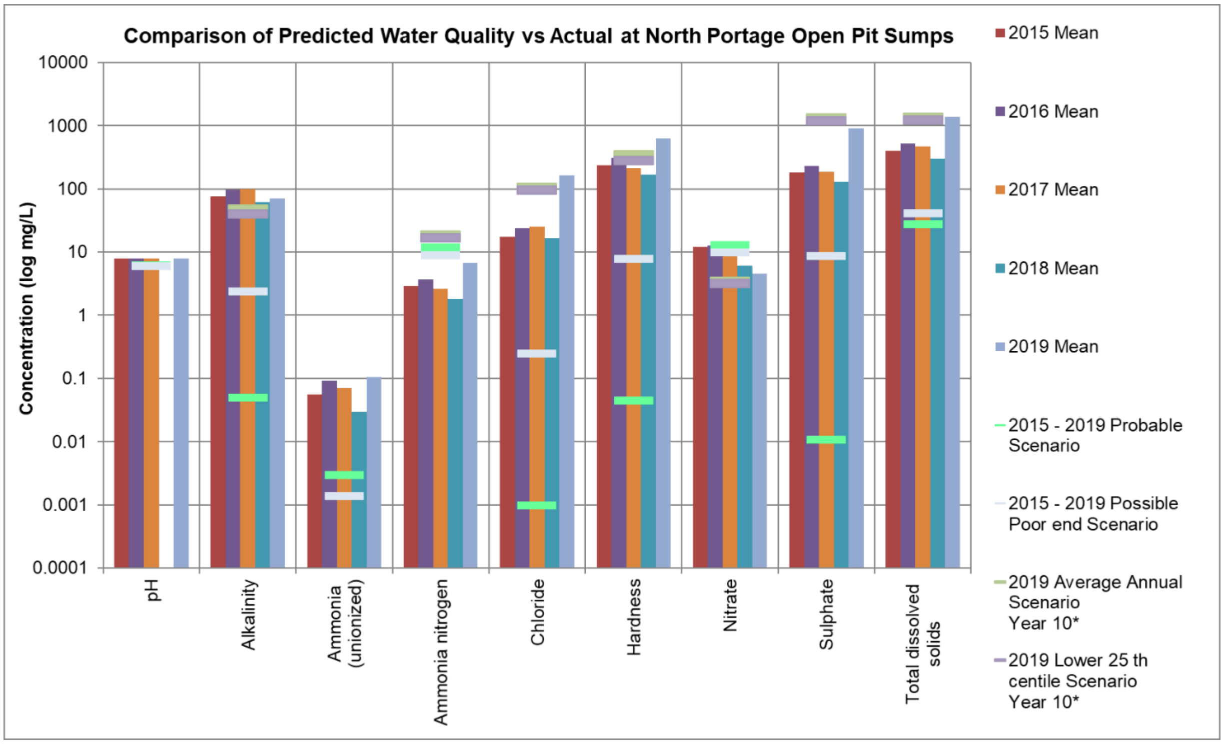
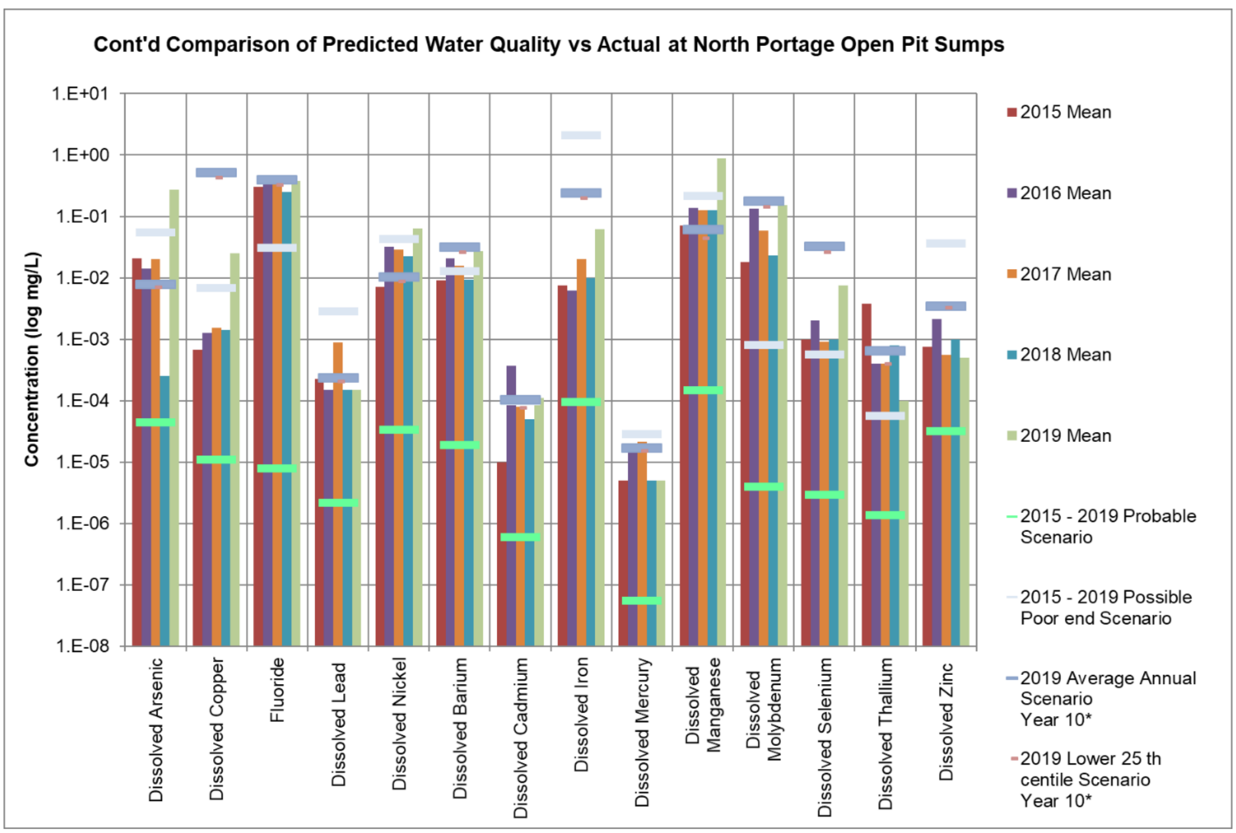


Figure 13 Meadowbank Mean Annual Water Quality – North Portage Pit Sumps





Based on this analysis, many of the predicted values for the Probable and Probable Poor End scenarios and Annual Average and 25% Centile 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. Consequently, there was less volume of water to attenuate any contaminant loads that may accumulate in the pit sump water body.
- For Portage Pit, the measured water volumes of 2019 were significantly higher than what was originally predicted. This can be explained by the higher observed precipitation in 2019 at the site and more runoff being directed toward Portage Pit. Consequently, there was more volume of water to attenuate contaminant loads that may accumulate in the pit sump water body.
- The contaminant loads measured in Portage and Goose Pits water were higher than the prediction until 2018. In 2019, the contaminant loads measured in Third Portage and Goose Pits water were lower than the prediction of year 10. However, in Goose Pit, the sample data set available in 2019 for the pit lake was limited. In North Portage pit, some parameters were much higher than the forecasted values of year 10, such as dissolved arsenic and manganese. This can be explained by the additional transfer of reclaim water from the Central Downstream Pond to North Portage Pit that in 2019.
- The contaminant loads measured in Vault and Phaser Pits water were generally higher than the prediction.
- The general higher contaminant loads measured in the pit water can also be contributed to a higher observed load in the seepages flowing into 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 that are slightly higher or 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. Other parameters found in the pit water could originate from the natural groundwater seepage into the pit (i.e. fluoride, sulphates, etc.) or from contact of runoff water and seepage water with potentially acid generating (PAG) rock surfaces of the pit wall.

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. No discharge limits were exceeded in 2012, 2013 and 2014 as all the results are below the maximum value required by NWB (Water License 2AM-MEA1526) and Environment and Climate Changes Canada (MDMER). 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. Reclaim water from the South Cell TSF Reclaim Pond was also transferred to Goose Pit in 2019. Reclaim water from the Central Downstream Pond was transferred to the North Portage Pit in 2019 also.
- 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 be 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).. No discharge limits were exceeded in 2014, 2015, 2016 and 2017, as all the results are below the maximum average concentration value required by NWB (Water License 2AM-MEA1525) and Environment and Climate Changes Canada (MDMER). In 2018 and 2019, 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.

<u>Water Quality Forecast model - Pit Water Quality</u>

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 for pit reflooding is completed in this forecast. Table 4.1 of the Meadowbank Water Quality Forecasting Update for the 2019 Water Management Plan found in Appendix C of the 2019 Water Management Report and Plan Version 8 (Appendix 11) summarizes the forecasted concentrations of applicable parameters in Portage and Goose Pits (based on measured water quality from the TSF) predicted in the pits after reflooding and compares them to originally predicted concentrations for Goose and Portage.

Based on the results of the water quality mass balance presented in Section 4.2 of the Meadowbank Water Quality Forecasting Update for the 2019 Water Management Plan treatment may be required for aluminium, arsenic, cadmium, chromium, copper, iron, nickel, selenium, fluoride, TSS, ammonia as the forecasted pit water quality may exceed CCME guidelines or other site specific criteria developed during the closure process prior to dike reconnection, if the water is not treated. Lead could also potentially be parameter of concerns. Sulfate, chloride, cyanide (total) and nitrate could represent a potential long-term contamination risk, so their monitoring will continue in the coming years. The increase in forecasted concentration for certain parameters is mainly due the milling and deposition of tailings from ore body extracted from Whale Tail pit at the Amaruq site. The ore body at Whale Tail pit has a different geochemical behavior when compared to the ore body from Portage/Goose/Vault pits. Total nitrogen forecasted concentration at closure is also higher than the threshold concentration adopted for Oligotrophic Lake in terms of nutrient concentration.

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. Table 5.1 of the Meadowbank Water Quality Forecasting Update for the 2019 Water Management Plan report presents the average concentrations of water quality from samples taken in the Vault area in 2019.

With respect to the potential elevated levels of metals and total ammonia mentioned above, treatment could be undertaken at the Reclaim Pond or in the Portage Pit if the trends shown in the model reveal to be true in the field. A potential treatment option for the removal of the metals in Reclaim Water prior to discharge in Portage Pit is caustic or lime precipitation, while aeration is recommended for total nitrogen reduction via ammonia volatilization. Coagulation with as aluminum sulfate could be used to adsorb the fluoride ion onto the aluminum hydroxide precipitate. 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 the addition of an oxidation step to help oxidize metal complexes, or additional polishing steps, like filtration or ion exchange.

Selenium forecasted concentration remains higher than the CCME guideline. This parameter still requires close monitoring. Speciation analysis of the selenium indicates it is mostly in the selenate form (Se(VI)) instead of selenite form (Se(IV)). Selenite (Se(IV)) can be easily removed by coagulation. However, selenate (Se(VI)) cannot be removed easily by chemical precipitation. Other forms of treatment would need to be considered, such as adsorption onto a specialized media, biotreatment, or chemical reduction followed by coagulation with a ferric based coagulant.

For the Vault area, ammonia and nitrate are the parameters of concern identified by Environment Canada, but no actual or forecasted concentration exceeds the Type A Water License discharge requirements for this area.

It is important to note that the water quality in the pits will be subject to CCME guidelines or site specific criteria at closure once the water level in the Goose and Portage Pits are equal to the water level in the Third Portage Lake. The dikes will only be breached once the water quality in the pits meets CCME guidelines or site specific criteria 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-WTP1826 Part E, Item 9: ***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.***

Whale Tail Project was in transition period from construction to operation phase in 2019. As per the NWB requirement, this comparison will be provided once in closure.

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 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-MEA1526 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 2019.

4.6.2 Whale Tail Site

As required by Water License 2AM-WTP1826 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 2019.

4.6.3 Exploration Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part B, Item 6n: ***Any other details on water use or waste disposal requested by the Board by the 1st of November of the year being reported***

No additional information was requested in 2019.

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-MEA1526 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);

In 2019, Agnico sampled approximately 25% of 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. The Total Sulphur (S) analysis is converted into a Maximum Potential Acidity (MPA) value by multiplying the Total S weight % by 31.25 which yields an MPA value in Kg $CaCO_3$ equivalent. The Total Inorganic Carbon analysis is similarly converted into a Carbonate Neutralization Potential (NP) by multiplying the Total weight % Inorganic Carbon (reported as $\%CO_2$) by 22.7 which yields an NP value in Kg $CaCO_3$ equivalent. The Net Potential Ratio (NPR) for the blast hole drill cutting sample is then calculated as follows: NPR = NP/MPA. See Table 5-1 for a summary of Acid Rock Drainage (ARD) Guidelines used to classify Meadowbank waste rock. The operational acid/base accounting used for waste rock designation (PAG and NPAG rock) is described as well as the frequency of sampling in the Operational ARD/ML Testing and Sampling Plan (Version 2, 2013). Once characterized by the geology team, the waste rock material is segregated and placed in appropriate location.

As per KivIA recommendation to the 2015 Annual Report: "*Agnico should provide a summary in the Annual Report of the proportion of PAG, NPAG and uncertain waste rock found in the sampling of 25% of blast holes*." In 2019, Agnico analyzed 398 samples from blast hole at Vault at his on-site laboratory. Of these samples, 1 % are PAG, 7 % are uncertain and 91 % are NPAG. For Portage, Agnico analyzed 2,319 samples from blast hole at its on-site laboratory. Of these samples, 64% are PAG, 8 % are uncertain and 28 % are NPAG.

Table 5-1 Summary of ARD Guidelines used to classify Waste

Initial Screening Criteria	ARD Potential
NPR< 1	Likely Acid Generating (PAG)
1 < NPR < 2	Uncertain
2 < NPR	Acid Consuming Non Potentially Acid Generating (NPAG)

The mine geology staff uses the derived NPR to characterize the rock in the blast pattern. Mine surveyors use this information to delineate the dig limits within the blasted rock to guide the shovel and loader operators in directing where the rock is to be taken. See Section 5.2.1 and Table 5-5 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 Meadowbank Waste Rock Management Plan. Sampling and testing of waste materials for acid rock drainage (ARD) is conducted during mine operation 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 will continue during the remaining operation period. Operational sampling and analysis is completed on site during mining activities in order to identified and delineate the material type in the pits during mining. As describe above, Agnico sampled approximately 25% of all blast holes and analyzed the percentages of Sulphur and carbon. The results from these analyses are used to differentiate the PAG and NPAG materials. Once characterized, the waste rock material is segregated and placed in appropriate location. The geochemical properties of all Meadowbank mining wastes have been confirmed with duplicates samples sent to certified laboratory, through both static and kinetic testing on numerous representative samples, by various test methods and through multiple project development stages.

The results of the NPAG-PAG classification confirmation are logged in the Meadowbank GEMCOM database. 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 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 (RSF), as well as construction use are recorded into a database.

In 2019, to validate the method used by Agnico, approximately 119 samples from Portage Pit 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's methodology and results to differentiate PAG/NPAG rock.

In its recommendations to the 2014 Annual Report, the NIRB requested that Agnico *provide a comparison of its results with the FEIS predictions and an explanation of how it re-evaluated rock disposal practices in* *order to incorporate preventative and control measures into the Waste Management Plan*. This information is provided below.

In the FEIS, Vault waste rock was found to be 100% Intermediate Volcanic (IV). Agnico's characterization of the Vault waste rock found that it is mostly comprised of IV group rocks, however a small portion is also iron formation. Ultimately, the FEIS was functionally accurate as the IV provides a high buffering capacity, low leachability and is considered NPAG.

Data collected for internal control during operations at Vault was compared to the Vault geochemical FEIS (Golder, 2005). The Vault and Portage database from Agnico included results for analyzed at the on-site laboratory for total sulphur, buffering capacity (NP) , acid potential (AP), the ratio of NP to AP (NRP) and total carbon. Starting at the end of 2014, Agnico sent quarterly samples to an accredited laboratory to validate Agnico internal determination of Vault waste rock. In 2019 no Vault samples were sent to an accredited laboratory as the operation were ending in this area. However, based on Portage results, the external laboratory confirmed Agnico's methodology and results to differentiate PAG/NPAG rock. The Vault FEIS prediction said that the ARD from Vault rock will be low which was consistent with Agnico findings. In the FEIS, it was determined that 14% of the rock will be PAG, 11% uncertain and 75% NPAG. Analysis from Agnico's internal determination shows that in 2019, as previously said, for Vault material, 1 % are PAG, 7% are uncertain and 91% are NPAG. Ultimately, there is a higher ratio of NPAG versus what was initially predicted. Similar results were obtained in previous year 2014-2018 (Table 5-2). As a mitigative measure any PAG or uncertain waste rock material is 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 will confirm the effectiveness of this abatement measure. To date water monitoring analysis from run off indicates no concerns related to ARD.

Table 5-2 Meadowbank Site Geochemical ARD determination 2014-2019

Year	PAG (%)	Uncertain (%)	NPAG (%)
Portage			
2014	NA	NA	NA
2015	NA	NA	NA
2016	34	9	57
2017	17	6	77
2018	44	6	50
2019	64	8	28
Vault			
2014	4	12	85
2015	8	10	82
2016	8	11	81
2017	9	15	76
2018	10	15	76
2019	1	7	91

NA – Calculation of percentage classification not completed in 2014 and 2015.

The water seepage from the Vault RSF 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 initiated water quality monitoring at Vault in 2014 and results to date 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 2019, ponded water was observed at the base of the VRSF (sampling station ST-24) in June, July, August and September. As per NWB Water License, samples were collected to assess water quality and the results are presented in Table 8-28. No water was pumped from this location as it is mainly a ponding area without flow and the water is evaporating. From the analysis results for ST-24, available in Table 8-28 of the 2019 Annual Report, there is no indication of acid rock drainage from the Vault RSF.

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;

Unless there are significant changes during reclamation, no more surface water quality monitoring have been completed since 2012. Previous water sampling results showed no evidence of geochemical issues in the quarries. Agnico will refer to the 2012 and previous Annual Report. 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 2019, no turbidity issues were visually observed so surface water quality sampling was not deemed necessary at quarry contact water pool. As in the past, Quarry 4 and 14 are flooded, as noted in the 2019 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. During previous summer periods, no mitigation was deemed necessary in Quarry 4 and 14 and in any other quarry along the AWAR as no significant amounts of water were observed in the quarries. During winter, the snow could be removed from the quarries to minimize water runoff at freshet. Slope remediation is in progress in some quarries but none of them were completely reclaimed. Agnico is currently evaluating which quarries can be progressively closed. 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.

Beginning of June 2019, small streams began flowing and by end of June all of the streams and rivers along the AWAR opened up with the exception of stream at Km 78 which only have a small flow. Thirteen (13) formal erosion inspections were completed by qualified environment technicians between May 17th and July 26th 2019 (5 in May, 5 in July and 3 in July) and weekly visual inspections were made during AWAR inspections. Agnico also conducted daily inspections in collaboration with the Meadowbank Energy and Infrastructures Department (in charge of the road and travel the road daily for ongoing maintenance). No turbidity issues were visually observed so surface water quality sampling was not deemed necessary at non-HADD crossings or quarry contact water pools. As the road is made of NPAG material, and has no sign of erosion or turbidity, Agnico considers the planned monitoring approach sufficient. As describe 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 2019.

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

In 2019, Agnico continued to conducts inspections around the Rock Storage Facilities (RSF) to determine if there is seepage at the base of the RSF. In 2019, as in previous year, seepage has been observed. Samples are taken in accordance with the NWB Water License 2AM-MEA1526 and reported in the annual report – ST-16 for the ponding water at the base of Portage RSF (Section 8.5.3.1.7).

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 very minimal water accumulation around the facility, mostly related to melt and runoff water in the spring. Thermistors installed in the Portage RSF 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 some water accumulating along the Portage RSF. 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 RSF, but rather from infiltration of reclaim water from the TSF through the RSF. Several mitigation measures were implemented in since 2013 to control effectively this seepage.

In 2014, as per inspections conducted within the framework of the Freshet Action Plan, run off was noted at the northeast side of the Portage NPAG waste rock extension pile in a natural depression (WEP). Agnico contained this run off and pumped it back to the North Cell TSF as a precaution and to prevent egress to the East Diversion non-contact water ditch. Sampling has commenced in 2016 at sumps WEP1 and WEP2 as per NWB Water License 2AM-MEA1526. There are no applicable license limits. Results are presented in Table 8-31 for WEP1 and Table 8-32 for WEP 2, and discussed in Section 8.5.3.1.15. Refer to Section 8.5.3.1.7 regarding the seepage event; mitigation and monitoring that occurred in NP2 Lake and other downstream lakes (i.e. NP1, Dogleg, and SPL).

The waste rock mined at Vault is largely NPAG. As a mitigative measure any PAG or uncertain waste rock material is 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 to date the effectiveness of this abatement measure. To date water monitoring analysis from run off indicates no concerns related to ARD. The water seepage from the Vault RSF 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 initiated water quality monitoring at Vault in 2014 and results to date 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 2019, ponded water was observed at the base of the VRSF (sampling station ST-24) and was sampled in June, July August and September. As per NWB Water License, samples were collected to assess water quality and the results are presented in Table 8-28. No water was pumped from this location as it is mainly a ponding area without flow, and the water is evaporating. From the analysis results for ST- 24, there is no indication of acid rock drainage from the Vault RSF.

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 takes throughout the year quarterly samples of tailings (modified to monthly sample 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 5-3 below presents the results of tailings solids. The results indicate that the tailings are PAG but have low metal leaching potential. These sample results are also integrated in the Water Quality Forecast updated yearly. Tailings samples analyses were also integrated in the design of the TSF cover for closure.

Table 5-3 Meadowbank 2019 Tailings Solids Monitoring

Analysis	Date	22-Jan-19	02-Apr-19	9-Jul-19	19-Oct-19	05-Nov-19	04-Dec-19
	Units						
NP	t $CaCO_3$/1000 t	18.7	39.4	19.8	36.0	34.5	37.6
AP	t $CaCO_3$/1000 t	67.2	57.2	55.6	80.6	100	98.8
Net NP	t $CaCO_3$/1000 t	-48.49	-17.79	-35.82	-44.62	-65.81	-61.15
NP/AP	ratio	0.28	0.69	0.26	0.45	0.34	0.38
Sulphur	%	2.11	1.88	2.04	2.59	3.29	3.19
Acid Leachable SO4-S	%	<0.02	0.06	0.26	0.22	0.08	0.03
Sulphide	%	2.15	1.83	1.78	2.58	3.21	3.16
C	%	0.151	0.482	0.204	0.498	0.576	0.411
CO_3	%	0.330	1.41	0.305	1.17	1.16	0.739
Final pH	units	1.52	1.75	1.50	1.56	1.86	1.61
As	mg/L	0.150	0.180	0.150	1.7	2.4	2.1
Cu	mg/L	0.055	0.041	0.040	0.087	0.085	0.078
Ni	mg/L	0.130	0.060	0.089	0.610	0.440	0.440
Zn	mg/L	0.054	0.049	0.061	0.078	0.074	0.076

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

See Section 5.1.1c above.

5.1.1.1 *Pore Water Quality*

Agnico received on May 24th, 2019 from NWB the Ministers Approval regarding the Amendment No.3 to Type A Water Licence No. 2AM-MEA1526 to authorize Water Uses and Waste Deposits associated with the In-Pit Tailings Disposal Proposal. Tailings generated from the Whale Tail Pit Project will be deposited in the mined-out Goose and Portage pits. As part of their decisions, Agnico was required to submit a Tailings Pore Water Quality Monitoring Program for the Board review and approval (Section IV, Part B: General Conditions). This plan was approved on October 21st, 2019 with a commitment to revisit the Pore Water Quality Monitoring plan as part of the 2019 Annual Report and commit to organize a meeting with ECCC and CIRNAC to discuss of the sampling methodology prior to the update of the plan. The meeting with ECCC and CIRNAC was held on February 6th, 2020. The revised Pore Water Quality Monitoring Program is attached in Appendix 23.

The chemical composition of the mill effluent process water will have 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 5th, 2019. As part of this program, Agnico collected on a monthly basis one sample of plant effluent slurry representative of the end of pipe prior to tailings disposal in Goose pit (collected in the mill). Following the start of the in-pit disposal, tailings sample were taken on July, October, November and December.

Once Goose Pit has reached its full storage capacity, pore water samples will be collected directly from the in-pit tailings, once it is safe to do. Agnico will sample in-pit tailings for two (2) subsequent years. If year two is within 20% or lower of year one, and within our prediction, then no further sampling in-situ will be performed. No direct in-pit tailings sample were taken in 2019.

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-WTP1826 Schedule B, Item 7: *Geochemical monitoring results including:*

The first version of the Operational ADR-ML Sampling Testing and Plan was submitted on June 2016. Subsequent versions have been emitted to include commitment of the NIRB Project Certificate no. 008 Condition 8 as well as recommendations from CIRNAC and ECCC. Version 4 (March 2019) included an comprehensive update of the plan and was resubmitted as part of the 2018 Annual Report (Appendix 51 of the 2018 Annual Report).

This document presents the Operational ARD-ML Sampling and Testing, with the exception of thermal monitoring of waste rock, which is covered in the Thermal Monitoring Plan (Version 3, March 2020). 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 Project. 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 will also define if the waste rock, the overburden, and the lake sediment can be used as construction/closure material.

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

In 2019, Agnico sampled 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 Testing Plan Section 3.2 (Appendix 51 of the 2018 Annual Report). See Table 5-11 above for a summary of Acid Rock Drainage (ARD) Guidelines used to classify Meadowbank 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.

In 2019, Agnico analyzed 16,673 samples from blast hole at Whale Tail site at its on-site laboratory. Of these samples, 42 % are PAG, 11 % are uncertain and 47 % are NPAG. Table 5-4 show the results for 2018-2019.

Table 5-4 Whale Tail Site Geochemical ARD determination 2018-2019 (including all waste types)

Year	PAG (%)	Uncertain (%)	NPAG (%)
2018	28	11	61
2019	42	11	47

The mine geology staff uses the derived NPR to characterize the rock in the blast pattern. Mine surveyors use this information to delineate the dig limits within the blasted rock to guide the shovel and loader operators in directing where the rock is to be taken. See Section 5.2.2 and Table 5-6 for a discussion of the use and location of waste rock.

The Whale Tail WRSF will be constructed to encapsulate potentially acid generating (PAG) and 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 waste rock pile. Rock oxidation can still occur in frozen material but will proceed at a slower rate than predicted by laboratory testing because of the cold temperature 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 WRSF are provided in the Whale Tail Pit – Waste Rock Management Plan (Appendix 25).

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 WRSF.

The geochemical properties of all Whale Tail mining wastes are confirmed in 2019 with duplicates samples sent to certified laboratory, through both static and kinetic testing on numerous representative samples, by various test methods and through multiple project development stages. This practice has been ongoing since the beginning of the mining operations at Meadowbank, and will be ongoing with the Whale Tail Project. In 2019, to validate the method used by Agnico, approximately 276 samples from Whale Tail Project were sent to an accredited external lab. The results from the external laboratory confirmed Agnico's methodology and results to differentiate PAG/NPAG rock.

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

If ponding water is found at the at the base of the WRSF (ST-WT-3), as per NWB Water License, samples was collected to assess water quality and water discharged to the Quarry 1. In 2019, water was pumped from this location. Refer to Section 8.5.3.2.1 for a complete discussion of the result. 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 is no issues to report for 2019.

Pre-freshet and freshet inspections were conducted at crossings along the Whale Tail Haul Road, eskers and quarries in 2019. 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. Freshet leaders were hired in 2019 and were only dedicated to the inspection of Whale Tail Haul Road including the esker, quarries, culvert and bridges. Refer to Section 8.5.3.11.1 for more information.

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

Nothing to report for 2019.

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

There is no geochemical outcomes or observations that could lead to an environmental impact In 2019. Refer to Section 8.5.8.2.4 for a discussed regarding the WRSF dike flow in 2019.

5.2 WASTE ROCK AND ORE VOLUME

5.2.1 Meadowbank Site

In accordance with NWB Water License 2AM-MEA1528 Schedule B, Item 8: *Volumes of waste rock used in construction and placed in the Rock Storage Facilities.*

The total volume of waste rock generated by the Portage pits and Vault pits in 2019 was 1,632,083 tonnes. There is no more mining in Goose Pit so no more waste rock was generated in 2019. The use and location of all of the rock, by volume, is presented in Table 5-5 and is identified by the following categories:

- Tailings Dams and Dikes– used for the construction of dams or dikes adjacent to the tailings pond;
- Other Construction;
    - Roads – used for road construction and maintenance;
    - Crushers – taken to the mobile crusher and used for construction or maintenance purposes;
    - Miscellaneous uses;
    - Tailings cover construction
- Rock Storage Facility – taken to the rock storage facilities.

The Mine Waste Rock and Tailings Management Plan (Version 10) was revised in March 2020 and can be found in Appendix 24. Details of all waste rock deposition and tailings management are contained in the revised Plan.

Table 5-5 Meadowbank 2019 Rock volumes

Month	Portage Pit & Vault Pit (tonnes)								Ore Processed in Mill (tonnes)
	Ore	Waste Rock							
		Dikes	Roads	WRSF	Backfill	Stockpiles	Other	Total	
January	144,114	86	565	39,778	140,693	269	96,170	277,561	251,914
February	111,814	0	435	24,953	148,716	83	39,017	213,204	208,736
March	120,143	0	131	3,641	256,068	0	3,682	263,522	176,931
April	100,456	0	9065	22,390	169,688	296	52,685	254,124	213,095
May	83,237	0	20,906	15,132	76,700	0	0	112,738	191,880
June	46,290	0	7,766	12,490	99,907	8,265	0	128,427	224,028
July	44,584	0	348	6,873	49,797	0	24,795	81,813	334,437
August	55,282	0	9,244	9,803	95,245	696	110,604	225,592	70,519
September	10,965	0	348	0	49,961	174	2,436	52,919	0
October	30,659	0	1,974	2,233	15,498	336	462	20,503	6,280
November	0	0	1,680	0	0	0	0	1,680	119,445
December	0	0	0	0	0	0	0	0	6,091
TOTAL	**747,544**	**86**	**52,461**	**137,293**	**1,102,273**	**10,118**	**329,851**	**1,632,083**	**1,803,356**

5.2.2 Whale Tail Site

5.2.2.1 *Waste and Ore Stockpile Volume*

In accordance with NWB Water License 2AM-WTP1826 Schedule B, Item 8: ***Volumes of Waste Rock used in construction and placed in the Waste Rock Storage Facility.***

And

In accordance with NWB Water License 2AM-WTP1826 Schedule B, Item 9: ***Volumes of ore stockpiled and overburden stored at Whale Tail Pit site.***

The total volume of waste rock generated by Whale Tail Pit in 2019 was 13,018,525 tonnes. The use and location of all of the rock, by volume, is presented in Table 5-6 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
    - Dewatering ramp road construction

The Whale Tail Waste Management Plan (Version 5) was revised in March 2020 and can be found in Appendix 25. Details of all waste rock deposition and tailings management are contained in the Plan.

Table 5-6 Whale Tail 2019 Rock Volume

Month	Whale Tail Pit								Ore Processed in Mill (tonnes)
	Ore[1]	Waste Rock						Overburden	
		Dikes	Roads[2]	WRSF[3]	Stockpiles	Construction[4]	Total		
January	41,490	42,457	18,834	452,885	40,471	52,779	607,426	45,195	-
February	33,836	2,412	11,523	693,420	110,515	11,271	829,141	5,322	-
March	67,378	1,760	29,225	683,370	138,570	53,788	906,713	5,569	-
April	28,741	1,644	23,318	459,676	47,160	97,862	629,660	131,006	-
May	73,591	-	58,546	358,131	357,206	490	774,373	206,267	-
June	44,646	-	45,366	695,176	61,572	844	802,957	207,710	49,598
July	89,492	57,124	34,135	802,735	87,313	4,722	986,029	259,885	-
August	88,613	25,764	67,286	850,427	52,662	2,617	998,756	451,512	174,077
September	98,084	-	65,003	1,225,511	50,183	14,474	1,355,170	165,027	97,797
October	126,797	-	193,903	1,205,410	80,172	-	1,479,486	156,402	179,374
November	243,092	167	98,218	1,561,644	73,438	117,001	1,850,468	32,494	109,362
December	204,563	8,442	7,856	1,668,482	38,249	75,317	1,798,346	51,079	334,862
TOTAL	**1,140,323**	**139,771**	**653,212**	**10,656,867**	**1,137,511**	**431,165**	**13,018,525**	**1,717,468**	**945,070**

1 *All ore mined is stockpiled before it's long hauled to the Mill; Ore Stockpile balance on Dec. 31st, 2019: 187,622 tonnes*
2 *Include 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*

5.2.2.2 *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 Pit – Waste Rock Management Plan was initially submitted in January 2017 (Version 1) with subsequent updates. The last version 5 (March 2020) (Appendix 25) was updated to align with recommendations issued from the various authorities. Agnico will continue to update the plan on an annual basis during the operation phase of the Whale Tail Project.

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 have submitted to NIRB on June 4th, 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. The below is a summary of the memorandum Site Specific Geotechnical Studies.

Since 2015, many field investigations have been carried out at the Whale Tail Pit Project in order to characterize the field conditions (types of soils encountered, overburden thicknesses, rock quality, etc.). This memorandum outlines the geotechnical studies conducted at four (4) specific locations:

- WRSF and WRSF Dike,
- Quarry;
- Mammoth Dike;
- Whale Tail Dike.

Field investigation campaigns have been carried out at the WRSF, Mammoth Dike, and quarry areas between 2014 and 2016. The information available as of May 2018 indicates that the bedrock depth varies from 7.2 m within the footprint of the WRSF – Phase 1 area (2.7 m within the footprint of the WRSF Dike), 5.1 m in the Mammoth Dike area and 4.9 m in the quarry area, on average. No further geotechnical data are available in these areas, hence no major sensitive land features have been identified at these locations. The design report of the Whale Tail Dike (WTD) contains all the required information on the field investigations carried out at the WTD, and should be referred to for all the implications of geotechnical investigations for construction.

There are no geotechnical investigations to report on in 2019. Some geotechnical investigations may be carried out in 2020; they will reported on in the 2020 Annual Report.

5.2.3 Exploration Whale Tail Site

In accordance with NWB Water License 2BB-MEA1828 Part B, Item 6c: ***An estimate of the current volume of waste rock and ore stockpiled on site.***

Refer to Section 5.2.2 above.

5.3 TAILINGS STORAGE FACILITY MEADOWBANK SITE

5.3.1 Tailings Storage Facility Capacity*

As required by NWB Water License 2AM-MEA1526 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 2019, a total of 34.4 Mt of dry tailings slurry from the mill had been deposited in the TSF's and the In-Pit Tailings Deposition sites as indicated in Table 5-7. In 2019, a total of 3.1 Mt of tailings slurry was deposited in the tailings storage facilities and the In-Pit Tailings Deposition sites, representing 2.02Mt dry tonnes. A monthly summary of the tailings produced in 2019 is provided in Table 5-8.

Agnico revised the tailings deposition plan (available in Updated Mine Waste Rock and Tailing Management Plan Version 10 presented in Appendix 24), to comply with the new LOM produced. The deposition model completed is valid until the end of the mining operation in July 2022. 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 5-9 presents the summary of the tailings management strategy in 2020-2022. More information on the tailings deposition modeling is presented in the Waste Management Plan.

The main conclusions from the modeling results are:

- The total maximum capacity of the In-Pit Tailings Deposition sites is estimated at: 42 Mt (without raising the West Road);

* TSF- Tailings Storage Facility

- The LOM mill throughput is 8.7 Mt, indicating there is sufficient capacity in the approved In-Pit Tailings Deposition sites.

Table 5-7 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

Table 5-8 Meadowbank 2019 Processed Tailings Volume and Associated Properties

Month	Total Tailings Slurry (tonnes)	Density of Tailings (% solid)	Density of Slurry (tonnes / m^3)	Tailings Placed in TSF (m^3)
January	252,371	55.5%	1.59	158,957
February	229,084	56.7%	1.61	142,229
March	213,504	50.4%	1.55	137,630
April	226,506	55.7%	1.58	143,482
May	258,718	52.2%	1.55	166,547
June	287,039	56.0%	1.57	182,978
July	339,547	55.6%	1.57	216,195
August	268,610	51.8%	1.53	176,100
September	154,343	53.8%	1.56	99,182
October	206,353	49.4%	1.50	137,488
November	309,883	58.3%	1.64	189,353
December	342,569	56.8%	1.60	214,492
TOTAL	**3,088,527**	**54.7%**		**1,964,632**

Table 5-9 Meadowbank Deposition plan and infrastructure construction – summary

Date	Operational Cell	Dry tonnes deposited	Infrastructure construction
January 2020 -August 2020	Goose Pit	2.09 Mt	• July 2020: Reclaim water from Pit A • June to August 2020: Water transfer from Goose Pit to Pit A
September 2020 -August 2021	Pit E	3.26 Mt	• September to October 2020: Water transfer from Goose Pit to Pit E • June to August 2021: Water transfer from Goose Pit to Pit E • Reclaim of water from Pit A
September 2021 -July 2022	Pit A	3.31 Mt	• September 2021: Reclaim of water from Pit E

5.3.2 Tailings in-Pit Disposal Meadowbank Site*

As required by NIRB Project Certificate No.008, 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 licence, 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.***

* TSF- Tailings Storage Facility

As per Condition 87 (Project Certificate 008), Agnico 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 have received the Minister approval for the NWB Water License 2AM-MEA1526 Amendment no.3 on May 23rd, 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 carry out in each current final pit shells. Other former and new structural information can be revisited such as existing televiewer surveys performed in 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) 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-MEA1526 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.***

Thermistors are installed within the tailings of the TSF and the waste rock of the Portage RSF. These instruments are used to obtain thermal data within the operation of these structures. Additional instruments will be installed at closure. 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. Tailings that are unfrozen are showing sign of permafrost aggradation over time. Thermistors installed within the Portage RSF indicate that freezeback is occurring within the Portage RSF structures. The instruments show that the active layer is variable in thickness based on the thermistors location. Refer to the Waste Rock and Tailings Management Plan (Appendix 24) and the Meadowbank Thermal Report (Appendix 26) for more information.

The final landform of the TSF at closure will include 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. The capping installed is not representative of the cover system that will be achieved once the final landform is achieved. Currently, there is not enough thermistors installed in the cover system to be able to fully assess the freezeback efficiency of the capping. Once closure of the TSF is completed additional thermistors will be installed and the freezeback efficiency will be assessed.

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 RSF. 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. Data from this study will be sent to Agnico in 2020 and reported in the next annual report.

The full list of all publications produced by the RIME related to the TSF and RSF covers is listed below. Note that some of the documents below are still in the publishing process and were not send yet to Agnico. Therefore comments on the results of the study will be provided in the next annual report.

<u>RIME Publication List</u>

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. 71th Canadian Geotechnical Conference, Edmonton, Alberta, Canada. (TSF + RSF)

Boulanger-Martel, V., Bussièere, 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

Boulanger-Martel, V., Bussière, B. & Côte, J. 2020. 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, Article accepted with revisions and resubmitted for review on 26 March 2020. (TSF + RSF)

Boulanger-Martel, V., Bussière, B. & Côte, J. 2020. Thermal beahviour and performance of two field experimental insulation covers to control sulfide oxidation at Meadowbank mine, Nunavut. Canadian Geotechnical Journal. Article accepted with revisions and resubmitted for review on 4 Februrary 2020. (TSF)

Boulanger-Martel, V., Bussière, B. & Côte, J. 2019. Insulation covers with capillary barrier effects to control sulfide oxidation in the Arctic. Canadian Geotechnical Journal. Article accepted with revisions on 3 Februrary 2020. To be resubmitted for review in April 2020. (TSF)

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. Article rejected by the Canadian Geotechnical Journal in 2019. To be resubmitted later. (RSF)

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 génis civil, géologique et des mines, Polytechnique Montréal. 422 pp. (TSF)

Poirier, A. 2019. Étude du comportement thermique d’une halde à stérile située en conditions nordiques. M.S.A. thesis, Département des génis civil, géologique et des mines, Polytechnique Montréal. 227 pp. (RSF)

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 RSF)

Tailings Storage Facility (TSF) and Rock Storage Facility (RSF)

This section presents the analysis obtained from the thermal monitoring of the tailings in the TSF and the waste rock in the RSF. Figure 14. shows the location of thermistors located in the TSF and RSF. The Meadowbank Thermal Report (Appendix 26) also lists all the thermistors installed within the tailings of the TSF and the waste rock of the RSF and provides the thermal profiles of all the thermistors.

The thermal profiles show freeze back progress of the tailings and waste rock storage facilities. In general, tailings and waste rock demonstrate frozen conditions with an active layer at the surface subjected to freeze and thaw processes. Depending on the cover (tailings or rockfill), the active layer varies due to different thermal processes. Further analysis is required to complete the TSF and RSF final closure design.

Appendix 26 presents the thermal monitoring results for all thermistors located in the TSF and RSF.

For the TSF, 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 in surface (with a 4-5 m active layer) and a progression of the freezing front advancing at depth. This is represented by yellow dot on Figure 14 (NC-16-1, NC-16-2, NC17-3, NC-17-2, NC-17-6). Instruments located away from the water pond show that the tailings and its foundation are entirely frozen with an active depth of 4-5 m. This is represented by red, green and orange dot on Figure 13 (NC-17-1, NC17-4, NC-17-6, NC-17-7, NCIS-01 to NCIS-04).

Instruments installed in the capping or rockfill structure above taillings show that the active layer remained confined in the waste rock showing the effectiveness of the capping concept. This is represented by green and red dot on Figure 14 (NC-17-5, SWD-16-01).

The thermal prediction of the tailings freezeback made by Golder in 2008 indicated that for the more 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.

In 2019 Agnico initiated a mandate with O'Kane to review the thermal model of the Portage RSF with the objective of evaluating the accuracy of the thermal model by comparing the simulated results with field data collected from the thermistor data. This report is attached with the Meadowbank Thermal Report (Appendix 26).

The study done by O'Kane came to the following conclusion:

- Decreasing trends in active zone depth are recorded at most thermistor locations
- The thermal model predicted colder temperatures near surface compared to recorded near surface temperatures
- Temperature trends are becoming more consistent with simulated temperatures over time
- The observed active zone is generally thicker on the north slope compared to the south slope which is the opposite of the conceptual model.

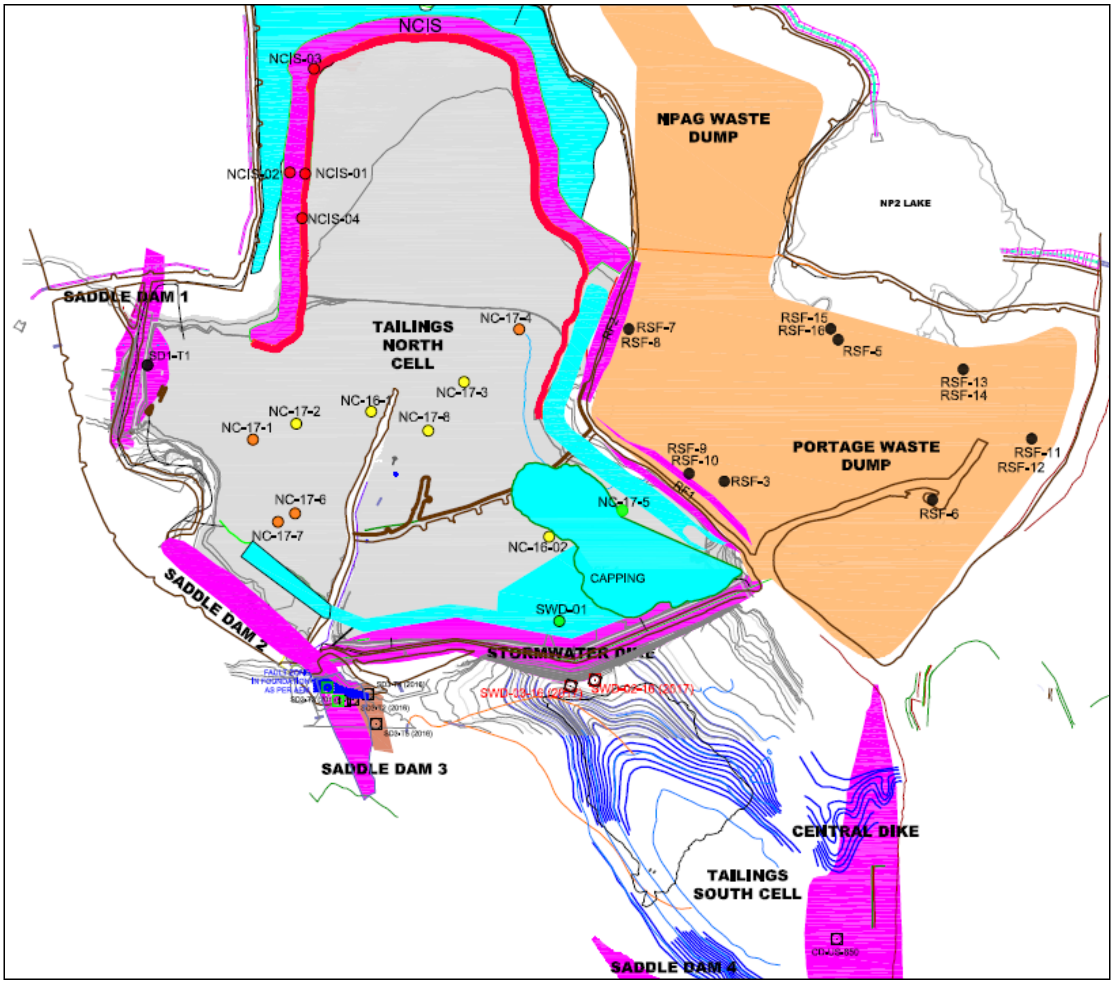
The conclusion of the 2019 thermal model update of the Portage TSF by O'Kane was that the numerical modelling undertaken in 2016 by O'Kane tended to predict colder soil temperatures than the thermistors during the observed period at all locations. However, the difference between the modelled and observed temperature is becoming less over time and the overall trend in the observed data is becoming more consistent with the model. The timing and amplitude of seasonal trends already show a good match between observed and modelled results, but the model results are shifted lower due to the predicted colder temperatures. It is expected that the trend towards consistency will continue, further increasing confidence.

The detailed analysis of the thermal monitoring is presented in the 2019 Annual Geotechnical Inspection Report (Appendix 9). The table below presents the sections of this report associated with each structure. Agnico will refer the reader to the 2019 Annual Geotechnical Inspection Report for a complete review of the results.

Table 5-10 Meadowbank Thermal Data Interpretation Sections in the 2019 Annual Geotechnical Inspection

Structure	Section in the 2019 Annual Geotechnical inspection (Golder, 2019)
Saddle Dam 1	5.6.1
Saddle Dam 2	5.6.2
RF1 & RF2	5.6.3
North Cell Tailings	5.6.4
Stormwater Dike	5.6.5
North Cell Internal Structure	5.6.6
Central Dike	5.5.1.1
Saddle Dam 3	5.5.2
Saddle Dam 4	5.5.3
Saddle Dam 5	5.5.4

Figure 14 Meadowbank Thermistor Location in Portage RSF, TSF North Cell, and TSF South Cell



5.4.2 Whale Tail Site

As required by Water License 2AM-WTP1826 Schedule B, Item 18: ***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 RSF. 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 33 thermistors placed at strategic locations recommended by the different designers and consultants involved in the project. The Thermal Monitoring Report (Appendix 27) presents a summary of the thermal monitoring program at Whale Tail Pit Project from the period of 2016 to 2019 along with interpretation of the thermistor results.

The data presented in Appendix A of the Thermal Monitoring Report informed and will continue to inform the detailed design of the project infrastructure such as the Whale Tail pit, 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 (no permafrost degradation) but there is less than 6 months of data available and the cover has not been installed yet over the instrumented section. The instrumentation data are showing thermal behaviour along the expected trend at Mammoth Dike and in the talik area of Whale Tail Dike (no change in existing talik condition). A degradation of the permafrost at the Eastern abutment of Whale Tail Dike was observed following flooding of the area in the summer of 2019 (0+710 U/S). This was predicted to occur eventually based on the thermal model of the structure but not within such a short timeframe. A degradation of the thermal condition in the keytrench of WRSF Dike was observed in the summer of 2019 leading to seepage. This fluctuation was due to heat transfer from ponded water and the data are indicating that the areas that thawed were freezing back at the end of 2019. The thermistors currently installed near the pit area are following the expected trend and are not showing any impact on the surrounding permafrost.

Agnico has updated the Whale Tail Thermal Monitoring Plan (Version 3) and it is presented in Appendix 28.

The detailed analysis of the thermal monitoring of the dikes is presented in the 2019 Annual Geotechnical Inspection Report (Appendix 10). The table below presents the sections of this report associated with each structure. Agnico will refer the reader to the 2019 Annual Geotechnical Inspection Report for a complete review of the results.

Table 5-11 Whale Tail Thermal Data Interpretation Sections in the 2019 Annual Geotechnical Inspection

Structure	Section in the 2019 Annual Geotechnical inspection (SNC Lavalin, 2019)
Whale Tail Dike	4.1.4
WRSF Dike	4.3.2
Mammoth Dike	4.4.2

SECTION 6. WASTE MANAGEMENT ACTIVITIES

6.1 GENERAL WASTE DISPOSAL ACTIVITY

6.1.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 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.*

A monthly summary of the amount of waste transferred to the incinerator in 2019 is included in Table 6-1. A total of 3,495.0 m^3 were incinerated. More details regarding quantities incinerated can be found in Section 6.2.1.

Table 6-1 Meadowbank 2019 volume of waste transferred to incinerator

Month	Volume of waste send to incinerator (m³)*
January	342.9
February	309.7
March	342.9
April	287.6
May	88.5
June	221.2
July	342.9
August	320.7
September	276.5
October	320.7
November	320.7
December	320.7
TOTAL	**3,495.0**

**Volume included waste from Whale Tail Project*

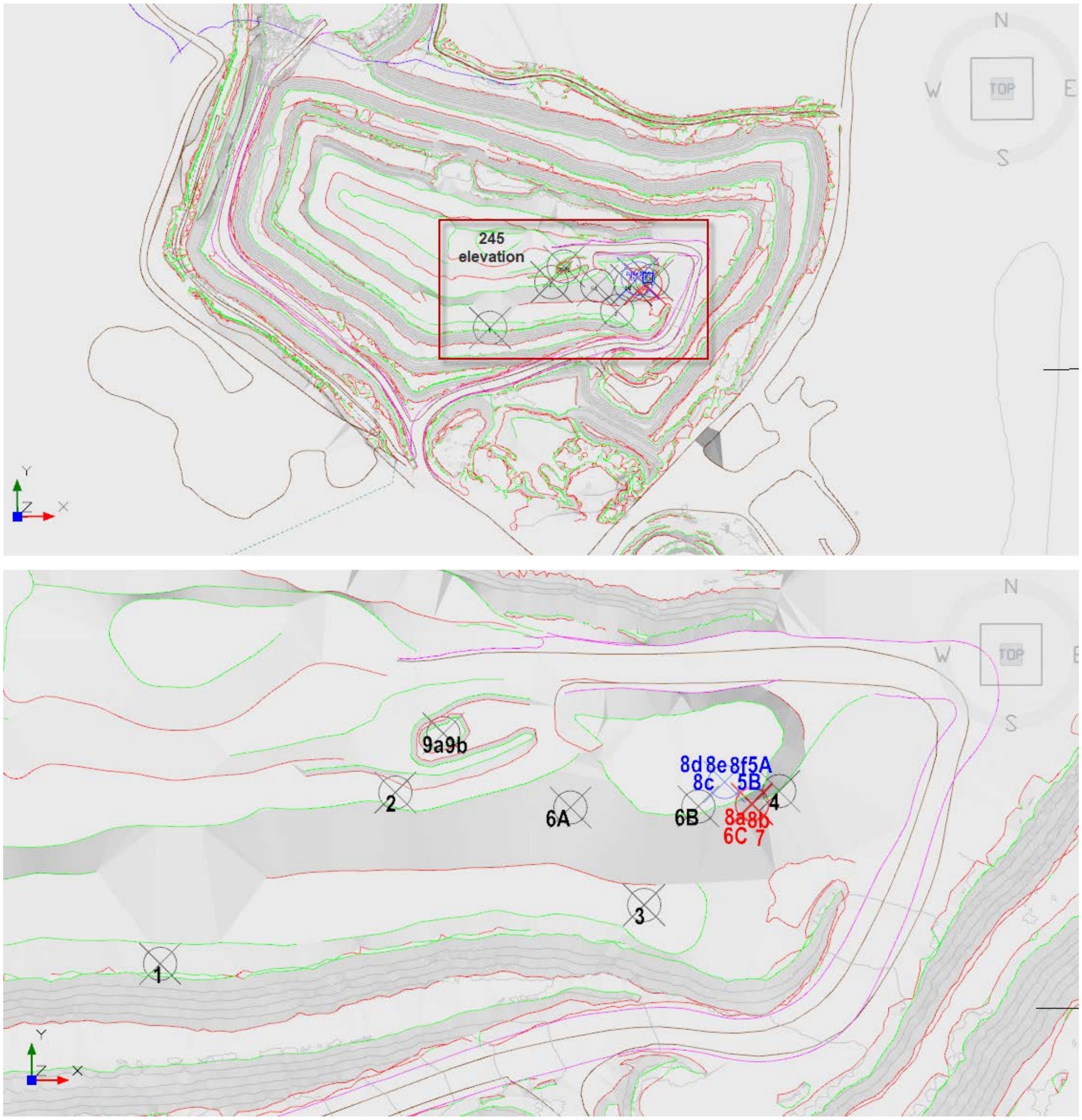
Table 6-2 below indicates the volume of waste in cubic meter (m^3) disposed of in each sub-landfill from 2012 to 2019 and Figure 15 indicates the location of each sub-landfill used to date. The volume of waste landfilled from the start of the project is 199,096 m^3. This is based on the engineering survey done at each sub-landfill. It should be noted that this amount is overestimated as some of the survey were completed once the capping of the landfill were completed. Sometime the waste were not yet compacted in the landfill and the volume is also overestimated. From that amount, Agnico landfilled 33,024 m^3 between October 1st, 2018 to January 1st, 2020. In 2019, sub-landfill #8d (October 1st, 2018 to April 4th, 2019), #8e (April 4th, 2019 to August 1st, 2019), #8f (August 1st, 2019 to September 2nd, 2019) were used for waste disposal and have all been covered with NPAG waste rock by the end of December. Landfill #9a and #9b are currently in use. In 2019, landfill waste were from Meadowbank and Whale Tail Sites (Section 6.1.2 and 6.1.3) up to October 2019. After this date, a landfill became operational at Whale Tail (Section 6.1.2). There is no distinction possible between the volume site provenance of inert waste before October, 2019.

The waste consists primarily of plastics, fiberglass, wood, cardboard, rubber, clothing and some metal that was not recycled.

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	7215715.58	638601.45	160	3,650	Dec-12-2012
#2	7215795.79	638711.42	186	840	Feb-27-2013
#3	7215743.12	638827.77	195	1,656	May-14-2013
#4	7215796.48	638890.93	200	9,507	Jan-19-2014
#5A	7206586.10	643115.90	210	3,870	Nov-30-2014
#5B	7206586.10	643115.90	210	2,768	Mar-13-2015
#6A	7215788.80	638793.30	212	278	Mar-21-2015
#6B	7215789.30	638853.10	212	3,260	Sept-05-2015
#6C	7215790.80	638878.10	212	9,290	May-20-2016
#7	7215790.80	638878.10	214	4,560	Dec-20-2016
#8a	7215790.10	638878.10	217	17,864	Nov-30-2017
#8b	7215790.10	638878.40	217	2,709	Jan-27-2018
#8b	7215790.10	638878.40	217	13,019	June-01-2018
#8c	7215800.70	638865.40	221	2,800	Oct-01-2018
#8d	7215800.70	638865.40	227	9,377	Apr-04-2019
#8e	7215800.7	638865.4	232	8,482	Aug-01-2019
#8f	7215800.7	638865.4	235	12,175	Sept-02-2019
#9a	7215823.5	638733.9	233	350	Active
#9b	7215823.5	638733.9	235	2,640	Active
			TOTAL	**109,095**	

Figure 15 Meadowbank sub-landfill location



In 2019, a total of 120 sea cans containing hazardous waste were transported to Solva-Rec Environnement Inc., Veolia ES Canada and Covanta Environmental Solutions, three (3) sea cans containing electronic waste was transported to Multirecycle and 15 sea cans of used tires were transported to Revalorisation TPOL Inc. These companies are all registered companies or disposal facilities located in the Province of Quebec. The total weight of hazardous waste was 469.78 tonnes. This amount of sea cans and total weight does not include the scrap metal (1,813.30 tonnes), scrap tires (62.67 tonnes), batteries (18.90 tonnes) and electronic waste (7.59 tonnes). The sea cans were shipped from the spud barge at Agnico's Baker Lake marshalling facilities to Bécancour, Quebec by sealift. These materials were transported under Waste Manifest #'s HL61042-8 (Appendix 29) 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. The volume of waste hazardous and non-hazardous waste disposed by sealift in 2019 are for both Meadowbank and Whale Tail Site. Since waste to be disposed off-site from Whale Tail Site all transit by Meadowbank during the year, there is no possibility to make any distinction between both site.

Table 6-3 Meadowbank and Whale Tail 2019 waste shipped to licensed hazardous waste companies

Description	UN	Class	P. G.	Regulated under T.D.G.A.[2]	Quantity	Container Type and Capacity	Unit Capacity	Volume (L)	Weight (kg)	Disposal Method
Empty drum, last residue cont, oil/grease	N/R	N/R	-	no	16	drum	205 L	3,280	288	Cleaning and metal recycling
Empty plastic drum, last residue contained: nitric acid	N/R	N/R	-	no	89	drum	205 L	18,245	979	Cleaning and plastic recycling
Empty plastic pails, last residue contained: oil/grease	N/R	N/R	-	no	3,940	pail	20 L	78,800	3,940	Cleaning and plastic recycling
Empty tote tank, last residue contained: oil/grease	N/R	N/R	-	no	22	tote	1,000 L	22,000	1,210	Cleaning and plastic recycling
Environmentally hazardous substances, solid (lead) - Lab sample	N/R	N/R	-	no	20	Quatrex	765 L	15,300	1,714	Neutralization and secure landfill
Hydrocarbon contaminated soils non-treatable at landfarm site	N/R	N/R	-	no	41	drum	205 L	8,405	13,407	Secure landfill
Hydrocarbon contaminated soils non-treatable at landfarm site	N/R	N/R	-	no	8	Quatrex	765 L	6,120	6,906	Secure landfill
Mixed waste labpack (Labpack of miscellaneous chemicals)	N/R	N/R	-	no	3	Quatrex	765 L	2,295	777	Neutralization and secure landfill
Oily contaminated solids	N/R	N/R	-	no	121	drum	205 L	24,805	11,350	Energy recovery
Oily contaminated solids	N/R	N/R	-	no	475	Quatrex	765 L	363,375	105,450	Energy recovery
Oily contaminated solids	N/R	N/R	-	no	1	tote	1,000 L	1,000	278	Energy recovery
Oily contaminated solids	N/R	N/R	-	no	1	box	800 L	800	323	Energy recovery
Residue last contained propane (small propane tank)	N/R	N/R	-	no	1	Quatrex	765 L	765	185	Metal recycling
Waste, oil	*Used Oil acceptable for recycling*				78 250	drum tote	205 L 1,000 L	189,746	168,874	Oil recycling
	Antifreeze < 30 % + water mixed with waste oil							7,707	7,707	Incineration
	Oily water mixed with waste oil							3,666	3,666	Water treatment
	Used Oil containing Chlorine > 2000 ppm - not acceptable for recycling							1,751	1,558	Energy recovery
Waste, aerosol, flammable	1950	2.1	-	yes	2	drum	205 L	410	116	Metal recycling
Waste, antifreeze - concentration > 30%	N/R	N/R	-	no	3	drum	205 L	615	588	Antifreeze recycling
Waste, antifreeze - concentration < 30%	N/R	N/R	-	no	3	tote	1000 L	3,000	2,985	Incineration
Waste, antifreeze and water - concentration < 30%	N/R	N/R	-	no	8	drum	205 L	1,640	1,728	Incineration
Waste, antifreeze - concentration > 30%	N/R	N/R	-	no	26	tote	1,000 L	26,000	26,494	Antifreeze recycling
Waste, ash	N/R	N/R	-	no	149	drum	205 L	30,545	17,880	Secure landfill
Waste, diesel fuel	1202	3	III	yes	25	drum	205 L	5,125	3,625	Energy recovery
Waste, diesel fuel	1202	3	III	yes	15	tote	1,000 L	15,000	9,825	Energy recovery
Waste, fuel, aviation, turbine engine	1863	3	III	yes	3	tote	1,000 L	3 000	1,965	Energy recovery
Waste, gasoline	1203	3	II	yes	2	drum	205 L	410	290	Energy recovery
Waste, grease	N/R	N/R	-	no	121	drum	205 L	24,805	7,865	Secure landfill
Waste, grease	N/R	N/R	-	no	12	drum	60 L	720	684	Secure landfill
Waste, isocyanate solid	N/R	N/R	-	no	1	drum	205 L	205	53	Secure landfill

Description	UN	Class	P. G.	Regulated under T.D.G.A.[2]	Quantity	Container Type and Capacity	Unit Capacity	Volume (L)	Weight (kg)	Disposal Method
Waste, kitchen grease	N/R	N/R	-	no	68	drum	205 L	13,940	11,424	Energy recovery
Waste, oil filters	N/R	N/R	-	no	160	drum	205 L	32,800	20,160	Metal recycling and energy recovery
Waste, oil filters	N/R	N/R	-	no	7	Quatrex	765 L	5,355	1,596	Metal recycling and energy recovery
Waste, oily sludge and debris	N/R	N/R	-	no	11	drum	205 L	2,255	2,145	Energy recovery
Waste, oily sludge and debris	N/R	N/R	-	no	1	tote	1,000 L	1,000	1,025	Energy recovery
Waste, oily water	N/R	N/R	-	no	26	drum	205 L	5,330	3,952	Water treatment
Waste, oily water	N/R	N/R	-	no	28	tote	1,000 L	28,000	22,764	Water treatment
Waste, sulphur solids	N/R	N/R	-	no	11	drum	205 L	2,255	3,778	Neutralization and secure landfill
Water treatment sludges - sewage solid waste	N/R	N/R	-	no	1	Quatrex	765 L	765	229	Incineration
							Total	**951,235**	**469,783**	

In 2019, Agnico generated approximately 24,724 tonnes of waste for Meadowbank and Whale Tail Site. This represents 87.8.% of general waste disposed in the landfill, 2.9% of organic waste disposed in the incinerator, 7.6 % of waste recycled on and off-site, and 1.7 % of industrial/hazardous waste sent to an approval facility off-site. As shown of Table 6-4 below the percentage of waste recycle, disposed on site or off-site are very similar to last year. The higher volume of general waste disposed of in 2019 compared to previous are mainly due to the ongoing construction and development of the Whale Tail Project and to the fact the that volume reported is from October 2018 to January 2020. It should also be noted that this amount is overestimated as some of the survey were completed once the capping of the landfill were completed. Sometime the waste were not yet compacted in the landfill and the volume is also overestimated.

Table 6-4 Percentage of waste disposed from 2015-2019

Waste	2015 Weight (tonne)	2016 Weight (tonne)	2017 Weight (tonne)	2018 Weight (tonne)	2019 Weight (tonne)	2015 Total waste (%)	2016 Total waste (%)	2017 Total waste (%)	2018 Total waste (%)	2019 Total waste (%)	Disposal Recycling location
General	8,561	8,672	8,403	11,073	24,339[1,4]	74.9	76.5	78.7	75.7	87.8	Landfill On-site disposal
Organic	545	541	557	924[2]	810[2]	4.8	4.8	5.2	6.3	2.9	Incinerator On-site disposal
Industrial/ Hazardous[3]	289	161	243	483	470	2.5	1.4	2.3	3.3	1.7	Off-site disposal + recycling
Waste oil	358	280	280	337	210	3.1	2.5	2.6	2.3	0.8	On-site recycling
Steel	1,449	1,550	1,097	1,690	1,813	12.7	13.6	10.3	11.5	6.5	Off-site recycling
Wood	88	55	0	0	0	0.8	0.5	0	0	0	Baker lake recycling
Batteries	38	17	17	18.8	18.9	0.3	0.1	0.2	0.1	0.1	Off-site recycling
Tire	97.3	67	81	110	62.67	0.9	0.6	0.8	0.8	0.2	Off-site recycling
TOTAL	**11,425**	**11,343**	**10,678**	**14,636**	**27,724**	**100**	**100**	**100**	**100**	**100**	

1. *2019 - Volume of general waste sent to Meadowbank Landfill is 23,117 tonnes and to Whale Tail Landfill is 1,222 tonnes based on engineering landfill survey.*
2. *2018 - Volume of organic waste sent to the Meadowbank Site incinerator is 536 tonnes and to Whale Tail Site incinerator is 388 tonnes.*
   2019 - Volume of organic waste sent to the Meadowbank Site incinerator is 500 tonnes and to Whale Tail Site incinerator is 310 tonnes.
3. *Refer to Table 6-2 above*
4. *Include waste disposed from October 1, 2018 to January 1,2020*

Several projects for waste reduction/recycling were undertaken or were ongoing in 2019 at Meadowbank Complex:

- Recycling of used protective personnel equipment (PPE)
  - o The objective of the Used PPE Project is to provide a second life to reusable PPEs. With the collaboration of all departments, Agnico collected used PPE around the Meadowbank

site 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 has an existing waste oil reuse plan. In 2019, Agnico reused approximately 239.07 m^3 of waste oil as a fuel source in the on-site incinerator (25.62 m^3) and in waste oil heaters (213.45 m^3). Table 6-14 provides a breakdown of the volume of waste oil incinerated by month. Major part of waste oil produced in 2018 was kept onsite, filtered and reused. Agnico is planning on continuing to reuse all waste oil produced in 2019 during 2020.
- Steel Recycling
  - A total of 1,813 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 2019, aluminum pop cans were donated to local groups as was done in previous years. It is anticipated that these will be donated in 2020 to a local charity or shipped south for recycling.
- Battery recycling
  - In 2019, 15.2 tonnes of batteries were shipped south and recycled in an accredited facility.
- Tire recycling
  - In 2019, 154 tonnes of scrap tire were shipped south and recycled in an accredited facility.
- Composter
  - In 2019, Agnico was in the started up of the Meadowbank composter. This was implemented in order to reduce the quantity of waste burned by the incinerator.
- Electronic material
  - In 2019, 3.6 tonnes of electronic material were shipped south and recycled in an accredited facility

6.1.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 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***

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.

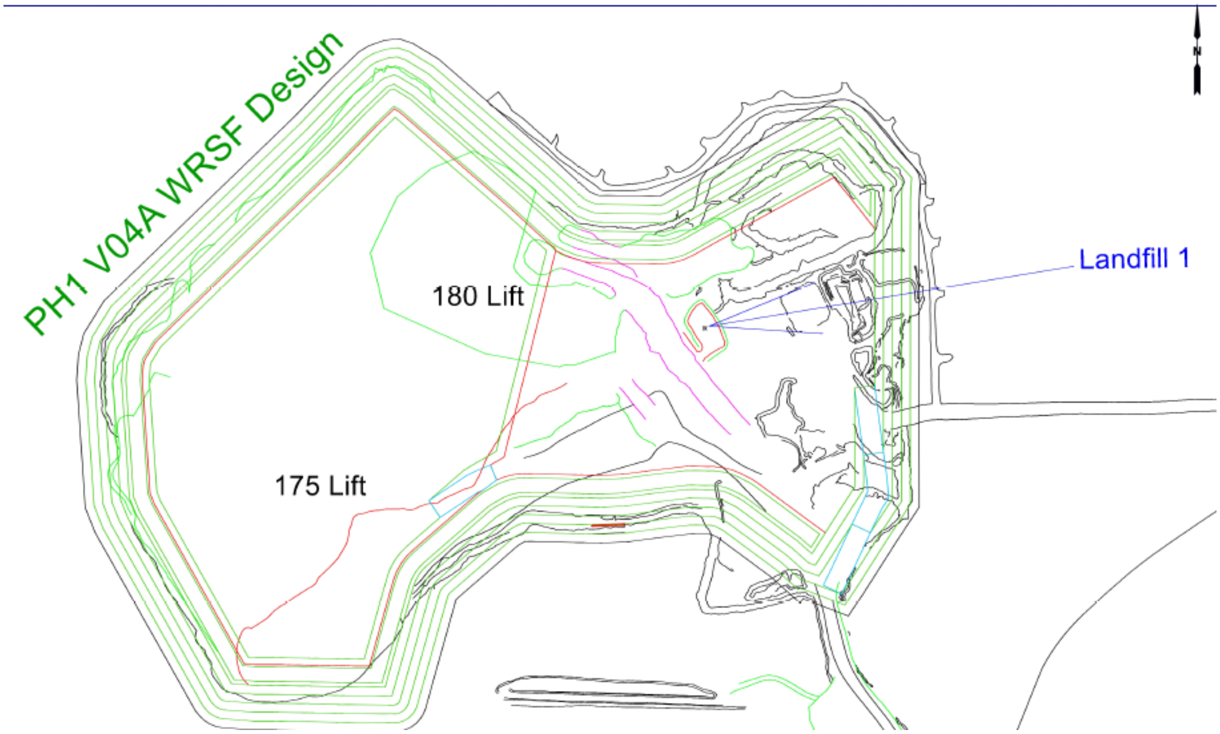
All inert waste that can be landfilled consist primarily of plastics, fiberglass, wood, cardboard, rubber, clothing and some metal that was not recycled. Landfillable waste were transported via the Whale Tail Haul Road to the Meadowbank Landfill up to October 2019. Refer to Section 6.1.2 and 6.1.3 above for a discussion regarding the volume of waste in provenance of Whale Tail disposed a Meadowbank. After October 2019 and following the approbation from the NWB to operate a landfill at Whale Tail, waste were no longer sent to Meadowbank but were disposed of directly on site.

Table 6-5 below indicates the volume of waste in cubic meter (m^3) disposed in Whale Tail Landfill starting October 2019 and Figure 16 indicates the location used to date. The volume of waste landfilled is 1,746 m^3 on January 1st, 2020. Only one landfill is currently in operation Once full, the landfill will be covered with NPAG waste rock and a new landfill will be establish in the same principle as Meadowbank.

Table 6-5 Whale Tail Volume of waste disposed in landfill (from survey)

Landfill	Coordinates (UTM)			Volume	Start Date	Date Covered
	Northing	Easting	Elevation	(m^3)		
#1	7256069.069	605637.5844	168	1,746	Oct-06-19	Still Active
			TOTAL	**1,746**		

Figure 16 Whale Tail landfill location



In 2019, a transition period occurred during the transfer from the Amaruq exploration camp to the permanent operation camp. For this reason, all domestic/organic waste generated by the camp up to May 2019 was incinerated in a dual-chamber incinerator under the authorized Water License 2BB-MEA1828. More detail can be found in Section 6.1.3 below. No more incineration occurred at Whale Tail after May 2019 and all domestic wastes were sent to the Meadowbank incinerator. There is no distinction possible between the volume site provenance of domestic waste after May 2019.

6.1.3 Exploration Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part J, Item 7: ***The Licensee shall provide the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations where wastes associated with camp operations and exploration activities are deposited including sump locations associated with drilling and drill casings left as stuck and cut off and for further drilling in casings***

In 2019, during the transition period from the Amaruq exploration camp to the operation permanent camp, all domestic wastes generated by the camp was incinerated in a dual-chamber incinerator under the authorized Water License 2BB-MEA1828. A monthly summary of the amount of waste transferred to the incinerator in 2019 is included in Table 6-6. A total of 2,164.5 m^3 were incinerated from January 1st to May 31st, 2019.

Table 6-6 2019 Volume of waste transferred to Whale Tail exploration incinerator

Month	Volume of waste send to incinerator (m^3)
January	596.7
February	344.5
March	214.5
April	530.4
May	478.4
June	0.0
July	0.0
August	0.0
September	0.0
October	0.0
November	0.0
December	0.0
Total	**2,164.5**

As detailed in Section 6.1.1 and 6.1.2 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.

The drilling waste (cutting) generated during the on-ice drilling, is recovered in containers during the drilling and transported on land or is pumped in sludge line to land and disposed of at least 31 meters from any water body where no connection with water will occur (Table 6-7).

For the drilling waste (cutting) generated during the on land drilling, it is disposed of near each drilling site in a natural depression where there is no risk of runoff to the water bodies (Table 6-8).

Table 6-7 Whale Tail coordinates for drilling waste disposal coming from drilling on ice

Cutting Dump 2019	UTMX	UTMY	Longitude	Latitude
Cutting Dump 1	607820	7256564	96° 40' 37.822" W	65° 24' 49.782" N
Cutting Dump 2	606901	7254749	96° 41' 54.165" W	65° 23' 52.294" N
Cutting Dump 3	606574	7255053	96° 42' 18.629" W	65° 24' 2.490" N
Cutting Dump 4	606498	7255779	96° 42' 22.466" W	65° 24' 26.011" N
Cutting Dump 5	607247	7255719	96° 41' 24.619" W	65° 24' 23.191" N
Cutting Dump 6	606115	7255349	96° 42' 53.343" W	65° 24' 12.582" N
Cutting Dump 7	604532	7255108	96° 44' 56.617" W	65° 24' 6.644" N
Cutting Dump 8	607515	7256354	96° 41' 2.051" W	65° 24' 43.367" N
Cutting Dump 9	607820	7256564	96° 40' 37.822" W	65° 24' 49.782" N
Cutting Dump 10	607562	7255597	96° 41' 0.567" W	65° 24' 18.880" N

Table 6-8 Whale Tail Exploration coordinates for drilling waste disposal coming from drilling on land

Hole ID	Latitude	Longitude	Hole ID	Latitude	Longitude	Hole ID	Latitude	Longitude
BDS19-010	64° 56' 56.313" N	96° 5' 46.397" W	AMQ19-2031	65° 24' 13.477" N	96° 41' 21.286" W	AMQ19-2079	65° 24' 33.892" N	96° 41' 1.647" W
BDS19-011	64° 56' 39.036" N	96° 6' 13.285" W	AMQ19-2032	65° 24' 13.613" N	96° 41' 25.927" W	AMQ19-2080	65° 24' 37.624" N	96° 40' 41.613" W
BDS19-012	64° 56' 45.685" N	96° 6' 7.763" W	AMQ19-2033	65° 24' 31.833" N	96° 40' 55.933" W	AMQ19-2080A	65° 24' 37.624" N	96° 40' 41.613" W
BDS19-013	64° 57' 29.405" N	96° 5' 21.861" W	AMQ19-2033A	65° 24' 31.833" N	96° 40' 55.933" W	AMQ19-2080B	65° 24' 37.624" N	96° 40' 41.613" W
GZ19-018	65° 5' 18.395" N	95° 52' 55.246" W	AMQ19-2033B	65° 24' 31.833" N	96° 40' 55.933" W	AMQ19-2081	65° 28' 34.741" N	96° 58' 7.662" W
PDF19-092	65° 8' 37.561" N	96° 4' 1.535" W	AMQ19-2034	65° 24' 14.149" N	96° 41' 18.745" W	AMQ19-2082	65° 28' 28.837" N	96° 58' 8.353" W
GZ19-016	65° 5' 19.106" N	95° 52' 16.112" W	AMQ19-2034A	65° 24' 14.149" N	96° 41' 18.745" W	AMQ19-2083	65° 24' 21.059" N	96° 41' 24.652" W
GZ19-017	65° 5' 24.782" N	95° 53' 2.530" W	AMQ19-2034B	65° 24' 14.149" N	96° 41' 18.745" W	AMQ19-2084	65° 24' 22.216" N	96° 41' 24.239" W
LR19-025	65° 8' 3.247" N	95° 54' 33.212" W	AMQ19-2034C	65° 24' 14.149" N	96° 41' 18.745" W	AMQ19-2086	65° 28' 25.697" N	96° 58' 5.487" W
LR19-026	65° 8' 18.660" N	95° 54' 31.636" W	AMQ19-2035	65° 24' 22.026" N	96° 41' 24.489" W	AMQ19-2087	65° 24' 32.072" N	96° 40' 56.765" W
LR19-026A	65° 8' 18.664" N	95° 54' 31.414" W	AMQ19-2037	65° 24' 15.352" N	96° 41' 14.994" W	AMQ19-2088	65° 24' 25.246" N	96° 41' 28.006" W
LR19-027	65° 8' 19.260" N	95° 54' 0.658" W	AMQ19-2038	65° 24' 21.019" N	96° 41' 24.190" W	AMQ19-2089	65° 24' 27.661" N	96° 41' 29.500" W
LR19-028	65° 8' 30.676" N	95° 54' 10.446" W	AMQ19-2040	65° 24' 20.054" N	96° 41' 18.147" W	AMQ19-2090	65° 24' 35.844" N	96° 40' 54.027" W
LR19-029	65° 8' 12.717" N	95° 54' 34.671" W	AMQ19-2043	65° 24' 24.336" N	96° 41' 17.072" W	AMQ19-2090A	65° 24' 35.844" N	96° 40' 54.027" W
LR19-030	65° 8' 29.943" N	95° 54' 47.597" W	AMQ19-2044	65° 24' 20.566" N	96° 42' 55.595" W	AMQ19-2091	65° 24' 11.522" N	96° 41' 28.671" W
LR19-031	65° 8' 15.587" N	95° 54' 33.066" W	AMQ19-2046	65° 24' 23.116" N	96° 43' 3.905" W	AMQ19-2091A	65° 24' 11.522" N	96° 41' 28.671" W
LR19-032	65° 8' 22.773" N	95° 54' 35.934" W	AMQ19-2048	65° 24' 24.975" N	96° 43' 9.327" W	AMQ19-2092	65° 24' 36.483" N	96° 40' 57.772" W
LR19-033	65° 8' 18.344" N	95° 54' 9.582" W	AMQ19-2050	65° 24' 15.076" N	96° 42' 49.403" W	AMQ19-2092A	65° 24' 36.483" N	96° 40' 57.772" W
LR19-034	65° 8' 7.148" N	95° 54' 38.792" W	AMQ19-2051	65° 24' 27.846" N	96° 42' 56.125" W	AMQ19-2092B	65° 24' 36.483" N	96° 40' 57.772" W
LR19-035	65° 8' 3.255" N	95° 54' 38.158" W	AMQ19-2052	65° 24' 13.251" N	96° 42' 50.570" W	AMQ19-2092C	65° 24' 36.483" N	96° 40' 57.772" W
LR19-036	65° 7' 56.259" N	95° 54' 36.155" W	AMQ19-2054	65° 24' 18.188" N	96° 46' 39.707" W	AMQ19-2093	65° 24' 38.277" N	96° 40' 44.115" W
LR19-037	65° 8' 31.926" N	95° 53' 57.317" W	AMQ19-2055	65° 23' 26.915" N	96° 48' 51.321" W	AMQ19-2093A	65° 24' 38.277" N	96° 40' 44.115" W
LR19-038	65° 8' 4.132" N	95° 54' 30.268" W	AMQ19-2056	65° 23' 35.111" N	96° 48' 28.159" W	AMQ19-2093B	65° 24' 38.277" N	96° 40' 44.115" W
LR19-039	65° 8' 4.132" N	95° 54' 30.268" W	AMQ19-2058	65° 23' 44.336" N	96° 49' 9.408" W	AMQ19-2095	65° 24' 2.504" N	96° 42' 34.446" W
LR19-040	65° 8' 2.177" N	95° 54' 31.052" W	AMQ19-2060	65° 24' 42.881" N	96° 41' 25.213" W	AMQ19-2095A	65° 24' 2.504" N	96° 42' 34.446" W
RON19-007	65° 10' 13.565" N	95° 48' 37.934" W	AMQ19-2061	65° 24' 24.769" N	96° 47' 16.378" W	AMQ19-2097	65° 24' 37.086" N	96° 41' 11.837" W

RON19-008	65° 10' 2.349" N	95° 48' 54.113" W	AMQ19-2064	65° 24' 16.651" N	96° 41' 2.703" W	AMQ19-2097A	65° 24' 37.086" N	96° 41' 11.837" W
RON19-009	65° 10' 34.037" N	95° 50' 14.716" W	AMQ19-2064A	65° 24' 16.651" N	96° 41' 2.703" W	AMQ19-2098	65° 24' 17.090" N	96° 41' 1.811" W
2726-19-002	65° 28' 38.923" N	96° 44' 3.250" W	AMQ19-2064B	65° 24' 16.651" N	96° 41' 2.703" W	AMQ19-2098A	65° 24' 17.090" N	96° 41' 1.811" W
AMQ-170-001	65° 24' 17.070" N	96° 41' 17.402" W	AMQ19-2064C	65° 24' 16.651" N	96° 41' 2.703" W	AMQ19-2099	65° 24' 30.855" N	96° 40' 51.133" W
AMQ-170-002	65° 24' 17.005" N	96° 41' 17.408" W	AMQ19-2066	65° 24' 26.878" N	96° 40' 46.830" W	AMQ19-2099A	65° 24' 30.855" N	96° 40' 51.133" W
AMQ-170-003	65° 24' 17.039" N	96° 41' 17.482" W	AMQ19-2067	65° 24' 30.704" N	96° 40' 51.844" W	AMQ19-2101	65° 24' 26.391" N	96° 42' 2.809" W
AMQ-170-003A	65° 24' 17.005" N	96° 41' 17.408" W	AMQ19-2067A	65° 24' 30.704" N	96° 40' 51.844" W	AMQ19-2101A	65° 24' 26.391" N	96° 42' 2.809" W
AMQ-170-004	65° 24' 17.005" N	96° 41' 17.408" W	AMQ19-2067B	65° 24' 30.704" N	96° 40' 51.844" W	AMQ19-2102	65° 24' 37.086" N	96° 41' 11.837" W
AMQ-170-005	65° 24' 17.005" N	96° 41' 17.408" W	AMQ19-2068	65° 24' 40.021" N	96° 41' 26.240" W	AMQ19-2103	65° 24' 53.573" N	96° 40' 30.038" W
AMQ-170-006	65° 24' 17.005" N	96° 41' 17.408" W	AMQ19-2070	65° 29' 13.593" N	96° 54' 27.601" W	AMQ19-2104	65° 24' 17.134" N	96° 41' 2.583" W
AMQ-170-006A	65° 24' 17.005" N	96° 41' 17.408" W	AMQ19-2072	65° 24' 37.624" N	96° 40' 41.613" W	AMQ19-2105	65° 24' 16.475" N	96° 41' 1.788" W
AMQ-170-007	65° 24' 17.005" N	96° 41' 17.408" W	AMQ19-2072A	65° 24' 37.624" N	96° 40' 41.613" W	AMQ19-2106	65° 24' 27.988" N	96° 40' 45.414" W
AMQ-170-007A	65° 24' 17.005" N	96° 41' 17.408" W	AMQ19-2072B	65° 24' 37.624" N	96° 40' 41.613" W	AMQ19-2107	65° 24' 33.892" N	96° 41' 1.647" W
AMQ-170-008	65° 24' 17.005" N	96° 41' 17.408" W	AMQ19-2073	65° 28' 39.441" N	96° 58' 15.929" W	AMQ19-2109	65° 24' 38.277" N	96° 40' 44.115" W
AMQ-170-008A	65° 24' 17.005" N	96° 41' 17.408" W	AMQ19-2074	65° 24' 32.751" N	96° 40' 58.877" W	AMQ19-2110	65° 24' 37.133" N	96° 40' 41.191" W
AMQ-170-009	65° 24' 17.005" N	96° 41' 17.408" W	AMQ19-2075	65° 24' 35.783" N	96° 40' 54.265" W	AMQ19-2111	65° 24' 29.805" N	96° 40' 52.234" W
AMQ-170-009A	65° 24' 17.005" N	96° 41' 17.408" W	AMQ19-2075A	65° 24' 35.783" N	96° 40' 54.265" W	AMQ19-2111A	65° 24' 29.805" N	96° 40' 52.234" W
AMQ-170-010	65° 24' 17.003" N	96° 41' 17.253" W	AMQ19-2076	65° 24' 38.277" N	96° 40' 44.115" W	AMQ19-2111B	65° 24' 29.805" N	96° 40' 52.234" W
AMQ19-1999	65° 24' 4.435" N	96° 42' 10.471" W	AMQ19-2076A	65° 24' 38.277" N	96° 40' 44.115" W	AMQ19-2112	65° 24' 28.091" N	96° 40' 50.058" W
AMQ19-2024	65° 24' 5.364" N	96° 42' 3.566" W	AMQ19-2076B	65° 24' 38.277" N	96° 40' 44.115" W	AMQ19-2113	65° 24' 28.266" N	96° 40' 48.802" W
AMQ19-2024A	65° 24' 5.364" N	96° 42' 3.566" W	AMQ19-2077	65° 28' 33.139" N	96° 58' 11.052" W	AMQ19-2114	65° 24' 28.440" N	96° 40' 47.545" W
AMQ19-2027	65° 24' 22.861" N	96° 42' 17.235" W	AMQ19-2078	65° 24' 34.540" N	96° 41' 3.839" W	AMQ19-2116	65° 23' 56.653" N	96° 41' 56.032" W
AMQ19-2027A	65° 24' 22.955" N	96° 42' 16.994" W	AMQ19-2078A	65° 24' 34.540" N	96° 41' 3.839" W	AMQ19-2117	65° 23' 57.469" N	96° 41' 56.581" W
AMQ19-2028	65° 24' 15.348" N	96° 41' 23.138" W	AMQ19-2078B	65° 24' 34.540" N	96° 41' 3.839" W	AMQ19-2118	65° 23' 58.118" N	96° 41' 58.850" W
AMQ19-2029	65° 24' 48.687" N	96° 40' 52.815" W	AMQ19-2078C	65° 24' 34.540" N	96° 41' 3.839" W	AMQ19-2119	65° 23' 57.956" N	96° 41' 58.864" W

Table 6-9 Whale Tail Exploration coordinates for casings left on the field

HOLE_ID	Latitude	Longitude	Comment
AMQ17-1607	65°24' 19.532" N	96°42' 52.422" W	
AMQ18-1641	65°24' 23.120" N	96°42' 45.513" W	
AMQ18-1748	65°24' 29.283" N	96°41' 50.574" W	
AMQ18-1821	65°24' 21.418" N	96°42' 34.564" W	
AMQ18-1843	65°23' 56.007" N	96°42' 59.001" W	
AMQ18-1845	65°24' 30.826" N	96°40' 50.944" W	
AMQ18-1870	65°24' 13.467" N	96°41' 14.126" W	
AMQ18-1875	65°24' 46.838" N	96°45' 9.137" W	
AMQ18-1886A	65°24' 28.818" N	96°40' 45.673" W	
AMQ18-1895A	65°24' 37.605" N	96°40' 19.708" W	
AMQ18-1902	65°24' 37.279" N	96°40' 41.895" W	
AMQ18-1904	65°24' 13.433" N	96°41' 21.673" W	
AMQ19-2033B	65°24' 31.827" N	96°40' 55.926" W	
AMQ19-2064B	65°24' 16.623" N	96°41' 2.706" W	
AMQ19-2066	65°24' 26.886" N	96°40' 46.752" W	
AMQ19-2067B	65°24' 30.692" N	96°40' 51.768" W	Thermistor
AMQ19-2075A	65°24' 35.783" N	96°40' 54.265" W	Thermistor
AMQ19-2078A	65°24' 34.540" N	96°41' 3.839" W	
AMQ19-2080B	65°24' 37.624" N	96°40' 41.613" W	
AMQ19-2090	65°24' 35.844" N	96°40' 54.027" W	
AMQ19-2093	65°24' 38.277" N	96°40' 44.115" W	
AMQ19-2111B	65°24' 29.805" N	96°40' 52.234" W	
AMQ19-2119	65°23' 57.956" N	96°41' 58.864" W	

6.2 INCINERATOR

6.2.1 Meadowbank Site

As per NWB Water License 2AM-MEA1526 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 2019. Based on the data recorded, approximately 50% of the material incinerated was food waste; the other 50% was dry waste comprised of food containers, cardboard boxes, paper and absorbent rags. In 2019, a total of 3,495 m^3 of waste burned in the incinerator. The location of the incinerator is highlighted in Figure 1.

In 2019, Agnico noted that there were 60 times, where the temperatures did not reach 1,000°C in the secondary chamber. In 2019, the incinerator was in operation for 314 days. This represents 19 % of the total burn, which can be considered as significant under the actual operating conditions at site. In 2018 this issue was reported in 2.36% of burns. This increase clearly shows the need to reset operating conditions of the incinerator. From the 60 events where the temperature didn't reach 1,000°C, 78% (47/60 burns) were for a temperature between 990 and 999°C, 12% (7/60 burns) for temperature between 923 and 989°C and 10% (6/60 burns) for temperature between 579 and 806°C.

The overall underperformance of the incinerator was linked to repetitive burner malfunctions. A procedure was put forward to manage loads capacities of the equipment. By reducing and having dryer goods in the overall loads, the temperature had the potential to achieve the set temperature in each burn. Improvements were also done on adjustments of the programming sequence to ensure full temperatures are reached.

Agnico will ensure that improvements are realized towards ensuring that the incinerator maintains consistently achieves the required temperature in every burn sequence. Modifications could include the implementation of a specific action plan to address the increase of burn temperature below 1,000 °C observed in 2019 and ensure better ratios are met in 2020, a detailed long term plan on the equipment's actual state with identification of problematic areas and overhaul if needed or an assessment by a subject matter expert on achieving acceptable performances of the incinerator.

In 2019, Agnico continued to conduct weekly regular inspections at the incinerator. During the inspection, worker 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*

As per discussions with Environment and Climate Change Canada, the frequency of stack testing changed in 2012 to every other year. Results from the 2014 test indicated that mercury level average (64.09 µg / Rm^3 @ 11 % v/v O_2) exceeded the Environment Canada guideline (20 µg / Rm^3 @ 11 % v/v O_2) during the incinerator stack testing. As a result, an investigation with Meadowbank's Energy and Infrastructure department was performed to determine the potential sources of this exceedance. Although Agnico had an alkaline battery recycling program, the investigation revealed that there could be a significant volume of batteries disposed of along with regular solid waste destined for the onsite incinerator. As a result, Agnico committed to conduct confirmatory stack testing in the summer of 2015 and implemented a comprehensive site wide information program to reinforce the requirements of the battery recycling program. It was also determined that a possible source of batteries going to the wrong disposal route was ones used around the living/camp facilities. Thus, the information provided to employees included flow chart on disposal within camp use. Information was posted on the Agnico intranet site, was discussed during meetings conducted by the Environmental Department and copies of the proper batteries disposal charts were distributed in all the dorm wings. This flowchart describes how batteries should properly be disposed of onsite. Waste management technical memos were also published on Agnico intranet and sent to all contractors and employees. In 2019, toolbox meetings on waste management were held with different departments to continue education and improve awareness of employees and contractors.

The number of quatrex of batteries backhauled in 2019 (Table 6-10) confirms the ongoing segregation efforts were effective at reducing the number of batteries burnt in the incinerator.

Table 6-10 Number of quatrex of batteries backhauled 2013-2019

Year	Quantity (unit)
2013	29
2014	12
2015	34
2016	20
2017	20
2018	47
2019	36

In accordance with Agnico's Incinerator Waste Management Plan (Version 8, October 2018), stack testing was conducted from November 27th to 30th, 2019 by Consulair Air & Environment Global Management. The 2019 Stack Testing Report is provided in Appendix 30. Results from the 2019 test indicated that the application standards for dioxins and furans (PCDD/F) were met for all test, as well as the applicable mercury (Hg). Table 6.11 below also provide the summary results for the stack testing from 2014 to 2019.

Table 6-11 Meadowbank 2014- 2019 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	20	64.09	0.08	0.054
2015		<0.22		0.021
2016		<0.46		0.033
2017		3.80		0.022
2018		<0.19		0.010
2019		0.45		0.027

R: Reference conditions 25 °C and 101.3 kPa on a dry basis

As per KivIA recommendation regarding the 2015 Annual report: "*Agnico should implement more frequent stack testing if the biennial monitoring reveals exceedances in mercury, dioxin and/or furan emissions*". Agnico agrees and had increased the stack testing frequency when the mercury exceedance occurred in 2014. Additional stack testing were done yearly from 2015 to 2019 and results are all below the emission standard. Canada-wide Standards (CWS) for Dioxins and Furans and the CWS for Mercury Emissions states that "*where five years data has been accumulated with all results reported below the Level of Quantification (emission standard), the stack testing frequency may be revised to a biennial schedule*". Based on the five previous years results, Agnico will consult ECCC in 2020 to request the authorization to return to biennial testing. If approved, the next stack testing will take place in 2021.

6.2.1.2 *Ash Monitoring*

In 2019, Agnico monitored the ash quality as stated in the Incinerator Waste Management Plan. The purpose of sampling ash is to determine its acceptability for disposal in the landfill, pursuant to the GN Environmental Guidelines for Industrial Discharge. Samples were collected from the incinerator on January 21st, August 4th, November 11th and December 28th, 2019. Results contained in Table 6-12 indicate only one chromium exceedance on December 28th, 2019. Upon receipt of the December 2019 results and as per the Incinerator Waste Management Plan, ash were buried within the Tailings Storage Facility (TSF) instead of the landfill as materials buried within the TSF are expected to freeze over a period of time, resulting in permafrost encapsulation. Following the chromium exceedance, sampling frequency was increased to monthly in 2020 and is expected to continue until results return below the GN guidelines. An investigation of the possible cause is ongoing, and as of today, did not permit to identify the cause of this exceedance.

Table 6-12 Meadowbank 2019 incinerator ash monitoring

Parameters	Units	Guideline for Industrial Waste Discharge*	2019-01-21	2019-08-04	2019-11-06	2019-12-28
Arsenic	mg/L	2.5	0.0065	0.0511	0.7449	0.4256
Barium	mg/L	100	0.3962	0.1077	0.3025	1.024
Cadmium	mg/L	0.5	0.0135	< 0.0001	0.0167	0.0075
Chromium	mg/L	5	1.029	0.8869	1.947	13.3
Lead	mg/L	5	< 0.0005	< 0.0005	0.0071	< 0.0005
Mercury	mg/L	0.1	0.00005	0.00016	0.00011	0.00441
Selenium	mg/L	1	0.029	0.003	0.0061	0.015
Silver	mg/L	5	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	500	0.003	0.006	84.63	0.007

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

6.2.1.3 *Waste Oil Monitoring*

In 2019, approximately 25.62 m^3 of waste oil was burned in the incinerator. Volumes of waste oil reused as fuel in 2019 are presented in Table 6-13. There was no waste oil burn at the beginning of 2019 due to the oil burner broken.

Table 6-13 Meadowbank 2019 volume of waste oil incinerated and consumed

Month	Volume of waste oil incinerated or consumed (at the incinerator) (m^3)	*Volume of waste oil incinerated or consumed (in the furnace (at Cat Dome, Blue coverall and SS Coverall) (m^3)
January	0.00	29.00
February	0.00	32.00
March	0.00	23.50
April	0.00	31.50
May	0.00	15.95
June	0.00	11.50

July	1.00	0.00
August	0.46	2.00
September	0.11	8.00
October	0.85	17.00
November	11.60	26.00
December	11.60	17.00
Total	**25.62**	**213.45**

No sampling frequency for waste oil is specified in the GN Environmental Guideline for Used Oil and Waste Fuel (2012). To ensure compliance with the Guideline parameters, Agnico will minimally sampled the waste oil feedstock twice a year. These data are presented in Table 6-14. In 2019, Agnico collected seven (7) samples of waste oil. All metals and PCB parameters met the GN Environmental Guideline.

Table 6-14 Meadowbank 2019 waste oil monitoring

Parameters	Units	Maximum Allowable Concentration *	21-01-2019	05-06-2019	04-08-2019	31-08-2019	28-10-2019	05-11-2019	22-12-2019
Cadmium	mg/L	2	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chromium	mg/L	10	< 1	< 3	< 3	< 3	< 1	< 1	< 1
Lead	mg/L	100	< 5	< 5	< 5	< 5	< 5	< 5	< 5
PCB	mg/L	2	< 1	< 1	< 2	< 1	< 1	< 1	7.4
Total Halogen	mg/L	1000	< 50	< 250	316	< 250	< 50	172	67.7
Flash point	ºC	≥ 37.7	>80	>80	> 80	>80	>80	>80	>80

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

6.2.2 Whale Tail Site

As per Water License 2AM-WTP1826 Schedule B, Item 12: ***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 related to Water License 2AM-WTP1826. In 2019, waste that needed to be burn were either burned in the exploration incinerator as detailed in Section 6.1.3 or hauled to the Meadowbank Site.

6.2.3 Exploration Activity Whale Tail Site

As per Waste Management Plan (2017), Agnico is authorized to use an incinerator to disposed of solid waste from the accommodation camp, kitchen, shops, and offices that cannot be recycled. The incineration of waste will divert waste which could create odors and potentially attract wildlife. The materials to be incinerated is limited to putrescible waste such as paper, food packaging, food waste and wood.

As mentioned in Section 6.1.3 above, 2,164.5 m^3 of waste where sent to the exploration incinerator in 2019. The use of the incinerator was permanently stopped on May 31st, 2019.

In 2019, the ash quality was monitored on a monthly basis from January to May 2019. As there is no regulatory testing frequency, Agnico was minimally targeting to test six (6) times a year. Results are reported in Table 6-15. No exceedance to the GN Environmental Guidelines for Industrial Discharge was observed in 2019. The purpose of sampling ash in 2019 was to determine its acceptability for disposal in the Meadowbank landfill. However, in 2019, all ashes produced by the incinerator were shipped South and were landfilled offsite.

Table 6-15 Whale Tail Exploration 2019 incinerator ash monitoring

Parameters	Units	Guideline for Industrial Waste Discharge*	2019-01-20	2019-02-17	2019-03-17	2019-04-14	2019-05-20
Arsenic	mg/L	2.5	0.1103	0.0613	0.0227	0.0674	0.0346
Barium	mg/L	100	0.2349	0.1038	0.1964	0.1204	0.1997
Cadmium	mg/L	0.5	0.0018	< 0.0001	0.0161	0.0001	0.0005
Chromium	mg/L	5	0.0114	0.0021	0.0816	0.0156	0.0613
Lead	mg/L	5	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Mercury	mg/L	0.1	0.00007	< 0.00002	< 0.00002	0.00042	< 0.00002
Selenium	mg/L	1	0.006	0.001	0.002	< 0.001	< 0.0005
Silver	mg/L	5	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	500	0.481	0.001	1.39	0.038	5.76

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

As per the Waste Management Plan, the minimization of the creation of dioxin and furan compounds that are byproducts of the incineration of some wastes is principally accomplished through the segregation from the incinerated wastes;

- The elimination of potential mercury sources from the incinerated wastes;
- The segregation and elimination of waste oils and oil stained materials from the incinerated waste; and
- The segregation and elimination of industrial and household hazardous wastes from the incinerated waste.

6.3 ADDITIONAL INFORMATION

6.3.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 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 2019.

6.3.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1826 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 2019.

6.3.3 Exploration Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part B, Item 6n: *Any other details on water use or waste disposal requested by the Board by the 1st of November of the year being reported*

The Board did not request any additional details on waste disposal in 2019.

SECTION 7. SPILL MANAGEMENT

7.1 SPILL SUMMARY

The number of spills in 2019 for both Meadowbank and Whale Tail Site are summarized in Table 7-1 below. The construction of the Whale Tail Project has started in 2016 with the construction of the Amaruq Exploration Access Road (future Whale Tail Haul Road). For this reason, there is 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 is now cancelled as of November 2018 and are reported in the Table 7-1 below.

To be consistent with previous years, Agnico 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 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 2019

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**

With the main mining operation shifted from Meadowbank towards Whale Tail Project in 2019, it was expected to see a significant decrease in spill internally and externally reported at Meadowbank and an increase at the Whale Tail site.

In 2016, Agnico noticed an increase in reported spills and began a Spill Reduction Action Plan. Key Performance Indicators (KPI) were developed to monitor the reported spills. A Spill Frequency is calculated and reported to the daily management meeting. All spills are discussed daily in the management meeting with respective departments. The Spill Frequency is the ratio of the total number of spill to date in the year over the number of days in the current year. The total number of spill to date includes the spills internally reported as well as the spills reported to the regulators. This KPI is used to follow trends related to spill increase or reduction, and to guide corrective actions when required. As well, “bad actors” identified through the data collected on spill reports are now mentioned within the daily management meetings. This enabled site management to identify any potential risks and work on preventing further spills. Since 2017, the total site spills have continued to decrease as a result of these efforts.

In 2019, 63% of the spills at Meadowbank and Whale Tail were during winter months from January to April and from October to December.

Agnico operates Meadowbank and Whale Tail under extreme cold condition during winter, and thus created extra pressure on equipment that can lead to more frequent equipment failure even if good inspection and maintenance were conducted. In 2019, as per previous and for the following 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 overall. Major loading equipment overhaul was pursued during 2019 focusing on equipment identified to have reoccurring issues, within the data compiled on spills on site.

Overall, furthermore to daily visual inspection and preventive maintenance that is in perpetual improvement, Agnico has started to reconstruct equipment and stopped equipment during extreme cold condition for to prevent breakdowns. These action items are part of the spill reduction action plan.

To continue the decreasing trends, management increased focus towards spill management by ensuring a proper assessment of historical data was conducted in Q4, 2019. The process will be ongoing in 2020 by ensuring reliability specialist are integrated fully in workshops and determination of improvement areas. The workshops will lead to a specific action plan aimed towards better understanding of spills in operations and an overall reduction of equipment related accidental releases in mining and hauling gears on site. Ensuring communication with all stakeholders will also be key into the success of the program.

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 and operators. By continuing education and awareness within our sites, Agnico 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 2019.

All internal reported spills and reported to regulators are managed according to the spill contingency plan. Spills are contained and cleaned, contaminated material is disposed to the appropriate area, such as the onsite landfarm 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 2019. 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 2019 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 September 22nd, 2019 at the Baker Lake Marshalling Facility. The scenario was: during fuel transfer from the vessel to the Agnico's tanks, the manifold flange spilled at the connection between the pipe and the transfer hose. Agnico Eagle's Environmental staff lead the exercise, which included Agnico supply chain and road dispatch representatives, on-shore vessel representative, Jana's vessel captain on duty and Intertek Contractor. 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 L of the Spill Contingency Plan (Appendix 37).

7.1.1 Meadowbank Site

As per NWB Water License 2AM-MEA1526 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 2019 is 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-MEA1526 and quarterly via the KivIA Production Lease Report. GN Spill Reporting Forms and the follow up reports as requested by the Water License 2AM-MEA1526 Part H, Item 8 for reported spills are included in Appendix 31. The spills presented in Table 7-2 and 7-3 below only included spill related to the Meadowbank Site, AWAR and Baker Lake infrastructures.

In 2019, twenty-two (22) spills were reported to the GN Spill hotline which is similar to 2018 reporting. Table 7-1 above provide a summary of the reportable and non-reportable spills from 2011 - 2019. The decrease observed in 2018 in the significantly lower number of non-reportable spills reported continued to be observed in 2019. This decrease is mainly due to the fact that the construction/operation activities at Meadowbank were lower in 2019, i.e. mining activities ceased in October 2019 and construction/operation activities continued to be shifted towards the Whale Tail Project in 2019.

As per the Spill Contingency Plan, spills are contained and cleaned, contaminated material is disposed to the appropriate area as per the below and the clean-up actions are monitored by the Environment team:

- all contaminated spill pads, and booms used during spill response are placed within Quatrex bags for shipment to an approved disposal facility;

- all the petroleum hydrocarbon contaminated soil collected during clean-up is placed into the landfarm for treatment;

- spills over 100 L of nonpetroleum hydrocarbon material (e.g. solvents, glycol) will be placed in drums and stored in the on-site hazardous material area for shipment south to approved facilities during barge season;

- spills of non-petroleum hydrocarbon material fewer than 100 L will be placed in the Tailings Storage Facility;

- spills fewer than 100 L of petroleum hydrocarbon contaminated snow will be placed in a designated area of the landfarm and treated as contact water after snowmelt; and

- spills over 100 L of petroleum hydrocarbon contaminated snow will be excavated and stored in labeled drums. All internal reported spills and reported to regulators are managed according to the spill contingency plan.

As per KivIA's recommendation regarding the 2017 Annual Report, it was recommended that Agnico provide more detail regarding the contaminated material disposal. As the comment's on the 2017 Annual Report were received at the end of 2018, the clean-up action taken was not updated to reflect KivIA's comments. In 2019, Agnico started to raise worker awareness to the importance to add full details in the spill report regarding contaminated material disposal. Agnico also initiated, in 2019, a trial period in the method of reporting spills to the Environment Department, which will improve collecting missing information in the disposal location. However, it should be noted that the contaminated material has always been disposed off as per the Spill Contingency Plan. Agnico intends in 2020 to keep updating and improving the spill reporting procedure and will conduct individual toolbox meetings with all departments to ensure future reporting will have the requested information.

Table 7-2 Meadowbank 2019 spills reported to the GN 24Hr spill HotLine

Date of Spill	Hazardous Material	Quantity	Units (L / Kg/m^3)	Location	Cause of spill	Clean-up action taken	Spill Number
January 6, 2019	Transmission oil	150	L	Portage Waste Rock Storage Facility	Equipment failure	Spill was contained and contaminated soil picked up and disposed of appropriately	2019-004
January 8, 2019	Transmission oil	200	L	Portage Pit E3	Hose busted on transmission pump	Stopped the equipment and called for repair. Contaminated soil picked up and disposed of appropriately	2019-010
January 16, 2019	Hydraulic Oil	180	L	Portage Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately	2019-050
February 4, 2019	Hydraulic Oil	150	L	Portage Pit E3	Hydraulic hose failure	Call mechanics for repairs. Contaminated material cleaned-up and disposed in MBK landfarm	2019-039
February 7, 2019	Hydraulic Oil	250	L	Portage Pit	Hydraulic hose failure	Contaminated material cleaned-up and disposed appropriately	2019-046
February 9, 2019	Hydraulic Oil	400	L	Portage Pit E3	Hydraulic hose failure	Contaminated soil picked up with the loader and disposed of appropriately	2019-047
March 8, 2019	Hydraulic Oil	260	L	Portage Pit	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately.	2019-098
March 14, 2019	Waste Oil	250	L	Truck Shop	Operator punctured a hole in the tote with the zoom boom forks causing waste oil to spill in the sea-can and on the ground	The area has been scrapped clean and all contaminated material has been brought to the landfarm area	2019-111
March 31, 2019	Diesel Fuel	300	L	Portage Pit	Diesel tank punctured	Contaminated material recovered and disposed at landfarm	2019-145
April 23, 2019	Tailings	25	m^3	Capping of Tailing Storage Facility	Tailings pipe failure near a flange	Stopped the pump and repairs the tailings pipe. Contained inside the TSF.	2019-168
May 8, 2019	Tailings	996	m^3	Tailings Storage Facility	After a planned electrical shutdown of the Tailings Storage Facility (TSF) "pig launcher" station, during restart of the system by the Mill control room, the wrong valve was opened remotely, discharging tailings at the top of Saddle Dam 4, by the station	Upon discovery of the spillage, the valve was immediately closed. The tailings were contained within the existing berm surrounding the area and another berm was added at the low point as a precautionary measure. The area will be cleaned-off and soil/slurry/snow removed will be put back into the TSF. There were no off site impacts or discharge to any receiving watercourses	2019-193
June 26, 2019	Sulphur	1000	Kg	SO_2 plant, mill door	Operator have bring some sulfur prill pallets, the bag on the top fell on the ground. The bag punctured and left sulfur on the ground.	Contaminated material was brought to the tailing pond.	2019-257
July 10, 2019	Hydraulic Oil	150	L	Portage Pit E	Hydraulic fitting failure	The drill was stopped and absorbent pads were put on the ground. Once the fitting was replaced, the drill was moved and the absorbent pads were picked up. The spill occurred on a blast pattern which will be collected and processed through the mill.	2019-276
August 10, 2019	Hydraulic Oil	150	L	Portage Pit E	Hydraulic hose failure on hammer	Machine was shutdown and hose was repaired. The spill fell on grade-A rocks so they will be send at the crusher.	2019-320

Date of Spill	Hazardous Material	Quantity	Units (L / Kg/m^3)	Location	Cause of spill	Clean-up action taken	Spill Number
August 26, 2019	Diesel	800	L	Portage Pit E	Genset slipped off the loader forks and tipped over on it's side causing diesel fuel to spill on the ground	Spill pads were immediately placed on the ground and the contaminated material was picked up and brought to the land farm	2019-344
August 29, 2019	Glycol / Rust inhibitor	250	L	Sea Can area	Tote punctured while removing from sea can	Spill pads were placed on the floor of the sea-can and the contaminated material was scraped up and removed with a loader	2019-350
September 2, 2019	Tailings	24	m^3	Goose Pit tailings discharge pipe	Some tailings had splashed outside of the berm surrounding the Goose pit tailings storage facility	The berm containing the splashed tailings were immediately excavated and placed back inside the TSF. New material was then placed on the ground and a higher berm was constructed around the deposition point.	2019-361
September 5, 2019	Sulphur Prills	40	Kg	SO_2 Plant	Damaged bags of sulphur prills into sea can	Contaminated material and soil picked up and disposed off appropriately	2019-367
October 11, 2019	Reclaim Water	150	L	Goose pit tailings deposition point	During an inspection of the Goose pit tailings deposition point, it was observed that some reclaim water had splashed outside of the berm surrounding the Goose pit tailings storage facility. This drizzle has been cause by a very high winds	The contaminated material will be brought to the tailing pond	2019-420
October 19, 2019	Transmission Oil	150	L	Emulsion Plant	While transporting oil cube in yard with skid steer discharge spout on cube failed.	The oil tote was flipped to have the spout on top. Contaminated snow was scrapped with a loader and disposed of adequately	2019-430
November 24, 2019	Coolant	4	L	Third Portage Lake	Coolant hose failure	Equipment stopped. After further inspection, a small coolant spill was observed. The contaminated material was picked up with a shovel and brought to the South Cell tailings.	2019-469
December 12, 2019	Waste Water	2,000	L	Lift Station no.9	Broken pipe	The plumber cut the water from the office washrooms and sink to ensure the stoppage of the leak. The vacuum truck will be used to collect any additional pooling of waste water during the inspection. Due to below freezing conditions, most of the waste water has frozen and is not accessible to clean up because of the confined space under the building	2019-481

Table 7-3 Meadowbank 2019 non-reportable spills

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
January 1, 2019	Steering Fluid	3	L	Vault Parking	Power steering hose failure	Used absorbent pad. Contaminated soil picked up and disposed of appropriately
January 1, 2019	Coolant	15	L	Vault Parking	Due to cold weather, coolant dripped by the clamp.	Used absorbent pad. Contaminated soil picked up and disposed of appropriately
January 3, 2019	Transmission oil	70	L	MBK Storage Area Row 3	Punctured tote with the fork lift	Used absorbent pad. Contaminated soil picked up and disposed of appropriately
January 6, 2019	Urea (DEF fluid)	90	L	Vault Kitchen Urea Station	Punctured tote	Removed the damaged tote and stopped the leak. Cleaned the spill with absorbent pad. Contaminated soil picked up and disposed of appropriately
January 8, 2019	Steering fluid	10	L	Vault Camp	Steering hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
January 9, 2019	Hydraulic Oil	30	L	Meadowbank Pit E3	Steering hydraulic fitting failure	Stopped the equipment and called for repair. Contaminated soil picked up and disposed of appropriately
January 11, 2019	Compressor Oil	35	L	Meadowbank Pit E3	Relief valve failure	Equipment was stopped. Absorbent pads were laid out over the spill then were collected and disposed of appropriately
January 17, 2019	Hydraulic Oil	80	L	Meadowbank South Cell Reclaim Barge	While pushing the dozer operator noticed oil on the ground and shut off the machine to assess the situation	Stopped the equipment and called for repair. Contaminated soil picked up and disposed of appropriately
January 17, 2019	Hydraulic Oil	60	L	Vault Pit	While loading the operator noticed oil dripping from his boom.	Stopped the equipment and called for repair. Contaminated soil picked up and disposed of appropriately
January 19, 2019	Coolant	5	L	Meadowbank Service Truck Parking	Equipment failure	Stopped the equipment and called for repair. Contaminated soil picked up and disposed of appropriately
January 19, 2019	Hydraulic Oil	2	L	Meadowbank BB Phaser pit	Hydraulic hose failure	Used absorbent pad. Contaminated soil picked up and disposed of appropriately
January 21, 2019	Diesel Exhaust fluid	60	L	Vault Kitchen Area	Due to cold weather, a tote punctured	Spill was contained and contaminated soil picked up and disposed of appropriately
January 24, 2019	Hydraulic Oil	10	L	Meadowbank East Dike LHT Parking	Disconnecting hydraulic hose from a trailer, a none return check valve didn't work properly to drain the line.	Used absorbent pad. Contaminated soil picked up and disposed of appropriately
February 1, 2019	Coolant	60	L	MBK Long Haul Truck Dump piles	Coolant hose failure	Contaminated soil picked up and disposed of appropriately
February 2, 2019	Fuel	30	L	Meadowbank fuel farm	Fuel truck loading arm was leaking by the joint	Spill was contained and contaminated soil picked up and disposed of appropriately
February 2, 2019	Transmission oil	10	L	Goose Parking	Oil blew on the ground during maintenance due to high wind	Contaminated soil picked up with the loader and disposed of appropriately
February 3, 2019	Hydraulic Oil	10	L	MBK Crusher Pad	Hydraulic hose failure	Call 980 loader and sent material to the contaminated pad.
February 3, 2019	Diesel fuel	40	L	MBK Site Service	Accidentally start tidy tank pump in pick-up truck	Used absurdist pads to clan the spill and lock-out tidy tank pump. Spill

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
				Parking		was contained and contaminated soil picked up and disposed of appropriately
February 5, 2019	Diesel fuel	85	L	MBK Maintenance parking	Spill during refuelling	Spill was contained and contaminated soil picked up and disposed of appropriately
February 5, 2019	Engine oil	10	L	MBK Maintenance parking	Oil pan seal failure	Stop the engine. Clean-up using absorbent pad. Contaminated soil has been disposed appropriately
February 7, 2019	Coolant	85	L	MBK Pit E3	Coolant hose failure	Call mechanics for repairs. Contaminated material cleaned-up and disposed appropriately
February 7, 2019	Diesel fuel	5	L	MBK snow cat garage	The fuel transfer pump skid is not properly sealed off and some fuel leaked on the ground	Shoveled the gravel that was contaminated and disposed of it in the yellow bin
February 10, 2019	Hydraulic Oil	90	L	MBK South cell road	Hydraulic hose failure	Pick up spill and brought to contaminated pad at main site. Spill was contained and contaminated soil picked up and disposed of appropriately
February 11, 2019	Coolant	50	L	MBK Pit E Ramp	Coolant Leak	Contaminant was picked up immediately by loader. Spill was contained and contaminated soil picked up and disposed of appropriately
February 16, 2019	Hydraulic Oil	10	L	MBK Fuel Farm	O-ring failure	Contaminant was picked up with loader and disposed of appropriately
March 10, 2019	Hydraulic Oil	70	L	Pit B Waste Rock Storage	Equipment failure	Equipment was shuttled down and repaired. Contaminated soil picked up and disposed of appropriately
March 13, 2019	Coolant	40	L	Portage Pit	Coolant hose failure	Contaminated soil picked up and disposed of appropriately
March 16, 2019	Diesel Exhaust Fluid	50	L	Vault Coverall	Tote was punctured due to the expansion of the fluid with cold weather	Contaminated soil has been collected and moved into a yellow bin at the incinerator.
March 21, 2019	Hydraulic Oil	80	L	Maintenance Shop	Fitting on hydraulic hose failure	Contaminated soil picked up and disposed of appropriately
March 22, 2019	Hydraulic Oil	90	L	Maintenance Shop	Steel plug in the final drive failure	Spill was contained and contaminated soil picked up and disposed of appropriately
March 25, 2019	Diesel Fuel	30	L	Core shack area	Fuel filter failure	Advise maintenance department for repairs. Shovel the contaminated snow and disposed at landfarm
March 29, 2019	Brake fluid	20	L	Portage Pit	Brake line failure	Spill was contained and contaminated soil picked up and disposed of appropriately
March 29, 2019	Brake fluid	20	L	Portage Pit	Brake line failure	Advise maintenance department for repairs. Contaminated soil picked up and disposed of appropriately
March 29, 2019	Coolant	30	L	Portage Pit	Coolant hose failure	Advise maintenance department for repairs. Contaminated soil picked up and disposed of appropriately
March 30, 2019	Hydraulic Oil	92	L	Portage Pit	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately
March 31, 2019	Coolant	15	L	Maintenance area	Tote not closed properly when removing from the lube truck.	Contaminated soil picked up and disposed of appropriately
April 1, 2019	Diesel	1	L	Fuel Tank Meadowbank	Valve seal leaking	Contaminated soil picked up and disposed of appropriately
April 2, 2019	Hydraulic Oil	95	L	Marginal Stockpile	Hydraulic hose failure	Advise maintenance department for repairs. Contaminated soil picked up and disposed of appropriately

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
April 4, 2019	Hydraulic Oil	90	L	Tear drop Lake Road (DOME)	Hydraulic hose fitting cracked	Blocked off the spill area with delineators. Placed absorbent pads on the ground to contain the oil. Contaminated soil picked up and disposed of appropriately
April 8, 2019	Hydraulic oil	70	L	Portage Pit	Hydraulic hose failure	Absorbent pads placed on the ground to contain oil. Contaminated soil picked up and disposed of appropriately
April 9, 2019	Hydraulic oil	80	L	Vault Marginal A stockpile	Hydraulic hose failure	Contaminated soil was picked up and placed with the Vault roll-off
April 13, 2019	Diesel Fuel	50	L	Fuel Tank Meadowbank	Operator lost control of the nozzle as truck was just about full.	Clean up contaminated area, speak with operator about proper fueling procedure. Contaminated material picked up and disposed of appropriately
April 13, 2019	Petroleum Product	50	L	Winter parking	Traction hose failure	Contained spill with absorbent pad. Contaminated snow shoveled waste drums
April 14, 2019	Hydraulic Oil	40	L	Goose Road	Hydraulic hose o ring failure	Contaminated soil picked up and disposed off at the landfarm. Equipment was taken out of service and repaired.
April 14, 2019	Transmission Oil	60	L	Portage Pit	Equipment failure	Contaminated soil picked up and placed at the landfarm. Equipment was taken off the shovel and out of service until repaired.
April 18, 2019	Hydraulic Oil	57	L	Portage Pit	Hydraulic hose failure	Maintenance has been called to fix the machine. Contaminated soil picked up and disposed off adequately
April 20, 2019	Hydraulic Oil	15	L	Sana area	The plastic container pan for used oil was cracked.	Removed some contaminated soil with the loader and disposed off adequately
April 21, 2019	Coolant	89	L	Portage pit entrance	Worn out "o" ring on engine oil cooler and leaking went machine is not running and cold (cold leak)	Equipment repaired. Contaminated soil and material picked up and disposed off adequately
April 21, 2019	Hydraulic Oil	16	L	Tear drop Lake	Hydraulic hose failure	Absorbent pads use to contain the spill. Contaminated material picked up and disposed off adequately
April 21, 2019	Hydraulic Oil	80	L	Maintenance area	Hydraulic hose failure	Removed failed hose, and replaced with new one.
April 22, 2019	Coolant	65	L	Portage Pit	Broken seal inside water pump for cooling of engine	Contaminated soil picked up and disposed of appropriately
April 28, 2019	Diesel	70	L	Fuel Tank Meadowbank	Valve handle of fuel arm was tied up with a rope, the operator didn't see the rope and he turned the pump on.	Stop the refueling. Contaminated material picked up and disposed off adequately
May 3, 2019	Hydraulic Oil	10	L	End of the maintenance shop	Unknown	Contaminated material was cleaned up and disposed of appropriately
May 4, 2019	Diesel	70	L	Baker Lake tank farm	When employee unhooked the arm off the tanker, the API dry connect did not close all the way and by the time employee got it closed manually he lost some fuel	Absorbent pad used. Spill was contained and contaminated soil picked up and disposed of appropriately
May 8, 2019	Hydraulic oil	5	L	Haul truck parking	Hydraulic hose leak	Contaminated soil picked up and disposed of appropriately
May 10, 2019	Hydraulic oil	85	L	Portage - Pit E	O-ring hydraulic hose failure	Contaminated soil picked up and disposed of appropriately

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
May 11, 2019	Hydraulic oil	75	L	Maintenance area (Bay #8)	O-ring hydraulic hose failure	Contaminated soil picked up and disposed of appropriately
May 16, 2019	Diesel fuel	40	L	Cold storage	Unknown	Contaminated soil picked up and disposed of appropriately
May 20, 2019	Coolant	20	L	Primary crusher	Coolant hose failure	Contaminated soil picked up and disposed of appropriately
May 21, 2019	Hydraulic Oil	30	L	Marginal stock pile	Hydraulic hose failure	Mechanic was call to fix the hose. Contaminated material picked up and disposed off adequately
June 6, 2019	Hydraulic oil	20	L	Vault Marginal Stockpile B	Pilot hose leaking	Absorbent pads used to contain the spill. All contaminated material pick up and cleaned and disposed off adequately. Hose was replaced.
June 6, 2019	Metabisulfate	0.5	Kg	Dome Warehouse	ripped bag inside sea can	Resealed the bag. Picked up contaminated material and adequately disposed off
June 12, 2019	Diesel	5	L	MBK Tank Farm	Fuel nozzle fell off while refuelling	Contaminated soil picked up and disposed of appropriately
June 12, 2019	Food grease and water	90	L	STP new terra	Overflow of the tank	System stopped and called the sewage truck to empty the tank
June 12, 2019	Hydraulic Oil	60	L	Baker Lake Fuel Farm	Hydraulic hose failure	The excavator was stopped when the operator noticed the spill. The hose was changed and absorbent pad used. Once the repair done, the contained material was pick up and disposed adequately
June 14, 2019	Hydraulic oil	20	L	Primary crusher	Hydraulic hose failure	All contaminated material pick up and cleaned and disposed off adequately. Hose was replaced.
June 19, 2019	Coolant	10	L	Transit Laydown	Coolant hose clamp failure	All contaminated material pick up and cleaned and disposed off adequately. Hose was repaired.
June 21, 2019	Petroleum Product	4	L	Baker Lake Fuel Farm	Equipment failure	Put absorbent pad and remove contaminated soil using a hand shovel. Send the fuel truck to mechanic for repair.
June 27, 2019	Hydraulic Oil	60	L	Crusher Pad	Hydraulic hose failure	Stopped loader. Put absorbent pad. All contaminated material disposed off adequately
July 3, 2019	Hydraulic Oil	15	L	Portage Pit E	O-ring failure	Mechanic was call to fix the hose. Contaminated material picked up and disposed off adequately
July 5, 2019	Diesel	2	L	Tankfarm - Haul truck refuelling	Hose in the reel of the Haul Truck Fuel Pumping Station was reported that it was leaking inside the reel box	The Mine Dispatch advised the Building Maintenance Supervisor who went and yellow flagged the access to the Pump first and then sent his plumber to change the leaking hose for a new one. There was a small leak done when removing the hose. All contaminated soil and material picked up and disposed of appropriately
July 6, 2019	Hydraulic Oil	25	L	Transfer tower	Hydraulic hose failure	Picked up oil with absorbent pads. All contaminated soil and material picked up and disposed of appropriately
July 6, 2019	Hydraulic Oil	10	L	Landfill	Hydraulic hose failure	Picked up oil with absorbent pads. All contaminated soil and material picked up and disposed in Haz mat area
July 20, 2019	Diesel	25	L	Spud barge Baker Lake	Small ball valve close to the manifold was resting on the wood blocks supporting the main fuel pipe and it was all wet underneath	contaminated soil was removed with shovel and place in drum
July 26, 2019	Hydraulic Oil	20	L	Maintenance	Caps blew on equipment	Recapped the lines and did not use that circuit. Spill was contained and

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
						contaminated soil picked up and disposed of appropriately
July 26, 2019	Hydraulic Oil	10	L	Marginal stock pile	While pushing the dozer operator noticed oil on the ground and shut off the machine	Spill was contained and contaminated soil picked up and disposed of appropriately
July 28, 2019	Hydraulic Oil	65	L	Pit E	Hydraulic hose failure	Shut down equipment. Spill was contained and contaminated soil picked up and disposed of appropriately
August 11, 2019	Hydraulic Oil	25	L	Old SANA	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately.
September 2, 2019	Hydraulic Oil	10	L	Outside of secondary crusher	Accumulation of hydraulic oil under the skid steer due to equipment malfunction	Equipment was stopped and supervisor notified. Mechanic called for repairs. Contaminated soil picked up and disposed of appropriately
September 8, 2019	Diesel	10	L	Meadowbank Fuel Farm	Fuel tank breather didn't work properly generating overflow.	Trainer and driver put some absorbent pads to control the spill. Contaminated material and soil picked up and disposed off appropriately
September 10, 2019	Diesel	3	L	Meadowbank Fuel Farm	Vent on equipment not working properly while refueling	Absorbent pad were put on the ground. The contaminated soil was removed using a loader and will be disposed properly.
October 6, 2019	Hydraulic Oil	10	L	Portage Pit E-5	Hydraulic hose failure	Mechanic called for repairs. Contaminated soil picked up and disposed of appropriately
October 7, 2019	Hydraulic Oil	2	L	Pushback Parking	Leak on the back of the dozer	Mechanic called for repairs. Contaminated soil picked up and disposed of appropriately
October 22, 2019	Coolant	50	L	Winter Parking	Coolant hose failure	Pinched off blown coolant line. Contaminated soil picked up and disposed of appropriately.
October 24, 2019	Hydraulic Oil	15	L	Mine OPS parking	Hydraulic hose failure	Failure reported to maintenance department. Contaminated soil picked up and disposed of appropriately.
November 1, 2019	Diesel	40	L	Baker Lake Tank Farm	Meter on the scully system defective	Contaminated soil picked up and disposed of appropriately
November 1, 2019	Coolant	10	L	Nahani Shop	Glycol stored in the steamer hose to prevent from freezing expended and spill out of the trailer.	Contaminated soil picked up and disposed of appropriately
November 6, 2019	Coolant	12	L	Sana yard	Probably rock ejected by fan blade on radiator core	Removed contaminated soil and snow with sky-track and put on contaminated special bin.
November 7, 2019	Hydraulic Oil	40	L	Portage parking haul truck	Truck was too cold and wheel seals leaked when fired up	Absorbent pads were put on the ground to contains the spill. Removed contaminated snow with loader and put on contaminated bin.
November 24, 2019	Grey Water	30	L	Laundry Lift Station (L/S#1)	A black pipe threaded nipple failure	Identify the leak location and repair. Contaminated soil picked up and disposed of appropriately
November 27, 2019	Diesel Fuel (5L) and oil (10L)	15	L	AWAR KM 103	Truck roll over	The fuel tank was patched and a secondary containment was placed underneath. Contaminated soil picked up and disposed of appropriately
December 12, 2019	Engine Oil	30	L	Downline maintenance shop	Engine failure	Clean-up the spill. Contaminated soil picked up and disposed of appropriately
December 14, 2019	Transmission Oil	50	L	Baker Lake spud barges	Mechanical issue on the dozer and transmission oil spilled on the ground	Stopped the dozer and install absorbent pads to contain the spill. Contaminated soil picked up and disposed of appropriately
December 15, 2019	Petroleum Product	5	L	Primary Crusher Stockpiles	Quick attach hose failure	Excavator stop working and hose was repaired Contaminated material was picked-up and brought to the proper disposal area

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
December 24, 2019	Coolant	2	L	Environment Office	During pre-operation of vehicle, a small amount of coolant was observed on the ground under Pick-up	Equipment brought to Maintenance to repair the leak. Contaminated soil picked up and disposed of appropriately
December 25, 2019	Coolant	10	L	Vault Road	Coolant hose failure	Equipment was shutdown and repairs were made on the roadway. Contaminated soil picked up and disposed of appropriately
December 30, 2019	Glycol	20	L	Under Wing 7	Leak under Wing 7.	Closed the supply & return valve immediately.

7.1.2 Whale Tail Site

As per NWB Water License 2AM-WTP1826 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 2019 is presented in Table 7-4. A summary of all non-reportable spills can be found in Table 7-5. This data was also included in monthly monitoring reports submitted to the NWB 2AM-WTP1826. Starting 2019, the spills was also be reported quarterly via the KivIA Production Lease Report. GN Spill Reporting Forms and the follow up report as requested by the Water License 2AM-WTP1826 Part H, Item 8 for reported spills are included in Appendix 32. The spills presented in Table 7-4 and 7-5 below only included spill related to the Whale Tail Site and Whale Tail Haul Road.

In 2019, forty-three (43) spills were reported to the GN Spill hotline which represents a significant increase from previous year (2016-2018). This increase is mainly due the higher activity with the construction of the Whale Tail Site and the operation activities that have continued to be shifted from Meadowbank towards the Whale Tail Project in 2019. It should be noted that even if there was a significant increase in spill report internally and externally in 2019, the combined total from both Meadowbank and Whale Tail have showed a decrease in the total number of spills in 2019. Table 7-1 above provides a summary of the reportable and non-reportable spills from 2016 -2019. From the forty-three (43) reportable spills, seven (7) were also exceedances to the Water License 2AM-WTP1826, 2BB-MEA1828 and/or MDMER regulation. Refer to Sections 8.5.2.2, 8.5.4.3, 11.6.2 and 11.6.3 below for more information.

As per the Spill Contingency Plan, spills are contained and cleaned, contaminated material is disposed to the appropriate area, such as the Meadowbank landfarm and the clean-up actions are monitored by the Environment team. Please refer to Section 7.1.1. All non-petroleum hydrocarbon and hydrocarbon material from Whale Tail site are shipped to Meadowbank for adequate disposal.

Table 7-4 Whale Tail 2019 spills reported to the GN 24Hr spill HotLine

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken	Spill Number
January 1, 2019	Hydraulic Oil	150	L	Whale Tail Waste Rock Storage Facility	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately	2019-001
January 15, 2019	Fecal Coliform	4,000	CFU/100ml	Sewage Treatment Plan	A result of 4,000 CFU/100ml of Fecal Coliform was received for a treated waste water effluent discharge sample taken on January 15th	Inspection of the STP to assessed the performance	2019-035
January 25, 2019	Sewage Water	100	L	Whale Tail STP	Truck tank overflow	Stopped the equipment. Contaminated soil picked up and disposed of appropriately	2019-027
January 27, 2019	Engine Oil	5	L	Whale Tail North Lake	5 liters of the engine oil got in contact with the ice of the lake following equipment failure	Equipment was stopped. Absorbent pads were laid out over the spill then were collected and disposed of appropriately	2019-028
February 2, 2019	Hydraulic Oil	250	L	Whale Tail Quarry 2	Cone bearing of the wheel let go and broke a seal and empty the hydraulic tank	Spill was contained and contaminated soil picked up and disposed of appropriately	2019-033
February 3, 2019	Engine Oil	3	L	Whale Tail North Basin	Pump' seal gasket failure	Spill was contained and contaminated soil picked up and disposed of appropriately	2019-038
February 4, 2019	Waste water (sewage)	1,000	L	Whale Tail STP	After 4 hours on electrical failure the system restart and overflow in STP	Stopped the system and call loader to scoop the spill. Contaminated soil picked up and disposed of appropriately	2019-040
February 6, 2019	Engine Oil	4	L	Whale Tail North Basin	Diesel Motor failure	Spill was contained and contaminated soil picked up and disposed of appropriately	2019-044
February 11, 2019	Fecal Coliform	42,000	CFU/100ml	Wastewater effluent STP	Coliform was received for a treated waste water effluent discharge sample taken on Feb 11th. Prior results were below the limit.	Investigation on STP.	2019-074
March 4, 2019	Fecal Coliform	12,000	CFU/100ml	STP	Fecal coliform exceedance of Water License 2BB-MEA1828 limit	Continue monitoring and reported to authorities.	2019-112
March 5, 2019	Hydraulic Oil	400	L	Whale Tail Quarry 2	Hydraulic hose failure	Maintenance department notified. Contaminated soil picked up and disposed of appropriately	2019-088
March 5, 2019	Hydraulic Oil	350	L	Whale Tail Quarry 2	Hydraulic hose failure	Equipment was shut off and maintenance department notified. Contaminated soil picked up and disposed of appropriately	2019-087
March 8, 2019	Hydraulic Oil	400	L	Whale Tail Quarry 2	Fitting on hydraulic hose failure	Equipment was shuttled down and repaired. Contaminated soil picked up and disposed of appropriately	2019-097
March 23, 2019	Hydraulic Oil	150	L	Whale Tail Quarry 2	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately	2019-129
March 31, 2019	Diesel	50	L	Dewatering WT ramp	Return line of fuel pump failure	Stop the pump and repair it. Contaminated soil picked up and disposed of appropriately	2019-144
April 6, 2019	Hydraulic Oil	300	L	Quarry 2	Hydraulic hose flange failure	The machine was shut down immediately and flange bolt was repaired. Contaminated soil picked up and disposed of appropriately	2019-302
April 20, 2019	Hydraulic Oil	400	L	Quarry 2	Main pump feeding hydraulic line failure	Contaminated soil picked up and disposed of appropriately	2019-164

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken	Spill Number
May 29, 2019	Diesel	300	L	Road 3	Diesel Tank overflow	Environment department was called, we used the 345 backhoe to do a trench to contain the diesel fuel used absorbing pads and snow to pick up the diesel fuel and bring it with the 966 loader to the contaminated soil bin at the transit pad. All contaminated material pick up and cleaned and disposed off adequately	2019-222
May 29, 2019	TSS	45	Kg	Whale Tail South	Charge of TSS in the WT North Basin Dewatering Water at 88mgL.	Basin dewatering was sampled on May 29, 2019 at 9:50 am as required by the Water License 2AM-WTP1826. The discharge was planned to be stopped during the day of May 29. At 10:00 am the pumps were shut down and remain inactive as of today. On June 6, 2019 Agnico Eagle was reviewing preliminary results and noted that the level of TSS at ST-MDMER-5 discharge was at 88 mg/L on May 29. The official laboratory certificate is pending. Based on a total flow of 500 m^3 between May 29 9 am (previous grab sample) and May 29 10 am, the quantity of TSS is estimated at 45 kg.	2019-233
June 16, 2019	Hydraulic oil	450	L	Whale Tail	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately (MBK landfarm)	2019-242
June 27, 2019	Diesel	200	L	N 65° 13' 33.2" W 96° 23' 33.6"	Fuel truck operator noticed fuel leaking behind him when returning from his fuel run. He pulled over and noticed a broken pipe	Fuel spill was contained as best possible with a spill kit and trenches. After, a shovel and a 50-ton truck collected the material that was transported the landfarm.	2019-258
June 28, 2019	Hydraulic Oil	150	L	N 65°24'16.65'' W 96°41'2.702''	Hydraulic hose from the tank on drill failure	The equipment was shut down and moved. Spill pad was used to clean up the drill and the contaminated material was picked up and brought to the MBK land farm.	2019-262
July 8, 2019	Diesel	100	L	Quarry 2	Rock got stock between traction and fuel tank and broke the drain plug on fuel tank	The spill occurred on a blast pattern which will be collected and processed through the Mill	2019-273
August 9, 2019	Hydraulic Oil	200	L	Quarry 2	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately	2019-319
August 12, 2019	Fecal Coliform	9,000	CFU/100ml	Bionest STP Exploration Camp	Results of 9000 CFU/100ml of Fecal Coliform for sample taken on August 12th and 2000 CFU/100ml for sample taken on August 19th were received for a treated waste water effluent discharge. Prior results (August 5th < 2 CFU/100ml) was below limit.	Follow up with STP operator.	2019-354
August 21, 2019	Hydraulic Oil	200	L	Whale Tail Pit	O-ring failure	Operator called his supervisor right away and shut down the machine. Spill was contained and contaminated soil picked up and disposed of appropriately	2019-333
August 21, 2019	Hydraulic Oil	200	L	Whale Tail Pit	O-ring failure	Equipment stopped and mechanic called for repair. Pick up the spill and brought to the yellow bin behind maintenance shop	NA
August 24, 2019	Water from WRSF Pond	10,000	m^3	WRSF Dike	During an inspection of the Waste Rock Storage Facility (WRSF) dike, a water flow was observed at the toe of the dike at	Work was initiated to pump out the WRSF collection pond to decrease the water flow	2019-339

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken	Spill Number
					approximately 100m^3/hr		
August 31, 2019	Hydraulic Oil	120	L	Quarry 2	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately	2019-357
September 5, 2019	Hydraulic Oil	2,500	L	Quarry 2	Track came off BAC 10 causing the tensioner cylinder to fully extend and drain all the oil in the machine.	Spill was contained and contaminated soil picked up and disposed of appropriately	2019-366
September 10, 2019	Coolant	240	L	Haul truck parking	Radiator hose clamp got loose causing the hose to unplugged from the radiator	Picked up by loader the contaminated material and disposed in right location	2019-372
September 27, 2019	Diesel	3,500	L	Road 3	Fuel truck went off the road	Spill was contained and contaminated soil picked up and disposed of in the landfarm	2019-403
October 10, 2019	TSS	367.8	Kg	Dewatering Water to WTS	The effluent of the ST-MDMER-5/ST-DD-7 Whale Tail North Basin dewatering was sampled on October 10th, 2019 at 17:00 am as required by the Water License 2AM-WTP1826. Results from the external laboratory were received and showed TSS result at 91 mg/L. The station was sampled again on the 11th at 6:50, and the result was 1 mg/L. Previous day's result (October 9th) showed TSS to be at 1 mg/L. Based on a total flow of 4,042 m^3 between October 10th and 11th, the quantity of TSS is estimated at 368 kg.	Increased internal monitoring is ongoing for this station.	2019-438
October 20, 2019	Transmission Oil	120	L	Whale Tail Pit	Transmission oil filter failed off the truck	The equipment was shut down and the contaminated soil was collected and put in the yellow roll off bin to be brought to the Meadowbank landfarm	2019-431
October 24, 2019	Diesel	200	L	Dewatering Pad	The kind of hose use to connect auxiliary fuel reservoir was not compatible with fuel	Stop the pump and fuel valve, notice dewatering supervisor. All contaminated material will be picked up and brought to the landfarm in Meadowbank.	2019-439
October 25, 2019	Hydraulic Oil	200	L	Quarry 2	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately to the MBK landfarm	2019-441
October 26, 2019	Sewage	4,000	L	Bionest #2 (explo camp)	Overflow pipe had a blockage and was causing sewage to leak out onto the sea-can floor and onto the ground below	The vacuum truck was used to empty the tank and prevent further overflow. The bionest system will be shut down and all future sewage from the camp will be kept in holding tanks then vacuum trucked to the Newterra system at the Amaruq camp. All contaminated soil will be collected and brought to the Meadowbank landfarm.	2019-442
October 28, 2019	Turbidity	80	NTU	Whale Tail Dewatering to Whale Tail South	A first water sample was taken at 6:50 on the morning of the 28th, turbidity was then assessed to be at 15,94 NTU and parameters sampled included TSS directed at our external	Increased internal monitoring is ongoing for this station.	2019-447

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken	Spill Number
					laboratory. As part of our regular water quality sampling, another turbidity reading was taken at 11:30 on the same morning. This reading was noted at 80,10 NTU, exceeding the Water Licence criteria (Part D, Item 7) of 30 NTU. With increasing wind and blizzard conditions on site it was determined to be unsafe to take additional sampling by our personnel or proceed to further actions on the discharge. When conditions permitted to resample the discharge, on the morning of October 29th , the turbidity reading had significantly decreased to 11,90 NTU		
November 27, 2019	Coolant	200	L	WRSF	The fan of the haul truck had contact with the radiator, causing a coolant leak	Contaminated soil picked up and disposed of appropriately	2019-490
November 27, 2019	Hydraulic Oil	120	L	Quarry 2	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately	2019-474
December 14, 2019	Hydraulic Oil	125	L	Bottom of phase 2 ramp	Operator made contact with spill rock from haul truck	Operator shut off drill and contacted drill and blast supervisor. Contacted mechanics for repairs. Spill was contained and contaminated soil picked up and disposed of appropriately at the MBK landfarm	2019-483
December 19, 2019	Hydraulic Oil	150	L	Quarry 2	Hydraulic hose for clam of the bucket failure	Contaminated soil picked up and disposed of appropriately at the MBK landfarm	2019-488
December 28, 2019	Hydraulic Oil	200	L	Whale Tail Rock Facility Storage	Hydraulic system failure	Contaminated soil picked up and disposed of in the landfarm	2019-493

Table 7-5 Whale Tail 2019 non-reportable spills

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
January 6, 2019	Hydraulic Oil	80	L	Whale Tail Quarry 2	O-ring failure	Spill was contained and contaminated soil picked up and disposed of appropriately
January 9, 2019	Diesel	40	L	Whale Tail Quarry 2	Worker was going to emptied the water tank but started emptying the fuel tank by mistake.	Spill was contained and contaminated soil picked up and disposed of appropriately
January 13, 2019	Hydraulic Oil	40	L	Whale Tail Primary Crusher oversize stock pile#3	Loose hose on hammer	Spill was contained and contaminated soil picked up and disposed of appropriately
January 18, 2019	Hydraulic Oil	20	L	Whale Tail Quarry 2	Hydraulic hose on the boom busted	Contaminated soil picked up and disposed of appropriately
January 20, 2019	Hydraulic Oil	10	L	Whale Tail Waste Rock Storage Facility	Skid plate failure	Contaminated soil picked up and disposed of appropriately
January 21, 2019	Hydraulic Oil	18	L	Whale Tail PAD Q	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately
January 22, 2019	Hydraulic Oil	3	L	Whale Tail Main Camp	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately
January 24, 2019	Hydraulic Oil	5	L	Whale Tail Maintenance	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately
January 25, 2019	Hydraulic Oil	3	L	Whale Tail Haul Road km 118	Hydraulic fitting failure	Used absorbent pad and repair the equipment. Contaminated soil picked up and disposed of appropriately
January 25, 2019	Hydraulic Oil	15	L	Whale Tail FGL	Equipment failure	Contaminated soil picked up and disposed of appropriately
January 25, 2019	Glycol	60	L	Whale Tail Maintenance	The connector opened on the tote of the service truck #45	Contaminated soil picked up and disposed of appropriately
January 26, 2019	Coolant	50	L	Whale Tail Quarry 2	Coolant hose failure	Contaminated soil picked up and disposed of appropriately
January 28, 2019	Hydraulic Oil	60	L	Whale Tail Quarry 2	Equipment failure	Contaminated soil picked up and disposed of appropriately
January 29, 2019	Hydraulic Oil	15	L	Whale Tail Quarry 2	Equipment failure	Stopped the equipment and called for repair. Contaminated soil picked up and disposed of appropriately
January 29, 2019	Coolant	65	L	Whale Tail Quarry 2	Coolant hose failure	Equipment was stopped. Absorbent pads were laid out over the spill then were collected and disposed of appropriately
February 1, 2019	Engine Oil	5	L	Whale Tail WRSF Sana crusher	Engine failure	Clean-up using absorbent pad and hand shovel. Contaminated soil has been disposed appropriately
February 2, 2019	Hydraulic Oil	2	L	Whale Tail Haul Road KM 122.5	Cap of tank leak oil	Contaminated soil picked up and disposed of appropriately
February 2, 2019	Sewage water	40	L	Whale Tail STP	Left over in the hose spill on the snow bank.	Contaminated soil picked up with the loader and disposed of appropriately

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
February 3, 2019	Hydraulic Oil	85	L	Whale Tail Road 22	Hydraulic hose loosen	Tightened the hoses to prevent more oil from leaking., Spill was contained and contaminated soil picked up and disposed of appropriately
February 7, 2019	Engine Oil	6	L	Whale Tail North Basin	Main hydraulic hose broke under the control panel. All contained upon inspection	Pick up all the contaminated snow and clean the drift pan under the control, put new absorbent under the control and disposed from all the contaminated snow and absorbent pads appropriately
February 8, 2019	Sewage	70	L	Whale Tail STP	STP overfilled after the shut down	Contaminated soil picked up with the loader and disposed of appropriately
February 9, 2019	Hydraulic Oil	30	L	Whale Tail Quarry 2	Swing Drive leak oil	Spill was contained and contaminated soil picked up and disposed of appropriately. Equipment was stopped and leaked was repaired
February 9, 2019	Coolant	2	L	Whale Tail North East Dike	Coolant reserve tank overflowed	Spill was contained and contaminated soil picked up and disposed of appropriately. Equipment sent to the maintenance shop for evaluation
February 10, 2019	Coolant	75	L	Whale Tail Maintenance Shop	Upper rad hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
February 12, 2019	Coolant	8	L	Whale Tail Haul Road KM144	Broken fan belt, engine overheated and coolant overflowed	Spill was contained and contaminated soil picked up and disposed of appropriately
February 12, 2019	Hydraulic Oil	52	L	Whale Tail Quarry 2	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
February 14, 2019	Hydraulic Oil	35	L	Whale Tail WRSF Dump	O-ring on bucket Cylinder busted	Equipment was shut off and repaired. Spill was contained and contaminated soil picked up and disposed of appropriately
February 14, 2019	Hydraulic Oil	40	L	Pad K	Small station of the turret broke; while falling it broke the hydraulic hoses that was connected to it	Equipment was shut off and repaired. Spill was contained and contaminated soil picked up and disposed of appropriately
February 15, 2019	Hydraulic Oil	30	L	Whale Tail Quarry 2	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
February 18, 2019	Hydraulic Oil	10	L	Whale Tail Maintenance	BAC05 is having a final drive replacement. The lines were capped off with a "Blue plug" but the plug fell out.	Contaminated soil picked up and disposed of appropriately
February 18, 2019	Hydraulic Oil	90	L	Whale Tail Quarry 2	Equipment failure	Contaminated soil picked up and disposed of appropriately
February 19, 2019	Hydraulic Oil	20	L	Whale Tail Quarry 2	O-ring on hydraulic hose failure.	Contaminated soil picked up and disposed of appropriately
February 19, 2019	Hydraulic oil	5	L	Whale Tail WRSF	Equipment failure	Contaminated soil picked up and disposed of appropriately
February 20, 2019	Hydraulic oil	15	L	Whale Tail Maintenance	Hydraulic tube rubbed through on a bolt	Spill was contained and contaminated soil picked up and disposed of appropriately
February 22, 2019	Hydraulic Oil	30	L	Whale Tail PAD K	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately
February 23, 2019	Engine Oil	10	L	Whale Tail Nemo road	Air cooler on top of the drill broke down while operating the drill	Contaminated soil picked up and disposed of appropriately

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
February 24, 2019	Engine Oil	8	L	Whale Tail Road #3	Hydraulic motor seal failure	Contaminated soil picked up and disposed of appropriately
February 25, 2019	Hydraulic oil	87	L	Whale Tail Quarry 2	O-ring failure	Contaminated soil picked up and disposed of appropriately
February 28, 2019	Hydraulic Oil	25	L	Whale Tail Quarry 2	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
March 8, 2019	Diesel	50	L	Road 7	Tank overfill	Employee shuttled off fuel nozzle and advised his supervisor. Contaminated soil picked up and disposed of appropriately
March 11, 2019	Hydraulic Oil	95	L	Whale Tail Quarry 2	Fitting on hydraulic hose failure	Operator notice right away and call the maintenance department for repair. Contaminated soil picked up and disposed of appropriately
March 13, 2019	Diesel	50	L	Between tank 120 and 123	Tank overfill	Contaminated soil picked up and disposed of appropriately
March 13, 2019	Hydraulic oil	95	L	Maintenance Shop	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately
March 13, 2019	Hydraulic oil	40	L	WRSF	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately
March 13, 2019	Hydraulic Oil	20	L	WRSF	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately
March 14, 2019	Waste Water	60	L	STP Bionest	STP lift station of effluent in the Bionest overflowed	Reduced the flow to the bionest. Contaminated material disposed adequately.
March 16, 2019	Coolant	25	L	Main entrance parking	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
March 17, 2019	Hydraulic Oil	30	L	WRSF	Equipment failure	Contaminated soil picked up and disposed of appropriately
April 16, 2019	Coolant	20	L	Quarry 2	Coolant hose failure	Equipment was shut off and repaired. The spill was picked up when the loader came back up and contaminated material disposed off adequately
April 20, 2019	Hydraulic Oil	75	L	WRSF	Truck has been down for over a week. When truck was started a seal busted and caused the leak	Contaminated soil picked up and disposed of appropriately
April 21, 2019	Hydraulic Oil	82	L	Ore stock pad	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately
April 22, 2019	Hydraulic oil	60	L	Maintenance	Mechanical failure caused hydraulic oil leak	Contaminated soil picked up and disposed of appropriately
April 23, 2019	Diesel	20	L	Quarry 2	Fuel truck driver filled up the fuel tank and fuel came out of the overflow	Stop the refueling and equipment repairs. Contaminated material picked up and disposed off adequately
April 26, 2019	Hydraulic Oil	90	L	Quarry 2	Hydraulic hose failure	Maintenance has been called to fix the machine. Contaminated soil picked up and disposed off adequately
April 26, 2019	Hydraulic Oil	20	L	WSF Parking	Hydraulic hose failure	Maintenance has been called to fix the machine. Contaminated soil picked up and disposed off adequately
April 27, 2019	Coolant	15	L	Maintenance parking	Equipment failure	Contaminated soil picked up and disposed of appropriately

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
May 1, 2019	Hydraulic Oil	50	L	Quarry 2	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
May 3, 2019	Coolant	90	L	Quarry 2	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
May 9, 2019	Hydraulic Oil	20	L	South dewatering road	O-ring hydraulic hose failure	Contaminated soil picked up and disposed of appropriately
May 11, 2019	Coolant	50	L	Quarry 2	Coolant hose failure	Contaminated soil picked up and disposed of appropriately
May 12, 2019	Hydraulic Oil	95	L	In front of the Maintenance shop	Steering filter O-ring failure	Absorbent pads used to contain the spill. All contaminated material pick up and cleaned and disposed off adequately
May 15, 2019	Hydraulic Oil	40	L	Quarry 2	Loose fitting caused hydraulic oil spill	Contaminated soil picked up and disposed of appropriately
May 18, 2019	Hydraulic Oil	30	L	Road 7	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately
May 18, 2019	Diesel	70	L	PAD C	Fuel was likely spilled during the fueling process of the RBD 07	Contaminated soil picked up and disposed of appropriately
May 18, 2019	Hydraulic Oil	30	L	Mammoth Dike	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately
May 19, 2019	Hydraulic Oil	80	L	Road 7	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately
May 22, 2019	Engine Oil	8	L	11km North east of AMQ	Rotation hydraulic hose failure	Absorbent pads used to contain the spill. All contaminated material pick up and cleaned and disposed off adequately
May 26, 2019	Diesel	6	L	Muck pad by haul road	Fuel hose fallen down while unscrewing pump and leaked	Absorbent pads used to contain the spill. All contaminated material pick up and cleaned and disposed off adequately
May 28, 2019	Hydraulic Oil	10	L	Haul truck parking Whale Tail	Hydraulic hose failure	Contaminated material picked up and disposed off adequately
May 28, 2019	Hydraulic Oil	15	L	Quarry 2	Hydraulic hose failure	Absorbent pads used to contain the spill. All contaminated material pick up and cleaned and disposed off adequately in the yellow bin behind the shop.
May 28, 2019	Hydraulic Oil	20	L	Dewatering road	Remove broken hydraulic steel elbow tube, had two drums under the unit to catch the oil but it was very windy and when hose was removed the wind carried/blew the oil.	Absorbent pads used to contain the spill. All contaminated material pick up and cleaned and disposed off adequately
June 6, 2019	Hydraulic oil	20	L	Quarry 2	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately
June 6, 2019	Glycol	10	L	WT UG shop	Radiator hose failure	Stopped truck to prevent a bigger leak and repaired the hose. Contaminated soil picked up and disposed of appropriately
June 7, 2019	Hydraulic Oil	40	L	5144MSW16	Ruptured hydraulic hose	Equipment stopped. Contaminated soil picked up and disposed off in the roll-off bin
June 7, 2019	Hydraulic oil	20	L	Quarry 2	One O-ring busted on BAC13	Contaminated soil picked up and disposed of appropriately

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
June 7, 2019	Hydraulic Oil	10	L	Quarry 2	O-ring busted on the LOA13	Contaminated soil picked up and disposed of appropriately
June 9, 2019	Hydraulic oil	35	L	Quarry 2	Hydraulic oil leak after loading truck	Contaminated soil picked up and disposed of appropriately
June 9, 2019	Coolant	10	L	WT Haul road	Broken bolt in the shroud. Bolt hit the fan and ricochet in the radiator.	Contaminated soil picked up and disposed of appropriately
June 10, 2019	Coolant	30	L	RSF	Coolant hose failure	Contaminated soil picked up and disposed of appropriately
June 12, 2019	Coolant	10	L	Construction Pad H	Water pump failure	Contaminated soil picked up and disposed of appropriately
June 16, 2019	Transmission Fluid	4	L	Construction Pad H	Front right wheel seal failure	Contaminated soil picked up and disposed of appropriately
June 16, 2019	Hydraulic oil	15	L	Quarry 2	Mechanic failure	Contaminated soil picked up and disposed of appropriately
June 17, 2019	Hydraulic Oil	15	L	Northing 6928.6, Easting 14545.7	Unknown	Spill was contained and contaminated soil picked up and disposed of appropriately
June 19, 2019	Coolant	20	L	LHT loading area	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
June 19, 2019	Coolant	40	L	LHT loading area	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
June 20, 2019	Coolant	75	L	Quarry 2	Coolant hose failure	All contaminated material pick up and cleaned and disposed off adequately. Hose was repaired.
June 22, 2019	Hydraulic Oil	10	L	Sana Crusher Pad	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
June 22, 2019	Diesel	1	L	Tundra hole #AMQ-19-2077	Leak on the fitting on the tank and hose that bring the fuel to the water heater	Put absorbent pad. All contaminated material disposed off adequately
June 23, 2019	Coolant	60	L	Whale Tail Pit 5130MSW06	Coolant hose on engine got disconnected	Spill was contained and contaminated soil picked up and disposed of appropriately
June 23, 2019	Engine Oil	30	L	Waste Dump Parking	Engine hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately. Call mechanic department for repair.
June 26, 2019	Coolant	80	L	5137MSW26	Coolant fitting hose failure	The equipment was shut down, absorbent pads were laid down while the machine was fixed. Absorbent pads and contaminated material were put in the proper bin.
June 28, 2019	Hydraulic Oil	80	L	5151MSW83 - Q2	Hydraulic hose failure	Stopped equipment and call for repair. All contaminated material disposed off adequately
June 29, 2019	Hydraulic Oil	5	L	Top of Quarry 2	Bucket Cylinder breakdown	Stopped equipment. All contaminated material disposed off adequately
July 4, 2019	Waste oil	45	L	Maintenance	Coupler on the bottom of the truck came loose	Contaminated soil picked up and disposed of appropriately

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
July 9, 2019	Diesel	80	L	Road 7	Fuel Tank vent cap malfunctioned, fuel came out of the vent cap	Contaminated soil picked up and disposed of appropriately
July 10, 2019	Petroleum Product	50	L	Whale Tail Haul Road KM173	Long haul truck was a complete loss due to fire. Most of the liquids were burnt in the fire. We estimate 50 liters spilled and did not ignite.	Spill pads were placed in small puddles beside the road once the fire was deemed "out". All contaminated soil and material picked up and disposed of appropriately
July 11, 2019	Hydraulic Oil	15	L	Maintenance	Ball valve seal failure	Contaminated soil picked up and disposed of appropriately
July 11, 2019	Coolant	15	L	Quarry 2	Pin hole in iron pipe causing a coolant spill	Contaminated soil picked up and disposed of appropriately
July 12, 2019	Diesel	60	L	Quarry 2	Defective fuel vent on equipment	Contaminated soil picked up and disposed of appropriately
July 13, 2019	Diesel	30	L	Quarry 2	Fuel tank vent cap malfunctioned	Contaminated soil picked up and disposed of appropriately
July 13, 2019	Diesel	80	L	Quarry	During refueling, fuel began spreading onto the ground because the air vent was not working properly	Spill was contained and contaminated soil picked up and disposed of appropriately
July 20, 2019	Steering Fluid	20	L	RSF parking	Steering Accumulator failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 20, 2019	Hydraulic Oil	90	L	NPAG stock pile	Hydraulic hose failure	Called mechanic for repairs. Spill was contained and contaminated soil picked up and disposed of appropriately
July 21, 2019	Hydraulic Oil	20	L	Quarry 2	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 24, 2019	Engine Oil	16	L	Pad H	Equipment failure	Spill was contained and contaminated soil picked up and disposed of appropriately
July 27, 2019	Hydraulic Oil	30	L	Quarry 2	O-ring failure	Stop equipment and call mechanic for repair. Pick up spill and brought to yellow bin behind maintenance shop
July 27, 2019	Hydraulic Oil	15	L	Quarry 2	Hydraulic hose attached to the traction motor broke off.	Machine was turned off to stop leaking, mechanic was called to fix the hose and contaminants were absorbed with absorbent pad and they were picked up and brought to the proper container.
July 29, 2019	Diesel	50	L	Whale Tail Haul Road KM 126	Wiggins on fuel tank stayed stuck. Missing Wiggins fuel cap.	Contaminated soil picked up and sent to contaminated pad
July 30, 2019	Diesel	50	L	Main road beside transit	Zoom boom was transporting a tote of fuel and the cap popped off and some fuel fell on the ground	Spill was contained and contaminated soil picked up and disposed of appropriately
August 1, 2019	Hydraulic Oil	30	L	5151MSW93	O-Ring failure	Equipment stopped and mechanic called for repair. Pick up the spill and brought to the yellow bin behind maintenance shop
August 8, 2019	Hydraulic Oil	18	L	Orbit Garant garage	Equipment was parked for few months at the Orbit Garant garage and released hydraulic oil	Contaminated soil picked up and disposed of appropriately
August 12, 2019	Coolant	10	L	Maintenance Shop	Coolant hose failure	Spill was contained and contaminated soil picked up and disposed of

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
						appropriately.
August 15, 2019	Hydraulic Oil	4	L	Whale Tail	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
August 15, 2019	Diesel	1	L	Whale Tail	Fuel tank breather malfunctioned	Spill was contained and contaminated soil picked up and disposed of appropriately
August 15, 2019	Hydraulic oil	10	L	Waste Rock Storage	Hydraulic hose failure	Spill was contained and contaminated soil picked up and disposed of appropriately
August 16, 2019	Diesel	40	L	By Road 7, near Nemo road	Tank has been filled up to its maximum capacity and fuel expanded with the temperature.	Spill was contained and contaminated soil picked up and disposed of appropriately
August 29, 2019	Hydraulic Oil	20	L	Muck Pad	Hydraulic rig failure	Contaminated soil picked up and disposed of appropriately
August 31, 2019	Diesel	60	L	Road 07	Broken attachment on fuel tank	Contaminated soil picked up and disposed of appropriately
September 3, 2019	Hydraulic Oil	60	L	Quarry 2	Loose fitting on the hydraulic line	Contaminated soil picked up and disposed of appropriately
September 4, 2019	Coolant	60	L	Whale Tail Pit	Coolant hose failure	Put absorbent pads, call mechanic and call loader to pick up spill. Contaminated soil picked up and disposed of appropriately
September 8, 2019	Hydraulic Oil	50	L	Whale Tale pit / Lake Bed	Hydraulic hose failure	The operator notice the leak right away and stopped the excavator. Contaminated material and soil picked up and disposed off appropriately
September 10, 2019	Coolant	86	L	Whale Tail Haul Road KM 154 to 157	Broken clamp on a rubber elbow of cooler	Water/Coolant absorbent pad were put on the spill. The contaminated soil was removed using a loader and will be disposed properly.
September 11, 2019	Hydraulic Oil	40	L	Whale Tail Pit South	Hydraulic hose failure	Stop machine immediately and identify situation. Contaminated soil picked up and disposed of appropriately
September 12, 2019	Diesel	50	L	Pump shack by Quarry 1	Spill in front of fuel tank	Cleaned spill with a shovel and disposed adequately of the contaminated material
September 16, 2019	Hydraulic Oil	25	L	Whale Tail Pit	Hydraulic hose failure	Stop excavator and reported right away to supervisor. Contaminated soil picked up and disposed of appropriately
September 17, 2019	Hydraulic Oil	80	L	Whale Tail Pit	Hydraulic hose failure	Stopped the equipment right away and called the supervisor and mechanics. Contaminated soil picked up and disposed of appropriately
September 17, 2019	Hydraulic Oil	30	L	Whale Tail Pit	Hydraulic hose failure on engine pump	Stopped engine and call dispatch and mechanics. Contaminated soil picked up and disposed of appropriately
September 20, 2019	Diesel	4	L	WRSF	Carburetor over flow	Contaminated soil picked up and disposed of appropriately
September 25, 2019	Diesel	25	L	Whale Tail Dike	Fuel truck operator was fueling and splash back	Contaminated soil picked up and disposed of appropriately
October 2, 2019	Hydraulic Oil	3	L	Quarry 2	Hydraulic hose fitting failure	Contaminated soil picked up and disposed of appropriately

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
October 7, 2019	Coolant	30	L	WT WRSF	Coolant hose failure	Contaminated soil picked up and disposed of appropriately
October 14, 2019	Oil	15	L	Snow cat garage	Valve open when moving the tote	Close valve and put absorbent pad. Contaminated soil picked up and disposed of appropriately
October 15, 2019	Hydraulic Oil	20	L	WT WRSF	Hydraulic pipe failure	Contaminated soil picked up and disposed of appropriately.
October 16, 2019	Coolant	15	L	Truck Parking (New Camp)	Coolant leak on equipment	Engine was turned off and maintenance was advised for repair. Contaminated soil picked up and disposed of appropriately
October 16, 2019	Engine Oil	40	L	Haul Truck Parking Amaruq	Some oil come out by breather	Oil was picked up and disposed in the yellow bin at the shop.
October 18, 2019	Hydraulic Oil	10	L	Quarry 2	Hydraulic hose failure	Stop the engine right away and called the supervisor. Contaminated soil picked up and disposed of appropriately
October 20, 2019	Hydraulic Oil	30	L	Ring road	Hydraulic Hose failure	Stop the engine and called the supervisor. Contaminated soil picked up and disposed of appropriately
October 21, 2019	Hydraulic Oil	10	L	Ring road	Rock fall down on hydraulic hose.	Stop the engine and called dispatch for a mechanic. Contaminated soil picked up and disposed of appropriately
October 22, 2019	Diesel	80	L	Between maintenance and Warehouse	While an employee was driving unit (HTR 20), the tech clipped the fuel tank tearing it off the generator and dragging it 20 ft.	Contaminated soil picked up and disposed of appropriately.
October 23, 2019	Hydraulic Oil	5	L	Quarry 2	Rock fell on hydraulic hose	Stop the engine and called the dispatch for mechanic. Contaminated soil picked up and disposed of appropriately.
October 26, 2019	Hydraulic Oil	75	L	Whale Tail Pit	Hydraulic pilot line failure	A shovel was removed from the face and shut down. The spill was collected with a 980 loader and placed in the yellow contaminated soil bin by the underground shop.
October 27, 2019	Hydraulic Oil	3	L	WRSF waste dump	Hydraulic hose O-ring leak	The operator put the dozer out of the way and stop the engine right away. The operator called the dispatch for the mechanic. Contaminated soil picked up and disposed of appropriately.
October 27, 2019	Hydraulic Oil	45	L	Whale Tail Pit	Hydraulic hose failure	The operator stop the engine right away and called the dispatch for the mechanic. Contaminated soil picked up and disposed of appropriately.
October 27, 2019	Petroleum Product	10	L	Environment parking	Wrong priming pump installed	Stopped equipment and cleaned up the spill with the backhoe
October 30, 2019	Hydraulic Oil	80	L	Quarry 2	Hydraulic O-ring failure	Contaminated soil picked up and disposed of appropriately
November 1, 2019	Coolant	27	L	WTHR KM 128	Coolant pump hose failure	Absorbent pad were put on the ground. The contaminated soil was removed and disposed properly.
November 3, 2019	Hydraulic Oil	60	L	Quarry 2	Hydraulic hose failure	Contaminated soil picked up and disposed of appropriately

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
November 6, 2019	Hydraulic Oil	5	L	Maintenance shop	Hydraulic pipe failure	Truck brought to mechanical shop for repair. Contaminated soil picked up and disposed of appropriately
November 11, 2019	DEF Diesel	2	L	Fuel Farm Inspection Pad	Arriving at Amaruq, the driver parked LHT 08 by the Fuel Farm area to perform his inspection. Approaching the DEF tank, employee saw some DEF leaking. By the time he tried to identify the location the leak had stopped.	Contaminated soil picked up and disposed of appropriately
November 11, 2019	Hydraulic Oil	10	L	WTHR KM 165	Drive shaft between the transmission and the transfer case had failed and damaged some air lines. The transfer case yoke was broken couldn't hold the oil anymore.	Absorbent pads and booms were put in place to control the spill. Contaminated soil picked up and disposed of appropriately
November 13, 2019	Hydraulic Oil	75	L	Pattern 5144MSW92 AMQ	Hydraulic hose O-ring failure	Mechanic was called to repair the O-ring. Contaminated soil picked up and disposed in the yellow bin behind the shop.
November 14, 2019	Hydraulic Oil	80	L	WRSF	Hydraulic hose failure	Stop equipment and contain the spill . Contaminated soil picked up and disposed of appropriately
November 14, 2019	Diesel	60	L	WTHR KM 151	Equipment flipped on its side witch caused fuel leaking by the breather	Plastic bag was put on the breather to contained fuel leaking. Contaminated soil picked up and disposed of appropriately
November 15, 2019	Hydraulic Oil	70	L	WTHR	Hydraulic hose failure	Stop equipment to contain the spill. Contaminated soil picked up and disposed of in the yellow bin at old shop
November 16, 2019	Transmission Oil	30	L	WTHR KM 150	Transmission filter broken because equipment flipped on its side	Stopped equipment. Contaminated soil picked up and disposed of appropriately
November 19, 2019	Hydraulic Oil	20	L	Phase 1 Ramp	O-ring failure	Stop equipment to contain the spill. Contaminated soil picked up and disposed of in the yellow bin at old shop
November 19, 2019	Diesel	85	L	Fuel farm	Refueling nozzle defective	Contaminated soil picked up and disposed of appropriately
November 20, 2019	Hydraulic oil	30	L	Road 24	Drain plate on transmission broken	Contaminated soil picked up and disposed of appropriately
November 21, 2019	Coolant	25	L	Quarry 2	Coolant radiator cap failure	Contaminated soil picked up and disposed of appropriately
November 23, 2019	Hydraulic oil	75	L	Quarry 2	Hydraulic hose cylinder failure	Contaminated soil picked up and disposed of appropriately. Contaminated soil picked up and disposed of appropriately
November 24, 2019	Turbine Oil	5	L	Whale Tail Dike	A fitting broke on a hose of air compressor	The air compressor was stopped. Contaminated soil and absorbent pads were collected and disposed of properly.
November 28, 2019	Hydraulic Oil	2	L	WRSF	Hydraulic hose failure	Operator called for a mechanic. Contaminated soil picked up and disposed of appropriately

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
November 30, 2019	Hydraulic Oil	10	L	Top lift WRSF	Hydraulic hose failure	The operator immediately shut the equipment down to prevent more spillage.
December 1, 2019	Coolant	30	L	Quarry 2	Coolant hose failure	The operator parked the truck, shut the truck down and called dispatch to report that the truck was down. Maintenance was called to fix the truck. Spill was contained and contaminated soil picked up and disposed of appropriately
December 1, 2019	Hydraulic Oil	40	L	Whale Tail Pit	During routine loading operations, the operator noticed a spray of hydraulic oil in his window	Operator stopped the truck, and put absorbing materials to contain the spill. Maintenance was called to repair the equipment.. Spill was contained and contaminated soil picked up and disposed of appropriately
December 2, 2019	Hydraulic Oil	30	L	Whale Tail Pit	Hydraulic system worn out part	Equipment was repaired. Spill was contained and contaminated soil picked up and disposed of appropriately
December 4, 2019	Diesel	80	L	Fuel Farm Amaruq	During refuelling operation, the ground cable unclipped from the truck and stopped the pump. The operator clipped the ground cable back on the truck. When the pump started, the pressure lifted the fuel filler pipe out the truck top of the fuel truck. The fuel truck operator then put the filler pipe back into the fuel truck tank to stop the spill.	Placed socks around the spill and spill pads to contain the fuel. Spill was contained and contaminated soil picked up and disposed of appropriately
December 6, 2019	Engine Oil	20	L	Waste Dump	Engine failure	Stopped the equipment and put some absorbent material on the spill. Contaminated soil picked up and disposed of appropriately
December 7, 2019	Engine Oil	2	L	Sana Crusher 3/4" STP	Engine oil leak	Shut off engine and call mechanic for repair. Contaminated soil picked up and disposed of appropriately
December 10, 2019	Hydraulic Oil	10	L	Whale Tail Haul Road KM 154	Operator saw some oil leaking from the nose of the equipment.	Operator inspected the leaking area, couldn't identify the origin but identify hydraulic oil. Reported to dispatcher and requested mechanics. Put a few absorbent pads to contain the spill. Contaminated soil picked up and disposed of appropriately
December 14, 2019	Coolant	10	L	Whale Tail Haul Road KM 150	Faulty radiator cap caused coolant to spill out	Radiator cap was replaced. Contaminated soil picked up and disposed of appropriately
December 15, 2019	Hydraulic Oil	75	L	Haul truck parking	Tote of oil came out a sea can while moving it	Stopped the leak from the tote and brought the contaminated material into the yellow bin. Asked the supervisor to dispose of the tote appropriately at the Hazmat area
December 21, 2019	Coolant	2	L	Camp	Coolant system failure	Contaminated snow picked up and disposed of adequately
December 23, 2019	Diesel	20	L	WT pit washroom parking	Fuel cap failure	Contaminated soil picked up and disposed of appropriately

Date of Spill	Hazardous Material	Quantity	Units (L / Kg)	Location	Cause of spill	Clean-up action taken
December 26, 2019	Hydraulic Oil	80	L	Whale Tail Pit	Hydraulic hose failure	Equipment was shut down, absorbent pads were placed on the spill and a mechanic was called. Spill was contained and contaminated soil picked up and disposed of appropriately
December 26, 2019	Diesel	15	L	Quarry	Fuel truck was refueling the drill and the fuel started to leak through the vent breather on the tank.	Fueling was stopped and mechanic was called right away. Spill was immediately cleaned up and placed in a contaminated soil roll-off bin
December 28, 2019	Coolant	8	L	Whale Tail Haul Road KM 166	Radiator leak	Truck brought to shop for repairs. Contaminated soil picked up and disposed of appropriately

7.2 LANDFARM MEADOWBANK

The complete 2019 Landfarm Report is provided in Appendix 33. A summary of activities is provided here.

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 constructed a new landfarm (Landfarm 2) in 2016, in order to continue the treatment of contaminated soil. Landfarm 2 is located on the north east side of the South Tailing Cell, north of the Central Dike and contaminated soil were disposed in Landfarm 2 since 2017. In 2019, the Landfarm 1 area became flooded by reclaim water and is not active anymore. No soil were added to the Landfarm 1 since the end of 2016, and thus only Landfarm 2 ("the landfarm") is in operation.

Based on surveys conducted by Meadowbank's Engineering Department, it is estimated that between January 1st, 2019 and January 17th, 2020, 1,225 m^3 of soil were added to Landfarm 2 from excavation of spills around the Meadowbank and Whale Tail sites. The remaining estimated capacity of the landfarm is 7,329 m^3.

No landfarm soil sampling was conducted in 2019, and no material was removed from the landfarm. A summary of historical sample results for years in which sampling was conducted (2014 – 2016) is provided in Table 7-6. No fine material was sampled in 2017, 2018, and 2019. Since landfarm additions and removals occurred each year, piles were mixed, and sampling locations are not consistent, year-over-year trends were not assessed.

Visual inspections (33 times) in 2019 indicated that the landfarm berm and pad appear to be structurally intact, and no maintenance was required. No ponded water or seepage from the landfarm area was observed, so no water quality monitoring was required.

Nutrient additions in the form of sewage sludge occurred in August, 2019, as detailed in the LDMP. Total volume of these additions was not recorded. Except to mix the nutrient amendment into the biopiles, no additional aeration was performed in 2019.

NRC conducted chemical and microbiological analyses of soil samples from the landfarm in October, 2017. Recommendations for enhancing biodegradation rates were made (specific nutrient amendment), which will be assessed for feasibility in 2020.

The majority of material deposited in the Landfarm was generated through the clean-up of spills at the Meadowbank and Whale Tail site with additional material generated from spills occurring in Baker Lake locations and along the AWAR/WTHR. A summary of spills occurring in 2019 including those sent to the landfarm are provided in Table 7-2 to 7-5.

Table 7-6 Meadowbank Landfarm historical PHC degradation 2014 – 2016. Government of Nunavut soil quality criteria for agricultural/wildlands and industrial areas, and results of landfarm soil analyses. *Sample locations do not necessarily correspond year-over-year. Samples exceeding GN Agricultural/Wildland criteria are shaded grey.

Year	Sample Name*	Parameter							
		Benzene	Toluene	Ethylbenzene	Xylene	F1	F2	F3	F4
Agricultural/ Wildland (mg/kg)>		**0.03**	**0.37**	**0.082**	**11**	**30**	**150**	**300**	**2800**
Industrial (mg/kg) >		**0.03**	**0.37**	**0.082**	**11**	**320**	**260**	**1700**	**3300**
2014	CSP-1A	-	-	-	-	<0.06	900	3500	650
	CSP-1B	-	-	-	-	<0.06	380	2200	460
	CSP-STP-2A	-	-	-	-	<0.06	590	2200	6400
	CSP-STP-2B	-	-	-	-	<0.06	450	2300	6600
	CSP-3	-	-	-	-	<0.06	25	110	<50
	CSP-4A	-	-	-	-	<0.06	480	3300	520
	CSP-4B	-	-	-	-	<0.06	51	1100	210
	CSP-5A	-	-	-	-	<0.06	51	2500	550
	CSP-5B	-	-	-	-	<0.06	460	5100	1000
	CSP-5C	-	-	-	-	<0.06	130	2100	540
	CSP-5D	-	-	-	-	<0.06	38	1400	360
	CSP-5E	-	-	-	-	<0.06	61	1900	450
	CSP-6	-	-	-	-	0.22	2300	610	57
	Average						**455**	**2178**	**1483**
2015	CSP-1a	<0.03	<0.06	<0.06	<0.06	<0.3	600	3200	490
	CSP-1b	<0.03	<0.06	<0.06	<0.06	<0.3	350	2300	380
	CSP-2a	<0.03	<0.06	<0.06	<0.06	<0.3	810	6200	2400
	CSP-2b	<0.03	<0.06	<0.06	<0.06	<0.3	5600	20000	3100
	CSP-3a	<0.03	<0.06	<0.06	<0.06	<0.3	670	4200	490
	CSP-3b	<0.03	<0.06	<0.06	<0.06	<0.3	920	3500	530
	CSP-4	<0.03	<0.06	<0.06	<0.06	<0.3	840	320	<50
	CSP-5a	<0.03	<0.06	<0.06	<0.06	<0.3	260	5200	720
	CSP-5b	<0.03	<0.06	<0.06	<0.06	<0.3	2000	13000	1600
	CSP-5c	<0.03	<0.06	<0.06	<0.06	<0.3	38	1500	350
	CSP-5d	<0.03	<0.06	<0.06	<0.06	<0.3	640	7300	1600
	CSP-6a	<0.03	<0.06	<0.06	<0.06	<0.3	<10	620	79
	CSP-6b	<0.03	<0.06	<0.06	<0.06	<0.3	200	1200	200
	Average						**1052**	**5496**	**1057**
2016	CSP-1a	<0.03	<0.06	<0.06	<0.06	<0.3	350	3000	530

Year	Sample Name*	Parameter							
		Benzene	**Toluene**	**Ethylbenzene**	**Xylene**	**F1**	**F2**	**F3**	**F4**
	CSP-1b	<0.03	<0.06	<0.06	<0.06	<0.3	240	2400	490
	CSP-1c	<0.03	<0.06	<0.06	<0.06	<0.3	840	5400	930
	CSP-2a	<0.03	<0.06	<0.06	<0.06	<0.3	470	3000	560
	CSP-2b	<0.03	<0.06	<0.06	<0.06	<0.3	560	5800	1200
	CSP-2c	<0.03	<0.06	<0.06	<0.06	<0.3	240	2200	400
	Average						**450**	**3633**	**685**

7.3 POSSIBLE ACCIDENT AND MALFUCTION 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 Gold Project management plans provided in Appendix 51 of the 2018 annual report and Appendix 34, 36, 37 and 38 of the 2019 Annual Report:

• Hazardous Materials Management Plan, Version 5, March 2020 (Appendix 36);

• Spill Contingency Plan, Version 10, February 2020 (Appendix 37);

• Emergency Response Plan, Version 14, January 2020 (Appendix 34);

• Oil Pollution Emergency Plan, Version 11, March 2020 (Appendix 38);

• OMS Manual for TSF, Version 9, February 2019;

• OMS Manual for the dewatering dikes, Version 8; February 2019.

Table 7-2 shows all spills that occurred on site, in Baker Lake and along the AWAR in 2019. Most spills were between 10L and 95L and were due to mechanical issues (for example - hydraulic hoses failure).

As per NIRB Recommendation 14 found in "*NIRB's 2014-2015 Annual Monitoring Report for the Meadowbank Gold Project and Board's Recommendation*": Condition 75 requires that the Proponent provide a complete list of possible accidents and malfunctions for various Project components which includes an assessment of the accident risk and mitigation developed in consultation with Elders and Meadowbank Gold Project – 2014 Annual Report potentially affected communities. Although it is unclear in the submitted management plans whether and how these were developed in consultation with Elders and potentially affected communities. The Board requested that Agnico provide within its 2014 annual reporting, further discussion as to how various management plans relating to accident risk and mitigation have been developed in consultation with Elders and potentially affected communities.

In the 2014 Annual Report, Agnico complied with most of this condition, including the provision of a list of possible accidents and malfunctions as contained in the Spill Contingency and Emergency Response Plans. 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.

Furthermore, Agnico has consulted, yearly, with Elder representation as part of the Baker Lake Liaison Committee. No significant spills occurred in 2019 and therefore possible accidents and malfunctions were not specifically discussed at the committee meetings in 2019. Although there were no concerns raised regarding this issue, Agnico did reassure the committee that the company would respond adequately to any spills occurring on the road. On August 20th, 2019, Agnico held an Open House in Baker Lake to provide an update of Agnico Eagle activities and review safety information. Included in the Open House was a review of Policies and Procedures of the All Weather Access Road from Baker Lake to the Meadowbank Mine site, as well as a reminder about Whale Tail Haul Road not being available for public use, to use marked snowmobile crossings and yield to heavy equipment. Agnico also discussed AWAR and WTHR use and safety at the May 23rd Baker Lake Community Liaison Committee meeting. Agnico Eagle also did Facebook posts on the AWAR procedure and the community can access the procedure via the website www.aemnunavut.ca/community/roads.

During this August 20th, 2019 held in Baker Lake, as part of the International Cyanide Management Code (ICMC), Agnico also discussed with the community the cyanide shipping and transportation along the AWAR. Notices have also been posted on social media and radio announcements.

To prevent and ensure accidents and malfunctions are dealt appropriately the following activities were held in 2019:

- Crisis management training were held at the Meadowbank site to test Agnico ability to respond to a crisis. Personnel from all departments participated in the crisis scenario. Also, training session regarding the role and responsibility were given to management people in 2019.

- A mock spill exercise was completed on September 22nd, 2019 at the Baker Lake Marshalling Facility. The scenario was during fuel transfer from the vessel to the Agnico's tanks, the manifold flange spill at the connection between the pipe and the transfer hose. Agnico Eagle's Environmental staff lead the exercise, which included Agnico supply chain and road dispatch representatives, on-shore vessel representative, Jana's vessel captain on duty and Intetek Contractor. 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 by found in Appendix L of the Spill Contingency Plan (Appendix 37).

SECTION 8. MONITORING

As required by NWB Water License 2AM-MEA1526 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-WTP1826 Schedule B, Item 16: ***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 projects in 2019, Agnico 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 sample collected under the Meadowbank Water Quality and Flow Monitoring Plan, trending was added starting in 2013 up to 2019. The same is also compiled for Whale Tail starting in 2018 up to 2019.

8.1 CORE RECEIVING ENVIRONMENT MONITORING PROGRAM (CREMP)

8.1.1 Meadowbank Site[*]

The CREMP 2019 report can be found in Appendix 35. Please take note that the following is just a summary of the CREMP report and Agnico will refer you to the whole report in Appendix 35 for an exhaustive comprehension of the program and results for 2019. Agnico will also refer the reader to Table ES-1 of the CREMP 2019 report for a summary of key finding with temporal and spatial trend assessment and annual CREMP results compared to FEIS prediction.

The CREMP focuses on identifying changes in water quality, sediment chemistry, and aquatic producers—both primary producers (phytoplankton) and secondary producers (benthic invertebrate community)—that may be associated with mine development activities. Changes are identified using a temporal/spatial trend assessment that includes applying quantitative decision criteria (i.e., early warning triggers and action thresholds) to facilitate making timely and objective management decisions and taking action. CREMP results are integrated annually into the Aquatic Ecosystem Monitoring Program (AEMP) for holistic environmental management and decision making.

<u>Meadowbank Study Lakes</u>

CREMP monitoring started in 2006 and in-water mine development started in 2008. Key mine development activities that could result in changes to the aquatic receiving environment include: East

[*] TSM- Biodiversity Conservation

Dike construction (2008), Bay-Goose Dike construction (2009-10), dewatering of both lakes and impoundments (2009-11, 2013, 2014), effluent discharge (2012 to present), and general site-related mining activities that mostly generate dust (e.g., rock crushing, blasting, ore and waste hauling; 2008 to present).

Key findings for 2019:

Water Quality

Full water quality monitoring (i.e., limnology and water chemistry) was completed in March, May, July, August, and September according to the monitoring strategy for the program. Limnology profiles were taken at the Near-Field (NF) areas—Third Portage Lake sampling areas, (TPN, TPE), Second Portage Lake (SP), and Wally Lake (WAL)—in the winter months when ice conditions were safe (January, February, November, and December), to verify the absence of anomalous changes in water quality (e.g., conductivity) attributable to site-related activities. Refer to map provided in the 2019 CREMP Report for location. Similar to previous years, statistically significant mine-related changes continue to be detected relative to baseline/reference conditions at one or more NF areas for alkalinity (TPE, SP); conductivity (TPN, TPE, SP, WAL); hardness (TPN, TPE, SP, WAL); major cations (i.e., calcium, potassium, magnesium, and sodium [TPN, TPE, SP, WAL]); silicon (SP); and total dissolved solids (TDS) (TPN, TPE, SP, WAL). In the absence of effects-based thresholds (e.g., CCME water quality criteria) for these parameters, their triggers were set at the 95th percentile of baseline data1. 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 2019 for any water quality parameters with CCME water quality guidelines, 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 2019 was considered low (i.e., less than 1x the CCME WQGs) and consistent with the original predictions. Routine water quality monitoring is recommended for 2020, to continue tracking the changes noted above

Sediment Chemistry

The 2019 program consisted of the routine grab sampling (particle size and total organic carbon [TOC]), metals, and organics analysis on the top 3–5 cm of sediment) and a follow-up targeted coring study on chromium at TPE; the next full sediment coring program, which is used to formally test for temporal changes, is scheduled for August 2020.

Grab sampling results, with the exception of chromium at TPE (see below), showed no mining-related temporal or spatial patterns.

Investigation of temporal trends in sediment chromium concentrations at TPE continued in 2019. Sediment chemistry from the 2017 coring program indicated chromium concentrations were trending higher, which prompted additional sediment coring investigations in 2018 and 2019. Natural sedimentation rates in these lakes are low, and the variability of reported chromium concentrations over the last few years suggests chromium concentrations can vary significantly over a small area. There is conclusive evidence that chromium has increased in the sediments at TPE relative to the baseline period; however, high annual variability in chromium concentrations observed between 2017 and 2019 suggests concentrations have stabilized. The ecological significance of these changes are discussed below in the Sediment Metals Bioavailability section below. Sediment coring is scheduled for 2020 and will further support interpretation of the temporal trends in chromium concentrations in TPE.

Phytoplankton Community

Phytoplankton community sampling was completed at the same time as the water chemistry sampling program in 2019. Based on before-after-control-impact (BACI) statistical analysis of the data, phytoplankton biomass was statistically significantly ($p<0.1$) higher at SP (80% increase) and WAL (57% increase) relative to reference/baseline conditions. The apparent increases appear to have more to do with lower biomass at INUG than higher biomass at SP or WAL. This is corroborated by nutrient concentrations in both lakes remaining well below levels associated with increased primary productivity. Further, the absolute biomass values at the NF are in line with their historical values. Considering these lines of evidence, there is no indication that mining operations are systematically increasing primary productivity in the NF areas. Phytoplankton richness was similar to previous monitoring cycles. The trends in phytoplankton biomass and richness will be reviewed again in 2020.

Benthos Community

The only statistically significant change to the benthic invertebrate community at Meadowbank identified by the 2019 BACI assessment was an apparent reduction in total abundance for the four-year (2016 to 2019 [42%; $p = 0.07$]) time period at TPE relative to baseline/reference conditions. That result, however, appears to be due mainly to particularly high abundance at INUG in recent years relative to its baseline years, rather than due to actual reductions at TPE. Absolute total abundance at TPE in 2019 (~2,500 organisms/m^2) was stable relative to the range of values dating back to 2012 (2,220–3,100 organisms/m^2) and was well within its baseline range. The regional increase in abundance assumed by the BACI model, based on the pattern at INUG, is not apparent at reference area PDL. Furthermore, there were no statistically significant changes in taxa richness. Richness at TPE has remained consistent throughout the monitoring period, indicating that mining activities are not adversely affecting the structure of the benthic invertebrate community. Collectively, these results suggest that the apparent reduction in total abundance at TPE is most likely an artefact of the BACI model, rather than a real ecological change to the benthic community.

Sediment Metals Bioavailability

The targeted study assessing the ecological significance of chromium increases in TPE continued in 2019. While the 2018 results showed limited toxicological effects midge larvae (*Chironomus dilutus*), which are the dominant invertebrates in the Meadowbank study lakes, they also showed substantial effects to amphipod (*Hyalella azteca*) survival and growth. While amphipods are not present in the Meadowbank study lakes, there are other taxa that could respond similarly. As the cause of the observed toxicity in 2018 could not be determined, further studies were conducted in 2019 to verify the toxicity results and to better characterize metals bioavailability. Bioavailability was assessed by measuring metals concentrations in sediment porewater to help determine if porewater chemistry is the probable cause of lower survival and growth for H. azteca. Key findings of these targeted bioavailability studies are:

1. *H. azteca* exposed to sediment from TPE for 14-d show reduced survival and growth compared to INUG and PDL field control groups. There was no evidence of corresponding effects to survival in the 10-d toxicity test with *C. dilutus*. Growth was statistically significant lower for chironomids exposed to sediment from TPE compared to the field control.

2. Chromium concentrations have increased in sediment at TPE, but there is no plausible evidence to suggest that chromium is the cause of effects to *H. azteca* survival. Sequential extraction test results in 2015 indicated chromium associated with sediment matrix (inorganic and organic

particles) is non-bioavailable; follow-up testing in 2018 was deemed unreliable due to data quality issues, which led to conducting the porewater analysis in 2019. Porewater chromium concentrations were less than concentrations reported at the reference area PDL.

3. Dissolved manganese in porewater is the likely cause of effects in the *Hyalella* tests in 2015, 2018, and 2019. Sediment manganese concentrations are naturally elevated and highly variable throughout the TPE study area. It's likely that porewater manganese is elevated in small discrete areas of TPE as a result of localized reducing conditions that favor dissociation of manganese oxides (MnO_2) in sediment to dissolved manganese in porewater.

4. The *H. azteca* toxicity test data provide important information about effects to sensitive aquatic invertebrate taxa, but the chironomid toxicity test results from 2015, 2018, and 2019 are more ecologically relevant for assessing potential risks to the benthos community at TPE. Over the three years of testing, chironomid sediment toxicity test results have substantiated the conclusions presented in the CREMP, namely, that there is no evidence to suggest the benthos community at TPE is being adversely affected by activities at the mine. The benthos community present in TPE has adapted to either tolerate elevated porewater manganese or avoid areas where manganese is elevated in porewater.

Results of the benthos community assessment and the targeted bioavailability studies at TPE clearly demonstrate that the increase in sediment chromium at TPE is not adversely affecting the benthos at TPE. No further targeted studies are recommended at this time other than annual monitoring of the benthos community as part of the routine CREMP.

Habitat Compensation Monitoring: Periphyton Community

Habitat Compensation Monitoring Program (HCMP) has tracked the development of attached algal communities (periphyton) on the faces of the East Dike habitat compensation feature (HCF; since 2009) and Bay-Goose Dike HCF (since 2011). From a community perspective, early-stage colonization was dominated by diatoms, followed by a shift to a more heterogeneous mix of cyanobacteria, diatoms, and to a lesser extent, chlorophyte taxa over the years to become more similar to local reference areas. The general trend in community biomass at the East Dike HCF has been increasing over the years, but it still approximately only a third of that seen at the reference area. Biomass accumulation is much slower at the Bay-Goose Dike HCF, with little increase observed since 2015. The next HCMP event is scheduled for 2021.

Baker Lake

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. Approximately double the usual number of barge shipments arrived at BPJ in 2018 to support construction activities for the Whale Tail Project. The number of barge shipments remained high in 2019. No spills of fuel or any other materials were reported in the vicinity of the barge dock or jetty in 2019.

Chemistry

Sampling was conducted at two near-field (BBD, BPJ) and one (BAP; water) or two (BAP, BES; sediment) areas situated along the north shore of Baker Lake in July, August, and September. The mean concentrations for ammonia (as N) and TKN exceeded their respective triggers at BBD and BPJ in 2019 compared with 2018 when no water quality parameters exceeded the triggers. The results from 2019 from the Meadowbank and Whale Tail study areas, including reference areas, indicated a region-wide increase in ammonia. The results from Baker Lake appear to support a natural increase, likely related to higher than normal precipitation in June and July 2019. Metals concentrations in sediment grab samples collected to support the benthos assessment were well within previously reported concentrations at the four locations. There was no evidence of any barge-related impacts to water quality or sediment chemistry at impact areas in Baker Lake. The trends in water and sediment chemistry will be monitored in 2020. Refer to map provided in the 2019 CREMP Report for location.

Biological Communities

The phytoplankton and benthos communities in Baker Lake have not exhibited any changes that are attributable to Agnico Eagle's activities in Baker Lake. No follow-up management actions are required for 2020 beyond routine monitoring.

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 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;

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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.***

And

As required by NWB Water License 2AM-WTP1826 Part I, Item 3: ***The Licensee shall submit for Board approval, at least ninety (90) days prior to Operations an updated CREMP. The Program shall include all comments provided during the technical review of Application and shall include a comparison of monitoring results for receiving waters to model predictions (including base case predictions) and to thresholds identified for management actions, should trends indicate water quality objectives may be exceeded.***

The CREMP 2015 Plan update – Whale Tail Addendum (May 2018) can be found in Appendix 51 of the 2018 Annual Report.

The CREMP 2019 report can be found in Appendix 35. Please take note that the following is just a summary of the CREMP report and Agnico will refer you to the whole report in Appendix 35 for an exhaustive comprehension of the program and results for 2019. Agnico will also refer the reader to Table ES-2 of the CREMP 2019 report for a summary of key finding with temporal and spatial trend assessment and annual CREMP results compared to FEIS prediction.

The Whale Tail Project was merged with the Meadowbank and Baker Lake CREMP reporting framework in 2018. Data analysis for Whale Tail study areas follows the same methods and framework as Meadowbank. Below are some of the important changes that occurred for the Whale Tail CREMP in 2019: Refer to 2019 CREMP Report for sampling location.

- WTS and MAM transitioned from control to impact in 2018 after the onset of construction activities on the Whale Tail Dike. The status of Lake A20, Lake A76, Lake DS1 switched to impact in January 2019, while Nemo Lake (NEM) transitioned in July 2019. Therefore, 2019 represents the first full year where most Whale Tail study area lakes were fully under an impact designation and potentially under the influence of mine activities.

- With the generation of a year of after data, 2019 was the first year that formal statistical analysis using the Before/After Control/Impact (BACI) framework at the Whale Tail study lakes. As usual, the statistical analyses were complemented with time-series plots to facilitate the visual exploration of temporal and spatial trends in chemistry parameters and biological metrics.

- Early warning triggers specific to the Whale Tail study lakes were derived in 2019 for water chemistry and sediment chemistry parameters.

- Water chemistry data (annual mean concentrations for each parameter) from Mammoth Lake were compared to water quality predictions in the Whale Tail FEIS.

Water Quality

The water quality monitoring program was completed with the Meadowbank water quality monitoring. Full water quality monitoring (i.e., limnology and water chemistry) was completed in March, May, July, August, and September according to the monitoring strategy for the program. Limnology profiles were taken at the NF areas (WTS, MAM, NEM) when ice conditions were safe in the winter months (January, February, November, and December), to verify there were no anomalous changes in water quality (e.g., conductivity) attributable to site-related activities.

Changes to baseline conditions were expected following the onset of construction activities for the project. The ultra-oligotrophic Whale Tail study lakes have a long ice cover season and tended to exhibit fairly stable conditions over the baseline sampling period. Consequently, the signal of development-related inputs was expected to be easily observed relative to the low noise levels of the baseline period in the time series plots used to characterize spatial-temporal trends in water quality.

Trigger and threshold values were developed for the Whale Tail study lakes in 2019 to help identify meaningful changes in water quality parameters. Changes were assessed by screening the yearly mean concentrations at each monitoring area against the newly developed trigger values; parameter/area combinations exceeding their respective trigger value were subject to formal BACI analysis to determine if the changes were statistically significant. Key results, including some parameters that increased but remained below their triggers, were as follows:

- Nutrients – increases in ammonia and TKN appeared to be related to regional trends, with elevated concentrations also occurring at the reference areas INUG and PDL. Nitrate and nitrite showed increases at MAM, WTS and NEM but remained below their triggers. Total phosphorous (TP), total organic carbon (TOC) and dissolved organic carbon (DOC) showed a statistically significant increases at WTS, likely the result of inputs from flooded terrestrial habitats following impoundment.

- Ionic Compounds – statistically significant increases above trigger values were observed at NF areas WTS and/or MAM for total alkalinity, conductivity, hardness, calcium, potassium, magnesium, sodium, and TDS. The statistically significant increases extended to MF area Lake A76 for calcium, potassium and magnesium.

- Metals/metalloids – statistically significant increases above trigger values were observed at NF areas WTS and/or MAM for total and dissolved lithium and for total titanium.

Similar to the results seen over the years at the Meadowbank study lakes, the trends identified above represent increases above baseline/reference conditions only; none of the analytes with statistically significant increases exceeding trigger values in 2019 have CCME effects-based guidelines for the protection of aquatic life. FEIS predictions for MAM were exceeded for TDS, lithium, and the ionic compounds calcium and magnesium. Despite early warning triggers and FEIS predictions being exceeded in 2019, the absolute concentrations of these parameters remain low and far lower than concentrations associated with adverse to aquatic life.

Routine water quality monitoring will continue in 2020 to track emerging spatial and temporal trends. Furthermore, additional monitoring targeting spatial-temporal trends in MAM will be initiated in early 2020 to better characterize ongoing changes in water quality in Mammoth Lake.

Phytoplankton Community

Phytoplankton taxonomy analyses were carried out with the water chemistry sampling program in 2019. Phytoplankton communities vary naturally throughout the year in total biomass (and density) and community composition (taxa richness). The primary, site-related stressors that have the potential to affect the phytoplankton community included nutrient loading and increased concentrations of metals. Nutrient loading can manifest as an increase in total biomass or a change in community structure, while increasing metals would be expected to cause lower biomass and taxa diversity.

Results for 2019 did not indicate a change to community structure (e.g., richness), which is a good indicator that there was no significant increase in the concentrations of metals at WTS and MAM (the lakes most likely to be impacted by mine activities). There was, however, a statistically significant apparent increase in biomass in WTS and a notable, but not statistically significant, increase in MAM. While biomass at WTS (peaked at 1,117 mg/m^3 in August) and MAM (peaked at 660 mg/m^3 in September) were 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 appear due to the combined influence of natural variability and mining-related activities.

Increased nutrient loading is the most likely explanation for increased primary productivity at WTS and MAM. The changes in primary productivity at WTS were likely caused by nutrients (e.g., total phosphorous) in flooded soil leaching into the water column as the water level increased in the south basin of Whale Tail Lake as a result of the impoundment of the north basin and the subsequent disruption in flow regime. Interestingly, these changes did not extent to Lake A20 although it too was flooded and connected to Whale Tail Lake. The spike in phytoplankton biomass seen in August at WTS had diminished substantially by September. In addition, the increases seen at MAM did not appear to extend down the watershed to Lake A76.

Trends in phytoplankton biomass and richness will continue to be assessed using the BACI framework in 2020.

Sediment Chemistry

Trigger values were derived for the Whale Tail study area lakes in 2019. Lakes in the Whale Tail study area have naturally high concentrations of some metals. During baseline period, arsenic, cadmium, chromium, copper, and zinc exceeded the CCME interim sediment quality guideline in at least one sample collected. Of these five metals, arsenic is particularly enriched in sediments throughout the study area lakes, with most samples exceeding the CCME probable effect level sediment quality guideline. The newly derived trigger values were provided as lake-specific triggers to acknowledge the natural, between-lake variability in some metals.

Changes in sediment chemistry data are evaluated on a three-year cycle as part of the sediment coring program (timing coincides with the EEM cycle). Coring is scheduled for August 2020. No statistical analysis was completed on sediment chemistry in 2019; however, sediment chemistry data from grab samples were screened against trigger values and, where applicable, threshold values. Concentrations measured in the various lakes in 2019 were comparable to results reported in previous annual monitoring reports. Furthermore, there was no evidence of upwards trends for metals with effects-based thresholds.

Routine sediment grab sampling for TOC, grain size, and hydrocarbons is recommended in 2020 to support the benthos community assessment. Sediment coring is planned for 2020 to assess potential changes in sediment metals concentrations.

<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). Benthos communities in these lakes have, by virtue of their presence, adapted to the naturally elevated concentrations of some metals in sediment. 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). The typical number of taxa identified among the various study areas is 10 to 15. The range observed in 2019 was slightly lower in WTS than 2018 but within the range of baseline conditions. All other study areas were also comparable with baseline conditions. The comparatively high taxa richness, combined with no apparent change in abundance, demonstrates that mine activities did not alter the structure or function of the benthos community in 2019.

Routine monitoring of the benthos community is recommended in 2020.

8.2 METHYLMERCURY STUDIES WHALE TAIL SITE*

As required by NWB Water License 2AM-WTP1826 Part I, Item 5: ***The Licensee shall submit to the Board for approval and implementation, within sixty (60) days of the approval of the Licence by the Minister, a Mercury Monitoring Studies Program. The Program shall include all comments and recommendations provided during the technical review of Application.***

And

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 CREMP Addendum - Appendix A: Mercury Monitoring Plan for Whale Tail South Area (Version 1) was initially submitted for NWB approval on July 2018. In November 2018, NWB approved the monitoring plan and requested an updated version as part of the 2018 Annual Report to address ECCC concerns. The CREMP Addendum - Appendix A: Mercury Monitoring Plan for Whale Tail South Area (Version 2, March 2019) can be found in Appendix 51 of the 2018 Annual Report and intents to address all ECCC concerns included in the letter '*2AM-WTP1826 – Agnico Eagle Mines Ltd. – Whale Tail Project – AEM Response to ECCC comments on the Mercury Monitoring Plan*' dated October 24th, 2018.

During construction and operation of Whale Tail Pit, the diversion of Whale Tail Lake will cause flooding in the Whale Tail Lake sub-watershed, potentially resulting in increased concentrations of mercury in water and biota.

The Mercury Monitoring Plan (MMP) was developed to define the sampling methods and data evaluation that will are used to assess impacts of the Project on concentrations of mercury in the Whale Tail South flooded area. The 2019 MMP report presents 2019 (i.e., post-impoundment) data for surface water and

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bulk sediment, a more detailed discussion is planned for 2020, coinciding with the first year of fish chemistry data from the after period.

The MMP includes analysis of mercury and methylmercury concentrations in surface water, sediment, and fish tissue for locations impacted by flooding, as well as reference locations. Measured concentrations of mercury are compared to FEIS predictions to understand whether impacts of the project were accurately identified. Refer to Section 12.4.1.2 for FEIS comparison available in 2019.

The 2019 Whale Tail Mercury Monitoring Report can be found in Appendix L of the 2019 CREMP Report (Appendix 35). Below is a summary of the major finding. Agnico will refer to the attached report for a complete review and interpretation of the results.

The scope of the 2019 MMP was limited to surface water and sediment. Lake trout captured from the north basin of Whale Tail during the fish-out in August and September 2018 were analyzed for total mercury in February 2020. Moving forward, large-bodied fish tissue sampling for the MMP will be synchronized with the EEM Biological Monitoring program which is next scheduled for 2020. Small-bodied fish tissue sampling also occurred in 2018 with approximately 30 to 50 slimy sculpin (*Cottus cognatus*) caught and preserved for mercury analysis for each of the following lakes: Whale Tail Lake – South Basin, Mammoth Lake, A20, A65, A63, Lake 8. These samples are currently archived and will be analyzed with the fish captured for MMP in 2020.

Benthic invertebrates and zooplankton were sampled during the baseline period; under the MMP, additional sampling of these media are only planned if impact assessment predictions are exceeded.

Locations of soil sampling in 2016 (baseline year) are now flooded and categorized as sediment sampling locations.

Dike construction was completed by early July 2018 and only minor flooding would have been expected by August of that year. By August 2019, flooding was extensive within the impoundment, resulting in connectivity between Whale Tail Lake south basin and lakes A20, A63 and A65. However, at that time, the diversion channel to Mammoth Lake was not operational, so there would not have been any connectivity to the downstream lakes.

Monthly mercury water quality data collected in March, May, July, August, and September as part of the routine CREMP water quality program from are reported in the main CREMP report (see figures and tables in Appendix B2 of the CREMP report (Appendix 35). Routine mercury water quality data were collected and analyzed according to established SOPs for the CREMP. The 2019 results appear somewhat anomalous for both total mercury and methylmercury. For total mercury, results jumped from around 0.5 ng/L or lower to nearly 20 ng/L across all stations. While less pronounced, similar changes were observed for methylmercury, but less consistently across stations. Assuming that data quality objectives have been met (see Section L.3.2 Appendix 35), the observed results suggest the possibility of either the a regional climate-influenced change in mercury concentrations in 2019 (e.g., due to higher rainfall and associated runoff to all lakes) or of some other influence on data quality. At the time of this report, Azimuth is currently working with Agnico Eagle, the lab (Biotron) and researchers at the University of Waterloo about the accuracy of the 2019 results.

Sediment chemistry collected for the MMP show that total mercury in sediment at WTS is below CCME's (2020b) interim sediment quality guidelines (ISQGs) and probable effect level (PEL) in all sediment grab and core samples collected between 2016 and 2019. Further, there was no observed change in sediment total mercury concentrations, which is not unexpected given that the sampling focused on locations that were inundated prior to impoundment. Methylmercury concentrations at WTS in 2019 ranged between less than DL (0.0005 mg/kg) and 0.00072 mg/kg. These results are consistent with baseline data from 2016, when methylmercury concentrations measured between 0.00033 and 0.00061 mg/kg. The 2019 mercury concentrations in sediment grabs from WTS are similar to baseline conditions prior to flooding activities in 2018. Sediment coring planned for 2020 should also include locations within the flood zone to allow spatial comparison between flooded and original substrates within the impoundment.

Fish sampling was completed in 2018 from the North Basin of Whale Tail Lake. Lake trout, Arctic char, and round whitefish were captured during the fish-out, and a select number of each fish species were retained for baseline characterization of metals concentrations in muscle tissue. Additional fish collections were completed at Lake A8 in 2018 to characterize baseline mercury concentrations in fish from a reference lake located closer to the Project than INUG and PDL, the two existing reference areas for the CREMP. Lake trout caught from Whale Tail Lake during the baseline period in 2015 were larger on average than fish captured during the baseline fish-out in 2018. Consequently, given the known strong relationship between fish size and tissue mercury concentrations, little emphasis should be placed on the mean mercury concentrations reported in Table L5-1 of Appendix 35. Once the 2020 post-impoundment data are available a quantitative assessment of size-mercury relationships will be conducted for all data to remove the size bias noted above.

Finally, the current Mercury Monitoring Plan (Version 2, 2019) does not specifically propose to assess risk to human health from consumption of fish residing in the Project-area lakes on an ongoing basis. Azimuth (2017) modeled expected concentrations in fish tissue, and addressed impacts of increased mercury concentrations in fish on Health Canada's recommended consumption rates. Further risk-based analyses will be implemented in the event that monitoring results exceed model predictions for fish tissue concentrations. This approach is supported by the low rates of fishing by local residents in the Project area (see FEIS Volume 7, Section 7.3), and a no-fishing policy for workers while onsite.

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, 3 and 6 illustrate the location of sampling stations at the Meadowbank mine site, EEM receiving environment monitoring program, the Vault Site, and Baker Lake marshalling facilities, respectively.

8.3.1.1 *Portage Attenuation Pond Discharge*

On November 19, 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 5th, 2014. In 2019, Agnico 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 is not reporting MDMER and EEM results any longer, starting 2019, in the new MERS system.

8.3.1.2 *Vault Attenuation Pond Discharge*

The Vault Discharge became subject to the MDMER on June 27th, 2013 during the dewatering of Vault Lake. There has been no further effluent discharge from the Vault Attenuation Pond to Wally Lake since October 2017. Therefore, sampling station ST-10, also named ST-MMER-2 were no used in 2019. There is currently no plans to have a discharge in 2020.

8.3.1.3 *East Dike Discharge*

The East Dike Seepage Discharge became subject to the MDMER on January 6th, 2014. In 2019, Agnico 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 15th, 2016, the request was approved by ECCC. Agnico 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 15th, 2016, ECCC approved the Agnico Eagle's request. The reduced frequency has started on October 1st, 2016. 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), from January 1st to January 14th, January 20th to January 25th, March 10th to March 30th and from November 13th to December 31st, 2019. On January 14th, the pipe has frozen and thus the discharge was stopped. Agnico noticed TSS results trending up after the restart of the East Dike Discharge on January 20th, therefore the discharge to Second Portage Lake was preventively stopped, the task was complete January 25th and diverted all water to the pits, as done in the past. Agnico had continued to monitor TSS and have restarted the discharge to Second Portage Lake on March 10th. East Dike Seepage discharge was stopped on March 30th and diverted back to the Pit, as all the water was accumulated in the pits. However, with the freezing period observed in September, it was determined that water will need to be diverted back to Second Portage Lake to avoid health and safety risk in accessing the pits that were not initially expected. Discharge to environment have restarted in November. The total volume discharged in 2019 was 33,026 m^3. There was no exceedance of the TSS MDMER/Water License limit in 2019.

One (1) non-compliance with the MDMER regulation were observed in 2019:

- No sample was collected at the East Dike Discharge Effluent sample for the week of January 13th to January 19th, 2019 as required by MDMER Division 2 Section 12(1). Due to unexpected event related to cold temperature, the discharge pipe had frozen around 03:30 on January 14th, 2019. No regulatory sample were taken on January 13th as the 14th was the planned sampling date. Corrective work was undertaken to thaw the discharge pipe, but Agnico was not able to thaw it by the end of January 19th, thus preventing Agnico from taking the weekly sample. The last sample collected from East Dike final discharge point was on January 7th. The Total Suspended Solids (TSS) result was 2 mg/L and was below the authorized limit discharge as per Schedule 4. The discharge to the receiving environment was restarted on January 20th around 15h30 and the next regulatory sample was collected on January 22nd, 2019. ECCC Inspector was notified on January 22nd, 2019 by email.

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.

Under the Environmental Effects Monitoring (EEM) program, Agnico was required in 2019 to collect sub-lethal toxicity samples at this discharge point. In 2019, there was only one discharge to the receiving environment. For this reason, the East Dike discharge (ST-MMER-3) is the mine's final discharge point that has potentially the most adverse environmental impact on the environment as per Schedule 5 Section 5. Two (2) 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 March 18th and November 25th, 2019. 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 2019 East Dike MDMER Monitoring

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
January											
January 2, 2019	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.71	NMR	NMR
January 7, 2019	< 0.0005	< 0.0005	0.002	< 0.0003	< 0.0005	< 0.001	2	< 0.0020	7.24	0	0
January 14, 2019	NA	NA	NA	NA	NA	NA	NA	NA	NA	NMR	NMR
January 22, 2019	NMR	NMR	NMR	NMR	NMR	NMR	25	NMR	8.44	NMR	NMR
February											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
March											
March 12, 2019	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	7.82	NMR	NMR
March 18, 2019	0.0006	0.0010	0.003	< 0.0003	< 0.0005	< 0.001	3	< 0.002	7.85	0	0
March 25, 2019	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	7.89	NMR	NMR
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
May											
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
July											
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
September											
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
November											
November 13, 2019	0.0011	0.0020	0.001	< 0.0003	0.0008	0.006	2	< 0.002	7.84	NMR	NMR
November 18, 2019	0.0019	0.0010	0.003	< 0.0003	0.0006	0.002	< 1	0.009	7.59	0	0
November 25, 2019	0.0025	0.0026	0.001	0.0069	0.0010	0.016	2	< 0.002	8.04	NMR	NMR

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
December											
December 2, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.80	NMR	NMR
December 9, 2019	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.67	NMR	NMR
December 16, 2019	0.0017	0.0015	< 0.001	< 0.0003	< 0.0005	0.004	4	< 0.002	7.50	0	0
December 23, 2019	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.74	NMR	NMR
December 28, 2019	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.93	NMR	NMR

Table 8-2 Meadowbank 2019 East Dike MDMER Volume

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
1	347	0	0	0	0	0	0	0	0	0	0	381	
2	347	0	0	0	0	0	0	0	0	0	0	404	
3	345	0	0	0	0	0	0	0	0	0	0	415	
4	344	0	0	0	0	0	0	0	0	0	0	410	
5	339	0	0	0	0	0	0	0	0	0	0	412	
6	342	0	0	0	0	0	0	0	0	0	0	415	
7	342	0	0	0	0	0	0	0	0	0	0	420	
8	341	0	0	0	0	0	0	0	0	0	0	412	
9	340	0	0	0	0	0	0	0	0	0	0	421	
10	339	0	140	0	0	0	0	0	0	0	0	428	
11	340	0	302	0	0	0	0	0	0	0	0	416	
12	339	0	308	0	0	0	0	0	0	0	0	420	
13	339	0	309	0	0	0	0	0	0	0	448	416	
14	69	0	310	0	0	0	0	0	0	0	432	417	
15	0	0	307	0	0	0	0	0	0	0	432	402	
16	0	0	307	0	0	0	0	0	0	0	416	407	
17	0	0	312	0	0	0	0	0	0	0	421	395	
18	0	0	313	0	0	0	0	0	0	0	423	398	
19	0	0	313	0	0	0	0	0	0	0	395	405	
20	54	0	310	0	0	0	0	0	0	0	393	396	
21	393	0	311	0	0	0	0	0	0	0	395	370	
22	655	0	315	0	0	0	0	0	0	0	401	404	
23	518	0	316	0	0	0	0	0	0	0	390	419	
24	361	0	311	0	0	0	0	0	0	0	389	390	
25	162	0	317	0	0	0	0	0	0	0	380	367	
26	0	0	320	0	0	0	0	0	0	0	390	422	
27	0	0	315	0	0	0	0	0	0	0	381	448	
28	0	0	321	0	0	0	0	0	0	0	382	461	
29	0		321	0	0	0	0	0	0	0	390	468	
30	0		215	0	0	0	0	0	0	0	381	458	
31	0		0		0		0	0		0		441	
Total (m^3)	**6,657**	**0**	**6,294**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**7,239**	**12,837**	**33,026**

Table 8-3 Meadowbank 2019 East Dike EEM Monitoring

	Ammonia	Alkalinity	Al	Cd	Cl	Cr	Co	Hardness	Fe	Mn	Hg	Mo	Nitrate	P	Se	Sulphate	Tl	U	Conductivity	T°	Sub-Lethal Toxicity			
	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/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)																								
January 7, 2019	<0.01	29	0.027	<0.00002	0.9	0.0006	<0.0005	27	0.02	<0.0005	<0.00001	<0.0005	0.04	0.01	<0.0005	7.9	<0.0002	<0.001	93.9	7.20	NMR	NMR	NMR	NMR
March 18, 2019	<0.01	39	0.031	<0.00002	1.5	<0.0006	<0.0005	36	0.04	0.0009	<0.00001	<0.0005	<0.01	<0.01	<0.0005	12.4	<0.0002	<0.001	87.0	4.50	Without SE and Without AL	Without SE and Without AL	Without SE	Without SE
November 18, 2019	0.13	22	0.023	<0.00002	0.8	0.0006	<0.0005	28	0.02	0.0007	<0.00001	<0.0005	0.04	<0.01	<0.0005	7.6	<0.0002	<0.001	78.5	6.50	NMR	NMR	NMR	NMR
November 25, 2019	<0.01	23	0.02	<0.00002	0.8	<0.0006	<0.0005	29	0.07	<0.0005	<0.00001	<0.0005	0.06	0.01	<0.0005	9.7	<0.0002	<0.001	82.5	7.70	Without SE and Without AL	Without SE and Without AL	With SE	Without SE
December 23, 2019	0.01	28	0.039	<0.00002	0.8	0.0007	<0.0005	30	0.02	0.001	<0.00001	<0.0005	0.04	<0.01	<0.0005	7.1	<0.0002	<0.001	78.9	8.40	NMR	NMR	NMR	NMR
December 28, 2019	0.01	30	0.023	<0.00002	0.9	0.0024	<0.0005	35	0.02	<0.0005	<0.00001	<0.0005	<0.01	<0.01	<0.0005	6	<0.0002	<0.001	78.3	7.30	NMR	NMR	NMR	NMR
Annual Average Concentration											**0.000005**				**0.00025**									

SE: Sub-Lethal effects
AL: Acute Lethality
NMR: No measure requirement

	Ammonia	Alkalinity	Al	Cd	Cl	Cr	Co	Hardness	Fe	Mn	Hg	Mo	Nitrate	P	Se	Sulphate	Tl	U	Conductivity	T°	pH	O_2	O_2	As	Cu	CN	Pb	Ni	Ra226	TSS	Zn
	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/L	mg/L	mg/L	mg/L	mg/L	µS/cm	°C		%	mg/L	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)																															
January 6, 2019	<0.01	17	<0.005	<0.00002	0.9	0.0008	<0.0005	16	<0.01	<0.0005	<0.00001	<0.0005	<0.01	<0.01	<0.0005	6.7	<0.0002	<0.001	20.9	1.55	7.83	NA	15.96	<0.0005	<0.0005	<0.001	<0.0003	<0.0005	NA	6	<0.001
March 12, 2019	<0.01	22	<0.005	<0.00002	1.3	<0.0006	<0.0005	16	<0.01	0.0006	<0.00001	<0.0005	<0.01	<0.01	<0.0005	6.8	<0.0002	<0.001	51.3	1.39	8.04	NA	17.54	<0.0005	<0.0005	<0.001	<0.0003	<0.0005	NA	1	<0.001
November 14, 2019	0.02	12	<0.005	<0.00002	0.9	<0.0006	<0.0005	17	0.04	0.0009	<0.00001	<0.0005	0.05	<0.01	<0.0005	6.7	<0.0002	<0.001	37.6	1.20	7.21	116.8	16.23	0.0016	0.0008	0.001	<0.0003	0.0006	<0.002	3	0.001
December 15, 2019	0.02	19	<0.005	<0.00002	0.9	<0.0006	<0.0005	15	0.05	<0.0005	<0.00001	<0.0005	<0.01	0.01	<0.0005	7.1	<0.0002	<0.001	40.3	1.25	6.76	110	15.53	0.0006	0.0007	0.001	<0.0003	0.0018	<0.002	<1	<0.001
Water Quality Monitoring Reference Area (65°58'10.90'' N 96°09'51.37'' W) (ST-MMER-1-EEM-TPS)																															
January 6, 2019	0.01	12	<0.005	<0.00002	0.7	<0.0006	<0.0005	9	<0.01	<0.0005	<0.00001	<0.0005	<0.01	<0.01	<0.0005	6.1	<0.0002	<0.001	15.3	0.53	7.35	125.9	17.89	<0.0005	<0.0005	<0.001	<0.0003	<0.0005	NA	16	<0.001
March 12, 2019	<0.01	16	<0.005	<0.00002	1.0	<0.0006	<0.0005	10	<0.01	<0.0005	<0.00001	<0.0005	<0.01	<0.01	<0.0005	7.8	<0.0002	<0.001	36.7	0.61	6.82	135.6	19.12	<0.0005	<0.0005	<0.001	<0.0003	<0.0005	NA	<1	<0.001
November 13, 2019	0.02	9	<0.005	<0.00002	0.8	<0.0006	<0.0005	11	0.02	0.0007	<0.00001	<0.0005	<0.01	<0.01	<0.0005	4.9	<0.0002	<0.001	27.4	0.78	7.28	113.3	15.98	0.0023	<0.0005	<0.001	<0.0003	0.0006	<0.002	<1	0.001
December 15, 2019	0.02	16	<0.005	<0.00002	0.7	0.0009	<0.0005	10	0.08	<0.0005	<0.00001	<0.0005	<0.01	<0.01	<0.0005	4.5	<0.0002	<0.001	30.9	0.82	7.45	117.1	16.79	0.0011	<0.0005	<0.001	<0.0003	<0.0005	0.005	1	<0.001

8.3.2 Whale Tail Site

8.3.2.1 *Whale Tail North Construction Discharge*

During the in-water portion of the Whale Tail Dike Construction, Agnico had discharged an effluent from the construction dewatering activities. The Whale Tail Site became subject to the MDMER on July 27th, 2018. The final discharge point Whale Tail North Basin (ST-MDMER-4) was in operation between July 27th to August 10th and between August 14th to August 27th 2018. The sample was taken from the Water Treatment Plan prior to the release on the tundra, which flows onto a natural boulder field at the edge of the Whale Tail Lake North Basin (receiving environment). In 2019, Agnico 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. This discharge was not in operation and no water was discharged from this location into Whale Tail Lake North Basin since August 27th, 2018.

8.3.2.2 *Whale Tail North Dewatering Phase 1 Discharge*

During the dewatering of the Whale Tail North Basin, a new FDP was created in 2019 - ST-MDMER-5 WT North Basin Dewatering Phase 1. This FDP was subject to MDMER on March 5th, 2019. Whale Tail North Basin dewatering water is pumped and discharged to Whale Tail Lake South Basin without water treatment and via submerged diffuser to control erosion and disturbance to bottom sediments. The final discharge point (FDP) is located at the merge ‘Y’ of the pipe near the shore of Whale Tail South Basin. On September 19th, 2019, Agnico Eagle provided to ECCC a notification of modification for this FDP. The modification only consisted of moving the intake closer to the Whale Tail Dike (WTD) to capture clean seepage water and sent it back to Whale Tail South (WTS) in our approved FDP. When water quality was below the MDMER limits, water was discharged back to WTS without any treatment. When water needed to be treated for TSS, water was processed via the Water Treatment Plan (WTP) and then sent back to Whale Tail South. This discharge is still active. The final discharge point ST-MDMER-5 WT North Basin Dewatering Phase 1 was in operation from March 5th to April 9th, May 3rd to May 17th, May 24th to May 29th, July 9th to July 18th, October 4th to November 2nd, November 7th to December 31st, 2019. The total volume discharged in 2019 was 3,085,651 m^3. Discharge monitoring samples are provided in Table 8-4.

Two (2) non-compliance with the MDMER regulation Section 12 were observed in 2019:

- Whale Tail North Basin dewatering water was first sampled on May 29th, 2019 at 9am as required by the Water License 2AM-WTP1826. At 9:50 am, an other water sample was taken as required by the MDMER regulations. The discharge was already planned to be stopped during the day of May 29th. At 10am the pumps were shut down and remain inactive for the rest of the month. On June 6th, 2019 Agnico Eagle was reviewing preliminary results and noted that the level of TSS at ST-MDMER-5 discharge was at 30 mg/L for the sample taken at 9am and 88 mg/L for the one taken at 9:50 am on May 29th. Result on May 29th, 2019 exceeded the MDMER Schedule 4 TSS maximum authorized concentration in a grab sample (30 mg/L). ECCC Inspector was advised of the effluent non-compliance on June 6th, 2019.

- Whale Tail North Basin dewatering water was sampled on October 10th, 2019 at 17 pm as required by the Water License 2AM-WTP1826. Results from the external laboratory were received and showed TSS result at 91 mg/L. The station was sampled again on the 11th at 6:50am and the result was 1 mg/L. Previous day's result (October 9th) showed TSS to be at 1 mg/L. As a preventive measure, internal sampling frequency were increased. Result on October

10th, 2019 exceeded the MDMER Schedule 4 TSS maximum authorized concentration in a grab sample (30 mg/L). ECCC Inspector was advised of the effluent non-compliance on October 23rd, 2019.

The volume of water discharged to the environment was reported on a weekly basis pursuant to the MDMER monitoring program requirements. Table 8-5 provides a daily breakdown of volumes of water pumped.

The water quality samples were taken from the discharge location (ST-MDMER-5), the receiving environment exposure area (ST-MDMER-5-EEM-WTSE) 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

Table 8-4 Whale Tail North Dewatering Phase 1 2019 MDMER Monitoring

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
January											
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
March											
March 6, 2019	< 0.0005	0.0022	0.001	< 0.0003	0.0028	0.004	< 1	< 0.002	6.57	NMR	NMR
March 11, 2019	0.0018	0.0014	< 0.001	0.002	0.0031	0.003	4	0.006	6.84	0	10
March 18, 2019	0.0022	0.0166	0.001	< 0.0003	0.0035	< 0.001	< 1	0.013	6.84	NMR	NMR
March 25, 2019	0.0021	0.0039	0.014	< 0.0003	0.0027	< 0.001	4	0.020	6.86	NMR	NMR
April											
April 1, 2019	0.0028	0.0062	0.002	< 0.0003	0.0037	0.006	< 1	0.011	6.69	0	0
April 2, 2019	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	6.47	NMR	NMR
April 3, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	6.81	NMR	NMR
April 4, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	6.48	NMR	NMR
April 5, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	6.71	NMR	NMR
April 6, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	6.58	NMR	NMR
April 7, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	6.50	NMR	NMR
April 8, 2019	0.0036	0.0075	< 0.001	< 0.0003	0.0040	0.007	2	0.004	6.53	NMR	NMR
May											
May 4, 2019	0.0026	0.001	0.004	< 0.0003	0.0040	< 0.001	5	0.015	6.58	NMR	NMR
May 5, 2019	NMR	NMR	NMR	NMR	NMR	NMR	9	NMR	6.82	NMR	NMR
May 6, 2019	0.0029	0.0187	0.013	< 0.0003	0.0050	0.004	9	0.010	6.34	0	0
May 7, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	6.90	NMR	NMR
May 8, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	6.77	NMR	NMR
May 9, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	6.93	NMR	NMR
May 10, 2019	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	6.88	NMR	NMR
May 11, 2019	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	6.78	NMR	NMR
May 12, 2019	0.0074	0.0199	< 0.001	0.003	0.0051	0.014	6	0.021	6.63	NMR	NMR
May 13, 2019	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	6.63	NMR	NMR
May 14, 2019	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	6.72	NMR	NMR

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
May 15, 2019	NMR	NMR	NMR	NMR	NMR	NMR	11	NMR	6.74	NMR	NMR
May 16, 2019	NMR	NMR	NMR	NMR	NMR	NMR	9	NMR	6.87	NMR	NMR
May 17, 2019	NMR	NMR	NMR	NMR	NMR	NMR	12	NMR	6.68	NMR	NMR
May 24, 2019	0.0042	< 0.0005	< 0.001	< 0.0003	0.0042	< 0.001	18	0.018	6.91	NMR	NMR
May 25, 2019	NMR	NMR	NMR	NMR	NMR	NMR	9	NMR	7.30	NMR	NMR
May 26, 2019	NMR	NMR	NMR	NMR	NMR	NMR	11	NMR	6.80	NMR	NMR
May 27, 2019	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	6.79	NMR	NMR
May 28, 2019	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	7.01	NMR	NMR
May 29, 2019	0.0115	0.0062	0.001	0.0005	0.0131	0.015	88	0.025	7.15	NMR	NMR
June											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
July											
July 9, 2019	0.0006	0.0010	0.001	< 0.0003	0.0032	< 0.001	5	< 0.002	7.36	NMR	NMR
July 10, 2019	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	6.70	NMR	NMR
July 11, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	6.84	NMR	NMR
July 12, 2019	NMR	NMR	NMR	NMR	NMR	NMR	10	NMR	6.66	NMR	NMR
July 13, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	6.22	NMR	NMR
July 14, 2019	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	7.28	NMR	NMR
July 15, 2019	0.0042	0.0012	< 0.001	< 0.0003	0.0034	< 0.001	1	NA	7.05	NMR	NMR
July 16, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	6.72	NMR	NMR
July 17, 2019	0.0042	0.0007	< 0.001	< 0.0003	0.0030	< 0.001	10	0.011	6.60	0	0
July 18, 2019	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	6.85	NMR	NMR
August											
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
October											
October 4, 2019	0.0084	0.0013	0.001	< 0.0005	< 0.002	< 0.007	10	0.007	7.35	NMR	NMR
October 5, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.74	NMR	NMR
October 6, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.80	NMR	NMR
October 7, 2019	0.0083	0.0013	< 0.001	< 0.0005	< 0.002	< 0.007	3	< 0.002	7.62	0	0
October 8, 2019	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	7.54	NMR	NMR

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
October 9, 2019	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	7.78	NMR	NMR
October 10, 2019	NMR	NMR	NMR	NMR	NMR	NMR	91	NMR	7.53	NMR	NMR
October 11, 2019	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	7.36	NMR	NMR
October 12, 2019	NMR	NMR	NMR	NMR	NMR	NMR	11	NMR	7.43	NMR	NMR
October 13, 2019	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	7.67	NMR	NMR
October 14, 2019	0.0105	0.0013	< 0.001	< 0.0003	0.0015	< 0.001	4	< 0.002	7.44	NMR	NMR
October 15, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.79	NMR	NMR
October 16, 2019	NMR	NMR	NMR	NMR	NMR	NMR	9	NMR	7.24	NMR	NMR
October 17, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.34	NMR	NMR
October 18, 2019	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	7.85	NMR	NMR
October 19, 2019	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	7.41	NMR	NMR
October 20, 2019	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	7.68	NMR	NMR
October 21, 2019	0.0085	0.0012	< 0.001	< 0.0003	0.0013	< 0.001	1	0.010	7.68	NMR	NMR
October 22, 2019	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	7.07	NMR	NMR
October 23, 2019	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	7.89	0	0
October 24, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.68	NMR	NMR
October 25, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.34	NMR	NMR
October 26, 2019	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	7.39	NMR	NMR
October 27, 2019	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	7.89	NMR	NMR
October 28, 2019	0.0094	0.0012	< 0.001	< 0.0003	0.002	< 0.001	12	< 0.002	7.36	NMR	NMR
October 29, 2019	NMR	NMR	NMR	NMR	NMR	NMR	26	NMR	7.32	0	0
October 30, 2019	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	7.35	NMR	NMR
October 31, 2019	NMR	NMR	NMR	NMR	NMR	NMR	11	NMR	7.51	NMR	NMR
November											
November 1, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.59	NMR	NMR
November 2, 2019	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	7.37	NMR	NMR
November 7, 2019	NMR	NMR	NMR	NMR	NMR	NMR	17	NMR	7.16	NMR	NMR
November 8, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.77	NMR	NMR
November 9, 2019	0.0089	0.0047	< 0.001	< 0.0003	0.0033	0.004	5	0.008	7.19	NMR	NMR
November 10, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.31	NMR	NMR
November 11, 2019	0.0102	0.0024	0.001	0.0006	0.0033	0.01	9	< 0.002	6.90	0	0
November 12, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.18	NMR	NMR

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
November 13, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.08	NMR	NMR
November 14, 2019	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	6.31	NMR	NMR
November 15, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	6.88	NMR	NMR
November 16, 2019	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	6.89	NMR	NMR
November 17, 2019	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	7.30	NMR	NMR
November 18, 2019	0.0039	0.0008	0.001	< 0.0003	0.0033	0.011	3	0.009	6.97	NMR	NMR
November 19, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	6.90	NMR	NMR
November 20, 2019	NMR	NMR	NMR	NMR	NMR	NMR	9	NMR	7.17	NMR	NMR
November 21, 2019	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	6.75	NMR	NMR
November 22, 2019	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	6.86	NMR	NMR
November 23, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	6.86	NMR	NMR
November 24, 2019	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	6.80	NMR	NMR
November 25, 2019	0.0048	0.0009	0.001	< 0.0003	0.0033	< 0.001	1	0.012	6.90	NMR	NMR
November 26, 2019	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	6.57	NMR	NMR
November 27, 2019	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	6.80	NMR	NMR
November 28, 2019	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	6.87	NMR	NMR
November 29, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.10	NMR	NMR
November 30, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.03	NMR	NMR
December											
December 1, 2019	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.07	NMR	NMR
December 2, 2019	0.0024	0.0005	0.007	< 0.0003	0.0026	0.004	2	0.012	7.12	10	0
December 3, 2019	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	6.73	NMR	NMR
December 4, 2019	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	7.40	NMR	NMR
December 5, 2019	NMR	NMR	NMR	NMR	NMR	NMR	9	NMR	7.28	NMR	NMR
December 6, 2019	NMR	NMR	NMR	NMR	NMR	NMR	9	NMR	7.10	NMR	NMR
December 7, 2019	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	7.42	NMR	NMR
December 8, 2019	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	7.62	NMR	NMR
December 9, 2019	0.0027	< 0.0005	< 0.001	< 0.0003	0.0022	0.007	8	0.014	7.05	NMR	NMR
December 10, 2019	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	7.06	NMR	NMR
December 11, 2019	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	7.20	NMR	NMR
December 12, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.00	NMR	NMR
December 13, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	6.93	NMR	NMR

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
December 14, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	6.79	NMR	NMR
December 15, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	6.97	NMR	NMR
December 16, 2019	0.0018	0.0008	< 0.001	< 0.0003	0.0023	0.007	3	0.008	7.47	NMR	NMR
December 17, 2019	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	7.42	NMR	NMR
December 19, 2019	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.72	NMR	NMR
December 20, 2019	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	6.73	NMR	NMR
December 21, 2019	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.03	NMR	NMR
December 22, 2019	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	6.97	NMR	NMR
December 23, 2019	0.0039	< 0.0005	0.001	< 0.0003	0.0029	0.007	< 1	< 0.002	6.96	NMR	NMR
December 24, 2019	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	6.60	NMR	NMR
December 25, 2019	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	7.29	NMR	NMR
December 26, 2019	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	7.13	NMR	NMR
December 27, 2019	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.29	NMR	NMR
December 28, 2019	0.0033	< 0.0005	0.001	< 0.0003	0.0035	0.008	< 1	0.002	6.95	NMR	NMR
December 29, 2019	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.05	NMR	NMR
December 30, 2019	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	7.11	NMR	NMR
December 31, 2019	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	7.09	NMR	NMR

Grey highlighted cell refer to regulatory limits exceeded

Table 8-5 Whale Tail North Dewatering Phase 1 2019 MDMER Volume

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
1	0	0	0	36,686	0	0	0	0	0	0	6,033	15,117	
2	0	0	0	37,715	0	0	0	0	0	0	6,033	15,074	
3	0	0	0	37,298	20,173	0	0	0	0	0	0	15,060	
4	0	0	0	37,324	9,384	0	0	0	0	4,299	0	14,870	
5	0	0	2,745	30,048	25,999	0	0	0	0	7,211	0	14,807	
6	0	0	25,834	36,810	27,971	0	0	0	0	6,794	0	14,663	
7	0	0	35,685	36,507	38,872	0	0	0	0	7,080	11,666	11,386	
8	0	0	38,696	36,723	38,703	0	0	0	0	6,917	20,002	9,767	
9	0	0	38,187	7,534	38,922	0	6,157	0	0	6,966	20,376	9,876	
10	0	0	37,407	0	38,691	0	25,411	0	0	7,021	20,794	11,457	
11	0	0	39,751	0	38,587	0	26,155	0	0	7,711	20,735	12,573	
12	0	0	36,379	0	38,467	0	38,438	0	0	7,089	20,662	12,063	
13	0	0	39,524	0	38,441	0	29,932	0	0	5,290	20,642	12,280	
14	0	0	40,741	0	43,383	0	27,505	0	0	4,969	20,654	12,235	
15	0	0	43,570	0	31,554	0	10,445	0	0	6,906	20,547	10,982	
16	0	0	51,721	0	43,966	0	18,784	0	0	6,730	20,384	12,091	
17	0	0	53,569	0	27,350	0	16,100	0	0	7,051	13,912	11,896	
18	0	0	53,697	0	0	0	8,400	0	0	6,876	13,790	11,009	
19	0	0	55,932	0	0	0	0	0	0	7,034	12,347	10,752	
20	0	0	41,130	0	0	0	0	0	0	6,566	11,391	10,154	
21	0	0	37,974	0	0	0	0	0	0	6,840	11,578	9,836	
22	0	0	32,513	0	0	0	0	0	0	6,931	11,767	9,702	
23	0	0	39,287	0	0	0	0	0	0	6,790	12,770	9,479	
24	0	0	39,750	0	7,173	0	0	0	0	9,272	14,506	9,437	
25	0	0	35,280	0	11,821	0	0	0	0	4,040	14,633	9,540	
26	0	0	36,054	0	14,996	0	0	0	0	6,521	14,887	9,215	
27	0	0	36,481	0	17,683	0	0	0	0	7,607	15,062	9,167	
28	0	0	38,590	0	25,954	0	0	0	0	5,609	14,897	9,765	
29	0		38,924	0	20,513	0	0	0	0	6,192	14,936	9,350	
30	0		38,837	0	0	0	0	0	0	7,073	12,746	9,724	
31	0		37,708		0		0	0		6,845		9,804	
Total (m^3)	**0**	**0**	**1,045,966**	**296,645**	**598,603**	**0**	**207,328**	**0**	**0**	**186,230**	**397,748**	**353,131**	**3,085,651**

Table 8-6 Whale Tail North Dewatering Phase 1 2019 EEM Monitoring

	Ammonia	Alkalinity	Al	Cd	Cl	Cr	Co	Hardness	Fe	Mn	Hg	Mo	Nitrate	P	Se	Sulphate	Tl	U	Conductivity	T°	Sub-Lethal Toxicity			
	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/L	mg/L	mg/L	mg/L	mg/L	µS/cm	°C	*Ceriodaphnia dubia*	*Fathead minnow*	*Lemna minor*	*Pseudokirchneriella subcapitata*
Effluent characterization (65°23'51.30''N 96°40'49.00''W) (ST-MDMER-5-EEM)																								
March 11, 2019	0.15	23	0.078	<0.00002	57.5	0.0018	<0.0005	82	0.17	0.0508	<0.00001	0.0017	<0.01	0.01	<0.0005	3.0	<0.0002	<0.001	267.3	6.84	NMR	NMR	NMR	NMR
May 6, 2019	0.16	34	0.081	0.00004	50.3	0.0021	0.0007	81	0.61	0.2117	0.00002	0.0017	0.86	0.02	<0.0005	7.7	<0.0002	<0.001	272.0	1.50	NMR	NMR	NMR	NMR
July 17, 2019	0.04	8	0.087	<0.00002	34.0	0.0019	<0.0005	51	0.36	0.1161	<0.00001	0.0015	0.34	0.06	<0.0005	3.7	<0.0002	<0.001	202.8	13.79	NMR	NMR	NMR	NMR
October 7, 2019	0.02	27	0.100	<0.00002	12.7	<0.005	<0.001	35	0.28	0.042	<0.0001	0.0017	0.62	<0.01	<0.003	4.2	<0.002	<0.001	113.5	6.20	NMR	NMR	NMR	NMR
December 2, 2019	0.17	24	<0.005	<0.00002	33	0.0015	0.0008	72	0.36	0.4008	<0.00001	0.0017	0.11	0.01	<0.0005	16.9	<0.0002	<0.001	217.8	3.95	NMR	NMR	NMR	NMR
Annual Average Concentration											**0.000017**				**0.0005**									

NMR: No measure requirement

	Ammonia	Alkalinity	Al	Cd	Cl	Cr	Co	Hardness	Fe	Mn	Hg	Mo	Nitrate	P	Se	Sulphate	Tl	U	Conductivity	T°	pH	O_2	O_2	As	Cu	CN	Pb	Ni	Ra226	TSS	Zn
	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/L	mg/L	mg/L	mg/L	mg/L	µS/cm	°C		%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Bq/L	mg/L	mg/L
Water Quality Monitoring Exposure Area (65°23'49.08'' N 96°40'58.00''W) (ST-MDMER-5-EEM-WTSE)																															
March 11, 2019	0.04	19	0.029	0.00004	21.1	0.0006	<0.0005	34	0.04	0.0118	<0.00001	<0.0005	<0.01	0.01	<0.0005	8.0	<0.0002	<0.001	99.7	1.28	6.82	NA	16.25	<0.0005	0.0005	<0.001	<0.0003	0.0012	<0.002	<1	0.001
May 5, 2019	100	19	<0.005	0.00003	23.2	<0.0006	<0.0005	40	0.08	0.0104	0.00001	<0.0005	0.29	0.02	0.0009	11.3	<0.0002	<0.001	119.1	0.91	7.08	NA	15.28	0.0005	0.0009	0.005	<0.0003	0.0020	0.007	4	<0.001
July 17, 2019	<0.01	7	<0.005	<0.00002	16.8	0.0012	<0.0005	26	0.05	0.0189	<0.00001	<0.0005	0.11	<0.01	<0.0005	1.6	<0.0002	<0.001	109.3	13.5	6.97	102.2	10.4	0.0006	<0.0005	<0.001	<0.0003	0.0012	0.007	8	<0.001
November 13, 2019	0.03	11	0.023	<0.00002	12.4	0.0009	<0.0005	27	0.11	0.0188	<0.00001	<0.0005	0.1	<0.01	<0.0005	1.4	<0.0002	<0.001	76.3	1.71	7.35	92	12.9	0.0022	0.0008	0.001	<0.0003	0.0020	<0.002	3	0.003
December 16, 2019	0.05	22	0.029	<0.00002	15.7	0.0010	<0.0005	32	0.02	0.0559	<0.00001	0.0005	<0.01	<0.01	<0.0005	3.3	<0.0002	<0.001	99.8	0.72	6.97	92.6	13.22	0.0010	0.0008	<0.001	<0.0003	0.0023	<0.002	5	0.002
Water Quality Monitoring Reference Area (65°58'10.90'' N 96°09'51.37'' W) (ST-EEM-TPS)																															
March 12, 2019	<0.01	16	<0.005	<0.00002	1.0	<0.0006	<0.0005	10	<0.01	<0.0005	<0.00001	<0.0005	<0.01	<0.01	<0.0005	7.8	<0.0002	<0.001	36.7	0.61	6.82	135.6	19.12	<0.0005	<0.0005	<0.001	<0.0003	<0.0005	NA	<1	<0.001
May 6, 2019	<0.01	14	<0.005	<0.00002	1.2	<0.0006	<0.0005	6	<0.01	<0.0005	<0.00001	<0.0005	0.01	<0.01	<0.0005	4.8	<0.0002	<0.001	33.7	0.86	6.90	NA	14.94	0.0019	<0.0005	0.001	<0.0003	<0.0005	0.003	1	<0.001
July 17, 2019	0.02	7	<0.005	<0.00002	0.6	0.0008	<0.0005	6	<0.01	<0.0005	<0.00001	<0.0005	0.01	<0.01	<0.0005	2	<0.0002	<0.001	25.8	4.00	6.68	110.0	14.15	<0.0005	<0.0005	<0.001	<0.0003	<0.0005	<0.002	1	<0.001
November 13, 2019	0.02	9	<0.005	<0.00002	0.8	<0.0006	<0.0005	11	0.02	0.0007	<0.00001	<0.0005	<0.01	<0.01	<0.0005	4.9	<0.0002	<0.001	27.4	0.78	7.28	113.3	15.98	0.0023	<0.0005	<0.001	<0.0003	0.0006	<0.002	<1	0.001
December 15, 2019	0.02	16	<0.005	<0.00002	0.7	0.0009	<0.0005	10	0.08	<0.0005	<0.00001	<0.0005	<0.01	<0.01	<0.0005	4.5	<0.0002	<0.001	30.9	0.82	7.45	117.1	16.79	0.0011	<0.0005	<0.001	<0.0003	<0.0005	0.005	1	<0.001

8.3.2.3 *Whale Tail North Dewatering Phase 2 Discharge*

During the Phase 2 dewatering of the Whale Tail North Basin, a new FDP was created in 2019 - ST-MDMER-6 WT North Basin Dewatering Phase 2. 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 Plan and discharged back in Mammoth Lake via a submerged diffuser to control erosion and disturbance to bottom sediments. The final discharge point ST-MDMER-6 WT North Basin Dewatering Phase 2 was in operation on June 17th, from June 22nd to July 8th, July 13th to August 3rd, August 5th to September 28th and from October 2nd to October 26th. The total volume discharged in 2019 was 2,915,472 m^3. Discharge monitoring samples are provided in Table 8-7. No non-compliance with the MDMER regulation Section 12 and 13 were observed in 2019.

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

Sublethal toxicity samples are collected directly after the effluent characterization samples, from the ST-MDMER-6 WT North Basin Dewatering Phase 2. In 2019, this discharge is the one that has potentially the most adverse environmental impact on the environment as per Schedule 5 Section 5. Agnico had determined this discharge is potentially the most deleterious as the loading of deleterious substance contained in the effluent, as determined under subsection 20(2), were higher than the other ST-MDMER-5 WT North Basin Dewatering Phase 1 and ST-MDMER-7 discharges. Also, the receiving environment Mammoth Lake is a smaller lake and it was assume that the manner in which the effluent mixes within the exposure area will be less performant compare to the discharge of STMDMER- 5 in Whale Tail South Basin. In 2019, two (2) sub-lethal toxicity samples were collected from this FDP in compliance with Schedule 5 Section 6.

The water quality samples were taken from the discharge location (ST-MDMER-6), the receiving environment exposure area (ST-MDMER-6-EEM-MAME) 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 8-7 Whale Tail North Dewatering Phase 2 2019 MDMER Monitoring

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
January											
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
March											
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
May											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
June											
June 17, 2019	NA	NA	NA	NA	NA	NA	NA	NA	6.66	0	0
June 22, 2019	< 0.0005	< 0.0005	0.001	< 0.0003	0.0043	0.023	2	0.016	6.60	NMR	NMR
June 23, 2019	< 0.0005	< 0.0005	0.001	< 0.0003	0.0044	0.008	10	0.027	6.44	NMR	NMR
June 24, 2019	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	6.42	NMR	NMR
June 25, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	6.74	NMR	NMR
June 26, 2019	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	6.60	NMR	NMR
June 27, 2019	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	6.65	NMR	NMR
June 30, 2019	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	6.56	NMR	NMR
July											
July 8, 2019	0.0007	< 0.0005	< 0.001	< 0.0003	0.0019	< 0.001	6	0.007	6.53	NMR	NMR
July 13, 2019	0.0040	0.0011	< 0.001	0.0093	0.0034	0.183	11	NA	6.66	NMR	NMR
July 14, 2019	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	7.27	NMR	NMR
July 15, 2019	0.0039	< 0.0005	< 0.001	< 0.0003	0.0032	< 0.001	6	< 0.002	6.91	0	0
July 16, 2019	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	6.79	NMR	NMR
July 17, 2019	NMR	NMR	NMR	NMR	NMR	NMR	11	NMR	6.79	NMR	NMR
July 18, 2019	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	6.72	NMR	NMR
July 19, 2019	0.0035	0.0020	< 0.001	< 0.0003	0.0032	0.003	6	0.012	6.90	NMR	NMR
July 20, 2019	0.0023	0.0009	0.002	< 0.0003	0.0047	0.003	4	0.016	7.07	NMR	NMR
July 21, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	6.82	NMR	NMR

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
July 22, 2019	0.0025	0.0029	0.002	< 0.0003	0.0037	0.020	6	0.012	6.83	NMR	NMR
July 23, 2019	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	7.23	NMR	NMR
July 24, 2019	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	6.67	NMR	NMR
July 25, 2019	NMR	NMR	NMR	NMR	NMR	NMR	9	NMR	7.10	NMR	NMR
July 26, 2019	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	7.13	NMR	NMR
July 27, 2019	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	7.05	NMR	NMR
July 28, 2019	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	6.93	NMR	NMR
July 29, 2019	0.0039	0.0035	0.004	< 0.0003	0.0054	0.012	6	0.014	6.90	NMR	NMR
July 30, 2019	NMR	NMR	NMR	NMR	NMR	NMR	10	NMR	7.00	NMR	NMR
July 31, 2019	NMR	NMR	NMR	NMR	NMR	NMR	10	NMR	6.93	NMR	NMR
August											
August 1, 2019	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	6.80	NMR	NMR
August 2, 2019	NMR	NMR	NMR	NMR	NMR	NMR	9	NMR	7.31	NMR	NMR
August 3, 2019	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	6.60	NMR	NMR
August 5, 2019	0.0053	0.0011	< 0.001	< 0.0003	0.0043	< 0.001	10	0.011	6.80	0	0
August 6, 2019	NMR	NMR	NMR	NMR	NMR	NMR	14	NMR	6.96	NMR	NMR
August 7, 2019	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	6.67	NMR	NMR
August 8, 2019	NMR	NMR	NMR	NMR	NMR	NMR	9	NMR	6.74	NMR	NMR
August 9, 2019	NMR	NMR	NMR	NMR	NMR	NMR	9	NMR	7.03	NMR	NMR
August 10, 2019	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	7.19	NMR	NMR
August 11, 2019	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	6.88	NMR	NMR
August 12, 2019	0.0041	0.0024	< 0.001	< 0.0003	0.0023	< 0.001	6	0.007	7.37	NMR	NMR
August 13, 2019	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	6.99	NMR	NMR
August 14, 2019	NMR	NMR	NMR	NMR	NMR	NMR	9	NMR	6.73	NMR	NMR
August 15, 2019	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	6.59	NMR	NMR
August 16, 2019	NMR	NMR	NMR	NMR	NMR	NMR	10	NMR	6.55	NMR	NMR
August 17, 2019	NMR	NMR	NMR	NMR	NMR	NMR	21	NMR	6.64	NMR	NMR
August 18, 2019	NMR	NMR	NMR	NMR	NMR	NMR	30	NMR	6.65	NMR	NMR
August 19, 2019	0.0019	0.0012	< 0.001	< 0.0003	0.0025	0.012	3	0.005	6.54	NMR	NMR
August 20, 2019	NMR	NMR	NMR	NMR	NMR	NMR	15	NMR	6.65	NMR	NMR
August 21, 2019	NMR	NMR	NMR	NMR	NMR	NMR	14	NMR	7.36	NMR	NMR
August 22, 2019	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	7.25	NMR	NMR
August 24, 2019	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	6.92	NMR	NMR

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
August 25, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.35	NMR	NMR
August 26, 2019	0.0026	0.0015	< 0.001	< 0.0003	0.0051	< 0.001	4	< 0.002	7.19	NMR	NMR
August 27, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.25	NMR	NMR
August 28, 2019	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	7.50	NMR	NMR
August 29, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.54	NMR	NMR
August 30, 2019	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	7.46	NMR	NMR
September											
September 1, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.19	NMR	NMR
September 2, 2019	0.0016	0.0010	< 0.001	< 0.0003	0.0027	0.006	5	0.006	6.86	0	0
September 3, 2019	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	7.26	NMR	NMR
September 4, 2019	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	7.31	NMR	NMR
September 5, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.08	NMR	NMR
September 6, 2019	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	7.15	NMR	NMR
September 7, 2019	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	6.31	NMR	NMR
September 8, 2019	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	7.08	NMR	NMR
September 9, 2019	0.0034	0.0011	< 0.001	< 0.0003	0.0018	0.005	8	0.013	6.83	NMR	NMR
September 10, 2019	NMR	NMR	NMR	NMR	NMR	NMR	16	NMR	7.43	NMR	NMR
September 11, 2019	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	7.26	NMR	NMR
September 13, 2019	NMR	NMR	NMR	NMR	NMR	NMR	11	NMR	6.44	NMR	NMR
September 14, 2019	NMR	NMR	NMR	NMR	NMR	NMR	15	NMR	7.27	NMR	NMR
September 15, 2019	NMR	NMR	NMR	NMR	NMR	NMR	14	NMR	7.16	NMR	NMR
September 16, 2019	NMR	NMR	NMR	NMR	NMR	NMR	18	NMR	7.01	NMR	NMR
September 17, 2019	0.0078	0.0018	0.001	< 0.0003	0.0026	< 0.001	20	0.015	7.41	NMR	NMR
September 18, 2019	NMR	NMR	NMR	NMR	NMR	NMR	9	NMR	8.04	NMR	NMR
September 19, 2019	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	7.25	NMR	NMR
September 20, 2019	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	7.37	NMR	NMR
September 21, 2019	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	7.29	NMR	NMR
September 22, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	6.54	NMR	NMR
September 23, 2019	0.0023	< 0.0005	< 0.001	< 0.0003	0.0019	0.003	3	0.009	6.99	NMR	NMR
September 24, 2019	NMR	NMR	NMR	NMR	NMR	NMR	8	NMR	6.92	NMR	NMR
September 25, 2019	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	6.57	NMR	NMR
September 26, 2019	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	6.90	NMR	NMR
September 27, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	6.73	NMR	NMR

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
September 28, 2019	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	6.89	NMR	NMR
October											
October 2, 2019	0.0018	< 0.001	< 0.001	< 0.0005	0.0021	< 0.007	4	0.014	6.80	NMR	NMR
October 3, 2019	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	6.95	NMR	NMR
October 4, 2019	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	7.61	NMR	NMR
October 5, 2019	NMR	NMR	NMR	NMR	NMR	NMR	5	NMR	7.53	NMR	NMR
October 6, 2019	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	7.14	NMR	NMR
October 7, 2019	0.0018	0.0011	< 0.001	< 0.0005	0.0024	< 0.007	5	0.012	7.18	0	0
October 8, 2019	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	6.96	NMR	NMR
October 9, 2019	NMR	NMR	NMR	NMR	NMR	NMR	< 1	NMR	7.41	NMR	NMR
October 10, 2019	NMR	NMR	NMR	NMR	NMR	NMR	2	NMR	6.87	NMR	NMR
October 11, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.10	NMR	NMR
October 12, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.16	NMR	NMR
October 13, 2019	NMR	NMR	NMR	NMR	NMR	NMR	15	NMR	7.26	NMR	NMR
October 14, 2019	0.0049	0.0036	< 0.001	< 0.0003	0.0039	0.011	7	< 0.002	7.10	NMR	NMR
October 15, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.44	NMR	NMR
October 16, 2019	NMR	NMR	NMR	NMR	NMR	NMR	16	NMR	7.01	NMR	NMR
October 17, 2019	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	6.92	NMR	NMR
October 18, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	7.12	NMR	NMR
October 19, 2019	NMR	NMR	NMR	NMR	NMR	NMR	3	NMR	7.03	NMR	NMR
October 20, 2019	NMR	NMR	NMR	NMR	NMR	NMR	1	NMR	7.00	NMR	NMR
October 21, 2019	0.01	0.0007	< 0.001	< 0.0003	0.0024	0.003	4	0.021	6.66	NMR	NMR
October 22, 2019	NMR	NMR	NMR	NMR	NMR	NMR	4	NMR	6.74	NMR	NMR
October 23, 2019	NMR	NMR	NMR	NMR	NMR	NMR	6	NMR	6.86	NMR	NMR
October 24, 2019	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	6.88	NMR	NMR
October 25, 2019	NMR	NMR	NMR	NMR	NMR	NMR	7	NMR	6.69	NMR	NMR
October 26, 2019	NMR	NMR	NMR	NMR	NMR	NMR	9	NMR	6.97	NMR	NMR
November											
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

Table 8-8 Whale Tail North Dewatering Phase 2 2019 MDMER Volume

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
1	0	0	0	0	0	0	14,707	29,712	6,931	0	0	0	
2	0	0	0	0	0	0	22,477	20,680	27,688	16,002	0	0	
3	0	0	0	0	0	0	17,136	5,392	32,567	13,983	0	0	
4	0	0	0	0	0	0	23,531	0	28,427	30,858	0	0	
5	0	0	0	0	0	0	23,107	26,840	32,075	34,819	0	0	
6	0	0	0	0	0	0	7,107	32,088	32,207	32,879	0	0	
7	0	0	0	0	0	0	16,417	31,632	30,555	35,783	0	0	
8	0	0	0	0	0	0	19,731	31,680	30,153	32,830	0	0	
9	0	0	0	0	0	0	0	31,680	31,286	34,204	0	0	
10	0	0	0	0	0	0	0	31,704	25,668	31,887	0	0	
11	0	0	0	0	0	0	0	31,800	32,023	22,813	0	0	
12	0	0	0	0	0	0	0	31,752	32,272	33,806	0	0	
13	0	0	0	0	0	0	3,112	31,752	33,087	29,139	0	0	
14	0	0	0	0	0	0	20,957	26,989	30,049	23,822	0	0	
15	0	0	0	0	0	0	12,616	4,948	29,868	32,980	0	0	
16	0	0	0	0	0	0	12,616	27,168	31,369	27,518	0	0	
17	0	0	0	0	0	2,500	14,215	28,947	29,916	29,935	0	0	
18	0	0	0	0	0	0	14,215	23,393	33,837	28,002	0	0	
19	0	0	0	0	0	0	14,215	34,621	38,980	26,040	0	0	
20	0	0	0	0	0	0	24,069	34,097	37,790	16,928	0	0	
21	0	0	0	0	0	0	22,581	10,414	37,457	17,648	0	0	
22	0	0	0	0	0	15,543	30,523	22,240	37,668	14,474	0	0	
23	0	0	0	0	0	16,452	25,080	24,691	35,793	15,920	0	0	
24	0	0	0	0	0	16,576	23,726	26,739	30,939	11,294	0	0	
25	0	0	0	0	0	19,307	28,688	26,626	27,859	8,317	0	0	
26	0	0	0	0	0	20,348	28,309	26,319	31,175	2,257	0	0	
27	0	0	0	0	0	20,823	28,309	25,350	34,552	0	0	0	
28	0	0	0	0	0	20,624	29,781	25,240	23,091	0	0	0	
29	0		0	0	0	2,839	28,001	17,285	0	0	0	0	
30	0		0	0	0	12,540	17,941	15,561	0	0	0	0	
31	0		0		0		14,830	23,164		0		0	
Total (m^3)	**0**	**0**	**0**	**0**	**0**	**147,552**	**537,996**	**760,504**	**865,282**	**604,138**	**0**	**0**	**2,915,472**

Table 8-9 Whale Tail North Dewatering Phase 2 2019 EEM Monitoring

	Ammonia	Alkalinity	Al	Cd	Cl	Cr	Co	Hardness	Fe	Mn	Hg	Mo	Nitrate	P	Se	Sulphate	Tl	U	Conductivity	T°	Sub-Lethal Toxicity			
	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/L	mg/L	mg/L	mg/L	mg/L	µS/cm	°C	*Ceriodaphia dubia*	*Fathead minnow*	*Lemna minor*	*Pseudokirchneriella subcapitata*
Effluent characterization (65°23'54.43'' N 96°43'35.41'' W) (ST-MDMER-6-EEM)																								
June 23, 2019	0.19	12	0.107	<0.00002	65.3	<0.0006	0.0015	113	0.31	0.3440	<0.00001	<0.0005	0.73	0.02	<0.0005	13.1	<0.0002	<0.001	333.2	6.44	NMR	NMR	NMR	NMR
July 2, 2019	0.08	9	0.025	<0.00002	26.9	<0.0006	0.0005	43	0.52	0.1924	<0.00001	0.0009	0.27	<0.01	0.0009	6.4	<0.0002	<0.001	175.1	6.55	Without AL and With SE	Without AL and Without SE	Without SE	Without SE
August 5, 2019	0.01	74	0.109	<0.00002	34.5	0.0018	0.0006	54	0.5	0.1642	<0.00001	0.0022	0.15	0.02	<0.0005	4.7	<0.0002	<0.001	174.9	14.26	Without AL and Without SE	Without AL and Without SE	Without SE	Without SE
October 7, 2019	0.11	24	0.05	<0.00002	43.3	<0.005	<0.001	84	0.49	0.51	<0.0001	0.0015	0.24	<0.01	<0.003	13.9	<0.002	<0.001	240.3	5.69	NMR	NMR	NMR	NMR
Annual Average Concentration											**0.000016**				**0.000725**									

NMR: No measure requirement
SE: Sub-Lethal effects
AL: Acute Lethality

	Ammonia	Alkalinity	Al	Cd	Cl	Cr	Co	Hardness	Fe	Mn	Hg	Mo	Nitrate	P	Se	Sulphate	Tl	U	Conductivity	T°	pH	O_2	O_2	As	Cu	CN	Pb	Ni	Ra226	TSS	Zn
	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/L	mg/L	mg/L	mg/L	mg/L	µS/cm	°C		%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Bq/L	mg/L	mg/L
Water Quality Monitoring Exposure Area (65°23'59.68'' N 96°43'37.74''W) (ST-MDMER-6-EEM-MAME)																															
July 17, 2019	<0.01	6	0.022	<0.00002	15.9	0.001	<0.0005	25	0.04	0.0081	<0.00001	<0.0005	<0.01	<0.01	<0.0005	4	<0.0002	<0.001	106.4	14.33	6.86	94.3	9.44	<0.0005	<0.0005	<0.001	<0.0003	0.0012	<0.002	1	<0.001
September 3, 2019	0.02	12	<0.005	<0.00002	20.7	<0.0006	<0.0005	52	0.08	0.0218	<0.00001	0.001	0.35	0.01	<0.0005	10.3	<0.0002	<0.001	140.2	7.25	6.96	93.5	11.03	0.0009	0.0022	<0.001	<0.0003	0.0016	<0.002	1	<0.001
Water Quality Monitoring Reference Area (65°58'10.90'' N 96°09'51.37'' W) (ST-EEM-TPS)																															
July 17, 2019	0.02	7	<0.005	<0.00002	0.6	0.0008	<0.0005	6	<0.01	<0.0005	<0.00001	<0.0005	0.01	<0.01	<0.0005	2	<0.0002	<0.001	25.8	4.00	6.68	110.0	14.15	<0.0005	<0.0005	<0.001	<0.0003	<0.0005	<0.002	1	<0.001
September 4, 2019	<0.01	10	<0.005	<0.00002	0.9	<0.0006	<0.0005	9	<0.01	0.0012	<0.00001	<0.0005	<0.01	<0.01	0.0005	3	<0.0002	<0.001	27.6	11.90	6.78	101.6	10.22	<0.0005	<0.0005	<0.001	<0.0003	<0.0005	<0.002	<1	0.002

8.3.2.4 *Quarry 1 Discharge*

A third Final discharge point (FDP) was created in 2019 and it's the Quarry 1 water discharged to Mammoth Lake via a submerged diffuser to control erosion and disturbance to bottom sediments - ST-MDMER-7. ST-MDMER-7 intake was originally planned to be the Whale Tail Attenuation Pond and the sampling point of the FDP at the Water Treatment Plan. Since the Whale Tail Attenuation Pond was not yet operational due to ongoing dewatering, Agnico sent a notification of modification to ECCC on September 19th, 2019 to move the intake from Whale Tail Attenuation Pond to Quarry 1. The sampling point of the FDP moved from after the WTP to the intake of the pump in Quarry 1. This discharge is still active on MERS system. The final discharge point ST-MDMER-7 was in operation from July 26th to September 14th and from September 16th to October 23rd, 2019. The total volume discharged in 2019 was 474,805 m^3. Discharge monitoring samples are provided in Table 8-10. No non-compliance with the MDMER regulation Section 12 and 13 were observed in 2019.

The volume of water discharged to the environment was reported on a weekly basis pursuant to the MDMER monitoring program requirements. Table 8-11 provides a daily breakdown of volumes of water pumped.

The water quality samples were taken from the discharge location (ST-MDMER-7), 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 8-12. This data was previously reported to Environment Canada via the MERS electronic database reporting system.

Table 8-10 Whale Tail Quarry 1 2019 MDMER Monitoring

Month	As	Cu	CN	Pb	Ni	Zn	TSS	Ra 226	pH	Results for Rainbow Trout Acute Lethality Tests (mean percentage mortality in 100% effluent test concentration)	Results for Daphnia magna Monitoring Tests (mean percentage mortality in 100% effluent test concentration)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L			
January											
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
March											
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
May											
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
July											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP
August											
August 27, 2019	0.0151	0.0039	0.008	< 0.0003	0.0159	< 0.001	10	0.018	7.16	0	0
September											
September 1, 2019	0.0108	0.0111	0.005	0.0009	0.0129	0.013	6	0.025	7.10	NMR	NMR
September 10, 2019	0.0155	0.0028	0.002	< 0.0003	0.0174	< 0.001	11	0.028	7.28	0	0
September 17, 2019	0.0133	0.0032	0.002	< 0.0003	0.0132	< 0.001	7	0.020	6.97	NMR	NMR
September 23, 2019	0.0091	0.0020	0.001	< 0.0003	0.0103	< 0.001	5	0.019	6.67	0	0
September 29, 2019	0.0101	0.0035	0.019	0.0007	0.0143	0.002	3	0.023	7.30	NMR	NMR
October											
October 7, 2019	0.0090	0.0032	0.021	0.00051	0.0120	< 0.007	14	0.015	7.31	0	0
October 14, 2019	0.0089	0.0029	0.016	< 0.0003	0.0143	< 0.001	5	< 0.002	6.99	NMR	NMR
October 21, 2019	0.0081	0.0027	0.018	< 0.0003	0.0130	< 0.001	1	0.029	7.14	NMR	NMR
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
December											
NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP	NDEP

Table 8-11 Whale Tail Quarry 1 2019 MDMER Volume

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
1	0	0	0	0	0	0	0	0	5,812	10,800	0	0	
2	0	0	0	0	0	0	0	0	5,526	10,812	0	0	
3	0	0	0	0	0	0	0	0	6,608	10,340	0	0	
4	0	0	0	0	0	0	0	0	6,052	6,120	0	0	
5	0	0	0	0	0	0	0	0	6,819	150	0	0	
6	0	0	0	0	0	0	0	0	3,692	11,376	0	0	
7	0	0	0	0	0	0	0	0	3,289	8,971	0	0	
8	0	0	0	0	0	0	0	0	6,671	5,586	0	0	
9	0	0	0	0	0	0	0	0	2,972	4,608	0	0	
10	0	0	0	0	0	0	0	0	11,928	1,960	0	0	
11	0	0	0	0	0	0	0	0	14,742	9,968	0	0	
12	0	0	0	0	0	0	0	0	14,487	8,957	0	0	
13	0	0	0	0	0	0	0	0	14,372	11,640	0	0	
14	0	0	0	0	0	0	0	0	4,434	11,520	0	0	
15	0	0	0	0	0	0	0	0	0	10,440	0	0	
16	0	0	0	0	0	0	0	0	13,146	7,944	0	0	
17	0	0	0	0	0	0	0	0	11,694	10,380	0	0	
18	0	0	0	0	0	0	0	0	12,130	10,320	0	0	
19	0	0	0	0	0	0	0	0	14,598	10,407	0	0	
20	0	0	0	0	0	0	0	0	14,277	11,256	0	0	
21	0	0	0	0	0	0	0	0	7,581	10,440	0	0	
22	0	0	0	0	0	0	0	0	10,139	4,912	0	0	
23	0	0	0	0	0	0	0	0	7,856	1,141	0	0	
24	0	0	0	0	0	0	0	0	7,716	0	0	0	
25	0	0	0	0	0	0	0	0	5,101	0	0	0	
26	0	0	0	0	0	0	0	9,880	5,880	0	0	0	
27	0	0	0	0	0	0	0	9,288	6,764	0	0	0	
28	0	0	0	0	0	0	0	4,451	5,960	0	0	0	
29	0		0	0	0	0	0	9,288	6,038	0	0	0	
30	0		0	0	0	0	0	6,768	2,027	0	0	0	
31	0		0		0		0	6,768		0		0	
Total (m^3)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**46,443**	**238,312**	**190,050**	**0**	**0**	**474,805**

Table 8-12 Whale Tail Quarry 1 2019 EEM Monitoring

	Ammonia	Alkalinity	Al	Cd	Cl	Cr	Co	Hardness	Fe	Mn	Hg	Mo	Nitrate	P	Se	Sulphate	Tl	U	Conductivity	T°	Sub-Lethal Toxicity			
	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/L	mg/L	mg/L	mg/L	mg/L	µS/cm	°C	*Ceriodaphia dubia*	*Fathead minnow*	*Lemna minor*	*Pseudokirchneriella subcapitata*
Effluent characterization (65°24'18.8'' N 96°41'28.96'' W) (ST-MDMER-7-EEM)																								
August 27, 2019	1.17	46	0.311	<0.00002	45.5	0.0063	0.002	184	0.54	0.2610	<0.00001	0.0118	6.33	0.03	0.0017	70.8	<0.0002	0.004	482.3	8.85	NMR	NMR	NMR	NMR
September 29, 2019	1.12	42	0.113	<0.00002	68.8	0.0011	0.0021	236	0.32	0.3028	<0.00001	0.0104	6.78	0.03	0.0019	68.6	<0.0002	0.005	547.5	3.16	NMR	NMR	NMR	NMR
October 7, 2019	1.21	45	0.15	<0.0002	69	<0.005	0.0016	194	0.3	0.31	<0.0001	0.0098	8.76	0.01	<0.003	59.8	<0.0002	0.005	559.7	2.27	NMR	NMR	NMR	NMR
Annual Average Concentration											**0.000023**				**0.0017**									

NMR: No measure requirement

	Ammonia	Alkalinity	Al	Cd	Cl	Cr	Co	Hardness	Fe	Mn	Hg	Mo	Nitrate	P	Se	Sulphate	Tl	U	Conductivity	T°	pH	O_2	O_2	As	Cu	CN	Pb	Ni	Ra226	TSS	Zn
	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/L	mg/L	mg/L	mg/L	mg/L	µS/cm	°C		%	mg/L	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)																															
September 3, 2019	0.02	10	<0.005	<0.00002	20.3	0.0008	<0.0005	49	0.06	0.0168	<0.00001	0.0010	0.41	0.01	0.0011	8.8	<0.0002	<0.001	138.1	6.95	7.00	98.6	11.68	0.0013	0.002	<0.001	<0.0003	0.0019	<0.002	1	<0.001
Water Quality Monitoring Reference Area (65°58'10.90'' N 96°09'51.37'' W) (ST-EEM-TPS)																															
September 4, 2019	<0.01	10	<0.005	<0.00002	0.9	<0.0006	<0.0005	9	<0.01	0.0012	<0.00001	<0.0005	<0.01	<0.01	<0.0005	3	<0.0002	<0.001	27.6	11.90	6.78	101.6	10.22	<0.0005	<0.0005	<0.001	<0.0003	<0.0005	<0.002	<1	0.002

8.3.2.5 *AP-5 Discharge*

The FDP ST-MDMER-10 was created in 2019. During September 23rd, 2019 ECCC's MDMER inspection at Whale Tail Site, the Inspector observed a discharge from the A-P5 pond to the tundra towards the Nemo Lake watershed. After investigation, Agnico Eagle was notified on October 3rd, 2019 that the A-P5 discharge to environment met the definition of an effluent and thus must submit to the Minister of the Environment the information required by MDMER Section 9. The requested information was provided on October 31st, 2019. A-P5 Stormwater Management Pond is a man made structure use for the water management on the Whale Tail site. Water collected by this pond is mainly non-contact water but can receive contact water from the underground operation or other location around site, if needed. Water from this pond is discharged to tundra in the watershed of Nemo Lake, via one HDEP pipe flowing into a boulder field in a manner to dissipate energy and limit erosion. No water treatment is expected for the discharge as the water quality is expected to reach the MDMER discharge criteria. If not, water will be pumped in the Whale Tail Attenuation Pond. The discharge to environment was stopped on September 26th, 2019 as the discharge pipe had completely frozen. Given that the official decision from ECCC was received on October 3rd, no MDMER and EEM regulatory water sample were taken between September 23rd and September 26th. A total of 46,690 m^3 was discharged during this period. This discharge is still active on MERS system.

8.4 ENVIRONMENTAL BIOLOGICAL STUDY

8.4.1 Meadowbank Site - EEM Study Design Cycle 3

As required by ECCC, a Biological Monitoring Study (EEM Cycle 3 study) was conducted in 2017 to assess impact on fish and fish habitat of Wally Lake (Vault Discharge). The Vault discharge was at this time the effluent which has been determined as the greatest potential to have an adverse effect on the receiving environment. While discharge is occurring, plume/effluent mixing in the exposure area has been assessed during the summer of 2017 in support of the Cycle 3 study design. The study design was submitted to ECCC on February 17th, 2017 (Appendix G3 of the 2017 Annual Report). On April 10th, 2017 Agnico received comments from the Technical Advisory Panel (TAP) regarding the Cycle 3 study design. On April 26th, 2017 Agnico responded to these comments (Appendix G4 of the 2017 Annual Report). The study design was subsequently approved. In June 2018, the Environmental Effect Monitoring Study 3 Interpretative Report was submitted to ECCC. The full data of the study has been processed and results are presented in Appendix 33 of the 2018 Annual Report. On November 26th, 2019, Agnico have received comments from the TAP regarding the EEM Study 3 Interpretative Report. By the end of December 2019, Agnico was still in the process of replying. Agnico Eagle will continue to provide KivIA and other regulators copies of reports and data submitted to ECCC via the Annual Report.

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 Project 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 have provided to ECCC the First EEM Biological Study Design. More details regarding the design submitted can be found in Appendix 39. By the end of December 2019, Agnico did not received yet the TAP's comments on the study design. Agnico Eagle will continue to provide KivIA and other regulators copies of reports and data submitted to ECCC via the Annual Report.

8.5 MINE SITE WATER QUALITY AND FLOW MONITORING

As required by NWB Water License 2AM-MEA1526 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-WTP1826 Schedule B, Item 15: ***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 site, 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 included historical data since 2013, 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.***

In 2019, there were no occurrences where runoff water from any work, undertaking, activity or operation would flow directly or indirectly into a water body. No mitigation action was necessary.

8.5.1.2 *Whale Tail Site*

As required by DFO Authorization 16HCAA-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 16HCAA-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 16HCAA-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 16HCAA-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 16HCAA-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.***

Agnico has provided to DFO on April 21st, 2020, the 2019 Technical Memorandum on Avoidance of Serious Harm to Fish and Fish Habitat – Whale Tail Project to addresses Conditions 3.1, 3.1.1, 3.1.3 and 3.1.4 of the Whale Tail Fisheries Act Authorization 16-HCAA-00370.

The complete report is provided as Appendix 20.

In accordance with DFO Authorization 16HCAA-00370 Condition 3.1, this Technical Memorandum discusses avoidance and mitigation measures listed under Section 2 of Whale Tail Fisheries Act Authorization 16-HCAA-00370:

- Adherence to the General Fish-out Protocol for Lakes and Impoundments in the Northwest Territories and Nunavut;

- Adherence to the Freshwater Intake End-of-Pipe Fish Screen Guideline for any and all intake in waterbodies that support fish;
- Development of a Blasting Mitigation Plan, which shall adhere to the guidance in Monitoring Explosive-Based Winter Seismic Exploration in Waterbodies;
- Adherence to the Protocol for Winter Water Withdrawal from Ice-Covered Waterbodies in the Northwest Territories and Nunavut; and
- 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 bearing streams and rivers, unless otherwise authorized by DFO.

As described in Condition 3.1.1, this report also summarizes the monitoring results related to fish and fish habitat contained in the documents listed in Section 2.4 of the Authorization. The referenced documents are:

- Core Receiving Environment Monitoring Program (CREMP): 2015 Plan Update Whale Tail Pit Addendum (May 2018)
- Water Quality and Flow Monitoring Plan (Version 3, May 2018)
- Water Quality Monitoring and Management Plan for Dike Construction and Dewatering (Version 1, January 2017)
- Conceptual Whale Tail Lake (North Basin) Fish-out Work Plan

Where appropriate, dated photographs with GPS coordinates and inspection reports are provided to demonstrate effective implementation of these mitigation measures and standards, as described in Authorization Condition 3.1.3.

Details of any contingency measures that were required to be followed to prevent further impacts in the event that mitigation did not function properly are provided, according to Authorization Condition 3.1.4.

In fulfillment of Condition 3.1.2, Agnico organized a conference call with DFO and the Kivalliq Inuit Association on February 24th, 2020, to review the results of the previous year's program (2018 Technical Memorandum on Avoidance of Serious Harm to Fish and Fish Habitat – Whale Tail Project). During the call and to date, no suggestions for changes to monitoring programs have been received by Agnico. Agnico will aim to propose a conference call in support of Condition 3.1.2 to review the 2019 report at the end of April or early May, 2020. This will improve the feasibility of incorporating any mutually agreed upon modifications into summer 2020 programs.

8.5.2 Dewatering Activities

8.5.2.1 *Meadowbank Site*

No dewatering activities occurred in 2019.

8.5.2.2 *Whale Tail Site*

8.5.2.2.1 Whale Tail Lake – North Basin Dewatering

Dewatering of Whale Tail Lake – North Basin began on March 5th, 2019, and continued through the end of the year. Effluent and receiving environment monitoring for dewatering was conducted according to the Water Quality Monitoring and Management Plan for Dike Construction and Dewatering (the Plan; January, 2017). Complete results and discussion for 2019 activities are provided in the 2019 Water Quality Monitoring for Dike Construction and Dewatering Report (Appendix 19), and summarized here. Sampling location are illustrate in Figure 4.

For the purposes of lake dewatering and as described in the Plan, water was discharged from Whale Tail North Basin to both Whale Tail South Basin and Mammoth Lake in 2019. Dewatering of Whale Tail North Basin to Whale Tail South Basin (compliance sample location ST-DD-7) occurred from March 5th – April 9th, 2019, May 3rd – 17th, May 24th – 29th, June 17th, June 22nd – 30th, July 9th – 18th, and October 4th – December 31st. Treatment of effluent at the water treatment plant (WTP) prior to discharge occurred in November and December in association with dike seepage discharge. Dewatering of Whale Tail North Basin to Mammoth Lake (compliance sample location ST-DD-9) occurred from July 1st – 8th, July 13th – September 28th, and October 2nd – 26th. Water was treated at the WTP for TSS prior to discharge throughout this time.

Monitoring during dewatering is primarily focused at the water intake pumps or at the outlets of the water treatment plant (if treatment is required) for compliance purposes, but also includes the receiving environment of Mammoth Lake and/or Whale Tail Lake (South Basin).

8.5.2.2.1.1 Dewatering Effluent (ST-DD-7, ST-DD-9)

In accordance with the Plan, daily water quality samples were collected by opening a valve at the Whale Tail North water intake pumps (ST-DD-7 for water pumped to Whale Tail South Basin; ST-DD-9 for water pumped to Mammoth Lake). Field-measured turbidity and conventional parameters were recorded daily during dewatering for these stations. Laboratory analyses were also completed approximately daily for turbidity, TSS, pH and weekly for total aluminum, according to NWB Type A Water License requirements.

The short-term maximum and maximum monthly for turbidity, TSS, pH, and total aluminum from these stations were measured according to the Plan for comparison to NWB Type A Water License Criteria, as listed in Part D Item 7 (Table 8-13).

Table 8-13 Maximum allowable water quality concentrations for effluent from dewatering of Whale Tail North Basin

Parameter	Maximum Monthly Mean (MMM)	Short Term Maximum (STM)
Total Suspended Solids	15 mg/L	22.5 mg/L
Turbidity	15 NTU	30 NTU
pH	6.0 – 9.0	6.0 – 9.0
Total Aluminum	1.5 mg/L	3.0 mg/L

Throughout the 2019 monitoring period for Whale Tail Lake dewatering, four non-compliance events occurred in May, August and October (described in detail below). All were isolated instances of turbidity or TSS exceedance of the STM by a single daily sample, and no supplemental management actions were required. No exceedances of the MMM as determined by 30-d moving average values were observed for any parameter.

All non-compliance were reported to the Spill HotLine distribution list. All results were also reported monthly to the NWB.

Non-compliance events

May (ST-DD-7):

Whale Tail North Basin dewatering effluent was sampled on May 29th, 2019 at 9 am as required by the Water License 2AM-WTP1826. At 9:50 am, another water sample was taken as required by the MDMER regulations. The discharge was already planned to be stopped during the day of May 29th. At 10:00 am the pumps were shut down and remained inactive for the rest of the month. On June 6th, 2019 Agnico Eagle was reviewing preliminary results and noted that the level of TSS at ST-MDMER-5 discharge was at 30 mg/L for the sample taken at 9 am and 88 mg/L for the one taken at 9:50 am on May 29th. Based on a total flow of 500 m^3 between May 29th, 9 am and May 29th 10 am, the quantity of TSS is estimated at 45 kg. The event was reported to regulators on June 6.

August (ST-DD-9):

One non-compliance was observed in August. TSS results for August 18th (30 mg/L) was above the Short Term Maximum limit of 22.5 mg/L. Agnico is of the opinion that the high result is related to a punctual event given the results before and after August 18th.

October (ST-DD-7):

TSS results for October 10th (91 mg/L) was above the Water License Short Term Maximum limit of 22.5 mg/L and MDMER TSS limit of 30 mg/L

Turbidity exceedance on October 28th (80.1 NTU) was above the Water License Short Term Maximum limit of 30 NTU. On October 29th, TSS result (26 mg/L) exceed the Water License Short Term Maximum Limit of 22.5 mg/L.

8.5.2.2.1.2 Receiving Environment (ST-DD-8, ST-DD-10)

For Whale Tail Lake dewatering, water samples were collected weekly (weather permitting) in the receiving environment at a distance of 30-100 m from water discharge locations (ST-DD-8 in Whale Tail South Basin; ST-DD-10 in Mammoth Lake – see Appendix 19, Section 4.2.2, Figure 5). Samples were collected using a clean diaphragm pump at a depth of approximately 3 meters.

Receiving environment samples were analyzed in the field for turbidity, TSS, and conventional parameters. Laboratory analyses were also completed for TSS and/or turbidity.

These values were not required to be reported monthly to NWB for compliance purposes, but results are compared to CCME guidelines, for reference. No exceedances occurred.

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 project. The following section reviews the water quality monitoring conducted around the mine site. Specific details regarding water transfers can be found in the 2019 Water Management Plan and Report (Appendix 11).

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 61,489 m^3 of water was transferred from the Stormwater Management Pond to the TSF South Cell in July 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 RSF. The diversion ditches are designed to redirect the fresh water from the northern area watershed away from the tailings pond and RSF 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 8-14 and Table 8-15 respectively; the sampling location is illustrated on Figure 1.

Results 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 6.for the ST-5 station.

TSS result for ST-6 (Table 8-15) exceeded the maximum average concentration (15 mg/L) permitted by the Water License Part F, Item 6. Only a 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 4th (21 mg/L) from the certified laboratory. Internal TSS analyses performed at the Meadowbank Assay Lab during June showed TSS level below 10 mg/L after June 7th and below 2 mg/L after June 14th until the end of the month.

Table 8-14 Meadowbank 2019 Non-Contact Water Diversion Ditch Water Quality Monitoring (ST-5)

Parameter	MAX GRAB	MAX MEAN	Sample Date	Annual Average							2019-06-04	2019-07-02	2019-08-05	2019-09-03
			Unit	2013	2014	2015	2016	2017	2018	2019				
Field Measured														
pH			pH units	7.45	7.47	7.08	7.83	8.00	6.97	7.48	7.32	7.23	7.51	7.87
Conductivity			uS/cm	-	-	200.04	201.12	237.00	127.37	181.60	84.1	153.1	147.2	342
Temperature			°C	-	-	16	12.4	12.78	7.30	10.55	6.4	11.2	14.1	10.5
Turbidity			NTU	11.13	3.99	5.37	10.69	2.79	3.31	11.27	18.2	18.7	6.66	1.5
Conventional Parameters														
Total suspended solids	30	15	mg/L	6.40	2.50	4.00	2.80	2.30	2.60	8.00	5	15	4	< 1
Major Ions														
Cyanide			mg/L	0.011	0.008	0.005	0.007	0.001	0.0046	0.0010	< 0.001	0.001	< 0.001	< 0.001
Sulphate			mg/L	49.20	168.18	55.46	49.06	40.10	27.46	19.35	6.4	14.1	18.5	38.4
Total Metals														
Aluminum			mg/L	0.1604	0.1002	0.1284	0.0688	0.0365	0.0590	0.23425	0.444	0.335	0.153	< 0.005
Arsenic			mg/L	0.00148	0.00146	0.00126	0.00096	0.00125	0.00050	0.00275	0.0031	0.0053	0.0012	0.0014
Copper			mg/L	0.0143	0.0059	0.0056	0.00432	0.0021	0.0037	0.00785	0.0145	0.0086	0.0045	0.0038
Lead			mg/L	0.00690	0.00030	0.00086	0.00096	0.00595	0.0030	0.00030	0.0003	< 0.0003	< 0.0003	< 0.0003
Nickel			mg/L	0.01804	0.00848	0.00376	0.004	0.00465	0.0045	0.00473	0.0037	0.0044	0.0045	0.0063
Zinc			mg/L	0.0056	0.0034	0.0014	0.001	0.001	0.0012	0.00800	0.005	< 0.001	0.025	< 0.001
Radionuclides														
Radium-226			Bq/l	0.0160	0.0030	0.0020	0.0020	0.0020	0.0036	0.0030	0.006	< 0.002	< 0.002	< 0.002

Table 8-15 Meadowbank 2019 Non-Contact Water Diversion Ditch Water Quality Monitoring (ST-6)

Parameter	MAX GRAB	MAX MEAN	Sample Date	Annual Average							2019-06-04	2019-07-02	2019-08-05	2019-09-03
			Unit	2013	2014	2015	2016	2017	2018	2019				
Field Measured														
pH			pH units	7.48	7.15	6.91	7.66	7.92	7.585	7.17	7.18	7.43	7.05	7.02
Conductivity			uS/cm	41.00	-	59.62	48.49	38.8	41.175	582.08	1764	225	258	81.3
Temperature			°C	-	-	19.8	14.3	11.25	7.325	11.95	10.8	11.2	14.7	11.1
Turbidity			NTU	14.56	2.93	9.46	15.94	1.9525	2.39	10.42	11.4	18	11.3	0.97
Conventional Parameters														
Total suspended solids	30	15	mg/L	3	4.14	11.04	2.2	1.33	1	12.75	21	14	14	2
Major Ions														
Cyanide			mg/L	0.007	0.00458	0.0054	0.0064	0.0015	0.001	0.0029	0.005	0.003	0.003	< 0.001
Sulphate			mg/L	6.9	7.07	5.42	5.68	6.125	5.6	29.85	34.4	22.4	56.1	6.5
Total Metals														
Aluminum			mg/L	0.0842	0.1075	0.1140	0.049	0.01175	0.012	0.13738	0.068	0.222	0.257	< 0.005
Arsenic			mg/L	0.00096	0.0005	0.0088	0.00058	0.0005	0.0005	0.00089	0.001	0.001	0.0013	< 0.0005
Copper			mg/L	0.00432	0.0016	0.0023	0.00084	0.0005	0.000925	0.00239	0.0029	0.0034	0.003	< 0.0005
Lead			mg/L	0.00178	0.0003	0.0003	0.00614	0.00123	0.000475	0.00030	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Nickel			mg/L	0.00102	0.001833	0.0025	0.00112	0.00058	0.0005	0.00303	0.0025	0.004	0.0047	0.0009
Zinc			mg/L	0.0018	0.0035	0.001	0.0018	0.00125	0.001	0.00213	< 0.001	0.003	0.003	0.002
Radionuclides														
Radium-226			Bq/l	0.002	0.002	0.002	0.0024	0.002	0.00225	0.0035	< 0.002	< 0.002	0.006	< 0.002

Grey highlighted cell refer to regulatory limits exceeded

8.5.3.1.3 East Dike Discharge (ST-8, ST-MMER-3)

Seepage rates and volumes through the East dike have been stable for the past eight years. In 2019, water was discharged from January 1st to 14th January 20th to 25th, March 10th to March 30th and November 13th to December 31st. A total of 33,026 m^3 of water collected from the seepage at the East dike was pumped to Second Portage Lake through the diffuser.

Discharge was stopped on January 14th as the pipe discharge froze. After the restart of the East Dike Discharge on January 20th, Agnico noticed TSS results trending up and therefore the discharge to Second Portage Lake was preventively stopped, the task was complete January 25th and diverted all water to the pits, as done in the past. Agnico had continued to monitor TSS and have restarted the discharge to Second Portage Lake on March 10. Ten (10) days notice for the restart of East Dike Discharge to Second Portage Lake provided to CIRNAC's Inspector on February 22nd. The discharge was stopped again on March 30th and diverted back to the Pit. all the water was accumulated in the Portage pits. However, with the freezing period observed in September, it was determined that water would need to be diverted back to Second Portage Lake to avoid health and safety risk in accessing the pits that were not initially expected. Discharge to environment restarted on November 13th, 2019.

Results from samples collected in 2019 at the final discharge point (ST-8) can be found in Table 8-16. Effluent water is analyzed as per NWB Water License Schedule I. The sampling location is illustrated on Figure 1. In 2019, there was no non-compliance observed with the Water License Part E Item 6. One (1) non-compliance with the MDMER regulation were observed. Refer to previous Section 8.3.1.3 East Dike Discharge for the complete information.

8.5.3.1.4 East Dike Seepage (ST-S-1)

As mentioned in Section 8.3.1.3, East Dike Seepage was discharged into the receiving environment, Second Portage Lake (SPL) in January, March, November and December. As done in the past, when the discharge was stopped water was directed to the Portage Pit sumps. A total of 115,060 m^3 were transferred to the Portage Pit in 2019. During that period of time, samples were taking 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 8-17. 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. Water in the South Cell TSF is currently used as reclaim water for the mill. There was no discharge from ST-9 into Third Portage Lake in 2019. The location of sampling station ST-9 is illustrated on Figure 1.

Channel crossing inspections were not undertaken in 2019 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 2019. There is currently no plans to have a discharge in 2020. The location of sampling station is illustrated on Figure 3.

Table 8-16 Meadowbank 2019 East Dike Discharge Water Quality Monitoring (ST-8)

Parameter	MAX GRAB	MAX MEAN	Sample Date	Annual Average						2019-01-07	2019-03-18	2019-11-13	2019-12-16
			Unit	2014	2015	2016	2017	2018	2019				
Field Measured													
pH			pH units	7.29	7.37	7.65	7.82	7.66	7.53	7.24	-	7.84	7.5
Turbidity			NTU	1.92	4.88	3.48	6.11	6.01	2.13	1.24	-	2	3.16
Conventional Parameters													
Total suspended solids	30	15	mg/L	8.45	6.77	4.31	10.43	1.33	2.75	2	3	2	4
Major Ions													
Cyanide			mg/L	0.0125	0.005	0.0048	0.0023	0.001	0.0020	0.002	0.003	0.001	< 0.001
Sulphate			mg/L	6.94	21.63	7.97	9.21	7.5	8.88	9.3	9.5	9.6	7.1
Total Metals													
Aluminum			mg/L	0.0684	0.0403	0.0473	0.0429	0.0461	0.0315	0.032	0.018	0.024	0.052
Arsenic			mg/L	0.0011	0.00377	0.00066	0.0011	0.0005	0.0010	< 0.0005	0.0006	0.0011	0.0017
Copper			mg/L	0.0013	0.00161	0.0017	0.0012	0.0005	0.0013	< 0.0005	0.001	0.002	0.0015
Lead			mg/L	0.0011	0.00137	0.0003	0.00081	0.0003	0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Nickel			mg/L	0.0011	0.00162	0.0011	0.00069	0.0005	0.00058	< 0.0005	< 0.0005	0.0008	< 0.0005
Zinc			mg/L	0.0030	0.0054	0.0043	0.0025	0.0010	0.0030	< 0.001	< 0.001	0.006	0.004
Radionuclides													
Radium-226			Bq/l	0.0031	0.002	0.0023	0.0022	0.0028	0.0020	< 0.002	< 0.002	< 0.002	< 0.002

Table 8-17 Meadowbank 2019 East Dike Seepage Water Quality Monitoring (ST-S-1)

Parameter	Sample Date	Annual Average					ST-S-1	ST-S-1	ST-S-1	ST-S-1 South	ST-S-1 North	ST-S-1 South	ST-S-1 North	ST-S-1 South	ST-S-1 North	ST-S-1 South	ST-S-1 North	ST-S-1 South	ST-S-1 North
	Unit	2013	2014	2015	2018	2019	2019-04-09	2019-05-27	2019-06-03	2019-07-08	2019-07-08	2019-08-05	2019-08-05	2019-09-03	2019-09-03	2019-10-09	2019-10-09	2019-11-11	2019-11-11
Field Measured																			
pH	pH units	7.73	7.45	7.07	7.57	7.77	-	7.41	7.67	7.08	7.08	7.81	7.81	8.29	8.29	8.29	8.29	7.94	7.94
Turbidity	NTU	6.26	4.35	2.51	5.22	2.28	-	3.16	15.4	11.3	11.3	148	148	0.9	0.9	1.36	1.36	1.89	1.89
Conventional Parameters																			
Hardness	mg CaCO3/L	30.00	24.00	40	32.33	32.33	31	30	36	35	35	62	62	36	36	41	41	30	30
Total alkalinity, as CaCO3	mg CaCO3/L	50.29	37.00	29.5	31.00	28.67	30	31	25	21	21	136	136	25	25	25	25	28	28
Total dissolved solids	mg/L	-	-	-	58.00	48.33	46	46	53	60	60	81	81	69	69	65	65	41	41
Total suspended solids	mg/L	-	-	-	6.00	11.38	3	6	74	40	40	219	219	2	2	< 1	< 1	< 1	< 1
Major Ions																			
Chloride	mg/L	0.7640	0.7333	0.8500	1.1333	1.067	1.1	1.1	1	6.9	6.9	1	1	0.8	0.8	0.7	0.7	0.7	0.7
Cyanide	mg/L	-	-	-	0.001	0.002	0.005	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Fluoride	mg/L	0.092	0.094	0.075	0.113	0.110	0.11	0.11	0.11	0.07	0.07	0.15	0.15	0.11	0.11	0.1	0.1	0.09	0.09
Sulphate	mg/L	4.660	5.967	18.050	11.900	8.667	8.5	7.1	10.4	14.2	14.2	30.7	30.7	11.2	11.2	13.2	13.2	14.6	14.6
Nutrients and Chlorophyll a																			
Total ammonia as NH4	mg/L	0.049	0.010	0.010	0.033	0.023	0.05	< 0.01	< 0.01	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	0.02
Un-Ionized Ammonia, calculated	mg/L	0.055	0.010	0.010	0.010	0.010	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Nitrite	mg/L	0.18	0.22	0.47	0.014	0.319	0.07	0.06	0.07	0.93	0.1	1.1	0.41	0.47	0.33	0.42	0.17	<0.01	<0.01
Nitrate	Mg/L	0.01	0.01	0.01	0.01	0.012	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.02	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total Metals																			
Aluminum	mg/L	0.24000	0.09800	0.04100	0.04400	0.19367	< 0.005	0.059	0.517	0.136	0.136	2.13	2.13	0.02	0.02	0.03	0.03	0.024	0.024
Arsenic	mg/L	0.00370	0.00180	0.00050	0.00437	0.00477	< 0.0005	0.0006	0.0132	< 0.0005	< 0.0005	0.0064	0.0064	0.0005	0.0005	< 0.001	< 0.001	0.0016	0.0016
Barium	mg/L	0.00920	0.00830	0.00830	0.00737	0.00743	0.0073	0.0048	0.0102	0.0059	0.0059	0.0322	0.0322	0.0092	0.0092	0.0099	0.0099	0.0042	0.0042
Cadmium	mg/L	0.00002	0.00004	0.00002	0.00002	0.00003	< 0.00002	< 0.00002	0.00005	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0002	< 0.0002	< 0.00002	< 0.00002
Chromium	mg/L	0.00095	0.00070	0.00110	0.00077	0.00330	< 0.0006	0.0012	0.0081	0.0019	0.0019	0.0182	0.0182	0.0016	0.0016	< 0.005	< 0.005	< 0.0006	< 0.0006
Copper	mg/L	0.00370	0.00120	0.00065	0.00090	0.00113	0.0008	< 0.0005	0.0021	< 0.0005	< 0.0005	0.0078	0.0078	0.0008	0.0008	< 0.001	< 0.001	0.0009	0.0009
Iron	mg/L	0.42000	0.15000	0.09500	0.11000	0.59000	0.03	0.19	1.55	0.25	0.25	3.5	3.5	0.04	0.04	< 0.06	< 0.06	0.06	0.06
Lead	mg/L	0.00220	0.00120	0.00030	0.00030	0.00030	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0005	< 0.0005	< 0.0003	< 0.0003
Manganese	mg/L	0.01000	0.00590	0.01400	0.00360	0.01747	0.0005	0.0023	0.0496	0.0073	0.0073	0.0724	0.0724	0.0008	0.0008	< 0.001	< 0.001	< 0.0005	< 0.0005
Mercury	mg/L	0.00001	0.00003	0.00001	0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.0001	< 0.0001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.00052	0.00110	0.00055	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0023	0.0023	< 0.0005	< 0.0005	< 0.001	< 0.001	< 0.0005	< 0.0005
Nickel	mg/L	0.00290	0.00120	0.00290	0.00147	0.00480	< 0.0005	< 0.0005	0.0134	< 0.0005	< 0.0005	0.0146	0.0146	< 0.0005	< 0.0005	< 0.002	< 0.002	0.0006	0.0006
Selenium	mg/L	0.00100	0.00100	0.00100	0.00217	0.00180	< 0.0005	0.0029	0.002	< 0.0005	< 0.0005	0.0023	0.0023	< 0.0005	< 0.0005	< 0.003	< 0.003	< 0.0005	< 0.0005
Silver	mg/L	0.00016	0.00010	0.00010	0.00010	0.00010	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.001	< 0.001	< 0.0001	< 0.0001
Thallium	mg/L	0.03100	0.00500	0.00500	0.00040	0.00020	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.002	< 0.002	< 0.0002	< 0.0002
Zinc	mg/L	0.09800	0.00300	0.00100	0.00133	0.01333	< 0.001	0.003	0.036	< 0.001	< 0.001	0.009	0.009	0.003	0.003	< 0.007	< 0.007	0.009	0.009

8.5.3.1.7 Portage Rock Storage Facility (ST-16)

The Portage Waste Rock Storage Facility (PRSF) has been in operation since 2009. In 2013, ponded water was observed at the south-east base of the PRSF (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 determined, in 2013, that the seepage contained reclaim water from the North Cell TSF that had flowed under the PRSF to a sump area designated as sampling station ST-16 (refer to RSF 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 PRSF 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 PRSF to ST-16. As part of progressive reclamation capping of the North Cell tailings commenced in winter 2015 and continued in 2016. The North portion on the North Cell was capped in 2015 and a 30m strip was placed in front of RF1 and RF2 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 RSF 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 2019, 774,375 m^3 of North Cell water was transferred to the South Cell reclaim pond 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 8-18. Water volumes pumped in 2019 at ST-16 (33,782 m^3) was higher compared to the pumped volume of previous years 2014-2018 (Table 8-18). However, Agnico is of the opinion that the higher volume was mainly caused by the extreme higher volume of rainfall received in 2019. The installation of the filters at RF-1 and RF-2, capping of tailings and decreased water volume in the North Cell likely contributed to be effective in controlling and minimizing seepage from the North Cell.

Table 8-18 Meadowbank Waste Rock Seepage pumped volume 2014-2019

Year	Volume pumped (m^3)
2014	32,169
2015	19,236
2016	20,844
2017	25,815
2018	12,606
2019	33,782

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 Licence and MDMER criteria in NP2 Lake from 2014 – 2018. From the results, the action plan implemented by Agnico has been very successful in preventing any further seepage into NP2 Lake and into the ST-16 sump itself. All seepage water are 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 in 2015 and 2016 have effectively mitigated this problem. In addition, thermistors installed in the RSF 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 continue monitoring until there is a 5 year period of non-detect cyanide results. In 2018 (5 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 NP2, NP1 and downstream lakes, Dogleg and Second Portage. Thus, based on the analysis of the previous results, Agnico Eagle has suspended the current program in 2019. However, ECCC's comment regarding the 2018 Annual Report recommended that Agnico continue to monitor Lake NP-2 on a yearly basis for the same suite of parameters as have been measured since 2014. Water quality results for 2019 ST-16 and NP-2 South can be found in Table 8-19 and 8-20, 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 2019 Freshet Action Plan (see Appendix D of the 2019 Water Management Report and Plan Version 8 (Appendix 11), Agnico will continue in 2020 to contain the ST-16 Seepage and to monitor the water quality, as needed. This is conducted to assess and prevent any impact to the receiving environment (NP2) and to downstream lakes (NP-1, Dogleg and Second Portage).

Table 8-19 Meadowbank 2019 RSF Seepage Water Quality Monitoring (ST-16)

Parameter	Sample Date	Annual Average							2019-07-22	2019-08-19	2019-09-15
	Unit	2013	2014	2015	2016	2017	2018	2019			
Field Measured											
pH	pH units	6.95	7.344	7.39	7.46	7.48	7.54	7.75	7.69	7.69	7.88
Conductivity	uS/cm	2138.33	2432.12	473.00	445.25	435.3	401.33	406.43	351	372	496.3
Temperature	°C	-	5.59	10.60	11.02	14.1	9.15	13.08	19.1	9.2	10.94
Turbidity	NTU	70.00	22.444	11.75	3.7625	2.74	4.15	2.90	1.71	4.5	2.49
Conventional Parameters											
Hardness	mg CaCO3/L	932.67	1130.5	143.25	189.25	153.75	176.00	166.67	128	135	237
Total alkalinity, as CaCO3	mg CaCO3/L	142.25	171.2	61.5	73.75	77.25	74.67	60.67	44	62	76
Total suspended solids	mg/L	50	19.33	10	8.75	4.25	1.00	264.67	216	255	323
Total dissolved solids	mg/L	1599.33	2524.6	317.75	336.25	315.25	247.67	2.33	2	3	2
Total organic carbon	mg/L	-	36.1	11.125	8.275	8.675	7.35	3.87	3.6	4	4
Dissolved organic carbon	mg/L	-	41.3	9.9	6.375	8.65	6.25	4.77	4.1	3.9	6.3
Major Ions											
Bicarbonate	mg CaCO3/L	-	-	-	73.75	77.25	72	60.667	44	62	76
Carbonate	mg CaCO3/L	-	-	-	2	2	2	2.000	< 2	< 2	< 2
Chloride	mg/L	223.77	500.62	10.3	8.85	9.63	5.167	5.167	3.5	4.7	7.3
Cyanide	mg/L	-	1.38	0.0215	0.0033	0.0743	0.002	0.0020	0.001	< 0.001	0.004
Cyanide (free)	mg/L	-	0.48	0.005	0.005	0.005	0.005	0.0020	-	-	0.002
Cyanide (WAD)	mg/L	-	0.14	0.0097	0.003	0.0528	0.001	0.001	< 0.001	< 0.001	0.002
Fluoride	mg/L	0.20	0.33	0.19	0.2	0.225	0.187	0.197	0.16	0.23	0.2
Sulphate	mg/L	1418.67	2020	130.075	136.25	92.45	106	102.233	83	95.7	128
Reactive silica	mg/L	-	2.3	-	3.88	2.98	2.98	2.573	2.62	4.09	1.01
Thiosulfates	mg/L	-	7.59	1.34	0.02	0.02	0.05	0.020	< 0.02	< 0.02	< 0.02
Thiocyanate	mg/L	-	3.91	0.225	0.1725	0.095	0.05	0.053	< 0.05	0.06	< 0.05

Parameter	Sample Date	Annual Average							2019-07-22	2019-08-19	2019-09-15
	Unit	2013	2014	2015	2016	2017	2018	2019			
Nutrients and Chlorophyll a											
Nitrate	mg/L	23.200	24.35	7.837	6.66	6.2975	4.203	5.440	4.12	4.95	7.25
Nitrite	mg/L	0.240	0.955	0.065	0.0425	0.07	0.035	0.040	0.02	0.06	0.04
Kjeldahl Nitrogen	mg/L	-	45	2.2775	1.115	1.3175	0.82	0.620	0.63	0.56	0.67
Total phosphorus	mg/L	-	0.1248	0.0466	0.0158	0.031	0.012	0.020	0.0095	0.019	0.03
Total orthophosphate (as phosphorus)	mg/L	0.0687	-	0.0225	0.0225	0.01	0.01	0.010	< 0.01	< 0.01	< 0.01
Total ammonia as NH4	mg/L	14.083	31.338	1.1125	0.2775	0.3175	0.0767	0.070	0.04	0.11	0.06
Un-Ionized Ammonia, calculated	mg/L	0.483	1.25	0.015	0.01	0.04	0.01	0.010	< 0.01	< 0.01	< 0.01
Chlorophyll A	ug/L	-	1.56	0.86	0.41	0.2775	0.31	0.553	0.13	1	0.53
Total Metals											
Aluminum	mg/L	0.183667	0.160000	0.006000	0.098500	0.038300	0.029667	2.3067	< 0.005	0.056	0.008
Antimony	mg/L	0.000767	0.000580	0.000133	0.000300	0.000230	0.000267	0.0003	0.0002	0.0003	0.0003
Arsenic	mg/L	0.008550	0.007200	0.000500	0.003000	0.000575	0.002367	0.0186	0.0087	0.0374	0.0096
Barium	mg/L	0.121167	0.032000	0.017175	0.018100	0.016300	0.018967	0.0191	0.0177	0.0136	0.026
Beryllium	mg/L	0.000367	0.000500	0.000500	0.000500	0.000500	0.000500	0.0005	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	0.095000	0.083000	0.040000	0.015000	0.012500	0.016667	0.010	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	0.000330	0.000260	0.000045	0.000040	0.000020	0.000030	0.00002	< 0.00002	< 0.00002	< 0.00002
Calcium	mg/L	312.000000	15.700000	-	53.300000	34.200000	36.800000	32.067	28.5	30.2	37.5
Chromium	mg/L	0.001833	0.0029	0.0006	0.0006	0.0006	0.0011	0.001	0.0009	0.0014	0.0009
Cobalt	mg/L	0.204433	0.265700	0.004650	0.002900	0.001325	0.000900	0.001	0.0006	0.0011	0.0017
Copper	mg/L	1.92545	0.39	0.0298	0.0259	0.018	0.0158	0.011	0.0105	0.0089	0.0122
Iron	mg/L	9.3000	1.15	0.255	0.0595	0.315	0.36	0.150	0.09	0.21	0.15
Lead	mg/L	0.00080	0.0022	0.0003	0.0003	0.0016	0.0003	0.0003	< 0.0003	< 0.0003	< 0.0003
Lithium	mg/L	0.0078	0.0053	0.005	0.005	0.018	0.005	0.005	< 0.005	< 0.005	< 0.005
Magnesium	mg/L	60.000000	15.670000	11.490000	18.925000	17.050000	17.000000	18.133	13.9	14.6	25.9
Manganese	mg/L	4.0825	1.5100	0.7082	0.3835	0.1315	11.35820	0.037	0.0161	0.0663	0.0288
Mercury	mg/L	0.00010	0.00002	0.00001	0.00023	0.00001	0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001

Parameter	Sample Date	Annual Average							2019-07-22	2019-08-19	2019-09-15
	Unit	2013	2014	2015	2016	2017	2018	2019			
Molybdenum	mg/L	0.093	0.0670	0.0152	0.0123	0.0106	0.01087	0.018	0.0137	0.0217	0.0188
Nickel	mg/L	0.9667	0.5400	0.0430	0.0369	0.0203	0.01577	0.010	0.0078	0.011	0.0119
Potassium	mg/L	88.000000	41.750000	8.330000	9.315000	8.345000	6.180000	8.117	6.02	7.13	11.2
Selenium	mg/L	0.013333	0.028	0.001	0.001	0.001	0.0009	0.00060	0.0008	< 0.0005	< 0.0005
Silver	mg/L	0.0056	0.0013	0.0001	0.0001	0.0001	0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001
Sodium	mg/L	590.0	4.500000	-	22.050000	14.757000	11.560000	11.630	8.93	7.66	18.3
Strontium	mg/kg	1.32667	0.4	0.15575	0.1668	0.157	0.20266667	0.190	0.148	0.166	0.256
Tellurium	mg/L	-	0.000500	-	0.000500	0.000500	0.000500	0.0005	< 0.0005	< 0.0005	< 0.0005
Thallium	mg/L	0.003367	0.005000	0.005000	0.000800	0.000800	0.000200	0.0002	< 0.0002	< 0.0002	< 0.0002
Tin	mg/kg	0.001000	0.001300	0.001000	0.003300	0.001000	0.001000	0.001	< 0.001	< 0.001	< 0.001
Titanium	mg/L	0.226900	0.180000	0.027500	0.027500	0.035000	0.043333	0.010	< 0.01	< 0.01	< 0.01
Uranium	mg/L	0.106333	0.069000	0.005667	0.005800	0.005000	0.004333	0.006	0.004	0.005	0.008
Vanadium	mg/L	0.000700	0.000500	0.000500	0.000500	0.000500	0.000500	0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	0.006250	0.005400	0.001000	0.001800	0.001000	0.001333	0.001	0.002	< 0.001	< 0.001
Dissolved Metals											
Aluminum	mg/L	0.0165	0.0175	0.4743	0.006	0.006	0.006	0.0005	< 0.0005	< 0.0005	< 0.0005
Antimony	mg/L	-	0.0006	0.0003	0.0002	0.0002	0.0001	0.00037	0.0004	0.0005	0.0002
Arsenic	mg/L	0.004450	0.005200	0.000500	0.001800	0.000780	0.000767	0.016	0.0079	0.0338	0.0066
Barium	mg/L	0.099550	0.053000	0.024200	0.017700	0.015400	0.017633	0.017	0.0188	0.0151	0.0164
Beryllium	mg/L	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	-	0.0825	0.055	0.0105	0.01	0.02	0.010	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	0.00040	0.00060	0.00016	0.00003	0.00002	0.00003	0.00002	< 0.00002	0.00003	< 0.00002
Chromium	mg/L	-	0.0029	0.0033	0.0006	0.0006	0.0009	0.0006	< 0.0006	< 0.0006	< 0.0006
Cobalt	mg/L	-	0.077	0.0062	0.0025	0.0012	0.00065	0.0010	0.0007	0.0009	0.0013
Copper	mg/L	1.81050	1.40000	0.04680	0.02080	0.01430	0.01270	0.0081	0.0098	0.0066	0.0078
Iron	mg/L	0.11500	0.56000	1.45000	0.21250	0.14500	0.09667	0.027	0.04	0.01	0.03
Lead	mg/L	0.00030	0.00065	0.00350	0.00030	0.00030	0.00030	0.0016	0.0042	< 0.0003	< 0.0003

Parameter	Sample Date	Annual Average							2019-07-22	2019-08-19	2019-09-15
	Unit	2013	2014	2015	2016	2017	2018	2019			
Lithium	mg/L	-	0.005	0.005	0.005	0.005	0.005	0.005	< 0.005	< 0.005	< 0.005
Manganese	mg/L	4.08250	2.62000	0.72660	0.35940	0.11400	9.89157	0.026	0.0086	0.0506	0.0196
Mercury	mg/L	0.00010	0.00010	0.00001	0.00001	0.00001	0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.09800	0.09900	0.01460	0.01250	0.00980	0.01033	0.01687	0.0135	0.0225	0.0146
Nickel	mg/L	1.11250	0.43000	0.05070	0.03470	0.01760	0.01443	0.00847	0.0073	0.0092	0.0089
Selenium	mg/L	0.0140	0.048	0.0013	0.0001	0.001	0.00116667	0.00063	0.0007	< 0.0005	0.0007
Silver	mg/L	0.000195	0.0001	0.0001	0.0001	0.0001	0.0001	0.00010	< 0.0001	< 0.0001	< 0.0001
Strontium	mg/L	-	0.3965	0.1628	0.1545	0.1548	0.1715	0.177	0.143	0.161	0.226
Tellurium	mg/L	-	0.005	-	0.005	0.005	-	0.00050	< 0.0005	< 0.0005	< 0.0005
Thallium	mg/L	0.003367	0.005	0.005	0.0008	0.0008	0.0002	0.00020	< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	-	0.001	0.001	0.001	0.001	0.001	0.0010	< 0.001	< 0.001	< 0.001
Titanium	mg/L	-	0.1825	0.0375	0.02	0.03	0.03	0.010	< 0.01	< 0.01	< 0.01
Uranium	mg/L	-	0.0685	0.0065	0.0055	0.0043	0.0045	0.005	0.004	0.005	0.006
Vanadium	mg/L	-	0.0005	0.0005	0.0005	0.0005	0.0005	0.00050	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	0.00625	0.001	0.0053	0.002	0.001	0.001	0.003	0.004	< 0.001	0.002

Table 8-20 Meadowbank 2019 NP2-South Water Quality Monitoring

Parameter	CCME Aquatic Freshwater	Sample Date	Annual Average						2019-07-08	2019-08-19
		Unit	2014	2015	2016	2017	2018	2019		
Field Measured										
pH		pH units	7.30	7.13	7.28	7.79	7.72	7.46	7.25	7.67
Conductivity		uS/cm	317.57	284.50	236.00	231.40	205.47	195.35	200	190.7
Temperature		°C	6.26	19.08	10.89	11.73	9.67	11.00	12.7	9.3
Turbidity		NTU	2.70	3.20	1.40	1.40	1.81	1.70	1.89	1.5
Conventional Parameters										
Hardness		mg CaCO3/L	98.50	75.00	81.50	73.75	68.67	71.00	74	68
Total alkalinity, as CaCO3		mg CaCO3/L	40.00	42.00	47.00	56.00	49.67	37.00	33	41
Total dissolved solids		mg/L	270.00	183.00	163.00	147.00	107.67	117.50	113	122
Total suspended solids		mg/L	1.88	1.00	2.75	3.20	1.50	1.00	1	1
Total organic carbon		mg/L	5.70	4.23	4.45	5.86	4.93	3.70	3.6	3.8
Dissolved organic carbon		mg/L	5.20	4.37	3.83	5.86	3.83	3.70	-	3.7
Major Ions										
Bicarbonate		mg CaCO3/L	-	-	47.00	56.00	49.67	37.00	33	41
Carbonate		mg CaCO3/L	-	-	2.00	2.00	2.00	2.00	< 2	< 2
Chloride	120	mg/L	9.600	6.770	5.130	4.640	3.633	3.05	2.8	3.3
Cyanide		mg/L	0.021	0.005	5.130	0.002	0.001	0.001	< 0.001	< 0.001
Fluoride		mg/L	0.120	0.110	0.003	0.130	0.117	0.13	0.1	0.15
Sulphate		mg/L	121.250	79.830	58.880	44.380	39.167	31.70	30.9	32.5
Reactive silica		mg/L	-	-	0.350	0.510	0.413	1.00	0.84	1.16
Cyanide (free)		mg/L	0.0088	0.0050	0.0050	0.0050	0.0050	0.001	< 0.001	-
Cyanide (WAD)		mg/L	0.0130	0.0050	0.0030	0.0021	0.0010	0.001	< 0.001	< 0.001
Thiocyanate		mg/L	0.05	0.05	0.13	0.11	0.05	0.05	< 0.05	< 0.05
Nutrients										
Nitrite		mg/L	0.19	0.01	0.01	0.01	0.18	0.01	<0.01	<0.01
Nitrate		mg/L	2.47	1.26	0.28	0.09	0.01	0.14	0.15	0.13
Total Kjeldahl nitrogen		mg/L	2.700	0.360	0.490	0.620	0.244	0.23	0.22	0.24
Total phosphorus		mg/L	0.008	0.011	0.007	2.230	0.006	0.01	< 0.01	-
Total orthophosphate (as phosphorus)		mg/L	0.010	0.010	0.010	0.010	0.010	0.01	< 0.01	< 0.01
Total ammonia as NH4		mg/L	2.900	0.010	0.030	0.053	0.027	0.01	< 0.01	0.01
Un-Ionized Ammonia, calculated		mg/L	0.023	0.010	0.010	0.040	0.010	0.01	< 0.01	< 0.01
Total Metals										
Aluminum		mg/L	0.06700	0.00600	0.00600	0.06700	0.00600	0.04300	0.043	< 0.005
Antimony		mg/L	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	< 0.0001	< 0.0001
Arsenic	0.005	mg/L	0.00075	0.00340	0.00050	0.00050	0.00057	0.00080	< 0.0005	0.0011
Barium		mg/L	0.01500	0.01000	0.00690	0.00500	0.00453	0.00420	0.0079	< 0.0005
Beryllium		mg/L	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	< 0.0005	< 0.0005
Boron		mg/L	0.01	0.01	0.01	0.01	0.01	0.01	< 0.01	< 0.01
Cadmium	0.00009	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	< 0.00002	< 0.00002
Calcium		mg/L	-	-	22.17	19.10	17.63	18.35	19.4	17.3
Chromium		mg/L	0.00060	0.00060	0.00093	0.00060	0.00067	0.00060	< 0.0006	< 0.0006
Cobalt		mg/L	0.00340	0.00100	0.00050	0.00063	0.00050	0.00050	< 0.0005	< 0.0005
Copper		mg/L	0.00850	0.00540	0.00500	0.00350	0.00320	0.00380	0.0036	0.004
Iron	0.3	mg/L	0.30000	0.05700	0.08300	0.13000	0.09333	0.06000	0.07	0.05
Lead		mg/L	0.00080	0.00030	0.00030	0.00080	0.00083	0.00030	< 0.0003	< 0.0003
Lithium		mg/L	0.00500	0.01200	0.00500	0.00500	0.00500	0.00500	< 0.005	< 0.005
Magnesium		mg/L	8.230	6.490	6.900	6.570	6.097	6.155	6.21	6.1

Manganese		mg/L	0.03200	0.01000	0.01600	0.01500	0.01077	0.00615	0.0078	0.0045
Mercury	0.000026	mg/L	0.00001	0.00001	0.00001	0.00002	0.00001	0.00001	< 0.00001	< 0.00001
Molybdenum	0.073	mg/L	0.00050	0.00053	0.00055	0.00055	0.00050	0.00060	< 0.0005	0.0007
Nickel		mg/L	0.01300	0.00520	0.00830	0.00530	0.00547	0.01105	0.0053	0.0168
Potassium		mg/L	5.17000	2.82000	3.66000	2.33000	1.92000	1.94000	1.86	2.02
Selenium	0.001	mg/L	0.00130	0.00100	0.00100	0.00100	0.00080	0.00080	0.0008	0.00065
Silver	0.0001	mg/L	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	< 0.0001	< 0.0001
Sodium		mg/L	-	-	11.70000	9.76000	7.05333	5.17000	5.3	5.04
Strontium		mg/kg	0.11000	0.09900	0.07100	0.08300	0.06767	0.07350	0.071	0.076
Tellurium		mg/L	-	-	0.00050	0.00050	0.00050	0.00050	< 0.0005	< 0.0005
Thallium	0.0008	mg/L	0.00500	0.00500	0.00080	0.00080	0.00020	0.00020	< 0.0002	< 0.0002
Tin		mg/kg	0.02000	0.00100	0.00100	0.00100	0.00100	0.00100	< 0.001	< 0.001
Titanium		mg/L	0.02000	0.01000	0.01000	0.01800	0.01333	0.01000	< 0.01	< 0.01
Uranium		mg/L	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	< 0.001	0.001
Vanadium		mg/L	0.00050	0.00050	0.00093	0.00050	0.00050	0.00050	< 0.0005	< 0.0005
Zinc	0.03	mg/L	0.00130	0.00100	0.00100	0.00250	0.00100	0.00100	0.001	< 0.001
Dissolved Metals										
Aluminum		mg/L	0.01300	0.00600	0.00600	0.00600	0.00533	0.00275	< 0.005	< 0.0005
Antimony		mg/L	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	< 0.0001	< 0.0001
Arsenic	0.005	mg/L	0.00068	0.00180	0.00050	0.00050	0.00057	0.00065	< 0.0005	0.0008
Barium		mg/L	0.01500	0.00860	0.00610	0.00440	0.00467	0.00550	0.0055	< 0.0005
Beryllium		mg/L	0.00050	0.00057	0.00050	0.00050	0.00050	0.00050	< 0.0005	< 0.0005
Boron		mg/L	0.01700	0.01000	0.01000	0.01000	0.01000	0.01000	< 0.01	< 0.01
Cadmium	0.00009	mg/L	0.00013	0.00003	0.00002	0.00002	0.00003	0.00002	< 0.00002	< 0.00002
Chromium		mg/L	0.00060	0.00150	0.00088	0.00076	0.00073	0.00060	< 0.0006	< 0.0006
Cobalt		mg/L	0.00360	0.00097	0.00050	0.00064	0.00050	0.00050	< 0.0005	< 0.0005
Copper		mg/L	0.00690	0.00400	0.00360	0.00270	0.00283	0.00270	0.0027	0.0027
Iron	0.3	mg/L	0.01800	0.01000	0.01000	0.03000	0.01667	0.01000	< 0.01	< 0.01
Lead		mg/L	0.00380	0.00030	0.00030	0.00048	0.00040	0.00030	< 0.0003	< 0.0003
Lithium		mg/L	0.00500	0.00500	0.00500	0.00500	0.00500	0.00500	< 0.005	< 0.005
Manganese		mg/L	0.04000	0.00050	0.00170	0.00460	0.00573	0.00155	0.0013	0.0018
Mercury	0.000026	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	< 0.00001	< 0.00001
Molybdenum	0.073	mg/L	0.00150	0.00057	0.00055	0.00054	0.00050	0.00055	< 0.0005	0.0006
Nickel		mg/L	0.01300	0.00460	0.00670	0.00430	0.00507	0.00890	0.0048	0.013
Selenium	0.001	mg/L	0.00150	0.00100	0.00100	0.00100	0.00067	0.00050	< 0.0005	< 0.0005
Silver	0.0001	mg/L	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	< 0.0001	< 0.0001
Strontium		mg/L	0.11000	0.08900	0.06800	0.07000	0.06867	0.06050	0.06	0.061
Thallium	0.0008	mg/L	0.00500	0.00500	0.00080	0.00080	0.00020	0.00030	< 0.0002	< 0.0002
Tin		mg/L	0.00300	0.00100	0.00100	0.00100	0.00100	0.00100	< 0.001	< 0.001
Titanium		mg/L	0.01700	0.01000	0.01000	0.01800	0.01333	0.01000	< 0.01	< 0.01
Uranium		mg/L	0.00100	0.00100	0.00100	0.00100	0.00100	0.00100	< 0.001	< 0.001
Vanadium		mg/L	0.00050	0.00050	0.00050	0.00050	0.00050	0.00050	< 0.0005	< 0.0005
Zinc	0.03	mg/L	0.00100	0.00100	0.00100	0.00100	0.00133	0.00100	< 0.001	< 0.001

8.5.3.1.8 North Portage Pit Sump/Lake (ST-17)

In 2019, there was no more sump associated with the North Portage Pit and thus, as per the Water License, Agnico has started to consider this area as the Portage Pit Lake. In 2019, only two samples were taken from the North Portage Pit Lake in July and October. Due to safety issues, no water sample was collected in August and September. There was also no water pumped out the pit. All the water was kept inside the pit to promote natural reflooding. Agnico Eagle will continue to maximize effort in ensuring that water sample will be collected during open water, but this will dependant of the in-pit disposal status in this area. Once the in-pit disposal started, the Pore Water Quality Monitoring Program will be followed. The sampling location is illustrated on Figure 1. Results are presented in Table 8-21 and compare the average to the sump results from previous years 2015-2018. There are no applicable license limits.

8.5.3.1.9 South Portage Pit Sump/Lake (ST-19)

In 2019, water from the South Portage Pit sump was sampled in June, August and October. Water from South Portage Pit Lake was first sample in 2019 on June and July. All sample were conducted during open water as per the requirements in the NWB Water License (sampling station ST-19 on Figure 1). Results are presented in Table 8-22 and Table 8-23. There are no applicable license limits.

With limited activity in South Pit, no water was transferred from the South Portage Pit Sump to the South Cell TSF in 2019, as in previous years.

Table 8-21 Meadowbank 2019 North Portage Pit Lake Water Quality Monitoring (ST-17 Lake)

Parameter	Sample Date	Annual Average*					2019-07-16	2019-10-20
	Unit	2015	2016	2017	2018	2019		
Field Measured								
pH	pH units	7.87	7.91	7.85	-	7.84	7.74	7.93
Turbidity	NTU	4.33	46.31	9.40	-	4.17	3.25	5.09
Conventional Parameters								
Hardness	mg CaCO3/L	238.750	305.857	214.267	166.00	630.50	576	685
Total alkalinity, as CaCO3	mg CaCO3/L	76.857	97.143	98.400	61.00	70.00	73	67
Total dissolved solids	mg/L	399.143	518.429	463.467	303.00	1390.50	1409	1372
Total suspended solids	mg/L	3.500	53.143	58.000	22.00	8.00	12	4
Total organic carbon	mg/L	-	-	-	-	14.00	-	14
Dissolved organic carbon	mg/L	-	-	-	-	15.15	15	15.3
Major Ions								
Chloride	mg/L	17.225	23.671	25.027	16.500	161.50	176	147
Cyanide	mg/L	0.007	0.019	0.046	0.007	0.04	0.037	0.033
Fluoride	mg/L	0.305	0.429	0.420	0.250	0.38	0.33	0.42
Sulphate	mg/L	179.400	231.857	186.000	130.000	915.50	946	885
Cyanide (free)	mg/L	0.010	0.007	0.016	-	0.01	0.015	0.012
Nutrients and Chlorophyll a								
Total phosphorus	mg/L	-	-	-	-	0.04	0.05	0.03
Nitrite	mg/L	0.17	0.07	0.17	0.11	0.24	0.14	0.33
Nitrate	mg/L	11.90	12.68	9.51	6.03	4.59	6.31	2.86
Total ammonia as NH4	mg/L	2.901	3.724	2.603	1.820	6.74	7.41	6.07
Un-Ionized Ammonia, calculated	mg/L	0.056	0.091	0.076	0.030	0.11	0.11	0.1
Total Metals								
Aluminum	mg/L	0.04200	1.21814	0.49773	0.32100	0.07300	0.038	0.108
Arsenic	mg/L	0.10547	0.01788	0.02132	0.00050	0.25070	0.0261	0.4753
Barium	mg/L	0.01635	0.01996	0.01971	0.00990	0.02295	0.023	0.0229
Cadmium	mg/L	0.00024	0.00036	0.00010	0.00003	0.00011	< 0.00002	0.00019
Calcium	mg/L	-	-	-	-	191	171	210
Chromium	mg/L	0.00175	0.03296	0.00317	0.00060	0.00125	0.001	0.0015
Copper	mg/L	0.00100	0.00403	0.00137	0.00190	0.02675	0.0204	0.0331
Iron	mg/L	0.04500	3.89143	1.03133	0.77000	0.32000	0.11	0.53
Lead	mg/L	0.00107	0.00193	0.00190	0.00160	0.00030	< 0.0003	< 0.0003
Magnesium	mg/L	-	-	-	-	37.75000	36.4	39.1
Manganese	mg/L	0.11350	0.21964	0.14531	0.12610	0.81470	0.8285	0.8009
Mercury	mg/L	0.00010	0.00003	0.00004	0.00001	0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.17830	0.11700	0.05889	0.02310	0.13995	0.1372	0.1427
Nickel	mg/L	0.03049	0.03817	0.06635	0.02420	0.05965	0.0608	0.0585

Potassium	mg/L	-	-	-	-	50.60	42.5	58.7
Selenium	mg/L	0.00150	0.00130	0.00111	0.00100	0.00350	< 0.0005	0.0065
Silver	mg/L	0.00010	0.00010	0.00013	0.00010	0.00010	< 0.0001	< 0.0001
Sodium	mg/L	-	-	-	-	279.50	241	318
Thallium	mg/L	0.00500	0.00114	0.00080	0.00080	0.00020	< 0.0002	< 0.0002
Zinc	mg/L	0.00229	0.00486	0.00280	0.00100	0.00100	< 0.001	< 0.001
Dissolved Metals								
Aluminum	mg/L	0.00600	0.00925	0.02013	0.02300	0.00800	0.011	< 0.005
Arsenic	mg/L	0.02045	0.01403	0.02027	0.00050	0.27210	0.0255	0.5187
Barium	mg/L	0.00915	0.02073	0.01592	0.00930	0.02730	0.0238	0.0308
Cadmium	mg/L	0.00002	0.00037	0.00009	0.00005	0.00012	< 0.00002	0.00021
Chromium	mg/L	-	-	0.00102	0.00060	0.00060	< 0.0006	< 0.0006
Copper	mg/L	0.00080	0.00125	0.00165	0.00140	0.02485	0.0202	0.0295
Iron	mg/L	0.01000	0.01000	0.02333	0.01000	0.06500	< 0.01	0.12
Lead	mg/L	0.00030	0.00030	0.00102	0.00030	0.00030	< 0.0003	< 0.0003
Manganese	mg/L	0.07060	0.13730	0.12553	0.12500	0.88165	0.8366	0.9267
Mercury	mg/L	0.00001	0.00005	0.00002	0.00001	0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.06470	0.13188	0.05919	0.02300	0.15325	0.1387	0.1678
Nickel	mg/L	0.02280	0.03250	0.02901	0.02220	0.06400	0.0605	0.0675
Selenium	mg/L	0.00100	0.00200	0.00111	0.00100	0.00750	0.0067	0.0083
Silver	mg/L	0.00010	0.00010	0.00015	0.00010	0.00010	< 0.0001	< 0.0001
Thallium	mg/L	0.00500	0.00080	0.00080	0.00080	0.00020	< 0.0002	< 0.0002
Zinc	mg/L	0.00100	0.00225	0.00097	0.00100	0.00100	< 0.001	< 0.001

**Annual average from 2015 to 2018 refer to ST-17 Sump*

Table 8-22 Meadowbank 2019 South Portage Pit Sump Water Quality Monitoring (ST-19)

Parameter	Sample Date	Annual Average						2019-06-17	2019-08-07	2019-10-20
	Unit	2013	2015	2016	2017	2018	2019			
Field Measured										
pH	pH units	7.49	6.66	7.7	8.14	7.67	7.93	-	7.85	8
Turbidity	NTU	14.52	4.6	26.68	1.77	3.11	25.90	-	15.8	36
Conventional Parameters										
Hardness	mg CaCO3/L	48	195.5	273	191.67	179.5	266.00	226	283	289
Total alkalinity, as CaCO3	mg CaCO3/L	72	63.67	63.67	76.67	58.00	59.67	46	76	57
Total dissolved solids	mg/L	-	498.00	562.00	388.00	310.50	424.33	368	481	424
Total suspended solids	mg/L	127	-	10.67	1.67	13.00	24.00	11	17	44
Major Ions										
Chloride	mg/L	1.650	15.400	30.500	28.700	16.600	29.433	33.3	30.4	24.6
Cyanide	mg/L	-	-	0.039	0.011	0.009	0.026	0.008	0.051	0.019
Fluoride	mg/L	0.130	0.270	0.510	0.390	0.270	0.337	0.18	0.4	0.43
Sulphate	mg/L	82.650	135.500	245.130	129.000	131.500	220.667	178	240	244
Nutrients and Chlorophyll a										
Nitrite	mg/L	0.030	0.195	0.150	0.350	0.115	0.280	0.09	0.21	0.54
Nitrate	mg/L	1.350	10.470	4.300	7.570	6.460	8.350	2.65	13.5	8.9
Total ammonia as NH4	mg/L	0.210	2.750	5.310	4.200	1.950	2.687	0.4	5.22	2.44
Un-Ionized Ammonia, calculated	mg/L	-	0.047	0.083	0.063	0.035	0.067	< 0.01	0.13	0.06
Total Metals										
Aluminum	mg/L	-	-	0.17200	0.01830	0.17800	0.485333	0.264	0.152	1.04
Arsenic	mg/L	-	0.011	0.00210	0.00050	0.00150	0.004233	0.0039	0.0058	0.003
Barium	mg/L	-	-	0.01100	0.01400	0.00980	0.015567	0.0174	0.0205	0.0088
Cadmium	mg/L	-	-	0.00024	0.00003	0.00004	0.000027	< 0.00002	< 0.00002	0.00004
Chromium	mg/L	-	-	0.00280	0.00060	0.00070	0.008867	0.0024	0.0022	0.022
Copper	mg/L	-	0.0005	0.00190	0.00083	0.00135	0.002533	0.003	0.0035	0.0011
Iron	mg/L	-	-	1.54000	0.04000	0.42000	0.780000	0.46	0.42	1.46

Parameter	Sample Date	Annual Average						2019-06-17	2019-08-07	2019-10-20
	Unit	2013	2015	2016	2017	2018	2019			
Lead	mg/L	-	0.0003	0.00030	0.00910	0.00160	0.000300	< 0.0003	< 0.0003	0.0003
Manganese	mg/L	-	-	0.26000	0.08800	0.12350	0.073033	0.1023	0.0493	0.0675
Mercury	mg/L	-	-	0.00010	0.00006	0.00001	0.000010	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	-	-	0.06600	0.02900	0.02165	0.033800	0.0267	0.0342	0.0405
Nickel	mg/L	-	0.08700	0.04000	0.01900	0.02120	0.016633	0.0102	0.0154	0.0243
Selenium	mg/L	-	-	0.00200	0.00170	0.001	0.001000	< 0.0005	0.0016	0.0009
Silver	mg/L	-	-	0.00010	0.00010	0.0001	0.000100	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	-	-	0.00120	0.00080	0.0008	0.000200	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	-	0.068	0.00400	0.00100	0.001	0.002333	< 0.001	0.005	< 0.001

Table 8-23 Meadowbank 2019 South Portage Pit Lake Water Quality Monitoring (ST-19 Lake)

Parameter	Sample Date / Unit	Annual Average	2019-06-17	2019-07-16
Field Measured				
pH	pH units	7.45	7.1	7.79
Turbidity	NTU	5.80	9.16	2.44
Conventional Parameters				
Hardness	mg CaCO3/L	300.00	280	320
Total alkalinity, as CaCO3	mg CaCO3/L	61.00	77	45
Total dissolved solids	mg/L	565.00	550	580
Total suspended solids	mg/L	9.50	14	5
Dissolved organic carbon	mg/L	4.70	7.6	1.8
Major Ions				
Chloride	mg/L	31.20	35.8	26.6
Cyanide	mg/L	0.15	0.266	0.025
Fluoride	mg/L	0.47	0.53	0.4
Sulphate	mg/L	266.50	270	263
Cyanide (free)	mg/L	0.06	0.1	0.019
Nutrients and Chlorophyll a				
Total phosphorus	mg/L	0.02	< 0.01	0.02
Nitrite	mg/L	0.53	0.57	0.53
Nitrate	mg/L	17.50	22.7	17.5
Total ammonia as NH4	mg/L	9.58	14.3	4.86
Un-Ionized Ammonia, calculated	mg/L	0.18	0.26	0.1
Total Metals				
Aluminum	mg/L	0.04750	0.062	0.033
Arsenic	mg/L	0.00180	0.0031	< 0.0005
Barium	mg/L	0.01545	0.0142	0.0167
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002
Calcium	mg/L	67.60000	64.8	70.4
Chromium	mg/L	0.00195	0.0023	0.0016
Copper	mg/L	0.00145	0.0021	0.0008
Iron	mg/L	0.25500	0.45	0.06
Lead	mg/L	0.00030	< 0.0003	< 0.0003
Magnesium	mg/L	32.10000	28.9	35.3
Manganese	mg/L	0.16075	0.192	0.1295
Mercury	mg/L	0.00006	0.00011	< 0.00001
Molybdenum	mg/L	0.05200	0.0642	0.0398
Nickel	mg/L	0.03050	0.0404	0.0206
Potassium	mg/L	20.95000	24.6	17.3
Selenium	mg/L	0.00050	< 0.0005	0.0005

Parameter	Sample Date / Unit	Annual Average	2019-06-17	2019-07-16
Silver	mg/L	0.00010	< 0.0001	< 0.0001
Sodium	mg/L	43.85000	51.5	36.2
Strontium	mg/kg	0.50800	0.511	0.505
Thallium	mg/L	0.00020	< 0.0002	< 0.0002
Zinc	mg/L	0.00100	< 0.001	< 0.001
Dissolved Metals				
Aluminum	mg/L	0.00925	< 0.0005	0.018
Arsenic	mg/L	0.00125	0.002	< 0.0005
Barium	mg/L	0.01365	0.0126	0.0147
Cadmium	mg/L	0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.00060	< 0.0006	< 0.0006
Copper	mg/L	0.00150	0.0022	0.0008
Iron	mg/L	0.04500	0.08	< 0.01
Lead	mg/L	0.00030	< 0.0003	< 0.0003
Manganese	mg/L	0.15025	0.1835	0.117
Mercury	mg/L	0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.05205	0.0654	0.0387
Selenium	mg/L	0.00050	< 0.0005	< 0.0005
Silver	mg/L	0.00010	< 0.0001	< 0.0001
Strontium	mg/L	0.49700	0.504	0.49
Thallium	mg/L	0.00020	< 0.0002	< 0.0002
Zinc	mg/L	0.00100	< 0.001	< 0.001

8.5.3.1.10 Goose Pit Sump/Lake (ST-20)

In 2012 a sump was constructed in the Bay Goose pit in an area of water accumulation. Water that was collected in the Goose Pit sump was transferred to the South Cell TSF. Mining activities have ceased in the Goose pit in April 2015. Starting in June 2015, no additional water was pumped out of the Bay Goose Pit; instead runoff and groundwater were kept in the pit to contribute to natural re-flooding of the pit. On May 24, 2019, Agnico received from NWB the Ministers Approval regarding the Amendment No.3 to Type A Water Licence No. 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.

Seepage rates and volumes through the Bay Goose dike are not significant. No seepage collection system has been implemented because there is no evidence of significant seepage that had affected the mining operation or the dike integrity, and that warrants a collection system.

In 2019, Agnico collected one monthly water quality samples in July at the bottom of the pit at station ST-20 Goose Pit Lake. Results of sampling conducted at station ST-20 Goose Pit Lake are presented in Table 8-24; the sampling location is illustrated on Figure 1. Four samples were also collected monthly during open water in from June to August as per the requirements in the NWB water license at a sump at the top of Bay Goose Pit (sampling station ST-20 Goose Pit Sump). The data are presented in Table 8-25, the sampling location is illustrated on Figure 1. There are no applicable license limits for ST-20 Goose Pit Sump and ST-20 Goose Pit Lake 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 have started in Bay Goose Pit. There was no sampling of the Bay Goose Pit after the in-pit disposal started for safety reasons. There are no applicable license limits for this station as the water is used as reclaim water at the mill. Sample results are presented in Table 8-26 . The location of sampling station ST-21 (South Cell TSF) is illustrated on Figure 1. As per the water license, no more monitoring in the TSF North Cell is required.

8.5.3.1.12 Vault Pit Sump (ST-23)

In 2014 a sump was constructed in the Vault pit in an area of water accumulation. Water from the Vault Pit is to be sampled monthly during open water as per the requirements in the NWB water license. In 2019 water from Vault Pit sump (Table 8-27) was sampled monthly during open water as per the requirements in the NWB Water License (sampling station ST-23 on Figure 1). Agnico Eagle will continue to maximize efforts in ensuring that water sample will be collected in open water season month. In 2019, no water was pumped to the Vault Attenuation Pond as per previous years. Water is rather kept in the pit and contribute to the natural reflooding. There are no applicable license limits for ST-23.

Table 8-24 Meadowbank 2019 Goose Pit Lake Water Quality Monitoring (ST-20 Lake)

Parameter	Sample Date	Annual Average					2019-07-31
	Unit	2015	2016	2017	2018	2019	
Field Measured							
pH	pH units	-	7.76	7.53	7.32	-	-
Turbidity	NTU	-	28.21	14.91	9.77	-	-
Conventional Parameters							
Hardness	mg CaCO3/L	104.00	173.00	172.25	114.50	405.00	405
Total alkalinity, as CaCO3	mg CaCO3/L	75.00	81.25	84.50	61.50	61.00	61
Total dissolved solids	mg/L	217.00	389.75	379.25	218.00	803.00	803
Total suspended solids	mg/L	1.00	12.25	8.75	6.00	20.00	20
Total Dissolved carbon	mg/L	-	0.20	3.12	3.85	8.60	8.6
Total organic carbon	mg/L	2.10	1.35	3.30	3.20	6.70	6.7
Major Ions							
Bicarbonate	mg CaCO3/L	75.00	81.25	84.50	36.00	61.00	61
Carbonate	mg CaCO3/L	2.00	2.00	2.00	2.00	2.00	< 2
Chloride	mg/L	13.70	24.58	25.25	14.40	80.00	80
Cyanide	mg/L	0.005	0.005	0.006	0.001	0.15	0.152
Sulphate	mg/L	45.80	146.00	148.50	80.20	469.00	469
Reactive silica	mg/kg	2.75	5.28	5.43	5.88	12.70	12.7
Cyanide (Free)	mg/L	-	0.005	0.005	0.005	0.15	0.147
Nutrients and Chlorophyll a							
Total Kjeldahl nitrogen	mg/L	0.490	3.440	1.390	0.775	17.600	17.6
Nitrite	mg/L	0.080	0.260	0.085	0.035	0.020	0.02
Nitrate	mg/L	4.110	2.920	3.830	2.190	1.900	1.9
Total phosphorus	mg/L	0.010	0.023	0.030	0.055	0.060	0.06
Total orthophosphate (as phosphorus)	mg/L	0.010	0.043	0.013	0.035	0.050	0.05
Total ammonia as NH4	mg/L	0.570	3.650	0.950	0.160	10.500	10.5
Un-Ionized Ammonia, calculated	mg/L	-	0.083	0.033	0.010	0.320	0.32
Total Metals							
Aluminum	mg/L	0.01100	0.40000	0.36000	0.10650	0.58800	0.588
Antimony	mg/L	0.00180	0.00150	0.00075	0.00016	0.00400	0.004
Arsenic	mg/L	0.00610	0.00050	0.00080	0.00295	0.01910	0.0191
Barium	mg/L	0.01660	0.04800	0.05400	0.03095	0.03830	0.0383
Beryllium	mg/L	0.00050	0.00050	0.00050	0.00050	0.00050	< 0.0005
Boron	mg/L	0.11000	0.05800	0.08000	0.06000	0.03000	0.03
Cadmium	mg/L	0.00002	0.00003	0.00002	0.00002	0.00024	0.00024
Calcium	mg/L	0.00250	44.90000	43.60000	28.85000	127.00000	127
Chromium	mg/L	0.00070	0.00350	0.00360	0.00155	0.00940	0.0094
Copper	mg/L	0.07000	0.00210	0.00110	0.00125	0.56090	0.5609
Iron	mg/L	0.00030	0.85000	0.80000	0.15000	1.03000	1.03

Lead	mg/L	0.00500	0.00060	0.00720	0.00030	0.00030	< 0.0003
Lithium	mg/L	11.10000	0.00500	0.00420	0.00500	0.01300	0.013
Magnesium	mg/L	0.01750	14.93000	15.48000	10.36500	21.10000	21.1
Manganese	mg/L	0.00005	0.15000	0.09800	0.01205	0.05090	0.0509
Mercury	mg/L	0.01450	0.00002	0.00006	0.00001	0.00002	0.00002
Molybdenum	mg/L	0.00970	0.02400	0.02070	0.01475	0.12810	0.1281
Nickel	mg/L	5.81000	0.01200	0.01700	0.01205	0.02320	0.0232
Potassium	mg/L	0.00100	9.98000	9.10000	6.73500	35.90000	35.9
Selenium	mg/L	0.00100	0.00100	0.00170	0.00095	0.00520	0.0052
Sodium	mg/L	18.50000	37.10000	36.48000	22.60000	149.00000	149
Strontium	mg/kg	0.17700	0.27000	0.33000	0.19800	0.62000	0.62
Thallium	mg/L	0.00500	0.00080	0.00080	0.00020	0.00020	< 0.0002
Tin	mg/kg	0.00100	0.00100	0.00100	0.00100	0.00100	< 0.001
Titanium	mg/L	0.01000	0.05500	0.05500	0.02000	0.01000	0.01
Uranium	mg/L	0.00300	0.00880	0.01100	0.00650	0.01300	0.013
Vanadium	mg/L	0.00050	0.00050	0.00073	0.00005	0.00200	0.002
Zinc	mg/L	0.00200	0.00300	0.00150	0.00200	0.00300	0.003
Dissolved Metals							
Aluminum	mg/L	0.00600	0.00600	0.00600	0.02950	0.02400	0.024
Antimony	mg/L	0.00200	0.00150	0.00073	0.00025	0.00320	0.0032
Arsenic	mg/L	0.00050	0.00050	0.00078	0.00290	0.01460	0.0146
Barium	mg/L	0.01630	0.04500	0.04800	0.02760	0.03030	0.0303
Beryllium	mg/L	0.00050	0.00050	0.00050	0.00065	0.00050	< 0.0005
Boron	mg/L	0.12000	0.05000	0.06500	0.06500	0.01000	< 0.01
Cadmium	mg/L	0.00002	0.00003	0.00002	0.00006	0.00002	< 0.00002
Chromium	mg/L	0.00060	0.00170	0.00060	0.00180	0.00060	< 0.0006
Copper	mg/L	0.00050	0.00060	0.00090	0.00085	0.35430	0.3543
Iron	mg/L	0.01000	0.01000	0.01500	0.01000	0.01000	< 0.01
Lead	mg/L	0.00030	0.00050	0.00540	0.00030	0.00030	< 0.0003
Lithium	mg/L	0.00500	0.00500	0.00500	0.00500	0.00500	< 0.005
Manganese	mg/L	0.00580	0.12000	0.07200	0.00433	0.03090	0.0309
Mercury	mg/L	0.00006	0.00014	0.00004	0.00001	0.00001	< 0.00001
Molybdenum	mg/L	0.01480	0.02300	0.02100	0.01235	0.10250	0.1025
Nickel	mg/L	0.00970	0.01000	0.01300	0.01020	0.01500	0.015
Selenium	mg/L	0.00100	0.00100	0.00130	0.00070	0.00150	0.0015
Tin	mg/L	0.00100	0.00100	0.00100	0.00100	0.00100	< 0.001
Strontium	mg/L	0.19300	0.28000	0.32000	0.19550	0.51400	0.514
Titanium	mg/L	0.01000	0.03000	0.04800	0.01500	0.01000	< 0.01
Thallium	mg/L	0.00500	0.00080	0.00080	0.00020	0.00020	< 0.0002
Uranium	mg/L	0.00300	0.00830	0.01200	0.00700	0.01100	0.011
Vanadium	mg/L	0.00050	0.00050	0.00050	0.00050	0.00050	< 0.0005
Zinc	mg/L	0.00100	0.00100	0.00130	0.00100	0.00100	< 0.001

Table 8-25 Meadowbank 2019 Goose Pit Sump Water Quality Monitoring (ST-20)

Parameter	Sample Date	Annual Average							2019-06-03	2019-06-26	2019-07-29	2019-08-12
	Unit	2013	2014	2015	2016	2017	2018	2019				
Field Measured												
pH	pH units	7.68	7.97	7.37	7.73	7.92	7.48	8.49	7.79	9.72	7.97	-
Turbidity	NTU	52.61	27.34	41.13	23.77	9.02	13.50	12.94	30.3	6.16	2.37	-
Conventional Parameters												
Hardness	mg CaCO3/L	0.0016	131	134	127	226	149	-	-	-	-	-
Total alkalinity, as CaCO3	mg CaCO3/L	130	90	56.5	4	85.67	46.33	-	-	-	-	-
Total dissolved solids	mg/L	314	530	180.00	238.00	423.00	236.33	224.75	75	307	266	251
Total suspended solids	mg/L	-	-	7.00	18.25	5.00	8.00	7.75	22	4	3	2
Major Ions												
Chloride	mg/L	62.200	52.450	22.170	13.350	12.700	7.700	5.025	0.5	7.3	7.6	4.7
Cyanide	mg/L	-	-	0.008	0.004	0.002	0.003	0.00125	< 0.001	< 0.001	0.002	0.001
Fluoride	mg/L	0.720	0.940	0.400	0.340	-	0.200	0.165	0.08	0.2	0.19	0.19
Sulphate	mg/L	66.400	60.750	78.970	84.200	147.330	115.167	100.15	29.6	118	145	108
Nutrients and Chlorophyll a												
Nitrite	mg/L	0.540	0.260	0.19	0.023	0.13	0.020	0.038	0.02	0.02	0.09	0.02
Nitrate	mg/L	20.800	10.850	2.96	3.71	13.22	5.370	3.788	0.79	6.17	5.88	2.31
Total ammonia as NH4	mg/L	0.300	0.064	1.130	0.100	1.160	0.157	0.585	0.21	0.07	< 0.01	2.05
Un-Ionized Ammonia, calculated	mg/L	-	-	0.015	0.010	0.020	0.010	0.018	< 0.01	< 0.01	< 0.01	0.04
Total Metals												
Aluminum	mg/L	-	-	0.30500	0.38700	0.11200	0.19967	0.1995	0.663	0.018	0.028	0.089
Arsenic	mg/L	-	-	0.00140	0.00063	0.00290	0.00150	0.001875	0.0024	< 0.0005	0.001	0.0036
Barium	mg/L	-	-	0.02760	0.02100	0.04100	0.02183	0.0201	0.008	0.0287	0.024	0.0197
Cadmium	mg/L	-	-	0.00002	0.00005	0.00003	0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	-	-	0.00060	0.00330	0.00060	0.00267	0.00285	0.0073	0.0009	0.0009	0.0023
Copper	mg/L	-	-	0.00230	0.00300	0.00200	0.00150	0.001875	0.0023	0.0007	0.0015	0.003
Iron	mg/L	-	-	0.69000	0.67000	0.21000	0.32333	0.355	1.12	0.1	0.05	0.15

Parameter	Sample Date	Annual Average							2019-06-03	2019-06-26	2019-07-29	2019-08-12
	Unit	2013	2014	2015	2016	2017	2018	2019				
Lead	mg/L	-	-	0.00048	0.00030	0.00030	0.00030	0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	-	-	0.26820	0.06800	0.09900	0.11740	0.05285	0.0697	0.0603	0.0455	0.0359
Mercury	mg/L	-	-	0.00001	0.00001	0.00002	0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	-	-	0.01380	0.00680	0.00660	0.00487	0.0048	0.0043	0.0053	0.0058	0.0038
Nickel	mg/L	-	-	0.03800	0.04000	0.07600	0.07540	0.0338	0.0105	0.0624	0.0498	0.0125
Selenium	mg/L	-	-	0.00100	0.00100	0.00170	0.00080	0.000725	< 0.0005	< 0.0005	< 0.0005	0.0014
Silver	mg/L	-	-	0.00010	0.00010	0.00170	0.00010	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	-	-	0.00500	0.00110	0.00080	0.00040	0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	-	-	0.00100	0.00300	0.00230	0.00167	0.0014	0.003	< 0.001	< 0.001	< 0.001

Table 8-26 Meadowbank 2019 Tailings Reclaim Pond Water Quality Monitoring (ST-21)

Parameter	Sample Date	Annual Average							2019-03-05	2019-04-09	2019-05-29	2019-06-03	2019-07-02	2019-07-14	2019-08-06	2019-09-03	2019-10-07	2019-10-12
	Unit	2013	2014	2015	2016	2017	2018	2019										
Field Measured																		
pH	pH units	8.4	7.84	7.99	8.14	8.22	8.24	8.03	-	8.04	7.51	7.85	-	-	8.71	8.01	8.03	-
Turbidity	NTU	15.31	6	10.68	10.59	7.85	16.28	16.22	-	9.57	11.4	8.94	-	-	33	22.3	12.1	-
Conventional Parameters																		
Hardness	mg CaCO3/L	1219	1252.25	1217.81	1264.33	1223.74	1119.17	810.00	1112	-	1053	-	-	552	-	-	-	523
Total dissolved solids	mg/L	2949.09	3669.14	2498.54	2338.17	3033.05	2628.08	1605.60	2428	2681	1658	1548	1642	1356	1245	1474	1088	936
Total suspended solids	mg/L	-	13.58	13.17	20.67	10.84	7.58	15.30	6	13	11	9	12	7	34	36	17	8
Total alkalinity, as CaCO3	mg CaCO3/L	125	100.25	122.690	124.830	126.850	118.083	79.00	105	124	58	44	61	71	137	44	67	79
Major Ions																		
Cyanide	mg/L	11.35	10.24	0.31	0.64	0.17	0.08	0.952	8	-	0.189	0.087	0.091	0.048	0.077	0.027	0.027	0.02
Fluoride	mg/L	2.17	2.59	0.65	0.58	0.40	0.47	0.422	0.58	-	0.52	0.39	0.41	0.37	0.41	0.43	0.35	0.34
Sulphate	mg/L	2033.67	2217.86	1644.85	1939.17	1855.43	2150.67	1153.000	2159	-	1733	1266	991	983	1063	793	750	639
Nutrients and Chlorophyll a																		
Nitrite	mg/L	0.55	0.42	0.33	0.19	0.24	0.63	0.270	<0.01	-	0.16	0.03	0.11	0.16	0.39	0.52	0.49	0.56
Nitrate	mg/L	15.20	26.19	9.45	7.20	3.69	4.86	4.350	4.53	-	8.38	2.47	4.34	4.88	2.77	2.27	4.09	5.41
Total ammonia as NH4	mg/L	25.70	0.70	37.57	42.32	43.57	50.48	22.311	50.2	-	17.5	21.3	30	28.5	16.3	11.4	13.1	12.5
Un-Ionized Ammonia, calculated	mg/L	-	-	3.11	1.96	1.28	1.87	0.670	1.23	-	0.44	0.33	0.67	1.02	1.05	0.2	0.42	-
Total Metals																		
Aluminum	mg/L	0.253	0.163	0.090300	0.144000	0.110000	0.237500	0.09933	0.036	-	0.114	0.133	0.112	0.013	0.307	0.024	0.1	0.055
Arsenic	mg/L	0.0192	0.0107	0.017000	0.015000	0.008600	0.017145	0.02179	0.0429	-	0.0104	0.0051	0.0249	0.05	0.0211	0.0162	0.012	0.0135
Barium	mg/L	0.0712	0.00774	0.075000	0.093000	0.086000	0.136783	0.04206	0.0946	-	0.0632	0.0279	0.0367	0.0361	0.0357	0.0316	0.028	0.0247
Cadmium	mg/L	0.00072	0.00101	0.000780	0.001300	0.001500	0.002695	0.000077	< 0.00002	-	0.00021	< 0.00002	< 0.00002	0.00007	< 0.00002	0.00009	< 0.0002	0.00022
Chromium	mg/L	0.001	0.0006	0.001500	0.001300	0.001500	0.002290	0.00149	< 0.0006	-	< 0.0006	< 0.0006	0.0018	0.0009	0.0022	< 0.0006	< 0.005	0.0011
Copper	mg/L	3.292	3.4	1.100000	0.460000	0.370000	0.907600	1.60514	4.602	-	6.778	1.061	1.317	0.4018	0.1351	0.0662	0.039	0.0462
Iron	mg/L	0.36	0.42	0.630000	1.010000	0.049000	1.092333	0.46875	0.91	-	0.36	0.37	0.36	< 0.01	0.9	0.24	0.32	0.29
Lead	mg/L	0.0024	0.0005	0.000460	0.000710	0.001400	0.003117	0.00212	< 0.0003	-	0.0012	< 0.0003	< 0.0003	< 0.0003	0.0069	0.0034	0.0036	0.0028
Manganese	mg/L	0.3343	0.0674	0.690000	0.210000	0.280000	0.486483	0.34204	0.4161	-	0.2281	0.7965	0.3474	0.2035	0.1965	0.2319	0.29	0.3684
Mercury	mg/L	0.00015	0.00035	0.000250	0.000350	0.000270	0.000186	0.000020	< 0.00001	-	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.0001	< 0.00001
Molybdenum	mg/L	0.3519	0.3672	0.310000	0.420000	0.530000	0.516775	0.23731	0.3968	-	0.3862	0.2057	0.2592	0.2271	0.2237	0.1859	0.14	0.1112
Nickel	mg/L	0.264	0.6694	0.110000	0.052000	0.130000	0.120342	0.09931	0.2635	-	0.1648	0.0581	0.1104	0.1197	0.0582	0.0432	0.033	0.0429
Selenium	mg/L	0.03	0.177	0.062000	0.073000	0.048000	0.069775	0.00540	0.0103	-	0.0102	0.0046	0.0037	0.006	0.0046	0.0035	< 0.003	0.0027
Silver	mg/L	-	-	0.001400	0.000880	0.000380	0.000150	0.00044	< 0.0001	-	0.0007	< 0.0001	0.0009	0.0009	< 0.0001	< 0.0001	< 0.001	< 0.0001
Thallium	mg/L	0.148	0.005	0.005000	0.001700	0.000800	0.000550	0.00062	0.0022	-	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.002	< 0.0002
Zinc	mg/L	0.004	0.01	0.002900	0.003500	0.010000	0.004750	0.00457	< 0.001	-	< 0.001	< 0.001	< 0.001	0.007	0.005	0.009	0.0071	0.009

Table 8-27 Meadowbank 2019 Vault Pit Sump Water Quality Monitoring (ST-23)

Parameter	Sample Date	Annual Average						2019-07-23	2019-08-07	2019-09-09
	Unit	2014	2015	2016	2017	2018	2019			
Field Measured										
pH	pH units	7.13	7.11	7.76	7.72	7.516	8.00	8.06	8.02	7.92
Turbidity	NTU	18.95	283.5	12.07	26.75	12.052	1.81	0.96	3.78	0.69
Conventional Parameters										
Total alkalinity, as CaCO3	mg CaCO3/L	88.50	126.00	94.75	119.50	107.00	63.00	57	75	57
Hardness	mg CaCO3/L	378.00	340.00	332.25	289.83	286.80	197.33	277	168	147
Total dissolved solids	mg/L	455.50	568.00	529.00	464.00	370.20	312.33	391	255	291
Total suspended solids	mg/L	-	-	13.00	30.83	7.80	7.33	1	20	< 1
Total organic carbon	mg/L	-	-	-	7.20	5.78	2.63	2.4	2.7	2.8
Dissolved organic carbon	mg/L	-	-	-	5.82	4.98	3.23	2.3	3.3	4.1
Major Ions										
Bicarbonate	mg CaCO3/L	-	-	-	119.500	107.000	63.000	57	75	57
Calcium	mg/L	-	-	-	-	80.12000	53.400000	70.9	47.3	42
Carbonate	mg CaCO3/L	-	-	-	2.000	2.000	2.000	< 2	< 2	< 2
Chloride	mg/L	30.900	33.200	29.330	35.580	25.280	10.900	15.5	11	6.2
Cyanide	mg/L	-	-	0.078	0.055	0.049	0.006	0.008	0.001	0.008
Magnesium	mg/L	-		29.33000	21.40000	21.26000	15.700000	24.4	12.4	10.3
Sodium	mg/L	-		29.33000	15.00000	13.80200	7.246667	11	5.53	5.21
Sulphate	mg/L	148.00	124.00	143.98	146.37	183.48	133.533	193	114	93.6
Reactive silica	mg/kg	-	-	-	8.55	6.10	6.477	5.68	8.61	5.14
Cyanide (free)	mg/L	-	-	0.017	0.017	0.037	0.003	0.004	< 0.001	0.004
Nutrients and Chlorophyll a										
Total Kjeldahl nitrogen	mg/L	-	-	-	3.900	3.894	1.293	0.97	0.95	1.96
Nitrate	mg/L	46.4	45.9	19.85	4.23	4.60	7.450	11.1	3.51	7.74
Nitrite	mg/L	1.5	2.05	0.27	0.15	0.08	0.040	0.07	0.03	0.02
Total phosphorus	mg/L	-	-	-	0.058	0.016	0.030	< 0.01	0.01	0.07

Parameter	Sample Date	Annual Average						2019-07-23	2019-08-07	2019-09-09
	Unit	2014	2015	2016	2017	2018	2019			
Total orthophosphate (as phosphorus)	mg/L	-	-	-	0.027	0.018	0.010	< 0.01	< 0.01	< 0.01
Total ammonia as NH4	mg/L	0.180	22.620	5.040	3.830	3.134	1.180	1.03	0.58	1.93
Un-Ionized Ammonia, calculated	mg/L	-	0.320	0.113	0.083	0.070	0.030	0.03	0.01	0.05
Total Metals										
Aluminum	mg/L	-	-	0.21000	0.51250	0.16760	0.052333	0.013	0.116	0.028
Antimony	mg/L	-	-	-	0.00422	0.08964	0.004000	0.0053	0.0025	0.0042
Arsenic	mg/L	-	0.00050	0.00270	0.00672	0.00284	0.004967	0.0047	0.0061	0.0041
Barium	mg/L	-	-	0.03200	0.03458	0.02908	0.029367	0.0307	0.0218	0.0356
Beryllium	mg/L	-	-	-	0.00050	0.00050	0.000500	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	-	-	-	0.01500	0.02200	0.010000	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	-	-	0.00018	0.00004	0.00010	0.000020	< 0.00002	< 0.00002	0.00002
Chromium	mg/L	-	-	0.00130	0.00180	0.00070	0.001133	< 0.0006	0.0011	0.0017
Copper	mg/L	-	0.00780	0.00380	0.00102	0.00120	0.002700	0.0022	0.0025	0.0034
Iron	mg/L	-		0.65000	1.16167	0.33600	0.153333	0.04	0.29	0.13
Lead	mg/L	-	0.02300	0.00030	0.00058	0.00130	0.000400	< 0.0003	0.0006	< 0.0003
Lithium	mg/L	-	-	-	0.00883	0.00560	0.005000	< 0.005	< 0.005	< 0.005
Manganese	mg/L	-	-	0.15000	0.31153	0.16454	0.059867	0.041	0.0746	0.064
Mercury	mg/L	-	-	0.00003	0.00002	0.00001	0.000010	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	-	-	0.06600	0.03683	0.05950	0.048367	0.0709	0.043	0.0312
Nickel	mg/L	-	0.02300	0.00690	0.01002	0.00614	0.003633	0.0036	0.0048	0.0025
Potassium	mg/L	-	33.20000	29.33000	6.60167	7.73400	7.230000	10.7	4.83	6.16
Selenium	mg/L	-		0.00400	0.00183	0.00120	0.001067	< 0.0005	< 0.0005	0.0022
Strontium	mg/kg	-	-	-	0.65133	0.70400	0.423333	0.557	0.399	0.314
Thallium	mg/L	-	-	0.00110	0.00080	0.00044	0.000200	< 0.0002	< 0.0002	< 0.0002
Tin	mg/kg	-	-	-	0.00100	0.00240	0.001000	< 0.001	< 0.001	< 0.001
Titanium	mg/L	-	-	-	0.08000	0.03600	0.010000	< 0.01	< 0.01	< 0.01
Uranium	mg/L	-	-	-	0.01000	0.01150	0.017000	0.029	0.009	0.013

Parameter	Sample Date	Annual Average						2019-07-23	2019-08-07	2019-09-09
	Unit	2014	2015	2016	2017	2018	2019			
Vanadium	mg/L	-	-	-	0.00052	0.00050	0.000500	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	-	0.01500	0.00100	0.00350	0.00120	0.003333	0.003	0.003	0.004
Dissolved Metals										
Aluminum	mg/L	0.00600	0.00600	0.01400	0.22000	0.01500	0.000500	< 0.0005	< 0.0005	< 0.0005
Antimony	mg/L	-	-	-	0.00320	0.00888	0.003767	0.0052	0.0024	0.0037
Arsenic	mg/L	0.01300	0.00050	0.00240	0.00470	0.00234	0.003933	0.0044	0.0045	0.0029
Barium	mg/L	0.59000	0.07000	0.03100	0.02700	0.02520	0.025033	0.0287	0.0216	0.0248
Beryllium	mg/L	-	-	-	0.00050	0.00050	0.000500	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	-	-	-	0.03700	0.01800	0.010000	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	0.00030	0.00002	0.00013	0.00004	0.00016	0.000020	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	-	-	-	0.00100	0.00064	0.000600	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	0.01200	0.00100	0.00240	0.00160	0.00142	0.002333	0.0023	0.0016	0.0031
Iron	mg/L	0.22000	0.59000	0.03500	0.74000	0.01400	0.010000	< 0.01	< 0.01	< 0.01
Lead	mg/L	0.00030	0.00030	0.00030	0.00060	0.00030	0.000300	< 0.0003	< 0.0003	< 0.0003
Lithium	mg/L	-	-	-	0.00530	0.00540	0.005000	< 0.005	< 0.005	< 0.005
Manganese	mg/L	0.13280	0.08600	0.14000	0.27000	0.13296	0.054500	0.0376	0.0653	0.0606
Mercury	mg/L	0.00010	0.00001	0.00001	0.00002	0.00001	0.000010	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.11000	0.11000	0.06600	0.02800	0.06018	0.046700	0.0683	0.0402	0.0316
Nickel	mg/L	0.02500	0.02200	0.00660	0.00770	0.00552	0.003600	0.004	0.0042	0.0026
Selenium	mg/L	0.00700	0.00400	0.00400	0.00170	0.00118	0.000500	< 0.0005	< 0.0005	< 0.0005
Strontium	mg/L	-	-	-	0.66000	0.66900	0.408667	0.528	0.387	0.311
Thallium	mg/L	0.00500	0.00500	0.00110	0.00080	0.00044	0.000200	< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	-	-	-	0.00100	0.00100	0.001000	< 0.001	< 0.001	< 0.001
Titanium	mg/L	-	-	-	0.06500	0.04800	0.010000	< 0.01	< 0.01	< 0.01
Uranium	mg/L	-	-	-	0.00780	0.01400	0.016667	0.028	0.009	0.013
Vanadium	mg/L	-	-	-	0.00050	0.00640	0.000500	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	0.00200	0.00100	0.00100	0.00120	0.00360	0.001333	0.002	0.001	< 0.001

8.5.3.1.13 Vault Rock Storage Facility (ST-24)

The Vault Waste Rock Storage Facility (VRSF) has been in operation since 2013. As in the past, ponded water was observed at the base of the VRSF (sampling station ST-24). In 2019, water was sampled only in June, July, August and September. As per NWB Water License, samples were collected to assess water quality and the results are presented in Table 8-28. 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 8-29 for information purposes only. The location of sampling station ST-25 is illustrated on Figure 3. There was on water pumped out from the Vault Attenuation Pond to Wally Lake in 2019.

Table 8-28 Meadowbank 2019 Vault Waste Rock Storage Facility Seepage Water Quality Monitoring (ST-24)

Parameter	Sample Date	Annual Average						2019-06-09	2019-07-23	2019-07-29	2019-08-06	2019-09-09
	Unit	2014	2015	2106	2017	2018	2019					
Field Measured												
pH	pH units	7.34	7.04	7.28	6.36	7.29	7.65	7.25	7.77	7.87	7.65	7.69
Turbidity	NTU	25.90	17.75	74.12	91.60	24.41	6.47	17.2	3.34	4.16	6.19	1.47
Conventional Parameters												
Total alkalinity, as CaCO3	mg CaCO3/L	171.2	37.00	27.00	32.00	41.67	39.40	18	23	31	83	42
Hardness	mg CaCO3/L	1130.5	42.00	168.67	86.00	117.00	84.60	56	74	78	101	114
Total dissolved solids	mg/L	58.00	58.50	272.00	118.00	207.33	143.20	85	122	122	143	244
Total suspended solids	mg/L	-	-	26.00	38.00	26.67	4.60	10	2	4	6	< 1
Major Ions												
Chloride	mg/L	3.200	1.600	4.670	1.500	3.600	1.760	1.2	1.4	1.7	1.9	2.6
Cyanide	mg/L	-	-	0.026	0.001	0.001	0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.001
Fluoride	mg/L	0.070	0.040	0.060	0.080	0.093	0.102	0.07	0.1	0.09	0.13	0.12
Sulphate	mg/L	5.100	-	155.630	43.600	102.333	66.460	40.1	59.8	67.2	67.3	97.9
Nutrients and Chlorophyll a												
Nitrite	mg/L	0.01	0.01	0.063	0.02	0.025	0.028	0.03	0.03	0.03	0.03	0.02
Nitrate	mg/L	0.02	0.11	2.89	2.41	2.990	2.172	1.27	2.11	2.16	2.13	3.19
Total ammonia as NH4	mg/L	0.010	0.110	2.520	0.290	0.227	0.188	0.15	0.16	0.24	0.2	0.19
Un-Ionized Ammonia, calculated	mg/L	-	0.010	0.010	0.010	0.010	0.010	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total Metals												
Aluminum	mg/L	0.066	0.105000	0.670000	2.010000	0.479000	0.12380	0.419	< 0.005	0.08	0.11	< 0.005
Arsenic	mg/L	0.0081	0.000500	0.000500	0.000500	0.000500	0.00454	0.0014	0.0046	0.005	0.0055	0.0062
Barium	mg/L	0.0632	0.007700	0.035000	0.025300	0.022900	0.01500	0.0138	0.0078	0.0086	0.0052	0.0396
Cadmium	mg/L	0.00091	0.000020	0.000080	0.000080	0.000103	0.00006	0.00015	< 0.00002	0.00007	< 0.00002	0.00006
Chromium	mg/L	0.0006	0.000600	0.000600	0.006200	0.000700	0.00094	0.0012	0.0011	0.0006	0.0012	< 0.0006
Copper	mg/L	0.7477	0.002200	0.003100	0.007200	0.006800	0.00618	0.005	0.0048	0.0049	0.0118	0.0044
Iron	mg/L	0.49	1.100000	8.540000	2.920000	1.130000	0.25400	0.85	0.11	0.12	0.15	0.04
Lead	mg/L	0.0003	0.001800	0.000630	0.000300	0.000300	0.00030	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	2.47	0.086000	1.420000	0.191200	0.188833	0.05128	0.1007	0.0318	0.0322	0.0462	0.0455

Parameter	Sample Date	Annual Average						2019-06-09	2019-07-23	2019-07-29	2019-08-06	2019-09-09
	Unit	2014	2015	2106	2017	2018	2019					
Mercury	mg/L	0.00005	0.000010	0.000010	0.000010	0.000023	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.211	0.001000	0.005600	0.007200	0.010933	0.01384	0.0054	0.0108	0.013	0.0164	0.0236
Nickel	mg/L	0.5806	0.002600	0.016000	0.125000	0.007933	0.00502	0.007	0.0045	0.0038	0.0057	0.0041
Selenium	mg/L	0.099	0.001000	0.001000	0.001000	0.001567	0.00062	< 0.0005	< 0.0005	< 0.0005	0.0011	< 0.0005
Silver	mg/L	-	-	0.000130	0.000100	0.000100	0.00034	< 0.0001	< 0.0001	< 0.0001	0.0013	< 0.0001
Thallium	mg/L	0.005	0.005000	0.001200	0.000800	0.000600	0.00020	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.009	0.001000	0.012000	0.013000	0.004000	0.00580	0.004	< 0.001	< 0.001	< 0.001	0.022

Table 8-29 Meadowbank 2019 Vault Attenuation Pond Water Quality Monitoring (ST-25)

Parameter	Sample Date	Annual Average						2019-06-09	2019-07-24	2019-08-06	2019-09-09
	Unit	2014	2015	2016	2017	2018	2019				
Field Measured											
pH	pH units	6.51	7.08	7.50	7.83	7.24	7.55	7.69	7.5	7.49	7.51
Turbidity	NTU	5.89	10.99	14.60	16.39	7.63	5.44	12.2	1.7	4.9	2.94
Conventional Parameters											
Total alkalinity, as CaCO3	mg CaCO3/L	46.67	41.60	47.83	54.25	35.75	35.75	19	21	77	26
Hardness	mg CaCO3/L	59	70.00	123.33	117.50	102.25	83.50	61	86	104	83
Total dissolved solids	mg/L	151.00	136.80	215.50	187.50	180.75	139.75	79	145	150	185
Total suspended solids	mg/L	-	-	7.83	30.25	10.75	4.33	6	2	5	< 1
Major Ions											
Chloride	mg/L	4.100	6.800	9.730	9.830	7.050	6.050	1.8	7.4	7.3	7.7
Cyanide	mg/L	0.009	0.008	0.013	0.005	0.002	0.001	< 0.001	0.001	< 0.001	< 0.001
Fluoride	mg/L	0.140	0.087	0.140	0.100	0.148	0.138	0.11	0.07	0.2	0.17
Sulphate	mg/L	23.900	7.100	65.330	88.430	74.600	58.375	36.1	63.8	71.3	62.3
Nutrients and Chlorophyll a											
Nitrite	mg/L	2.3	4.67	2.75	2.19	2.69	0.010	0.01	0.01	0.01	<0.01
Nitrate	mg/L	0.08	0.14	0.07	1.4	0.020	1.203	0.66	1.22	1.19	1.74
Total ammonia as NH4	mg/L	0.025	2.230	1.200	1.860	0.878	0.445	0.33	0.31	0.46	0.68
Un-Ionized Ammonia, calculated	mg/L	-	0.032	0.017	0.023	0.010	0.010	< 0.01	< 0.01	< 0.01	< 0.01
Total Metals											
Aluminum	mg/L	-	0.02700	0.19600	0.63400	0.25425	0.15775	0.361	< 0.005	0.238	0.027
Arsenic	mg/L	-	0.00050	0.00080	0.00410	0.00055	0.00170	0.0014	0.0014	0.0021	0.0019
Barium	mg/L	0.00810	0.01400	0.02700	0.02300	0.02363	0.01685	0.0145	0.0095	0.0115	0.0319
Cadmium	mg/L	-	0.00002	0.00004	0.00002	0.00007	0.00009	0.0001	< 0.00002	0.00011	0.00014
Chromium	mg/L	-	0.00110	0.00820	0.00220	0.00195	0.00098	0.0011	< 0.0006	0.001	0.0012
Copper	mg/L	-	0.00340	0.00250	0.00370	0.00660	0.00728	0.0055	0.005	0.0142	0.0044
Iron	mg/L	-	0.17000	0.60000	0.99000	0.50000	0.37250	0.5	0.27	0.38	0.34

Parameter	Sample Date	Annual Average						2019-06-09	2019-07-24	2019-08-06	2019-09-09
	Unit	2014	2015	2016	2017	2018	2019				
Lead	mg/L	-	0.00060	0.00030	0.00030	0.00030	0.00030	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	-	0.02900	0.19000	0.06900	0.12868	0.10080	0.1192	0.0886	0.1324	0.063
Mercury	mg/L	-	0.00001	0.00170	0.00001	0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	-	0.01100	0.01100	0.01700	0.00615	0.00328	0.0027	0.0029	0.0038	0.0037
Nickel	mg/L	-	0.00360	0.00560	0.00520	0.01223	0.00928	0.0078	0.0082	0.0157	0.0054
Selenium	mg/L	-	0.00100	0.00100	0.00130	0.00080	0.00108	< 0.0005	0.0008	0.0016	0.0014
Silver	mg/L	-	-	0.00010	-	0.00010	0.00025	< 0.0001	< 0.0001	0.0007	< 0.0001
Thallium	mg/L	-	0.00500	0.00100	0.00080	0.00050	0.00020	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	-	0.00220	0.00470	0.00180	0.00875	0.00700	0.004	0.004	0.011	0.009

8.5.3.1.15 PRSF – Waste Extension Pool (WEP/ ST-30 and ST-31)

In 2014, as per inspections conducted within the framework of the Freshet Action Plan, run off was noted at the northeast side of the NPAG waste rock extension pile in a natural depression (WEP). Agnico contained this run off 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 2019, 35,111 m^3 of water was pumped from the WEP collection system to the North Cell TSF which includes 14,680 m^3 of water from WEP1 and 20,431 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.

Total volume pumped in 2019 is higher than previous year. Agnico is of the opinion that it mainly caused by the higher quantity of rainfall received in 2019 compared to previous years. This continues to confirm the effectiveness of the WEP collection system in collecting water. Table 8-30 below provide 2016 – 2019 pumped volume for WEP1 and WEP2.

Table 8-30 Meadowbank 2016 -2019 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

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 PRSF and to ensure that all water ponding behind the PRSF 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. Sumps 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-MEA1525. There are no applicable license limits. The sampling location is illustrated on Figure 1 and results are presented in Table 8-31 for WEP1 (ST-30) and Table 8-32 for WEP 2 (ST-31).

Results of samples collected in 2019 at station ST-5 (East Diversion ditch discharge point into NP2) are documented in Table 8-14. The results from summer 2019 show that no water coming from the former WEP collection system was in contact with the East Diversion ditch. Agnico 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 8-31 Meadowbank 2019 Waste Extension Pool WEP1 Water Quality Monitoring (ST-30)

Parameter	Sample Date	Annual Average				2019-06-04	2019-07-09	2019-08-05	2019-09-04
	Unit	2016	2017	2018	2019				
Field Measured									
pH	pH units	7.36	7.49	7.42	7.42	7.08	7.26	7.57	7.78
Turbidity	NTU	15.74	44.26	8.35	7.51	15.1	3.25	9.4	2.3
Conventional Parameters									
Hardness	mg CaCO3/L	102.20	157.00	65.50	115.00	-	97	90	158
Total alkalinity, as CaCO3	mg CaCO3/L	79.6	104.8	53.50	51.25	15	38	85	67
Total Dissolved Solids	mg/L	220.80	249.25	136.00	169.00	52	145	134	228
Total suspended solids	mg/L	7.00	13.80	6.25	5.50	12	2	7	< 1
Major Ions									
Chloride	mg/L	6.700	6.700	2.700	2.500	1.4	2.5	1.9	4.2
Cyanide	mg/L	0.002	0.032	0.010	0.005	0.003	0.005	0.01	< 0.001
Fluoride	mg/L	0.150	0.180	0.128	0.130	0.06	0.13	0.18	0.15
Sulphate	mg/L	55.860	71.380	32.225	44.825	17.2	48.5	43.3	70.3
Cyanide (free)	mg/L	0.005	0.0068	0.005	0.054	0.001	0.001	0.001	0.212
Nutrients and Chlorophyll a									
Nitrite	mg/L	0.054	0.048	0.017	0.103	0.33	0.02	0.05	<0.01
Nitrate	mg/L	1.07	0.79	0.39	1.79	0.33	1.67	2.29	2.86
Total ammonia as NH4	mg/L	2.210	1.370	0.185	0.095	0.11	0.11	0.1	0.06
Un-Ionized Ammonia, calculated	mg/L	0.033	0.020	0.010	0.010	< 0.01	< 0.01	< 0.01	< 0.01
Total Metals									
Aluminum	mg/L	0.246000	0.864000	0.121500	0.071667	-	0.045	0.131	0.039
Arsenic	mg/L	0.000840	0.042000	0.004675	0.008367	-	0.0036	0.0163	0.0052
Barium	mg/L	0.017000	0.019000	0.010200	0.010067	-	0.0103	0.0031	0.0168
Cadmium	mg/L	0.000082	0.000020	0.000020	0.000033	-	< 0.00002	< 0.00002	0.00006
Chromium	mg/L	0.000600	0.003600	0.001525	0.003000	-	0.0026	0.0052	0.0012
Copper	mg/L	0.017000	0.012000	0.010925	0.013700	-	0.0154	0.0121	0.0136

Parameter	Sample Date	Annual Average				2019-06-04	2019-07-09	2019-08-05	2019-09-04
	Unit	2016	2017	2018	2019				
Iron	mg/L	2.540000	3.140000	0.875000	0.466667	-	0.26	0.39	0.75
Lead	mg/L	0.001200	0.000860	0.000300	0.000300	-	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	0.280000	0.680000	0.066400	0.014333	-	0.0068	0.0144	0.0218
Mercury	mg/L	0.000180	0.000010	0.000010	0.000010	-	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.019000	0.001800	0.001775	0.004033	-	0.0041	0.0052	0.0028
Nickel	mg/L	0.005600	0.012000	0.004700	0.004500	-	0.0037	0.0055	0.0043
Selenium	mg/L	0.001000	0.001000	0.002250	0.000667	-	0.0007	0.0008	< 0.0005
Silver	mg/L	0.000140	0.000100	0.000100	0.000100	-	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.001000	0.000800	0.000500	0.000200	-	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.001200	0.003000	0.001250	0.001000	-	0.001	< 0.001	< 0.001

Table 8-32 Meadowbank 2019 Waste Extension Pool WEP2 Water Quality Monitoring (ST-31)

Parameter	Sample Date	Annual Average				2019-06-04	2019-07-09	2019-08-05	2019-09-04
	Unit	2016	2017	2018	2019				
Field Measured									
pH	pH units	7.56	7.66	7.30	7.34	7.29	7.24	7.33	7.48
Turbidity	NTU	17.32	12.94	18.24	7.94	20	1.49	6.58	3.69
Conventional Parameters									
Hardness	mg CaCO3/L	134.50	95.50	72.00	115.00	-	88	90	167
Total alkalinity, as CaCO3	mg CaCO3/L	112.50	78.75	52.00	50.00	14	26	91	69
Total dissolved solids	mg/L	181.25	211.75	112.00	124.75	41	124	103	231
Total suspended solids	mg/L	5.00	10.25	79.25	5.00	13	1	4	2
Major Ions									
Chloride	mg/L	5.480	12.180	5.600	2.875	1.6	2.3	1.7	5.9
Cyanide	mg/L	0.004	0.002	0.002	0.001	< 0.001	< 0.001	0.002	< 0.001
Fluoride	mg/L	0.300	0.150	0.130	0.105	0.04	0.08	0.14	0.16
Sulphate	mg/L	32.200	41.700	30.850	39.025	8.6	42.6	31.1	73.8
Cyanide (free)	mg/L	0.0050	0.0120	0.0050	0.001	0.001	< 0.001	< 0.001	0.001
Nutrients and Chlorophyll a									
Nitrite	mg/L	0.01	0.19	0.150	0.020	0.04	<0.01	0.02	<0.01
Nitrate	mg/L	0.55	3.085	0.340	1.117	0.28	0.779	1.73	1.68
Total ammonia as NH4	mg/L	0.090	1.820	0.037	0.060	0.07	0.05	0.1	0.02
Un-Ionized Ammonia, calculated	mg/L	0.010	0.028	0.010	0.010	< 0.01	< 0.01	< 0.01	< 0.01
Total Metals									
Aluminum	mg/L	0.27700	0.19200	1.25850	0.07400	-	0.029	0.132	0.061
Arsenic	mg/L	0.00058	0.00460	0.00240	0.04397	-	0.0025	0.1179	0.0115
Barium	mg/L	0.01600	0.00970	0.01783	0.00827	-	0.0058	0.0023	0.0167
Cadmium	mg/L	0.00004	0.00002	0.00002	0.00002	-	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.00150	0.00270	0.00588	0.00227	-	0.0019	0.0038	0.0011
Copper	mg/L	0.00390	0.00160	0.00463	0.00177	-	0.0017	0.0016	0.002

Parameter	Sample Date	Annual Average				2019-06-04	2019-07-09	2019-08-05	2019-09-04
	Unit	2016	2017	2018	2019				
Iron	mg/L	0.82000	0.63000	2.73750	0.33667	-	0.29	0.39	0.33
Lead	mg/L	0.00030	0.00220	0.00030	0.00030	-	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	0.12000	0.15000	0.12480	0.05080	-	0.0563	0.0146	0.0815
Mercury	mg/L	0.00001	0.00003	0.00001	0.00001	-	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.00110	0.00140	0.00078	0.00680	-	< 0.0005	0.0172	0.0027
Nickel	mg/L	0.00550	0.00390	0.00868	0.00340	-	0.0025	0.0032	0.0045
Selenium	mg/L	0.00100	0.00100	0.00250	0.00050	-	< 0.0005	< 0.0005	< 0.0005
Silver	mg/L	0.00010	0.00010	0.00010	0.00010	-	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.00110	0.00080	0.00050	0.00020	-	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.00100	0.00200	0.05350	0.00100	-	0.001	< 0.001	< 0.001

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 (28,9198 m^3 in 2019). The higher volume pumped in 2019 compared to previous years is mainly du the higher volume of rainfall received in 2019. 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 8-35 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 8-33 below provide 2016 – 2019 pumped volume from ST-32.

Table 8-33 Meadowbank 2016 -2019 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

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 (7,050 m^3 in 2019). The higher volume pumped in 2019 compared to previous years is mainly due to the higher volume of rainfall received in 2019. 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 8-36) 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 8-34 below provide 2015 – 2018 pumped volume from ST-S-2.

Table 8-34 Meadowbank 2015 -2019 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

Table 8-35 Meadowbank 2019 Saddle Dam 3 Water Quality Monitoring (ST-32)

Parameter	Sample Date / Unit	Annual Average 2016	2017	2018	2019	2019-06-10	2019-07-09	2019-08-12	2019-09-04
Field Measured									
pH	pH units	6.84	7.57	7.45	7.51	-	7.38	7.47	7.67
Turbidity	NTU	32.03	104.55	97.98	11.02	-	15.3	14.2	3.56
Conventional Parameters									
Hardness	mg CaCO3/L	252.67	356.50	194.50	261.50	144	217	268	417
Total alkalinity, as CaCO3	mg CaCO3/L	45.67	120.75	265.75	46.25	35	42	48	60
Total dissolved solids	mg/L	399.00	504.25	335.25	406.00	241	343	427	613
Total suspended solids	mg/L	14.33	664.50	55.75	18.50	56	11	6	< 1
Major Ions									
Chloride	mg/L	20.270	16.180	14.675	25.550	13.4	31.9	28.2	28.7
Cyanide	mg/L	0.010	0.049	0.016	0.008	0.009	0.019	0.004	< 0.001
Fluoride	mg/L	0.350	0.380	0.318	0.305	0.22	0.32	0.32	0.36
Sulphate	mg/L	184.670	185.100	116.825	136.450	91.1	89.7	126	239
Nutrients and Chlorophyll a									
Nitrite	mg/L	0.070	0.350	0.170	0.078	0.05	0.07	0.09	0.1
Nitrate	mg/L	8.83	16.53	23.230	16.640	8.24	12.3	19.5	26.5
Total ammonia as NH4	mg/L	1.400	4.340	6.788	2.303	1.9	1.89	1.54	3.88
Un-Ionized Ammonia, calculated	mg/L	0.010	0.038	0.128	0.048	0.03	0.03	0.02	0.11
Total Metals									
Aluminum	mg/L	0.24500	11.01000	1.45600	0.49425	1.46	0.349	0.137	0.031
Arsenic	mg/L	0.00050	0.00750	0.00740	0.03923	0.045	0.0134	0.05	0.0485
Barium	mg/L	0.04100	0.22000	0.04975	0.05083	0.0302	0.048	0.0665	0.0586
Cadmium	mg/L	0.00005	0.00013	0.00005	0.00005	< 0.00002	0.00003	< 0.00002	0.00013
Chromium	mg/L	0.00490	0.05000	0.01395	0.00873	0.0262	0.0061	0.0018	0.0008
Copper	mg/L	0.01400	0.08300	0.01318	0.00583	0.0067	0.007	0.0058	0.0038
Iron	mg/L	2.28000	22.38000	2.68500	0.86250	2.36	0.73	0.28	0.08
Lead	mg/L	0.00780	0.01500	0.00543	0.00030	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	1.41000	2.88000	0.44418	0.29060	0.1608	0.315	0.3132	0.3734
Mercury	mg/L	0.00001	0.00005	0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001	<0.00001
Molybdenum	mg/L	0.00270	0.00370	0.00633	0.01075	0.0159	0.0105	0.0097	0.0069
Nickel	mg/L	0.21000	0.18000	0.05125	0.06655	0.0364	0.0602	0.0761	0.0935
Selenium	mg/L	0.00100	0.00300	0.00108	0.00273	0.0065	< 0.0005	< 0.0005	0.0034
Silver	mg/L	0.00010	0.00043	0.00010	0.00010	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.00080	0.00080	0.00050	0.00020	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.00530	0.07300	0.00725	0.00150	< 0.001	0.002	0.002	< 0.001

Table 8-36 Meadowbank 2019 Saddle Dam 1 Water Quality Monitoring (ST-S-2)

Parameter	Sample Date	Annual Average							2019-06-03	2019-06-26	2019-07-09
	Unit	2013	2014	2015	2016	2017	2018	2019			
Field Measured											
pH	pH units	7.04	7.31	6.64	7.47	7.92	7.60	7.04	7.6	6.76	6.77
Turbidity	NTU	27.31	26.91	45.78	22.12	21.05	27.90	21.03	13.8	7.19	42.1
Conventional Parameters											
Hardness	mg CaCO3/L	228.00	199.00	175.00	179.00	215.25	191.33	482.67	141	827	480
Total alkalinity, as CaCO3	mg CaCO3/L	72.00	66.00	51.00	62.75	68.50	50.00	32.67	29	27	42
Total dissolved solids	mg/L	-	-	-	303.75	302.25	281.67	450.00	217	531	602
Total suspended solids	mg/L	-	-	-	43.25	8.50	4.67	111.00	16	4	313
Major Ions											
Chloride	mg/L	55.180	27.340	7.230	6.880	5.400	5.667	11.30	4.2	15.2	14.5
Cyanide	mg/L	-	-	-	0.013	0.009	0.014	0.02	0.014	0.011	0.022
Fluoride	mg/L	0.300	0.260	0.210	0.200	0.210	0.223	0.15	0.06	0.17	0.23
Sulphate	mg/L	311.200	172.200	119.050	179.500	110.230	164.333	299.00	153	377	367
Nutrients and Chlorophyll a											
Nitrite	mg/L	-	-	-	0.042	0.02	0.020	0.05	0.01	0.09	0.05
Nitrate	mg/L	16.80	9.88	7.50	8.20	9.72	4.720	3.34	0.86	3.62	5.55
Total ammonia as NH4	mg/L	0.052	0.040	1.510	0.130	0.095	0.143	0.27	0.14	0.33	0.33
Un-Ionized Ammonia, calculated	mg/L	2.440	2.240	0.015	0.010	0.010	0.010	0.01	< 0.01	< 0.01	< 0.01
Total Metals											
Aluminum	mg/L	0.36000	0.36000	0.41000	0.39000	0.28000	0.23467	1.52333	0.161	0.039	4.37
Arsenic	mg/L	0.15000	0.02800	0.00730	0.02800	0.03600	0.01673	0.03093	0.0032	0.0091	0.0805
Barium	mg/L	0.04600	0.02000	0.01800	0.01700	0.01600	0.01707	0.02603	0.0081	0.0294	0.0406
Cadmium	mg/L	0.00011	0.00006	0.00004	0.00005	0.00003	0.00003	0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.00170	0.00250	0.00170	0.00410	0.00460	0.00167	0.01377	0.0013	0.0017	0.0383
Copper	mg/L	0.02800	0.01000	0.01400	0.00870	0.00350	0.00413	0.01190	0.0026	0.0053	0.0278
Iron	mg/L	0.72000	0.64000	1.15000	1.44000	0.52000	0.49667	3.94333	0.39	0.14	11.3

Parameter	Sample Date	Annual Average							2019-06-03	2019-06-26	2019-07-09
	Unit	2013	2014	2015	2016	2017	2018	2019			
Lead	mg/L	0.00230	0.00030	0.00030	0.00920	0.00150	0.00067	0.00540	< 0.0003	0.0006	0.0153
Manganese	mg/L	0.42000	0.24000	0.33000	0.28000	0.08100	0.25050	0.29553	0.1124	0.2822	0.492
Mercury	mg/L	0.00001	0.00001	0.00001	0.00039	0.00024	0.00013	0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.06400	0.02000	0.01400	0.01200	0.01100	0.00963	0.00947	0.0053	0.0118	0.0113
Nickel	mg/L	0.13000	0.02700	0.02600	0.03100	0.02500	0.03250	0.05473	0.0092	0.0319	0.1231
Selenium	mg/L	0.00300	0.00160	0.00250	0.00100	0.00100	0.00097	0.00260	0.0011	0.0017	0.005
Silver	mg/L	0.00040	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.00500	0.00500	0.00500	0.00110	0.00080	0.00060	0.00020	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.07900	0.00260	0.02600	0.25000	0.00250	0.05567	0.07733	< 0.001	0.001	0.23

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 back to the South Cell TSF or the Portage Pit. Sample results are presented in Table 8-38. See Figure 1 for the location of ST-S-5. A total of 2,123,022 m^3 of water was pumped in 2019 from this sump. The volume is similar to 2018 which signify a constant seepage rate. In 2019, the water was transferred from the Central Dike Seepage Sump to the South Cell TSF and Portage Pit. Refer to Section 8.5.8.1.2 for details on the Central Dike seepage regarding consequence and mitigation measure in place. Table 8-37 below provide 2015 – 2019 pumped volume from ST-S-5.

Table 8-37 Meadowbank 2015 -2019 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

8.5.3.1.19 Phaser Pit Sump (ST-41)

The Phaser Pit Sump (ST-41) was constructed during 2018 operation to manage the water runoff from the pit. Monthly samples has been conducted in July and September, during open, water season as per the requirements of the NWB Water License. No sample was taken in August due to safety reason with the access of the sump. There are no applicable license limits. The data is presented in Table 8-39. Sampling station ST-41 is illustrated on Figure 3. No water was transferred to Phaser Attenuation Pond in 2019. All water was kept in the pit to promote the natural reflooding.

8.5.3.1.20 BB Phaser Pit Sump (ST-42)

The BB Phaser Pit Sump was constructed during 2018 operation to manage the water runoff from the pit. Monthly samples has been conducted in July and September, 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 8-40. Sampling station ST-42 is illustrated on Figure 3. No water was transferred to Phaser Attenuation Pond in 2019. All water was kept in the pit to promote the natural reflooding.

8.5.3.1.21 Phaser Attenuation Pond (ST-43)

During 2019, no water from Phaser et BB Phaser Pit Sumps 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. In 2019, no water transferred. 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 8-41. Sampling station ST-43 is illustrated on Figure 3.

Table 8-38 Meadowbank 2019 Central Dike Seepage Water Quality Monitoring (ST-S-5)

Parameter	Sample Date	Annual Average					2019-01-09	2019-02-06	2019-03-05	2019-04-09	2019-05-06	2019-06-03	2019-06-24	2019-07-01	2019-07-11	2019-07-22	2019-07-29	2019-08-06	2019-08-19	2019-09-03	2019-09-16
	Unit	2015	2016	2017	2018	2019															
Field Measured																					
pH	pH units	7.37	7.71	7.52	7.56	7.60	7.59	7.56	-	7.58	7.51	7.56	7.17	7.65	7.82	7.62	7.57	7.61	7.5	7.76	7.67
Turbidity	NTU	10.21	10.33	11.89	17.27	19.36	24.2	21.6	-	14.2	19.3	14.6	18.2	18.8	14.5	17.5	25.8	22.2	17.2	12	24.9
Conventional Parameters																					
Hardness	mg CaCO3/L	1139.58	1175.83	1126.32	1094.42	1038.31	1522	1280	1464	1177	1275	951	989	887	767	824	923	989	923	1103	914
Total alkalinity, as CaCO3	mg CaCO3/L	179.75	145.25	124.73	116.00	88.69	105	109	109	101	104	81	79	61	67	63	78	132	87	71	83
Total dissolved solids	mg/L	2239.67	2582.42	2752.73	2375.67	2174.35	2292	2202	2208	2194	2034	2009	2615	2116	1786	1884	1880	1982	2890	2791	2382
Total suspended solids	mg/L	6.33	5.83	4.72	8.00	8.54	4	9	12	4	6	7	4	10	5	6	5	8	6	4	17
Major Ions																					
Chloride	mg/L	498.13	451.17	379.36	459.58	334.550	396	430	449	453	79.4	378	419	337	300	61.9	316	316	346	317	306
Cyanide	mg/L	0.30	0.31	0.20	0.14	0.057	0.212	0.213	0.063	0.073	0.043	0.061	0.05	0.056	0.075	0.024	0.028	0.032	0.026	0.043	0.027
Fluoride	mg/L	0.69	0.53	0.48	0.55	0.508	0.54	0.48	0.56	0.53	0.52	0.53	0.5	0.45	0.42	0.43	0.45	0.5	0.52	0.54	0.46
Sulphate	mg/L	1449.21	1805.91	1713.75	2019.08	1715.692	2003	2172	2028	1943	1907	1652	1734	1548	1568	1388	1798	1631	1792	1794	1471
Nutrients and Chlorophyll a																					
Nitrate	mg/L	2.79	0.60	0.10	0.07	0.374	<0.01	<0.01	0.01	0.01	<0.01	0.14	0.14	1.53	2.14	1.77	0.5	0.38	0.62	0.20	0.47
Nitrite	mg/L	0.063	0.06	0.02	0.02	0.069	0.02	0.02	0.01	0.01	0.04	0.06	0.05	0.07	0.1	0.17	<0.01	0.08	0.08	0.1	0.17
Total ammonia as NH4	mg/L	17.890	27.320	29.830	31.492	25.142	26.7	27.3	31.4	32	23.1	20.6	29.3	27.5	27.1	25.7	31	31.3	28.6	32.2	20.2
Un-Ionized Ammonia, calculated	mg/L	0.270	0.390	0.380	0.389	0.311	0.29	0.22	0.35	0.51	0.18	0.18	0.29	0.43	0.45	0.28	0.26	0.35	0.4	0.53	0.27
Total Metals																					
Aluminum	mg/L	0.22000	0.02200	0.01500	0.00750	0.0218	< 0.005	< 0.005	0.023	< 0.005	< 0.005	0.023	< 0.005	0.043	< 0.005	< 0.005	0.088	0.036	< 0.005	< 0.005	0.086
Arsenic	mg/L	0.02100	0.04500	0.05500	0.04203	0.0587	0.0712	0.0659	0.0683	0.0656	0.0802	0.0657	0.0097	0.0408	0.0168	0.0458	0.0627	0.0733	0.0657	0.0352	0.0628
Barium	mg/L	0.03400	0.03200	0.02400	0.02452	0.0231	0.0292	0.0197	0.025	0.0202	0.0267	0.0214	0.025	0.0265	0.0247	0.029	0.025	0.0283	0.0159	0.0281	0.033
Cadmium	mg/L	0.00042	0.00084	0.00079	0.00089	0.00015	< 0.00002	0.00002	< 0.00002	< 0.00002	0.0007	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.00250	0.00160	0.00120	0.00090	0.0011	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	0.0007	0.0016	0.0009	0.0011	0.0012	< 0.0006	< 0.0006	0.001
Copper	mg/L	0.07000	0.05400	0.00540	0.00463	0.0307	< 0.0005	0.0088	< 0.0005	< 0.0005	< 0.0005	0.0013	< 0.0005	0.4811	0.0946	0.0987	0.0282	0.0067	< 0.0005	0.003	0.0247
Iron	mg/L	1.58000	2.07000	1.82000	1.68417	2.1081	3.3	3.01	2.83	3.67	3.27	2.34	0.12	1.38	0.02	1.21	2.11	2.82	2.3	1.05	2.14
Lead	mg/L	0.00090	0.00083	0.00280	0.00030	0.00042	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0016
Manganese	mg/L	2.80000	2.20000	2.19000	2.20350	2.0181	2.952	2.43	2.504	2.397	2.708	2.026	1.853	1.435	1.092	1.166	1.783	2.027	1.909	2.254	1.652
Mercury	mg/L	0.00003	0.00009	0.00001	0.00006	0.00002	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00002	0.00012	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.18000	0.30000	0.30000	0.29025	0.2303	0.1549	0.2565	0.2683	0.2358	0.2836	0.2119	0.2123	0.2428	0.213	0.231	0.2456	0.2412	0.2044	0.24	0.2396
Nickel	mg/L	0.09800	0.04700	0.01800	0.02313	0.0343	0.0231	0.0173	0.0133	0.0369	0.0747	0.0719	0.0565	0.0794	0.064	0.058	0.0449	0.0412	0.0294	0.0293	0.0254
Selenium	mg/L	0.02600	0.03400	0.01400	0.01103	0.0024	< 0.0005	0.003	0.009	0.0009	< 0.0005	< 0.0005	0.0049	< 0.0005	0.0028	0.001	< 0.0005	0.0037	0.0024	0.0055	< 0.0005
Silver	mg/L	0.00010	0.00022	0.00014	0.00010	0.00018	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0014	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.00500	0.00170	0.00080	0.00053	0.00045	< 0.0002	< 0.0002	0.0029	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0021	< 0.0002	< 0.0002
Zinc	mg/L	0.00320	0.00630	0.00250	0.00167	0.0077	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.004	0.008	< 0.001	0.02	< 0.001	0.002
Dissolved Metals																					
Aluminum	mg/L	0.00600	0.00600	0.00630	0.00596	0.0022	< 0.0005	< 0.0005	< 0.005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.007	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Arsenic	mg/L	0.02200	0.02200	0.01400	0.01364	0.0128	0.0076	0.0109	0.0084	0.0203	0.0072	0.0137	0.0079	0.0171	0.0144	0.0102	0.0095	0.0274	0.0156	0.0166	0.009
Barium	mg/L	-	-	0.02100	0.02487	0.0202	0.0272	0.0162	0.0224	0.0182	0.0167	0.0212	0.0168	0.0261	0.0251	0.0291	0.0239	0.0232	0.0157	0.0266	0.0185
Cadmium	mg/L	0.00051	0.00075	0.00075	0.00094	0.00015	< 0.00002	0.00009	< 0.00002	0.00004	0.00051	0.00004	< 0.00002	< 0.00002	0.00009	< 0.00002	< 0.00002	< 0.00002	0.00009	< 0.00002	< 0.00002
Chromium	mg/L	0.00140	0.00160	0.00067	0.00101	0.00062	< 0.0006	< 0.0006	< 0.0006	< 0.0006	0.0012	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	0.00560	0.04700	0.00530	0.00547	0.0209	< 0.0005	0.0027	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.3579	0.0794	0.0333	0.0008	0.0021	< 0.0005	0.0007	0.0034
Iron	mg/L	0.05500	0.17000	0.05600	0.19942	0.0577	0.01	0.02	< 0.01	0.02	0.1	< 0.01	< 0.01	< 0.01	< 0.01	0.01	0.02	0.01	< 0.01	< 0.01	0.05
Lead	mg/L	0.00060	0.00071	0.00370	0.00030	0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	2.55000	2.18000	2.14000	2.27242	1.9717	2.765	2.284	2.347	2.686	2.489	1.79	1.859	1.52	1.141	1.142	1.516	2.153	1.94	2.336	1.465
Mercury	mg/L	0.00004	0.00007	0.00010	0.00002	0.000047	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00016	0.00066	< 0.00001	< 0.00001	0.00009	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.21000	0.29000	0.30000	0.29815	0.2234	0.1237	0.2163	0.258	0.2605	0.2504	0.2229	0.199	0.2477	0.2244	0.2229	0.2081	0.2466	0.2125	0.2498	0.2088
Nickel	mg/L	0.04900	0.06100	0.01800	0.02380	0.0332	0.0205	0.0169	0.0133	0.0405	0.0645	0.0707	0.0599	0.0833	0.0656	0.056	0.0365	0.0408	0.0271	0.0307	0.0201
Selenium	mg/L	0.02800	0.03700	0.01800	0.01731	0.0033	< 0.0005	0.0031	0.006	0.0007	< 0.0005	0.004	0.0037	0.0028	0.0014	0.0016	0.0038	0.0035	0.0037	0.0038	0.0023
Silver	mg/L	0.00010	0.00020	0.00013	0.00010	0.00010	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0.0002	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.00500	0.00170	0.00080	0.00055	0.00036	< 0.0002	< 0.0002	0.0024	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.00100	0.00230	0.00150	0.00108	0.0015	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	0.004	0.002	< 0.001	< 0.001	< 0.001	< 0.001

Parameter	Sample Date / Unit	2019-09-23	2019-09-30	2019-10-07	2019-10-10	2019-10-21	2019-10-29	2019-11-04	2019-11-18	2019-11-25	2019-12-02	2019-12-09
Field Measured												
pH	pH units	7.58	7.7	7.63	7.76	7.61	7.67	7.58	7.58	7.66	7.59	7.51
Turbidity	NTU	32.4	18.2	16.1	16.4	21	20.5	18.7	22.5	18.5	19.1	15.6
Conventional Parameters												
Hardness	mg CaCO3/L	995	1083	1025	951	1054	876	932	807	1328	1041	916
Total alkalinity, as CaCO3	mg CaCO3/L	107	108	93	71	58	66	84	88	94	108	99
Total dissolved solids	mg/L	2558	2642	2134	1984	2265	2105	2218	2391	2488	24	2459
Total suspended solids	mg/L	6	7	7	5	6	8	2	6	6	8	54
Major Ions												
Chloride	mg/L	322	348	341	330	338	331	319	351	387	375	352
Cyanide	mg/L	0.03	0.04	0.036	0.037	0.051	0.036	0.038	0.038	0.053	0.057	0.052
Fluoride	mg/L	0.48	0.51	0.49	0.5	0.52	0.52	0.52	0.54	0.53	0.54	0.62
Sulphate	mg/L	1634	1674	1647	1489	1670	1654	1683	1638	1548	1791	1751
Nutrients and Chlorophyll a												
Nitrate	mg/L	0.46	0.03	0.37	.35	0.22	.12	<0.01	0.06	<0.01	0.15	<0.01
Nitrite	mg/L	0.06	0.10	0.06	0.07	0.07	0.07	0.07	0.11	0.06	0.13	<0.01
Total ammonia as NH4	mg/L	21.3	21.2	19.9	22.4	21.2	20.6	21.6	21.9	23.7	23.2	22.7
Un-Ionized Ammonia, calculated	mg/L	0.34	0.37	0.36	-	0.35	0.25	0.25	0.19	0.24	0.24	0.2
Total Metals												
Aluminum	mg/L	0.08	0.03	0.01	0.028	< 0.005	0.041	0.006	< 0.005	0.008	< 0.005	< 0.005
Arsenic	mg/L	0.0507	0.0386	0.058	0.0623	0.0828	0.0714	0.0673	0.0617	0.0846	0.0603	0.0592
Barium	mg/L	0.0323	0.0255	0.021	0.0214	0.0146	0.0175	0.0192	0.0112	0.0257	0.0176	0.0157
Cadmium	mg/L	0.00007	0.00006	< 0.0002	0.00037	0.0003	0.00015	0.00032	0.00029	0.00058	0.00036	0.00023
Chromium	mg/L	0.0015	0.0008	< 0.005	0.0014	0.0008	0.0008	0.0007	< 0.0006	0.001	0.0017	0.0007
Copper	mg/L	0.0054	0.002	< 0.001	0.0036	0.0041	0.0049	0.0026	0.0038	0.0076	0.0069	0.0059
Iron	mg/L	2.47	1.35	2	1.95	2.72	2.39	2.22	1.64	2.61	2.02	1.87
Lead	mg/L	< 0.0003	< 0.0003	< 0.0005	0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0019	< 0.0003	< 0.0003
Manganese	mg/L	2.012	2.195	1.9	2.046	2.204	1.881	1.942	1.621	2.658	1.889	1.935
Mercury	mg/L	< 0.00001	< 0.00001	< 0.0001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.2404	0.2406	0.23	0.2361	0.2476	0.1996	0.2224	0.184	0.309	0.1942	0.2033
Nickel	mg/L	0.0224	0.0294	0.018	0.0233	0.0224	0.0226	0.0142	0.015	0.0262	0.0148	0.017
Selenium	mg/L	0.0008	0.0015	< 0.003	0.0022	0.0023	0.0031	0.0035	0.0055	0.0018	0.0021	< 0.0005
Silver	mg/L	< 0.0001	< 0.0001	< 0.001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	< 0.0002	< 0.0002	< 0.002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.012	< 0.001	< 0.007	0.006	< 0.001	< 0.001	< 0.001	< 0.001	0.002	< 0.001	< 0.001
Dissolved Metals												
Aluminum	mg/L	< 0.0005	0.0086	< 0.01	0.0141	< 0.005	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Arsenic	mg/L	0.0039	0.0112	0.015	0.0169	0.0223	0.0238	0.0186	0.0091	0.0093	0.0045	0.0035
Barium	mg/L	0.0196	0.0226	0.021	0.0221	0.0168	0.0182	0.0212	0.0054	0.0204	0.0139	0.0165
Cadmium	mg/L	0.00005	< 0.00002	< 0.0002	0.00039	0.00027	0.00027	0.0003	0.00029	0.00046	0.00033	0.00026
Chromium	mg/L	< 0.0006	< 0.0006	< 0.0005	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	0.0015	< 0.0005	-	0.003	0.0037	0.0042	0.0023	0.005	0.0072	0.0073	0.0048
Iron	mg/L	< 0.01	< 0.01	< 0.06	0.13	0.17	0.22	0.1	0.09	0.22	0.1	0.08
Lead	mg/L	< 0.0003	< 0.0003	< 0.0001	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	1.711	2.102	2	2.392	2.111	1.841	2.005	1.64	2.477	1.654	1.898
Mercury	mg/L	< 0.00001	< 0.00001	< 0.0001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.2033	0.2343	0.23	0.2871	0.2328	0.1951	0.2372	0.1848	0.2837	0.1709	0.1973
Nickel	mg/L	0.0182	0.0278	0.017	0.0262	0.0216	0.0217	0.0146	0.0155	0.0237	0.0148	0.0158
Selenium	mg/L	0.0028	0.0037	0.0034	0.0055	0.0053	0.0046	0.0043	0.0065	0.0039	0.003	< 0.0005
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	< 0.0002	0.0004	< 0.002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.003	< 0.001	< 0.005	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002

Table 8-39 Meadowbank 2019 Phaser Pit Sump Water Quality Monitoring (ST-41)

Parameter	Sample Date	Annual Average		2019-07-08	2019-09-09	2019-09-15
	Unit	2018	2019			
Field Measured						
pH	pH units	7.69	7.41	6.91	-	7.9
Turbidity	NTU	8.51	7.79	13.3	-	2.28
Conventional Parameters						
Hardness	mg CaCO3/L	117.00	109.33	91	106	131
Total alkalinity, as CaCO3	mg CaCO3/L	223.33	38.67	25	43	48
Total dissolved solids	mg/L	370.67	202.00	174	226	206
Total suspended solids	mg/L	7.00	4.33	10	< 1	2
Major Ions						
Chloride	mg/L	10.100	3.400	3.2	3.2	3.8
Cyanide	mg/L	0.190	0.002	0.002	0.002	0.003
Fluoride	mg/L	0.190	0.133	0.11	0.15	0.14
Sulphate	mg/L	83.667	68.833	60.7	75.4	70.4
Nutrients and Chlorophyll a						
Nitrate	mg/L	26.180	4.110	3.26	4.69	4.38
Nitrite	mg/L	0.40	0.04	0.04	0.03	0.04
Total ammonia as NH4	mg/L	12.633	2.090	2.07	2.07	2.13
Un-Ionized Ammonia, calculated	mg/L	0.243	0.033	0.02	0.04	0.04
Total Metals						
Aluminum	mg/L	0.197000	0.16000	0.351	0.064	0.065
Arsenic	mg/L	0.001600	0.00273	0.0022	0.003	0.003
Barium	mg/L	0.095367	0.02467	0.0197	0.0216	0.0327
Cadmium	mg/L	0.000087	0.00006	0.00011	< 0.00002	0.00005
Chromium	mg/L	0.001200	0.00100	< 0.0006	0.0018	< 0.0006
Copper	mg/L	0.010967	0.00697	0.0093	0.0057	0.0059
Iron	mg/L	0.523333	0.29667	0.6	0.14	0.15
Lead	mg/L	0.000600	0.00033	0.0004	< 0.0003	< 0.0003
Manganese	mg/L	0.086600	0.11567	0.1454	0.0923	0.1093
Mercury	mg/L	0.000010	0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.029367	0.01363	0.0082	0.0191	0.0136
Nickel	mg/L	0.005900	0.00840	0.0121	0.0063	0.0068
Selenium	mg/L	0.001567	0.00060	< 0.0005	0.0005	0.0008
Silver	mg/L	0.000100	0.00010	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.000233	0.00020	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.003333	0.00500	0.005	0.009	< 0.001

Table 8-40 Meadowbank 2019 BB Phaser Pit Sump Water Quality Monitoring (ST-42)

Parameter	Sample Date	Annual Average		2019-06-09	2019-09-15
	Unit	2018	2019		
Field Measured					
pH	pH units	7.84	7.69	7.68	7.69
Turbidity	NTU	2.59	15.82	23.2	8.43
Conventional Parameters					
Hardness	mg CaCO3/L	276.00	86.50	58	115
Total alkalinity, as CaCO3	mg CaCO3/L	77.33	58.00	71	45
Total dissolved solids	mg/L	317.00	132.50	93	172
Total suspended solids	mg/L	3.33	10.00	12	8
Major Ions					
Chloride	mg/L	5.667	2.550	2.3	2.8
Cyanide	mg/L	0.027	0.015	0.028	0.001
Fluoride	mg/L	0.163	0.115	0.09	0.14
Sulphate	mg/L	178.333	43.150	22	64.3
Nutrients and Chlorophyll a					
Nitrate	mg/L	5.48	2.040	2.12	1.95
Nitrite	mg/L	0.11	0.040	0.05	0.02
Total ammonia as NH4	mg/L	3.280	1.245	1.97	0.52
Un-Ionized Ammonia, calculated	mg/L	0.043	0.020	0.03	0.01
Total Metals					
Aluminum	mg/L	0.08700	0.31950	0.515	0.124
Arsenic	mg/L	0.00210	0.00335	0.0034	0.0033
Barium	mg/L	0.08563	0.02575	0.0223	0.0292
Cadmium	mg/L	0.00004	0.00004	0.00005	< 0.00002
Chromium	mg/L	0.00077	0.00100	0.0012	0.0008
Copper	mg/L	0.00907	0.00810	0.0067	0.0095
Iron	mg/L	0.14667	0.39000	0.59	0.19
Lead	mg/L	0.00030	0.00030	< 0.0003	< 0.0003
Manganese	mg/L	0.35770	0.08025	0.0581	0.1024
Mercury	mg/L	0.00001	0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.00877	0.00785	0.0079	0.0078
Nickel	mg/L	0.01657	0.00480	0.0031	0.0065
Selenium	mg/L	0.00130	0.00105	0.0016	< 0.0005
Silver	mg/L	0.00010	0.00010	< 0.0001	< 0.0001
Thallium	mg/L	0.00020	0.00020	< 0.0002	< 0.0002
Zinc	mg/L	0.00933	0.00100	< 0.001	< 0.001

Table 8-41 Meadowbank 2019 Phaser Attenuation Pond Water Quality Monitoring (ST-43)

Parameter	Sample Date	Annual Average		2019-06-09	2019-07-08	2019-08-06	2019-09-09
	Unit	2018	2019				
Field Measured							
pH	pH units	7.29	7.17	7.17	6.86	7.43	7.2
Turbidity	NTU	10.10	19.91	43.5	18.2	10.4	7.52
Conventional Parameters							
Hardness	mg CaCO3/L	254.00	73.50	66	68	85	75
Total alkalinity, as CaCO3	mg CaCO3/L	16.00	34.75	12	40	73	14
Total dissolved solids	mg/L	355.33	122.25	110	73	135	171
Total suspended solids	mg/L	4.00	13.00	25	12	13	2
Major Ions							
Chloride	mg/L	5.467	2.225	2.3	2.4	2	2.2
Cyanide	mg/L	0.005	0.004	0.011	< 0.001	< 0.001	< 0.001
Fluoride	mg/L	0.147	0.103	0.09	0.09	0.13	0.1
Sulphate	mg/L	287.333	65.025	52.4	66.7	67.4	73.6
Nutrients and Chlorophyll a							
Nitrate	mg/L	5.550	2.555	3.64	2.28	2.19	2.11
Nitrite	mg/L	0.733	0.040	0.05	0.04	0.04	0.03
Total ammonia as NH4	mg/L	3.733	1.913	3.11	2.05	1.56	0.93
Un-Ionized Ammonia, calculated	mg/L	0.023	0.010	0.01	< 0.01	0.01	< 0.01
Total Metals							
Aluminum	mg/L	0.516000	0.70800	1.32	0.767	0.525	0.22
Arsenic	mg/L	0.000867	0.00170	0.0019	0.002	0.0013	0.0016
Barium	mg/L	0.055267	0.02038	0.0157	0.016	0.0178	0.032
Cadmium	mg/L	0.001223	0.00020	0.00021	0.00035	0.00018	0.00005
Chromium	mg/L	0.000600	0.00100	0.002	0.0007	0.0007	< 0.0006
Copper	mg/L	0.035000	0.01588	0.023	0.0179	0.0136	0.009
Iron	mg/L	2.653333	1.34000	1.71	1.38	1.36	0.91
Lead	mg/L	0.000400	0.00030	< 0.0003	0.0003	< 0.0003	< 0.0003
Manganese	mg/L	0.673467	0.17453	0.2225	0.1789	0.1901	0.1066
Mercury	mg/L	0.000010	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.003533	0.00470	0.0027	0.0028	0.0029	0.0104
Nickel	mg/L	0.099767	0.02715	0.0322	0.0268	0.0294	0.0202
Selenium	mg/L	0.001800	0.00440	0.0068	0.0043	0.0036	0.0029
Silver	mg/L	0.000100	0.00010	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.000200	0.00020	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.102667	0.02575	0.029	0.025	0.022	0.027

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) is currently flooded and is now inactive. Landfarm 2 (ST-14b) was constructed in 2016, contaminated soil was added since 2017. In 2019, no ponded water or seepage from the landfarm area was identified, so no water quality sampling was required. It should be noted that if any runoff is observed from the landfarm, the direction of flow is directly towards the adjacent TSF.

8.5.3.1.23 Landfill

No water quality monitoring was completed at the landfill in 2019 as no leachate was observed. The total volume of waste transferred to the landfill in 2019 was 33,210 m^3. A monthly summary of the solid waste disposed at the landfill is presented in Section 6.1.1 Table 6-2 .

8.5.3.2 *Whale Tail Site*

8.5.3.2.1 Waste Rock Storage Facility (WRSF) Pond (ST-WT-3)

In 2019, water was observed in the Whale Tail WRSF pond. As per the Water License, water sample are required to be taken four (4) time per calendar year. In 2019, fifteen (15) water samples were taken and the data is presented in Table 8-42. Agnico has taken weekly samples started in July 2019 to have a better control of the water management on site. There are no applicable license limits. Sampling station ST-WT-3 is illustrated on Figure 4. A total of 203,707 m^3 was transferred from this pond to Quarry 1 in 2019. No water were transferred from this pond in 2018.

Refer to Section 8.5.8.2.4 below for a discussion regarding the water flow through the Whale Tail Waste Rock Storage Facility (WRSF) Dike was observed on August 24th, 2019 at the toe of the dike flowing toward Mammoth Lake.

8.5.3.2.2 Whale Tail Pit / Sump (ST-WT-4)

In 2019, development of the Whale Tail Pit allowed Agnico to start the water quality monitoring in the pit/sump. As per the Water License, water sample needed to be taken four (4) time per calendar year. In 2019, twelve (12) water samples were taken and the data is presented in Table 8-43. Agnico has taken weekly samples, when safe to do and water is present in the pit, started 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 343,273 m^3 was transferred from this pond to Quarry 1 in 2019.

8.5.3.2.3 Lake A47 (ST-WT-6)

In 2019, water from the Lake A47 (ST-WT-6) was sampled in July, August and September during open water as per the requirements in the NWB Water License (sampling station ST-WT-6 on Figure 4). There are no applicable license limits. Results are presented in Table 8-44.

Table 8-42 Whale Tail 2019 Waste Rock Storage Facility (WRSF) Pond Water Quality Monitoring (ST-WT-3)

Parameter	Sample Date	Annual Average		2019-06-04	2019-07-03	2019-07-09	2019-07-24	2019-07-29	2019-08-05	2019-08-11	2019-08-21	2019-08-25	2019-09-01	2019-09-09	2019-09-15	2019-09-22	2019-09-29	2019-10-07
	Unit	2018	2019															
Field Measured																		
pH	pH units	6.84	7.08	7.02	6.98	6.66	7.03	6.95	7.14	6.79	7.14	-	7.75	6.61	6.9	7.39	6.95	7.78
Conductivity	uS/cm	-	501.84	29	239.3	328.3	462.6	376.9	437.8	521.1	580.2	-	760.2	296.8	949.5	867.1	1069	108
Temperature	°C	-	8.61	4.73	8.48	14.78	10.05	9.6	11.95	9.43	11.47	-	8.08	11.24	7.45	6.4	3.26	3.66
Dissolved oxygen	mg/L	-	16.68	91.8	10.64	9.73	10.71	10.7	9.75	10.09	10.36	-	11.69	10.74	11.78	11.57	12.33	11.68
Turbidity	NTU	222.45	27.53	110.03	72.9	56.31	35.58	11.25	13.04	11.44	2.4	-	8.66	20	16	8.01	16.8	3
Conventional Parameters																		
Hardness	mg CaCO3/L	64.00	484.60	16	69	87	112	125	155	156	209	238	280	123	452	424	473	4350
Total alkalinity, as CaCO3	mg CaCO3/L	14.50	43.53	9	12	16	29	30	85	38	49	54	45	40	62	49	83	52
Total dissolved solids	mg/L	-	354.13	14	106	181	212	224	244	351	387	431	489	183	607	563	686	634
Total suspended solids	mg/L	47.00	14.00	47	24	14	7	12	7	5	11	11	5	10	20	6	30	< 1
Major Ions																		
Chloride	mg/L	16.450	24.71	1.2	10.7	14.6	19.5	20.4	22.3	24.4	27.2	27.3	33.2	14.4	43.3	36.7	38.5	36.9
Fluoride	mg/L	0.045	0.15	0.05	0.05	0.07	0.09	0.09	0.11	0.1	0.11	0.12	0.1	0.07	0.08	0.09	1	0.07
Sulphate	mg/L	37.950	148.19	2.2	34.2	48.4	69.6	79.7	86.2	110	149	148	203	64.5	289	255	354	330
Nutrients and Chlorophyll a																		
Total phosphorus	mg/L	-	0.044	0.06	0.04	0.04	0.06	0.03	0.07	0.04	0.04	-	0.03	0.04	0.05	0.05	0.04	0.02
Total orthophosphate (as phosphorus)	mg/L	-	0.032	0.14	0.05	0.03	0.03	0.01	0.01	< 0.01	< 0.01	0.02	< 0.01	0.02	0.03	0.01	0.06	0.04
Nitrate	mg/L	2.440	8.900	0.09	4.97	6.65	6.48	6.15	6.09	8.06	8.94	7.5	11.4	0.81	14.9	15.4	18.2	17.9
Nitrite	mg/L	0.010	0.449	0.03	0.17	0.36	0.62	0.77	0.81	0.79	0.68	0.59	0.57	0.02	0.3	0.27	0.38	0.37
Total ammonia as NH4	mg/L	0.07500	0.898	< 0.01	0.18	0.37	0.47	0.8	0.55	0.68	0.81	-	1.24	0.31	1.55	1.65	1.97	1.98
Un-Ionized Ammonia, calculated	mg/L	-	0.011	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	-	0.02	< 0.01	0.01	0.01	0.01	< 0.01
Total Metals																		
Aluminum	mg/L	2.79150	0.67647	4.28	1.74	1.4	0.264	0.252	0.181	0.077	0.025	0.18	0.158	0.537	0.525	0.156	0.302	0.07
Arsenic	mg/L	0.01095	0.00788	0.0112	0.0113	0.0088	0.0065	0.0065	0.0081	0.008	0.007	0.0099	0.0072	0.0049	0.0089	0.0072	0.0091	0.0036
Barium	mg/L	0.05685	0.08301	0.0445	0.0494	0.0526	0.058	0.0775	0.066	0.0595	0.0809	0.0925	0.0657	0.0584	0.1369	0.1253	0.138	0.14
Cadmium	mg/L	0.00002	0.00004	0.00006	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00008	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00004	0.00002	0.00005	< 0.0002
Chromium	mg/L	0.01350	0.00541	0.0248	0.0122	0.0052	0.0024	0.0027	0.0024	0.0025	0.0007	0.0018	0.0014	0.0043	0.0084	0.0015	0.0058	< 0.005
Copper	mg/L	0.00815	0.00297	0.0068	0.006	0.0039	0.0028	0.0032	0.0018	0.0019	0.0012	0.0021	< 0.0005	0.0034	0.0036	0.0022	0.0036	0.0015
Iron	mg/L	5.21500	1.28667	5.71	2.9	1.67	0.55	0.55	0.51	0.33	0.27	1.03	1.26	1.19	1.58	0.67	0.87	0.21
Lead	mg/L	0.00325	0.00037	0.0004	0.0011	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0003	< 0.0003	< 0.0003	< 0.0003	0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0005
Manganese	mg/L	0.19565	0.49122	0.1106	0.1508	0.1562	0.1603	0.1745	0.238	0.2951	0.503	0.8203	0.6757	0.7246	0.8317	0.5891	0.8384	1.1
Mercury	mg/L	0.00001	0.00002	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00002	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.0001
Molybdenum	mg/L	0.00125	0.00112	< 0.0005	0.0006	< 0.0005	0.0009	0.0008	0.0014	0.0016	0.0013	0.0018	0.0015	< 0.0005	0.0011	0.0012	0.002	0.0011
Nickel	mg/L	0.02430	0.03611	0.0183	0.0201	0.0173	0.0157	0.0158	0.0235	0.025	0.035	0.0322	0.0286	0.015	0.0484	0.0562	0.0906	0.1
Selenium	mg/L	0.00050	0.00349	0.0043	0.0013	< 0.0005	0.0035	0.0015	< 0.0005	0.0013	0.0039	0.0025	0.0041	0.001	0.0095	0.0043	0.0069	0.0073
Silver	mg/L	0.00010	0.00016	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.001
Thallium	mg/L	0.00020	0.00032	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.002

Parameter	Sample Date	Annual Average		2019-06-04	2019-07-03	2019-07-09	2019-07-24	2019-07-29	2019-08-05	2019-08-11	2019-08-21	2019-08-25	2019-09-01	2019-09-09	2019-09-15	2019-09-22	2019-09-29	2019-10-07
	Unit	2018	2019															
Zinc	mg/L	0.01650	0.00493	0.005	0.011	0.007	0.006	0.014	0.002	0.003	0.002	< 0.001	< 0.001	0.004	0.006	< 0.001	0.004	< 0.007
Dissolved Metals																		
Aluminum	mg/L	-	0.01666	0.147	< 0.0005	0.054	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0101	< 0.0005	< 0.0005	0.0038	< 0.03
Arsenic	mg/L	-	0.00411	0.0017	0.0045	0.0045	0.0044	0.0052	0.0054	0.0059	0.0048	0.0065	0.005	0.0018	0.0033	0.0023	0.004	0.0023
Barium	mg/L	-	0.06987	0.004	0.0338	0.0458	0.0537	0.0562	0.0506	0.0543	0.0727	0.085	0.0641	0.045	0.1157	0.0921	0.1351	0.14
Cadmium	mg/L	-	0.00012	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00045	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00004	< 0.00002	0.00003	< 0.001
Chromium	mg/L	-	0.00089	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.005
Copper	mg/L	-	0.00173	0.0012	< 0.0005	0.0015	0.0022	0.0025	0.002	0.0017	0.0011	0.0015	0.0016	0.0016	0.0018	0.0011	0.0027	< 0.003
Iron	mg/L	-	0.09200	0.15	0.05	0.05	0.02	0.03	0.03	0.02	0.06	0.29	0.36	0.07	0.05	0.07	0.03	< 0.1
Lead	mg/L	-	0.00035	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.001
Manganese	mg/L	-	0.45820	0.0128	0.1103	0.1246	0.1147	0.1233	0.18	0.2653	0.4849	0.8145	0.7072	0.6016	0.806	0.4758	0.852	1.2
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	< 0.00001	< 0.00001	< 0.00001	<0.00001	< 0.0001
Molybdenum	mg/L	-	0.00171	< 0.0005	0.0005	0.0006	0.001	0.0012	0.0012	0.0013	0.0012	0.002	0.001	< 0.0005	0.0018	0.0006	0.0023	< 0.01
Nickel	mg/L	-	0.03277	0.0037	0.0101	0.0132	0.0128	0.0135	0.0197	0.024	0.033	0.0307	0.0295	0.0103	0.0449	0.0465	0.0897	0.11
Selenium	mg/L	-	0.00333	< 0.0005	< 0.0005	< 0.0005	0.001	0.0015	0.0008	0.0014	0.0037	0.0026	0.0058	< 0.0005	0.009	0.0041	0.0103	0.0077
Silver	mg/L	-	0.00011	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0003
Thallium	mg/L	-	0.00021	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0005	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0001
Zinc	mg/L	-	0.00192	< 0.001	0.003	0.001	0.003	0.003	< 0.001	0.003	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001	0.001	0.0068

Table 8-43 Whale Tail Pit Sump 2019 Water Quality Monitoring (ST-WT-4)

Parameter	Sample Date / Unit	Annual Average	2019-06-11	2019-07-09	2019-07-28	2019-08-11	2019-08-19	2019-08-25	2019-09-01	2019-09-09	2019-09-30	2019-10-13	2019-10-20	2019-12-12
Field Measured														
pH	pH units	7.49	6.88	6.88	7.86	6.93	6.89	7.48	7.76	7.58	7.29	7.52	7.65	7.26
Conductivity	uS/cm	952.04	92	666	669	673.4	730.6	832	789.7	880.1	1560	1146	1916	1112
Temperature	°C	6.08	8	14.53	6.7	9.33	12.59	10.78	8.65	5.94	2.59	3.3	3.96	7.7
Dissolved oxygen	mg/L	11.84	12.92	9.93	10.66	10.28	9.65	10.43	11.08	11.54	13.05	11.63	12.05	12.54
Turbidity	NTU	42.81	295.3	27.31	8.63	95.17	14.6	28.5	42	84	7.33	25.6	13.6	6
Conventional Parameters														
Hardness	mg CaCO3/L	322.75	38	157	202	186	210	324	254	333	649	414	651	455
Total alkalinity, as CaCO3	mg CaCO3/L	70.75	15	37	42	56	59	81	66	81	142	75	118	77
Total dissolved solids	mg/L	559.00	52	352	407	430	472	548	508	528	976	652	1095	688
Total suspended solids	mg/L	89.67	225	13	8	40	8	34	28	664	9	28	10	9
Major Ions														
Chloride	mg/L	105.23	11.3	53.2	51	48.9	57.6	60.2	76.9	90.6	142	157	254	260
Fluoride	mg/L	0.15	0.06	0.14	0.14	0.15	0.16	0.18	0.17	0.15	0.18	0.16	0.19	0.14
Sulphate	mg/L	122.50	8.7	88.9	118	124	114	142	123	108	191	157	269	26.4
Nutrients and Chlorophyll a														
Total phosphorus	mg/L	0.063	0.16	0.03	0.1	0.04	0.02	-	0.01	0.25	0.02	0.03	< 0.01	0.02
Nitrate	mg/L	16.33	0.43	10.2	14.7	11	12.4	11.6	11.9	13	50.7	16.3	42.9	0.83
Nitrite	mg/L	0.76	0.07	0.54	1.71	0.51	0.65	0.9	0.46	0.36	0.9	1.28	1.7	0.02
Total orthophosphate (as phosphorus)	mg/L	0.088	0.53	0.05	0.02	0.12	0.04	0.11	0.06	< 0.01	0.02	0.05	0.02	0.02
Total ammonia as NH4	mg/L	3.984	0.52	3.42	2.92	2.47	2.8	-	2.71	3.4	15.2	3.81	6.84	1.37
Total Metals														
Aluminum	mg/L	1.50000	5.86	0.524	0.158	0.692	0.12	1.35	0.753	7.83	0.161	0.41	0.067	0.075
Arsenic	mg/L	0.03997	0.0131	0.0446	0.0427	0.0375	0.0624	0.04	0.0215	0.0417	0.0542	0.0415	0.0519	0.0285
Barium	mg/L	0.12214	0.0918	0.08	0.1098	0.074	0.0868	0.1375	0.0813	0.1845	0.1829	0.0953	0.1112	0.2306
Cadmium	mg/L	0.00003	< 0.00002	0.00014	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00004	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.03685	0.0271	0.0098	0.0045	0.0094	0.003	0.0314	0.0259	0.3053	0.0039	0.0128	0.005	0.0041
Copper	mg/L	0.00951	0.0103	0.0058	0.0064	0.0059	0.0081	0.0146	< 0.0005	0.0136	0.0362	0.0072	0.0032	0.0023
Iron	mg/L	2.71083	10.4	0.94	0.3	1.62	0.34	2.3	1.36	13	0.65	1.16	0.24	0.22
Lead	mg/L	0.00125	0.0062	< 0.0003	< 0.0003	0.0022	< 0.0003	< 0.0003	< 0.0003	0.0039	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	0.37702	0.4484	0.1685	0.115	0.4258	0.3555	0.5709	0.229	0.4301	0.362	0.3417	0.1303	0.947
Mercury	mg/L	0.00004	0.00035	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00003
Molybdenum	mg/L	0.00915	0.0006	0.0061	0.0118	0.0035	0.0054	0.0112	0.007	0.0063	0.0205	0.0094	0.0236	0.0044
Nickel	mg/L	0.04096	0.021	0.0156	0.0144	0.0366	0.0458	0.0351	0.0203	0.1194	0.0545	0.0377	0.0726	0.0185
Selenium	mg/L	0.00427	0.007	0.0012	0.0045	0.0067	0.0025	0.0034	0.002	0.0079	0.0077	0.0032	0.0046	< 0.0005
Silver	mg/L	0.00010	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Thallium	mg/L	0.00020	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Zinc	mg/L	0.00433	0.022	0.002	0.007	0.002	< 0.001	< 0.001	< 0.001	0.011	0.002	< 0.001	< 0.001	< 0.001

Table 8-44 Whale Tail 2019 Lake A47 Water Quality Monitoring (ST-WT-6)

Parameter	Sample Date	Annual Average		2019-07-03	2019-08-05	2019-09-01
	Unit	2018	2019			
Field Measured						
pH	pH units	6.88	7.01	6.38	6.93	7.72
Conductivity	uS/cm	172.30	737.90	1330	401.1	482.6
Temperature	°C	7.50	9.55	9.65	12.47	6.54
Dissolved oxygen	mg/L	10.79	10.49	10.14	10.46	10.87
Turbidity	NTU	0.83	3.66	2.6	0.87	7.52
Conventional Parameters						
Hardness	mg CaCO3/L	70.00	243.33	418	140	172
Total alkalinity, as CaCO3	mg CaCO3/L	23.00	36.00	10	76	22
Total dissolved solids	mg/L	110.00	403.00	655	229	325
Total suspended solids	mg/L	1.00	3.00	3	4	2
Total organic carbon	mg/L	5.40	6.07	5.5	6	6.7
Dissolved organic carbon	mg/L	5.20	6.43	5.5	7.8	6
Major Ions						
Bicarbonate	mg CaCO3/L	23.00	36.00	10	76	22
Calcium	mg/L	20.70	82.97	145	45.9	58
Carbonate	mg CaCO3/L	2.00	2.00	< 2	< 2	< 2
Chloride	mg/L	24.10	176.67	321	100	109
Magnesium	mg/L	4.54	8.85	13.4	6.34	6.8
Potassium	mg/L	2.050	6.12	8.87	4.59	4.89
Sulphate	mg/L	20.80	9.07	5.8	11.6	9.8
Reactive silica	mg/L	0.71	3.02	3.87	2.07	3.13
Nutrients and Chlorophyll a						
Total Kjeldahl nitrogen	mg/L	0.35	0.457	0.4	0.51	0.46
Total phosphorus	mg/L	0.01	0.030	0.04	0.04	0.01
Total orthophosphate (as phosphorus)	mg/L	0.01	0.010	< 0.01	< 0.01	< 0.01
Nitrite	mg/L	0.01	0.008	<0.01	0.01	-
Nitrate	mg/L	0.01	0.040	0.02	0.06	-
Total ammonia as NH4	mg/L	0.01	0.013	< 0.01	0.02	0.01
Total Metals						
Aluminum	mg/L	0.01500	0.057	0.042	< 0.005	0.124
Antimony	mg/L	0.00010	0.00010	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	0.00050	0.0066	0.0089	0.0047	0.0061
Barium	mg/L	0.02290	0.21	0.3895	0.1116	0.1374
Beryllium	mg/L	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	0.01000	0.010	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	0.00002	0.000067	0.00016	< 0.00002	< 0.00002
Chromium	mg/L	0.00060	0.0021	0.0014	0.0009	0.0041
Copper	mg/L	0.00060	0.00060	0.0008	< 0.0005	< 0.0005
Iron	mg/L	0.18000	0.41	0.28	0.21	0.73
Lead	mg/L	0.00030	0.00030	< 0.0003	< 0.0003	< 0.0003
Lithium	mg/L	0.00500	0.011	-	-	0.011
Manganese	mg/L	0.01700	0.39	0.8209	0.1375	0.2177
Mercury	mg/L	0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	0.00440	0.0100	0.0117	0.0093	0.0089
Selenium	mg/L	0.00080	0.00053	0.0006	< 0.0005	0.0005
Sodium	mg/L	1.29000	3.18	5	2.18	2.36
Strontium	mg/kg	0.11000	0.48	0.783	0.286	0.368
Thallium	mg/L	0.00020	0.00020	< 0.0002	< 0.0002	< 0.0002
Tin	mg/kg	0.00100	0.0010	< 0.001	< 0.001	< 0.001

Parameter	Sample Date	Annual Average		2019-07-03	2019-08-05	2019-09-01
	Unit	2018	2019			
Titanium	mg/L	0.02000	0.010	< 0.01	< 0.01	< 0.01
Uranium	mg/L	0.00100	0.0010	< 0.001	< 0.001	< 0.001
Vanadium	mg/L	0.00050	0.00050	< 0.0005	< 0.0005	0.0005
Zinc	mg/L	0.00200	0.0067	0.016	0.003	< 0.001
Dissolved Metals						
Aluminum	mg/L	0.00500	0.00050	< 0.0005	< 0.0005	< 0.0005
Antimony	mg/L	0.00010	0.00010	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	0.00050	0.0051	0.0066	0.0039	0.0048
Barium	mg/L	0.01900	0.21	0.3994	0.0915	0.1327
Beryllium	mg/L	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	0.01000	0.01	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	0.00002	0.000037	0.00007	< 0.00002	< 0.00002
Chromium	mg/L	0.00060	0.0006	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	0.00090	0.0007	< 0.0005	< 0.0005	0.0007
Iron	mg/L	0.01000	0.17	0.33	0.05	0.13
Lead	mg/L	-	0.0003	< 0.0003	< 0.0003	< 0.0003
Lithium	mg/L	0.00500	0.011	-	-	0.011
Manganese	mg/L	0.00070	0.39117	0.8665	0.0913	0.2157
Mercury	mg/L	0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.00070	0.00050	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	0.00400	0.0092	0.0108	0.0078	0.0091
Selenium	mg/L	0.00070	0.00050	< 0.0005	< 0.0005	< 0.0005
Strontium	mg/L	0.10500	0.496	0.82	0.246	0.423
Thallium	mg/L	0.00020	0.0002	< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	0.00100	0.001	< 0.001	< 0.001	< 0.001
Titanium	mg/L	0.02000	0.01	< 0.01	< 0.01	< 0.01
Uranium	mg/L	0.00100	0.001	< 0.001	< 0.001	< 0.001
Vanadium	mg/L	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	0.00100	0.006	0.011	< 0.001	0.006

8.5.3.2.4 Lake A45 (ST-WT-13)

In 2019, water from the Lake A45 (ST-WT-13) was sampled in July, August, September and November. The requirement for this station is monthly during open water season, as per the requirements in the NWB Water License (sampling station ST-WT-13 on Figure 4). There are no applicable license limits. Results are presented in Table 8-45. As the Whale Tail South Channel was not constructed yet in 2019, as the construction will begin in 2020, no flow was monitored. The A45 flow monitoring will start in 2020 once the channel is constructed.

Table 8-45 Whale Tail 2019 Lake A45 Water Quality Monitoring (ST-WT-13)

Parameter	Sample Date / Unit	Annual Average	2019-07-07	2019-08-11	2019-09-02	2019-11-17
Field Measured						
pH	pH units	7.40	7.9	6.88	7.47	7.35
Conductivity	uS/cm	22.70	18.9	20.4	22.2	29.3
Temperature	°C	6.11	6.34	8.94	6.87	2.28
Dissolved oxygen	mg/L	11.29	10.8	10.57	11.9	11.89
Turbidity	NTU	0.98	0.74	1.35	1.44	0.4
Conventional Parameters						
Total suspended solids	mg/L	2.00	3	2	1	2
Major Ions						
Sulphate	mg/L	1.28	< 0.6	1.2	1.8	1.5
Total Metals						
Aluminum	mg/L	0.00975	0.024	< 0.005	< 0.005	< 0.005
Arsenic	mg/L	0.00050	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Copper	mg/L	0.00050	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Lead	mg/L	0.00030	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Nickel	mg/L	0.00050	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	0.00125	< 0.001	< 0.001	0.002	< 0.001

8.5.3.2.5 Lake A16 outlet (ST-WT-14)

In 2019, 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 8-46.

8.5.3.2.6 Lake A15 (ST-WT-15)

In 2019, 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 8-47.

Table 8-46 Whale Tail 2019 Lake A16 Outlet Water Quality Monitoring (ST-WT-14)

Parameter	Sample Date	Annual Average		2019-07-07	2019-08-11	2019-09-02
	Unit	2018	2019			
Field Measured						
pH	pH units	6.68	6.87	6.86	6.62	7.14
Conductivity	uS/cm	57.30	74.97	62.9	72.3	89.7
Temperature	°C	13.70	7.30	5.86	8.81	7.24
Dissolved oxygen	mg/L	10.42	11.19	11.31	10.62	11.65
Turbidity	NTU	0.29	0.50	0.68	0.1	0.71
Conventional Parameters						
Hardness	mg CaCO3/L	19.00	22.33	18	20	29
Total alkalinity, as CaCO3	mg CaCO3/L	7.00	10.00	5	15	10
Total dissolved solids	mg/L	38.00	50.00	38	48	64
Total suspended solids	mg/L	1.00	1.00	1	< 1	< 1
Total organic carbon	mg/L	1.20	1.63	1.8	1.5	1.6
Dissolved organic carbon	mg/L	1.10	1.77	1.6	2.2	1.5
Major Ions						
Bicarbonate	mg CaCO3/L	7.00	10.00	5	15	10
Carbonate	mg CaCO3/L	2.00	2.00	< 2	< 2	< 2
Chloride	mg/L	10.80	11.67	9.5	11.5	14
Sulphate	mg/L	4.30	4.97	3.4	4	7.5
Reactive silica	mg/L	0.55	0.76	0.7	0.89	0.7
Nutrients and Chlorophyll a						
Nitrate	mg/L	0.010	0.010	< 0.01	0.01	0.01
Nitrite	mg/L	0.010	0.010	< 0.01	0.01	< 0.01
Total Kjeldahl nitrogen	mg/L	0.110	0.260	0.13	0.24	0.41
Total phosphorus	mg/L	0.010	0.010	0.01	< 0.01	< 0.01
Total orthophosphate (as phosphorus)	mg/L	0.010	0.010	< 0.01	< 0.01	< 0.01
Total ammonia as NH4	mg/L	0.010	0.027	0.05	0.02	< 0.01
Total Metals						
Aluminum	mg/L	0.005	0.00767	0.013	< 0.005	< 0.005
Antimony	mg/L	0.0001	0.00010	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	0.0005	0.00050	< 0.0005	< 0.0005	< 0.0005
Barium	mg/L	0.0093	0.00763	0.008	0.001	0.0139
Beryllium	mg/L	0.0005	0.00050	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	0.01	0.01000	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002
Calcium	mg/L	5.65	6.78333	5.39	6.3	8.66
Chromium	mg/L	0.0006	0.00063	< 0.0006	0.0007	< 0.0006
Copper	mg/L	0.0005	0.00067	0.0009	< 0.0005	0.0006
Iron	mg/L	0.01	0.02333	0.04	< 0.01	0.02

Parameter	Sample Date	Annual Average		2019-07-07	2019-08-11	2019-09-02
	Unit	2018	2019			
Lead	mg/L	0.0003	0.00030	< 0.0003	< 0.0003	< 0.0003
Lithium	mg/L	0.005	0.00500	< 0.005	< 0.005	< 0.005
Magnesium	mg/L	1.31	1.58	1.25	1.51	1.97
Manganese	mg/L	0.0007	0.00123	0.0012	0.0009	0.0016
Mercury	mg/L	0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.0005	0.00050	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	0.0012	0.00113	0.0016	0.0009	0.0009
Potassium	mg/L	0.71	1.19	0.95	1.07	1.56
Selenium	mg/L	0.0005	0.00050	< 0.0005	< 0.0005	< 0.0005
Sodium	mg/L	0.05	0.86333	0.53	0.8	1.26
Thallium	mg/L	0.0002	0.00020	< 0.0002	< 0.0002	< 0.0002
Tin	mg/kg	0.001	0.00100	< 0.001	< 0.001	< 0.001
Titanium	mg/L	0.01	0.01000	< 0.01	< 0.01	< 0.01
Uranium	mg/L	0.001	0.00100	< 0.001	< 0.001	< 0.001
Vanadium	mg/L	0.0005	0.00050	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	0.001	0.01200	0.007	0.019	0.01
Dissolved Metals						
Aluminum	mg/L	0.005	0.00050	< 0.0005	< 0.0005	< 0.0005
Antimony	mg/L	0.0001	0.00010	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	0.0005	0.00050	< 0.0005	< 0.0005	< 0.0005
Barium	mg/L	0.0093	0.00707	0.008	< 0.0005	0.0127
Beryllium	mg/L	0.0005	0.00050	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	0.01	0.01000	< 0.01	< 0.01	< 0.01
Chromium	mg/L	0.00002	0.00060	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	0.0006	0.00057	0.0007	< 0.0005	< 0.0005
Iron	mg/L	0.0018	0.01000	< 0.01	< 0.01	< 0.01
Lead	mg/L	0.01	0.00107	0.0013	< 0.0003	0.0016
Lithium	mg/L	0.005	0.00500	< 0.005	< 0.005	< 0.005
Manganese	mg/L	0.0005	0.00050	< 0.0005	< 0.0005	< 0.0005
Mercury	mg/L	0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.0005	0.00050	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	0.0005	0.00080	0.0009	0.0006	0.0009
Selenium	mg/L	0.0005	0.00050	< 0.0005	< 0.0005	< 0.0005
Thallium	mg/L	0.0002	0.00020	< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	0.001	0.00100	< 0.001	< 0.001	< 0.001
Titanium	mg/L	0.01	0.01000	< 0.01	< 0.01	< 0.01
Uranium	mg/L	0.001	0.00100	< 0.001	< 0.001	< 0.001
Vanadium	mg/L	0.0005	0.00050	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	0.001	0.00167	0.003	< 0.001	< 0.001

Table 8-47 Whale Tail 2019 Lake A15 Outlet Water Quality Monitoring (ST-WT-15)

Parameter	Sample Date	Annual Average		2019-07-07	2019-08-11	2019-09-02
	Unit	2018	2019			
Field Measured						
pH	pH units	6.75	6.88	6.78	6.69	7.16
Conductivity	uS/cm	57.90	73.00	63.1	66.6	89.3
Temperature	°C	10.00	7.83	6.34	9.45	7.7
Dissolved oxygen	mg/L	10.83	11.07	11.31	10.52	11.37
Turbidity	NTU	0.00	0.76	0.8	0.47	1.02
Conventional Parameters						
Hardness	mg CaCO3/L	20.00	21.67	17	18	30
Total alkalinity, as CaCO3	mg CaCO3/L	7.00	10.33	6	15	10
Total dissolved solids	mg/L	39.00	48.00	35	45	64
Total suspended solids	mg/L	1.00	1.00	1	< 1	< 1
Total organic carbon	mg/L	1.50	1.60	1.7	1.6	1.5
Dissolved organic carbon	mg/L	1.50	1.60	1.6	1.8	1.4
Major Ions						
Bicarbonate	mg CaCO3/L	7.00	10.33	6	15	10
Carbonate	mg CaCO3/L	2.00	2.00	< 2	< 2	< 2
Chloride	mg/L	10.90	10.70	8.1	9.9	14.1
Sulphate	mg/L	2.80	5.10	3.7	4.7	6.9
Reactive silica	mg/L	0.59	0.85	0.67	1.18	0.71
Nutrients and Chlorophyll a						
Total Kjeldahl nitrogen	mg/L	0.070	0.277	0.1	0.26	0.47
Total phosphorus	mg/L	0.010	0.010	< 0.01	< 0.01	0.01
Total orthophosphate (as phosphorus)	mg/L	0.010	0.010	< 0.01	< 0.01	< 0.01
Total ammonia as NH4	mg/L	0.020	0.010	< 0.01	< 0.01	< 0.01
Nitrate	mg/L	0.040	0.020	<0.01	0.03	0.02
Nitrite	mg/L	0.010	0.010	<0.01	<0.01	<0.01
Total Metals						
Aluminum	mg/L	0.00500	0.00500	0.005	< 0.005	< 0.005
Antimony	mg/L	0.00010	0.00010	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005
Barium	mg/L	0.00810	0.00713	0.0082	< 0.0005	0.0127
Beryllium	mg/L	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	0.01000	0.01000	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002
Calcium	mg/L	5.85000	6.46000	5.11	5.36	8.91
Chromium	mg/L	0.00060	0.00087	< 0.0006	< 0.0006	0.0014
Copper	mg/L	0.00050	0.00057	< 0.0005	0.0007	< 0.0005

Iron	mg/L	0.01000	0.01667	< 0.01	0.02	0.02
Lead	mg/L	0.00030	0.00030	< 0.0003	< 0.0003	< 0.0003
Lithium	mg/L	0.00500	0.00500	< 0.005	< 0.005	< 0.005
Magnesium	mg/L	1.44000	1.49333	1.06	1.36	2.06
Manganese	mg/L	0.00050	0.00103	0.001	0.0007	0.0014
Mercury	mg/L	0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	0.00090	0.00100	0.0007	0.0011	0.0012
Potassium	mg/L	0.71000	1.16000	0.85	0.91	1.72
Selenium	mg/L	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005
Sodium	mg/L	0.04900	0.88333	0.54	0.71	1.4
Thallium	mg/L	0.00020	0.00020	< 0.0002	< 0.0002	< 0.0002
Tin	mg/kg	0.00100	0.00100	< 0.001	< 0.001	< 0.001
Titanium	mg/L	0.01000	0.01000	< 0.01	< 0.01	< 0.01
Uranium	mg/L	0.00100	0.00100	< 0.001	< 0.001	< 0.001
Vanadium	mg/L	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	0.00100	0.00133	< 0.001	< 0.001	0.002
Dissolved Metals						
Aluminum	mg/L	0.00500	0.00050	< 0.0005	< 0.0005	< 0.0005
Antimony	mg/L	0.00010	0.00010	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	0.00050	0.00050	< 0.0005	0.0005	< 0.0005
Barium	mg/L	0.00830	0.00593	0.0061	< 0.0005	0.0112
Beryllium	mg/L	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	0.01000	0.01000	< 0.01	< 0.01	< 0.01
Chromium	mg/L	0.00002	0.00060	< 0.0006	< 0.0006	< 0.0006
Copper	mg/L	0.00070	0.00063	< 0.0005	< 0.0005	0.0009
Iron	mg/L	0.00070	0.01000	< 0.01	< 0.01	< 0.01
Lead	mg/L	0.01000	0.00030	< 0.0003	< 0.0003	< 0.0003
Lithium	mg/L	0.00500	0.00500	< 0.005	< 0.005	< 0.005
Manganese	mg/L	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005
Mercury	mg/L	0.00001	0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	0.00100	0.00097	0.0007	0.0011	0.0011
Selenium	mg/L	0.00050	0.00060	< 0.0005	0.0008	< 0.0005
Thallium	mg/L	0.00020	0.00020	< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	0.00100	0.00100	< 0.001	< 0.001	< 0.001
Titanium	mg/L	0.01000	0.01000	< 0.01	< 0.01	< 0.01
Uranium	mg/L	0.00100	0.00100	< 0.001	< 0.001	< 0.001
Vanadium	mg/L	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	0.00100	0.00100	< 0.001	< 0.001	< 0.001

8.5.3.2.7 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 has been observed out of the downstream toe of Whale Tail Dike (WTD) in a low spot. In September 2019, Agnico communicated with the NWB to discuss water management strategy regarding the Whale Tail Dike seepage. As dewatering of the Whale Tail North Basin was not completed and Whale Tail Dike construction activity were still ongoing in 2019, Agnico proposed to manage water from WTD seepage as part of the dewatering of the Whale Tail North Basin. Agnico proposed to intercept non-contact water seeping from WTD before reaching Whale Tail North Basin and then discharge this non-contact water to Whale Tail South Basin. This was done in order to improve the dewatering of Whale Tail North that was processed via the WTP, when needed, and then discharged to Mammoth Lake. Water was discharged without treatment if it met TSS water quality limit. If needed, water was treated via the Water Treatment Plan and then discharge back to Whale Tail South. As this was part of the dewatering strategy, water continued to be monitored for Water License 2AM-WTP1826 Part D Item 7. Refer to Section 8.5.2.2.1 above for the result of the Whale Tail North Basin dewatering.

Once the access of the downstream toe was safe and possible, water quality sampling was conducted at a minimum on a monthly as per the seepage requirements of the NWB water license. Sample results are presented in Table 8-48. See Figure 4 for the location of ST-WT-17. As the water was mixed at some point with the dewatering water, no exact seepage volume was determined in 2019. Refer to Section 8.5.8.2.2 for details on the Whale Tail Dike seepage regarding consequence and mitigation measure in place.

8.5.3.2.8 Whale Tail South Transfer (ST-WT-25)

On September 6th, 2019, a meeting was held between Agnico and NWB to discuss Whale Tail Project Water Management Strategy. The strategy include, among other, the Whale Tail South Basin (WTS) non-contact water transfer to Mammoth Lake. This pumping activity is to lower and then maintain water level in WTS in order to allow for the construction of the Whale Tail South Channel (SWTC) and preserve WTD integrity. The objective of this activity is to temporarily substitute passive flow via the SWTC with a pumping alternative that would comply with the original intent of the approved water balance and Water License 2AM-WTP1826 (same origin and destination of water). Water quality monitoring followed the Water License 2AM-WTP1826 Part F Item 6 and Schedule I Table 1 - Group 3, same as the one required for water flowing though the Whale Tail South Channel. Agnico have sent a notification on October 25th, 2019 to CIRNAC Inspector, as per Part I Item 7 of the Water License 2AM-WTP1826, regarding the new station required for the pumping water from Whale Tail South Basin to Mammoth Lake. The 10 days notice as per Water License Part F Item 13, was sent on September 17th, 2019.

Water transfer started on October 21st, 2019 and was ended on December 18th, 2019. A total volume of 1,701,213 m^3 was transferred in 2019. As per Water License Part F Item 6, the effluent from this discharge shall not exceed the maximum authorized concentration grab of 30 mg/L and the maximum authorized monthly mean concentration of 15 mg/L. Result are presented in Table 8-49 below and sampling location on Figure 4. No non-compliance observed related to this non-contact water transfer to Mammoth Lake.

Table 8-48 Whale Tail Dike Seepage 2019 Water Quality Monitoring (ST-WT-17)

Parameter	Sample Date / Unit	Annual Average	2019-07-31	2019-08-06	2019-08-13	2019-08-20	2019-08-26	2019-09-03	2019-09-18	2019-09-22	2019-09-29	2019-10-07	2019-10-13	2019-10-20	2019-10-29	2019-11-08	2019-11-11	2019-11-18	2019-11-25	2019-12-02	2019-12-16	2019-12-23	2019-12-31
Field Measured																							
pH	pH units	8.10	-	7.42	7.27	7.6	7.55	7.9	6.99	7.27	7.85	7.53	7.95	8.23	-	7.95	7.54	8.68	8.67	9.01	9.56	9.53	9.44
Conductivity	uS/cm	126.67	-	127.4	125.7	124.4	117.6	101.6	108.6	109.6	192	108.1	104.9	108.6	-	118.2	86.9	121.8	128.7	144.4	175.1	156.4	146.8
Temperature	°C	6.65	-	11.99	13.47	12.35	10.73	13.6	10.3	8.8	5.31	3.9	4.98	4.68	-	0.5	1.32	7.79	5.93	4.32	2.78	2.9	0.65
Dissolved oxygen	mg/L	11.39	-	9.92	9.63	9.72	9.26	-	9.98	10.12	12.95	11.25	11.43	12.29	-	13.3	13.09	12	10.96	12.02	13.21	-	12.55
Turbidity	NTU	21.72	-	77.09	49.16	72.3	85.7	7.42	6.8	38.9	7.03	5.66	5.42	5.39	-	30.6	4.69	2.91	2.95	3.21	3.45	2.28	1.74
Conventional Parameters																							
Hardness	mg CaCO3/L	44.10	47	41	32	32	42	41	37	45	36	37	31	40	42	44	52	33	50	47	64	76	57
Total alkalinity, as CaCO3	mg CaCO3/L	29.56	-	-	-	18	21	21	26	24	23	26	28	27	25	26	34	26	28	37	60	41	41
Total dissolved solids	mg/L	86.90	76	70	114	89	82	76	78	186	88	68	61	66	62	66	71	80	84	88	113	104	103
Total suspended solids	mg/L	17.43	44	31	16	71	70	2	2	5	3	4	4	1	38	57	2	3	3	2	4	1	3
Major Ions																							
Chloride	mg/L	17.95	84.8	15.5	14.8	16.9	13.3	13.5	12.6	13.6	13.7	12.5	12.6	12.1	12.2	13	13.7	13.7	< 0.5	16.3	19.8	17.5	16.8
Fluoride	mg/L	0.10	-	-	-	-	-	-	-	-	-	-	-	0.09	0.09	0.09	0.1	0.1	0.09	0.11	0.09	0.11	0.11
Sulphate	mg/L	7.33	7.6	6.4	5.7	6.6	5.6	5.2	7	4.7	5	5.5	5.1	4.6	6.2	6.6	6.1	11.3	9.5	11.8	11.6	13.9	7.9
Nutrients and Chlorophyll a																							
Nitrate	mg/L	0.118	0.17	0.22	0.21	0.25	0.11	0.08	0.11	0.11	0.06	0.11	0.08	0.01	0.08	0.11	0.11	0.11	0.13	0.1	0.08	0.15	0.08
Nitrite	mg/L	0.021	0.01	0.02	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.14	0.11	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01
Total phosphorus	mg/L	0.023	0.05	0.03	0.02	0.07	0.06	0.01	0.01	0.02	< 0.01	0.01	0.02	< 0.01	0.04	0.04	0.01	< 0.01	0.01	0.01	0.02	0.02	0.01
Total orthophosphate (as phosphorus)	mg/L	0.038	0.1	0.1	0.04	0.16	0.02	< 0.01	0.01	0.02	0.03	0.02	0.02	0.02	0.05	0.1	0.02	0.01	0.02	0.01	0.01	0.01	0.02
Total ammonia as NH4	mg/L	0.029	0.03	0.08	0.04	0.04	0.07	0.01	0.03	< 0.01	0.03	0.01	0.03	0.01	0.02	0.01	0.02	0.05	0.03	0.01	0.03	0.01	0.03
Total Metals																							
Aluminum	mg/L	0.30981	1.12	1.02	0.309	0.779	1.21	0.126	0.084	0.207	0.12	0.18	0.05	0.066	0.31	0.539	0.099	0.028	0.056	0.059	0.056	0.057	0.031
Arsenic	mg/L	0.01125	0.0146	0.0114	0.009	0.01	0.0114	0.0077	0.0084	0.0112	0.0083	0.0087	0.0094	0.0104	0.0125	0.0159	0.0137	0.0082	0.0094	0.013	0.0135	0.018	0.0116
Barium	mg/L	0.02624	0.0346	0.0327	0.0166	0.0286	0.0436	0.0295	0.0265	0.0278	0.0296	0.024	0.0148	0.0161	0.0268	0.0275	0.0267	0.0126	0.0161	0.0194	0.0318	0.0363	0.0294
Cadmium	mg/L	0.00005	0.00023	0.00021	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.00275	0.0061	0.0049	0.0016	0.003	0.0043	0.0014	0.0011	0.0014	0.0009	< 0.005	0.0008	0.0009	0.0022	0.0099	0.0011	< 0.0006	0.001	0.0014	0.008	0.0015	< 0.0006
Copper	mg/L	0.00888	0.1424	0.0035	0.0011	0.0032	0.0038	0.0016	0.0014	0.0017	0.0017	0.0016	0.0016	0.0014	0.0025	0.0059	0.0022	0.0013	0.0021	0.0017	0.002	0.0023	0.0015
Iron	mg/L	0.76619	2.51	2.55	0.89	2.01	3.06	0.3	0.27	0.39	0.28	0.33	0.19	0.19	0.67	1.26	0.18	0.13	0.29	0.23	0.07	0.16	0.13
Lead	mg/L	0.00037	0.0005	0.0004	< 0.0003	0.0004	< 0.0003	0.0004	< 0.0003	< 0.0003	< 0.0003	< 0.0005	< 0.0003	< 0.0003	0.0003	0.0009	0.0004	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L	0.07778	0.1772	0.1589	0.1182	0.1625	0.2261	0.1047	0.0752	0.0722	0.0455	0.044	0.0354	0.0396	0.0666	0.0798	0.049	0.0293	0.0451	0.0352	0.0237	0.0255	0.0197
Mercury	mg/L	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00001	< 0.0001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00002	< 0.00001	< 0.00001
Molybdenum	mg/L	0.00254	0.0085	0.004	0.0026	0.0023	0.0026	0.0022	0.0023	0.0024	0.0019	0.0022	0.0015	0.0018	0.0017	0.0019	0.0023	0.0011	0.0019	0.0022	0.0039	0.0025	0.0015
Nickel	mg/L	0.00296	0.0137	0.0045	0.0017	0.0036	0.0031	0.0021	0.0014	0.002	0.0017	< 0.002	0.0015	0.0018	0.0029	0.0055	0.0023	0.0012	0.002	0.0017	0.0021	0.0031	0.0023
Selenium	mg/L	0.00099	0.0013	0.0025	< 0.0005	0.0021	0.0032	< 0.0005	< 0.0005	0.0012	< 0.0005	< 0.003	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Silver	mg/L	0.00049	0.0073	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Zinc	mg/L	0.00195	0.007	0.005	< 0.001	0.001	< 0.001	0.001	< 0.001	< 0.001	0.001	< 0.007	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002	0.004	0.001

Table 8-49 Whale Tail South Transfer 2019 Water Quality Monitoring (ST-WT-25)

Parameter	Max Grab	Max Mean	Unit	Annual Average	Sample Date							
					ST-WT-25 2019-10-29	ST-WT-25 2019-11-04	ST-WT-25 2019-11-11	ST-WT-25 2019-11-18	ST-WT-25 2019-11-25	ST-WT-25 2019-12-02	ST-WT-25 2019-12-09	ST-WT-25 2019-12-16
Conventional Constituents												
pH			N/A	7.14	7.09	7.29	6.91	7.05	7.11	7.21	7.26	7.21
Turbidity			NTU	1.176	1.61	1.66	1.61	1.07	1.14	1.00	0.66	0.66
Total suspended solids	30	15	mg/L	3.500	3	3	2	3	<1	<1	8	2
Sulphate			mg/L	4.863	3.7	2.6	0.9	5.0	6.0	6.3	5.4	9.0
Total Metals												
Aluminum			mg/L	0.020	0.029	0.028	0.025	0.017	0.021	0.010	<0.005	0.021
Arsenic			mg/L	0.002	0.0020	0.0016	0.0021	0.0023	<0.0005	0.0025	0.0016	0.0025
Copper			mg/L	0.001	0.0021	0.0007	<0.0005	0.001	0.0032	0.0013	0.0013	0.0011
Lead			mg/L	0.000	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Nickel			mg/L	0.003	0.0046	0.0018	0.0025	0.002	0.0027	0.0021	0.0023	0.0025
Zinc			mg/L	0.006	<0.001	<0.001	<0.001	0.003	0.005	<0.001	0.030	0.002

Parameter	Max Grab	Max Mean	Unit	Annual Average	Sample Date						
					ST-WT-25a 2019-10-29	ST-WT-25a 2019-11-04	ST-WT-25a 2019-11-11	ST-WT-25a 2019-11-18	ST-WT-25a 2019-11-25	ST-WT-25a 2019-12-02	ST-WT-25a 2019-12-09
Conventional Constituents											
pH			N/A	7.16	7.08	7.26	6.93	7.08	7.13	7.25	7.40
Turbidity			NTU	1.179	2.01	1.44	1.52	1.10	0.86	0.75	0.57
Total suspended solids	30	15	mg/L	2.571	3	4.0	1.0	<1	<1	2.0	6.0
Sulphate			mg/L	4.957	3.2	2.6	2.5	5.2	7.1	6.6	7.5
Total Metals											
Aluminum			mg/L	0.021	0.025	0.028	0.043	0.021	0.012	0.012	<0.005
Arsenic			mg/L	0.002	0.0015	0.0016	0.0029	0.0022	<0.0005	0.0005	0.0024
Copper			mg/L	0.002	0.0008	0.0007	0.0078	0.0008	0.0016	0.0007	0.0009
Lead			mg/L	0.000	<0.0003	<0.0003	0.001	<0.0003	<0.0003	<0.0003	<0.0003
Nickel			mg/L	0.002	0.0021	0.0016	0.0048	0.0021	0.0023	0.0022	0.0021
Zinc			mg/L	0.003	<0.001	<0.001	0.011	0.003	<0.001	<0.001	<0.001

8.5.3.2.9 North-East Pond to Nemo Watershed

On August 15th, 2019, Agnico submitted to NWB a request regarding a new water management strategy. The Water Management Plan indicated that non-contact water from the North-East Pond watershed will overflow by gravity toward Nemo Lake once the North-East (NE) Dike is operational. The NE Dike was constructed in Q1 2019 and became operational during freshet of 2019. During a routine inspection in July 2019, it was observed that the topography toward Nemo Lake would not allow water to overflow naturally before overtopping the dike liner. Since then, water has been pumped from NE Pond toward the project site adding pressure on dewatering activity.

Agnico will pump water from the NE Pond to the Nemo watershed in 2019 and 2020. This system would be used to empty the NE Pond when required and would be operational until NE Dike is dismantled (which is planned prior to freshet 2021). The NE Pond is also planned to become the IVR Pit as part of the Whale Tail Expansion Project, once approved.

Pumps were used and their intake were positioned in an area where there is sufficient water depth. To minimize impact on the receiving environment the line installed in the tundra will be made of Mineflex and the discharge location have an energy dissipating pad to avoid erosion. Existing access were used to position the pump, intake and discharge.

Agnico was not expecting any concerns relating to water quality as this is non-contact water from NE Pond. To ensure compliance with the Water License 2AM-WTP1826 (WL), Agnico monitored the effluent of the NE Pond for TSS as per WL Part F Item 6.

This water management strategy was approved by the NWB on August 16th, 2019.

A total volume of 523,014 m^3 was transferred in 2019 to AP-5 pond, Whale Tail North or to the tundra in the watershed of Nemo Lake. From that amount, 275,701 m^3 was pumped to the tundra from August 18th, 2019 to October 2nd, 2019. Refer to report 2019 Migratory Bird Protection Plan for a discussion of the water level versus the FEIS (Appendix M of the Wildlife Monitoring Summary Report in Appendix 52). As per Water License Part F Item 6, the effluent from this discharge shall not exceed the maximum authorized concentration grab of 30 mg/L and the maximum authorized monthly mean concentration of 15 mg/L. Result are presented in Table 8-50 below for the discharge to tundra. No non-compliance observed related to this non-contact water transfer to Mammoth Lake.

8.5.3.2.10 Quarry 1 Discharge

Water from Quarry 1 was discharge from July 20th to October 23rd, 2019 following the approval from CIRNAC on July 18th, 2019. Water was treated via the WTP, and then discharged to Mammoth Lake temporary diffuser. Started on August 26th, water was discharged without WTP, as water quality was below the regulatory limits, and discharged back to Mammoth Lake in one permanent diffuser. A total volume of 599,040 m^3 of water from Quarry 1 was discharged during this period.

Agnico have monitored the discharged water as per Water License Part F Item 4, as the effluent from this discharge shall not exceed the limits detailed in Table 8-51. No non-compliance were observed. Refer to Section 8.3.2.4 above to the MDMER-EEM monitoring requirement associated with this discharge.

Table 8-50 Whale Tail North-East Pond 2019 Water Quality Monitoring

Parameter	Max Grab	Max Mean	Sample Date / Unit	Annual Average	2019-08-20	2019-08-26	2019-09-03	2019-09-10	2019-09-17	2019-09-23
Field Measured										
pH			pH units	6.80		7.07	6.85	7.27	6.71	6.51
Conductivity			uS/cm	1832.00	1800	423.1	1310	463.1	1889	1438
Temperature			°C	9.37	10.85	16.88	6.67	12.69	6.21	11.02
Dissolved oxygen			mg/L	11.02	10.31	9.72	10.93	10.78	11.7	11.25
Turbidity			NTU	7.62	2.5	1.72	4.21	2.51	4.62	4.52
Conventional Parameters										
Total suspended solids	30	15	mg/L	4.17	5	3	2	4	5	6

Table 8-51 Whale Tail Quarry 1 Discharge 2019 Water Quality Monitoring

Parameter	Max Mean	Max Grab	Unit	Annual Average	Sample Date													
					2019-07-20	2019-07-21	2019-07-22	2019-07-29	2019-08-19*	2019-08-26	2019-09-02	2019-09-11	2019-09-17	2019-09-22	2019-09-29	2019-10-07	2019-10-14	2019-10-21
Conventional Constituents																		
pH	6.0 to 9.5	6.0 to 9.5	N/A	7.08	6.90	6.67	6.75	6.72	6.69	7.54	7.32	7.10	6.97	7.70	7.30	7.31	6.99	7.14
Conductivity			uS/cm	471.87	337.7	354.4	366.6	363	451.7	475.9	512.3	573.2	466.9	475.7	547.5	559.7	549.6	572
Hardness			mg CaCO3/L	161.93	83	83	86	103	144	199	181	203	191	150	230	199	192	223
Turbidity			NTU	7.66	5.5	4.04	1.09	4.58	10.8	10.6	12.9	15.5	8.42	6.58	8.82	7.02	5.94	5.49
Total alkalinity, as CaCO3			mg CaCO3/L	36.31	15	12	15	NA	40	40	44	49	46	38	40	41	40	52
Total organic carbon			mg/L	3.42	2.7	-	2.7	3.3	4.3	3.7	4.2	4.1	3.5	3.8	3.7	1.9	3.2	3.3
Dissolved organic carbon			mg/L	4.32	2.7	-	-	4.5	4.3	3.6	3.7	5.8	5.1	4.8	5	4.2	4.2	3.9
Total suspended solids	15	30	mg/L	6.14	3	5	4	4	15	8	9	10	6	5	2	5	9	<1
Total Dissolved Solids	1400	1400	mg/L	270.43	163	170	174	<1	322	318	335	339	298	302	346	334	326	358
Nutrients																		
Nitrate			mg/L	5.909	2.65	3.23	3.69	4.31	6.29	6	6.78	6.54	6.32	6.33	6.13	8.36	7.77	8.33
Nitrite			mg/L	0.167	0.1	0.17	0.13	0.38	0.33	0.3	0.23	0.14	0.12	0.1	0.08	0.1	0.09	0.07
Total Orthophosphate			mg/L	0.016	< 0.01	< 0.01	< 0.01	< 0.01	0.03	0.02	0.01	0.02	0.01	0.01	0.04	0.02	0.02	0.01
Total Phosphorus			mg/L	0.022	0.01	< 0.01	0.06	< 0.01	0.04	0.01	0.04	0.03	0.01	0.03	0.02	0.01	0.02	0.01
Total Ammonia	16	32	mg/L	0.904	0.62	0.63	0.72	1.08	0.99	1.04	0.93	0.91	0.7	0.6	1.13	1.22	1.08	1.01
Total Kjeldahl			mg/L	1.045	1.2	1.25	1.05	1.52	0.99	1.04	0.93	0.91	0.7	0.6	1.13	1.22	1.08	1.01
Major Ions																		
Bicarbonate			mg CaCO3/L	36.31	15	12	15	NA	40	40	44	49	46	38	40	41	40	52
Carbonate			mg CaCO3/L	2.64	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 5	< 5	< 5
Chloride			mg/L	56.00	38.7	37.4	38.9	45.6	46.8	51.3	54.6	59.3	57.1	57.6	69.5	69.1	78.1	80
Magnesium			mg/L	7.75	5.11	5.62	5.79	7.21	-	-	-	-	-	-	-	15	-	-
Potassium			mg/L	14.69	7.08	7.69	7.77	10.9	13.5	22.9	17.4	20.5	17.2	13.3	18.5	17	15	16.9
Sodium			mg/L	5.36	2.17	2.33	2.86	3.66	4.5	6.85	6.18	6.95	6.39	5.18	8.34	6.8	5.23	7.63
Sulphate			mg/L	57.26	27.1	31.9	34	41.9	67	66	74.2	72.7	59.6	59.9	61.9	69	67.9	68.5
Reactive silica			mg/L	4.04	4.49	3.93	4.05	3.7	-	-	-	-	-	-	-	-	-	-
Total Metals																		
Aluminum	0.5	1	mg/L	0.15621	0.141	0.171	0.121	0.034	0.536	0.268	0.204	0.170	0.137	0.054	0.079	0.150	0.05	0.072
Antimony			mg/L	0.00195	< 0.0001	< 0.0001	0.0006	0.0018	0.0018	0.0034	0.0024	0.0028	0.0024	0.002	0.0025	0.003	0.0021	0.0023
Boron			mg/L	0.01286	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01
Barium			mg/L	0.08960	0.0566	0.0526	0.0617	0.0551	0.0802	0.1179	0.0919	0.1218	0.1002	0.0893	0.1162	0.11	0.0969	0.104
Beryllium			mg/L	0.00061	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.002	< 0.0005	< 0.0005
Arsenic	0.1	0.2	mg/L	0.00922	0.0024	0.0032	0.0017	0.0036	0.0147	0.0168	0.0129	0.0137	0.0127	0.0094	0.0106	0.0099	0.0095	0.008
Cadmium	0.002	0.004	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	< 0.0002	< 0.00002	< 0.00002
Chromium	0.02	0.04	mg/L	0.00234	0.0014	0.0015	0.0009	0.0008	0.0034	0.0041	0.0032	0.0036	0.0043	0.0013	0.0011	<0.005	0.001	0.0011
Copper	0.1	0.2	mg/L	0.00463	0.0025	0.0028	0.026	0.0015	0.003	0.0033	0.0036	0.0036	0.0035	0.0019	0.0038	0.0035	0.0027	0.0031
Iron	1	2	mg/L	0.51500	0.72	1.09	0.72	0.53	1.18	0.46	0.46	0.43	0.33	0.15	0.30	0.34	0.25	0.25
Lithium			mg/L	0.00500	< 0.005	< 0.005	< 0.005	0.005	-	-	-	-	-	-	-	-	-	-
Lead	0.05	0.1	mg/L	0.00036	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.0007	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.00063	<0.0003	0.0004
Manganese			mg/L	0.24331	0.1381	0.1453	0.1526	0.1481	0.2812	0.2845	0.2571	0.2701	0.2683	0.1942	0.3047	0.34	0.3318	0.2903
Mercury	0.004	0.008	mg/L	0.00002	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	<0.0001	<0.00001	<0.00001
Molybdenum			mg/L	0.01054	0.0139	0.01	0.0112	0.0098	0.007	0.0135	0.0116	0.0133	0.011	0.0092	0.0108	0.01	0.0078	0.0085
Nickel	0.25	0.5	mg/L	0.01286	0.0056	0.0064	0.0064	0.0061	0.0176	0.0203	0.0177	0.0183	0.0142	0.0096	0.0157	0.013	0.0143	0.0148
Selenium			mg/L	0.00170	< 0.0005	< 0.0005	0.0011	< 0.0005	0.0033	0.0025	0.001	0.0016	0.0021	0.0016	0.003	< 0.003	0.0017	0.0014
Tin			mg/L	0.00107	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.001
Strontium			mg/L	0.24293	0.131	0.129	0.142	0.168	0.229	0.305	0.262	0.276	0.309	0.226	0.299	0.3	0.311	0.314

Parameter	Max Mean	Max Grab	Unit	Annual Average	Sample Date													
					2019-07-20	2019-07-21	2019-07-22	2019-07-29	2019-08-19*	2019-08-26	2019-09-02	2019-09-11	2019-09-17	2019-09-22	2019-09-29	2019-10-07	2019-10-14	2019-10-21
Titanium			mg/L	0.01071	< 0.01	< 0.01	< 0.01	< 0.01	0.02	0.01	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Thallium			mg/L	0.00033	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.002	< 0.0002	< 0.0002
Uranium			mg/L	0.00369	0.001	0.001	< 0.001	0.002	0.003	0.005	0.005	0.005	0.005	0.003	0.005	0.005	0.004	0.004
Vanadium			mg/L	0.00091	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0008	0.0009	0.0009	0.001	0.0009	< 0.0005	< 0.0005	< 0.002	0.0013	0.0019
Zinc	0.1	0.2	mg/L	0.00400	0.004	0.006	0.023	0.005	<0.001	<0.001	0.002	< 0.001	< 0.001	< 0.001	0.002	<0.007	<0.001	<0.001
Dissolved Metals																		
Aluminum			mg/L	0.00443	< 0.005	< 0.0005	< 0.0005	< 0.005	< 0.0005	0.017	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.03	< 0.0005	< 0.005
Antimony			mg/L	0.00195	< 0.0001	< 0.0001	0.0005	0.0019	0.0029	0.003	0.0023	0.0026	0.0019	0.0021	0.0025	< 0.003	0.0022	0.0022
Boron			mg/L	0.01286	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01
Barium			mg/L	0.08488	0.0543	0.0535	0.0647	0.0544	0.0976	0.0934	0.085	0.1296	0.0764	0.0924	0.091	0.11	0.086	0.1
Beryllium			mg/L	0.00061	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.002	< 0.0005	< 0.0005
Arsenic			mg/L	0.00588	0.0008	0.0005	< 0.0005	0.0011	0.0127	0.0122	0.0089	0.0092	0.0078	0.0077	0.0061	0.0061	0.0044	0.0043
Cadmium			mg/L	0.00010	0.00006	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00007	< 0.001	0.00004	< 0.00002
Chromium			mg/L	0.00091	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.005	< 0.0006	< 0.0006
Copper			mg/L	0.00192	0.0015	0.0015	0.0015	0.001	0.0022	0.0025	0.0023	0.002	0.0011	0.0015	0.003	< 0.003	0.0016	0.0022
Iron			mg/L	0.04714	0.09	0.05	0.05	0.03	0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	0.2	< 0.1	0.03	0.05
Lithium			mg/L	0.00500	-	-	-	0.005	-	-	-	-	-	-	-	-	-	-
Lead			mg/L	0.00035	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.001	< 0.0003	< 0.0003
Manganese			mg/L	0.19741	0.1274	0.1345	0.1435	0.1488	0.2622	0.2282	0.1094	0.1676	0.1694	0.1718	0.2336	0.31	0.296	0.2614
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	0.00002	< 0.0001	< 0.00001	< 0.00001
Molybdenum			mg/L	0.00971	0.0132	0.0096	0.0103	0.0091	0.0081	0.0116	0.0118	0.0113	0.0086	0.009	0.0086	< 0.01	0.007	0.0078
Nickel			mg/L	0.01061	0.0049	0.0055	0.0056	0.0058	0.0181	0.0162	0.0129	0.0119	0.009	0.0096	0.0117	0.012	0.0123	0.013
Selenium			mg/L	0.00105	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.002	0.0015	0.0018	0.0011	< 0.0005	0.0013	0.0014	0.0013	0.0013
Tin			mg/L	0.00450	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.05	< 0.001	< 0.001
Strontium			mg/L	0.22500	0.132	0.127	0.142	0.17	0.278	0.257	0.259	0.23	0.231	0.233	0.243	0.28	0.274	0.294
Titanium			mg/L	0.01364	-	-	-	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.05	< 0.01	< 0.01
Thallium			mg/L	0.00090	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.01	< 0.0002	< 0.0002
Uranium			mg/L	0.00303	< 0.001	< 0.001	< 0.001	0.002	0.003	0.004	0.004	0.004	0.003	0.003	0.004	0.0044	0.004	0.004
Vanadium			mg/L	0.00119	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.01	0.0006	< 0.0005
Zinc			mg/L	0.00357	0.004	0.002	0.014	0.006	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.011	< 0.005	< 0.001	< 0.001
Other																		
Total oil and grease	3	6	mg/L	1.15385	<1	NA	<1	2	1	< 1	< 1	1	2	< 1	< 1	<1	1	1

8.5.3.2.11 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 (V. 1; June 2018) for the Whale Tail site. This plan presents the monitoring and mitigation actions related to three specific periods of activity for the Whale Tail Pit: the period of construction and dewatering (during construction and operation), the period of freshet (during construction, operation and closure) and the period of rise in water level in the South Basin of Whale Tail Lake (during operation).

For each period of activity, monitoring consists of water quality analyses and visual inspections in erosion-prone areas.

8.5.3.2.11.1 Water Quality

According to the Erosion Management Plan, water quality monitoring for erosion management generally consists of TSS or turbidity assessments, which are conducted and reported under a number of programs, as follows.

- For erosion related to dike construction and dewatering:
    - Water Quality Monitoring and Management Plan for Dike Construction and Dewatering (Agnico Eagle, 2016), as described in Appendix 19 of this report.
- For erosion related to freshet:
    - Water Quality and Flow Monitoring Plan (according to NWB Type A Water License requirements), as described in Section 8 of this report.
    - Freshet Action Plan (below)
- For erosion related to increased water levels due to flooding:
    - Water Quality and Flow Monitoring Plan (according to NWB Type A Water License requirements), as described in Section 8 of this report
    - CREMP (Appendix 35 of this report).

Results of these programs are reported under the various sections of this Annual Report, as described above.

Under the Freshet Action Plan, inspections of water management infrastructure (bridges, culverts, ditches) are conducted daily by dedicated personnel (freshet leader) starting in May, and water quality monitoring for turbidity/TSS is conducted as required. TSS is analyzed by onsite assay laboratory procedures when excess turbidity is observed, and by commercial accredited laboratory if any elevated results are received. Measured TSS results that exceed 30 mg/L are reported to appropriate regulators.

For Whale Tail Haul Road bridges (km 119, 126, 131, 135, 139, 141, 148, 159, and 160), turbidity/TSS was measured between two and eight times, from June 4th to July 12th, 2019. For culverts, turbidity/TSS was measured one to three times, from June 5th to July 11th, 2019. No exceedances of the TSS limit occurred.

8.5.3.2.11.2 Visual Inspections

As described in the Erosion Management Plan, visual inspections were performed as a component of erosion monitoring related to freshet and flooding. Visual inspections for freshet monitoring were conducted under the Freshet Action Plan. As described above, these inspections occurred daily or weekly during freshet for onsite and Whale Tail Haul road water management infrastructure including culverts, ditches and bridges. 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.

In 2019, no major erosion concerns were identified during visual inspections for onsite or Whale Tail haul road water management infrastructure during freshet monitoring.

As preventative mitigation measures, straw booms and silt fences were installed for Whale Tail Haul Road infrastructure as follows:

- Culvert 123
    - straw booms were installed on June 14th and July 3rd
    - a silt fence was installed on June 20th and removed June 24th
- Bridge km 141
    - straw boom was installed June 18th

In addition to freshet monitoring, visual inspections were conducted on a regular basis during the open water season throughout the Whale Tail South flood zone. 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 2019 and no mitigation was required.

8.5.3.2.12 Effluent discharged from AP-5 and Trench-water Containment Pond (MEA-4)

As per Water License 2BB-MEA1828 Part D Item 17, a 10 days' notice was sent to CIRNAC's Inspector on June 21st to advise the start of the pumping of AP-5 containment pool to the tundra. On September 9th, 2019, Agnico contacted the NWB to discuss the AP-5 discharge to tundra with the NWB and proposed to continue to use the pond for managing excessive non-contact water on site. On September 10th, the NWB agreed to the proposed water management strategy. On September 10th, Agnico contacted the CIRNAC Inspector to notify that following higher than anticipated precipitation during July and August, discharges from AP-5 were higher than originally estimated, and thus it was anticipated that it will continue to discharge an additional approximately 1,000,000 m^3 of compliant water to the tundra over the next few weeks period. Flow dissipaters were put in place at the discharge locations to prohibit erosion from the discharge. The discharge met discharge criteria in accordance with Part D, Item 14 of the NWB 2BB Water License. As per the requirement of the Water License, weekly samples were taken during discharge and results are provided in Table 8-52. A total volume of 1,080,667 m^3 of water was discharged to tundra towards the Nemo watershed from July 11th to September 26th, 2019. No non-compliance were observed during discharge.

8.5.3.3 *Exploration Whale Tail Site*

As required by NWB Water License 2BB-MEA1828 Part B, Item 6d: *Tabular summary of all data generated under the Monitoring Program, Part J*

And

As required by NWB Water License 2BB-MEA1828 Part J, Item 9: *The Licensee shall establish background and post drilling water quality for pH, conductivity, temperature and dissolved oxygen at the nearest downstream water body to drill locations. Monitoring is to be done just prior to commencement of drilling and weekly thereafter, concluding one week after drilling has been completed and the site restored.*

And

As required by NWB Water License 2BB-MEA1828 Part J, Item 10: *The Licensee shall obtain representative samples of the water column below any ice where required under Part F, Items 9 and 10. Monitoring shall include, at a minimum, the following Physical Parameters (pH, electrical conductivity, total suspended: solids), Major Ions (Calcium, chloride, magnesium, potassium, sodium, sulphate), Total Metals (Aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, titanium, uranium, vanadium and zinc).*

And

As required by NWB Water License 2BB-MEA1828 Part J, Item 11: *The Licensee shall establish baseline water quality conditions prior to drilling within thirty-one (31) metres of the ordinary High Water Mark as per Part F, Items 2 and 3. Monitoring shall include the following: Physical Parameters (pH, electrical conductivity, total suspended solids, turbidity). Major Ions (Calcium, chloride, magnesium, potassium, sodium, sulphate) Total Metals (Aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, tin, titanium, uranium, vanadium and zinc)*

And

As required by NWB Water License 2BB-MEA1828 Part J, Item 12: ***The Licensee shall, where turbidity is observed in adjacent waters or waters immediately downstream of any drilling program conducted within thirty-one (31) metres of the ordinary High Water Mark of any water body, during summer following any such drilling program as per Part F, Item 5 (c), conduct additional monitoring of the parameters listed in Part J, Item 10 to determine whether any further mitigation is required.)***

All results related to drilling on ice can be found in Table 8-53. No drillings within 31 m of the above high water marks were conducted in 2019.

No turbidity was observed in adjacent water or waters immediately downstream of drilling sites. The drilling waste (cutting) was disposed of at least 31 meters from the water body in a natural depression where direct flow into water body is not possible.

Table 8-52 Whale Tail AP-5 Pond Discharge 2019 Water Quality Monitoring (MEA-4)

Parameter	Max Grab	Max Mean	Sample Date	Annual Average*		Pre-discharge sample	Pre-discharge sample	Pre-discharge sample	Pre-discharge sample	2019-07-12	2019-07-18	2019-07-19	2019-07-22	2019-07-25	2019-07-29	2019-08-01	2019-08-05	2019-08-09	2019-08-26	2019-09-02	2019-09-10	2019-09-11	2019-09-13	2019-09-16	2019-09-20	2019-09-22
			Unit	2018	2019	2019-06-16	2019-06-24	2019-07-01	2019-07-09																	
Field Measured																										
pH	6.0 - 9.5	6.0 - 9.5	pH units	6.90	6.86	7.36	6.61	6.15	6.98	6.61	6.73	6.67	6.54	6.97	6.85	6.4	6.42	6.73	7.37	7.08	6.35	6.85	7.8	6.72	7.11	7.45
Conductivity			uS/cm	-	575.25	-	935.7	867.3	1031	1013	709.1	658.4	566.9	514	366.8	383.6	497.4	628.4	776.6	665.8	610.8	619.7	538.5	387.9	381.2	461.2
Temperature			°C	-	10.62	-	9.97	7.82	14.93	11.8	12.99	11.2	15.49	11.82	11.82	12.67	13.64	13.75	9.93	10.03	6.54	7.78	7.46	7.84	8.39	7.37
Dissolved oxygen			mg/L	-	10.50	-	10.52	11.33	9.92	10.66	10.18	10.35	9.25	10.44	10.5	10	9.55	9.77	10.47	10.68	12.45	11.02	10.72	10.88	10.48	11.02
Turbidity			NTU	-	15.54	-	8.8	21.04	10.24	19.56	17.76	20.51	15.48	24.8	10.71	11.19	24.33	22.38	14.8	21.6	11.7	9.62	8.94	10.9	11	8.84
Conventional Parameters																										
Total dissolved solids	1400	1400	mg/L	501.86	328.88	366	597	463	535	-	-	-	262		217		273		516	429		387		255		292
Total suspended solids	50	25	mg/L	11.43	8.71	22	12	17	18	8	8	6	8	4	11	10	15	7	18	16	6	5	5	6	6	9
Major Ions																										
Chloride	2000	1000	mg/L	273.51	112.50	144	232	185	211	-	-	-	109		78.4		58.9		194	150		121		86.7		102
Nutrients and Chlorophyll a																										
Total ammonia as NH4	32	16	mg/L	2.57	1.074	1.38	1.84	1.11	0.95	-	-	-	0.45		0.32		0.84		2.07	1.71		1.42		0.76		1.02
General Organics																										
Total oil and grease	No visible sheen	No visible sheen	mg/L	1.00	1.13	1	1	< 1	1	-	-	-	<1		2		1		1	<1		1		< 1		< 1
Total Metals																										
Arsenic	1	0.5	mg/L	0.0035	0.00481	0.004	0.0036	0.0028	0.0026	-	-	-	0.0035		0.0034		0.0058		0.0059	0.0044		0.0042		0.0058		0.0055
Copper	0.3	0.6	mg/L	0.0042	0.00200	0.0026	0.0016	0.001	0.0021	-	-	-	0.0028		0.0026		0.0024		0.0015	0.0025		0.0017		0.0013		0.0012
Lead	0.4	0.2	mg/L	0.0012	0.00033	0.0041	< 0.0003	< 0.0003	< 0.0003	-	-	-	<0.0003		<0.0003		<0.0003		<0.0003	0.0005		<0.0003		<0.0003		<0.0003
Nickel	1	0.5	mg/L	0.019	0.00906	0.01	0.0118	0.0113	0.0157	-	-	-	0.0079		0.0066		0.0102		0.0137	0.0108		0.0109		0.0062		0.0062
Zinc	1	0.5	mg/L	0.0036	0.00388	0.006	< 0.001	0.001	0.007	-	-	-	0.007		0.01		0.003		<0.001	0.003		<0.001		0.001		0.005

**Average do not include pre-discharge results*

Table 8-53 Whale Tail Exploration 2019 Drillings Water Quality Monitoring

Parameter	Sample Date	2019-05-07	2019-05-09	2019-05-17
	Sample Name	ST-WT-DRILL-M219		ST-WT-DRILL-M199
	Unit	Before	During	After
Total suspended solids	mg/L	< 1	1	< 1
Chloride	mg/L	25.8	27.7	28.3
Sulphate	mg/L	12.4	10	8.5
Aluminum	mg/L	< 0.005	< 0.005	< 0.005
Antimony	mg/L	< 0.0001	< 0.0001	0.0022
Arsenic	mg/L	< 0.0005	< 0.0005	< 0.0005
Barium	mg/L	0.0382	0.0351	0.0299
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	< 0.00002	< 0.00002	< 0.00002
Calcium	mg/L	18.7	18.3	16.7
Chromium	mg/L	0.0007	0.0015	< 0.0006
Copper	mg/L	< 0.0005	0.0194	0.0006
Iron	mg/L	0.03	0.23	< 0.01
Lead	mg/L	< 0.0003	0.002	< 0.0003
Lithium	mg/L	< 0.005	< 0.005	< 0.005
Magnesium	mg/L	4.69	4.53	3.26
Manganese	mg/L	0.0057	0.0076	0.0038
Mercury	mg/L	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	0.005	0.0055	0.0032
Potassium	mg/L	0.69	2.34	1.93
Selenium	mg/L	< 0.0005	< 0.0005	0.0008
Silver	mg/L	< 0.0001	< 0.0001	< 0.0001
Sodium	mg/L	2.2	3.08	1.93
Strontium	mg/kg	0.129	0.121	0.106
Tin	mg/kg	< 0.001	< 0.001	< 0.001
Titanium	mg/L	< 0.01	< 0.01	< 0.01
Uranium	mg/L	< 0.001	< 0.001	< 0.001
Vanadium	mg/L	0.0127	0.0267	< 0.0005
Zinc	mg/L	0.001	0.009	< 0.001

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 2019, water was pumped from the SMP to the South Cell TSF in July 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 8-55, 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 2019 was 29,913 m^3. In addition, 422 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 8-54.

Table 8-54 Meadowbank 2019 Sewage Treatment Plant Waste Volume

Sewage volume from STP 2019			
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 TDL*	*Sewage sludge removed from STP*
January	2,631	3,662	71.40
February	2,467	3,446	40.80
March	2,720	3,821	25.02
April	2,450	3,524	27.20
May	2,720	3,995	44.20
June	2,616	3,789	40.80
July	2,395	3,625	19.72
August	2,391	3,602	50.32
September	2,304	3,488	17.00
October	2,380	3,578	24.14
November	2,438	3,486	34.00
December	2,401	3,523	27.20
Total	**29,913**	**43,539**	**422**

Note:
Daily the sewage truck picks up greywater from TCG and then grease from kitchen and takes that to the Tailings Pond
After that the sewage truck picks up sewage from various locations around the mine and takes that to the STP

Table 8-55 Meadowbank 2019 Sewage Treatment Plan (STP-IN, STP-SEP and LJ-MIX)

STP-IN	Sample Date	2019-01-07	2019-02-04	2019-03-04	2019-04-01	2019-05-08	2019-06-04	2019-07-01	2019-08-05	2019-09-02	2019-10-08	2019-11-04	2019-12-17
Parameter	**Unit**												
pH, field measured	pH units	7.7	8.3	8.1	8.1	9.3	8.1	7.8	6.9	7.4	6.8	7.1	8.0
Total Suspended Solids	mg/L	< 1	188	80	131	28	106	75	517	125	22	102	81
Total ammonia as NH4	mg/L	91.8	67.6	60.8	102	9.31	102	77.8	75.6	75.2	81.7	116	79.2
Un-Ionized Ammonia, calculated	mg/L	1.11	0.7	0.42	2.49	0.54	0.36	0.54	0.68	< 0.01	0.67	5.65	1.23
Kjeldahl Nitrogen	mg/L	109	89.3	68.1	131	94.7	106	86.3	85.5	92.9	101	135	100
Nitrate	mg/L	0.04	0.04	0.05	0.04	0.09	0.02	0.03	0.03	0.03	0.08	18.1	0.29
Nitrite	mg/L	0.03	0.02	0.02	0.02	< 0.01	0.05	0.02	0.01	0.03	0.01	0.09	0.33
Phosphorus	mg/L	7.79	7.75	-	11.4	2.09	10.4	8.37	7.7	7.44	9.41	8.94	-
Biochemical Oxygen Demand	mg/L	256	254	200	295	91	279	93	188	258	252	111	238
Chemical Oxygen Demand	mg/L	596	510	421	559	393	545	233	429	551	502	398	610
Atypical colonies	CFU/100mL	4 200 000	>200 000 000	44 000 000	22 000 000	-	35 000 000	136 000 000	5 000 000	66 000 000	35 000 000	41 000 000	107 000 000
Fecal Coliform	CFU/100mL	4 000 000	6 000 000	5 600 000	4 400 000	-	9 000 000	2 900 000	3 900 000	14 000 000	3 300 000	11 000 000	5 500 000
Total Coliform	CFU/100mL	>80 000 000	***	>80 000 000	61 000 000	-	44 000 000	10 000 000	21 000 000	40 000 000	36 000 000	44 000 000	57 000 000

****The great number of bacteria restrain distinction of total coliforms and atypical colony*

STP-SEP	Sample Date	2019-01-07	2019-02-04	2019-03-04	2019-04-01	2019-05-08	2019-06-04	2019-07-01	2019-08-05	2019-09-02	2019-10-08	2019-11-04	2019-12-17
Parameter	**Unit**												
pH, field measured	pH units	7.2	7.4	7.3	6.8	7.1	7.3	7.4	7.1	7.2	7.0	7.1	7.5
Total Suspended Solids	mg/L	< 1	11	15	12	8	18	12	23	15	7	12	21
Total ammonia as NH4	mg/L	25.7	29.4	24.9	36.2	23.8	34.2	27.4	63.1	22.4	33.9	62.2	50.1
Un-Ionized Ammonia, calculated	mg/L	0.24	0.31	0.2	0.69	0.15	< 0.01	0.22	0.87	0.27	0.33	1.06	0.63
Kjeldahl Nitrogen	mg/L	15.6	33.4	25.9	45.6	19.1	35.9	32.8	64.4	25.2	40.8	72.6	57.2
Nitrate	mg/L	7.2	7.24	5.88	6.08	14	5.23	6.69	2.77	6.11	8.81	6.41	2.65
Nitrite	mg/L	0.94	1.18	1.13	1.5	1.29	1	0.96	0.67	1.72	1.19	1.05	1.15
Biochemical Oxygen Demand	mg/L	11	11	13	12	5	17	13	16	11	7	10	13
Chemical Oxygen Demand	mg/L	78	77	69	78	67	79	82	108	65	56	78	68
Atypical colonies	CFU/100mL	500	5 800	3 300	1 060 000	-	89 000	> 2 000 000	> 2 000 000	730 000	160 000	1 070 000	210 000
Fecal Coliform	CFU/100mL	140	120	40	200	-	140	10	6 000	100	100	170	40
Total Coliform	CFU/100mL	7 700	10 100	7 900	< 10 000	-	5 000	***	***	< 10 000	< 10 000	< 10 000	< 10 000

****The great number of bacteria restrain distinction of total coliforms and atypical colony*

LJ-MIX	Sample Date	2019-01-07	2019-02-04	2019-03-04	2019-04-01	2019-05-08	2019-06-04	2019-07-01	2019-08-05	2019-09-02	2019-10-08	2019-11-04	2019-12-17
Parameter	**Unit**												
pH, field measured	pH units	7.1	7.1	6.8	6.8	7.4	7.0	6.7	6.8	7.2	6.7	7.0	7.0
Total Suspended Solids	mg/L	448	8	3	1	7	32	79	21	28	297	36	21
Total ammonia as NH4	mg/L	8.28	11.3	3.63	2.82	24.3	4.05	2.93	47.1	7.87	26.4	32.3	13.2
Un-Ionized Ammonia, calculated	mg/L	0.03	0.07	< 0.01	0.01	0.08	0.61	< 0.01	0.21	< 0.01	0.16	0.12	0.04
Kjeldahl Nitrogen	mg/L	9.75	14.7	4.47	4.57	3.23	5.61	8.08	49.8	13	37.3	73.1	17.4
Nitrate	mg/L	14.8	12	12.2	16.3	20.7	12.4	24.2	10.9	12	8.16	52.4	13.7
Nitrite	mg/L	0.7	0.77	1.05	0.4	0.81	1.13	2.19	1.89	2.02	2.04	2.11	1.64
Biochemical Oxygen Demand	mg/L	2	5	2	2	4	40	28	12	20	19	56	7
Chemical Oxygen Demand	mg/L	56	53	26	54	52	97	77	88	77	72	84	60
Atypical colonies	CFU/100mL	15 000	< 1 000	40 000	5 000	-	< 10 000	280 000	150 000	< 10 000	420 000	240 000	230 000
Fecal Coliform	CFU/100mL	10	2 700	4 500	70	-	4 200	10 000	22 000	18 000	12 000	19 000	3 000
Total Coliform	CFU/100mL	4 400	> 80 000	180 000	5 000	-	90 000	< 10 000	140 000	360 000	110 000	130 000	730 000

****The great number of bacteria restrain distinction of total coliforms and atypical colony*

8.5.4.2 *Whale Tail Site*

The 60 days notice was sent for STP construction on December 21st, 2018 and approved on January 24th, 2019. The Sewage Treatment Plan located in the permanent camp associated with the Water License 2AM-WTP1826 was commissioned on April 12th, 2019. The STP Newterra was moved from the Exploration camp. In 2019, effluent was discharged in the future Whale Tail Attenuation Pond on a daily basis. As per Water License Schedule I Sampling Station ST-WT-11, effluent is to be sample four time per calendar year. To asses the efficiency of the STP, a weekly sample were taken at the STP effluent. There are no applicable license limits. Results are provided in Table 8-57 below.

The total volume of treated sewage discharged in 2019 from the Newterra associated to the permanent camp was 11,268 m^3. In addition, 106 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 8-56.

Table 8-56 Whale Tail Permanent Camp 2019 Newterra Sewage Treatment Plant Waste Volume

Month	Total flow out Newterra Permanent Camp (m^3)	Sludge Removal (m^3)
January	0	0
February	0	0
March	0	0
April	167.41	3.4
May	1086.51	
June	1290.3	0
July	1496.96	0
August	1725.49	8.0
September	1590.61	12.8
October	1864.1	45.6
November	2045.7	36
December	2144.9	65
Total	**11,267.08**	**105.8**

Table 8-57 Whale Tail 2019 Sewage Treatment Plan (ST-WT-11)

Parameter	Annual Average	Sample Date	2019-05-01	2019-05-07	2019-05-14	2019-05-21	2019-05-27	2019-06-03	2019-06-10	2019-06-17	2019-06-24	2019-07-01	2019-07-09	2019-07-16	2019-07-22	2019-07-30	2019-08-05	2019-08-12	2019-08-19	2019-08-27
	2019	Unit																		
Conventional Parameters																				
pH	6.88	-	7.00	6.80	7.17	7.00	6.70	7.19	6.10	6.94	6.28	7.10	6.60	7.34	7.09	7.23	7.22	7.00	7.10	6.80
Turbidity	2.57	NTU	0.77	1.64	1.07	0.26	0.23	0.53	0.45	0.9	1.21	0.41	0.82	0.83	4.69	11.6	2.95	0.84	2.58	2.44
Hardness	59.57	mg CaCO3/L	43	27	41	144	34	32	59	41	31	236	34	25	29	35	14	46	45	49
Total alkalinity, as CaCO3	64.94	mg CaCO3/L	29	180	69	42	32	27	5	10	13	29	21	38	24	37	88	64	< 5	30
Total dissolved solids	383.40	mg/L	620	668	485	430	390	216	403	436	385	359	337	305	291	263	286	355	505	273
Total suspended solids	4.49	mg/L	1	1	1	2	< 1	< 1	1	< 1	1	< 1	1	< 1	1	28	8	3	5	3
Major Ions																				
Chloride	69.14	mg/L	49.1	46	56.1	53.3	49.4	47.3	51.8	47	47.3	52.6	53.5	51.3	59.6	61.1	74.2	79.3	74	55.6
Fluoride	0.06	mg/L	0.08	0.07	0.05	0.05	0.06	0.06	0.04	0.07	0.05	0.05	0.06	0.05	0.05	0.07	0.09	0.09	0.1	0.08
Sulphate	45.68	mg/L	51.6	53.4	50.8	37.7	38.3	38.8	30.7	169	31.7	38.3	37.9	34.1	49.4	52.2	32.1	37.1	37.9	34.6
Nutrients and Chlorophyll a																				
Total phosphorus	5.94	mg-P/L	-	7	6.55	7.96	5.88	6.27	8.22	7.11	4.54	6.36	7.42	7.56	5.07	5	6.37	5.06	5.66	5.54
Total orthophosphate	5.71	mg-P/L	-	3.66	6.74	7.13	7.2	6.18	7.92	7.83	4.66	7.01	8.13	6.73	5.31	4.53	6.48	5.31	4.76	4.66
Nitrate	20.48	mg/L	27.6	71.2	64.4	49.9	47.4	37.4	50.3	54.6	34.5	21.2	23.6	10.3	10.3	5	7.42	8.01	9.51	6.99
Nitrite	0.06	mg/L	0.05	0.27	0.02	0.11	0.02	0.04	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.01	0.03	0.06	0.02
Ammoniacal Nitrogen as NH4	0.11	mg/L	0.01	0.04	0.01	0.12	< 0.01	0.05	0.05	0.04	0.01	< 0.01	< 0.01	0.17	0.04	0.05	0.05	0.09	0.11	0.13
Total Metals																				
Aluminum	0.09197	mg/L	< 0.005	0.263	0.055	0.017	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.229	< 0.005	0.027	< 0.005	0.372	< 0.005	0.033	0.109	0.067
Arsenic	0.00339	mg/L	0.0029	0.0016	0.0017	0.0017	0.0008	0.0013	0.0013	0.0055	0.0016	0.0037	0.0011	0.0012	0.0016	0.0021	< 0.0005	0.0018	0.0023	0.0032
Barium	0.00543	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.001	0.0013	< 0.0005	< 0.0005	0.0824	< 0.0005	< 0.0005	< 0.0005	0.0044	0.0028	< 0.0005	0.005	< 0.0005
Cadmium	0.00003	mg/L	< 0.00002	0.00012	< 0.00002	0.00006	< 0.00002	< 0.00002	0.00005	0.00005	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	0.00134	mg/L	< 0.0006	< 0.0006	0.0016	0.001	0.0015	< 0.0006	0.0007	0.0007	< 0.0006	0.0036	< 0.0006	0.0009	< 0.0006	0.0023	0.0007	0.001	0.0011	0.0013
Copper	0.01520	mg/L	0.0188	0.0132	0.0373	0.0138	0.0391	0.0233	0.018	0.0247	0.0288	0.0012	0.0346	0.0103	0.0075	0.0214	0.0006	0.008	0.0212	0.0129
Iron	0.11943	mg/L	0.08	0.11	0.07	0.04	0.04	0.03	0.03	0.04	0.02	0.73	0.03	0.03	< 0.01	0.22	0.04	0.04	0.06	0.05
Lead	0.00048	mg/L	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.001	< 0.0003
Manganese	0.01700	mg/L	< 0.0005	< 0.0005	0.0013	< 0.0005	< 0.0005	< 0.0005	0.0241	0.0011	< 0.0005	0.452	0.0008	< 0.0005	0.0007	0.0068	< 0.0005	0.0015	0.0025	0.0063
Mercury	0.00001	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	< 0.00001
Molybdenum	0.00096	mg/L	0.0021	0.0009	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0032	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0013	0.0013	0.0008
Nickel	0.00571	mg/L	0.0058	0.0046	0.0058	0.0049	0.0041	0.0044	0.0049	0.0043	0.0031	0.0115	0.0052	0.003	0.0031	0.0046	< 0.0005	0.0039	0.0035	0.0053
Selenium	0.00156	mg/L	0.0006	0.002	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0006	< 0.0005	< 0.0005	0.0006	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Silver	0.00010	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Zinc	0.04883	mg/L	0.063	0.026	0.051	0.039	0.07	0.045	0.142	0.064	0.054	< 0.001	0.057	0.03	0.029	0.052	< 0.001	0.027	0.038	0.034

Parameter	Annual Average 2019	Sample Date / Unit	2019-09-02	2019-09-09	2019-09-16	2019-09-23	2019-09-30	2019-10-08	2019-10-15	2019-10-22	2019-10-29	2019-11-04	2019-11-11	2019-11-19	2019-11-25	2019-12-02	2019-12-11	2019-12-16	2019-12-23
Conventional Parameters																			
pH	6.88	-	6.70	6.50	6.50	7.10	6.60	6.87	6.93	6.80	7.00	7.30	7.32	6.80	6.80	7.00	6.67	6.70	6.70
Turbidity	2.57	NTU	3.54	7.17	1.83	13.9	9.66	5.33	1	0.62	3.94	2.19	1.27	0.72	1.57	0.84	0.8	0.85	0.48
Hardness	59.57	mg CaCO3/L	54	46	71	73	96	71	70	71	69	57	67	42	70	64	55	69	75
Total alkalinity, as CaCO3	64.94	mg CaCO3/L	28	36	32	53	17	585	49	48	28	54	17	69	58	82	94	100	120
Total dissolved solids	383.40	mg/L	345	407	344	374	398	390	346	327	346	357	344	400	409	349	382	440	454
Total suspended solids	4.49	mg/L	8	14	4	17	24	3	1	1	9	2	< 1	2	< 1	< 1	1	6	< 1
Major Ions																			
Chloride	69.14	mg/L	68.9	83.1	75.7	92	90.6	80.4	85.6	80.3	92.5	87.6	81.7	82.7	85.7	72.3	75.6	87.8	89
Fluoride	0.06	mg/L	0.05	0.06	0.05	0.08	0.05	0.07	0.06	0.06	0.06	0.07	0.06	0.06	0.06	0.05	0.07	0.07	0.07
Sulphate	45.68	mg/L	46.4	47	47	38.2	39.3	45.6	43.1	43.5	53.5	45.5	39.2	40.8	41.8	42.9	50.8	40.3	38.3
Nutrients and Chlorophyll a																			
Total phosphorus	5.94	mg-P/L	7	6.97	5.65	5.32	7.69	5.31	4.66	6.48	5.72	4.62	3.46	4.57	5.98	5.49	4.65	5.76	4.89
Total orthophosphate	5.71	mg-P/L	5.13	7.18	5.6	5.06	6.13	5.16	2.51	5.96	5.72	4.97	3.82	5.38	5.92	5.51	4.61	5.85	5.53
Nitrate	20.48	mg/L	12.5	10.5	9.29	7.92	15.8	15	12.7	12.9	10	7.07	5.84	9.8	13.3	6.95	9.2	10.8	7.68
Nitrite	0.06	mg/L	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.03	0.05	0.07	0.14	0.06	0.14	0.09	0.19	0.18	0.18
Ammoniacal Nitrogen as NH4	0.11	mg/L	0.07	0.21	0.12	0.35	0.55	0.17	0.12	0.18	0.17	0.12	0.1	0.13	0.14	0.16	0.14	0.2	0.09
Total Metals																			
Aluminum	0.09197	mg/L	0.155	0.215	0.141	0.571	0.289	0.29	< 0.005	0.035	0.109	0.027	0.039	< 0.005	0.031	0.024	0.009	0.028	0.029
Arsenic	0.00339	mg/L	0.0033	0.0049	0.0049	0.0048	0.004	0.0036	0.0039	0.0063	0.0043	0.0052	0.0062	< 0.0005	0.0051	0.0059	0.0066	0.0074	0.0058
Barium	0.00543	mg/L	0.0029	0.0154	0.0041	0.011	0.0143	0.0089	0.0013	0.0093	0.0058	0.0031	0.0018	< 0.0005	< 0.0005	0.0027	< 0.0005	0.0022	0.0028
Cadmium	0.00003	mg/L	< 0.00002	0.00006	< 0.00002	0.00002	0.00003	< 0.00002	0.00003	< 0.00002	< 0.00002	0.00003	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	0.00134	mg/L	0.0026	0.0015	0.0021	0.0041	0.0025	< 0.0006	0.0009	0.0007	0.0018	0.0007	0.001	0.0037	< 0.0006	0.0011	0.001	0.0013	0.0008
Copper	0.01520	mg/L	0.0088	0.0087	0.0155	0.0152	0.0229	0.01	0.0235	0.0078	0.01	0.0055	0.0131	0.0058	0.0118	0.0053	0.0093	0.01	0.0141
Iron	0.11943	mg/L	0.1	0.16	0.14	0.38	0.24	0.27	0.04	0.04	0.16	< 0.01	< 0.01	0.75	0.06	0.05	< 0.01	0.08	< 0.01
Lead	0.00048	mg/L	< 0.0003	< 0.0003	< 0.0003	0.0006	< 0.0003	0.00053	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0003	< 0.0003	0.0055	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Manganese	0.01700	mg/L	0.0053	0.0045	0.0073	0.0165	0.0187	0.0077	0.0046	0.0081	0.0069	0.0015	0.003	< 0.0005	0.0024	0.0048	0.0009	< 0.0005	0.0006
Mercury	0.00001	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	0.00096	mg/L	< 0.0005	0.0016	0.0016	0.0014	< 0.0005	0.0014	0.0009	0.0009	0.001	0.0012	0.001	< 0.0005	0.0009	0.0008	0.0013	0.0014	0.001
Nickel	0.00571	mg/L	0.0055	0.0067	0.009	0.0081	0.0086	0.0081	0.0068	0.0073	0.0077	0.0056	0.0063	0.0049	0.0066	0.0077	0.0053	0.0053	0.0077
Selenium	0.00156	mg/L	0.0011	0.0009	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0348	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Silver	0.00010	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Zinc	0.04883	mg/L	0.044	0.083	0.069	0.073	0.094	0.052	0.043	0.043	0.029	0.034	0.052	< 0.001	0.096	0.042	0.039	0.036	0.056

8.5.4.3 *Exploration Whale Tail Site*

As discussed in Section 8.5.4.3 above, in April 2018, the Bionest wastewater treatment plan (STP) was replaced by a Newterra system (which became the wastewater treatment plan for the permanent camp in April 2019). With the ongoing increase for the project and in order to accommodate more people, in January 2019 the Bionest was restarted and was operating jointly with the Newterra wastewater treatment plan at the exploration camp. In April 2019, the Newterra system were dismantled from the exploration camp and installed at the permanent camp. With the upcoming closure of the exploration camp, the Bionest system was permanently stopped in November 3rd, 2019 and the sewage produced by the exploration camp is transferred by truck to the Newterra to be treated.

Effluent from the Sewage Treatment Plan (STP) has been discharged to the Whale Tail Lake North Basin, fishless since 2018, and monitoring has been conducted as per the Water License 2BB-MEA1828 Part D Item 10. According to Water Licence 2BB-MEA1828: Part J Item 2, sample results (MEA-2) are available in Table.8-59.

The following exceedances were observed in 2019, all related to Fecal coliform exceedance:

- A Fecal coliform exceedance occurred on January 15th, 2019 and was reported to the Government of Nunavut Spill Line. The sample had a concentration of 4,000 CFU/100 ml (Water licence 2BB-MEA1318 limit:1,000 CFU/100ml)

- A Fecal coliform exceedance occurred on February 11th, 2019 and was reported to the Government of Nunavut Spill Line. The sample had a concentration of 42,000 CFU/100 ml (Water licence 2BB-MEA1318 limit:1,000 CFU/100ml)

- A Fecal coliform exceedance occurred on March 4th, 2019 and was reported to the Government of Nunavut Spill Line. The sample had a concentration of 12,000 CFU/100 ml (Water licence 2BB-MEA1318 limit:1,000 CFU/100ml)

- A Fecal coliform exceedance occurred on August 12th, 2019 and was reported to the Government of Nunavut Spill Line. The sample had a concentration of 9,000 CFU/100 ml (Water licence 2BB-MEA1318 limit:1,000 CFU/100ml)

- A Fecal coliform exceedance occurred on August 19th, 2019 and was reported to the Government of Nunavut Spill Line. The sample had a concentration of 2,000 CFU/100 ml (Water licence 2BB-MEA1318 limit:1,000 CFU/100ml)

- A Total Oil and Grease exceedance occurred on September 16th, 2019. The sample had a concentration of 6 mg/L (Water licence 2BB-MEA1318 limit:5 mg/L)

Corrective measures put in place included:

- Remind technician to make sure to eliminate the possibility of cross contamination during the sampling

- Preventative maintenance was done on the unit including cleaning and disinfecting all sampling lines, changing UV lights on Newterra system and installed UV light on Bionest system

- Reminder to technicians and operators to flush the lines prior to sampling

The total volume of treated sewage discharged in 2019 was 7,994.33 m^3. Monthly discharge summary is presented in Table 8-58 as required by 2BB-MEA1828 Part B Item 6.

Table 8-58 Whale Tail Exploration Camp 2019 Sewage Treatment Plant Waste Volume

Month	Total flow out Newterra Exploration Camp (m^3)	Total flow out Bionest Exploration Camp(m^3)
January	1337.59	22.53
February	1447.04	405.95
March	972.13	628.85
April	0	821.39
May	0	797.13
June	0	707.55
July	0	350.18
August	0	121.76
September	0	172.06
October	0	198.79
November	0	11.38
December	0	0
Total	**3,756.76**	**4,237.57**

Table 8-59 Whale Tail Exploration Camp 2019 Sewage Treatment Plan (MEA-2)

Parameter	Max Grab	Sample Date / Unit	2019-01-02	2019-01-07	2019-01-15	2019-01-21	2019-01-29	2019-02-04	2019-02-11	2019-02-25	2019-03-04	2019-03-12	2019-03-25	2019-04-09	2019-04-15	2019-04-22	2019-04-29	2019-05-07	2019-05-14	2019-05-21	2019-05-27	2019-06-03
Field Measured																						
pH	6 - 9.5	-	7.51	7.30	7.27	7.21	7.38	7.33	7.41	7.72	7.51	7.26	7.80	-	-	7.70	7.79	7.63	7.80	7.40	7.58	7.51
Conventional Parameters																						
Total suspended solids	100	mg/L	< 1	3	58	73	1	2	4	1	12	3	22	2	33	1	51	15	6	14	9	17
Nutrients and Chlorophyll a																						
Biochemical oxygen demand	80	mg/L	< 1	2	4	3	1	1	4	1	6	< 1	8	42	<1	1	7	1	3	8	< 1	< 1
General Organics																						
Total oil and grease	5	mg/L	1	< 1	< 1	-	< 1	2	< 1	< 1	< 1	< 1	1	< 1	< 1	< 1	2	2	1	< 1	1	3
Toxicity																						
Fecal Coliform	1,000	CFU/100mL	45	23	4,000	190	39	270	42,000	74	12,000	490	< 10	< 2	< 10	< 10	< 10	< 2	< 2	< 10	< 2	< 2

Parameter	Max Grab	Sample Date / Unit	2019-06-10	2019-06-17	2019-06-24	2019-07-01	2019-07-09	2019-07-16	2019-07-22	2019-07-30	2019-08-05	2019-08-12	2019-08-19	2019-08-27	2019-09-02	2019-09-09	2019-09-16	2019-09-23	2019-09-30	2019-10-08	2019-10-15	2019-10-22
Field Measured																						
pH	6 - 9.5	-	7.34	7.45	7.71	6.90	7.06	7.49	7.52	6.80	6.90	7.20	6.70	6.60	8.40	7.50	7.40	7.90	6.90	7.30	7.96	6.70
Conventional Parameters																						
Total suspended solids	100	mg/L	13	10	10	14	5	12	8	40	54	8	5	6	6	5	6	7	13	11	31	24
Nutrients and Chlorophyll a																						
Biochemical oxygen demand	80	mg/L	< 1	1	< 1	8	5	< 1	5	< 1	< 1	5	5	1	< 1	< 1	< 1	< 1	< 1	7	< 1	< 1
General Organics																						
Total oil and grease	5	mg/L	2	1	3	1	1	1	< 1	2	< 1	2	2	1	1	< 1	6	< 1	3	1	2	2
Toxicity																						
Fecal Coliform	1,000	CFU/100mL	< 10	< 2	< 2	100	< 2	< 2	< 2	< 10	< 2	9,000	2,000	< 2	< 2	< 2	< 2	< 2	< 2	727	< 2	< 2

Grey highlighted cell refer to regulatory limits exceeded

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 10th, 2019 and September 12th, 2019. Water from the Meadowbank tank farm will be directed South of the tank farm to get the Meadowbank Stormwater Management Pond and will not reach any receiving environment. Results are presented in Table 8-60 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 8 of the 2AM-MEA1526 Water License. Notification to the CIRNAC Inspector, made in accordance with Part F, Item 12 of NWB License 2AM-MEA1526 to empty the secondary containment area, was sent June 10th and September 10th, 2019. As a result, 250 m^3 of water was discharged in June and 200 m^3 in September to the Stormwater Management Pond via a temporary pipe from the secondary containment area of the Meadowbank bulk fuel storage tank.

Table 8-60 Meadowbank 2019 Bulk Fuel Storage Facility Water Quality Monitoring (ST-37)

Parameter	MAX GRAB	MAX MEAN	Sample Date / Unit	2019-06-10	2019-09-12
pH, field measured	6.0 - 9.5	6.0 - 9.5	pH units	7.74	8.17
Total Suspended Solids	30	15	mg/L	4	2
Ammonia	6.0	6.0	mg/L	< 0.01	< 0.01
Oil & Grease	5 and no visible sheen	5 and no visible sheen	mg/L	1	1
Arsenic	1	0.5	mg/L	0.0024	0.0091
Copper	0.6	0.3	mg/L	0.0048	0.0032
Lead	0.1	0.1	mg/L	< 0.0003	< 0.0003
Nickel	1	0.5	mg/L	0.0027	0.0017
Zinc	1	0.5	mg/L	< 0.001	< 0.001
Benzene	0.37	0.37	mg/L	< 0.0002	< 0.0003
Ethylbenzene	0.09	0.09	mg/L	< 0.0001	< 0.0003
Toluene	0.002	0.002	mg/L	< 0.001	< 0.0003

8.5.5.2 *Baker Lake Marshalling Facilities*

Water collected in the secondary containment areas of the main (Tanks 1 – 4; ST-40.1) and additional (Tanks 5 - 6; ST-40.2) diesel bulk fuel storage facilities and Jet A secondary tank (ST-38) at the Baker Lake Marshalling Facility were sampled on June 9th, 2019. Notification to the CIRNAC Inspector, made in accordance with Part F, Item 12 of NWB License 2AM-MEA1526 to empty secondary containment areas, was sent on June 5th, 2019 and September 10th, 2019 for ST-40.1. and ST-40.2. No samples were taken following the notification sent to CIRNAC Inspector in September as the water froze before the sampling occurred. Approximately 7,170 m^3 of water was discharged from secondary containment Tank 1 to 4 (ST-40.2) , 2,830 m^3 from secondary containment Tank 5-6 (ST-40.1) and 315 m^3 from the Jet-A secondary containment to the tundra in June. The use of silt bags to transfer water were not necessary in 2019 as the results were compliant with the discharge limits.

The locations of these sampling stations (ST-40.1 and ST-40.2) are illustrated on Figure 6 and results are presented in Table 8-61.

As part of the Core Receiving Environment Monitoring Program (CREMP), water quality samples are collected at stations on Baker Lake during the open water season. Four monitoring stations are sampled; one at the Baker Lake community barge dock, one at the Baker Lake marshalling area, and two at upstream reference locations. For more details, please refer to the report entitled ‘'Core Receiving Environment Monitoring Program 2019" prepared for Agnico by Azimuth Consulting Group, attached as Appendix 35. The results indicate no effects from mine related activities.

Table 8-61 Baker Lake 2019 Bulk Fuel Storage Facility Water Quality Monitoring (ST-40.1, ST-40.2, ST-38)

Parameter	MAX GRAB	MAX MEAN	Sample Date	2019-06-09	2019-06-09	2019-06-09
			Location	ST-38	ST-40.1	ST-40.2
			Unit			
pH, field measured	6.0 - 9.5	6.0 - 9.5	pH units	7.23	7.55	7.72
Total Suspended Solids	30	15	mg/L	9	10	8
Ammonia	6.0	6.0	mg/L	0.01	0.01	0.02
Oil & Grease	5 and no visible sheen	5 and no visible sheen	mg/L	1	1	2
Arsenic	1	0.5	mg/L	< 0.0005	< 0.0005	< 0.0005
Copper	0.6	0.3	mg/L	0.0015	0.0059	0.0037
Lead	0.1	0.1	mg/L	< 0.0003	< 0.0003	< 0.0003
Nickel	1	0.5	mg/L	< 0.0005	0.0007	< 0.0005
Zinc	1	0.5	mg/L	0.015	< 0.001	0.081
Benzene	0.37	0.37	mg/L	< 0.0002	< 0.0002	< 0.0002
Ethylbenzene	0.09	0.09	mg/L	< 0.0001	< 0.0001	< 0.0001
Toluene	0.002	0.002	mg/L	< 0.001	< 0.001	< 0.001

8.5.5.3 *Whale Tail Site*

A new location was proposed in 2019 regarding water accumulated in the secondary containment associated with the power plant fuel tanks at Whale Tail. Agnico notified CIRNAC inspector on June 13th, as per Water License 2AM-WTP1826 Part I Item 7, of the intent to start sampling at one new monitoring station (ST-WT-16) and discharge water from there if water quality is below the regulatory limit stipulated by the current Water License.

On June 11th, 2019, water was collected in the secondary containment areas of the main Whale Tail 1.5 ML (ST-WT-12) and secondary containment area of the power plant fuel tanks (ST-WT-16). Notification to the CIRNAC Inspector, made in accordance with Part F, Item 12 of NWB License 2AM-WTP1826 to empty secondary containment areas, was sent on June 13th, 2019. Approximately 54.43 m^3 of water was discharged from secondary containment ST-WT-12 and 35.18 m^3 from ST-WT-16 to the land at the end of June. Agnico also sent notification to CIRNAC Inspector as per Part F, Item 12 on August 16th (ST-WT-16) and September 10th (ST-WT-12). During the second discharge, approximately 60.31m^3 of water was discharged from secondary containment ST-WT-12 and 38.07 m^3 from ST-WT-16.

The locations of these sampling stations (ST-WT-12 and ST-WT-16) are illustrated on Figure 4 and results are presented in Table 8-62.

Table 8-62 Whale Tail 2019 Bulk Fuel Storage Facility Water Quality Monitoring (ST-WT-12, ST-WT-16)

Parameter	Max Monthly	Max Grab	Sample Date	ST-WT-12	ST-WT-12	ST-WT-12	ST-WT-16
			Unit	2019-06-11	2019-09-15	2019-06-11	2019-08-25
Field Measured							
pH	6.0 - 9.5	6.0 - 9.5	-	6.42	8.04	7.07	7.67
Conventional Parameters							
Total suspended solids	30	15	mg/L	13	13	11	2
Nutrients and Chlorophyll a							
Total ammonia as NH4	6.0	6.0	mg/L	< 0.01	0.02	< 0.01	< 0.01
General Organics							
Total oil and grease	5 and no visible sheen	5 and no visible sheen	mg/L	2	<1	1	< 1
Benzene	370	370	µg/L	< 0.2	< 0.3	<0.2	<1
Ethylbenzene	90	90	µg/L	< 0.1	< 0.3	0.23	<
Toluene	2	2	µg/L	< 1	< 0.3	<1	<1
Total Metals							
Arsenic	0.5	1	mg/L	0.0072	0.0548	0.004	0.0283
Copper	0.3	0.6	mg/L	0.0021	0.0018	0.0028	0.0013
Lead	0.1	0.1	mg/L	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Nickel	0.5	1	mg/L	0.0079	0.0248	0.0061	0.0037
Zinc	0.5	1	mg/L	< 0.001	0.002	0.075	< 0.001

8.5.5.4 *Exploration Whale Tail Site*

There were no samples associated with tank farm under 2BB-MEA1828 in 2019.

8.5.6 All Weather Access Road (AWAR)/ 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 Golder Associates in 2019. This annual inspection is a requirement of the Water License. The findings are presented in the report entitled '2019 Annual Geotechnical Inspection, Meadowbank Gold Mine, Nunavut', attached in Appendix 9. Agnico responses to the recommendations from the inspection are also included in Appendix 15.

* TSM- Biodiversity and Conservation Management

In relation to Fisheries and Oceans Canada (DFO) Authorizations NU-03-0190, NU-03-0191.3, NU-03-0191.4, NU-08-0013 and NU-14-1046 Agnico 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 (HCMP), monitoring of compensation features currently occurs every 2 years. Monitoring was conducted in 2019 for the constructed spawning pad, located at stream crossing R02 along the all-weather access road. The constructed spawning pads were visually confirmed to be stable as designed. The next monitoring is planned for the summer of 2021. Complete details can be found in the 2019 HCMP report found at Appendix 40.

Pre-freshet and freshet inspections were conducted at crossings along the AWAR in 2019. These inspections are conducted to document the presence/absence of flow, erosional concerns and turbidity plumes. A total of thirteen (13) inspections were conducted between May 17th and July 26th, 2019 (5 in May, 5 in July and 3 in July). No flow was observed during the first inspection conducted on May 17th, 2019. On June 4th, 2019, in most of the crossings flow was observed, but no erosional concern or visual turbidity plumes were observed.

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 2019, no visual turbidity plumes or erosion was 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 by SNC-Lavalin in 2019. This annual inspection is a requirement of the Water License. The findings are presented in the report entitled 'Whale Tail Project 2019 Annual Geotechnical Inspection', attached in Appendix 10. Agnico responses to the recommendations from the inspection are also included in Appendix 16.

Pre-freshet and freshet inspections were conducted at crossings along the Whale Tail Haul Road, eskers and quarries in 2019. 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. A freshet leader was hired in 2019 and was only dedicated, on a daily basis, to the inspection of Whale Tail Haul Road including the esker, quarries, culvert and bridges. If needed, mitigation measures, as straw boom or turbidity barrier, were put in place as prevention measures. No issues with runoff water inside the eskers/quarries, culvert or bridge to any waterbodies were noted in 2019. Refer to Section 8.5.3.2.11 for more details.

Weekly inspections are also conducted along the Whale Tail Haul Road and eskers/quarries on a year round basis. During the freshet and open water season, any visual turbidity plumes or erosion along the road, culverts, bridge or eskers/quarries are documented by Environmental Technicians. In 2019, no visual turbidity plumes or erosion was observed.

8.5.6.3 *Exploration Whale Tail Site*

As required by NWB Water License 2BB-MEA1828 Part J, Item 13: ***The Licensee shall monitor runoff and/or discharge from the quarry sites to receiving environment, during blasting activities, during periods of flow and following significant precipitation events, on a monthly basis, for the following parameters:***

And

As required by NWB Water License 2BB-MEA1828 Part J, Item 15: ***The Licensee shall implement a water crossings visual inspection and maintenance program prior to, during spring freshet and after heavy rainfall events to identify issues related to watercourse crossings structural integrity and hydraulic function***

And

As required by NWB Water License 2BB-MEA1828 Part J, Item 14: ***The Licensee shall, during periods of flow and just after a major rainfall event, conduct water quality testing immediately upstream and downstream of the water crossings, any significant water seeps in contact with the road and any flows originating from borrow pits or rock quarries on a monthly basis prior to construction, during the construction and upon completion for the parameters listed under Part J, Item 11.***

In 2019, no runoff from quarry on site to the receiving environment were observed. No issue related to watercourse crossing's structural integrity or hydraulic function was seen in 2019.

No monitoring as per Part J, Item 11 was required in 2019 under 2BB-MEA1828 Water License.

Inspection during freshet is included in the Freshet Action Plan, revised on an annual basis and provided as an appendix of the Water Management Plan.

Furthermore, inspection on water crossing is also part of the weekly inspection implemented by the Environment Department.

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-MEA1526 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-WTP1826 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) 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.

All chemical analyses for Meadowbank and Whale Tail Sites were performed by H2Lab in Val d'Or, Quebec, an accredited facility. All data from H2Lab 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.

All toxicity tests were performed by Maxxam in Québec or Aquatox in Ontario, and sublethal toxicity by Aquatox in Ontario. 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.

Field blanks are laboratory bottles filled with deionized water in the field, and then treated as a normal sample. They are used to identify errors or contamination in sample collection and analysis. Trip blank are laboratory pre-filed bottles with DI water carried to the sampling location and are left unopened. Duplicate field water quality samples are collected simultaneously in the field and used to assess sampling variability and sample homogeneity.

The QAQC Plan was revised in March 2020 and the new version 5 is submitted as part of the 2019 Annual Report (Appendix 59)

8.5.7.1 *Meadowbank Site*

The following presents the percentage of duplicate and field samples collected from each of the monitoring programs:

- MDMER and EEM monitoring programs:9 duplicate samples, 10 field blanks and 6 trip blanks were collected from a total of 29 samples, representing 31.03 %;

- STP monitoring program: 7 duplicate samples and 1 trip blank were collected from a total of 36 samples, representing 19.4%;

- Surface water monitoring programs: 31 duplicate samples, 25 field blanks and 15 trip blanks were collected from a total of 109 samples, representing 28.4%; and

- Bulk fuel storage facilities monitoring program: 4 duplicate and 4 field blanks samples were collected from a total of 5 samples, representing 80.0%.

This represents approximately 33.1% of the samples collected, which is higher than the QA/QC duplicate program objective of 10%.

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 8-63 to 8-87 for the MDMER and EEM, Surface Water, STP and Bulk Fuel Storage Facility monitoring programs, respectively. The following is a brief summary of the QA/QC results, per sampling program:

- MDMER and EEM (Tables 8-63 and 8-64): All the duplicate samples collected were considered as having high analytical precision.
- Surface Water (Tables 8-65 – 8-85): All QAQC sampling events conducted within the surface water quality program are rated as having high analytical precision except for 7 samples having a medium analytical precision between 10% and 18.52%.
- STP (Table 8-86): Analytical precision is rated high for all sampling events except for 2 sampling events having a medium analytical precision between 14.29% and 16.67% and 2 sampling event having a low analytical precision between 33.33% and 50%. However, as the number of parameters analysed is low, one sample with notable variation between field and duplicate samples will trigger a medium or low analytical precision.
- Bulk Fuel Storage Facility (Table 8-87): Analytical precision is rated high for the duplicate sampling event conducted at the Bulk Storage Facility.

The QA/QC plan was followed and samples were collected by qualified technicians. Given the high number of samples collected in 2019, 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 2019. Agnico 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 datasheet are kept for future reference, if needed.

QA/QC methods and results for specific field programs are discussed separately in their respective reports; these field programs are presented in the Appendices listed below:

- Appendix 35: *Core Receiving Environment Monitoring Program 2019* – Sections 3;

- Appendix 46: *2019 Groundwater Report* – Sections 2.3 and 3.1;
- Appendix 39: *Air Quality and Dustfall Monitoring Report 2019*– Section 4.4.

Table 8-63 Meadowbank 2019 MDMER QAQC (ST-MMER-3)

Parameter	Sample Date		2019-03-18					2019-11-18					2019-12-09			2019-12-16				
	Unit	MDL	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Original	Trip Blank	Field Blank	Duplicate	Original	RPD
Total suspended solids	mg/L	1	1	2	4	3	**28.57**	1	1	1	1	0.00	1	1	1	1	1	1	4	**120.00**
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.003	**100.00**	0.001	0.001	0.001	0.003	**100.00**	-	-	-	0.001	0.001	0.001	0.001	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0006	0.0006	0.00	0.0014	0.0009	0.002	0.0019	5.13	-	-	-	0.0005	0.0007	0.0006	0.0017	**95.65**
Copper	mg/L	0.0005	1.394	0.038	0.0008	0.001	**22.22**	0.0005	0.0005	0.0011	0.001	9.52	-	-	-	0.0005	0.0005	0.0016	0.0015	6.45
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.0003	0.00	-	-	-	0.0003	0.0003	0.0003	0.0003	0.00
Nickel	mg/L	0.0005	0.0824	0.0035	0.0005	0.0005	0.00	0.0005	0.0005	0.0009	0.0006	**40.00**	-	-	-	0.0005	0.0005	0.0005	0.0005	0.00
Zinc	mg/L	0.001	2.41	0.09	0.001	0.001	0.00	0.001	0.002	0.003	0.002	**40.00**	-	-	-	0.001	0.001	0.005	0.004	**22.22**
Radium-226	Bq/l	0.002	0.002	0.002	0.002	0.002	0.00	0.006	0.006	0.007	0.009	**25.00**	-	-	-	0.002	0.002	0.002	0.002	0.00
% Exceedance*							0%					0%								0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-64 Meadowbank 2019 EEM QAQC (ST-MMER-3-EEM, ST-MMER-3-EEM-SPLE, ST-MMER-1-TPS)

Water Quality Monitoring Effluent Characterization (ST-MMER-3-EEM)											
Parameter	Sample Date		2019-03-18				2019-11-25				
	Unit	MDL	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters											
Hardness	mg CaCO3/L	1	1	33	36	8.70	1	1	32	29	9.84
Total alkalinity, as CaCO3	mg CaCO3/L	2	6	40	39	2.53	5	5	23	23	0.00
Major Ions											
Chloride	mg/L	0.5	0.5	0.5	1.5	**100.00**	0.5	0.5	0.7	0.8	13.33
Sulphate	mg/L	0.6	0.6	11.7	12.4	5.81	0.6	0.6	8.8	9.7	9.73
Nutrients and Chlorophyll a											
Nitrate	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.05	0.06	18.18
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00
Ammonia	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00
Total Metals											
Aluminum	mg/L	0.005	0.005	0.017	0.031	**58.33**	0.005	0.005	0.018	0.02	10.53
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00	0.00002	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0008	0.0006	0.0006	0.00	0.0006	0.0006	0.001	0.0006	**50.00**
Cobalt	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.0005	0.00
Iron	mg/L	0.01	0.02	0.03	0.04	**28.57**	0.04	0.05	0.06	0.07	15.38
Manganese	mg/L	0.0005	0.0005	0.0005	0.0009	**57.14**	0.0005	0.0005	0.0005	0.0005	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.0005	0.00
Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.0005	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.0002	0.00
Uranium	mg/L	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.001	0.00
% Exceedances*						0%					0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Water Quality Monitoring Exposure Area Second Portage Lake (ST-MMER-3-EEM-SPLE)											
Parameter	Sample Date		2019-03-12				2019-12-15				
	Unit	MDL	Field Blank	Duplicate	Original	RPD	Field Blank	Trip Blank	Duplicate	Original	RPD
Conventional Parameters											
Hardness	mg CaCO3/L	1	1	16	16	0.00	1	1	14	15	6.90
Total alkalinity, as CaCO3	mg CaCO3/L	2	6	20	22	9.52	8	8	19	19	0.00
Total suspended solids	mg/L	1	1	1	1	0.00	1	1	1	1	0.00
Major Ions											
Chloride	mg/L	0.5	0.5	1.2	1.3	8.00	0.5	0.5	0.9	0.9	0.00
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.001	0.00
Sulphate	mg/L	0.6	0.6	6.5	6.8	4.51	0.6	0.6	6.5	7.1	8.82
Nutrients and Chlorophyll a											
Nitrate	mg/L	0.01	0.03	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00
Ammonia	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.02	**66.67**
Total Metals											
Aluminum	mg/L	0.005	0.005	0.005	0.005	0.00	0.005	0.005	0.005	0.005	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0017	0.0007	0.0005	0.0006	18.18
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00	0.00002	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.00	0.0006	0.0006	0.0006	0.0006	0.00
Cobalt	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.0005	0.00
Copper	mg/L	0.0005	0.021	0.0011	0.0005	**75.00**	0.0005	0.0005	0.0008	0.0007	13.33
Iron	mg/L	0.01	0.01	0.01	0.01	0.00	0.08	0.08	0.08	0.05	**46.15**
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.0003	0.00
Manganese	mg/L	0.0005	0.0005	0.0007	0.0006	15.38	0.0005	0.0005	0.0005	0.0005	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.0005	0.00
Nickel	mg/L	0.0005	0.0009	0.0005	0.0005	0.00	0.0005	0.0005	0.0008	0.0018	**76.92**
Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0012	0.0005	0.0005	0.0005	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.0002	0.00
Uranium	mg/L	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.001	0.00
Zinc	mg/L	0.001	0.051	0.001	0.001	0.00	0.001	0.001	0.001	0.001	0.00
Radionuclides											
Radium-226	Bq/l	0.002	-	-	-	-	0.005	0.005	0.002	0.002	0
% Exceedances*						0%					0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Water Quality Monitoring Reference Area Third Portage Lake (ST-MMER-3-EEM-TPS)										
Parameter	**Sample Date**		**2019-03-12**				**2019-12-15**			
	Unit	**MDL**	**Field Blank**	**Duplicate**	**Original**	**RPD**	**Field Blank**	**Duplicate**	**Original**	**RPD**
Conventional Parameters										
Hardness	mg CaCO3/L	1	1	10	10	0.00	1	10	10	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	2	6	16	16	0.00	8	16	16	0.00
Total suspended solids	mg/L	1	1	1	1	0.00	1	1	1	0.00
Major Ions										
Chloride	mg/L	0.5	0.5	1.1	1	9.52	0.5	0.8	0.7	13.33
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.00
Sulphate	mg/L	0.6	1	6.3	7.8	21.28	0.6	5.9	4.5	**26.92**
Nutrients and Chlorophyll a										
Nitrate	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00
Ammonia	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.03	0.02	**40.00**
Total Metals										
Aluminum	mg/L	0.005	0.005	0.005	0.005	0.00	0.005	0.005	0.005	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0008	0.001	0.0011	9.52
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.00	0.0006	0.0006	0.0009	**40.00**
Cobalt	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.00
Copper	mg/L	0.0005	0.0174	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.00
Iron	mg/L	0.01	0.01	0.01	0.01	0.00	0.09	0.08	0.08	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.00
Nickel	mg/L	0.001	0.001	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.00
Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0008	0.0005	0.0005	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.00
Uranium	mg/L	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.00
Zinc	mg/L	0.05	0.05	0.002	0.001	**66.67**	0.001	0.001	0.001	0.00
Radionuclides										
Radium-226	Bq/l	0.002	-	-	-	-	0.002	0.002	0.005	**85.71**
% Exceedances*						4%				0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-65 Meadowbank 2019 Non-Contact Water Diversion Ditch QAQC (ST-5)

Parameter	Sample Date		2019-07-02				
	Unit	MDL	Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters							
Total suspended solids	mg/L	1	1	1	11	15	30.77
Major Ions							
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.001	0.00
Sulphate	mg/L	0.6	0.6	0.6	14.7	14.1	4.17
Total Metals							
Aluminum	mg/L	0.005	0.005	0.005	0.383	0.335	13.37
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0054	0.0053	1.87
Copper	mg/L	0.0005	0.0005	0.0005	0.0085	0.0086	1.17
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0043	0.0044	2.30
Zinc	mg/L	0.001	0.026	0.001	0.001	0.001	0.00
Radionuclides							
Radium-226	Bq/l	0.002	0.002	0.002	0.01	0.002	**133.33**
% Exceedance *							10%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-66 Meadowbank 2019 Non-Contact Water Diversion Ditch QAQC (ST-6)

Parameter	Sample Date		2019-07-02				2019-09-03	
	Unit	MDL	Field Blank	Duplicate	Original	RPD	Trip Blank	Original
Conventional Parameters								
Total suspended solids	mg/L	1	1	5	14	*94.74*	1	2
Major Ions								
Cyanide	mg/L	0.001	0.001	0.002	0.003	**40.00**	0.001	0.001
Sulphate	mg/L	0.6	0.6	14.2	22.4	44.81	0.6	6.5
Total Metals								
Aluminum	mg/L	0.005	0.005	0.087	0.222	87.38	0.005	0.005
Arsenic	mg/L	0.0005	0.0005	0.0005	0.001	**66.67**	0.0005	0.0005
Copper	mg/L	0.0005	0.0005	0.0017	0.0034	**66.67**	0.0005	0.0005
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003
Nickel	mg/L	0.0005	0.0005	0.0025	0.004	**46.15**	0.0005	0.0009
Zinc	mg/L	0.001	0.001	0.001	0.003	**100.00**	0.001	0.002
Radionuclides								
Radium-226	Bq/l	0.002	0.002	0.002	0.002	0.00	0.002	0.002
%Exceedance*	20%							

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-67 Meadowbank 2019 East Dike Seepage QAQC (ST-S-1)

Parameter	Sample Date	MDL	2019-04-09					2019-08-05				2019-08-05			
			ST-S-1					ST-S-1 N				ST-S-1 S			
	Unit		Field Blank	Trip Blank	Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD
Conventional Parameters															
Hardness	mg CaCO3/L	1	1	1	28	31	10.17	1	62	62	0.00	1	96	101	5.08
Total alkalinity, as CaCO3	mg CaCO3/L	2	4	4	30	30	0.00	32	80	136	51.85	31	80	83	3.68
Total dissolved solids	mg/L	1	1	1	44	46	4.44	1	80	81	1.24	1	134	117	13.55
Total suspended solids	mg/L	1	2	2	3	3	0.00	1	186	219	16.30	1	296	276	6.99
Major Ions															
Chloride	mg/L	0.5	0.5	0.5	1.3	1.1	16.67	0.5	1.1	1	9.52	0.8	1.3	1.5	14.29
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.005	**133.33**	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.11	0.11	0.00	0.05	0.16	0.15	6.45	0.05	0.2	0.2	0.00
Sulphate	mg/L	0.6	0.8	0.6	7.1	8.5	17.95	0.6	29.7	30.7	3.31	0.6	56.4	54.4	3.61
Nutrients and Chlorophyll a															
Total ammonia as NH4	mg/L	0.01	0.01	0.01	0.01	0.05	**133.33**	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00
Total Metals															
Aluminum	mg/L	0.005	0.005	0.005	0.012	0.005	**82.35**	0.005	1.83	2.13	15.15	0.005	3.55	3.63	2.23
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.007	0.0064	8.96	0.0005	0.0142	0.0148	4.14
Barium	mg/L	0.0005	0.0005	0.0005	0.0077	0.0073	5.33	0.0005	0.0299	0.0322	7.41	0.0005	0.0453	0.0471	3.90
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00	0.00002	0.00002	0.00002	0.00	0.00002	0.00002	0.00003	**40.00**
Chromium	mg/L	0.0006	0.0017	0.0006	0.0006	0.0006	0.00	0.0006	0.0133	0.0182	31.11	0.0006	0.0188	0.0199	5.68
Copper	mg/L	0.0005	0.0005	0.007	0.001	0.0008	**22.22**	0.0005	0.0079	0.0078	1.27	0.0005	0.013	0.0142	8.82
Iron	mg/L	0.01	0.01	0.01	0.04	0.03	**28.57**	0.01	3.35	3.5	4.38	0.01	6.13	6.58	7.08
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.00	0.0003	0.001	0.0014	**33.33**
Manganese	mg/L	0.0005	0.0005	0.0005	0.0009	0.0005	**57.14**	0.0005	0.0722	0.0724	0.28	0.0005	0.1442	0.1503	4.14
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0023	0.0023	0.00	0.0005	0.0019	0.002	5.13
Nickel	mg/L	0.0005	0.0005	0.0093	0.0005	0.0005	0.00	0.0005	0.011	0.0146	28.13	0.0005	0.0208	0.0226	8.29
Selenium	mg/L	0.0005	0.0005	0.005	0.0005	0.0005	0.00	0.0005	0.0005	0.0023	**128.57**	0.0008	0.0034	0.0039	13.70
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.00
Zinc	mg/L	0.001	0.001	0.043	0.001	0.001	0.00	0.001	0.007	0.009	**25.00**	0.001	0.012	0.017	**34.48**
% Exceedance*							0%				7.69%				0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-68 Meadowbank 2019 Portage RSF QAQC (ST-16)

Parameter	Sample Date	MDL	2019-08-19				
	Unit		Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters							
Hardness	mg CaCO3/L	1	1	1	139	135	2.92
Total alkalinity, as CaCO3	mg CaCO3/L	2	7	7	60	62	3.28
Total dissolved solids	mg/L	1	6	5	252	255	1.18
Total suspended solids	mg/L	1	1	1	2	3	**40.00**
Total organic carbon	mg/L	0.2	0.43	0.49	4	4	0.00
Dissolved organic carbon	mg/L	0.2	0.2	0.2	3.9	3.9	0.00
Major Ions							
Bicarbonate	mg CaCO3/L	2	7	7	60	62	3.28
Carbonate	mg CaCO3/L	2	2	2	2	2	0.00
Chloride	mg/L	0.5	-	0.5	4.5	4.7	4.35
Cyanide	mg/L	0.001	0.001	0.001	0.003	0.001	**100.00**
Fluoride	mg/L	0.02	-	0.06	0.23	0.23	0.00
Sulphate	mg/L	0.6	0.9	0.6	104	95.7	8.31
Reactive silica	mg/L	0.01	0.02	0.02	3.99	4.09	2.48
Cyanide (WAD)	mg/L	0.001	0.001	0.001	0.001	0.001	0.00
Thiocyanate	mg/L	0.05	0.05	0.05	0.06	0.06	0.00
Nutrients and Chlorophyll a							
Nitrate	mg/L	0.01	0.01	0.01	4.97	4.95	0.40
Nitrite	mg/L	0.01	0.01	0.01	0.06	0.06	0.00
Total nitrogen	mg/L	0.05	0.05	0.05	0.27	0.56	*69.88*
Total Phosphorus	mg/L	0.0019	0.0019	0.0019	0.021	0.019	*10.00*
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.01	0.01	0.00
Total ammonia as NH4	mg/L	0.01	0.01	0.01	0.11	0.11	0.00
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.01	0.01	0.01	0.00
Chlorophyll A	ug/L	0.04	-	-	0.51	1	64.90
Total Metals							
Aluminum	mg/L	0.005	0.005	0.005	0.059	0.056	5.22
Antimony	mg/L	0.0001	0.0001	0.0001	0.0003	0.0003	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0391	0.0374	4.44
Barium	mg/L	0.0005	0.0005	0.0005	0.0167	0.0136	20.46
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Boron	mg/L	0.01	0.01	0.01	0.01	0.01	0.00
Cadmium	mg/L	0.00003	0.00003	0.00007	0.00003	0.00002	**40.00**
Calcium	mg/L	0.03	0.03	0.03	31	30.2	2.61
Chromium	mg/L	0.0006	0.0006	0.0006	0.0012	0.0014	15.38
Cobalt	mg/L	0.0005	0.0005	0.0005	0.0011	0.0011	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0092	0.0089	3.31
Iron	mg/L	0.01	0.01	0.01	0.17	0.21	21.05
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.00
Lithium	mg/L	0.005	0.005	0.005	0.005	0.005	0.00
Magnesium	mg/L	0.02	0.02	0.02	15.1	14.6	3.37
Manganese	mg/L	0.0005	0.0005	0.0005	0.0663	0.0663	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0236	0.0217	8.39
Nickel	mg/L	0.0005	0.0005	0.0005	0.0112	0.011	1.80
Potassium	mg/L	0.05	0.05	0.05	7.57	7.13	5.99
Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00
Sodium	mg/L	0.05	0.05	0.05	7.95	7.66	3.72

Strontium	mg/kg	0.005	0.005	0.005	0.178	0.166	6.98
Tellurium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.00
Tin	mg/kg	0.001	0.001	0.001	0.001	0.001	0.00
Titanium	mg/L	0.01	0.01	0.01	0.01	0.01	0.00
Uranium	mg/L	0.001	0.001	0.001	0.006	0.005	18.18
Vanadium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.00
Dissolved Metals							
Aluminum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	0.0005	0.0005	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0331	0.0338	2.09
Barium	mg/L	0.0005	0.0005	0.0005	0.0133	0.0151	12.68
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Boron	mg/L	0.01	0.01	0.01	0.01	0.01	0.00
Cadmium	mg/L	0.00003	0.00003	0.00016	0.00002	0.00003	**40.00**
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.00
Cobalt	mg/L	0.0005	0.0005	0.0005	0.0009	0.0009	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0073	0.0066	10.07
Iron	mg/L	0.01	0.01	0.01	0.02	0.01	**66.67**
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.00
Lithium	mg/L	0.005	0.005	0.005	0.005	0.005	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.0496	0.0506	2.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0207	0.0225	8.33
Nickel	mg/L	0.0005	0.0005	0.0005	0.0096	0.0092	4.26
Selenium	mg/L	0.0005	0.0005	0.001	0.0016	0.0005	**104.76**
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00
Strontium	mg/L	0.005	0.005	0.005	0.159	0.161	1.25
Tellurium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.00
Tin	mg/L	0.001	0.001	0.001	0.001	0.001	0.00
Titanium	mg/L	0.01	0.01	0.01	0.01	0.01	0.00
Uranium	mg/L	0.001	0.001	0.001	0.005	0.005	0.00
Vanadium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.00
% Exceedance*							3.70%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-69 Meadowbank 2019 North Portage Pit Lake QAQC (ST-17)

Parameter	Sample Date	MDL	2019-07-16			2019-10-20			
	Unit		Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD
Conventional Parameters									
Hardness	mg CaCO3/L	1	573	576	0.52	1	693	685	1.16
Total alkalinity, as CaCO3	mg CaCO3/L	5	56	73	26.36	9	77	67	13.89
Total dissolved solids	mg/L	1	1437	1409	1.97	2	1383	1372	0.80
Total suspended solids	mg/L	1	6	12	*66.67*	1	11	4	*93.33*
Total organic carbon	mg/L	0.2	-	-	-	0.2	14	14	0.00
Dissolved organic carbon	mg/L	0.2	15	15	0.00	0.2	15.1	15.3	1.32
Major Ions									
Chloride	mg/L	0.5	175	176	0.57	0.5	143	147	2.76
Cyanide	mg/L	0.001	0.038	0.037	2.67	0.001	0.033	0.033	0.00
Fluoride	mg/L	0.02	0.36	0.33	8.70	0.02	0.43	0.42	2.35
Sulphate	mg/L	0.6	938	946	0.85	0.6	961	885	8.23
Cyanide (free)	mg/L	0.001	0.016	0.015	6.45	0.001	0.014	0.012	15.38
Nutrients and Chlorophyll a									
Total phosphorus	mg/L	0.01	0.02	0.05	**85.71**	0.01	0.02	0.03	**40.00**
Total ammonia as NH4	mg/L	0.01	7.48	7.41	0.94	0.01	6.07	6.07	0.00
Un-Ionized Ammonia, calculated	mg/L	0.01	0.12	0.11	8.70	0.01	0.12	0.1	18.18
Total Metals									
Aluminum	mg/L	0.005	0.047	0.038	**21.18**	0.005	0.13	0.108	18.49
Arsenic	mg/L	0.0005	0.0267	0.0261	2.27	0.0005	0.5007	0.4753	5.20
Barium	mg/L	0.0005	0.024	0.023	4.26	0.0005	0.0232	0.0229	1.30
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00	0.00002	0.00018	0.00019	5.41
Calcium	mg/L	0.03	168	171	1.77	0.03	212	210	0.95
Chromium	mg/L	0.0006	0.0013	0.001	**26.09**	0.0006	0.0014	0.0015	6.90
Copper	mg/L	0.0005	0.0211	0.0204	3.37	0.0005	0.0337	0.0331	1.80
Iron	mg/L	0.01	0.12	0.11	8.70	0.02	0.54	0.53	1.87
Lead	mg/L	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.00
Magnesium	mg/L	0.02	37.2	36.4	2.17	0.02	39.8	39.1	1.77
Manganese	mg/L	0.0005	0.8605	0.8285	3.79	0.0005	0.8128	0.8009	1.47
Mercury	mg/L	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.1383	0.1372	0.80	0.0005	0.1459	0.1427	2.22
Nickel	mg/L	0.0005	0.0633	0.0608	4.03	0.0005	0.0594	0.0585	1.53
Potassium	mg/L	0.05	44	42.5	3.47	0.05	58.8	58.7	0.17
Selenium	mg/L	0.0005	0.0016	0.0005	**104.76**	0.0005	0.0066	0.0065	1.53
Silver	mg/L	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.00
Sodium	mg/L	0.05	250	241	3.67	0.05	249	318	24.34
Thallium	mg/L	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.00
Zinc	mg/L	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.00
Dissolved Metals									
Aluminum	mg/L	0.005	0.009	0.011	**20.00**	0.005	0.005	0.005	0.00
Arsenic	mg/L	0.0005	0.0255	0.0255	0.00	0.0005	0.4216	0.5187	20.65
Barium	mg/L	0.0005	0.0232	0.0238	2.55	0.0005	0.0249	0.0308	21.18
Cadmium	mg/L	0.00002	0.00003	0.00002	**40.00**	0.00002	0.0002	0.00021	4.88
Chromium	mg/L	0.0006	0.0006	0.0006	0.00	0.0006	0.0006	0.0006	0.00
Copper	mg/L	0.0005	0.0207	0.0202	2.44	0.0005	0.0249	0.0295	16.91
Iron	mg/L	0.01	0.01	0.01	0.00	0.04	0.11	0.12	8.70
Lead	mg/L	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.00
Manganese	mg/L	0.0005	0.8472	0.8366	1.26	0.0005	0.7765	0.9267	17.64
Mercury	mg/L	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.1373	0.1387	1.01	0.0005	0.1402	0.1678	17.92

Nickel	mg/L	0.0005	0.0622	0.0605	2.77	0.0005	0.056	0.0675	18.62
Selenium	mg/L	0.0005	0.0005	0.0067	*172.22*	0.0005	0.0068	0.0083	19.87
Silver	mg/L	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.00
Strontium	mg/L	0.005	0.812	0.792	2.49	0.005	0.842	1.01	18.14
Thallium	mg/L	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.00
Zinc	mg/L	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.00
% Exceedance*					1.96%				5.88%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-70 Meadowbank 2019 South Portage Pit Lake QAQC (ST-19 Lake)

Parameter	Sample Date	MDL	2019-07-16		
	Unit		Duplicate	Original	RPD
Conventional Parameters					
Hardness	mg CaCO3/L	1	352	320	9.52
Total alkalinity, as CaCO3	mg CaCO3/L	5	44	45	2.25
Total dissolved solids	mg/L	1	583	580	0.52
Total suspended solids	mg/L	1	6	5	18.18
Dissolved organic carbon	mg/L	0.2	1.8	1.8	0.00
Major Ions					
Chloride	mg/L	0.5	26.6	26.6	0.00
Cyanide	mg/L	0.001	0.024	0.025	4.08
Fluoride	mg/L	0.02	0.4	0.4	0.00
Sulphate	mg/L	0.6	283	263	7.33
Nutrients and Chlorophyll a					
Total phosphorus	mg/L	0.01	0.01	0.02	**66.67**
Total ammonia as NH4	mg/L	0.01	4.86	4.86	0.00
Un-Ionized Ammonia, calculated	mg/L	0.01	0.1	0.1	0.00
Total Metals					
Aluminum	mg/L	0.005	0.055	0.033	*50.00*
Arsenic	mg/L	0.0005	0.0009	0.0005	**57.14**
Barium	mg/L	0.0005	0.0167	0.0167	0.00
Cadmium	mg/L	0.0003	0.00002	0.00002	0.00
Calcium	mg/L	0.03	76.4	70.4	8.17
Chromium	mg/L	0.0006	0.0017	0.0016	6.06
Copper	mg/L	0.0005	0.0012	0.0008	**40.00**
Iron	mg/L	0.01	0.07	0.06	15.38
Lead	mg/L	0.0003	0.0003	0.0003	0.00
Magnesium	mg/L	0.02	39.3	35.3	10.72
Manganese	mg/L	0.0005	0.1446	0.1295	11.02
Mercury	mg/L	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0006	0.0472	0.0398	17.01
Nickel	mg/L	0.0005	0.0234	0.0206	12.73
Potassium	mg/L	0.05	19.3	17.3	10.93
Selenium	mg/L	0.0005	0.0005	0.0005	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.00
Sodium	mg/L	0.05	39.9	36.2	9.72
Strontium	mg/kg	0.005	0.579	0.505	13.65
Thallium	mg/L	0.0002	0.0002	0.0002	0.00
Zinc	mg/L	0.001	0.001	0.001	0.00

Dissolved Metals					
Aluminum	mg/L	0.0005	0.014	0.018	25.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.00
Barium	mg/L	0.0005	0.0182	0.0147	21.28
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.00
Copper	mg/L	0.0005	0.001	0.0008	**22.22**
Iron	mg/L	0.01	0.01	0.01	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.00
Manganese	mg/L	0.0005	0.1199	0.117	2.45
Mercury	mg/L	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0398	0.0387	2.80
Selenium	mg/L	0.0005	0.0015	0.0005	**100.00**
Silver	mg/L	0.0001	0.0001	0.0001	0.00
Strontium	mg/L	0.005	0.511	0.49	4.20
Thallium	mg/L	0.0002	0.0002	0.0002	0.00
Zinc	mg/L	0.001	0.001	0.001	0.00
% Exceedance*					4.08%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-71 Meadowbank 2019 South Portage Pit Sump QAQC (ST-19 Sump)

Parameter	Sample Date	MDL	2019-06-17				2019-10-20				
	Unit		Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters											
Hardness	mg CaCO3/L	1	1	220	226	2.69	1	1	337	289	15.34
Total alkalinity, as CaCO3	mg CaCO3/L	5	3	45	46	2.20	9	9	62	57	8.40
Total dissolved solids	mg/L	1	1	369	368	0.27	1	1	450	424	5.95
Total suspended solids	mg/L	1	1	16	11	37.04	2	1	56	44	24.00
Dissolved organic carbon	mg/L	0.2	0.2	6.5	6.1	6.35	0.6	0.5	2.2	1.1	*66.67*
Major Ions											
Chloride	mg/L	0.5	0.5	33.1	33.3	0.60	0.5	0.5	24.1	24.6	2.05
Cyanide	mg/L	0.001	0.001	0.01	0.008	**22.22**	0.001	0.001	0.02	0.019	5.13
Fluoride	mg/L	0.02	0.02	0.19	0.18	5.41	0.02	0.02	0.41	0.43	4.76
Sulphate	mg/L	0.6	1.1	190	178	6.52	0.6	0.6	245	244	0.41
Nutrients and Chlorophyll a											
Total ammonia as NH4	mg/L	0.01	0.04	0.46	0.4	13.95	0.02	0.01	2.47	2.44	1.22
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.06	0.06	0.00
Total Metals											
Aluminum	mg/L	0.005	0.005	0.191	0.264	32.09	0.005	0.005	1.1	1.04	5.61
Arsenic	mg/L	0.0005	0.0013	0.0038	0.0039	2.60	0.0005	0.0005	0.0048	0.003	**46.15**
Barium	mg/L	0.0005	0.0005	0.0174	0.0174	0.00	0.0005	0.0005	0.0117	0.0088	28.29
Cadmium	mg/L	0.0003	0.0003	0.00002	0.00002	0.00	0.00002	0.00002	0.00002	0.00004	**66.67**
Calcium	mg/L	0.03	0.03	59.4	60.8	2.33	0.03	0.03	71.5	60	17.49
Chromium	mg/L	0.0006	0.0006	0.0012	0.0024	**66.67**	0.0006	0.0006	0.0235	0.022	6.59
Copper	mg/L	0.0005	0.0005	0.0029	0.003	3.39	0.0005	0.0005	0.0014	0.0011	**24.00**
Iron	mg/L	0.01	0.01	0.43	0.46	6.74	0.01	0.01	1.64	1.46	11.61
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0005	0.0003	**50.00**
Manganese	mg/L	0.0005	0.0005	0.0932	0.1023	9.31	0.0005	0.0005	0.0765	0.0675	12.50

Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0006	0.0006	0.0271	0.0267	1.49	0.0005	0.0005	0.0457	0.0405	12.06
Nickel	mg/L	0.0005	0.0005	0.0101	0.0102	0.99	0.0005	0.0005	0.0283	0.0243	15.21
Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0006	0.0009	**40.00**
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.0001	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.0002	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.001	0.00
% Exceedance*							7.14%				7.14%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-72 Meadowbank 2019 Goose Pit Lake QAQC (ST-20 Lake)

Parameter	Sample Date	MDL	2019-07-31		
	Unit		Duplicate	Original	RPD
Conventional Parameters					
Hardness	mg CaCO3/L	1	373	405	8.23
Total alkalinity, as CaCO3	mg CaCO3/L	5	64	61	4.80
Total dissolved solids	mg/L	1	809	803	0.74
Total suspended solids	mg/L	1	15	20	28.57
Total organic carbon	mg/L	0.2	2.8	6.7	82.11
Dissolved organic carbon	mg/L	0.2	8.8	8.6	2.30
Major Ions					
Bicarbonate	mg CaCO3/L	2	64	61	4.80
Carbonate	mg CaCO3/L	2	2	2	0.00
Chloride	mg/L	0.5	15.2	80	136.13
Cyanide	mg/L	0.001	0.157	0.152	3.24
Fluoride	mg/L	0.01	0.73	0.54	29.92
Sulphate	mg/L	0.6	487	469	3.77
Reactive silica	mg/kg	0.02	12.2	12.7	4.02
Nutrients and Chlorophyll a					
Total nitrogen	mg/L	0.01	19.1	17.6	8.17
Total phosphorus	mg/L	0.01	0.06	0.06	0.00
Total orthophosphate (as phosphorus)	mg/L	0.01	0.04	0.05	**22.22**
Total ammonia as NH4	mg/L	0.01	10.5	10.5	0.00
Un-Ionized Ammonia, calculated	mg/L	0.01	0.34	0.32	6.06
Total Metals					
Aluminum	mg/L	0.005	0.579	0.588	1.54
Antimony	mg/L	0.0001	0.0035	0.004	13.33
Arsenic	mg/L	0.0005	0.0176	0.0191	8.17
Barium	mg/L	0.0005	0.0356	0.0383	7.31
Beryllium	mg/L	0.0005	0.0005	0.0005	0.00
Boron	mg/L	0.01	0.02	0.03	**40.00**
Cadmium	mg/L	0.00002	0.00002	0.00024	**169.23**
Calcium	mg/L	0.03	117	127	8.20
Chromium	mg/L	0.0006	0.0108	0.0094	13.86
Cobalt	mg/L		0.0263	0.0284	7.68
Copper	mg/L	0.0005	0.5137	0.5609	8.78
Iron	mg/L	0.01	1.1	1.03	6.57
Lead	mg/L	0.0003	0.0003	0.0003	0.00
Lithium	mg/L	0.005	0.01	0.013	**26.09**
Magnesium	mg/L	0.002	19.8	21.1	6.36
Manganese	mg/L	0.0005	0.0496	0.0509	2.59
Mercury	mg/L	0.00001	0.00001	0.00002	**66.67**

Molybdenum	mg/L	0.0005	0.1185	0.1281	7.79
Nickel	mg/L	0.0005	0.0223	0.0232	3.96
Potassium	mg/L	0.05	33.2	35.9	7.81
Selenium	mg/L	0.0005	0.0013	0.0052	*120.00*
Sodium	mg/L	0.05	139	149	6.94
Strontium	mg/kg	0.005	0.578	0.62	7.01
Thallium	mg/L	0.0002	0.0002	0.0002	0.00
Tin	mg/kg	0.001	0.001	0.001	0.00
Titanium	mg/L	0.01	0.01	0.01	0.00
Uranium	mg/L	0.0005	0.012	0.013	8.00
Vanadium	mg/L	0.0005	0.0015	0.002	**28.57**
Zinc	mg/L	0.001	0.001	0.003	**100.00**
Dissolved Metals					
Aluminum	mg/L	0.005	0.033	0.024	**31.58**
Antimony	mg/L	0.0005	0.0036	0.0032	11.76
Arsenic	mg/L	0.0005	0.0168	0.0146	14.01
Barium	mg/L	0.0005	0.0364	0.0303	18.29
Beryllium	mg/L	0.0005	0.0005	0.0005	0.00
Boron	mg/L	0.01	0.01	0.01	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.00
Copper	mg/L	0.0005	0.4465	0.3543	23.03
Iron	mg/L	0.01	0.01	0.01	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.00
Lithium	mg/L	0.005	0.005	0.005	0.00
Manganese	mg/L	0.0003	0.0332	0.0309	7.18
Mercury	mg/L	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.1199	0.1025	15.65
Nickel	mg/L	0.0005	0.0168	0.015	11.32
Selenium	mg/L	0.0005	0.0005	0.0015	**100.00**
Strontium	mg/L	0.005	0.582	0.514	12.41
Titanium	mg/L	0.01	0.01	0.01	0.00
Uranium	mg/L	0.0005	0.012	0.011	8.70
Vanadium	mg/L	0.0005	0.0005	0.0005	0.00
Zinc	mg/L	0.001	0.002	0.001	**66.67**
% Exceedance*					7.25%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-73 Meadowbank 2019 Goose Pit Sump QAQC (ST-20 Sump)

Parameter	Sample Date	MDL	2019-06-03			2019-06-26		2019-07-29		2019-08-12	
	Unit		Duplicate	Original	RPD	Field Blank	Original	Field Blank	Original	Trip Blank	Original
Conventional Parameters											
Total dissolved solids	mg/L	1	76	75	1.32	1	307	1	266	2	251
Total suspended solids	mg/L	1	26	22	16.67	1	4	1	3	1	2
Major Ions											
Chloride	mg/L	0.5	3.1	0.5	**144.44**	0.5	7.3	0.5	7.6	0.5	4.7
Cyanide	mg/L	0.001	0.005	0.001	**133.33**	0.001	0.001	0.001	0.002	0.002	0.001
Fluoride	mg/L	0.02	0.08	0.08	0.00	0.02	0.2	0.03	0.19	0.07	0.19
Sulphate	mg/L	0.6	32.4	29.6	9.03	0.6	118	0.8	145	0.6	108
Nutrients and Chlorophyll a											
Total ammonia as NH4	mg/L	0.01	0.25	0.21	17.39	0.03	0.07	0.01	0.01	0.01	2.05
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.04
Total Metals											
Aluminum	mg/L	0.005	0.385	0.663	53.05	0.005	0.018	0.005	0.028	0.005	0.089
Arsenic	mg/L	0.0005	0.0013	0.0024	**59.46**	0.0005	0.0005	0.0005	0.001	0.0005	0.0036
Barium	mg/L	0.0005	0.0098	0.008	20.22	0.0005	0.0287	0.0005	0.024	0.0005	0.0197
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Chromium	mg/L	0.0006	0.0044	0.0073	*49.57*	0.0007	0.0009	0.0006	0.0009	0.0006	0.0023
Copper	mg/L	0.0005	0.0015	0.0023	**42.11**	0.0005	0.0007	0.0005	0.0015	0.0005	0.003
Iron	mg/L	0.01	0.84	1.12	28.57	0.01	0.1	0.01	0.05	0.01	0.15
Lead	mg/L	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003
Manganese	mg/L	0.0005	0.0726	0.0697	4.08	0.0005	0.0603	0.0005	0.0455	0.0005	0.0359
Mercury	mg/L	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.0005	0.0037	0.0043	15.00	0.0005	0.0053	0.0005	0.0058	0.0005	0.0038
Nickel	mg/L	0.0005	0.0086	0.0105	19.90	0.0005	0.0624	0.0005	0.0498	0.0005	0.0125
Selenium	mg/L	0.0005	0.001	0.0005	**66.67**	0.0005	0.0005	0.0005	0.0005	0.0005	0.0014

Silver	mg/L	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Thallium	mg/L	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Zinc	mg/L	0.001	0.001	0.003	**100.00**	0.001	0.001	0.001	0.001	0.001	0.001
% Exceedance*					**12.50%**						

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-74 Meadowbank 2019 TSF Reclaim Water QAQC (ST-21)

Parameter	Sample Date	MDL	2019-03-05					2019-06-03			2019-10-07	
	Unit		Trip Blank	Field Blank	Duplicate	Original	RPD	Duplicate	Original	RPD	Trip Blank	Original
Conventional Parameters												
Hardness	mg CaCO3/L	1	1	1	1292	1112	14.98	-	-	-	-	-
Total alkalinity, as CaCO3	mg CaCO3/L	5	6	5	106	105	0.95	44	44	0.00	7	67
Total dissolved solids	mg/L	1	1	4	2428	2428	0.00	1552	1548	0.26	1	1088
Total suspended solids	mg/L	1	1	1	4	6	**40.00**	9	9	0.00	1	17
Major Ions												
Chloride	mg/L	0.5	0.5	0.5	484	484	0.00	284	271	4.68	0.5	73.1
Cyanide	mg/L	0.001	0.002	0.001	8.31	8	3.80	0.401	0.087	128.69	0.001	0.027
Fluoride	mg/L	0.02	0.02	0.02	0.56	0.58	3.51	0.4	0.39	2.53	0.02	0.35
Sulphate	mg/L	0.6	0.6	0.6	2070	2159	4.21	1332	1266	5.08	0.5	750
Nutrients and Chlorophyll a												
Total ammonia as NH4	mg/L	0.01	0.02	0.01	36	50.2	32.95	17.2	21.3	21.30	0.01	13.1
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.01	0.9	1.23	30.99	0.27	0.33	20.00	0.01	0.42
Total Metals												
Aluminum	mg/L	0.005	0.005	0.008	0.038	0.036	5.41	0.068	0.133	64.68	0.01	0.1
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0434	0.0429	1.16	0.0059	0.0051	14.55	0.001	0.012
Barium	mg/L	0.0005	0.0005	0.0005	0.1065	0.0946	11.83	0.0249	0.0279	11.36	0.002	0.028
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00005	0.00002	**85.71**	0.00021	0.00002	**165.22**	0.0002	0.0002
Calcium	mg/L	0.03	0.03	0.06	450	384	15.83	254	255	0.39	0.5	160
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.00	0.0006	0.0006	0.00	0.005	0.005
Copper	mg/L	0.0005	0.0744	0.0161	4.954	4.602	7.37	0.8835	1.061	18.26	0.001	0.039
Iron	mg/L	0.01	0.01	0.01	0.97	0.91	6.38	0.26	0.37	34.92	0.06	0.32
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.00	0.0005	0.0036
Manganese	mg/L	0.0005	0.0005	0.0005	0.4466	0.4161	7.07	0.6744	0.7965	16.60	0.001	0.29
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00	0.0001	0.0001

Molybdenum	mg/L	0.0005	0.0005	0.0033	0.4456	0.3968	11.59	0.1953	0.2057	5.19	0.001	0.14
Nickel	mg/L	0.0005	0.0118	0.0005	0.2866	0.2635	8.40	0.0515	0.0581	12.04	0.002	0.033
Selenium	mg/L	0.0005	0.0005	0.0005	0.0205	0.0103	66.23	0.0054	0.0046	16.00	0.003	0.003
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.00	0.001	0.001
Thallium	mg/L	0.0002	0.0028	0.0029	0.0021	0.0022	4.65	0.0002	0.0002	0.00	0.002	0.002
Zinc	mg/L	0.001	0.659	0.001	0.002	0.001	**66.67**	0.001	0.001	0.00	0.007	0.0071
% Exceedance*							11.11%			18.52%		

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-75 Meadowbank 2019 Vault Pit Sump QAQC (ST-23)

Parameter	Sample Date	MDL	2019-07-23			
	Unit		Field Blank	Duplicate	Original	RPD
Conventional Parameters						
Hardness	mg CaCO3/L	1	1	290	277	4.59
Total alkalinity, as CaCO3	mg CaCO3/L	2	2	51	57	11.11
Total dissolved solids	mg/L	1	1	392	391	0.26
Total suspended solids	mg/L	1	1	1	1	0.00
Total organic carbon	mg/L	0.2	0.29	2	2.4	18.18
Dissolved organic carbon	mg/L	0.2	0.8	2.8	2.3	19.61
Major Ions						
Bicarbonate	mg CaCO3/L	2	2	51	57	11.11
Carbonate	mg CaCO3/L	2	2	2	2	0.00
Chloride	mg/L	0.5	0.5	16.3	15.5	5.03
Cyanide	mg/L	0.001	0.001	0.006	0.008	**28.57**
Sulphate	mg/L	0.6	0.6	197	193	2.05
Reactive silica	mg/kg	0.01	0.01	5.87	5.68	3.29
Cyanide (free)	mg/L	0.001	0.001	0.004	0.004	0.00
Nutrients and Chlorophyll a						
Total nitrogen	mg/L	0.01	0.24	1.18	0.97	19.53
Total phosphorus	mg/L	0.01	0.01	4.18	0.01	*199.05*
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.01	0.00
Total ammonia as NH4	mg/L	0.01	0.01	0.94	1.03	9.14
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.02	0.03	**40.00**
Total Metals						
Aluminum	mg/L	0.005	0.005	0.011	0.013	16.67
Antimony	mg/L	0.0001	0.0001	0.0054	0.0053	1.87
Arsenic	mg/L	0.0005	0.0005	0.0047	0.0047	0.00
Barium	mg/L	0.0005	0.0023	0.0321	0.0307	4.46
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Boron	mg/L	0.01	0.01	0.01	0.01	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00
Calcium	mg/L	0.03	0.26	75.9	70.9	6.81
Chromium	mg/L	0.0006	0.0006	0.0007	0.0006	15.38
Copper	mg/L	0.0005	0.0009	0.0021	0.0022	4.65
Iron	mg/L	0.01	0.01	0.04	0.04	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00
Lithium	mg/L	0.005	0.005	0.005	0.005	0.00
Magnesium	mg/L	0.02	0.02	24.5	24.4	0.41
Manganese	mg/L	0.0005	0.0005	0.0417	0.041	1.69
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0735	0.0709	3.60
Nickel	mg/L	0.0005	0.0005	0.0037	0.0036	2.74

Potassium	mg/L	0.05	0.35	10.7	10.7	0.00
Selenium	mg/L	0.0005	0.0005	0.0021	0.0005	**123.08**
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.00
Sodium	mg/L	0.05	0.71	11.3	11	2.69
Strontium	mg/kg	0.005	0.005	0.575	0.557	3.18
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00
Tin	mg/kg	0.001	0.001	0.001	0.001	0.00
Titanium	mg/L	0.01	0.01	0.01	0.01	0.00
Uranium	mg/L	0.001	0.001	0.03	0.029	3.39
Vanadium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Zinc	mg/L	0.001	0.004	0.002	0.003	**40.00**
Dissolved Metals						
Aluminum	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Antimony	mg/L	0.0001	0.0001	0.0055	0.0052	5.61
Arsenic	mg/L	0.0005	0.0005	0.0046	0.0044	4.44
Barium	mg/L	0.0005	0.0005	0.0313	0.0287	8.67
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Boron	mg/L	0.01	0.01	0.01	0.01	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.00
Copper	mg/L	0.0005	0.001	0.0023	0.0023	0.00
Iron	mg/L	0.01	0.01	0.01	0.01	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00
Lithium	mg/L	0.005	0.005	0.005	0.005	0.00
Manganese	mg/L	0.0005	0.0005	0.0396	0.0376	5.18
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0713	0.0683	4.30
Nickel	mg/L	0.0005	0.0005	0.0037	0.004	7.79
Selenium	mg/L	0.0005	0.0006	0.0031	0.0005	**144.44**
Strontium	mg/L	0.005	0.005	0.555	0.528	4.99
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00
Tin	mg/L	0.001	0.001	0.001	0.001	0.00
Titanium	mg/L	0.01	0.01	0.01	0.01	0.00
Uranium	mg/L	0.001	0.001	0.028	0.028	0.00
Vanadium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Zinc	mg/L	0.001	0.001	0.002	0.002	0.00
% Exceedance*						0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-76 Meadowbank 2019 Vault RSF QAQC (ST-24)

Parameter	Sample Date	MDL	2019-07-23				2019-07-29		
	Unit		Field Blank	Duplicate	Original	RPD	Duplicate	Original	RPD
Conventional Parameters									
Hardness	mg CaCO3/L	1	1	79	74	6.54	78	78	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	2	2	23	23	0.00	26	31	17.54
Total dissolved solids	mg/L	1	1	126	122	3.23	122	122	0.00
Total suspended solids	mg/L	1	1	3	2	**40.00**	4	4	0.00
Major Ions									
Chloride	mg/L	0.5	0.5	2.2	1.4	**44.44**	2	1.7	16.22
Cyanide	mg/L	0.001	0.001	0.001	0.002	**66.67**	0.001	0.001	0.00
Fluoride	mg/L	0.1	0.1	0.13	0.1	**26.09**	0.09	0.09	0.00
Sulphate	mg/L	0.6	0.6	55.5	59.8	7.46	64.6	67.2	3.95
Nutrients and Chlorophyll a									
Total ammonia as NH4	mg/L	0.01	0.01	0.14	0.16	13.33	0.25	0.24	4.08
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.00
Total Metals									
Aluminum	mg/L	0.005	0.005	0.099	0.005	*180.77*	0.094	0.08	16.09
Arsenic	mg/L	0.0005	0.0005	0.0049	0.0046	6.32	0.0052	0.005	3.92
Barium	mg/L	0.0005	0.0005	0.0061	0.0078	24.46	0.009	0.0086	4.55
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00	0.00002	0.00007	**111.11**
Chromium	mg/L	0.0006	0.0006	0.0008	0.0011	**31.58**	0.0011	0.0006	**58.82**
Copper	mg/L	0.0005	0.0026	0.0046	0.0048	4.26	0.005	0.0049	2.02
Iron	mg/L	0.01	0.01	0.13	0.11	16.67	0.13	0.12	8.00
Lead	mg/L	0.0003	0.0003	0.0004	0.0003	**28.57**	0.0003	0.0003	0.00
Manganese	mg/L	0.0005	0.0005	0.0373	0.0318	15.92	0.0355	0.0322	9.75
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0115	0.0108	6.28	0.0132	0.013	1.53
Nickel	mg/L	0.0005	0.0005	0.0047	0.0045	4.35	0.0035	0.0038	8.22

Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.00
Zinc	mg/L	0.001	0.003	0.001	0.001	0.00	0.001	0.001	0.00
% Exceedance*						3.85%			0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-77 Meadowbank 2019 Vault Attenuation Pond QAQC (ST-25)

Parameter	Sample Date	MDL	2019-06-09			
	Unit		Field Blank	Duplicate	Original	RPD
Conventional Parameters						
Hardness	mg CaCO3/L	1	1	54	61	12.17
Total alkalinity, as CaCO3	mg CaCO3/L	2	4	19	19	0.00
Total dissolved solids	mg/L	1	1	79	79	0.00
Total suspended solids	mg/L	1	1	6	6	0.00
Major Ions						
Chloride	mg/L	0.5	0.5	1.8	1.8	0.00
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.00
Fluoride	mg/L	0.02	0.02	0.11	0.11	0.00
Sulphate	mg/L	0.6	1.5	36.8	36.1	1.92
Nutrients and Chlorophyll a						
Total ammonia as NH4	mg/L	0.01	0.01	0.36	0.33	8.70
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.01	0.01	0.00
Total Metals						
Aluminum	mg/L	0.005	0.005	0.465	0.361	25.18
Arsenic	mg/L	0.0005	0.0005	0.0016	0.0014	13.33
Barium	mg/L	0.0005	0.0005	0.0118	0.0145	20.53
Cadmium	mg/L	0.00002	0.00002	0.00004	0.0001	**85.71**
Chromium	mg/L	0.0006	0.0006	0.0011	0.0011	0.00
Copper	mg/L	0.0005	0.0005	0.0059	0.0055	7.02
Iron	mg/L	0.01	0.01	0.48	0.5	4.08
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00
Manganese	mg/L	0.0005	0.0005	0.1102	0.1192	7.85
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0022	0.0027	**20.41**
Nickel	mg/L	0.0005	0.0005	0.008	0.0078	2.53
Selenium	mg/L	0.0005	0.0005	0.0034	0.0005	**148.72**
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00
Zinc	mg/L	0.001	0.001	0.001	0.004	**120.00**
% Exceedance*						7.69%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-78 Meadowbank 2019 West Extension Pool WEP 1 QAQC (ST-30)

Parameter	Sample Date	MDL	2019-08-05				
	Unit		Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters							
Hardness	mg CaCO3/L	1	1	1	100	90	10.53
Total alkalinity, as CaCO3	mg CaCO3/L	2	44	36	86	85	1.17
Total dissolved solids	mg/L	1	1	1	120	134	11.02
Total suspended solids	mg/L	1	1	1	6	7	15.38
Major Ions							
Chloride	mg/L	0.5	0.5	0.5	1.7	1.9	11.11
Cyanide	mg/L	0.001	0.001	0.001	0.01	0.01	0.00
Fluoride	mg/L	0.02	0.08	0.06	0.2	0.18	10.53
Sulphate	mg/L	0.6	0.6	0.6	44.2	43.3	2.06
Nutrients and Chlorophyll a							
Total ammonia as NH4	mg/L	0.01	0.01	0.01	0.09	0.1	10.53
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.01	0.01	0.01	0.00
Total Metals							
Aluminum	mg/L	0.005	0.005	0.005	0.128	0.131	2.32
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0178	0.0163	8.80
Barium	mg/L	0.0005	0.0005	0.0005	0.0068	0.0031	*74.75*
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0032	0.0052	**47.62**
Copper	mg/L	0.0005	0.0005	0.0005	0.0132	0.0121	8.70
Iron	mg/L	0.01	0.01	0.01	0.39	0.39	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.0139	0.0144	3.53
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0059	0.0052	12.61
Nickel	mg/L	0.0005	0.0005	0.0005	0.0051	0.0055	7.55
Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0008	**46.15**
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.00
% Exceedance*							0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-79 Meadowbank 2019 West Extension Pool WEP 2 QAQC (ST-31)

Parameter	Sample Date	MDL	2019-08-05				
	Unit		Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters							
Hardness	mg CaCO3/L	1	1	1	82	90	9.30
Total alkalinity, as CaCO3	mg CaCO3/L	2	39	43	86	91	5.65
Total dissolved solids	mg/L	1	1	1	106	103	2.87
Total suspended solids	mg/L	1	1	1	5	4	**22.22**
Major Ions							
Chloride	mg/L	0.5	0.5	0.5	1.2	1.7	**34.48**
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.002	**66.67**
Fluoride	mg/L	0.05	0.05	0.1	0.14	0.14	0.00
Sulphate	mg/L	0.6	0.6	0.6	31.1	31.1	0.00
Nutrients and Chlorophyll a							
Total ammonia as NH4	mg/L	0.01	0.01	0.01	0.13	0.1	*26.09*
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.01	0.01	0.01	0.00
Total Metals							
Aluminum	mg/L	0.005	0.005	0.005	0.112	0.132	16.39
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0944	0.1179	22.14
Barium	mg/L	0.0005	0.0005	0.0005	0.0016	0.0023	**35.90**
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0036	0.0038	5.41
Copper	mg/L	0.0005	0.0017	0.0005	0.0015	0.0016	6.45
Iron	mg/L	0.01	0.01	0.01	0.33	0.39	16.67
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.0138	0.0146	5.63
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0142	0.0172	19.11
Nickel	mg/L	0.0005	0.0005	0.0005	0.0034	0.0032	6.06
Selenium	mg/L	0.0005	0.0005	0.0005	0.0018	0.0005	**113.04**
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.00
% Exceedance*							3.85%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-80 Meadowbank 2019 Saddle Dam 3 QAQC (ST-32)

Parameter	Sample Date	MDL	2019-06-10			
	Unit		Field Blank	Duplicate	Original	RPD
Conventional Parameters						
Hardness	mg CaCO3/L	1	1	145	144	0.69
Total alkalinity, as CaCO3	mg CaCO3/L	2	3	38	35	8.22
Total dissolved solids	mg/L	1	1	241	241	0.00
Total suspended solids	mg/L	1	1	52	56	7.41
Major Ions						
Chloride	mg/L	0.5	0.5	12.6	13.4	6.15
Cyanide	mg/L	0.001	0.001	0.01	0.009	10.53
Fluoride	mg/L	0.02	0.02	0.22	0.22	0.00
Sulphate	mg/L	0.6	0.6	94.2	91.1	3.35
Nutrients and Chlorophyll a						
Total ammonia as NH4	mg/L	0.01	0.01	1.93	1.9	1.57
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.03	0.03	0.00
Total Metals						
Aluminum	mg/L	0.005	0.005	1.94	1.46	28.24
Arsenic	mg/L	0.0005	0.0005	0.0479	0.045	6.24
Barium	mg/L	0.0005	0.0005	0.0348	0.0302	14.15
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0007	0.0364	0.0262	32.59
Copper	mg/L	0.0005	0.0005	0.0059	0.0067	12.70
Iron	mg/L	0.01	0.01	2.48	2.36	4.96
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00
Manganese	mg/L	0.0005	0.0005	0.1473	0.1608	8.76
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0156	0.0159	1.90
Nickel	mg/L	0.0005	0.0005	0.0465	0.0364	24.37
Selenium	mg/L	0.0005	0.0005	0.0016	0.0065	*120.99*
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.00
% Exceedance*						11.54%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-81 Meadowbank 2019 Saddle Dam 1 QAQC (ST-S-2)

Parameter	Sample Date	MDL	2019-06-26			2019-07-09			
	Unit		Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD
Conventional Parameters									
Hardness	mg CaCO3/L	1	391	827	71.59	1	422	480	12.86
Total alkalinity, as CaCO3	mg CaCO3/L	2	29	27	7.14	2	34	42	21.05
Total dissolved solids	mg/L	1	536	531	0.94	1	600	602	0.33
Total suspended solids	mg/L	1	4	4	0.00	1	265	313	16.61
Major Ions									
Chloride	mg/L	0.5	15.1	15.2	0.66	0.5	14.3	14.5	1.39
Cyanide	mg/L	0.001	0.011	0.011	0.00	0.001	0.023	0.022	4.44
Fluoride	mg/L	0.02	0.17	0.17	0.00	0.02	0.22	0.23	4.44
Sulphate	mg/L	0.6	380	377	0.79	0.6	369	367	0.54
Nutrients and Chlorophyll a									
Total ammonia as NH4	mg/L	0.01	0.36	0.33	8.70	0.01	0.33	0.33	0.00
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00
Total Metals									
Aluminum	mg/L	0.01	0.058	0.039	**39.18**	0.01	3.45	4.37	23.53
Arsenic	mg/L	0.0005	0.0087	0.0091	4.49	0.0005	0.0727	0.0805	10.18
Barium	mg/L	0.0005	0.0288	0.0294	2.06	0.0005	0.037	0.0406	9.28
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0021	0.0017	**21.05**	0.0006	0.0322	0.0383	17.30
Copper	mg/L	0.0005	0.0058	0.0053	9.01	0.0005	0.0231	0.0278	18.47
Iron	mg/L	0.02	0.16	0.14	13.33	0.02	9.12	11.3	21.35
Lead	mg/L	0.0003	0.0003	0.0006	**66.67**	0.0003	0.0124	0.0153	20.94
Manganese	mg/L	0.0005	0.3608	0.2822	24.45	0.0005	0.41	0.492	18.18
Mercury	mg/L	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0118	0.0118	0.00	0.0005	0.0109	0.0113	3.60
Nickel	mg/L	0.0005	0.0372	0.0319	15.34	0.0005	0.1043	0.1231	16.53
Selenium	mg/L	0.0005	0.011	0.0017	*146.46*	0.0005	0.005	0.005	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.00
Zinc	mg/L	0.001	0.002	0.001	**66.67**	0.001	0.177	0.23	26.04
% Exceedance*					3.85%				15.38%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-82 Meadowbank 2019 Central Dike Seepage QAQC (ST-S-5)

Parameter	Sample Date		2019-03-05				2019-06-03				2019-09-03					2019-11-04		2019-12-02	
	Unit	MDL	Field Blank	Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Original	Trip Blank	Original
Conventional Parameters																			
Hardness	mg CaCO3/L	1	1	1423	1464	2.84	1	1004	951	5.42	1	1	1164	1103	5.38	1	932	1	1041
Total alkalinity, as CaCO3	mg CaCO3/L	2	6	109	109	0.00	2	76	81	6.37	5	5	75	71	5.48	8	84	5	108
Total dissolved solids	mg/L	1	4	2246	2208	1.71	1	2024	2009	0.74	14	37	2813	2791	0.79	2	2218	4	24
Total suspended solids	mg/L	1	4	11	12	8.70	1	6	7	15.38	1	1	4	4	0.00	1	2	1	8
Major Ions																			
Chloride	mg/L	0.5	0.5	435	449	3.17	0.5	377	378	0.26	0.5	0.5	318	317	0.31	0.5	319	0.5	375
Cyanide	mg/L	0.001	0.001	0.064	0.063	1.57	0.002	0.082	0.061	29.37	0.001	0.001	0.042	0.043	2.35	0.001	0.038	0.002	0.057
Fluoride	mg/L	0.02	0.02	0.55	0.56	1.80	0.02	0.51	0.53	3.85	0.02	0.02	0.53	0.54	1.87	0.02	0.52	0.02	0.54
Sulphate	mg/L	0.6	0.6	2065	2028	1.81	0.6	1692	1652	2.39	0.6	0.6	1810	1794	0.89	0.6	1683	0.6	1791
Nutrients and Chlorophyll a																			
Total ammonia as NH4	mg/L	0.01	0.01	32.4	31.4	3.13	0.01	29.4	20.6	35.20	0.01	0.01	31.4	32.2	2.52	0.01	21.6	0.01	23.2
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.37	0.35	5.56	0.01	0.26	0.18	36.36	0.01	0.01	0.47	0.53	12.00	0.01	0.25	0.01	0.24
Total Metals																			
Aluminum	mg/L	0.005	0.005	0.009	0.023	**87.50**	0.005	0.027	0.023	16.00	0.005	0.005	0.005	0.005	0.00	0.005	0.006	0.005	0.005
Arsenic	mg/L	0.0005	0.0005	0.0668	0.0683	2.22	0.0005	0.0618	0.0657	6.12	0.0005	0.0005	0.0374	0.0352	6.06	0.0005	0.0673	0.0005	0.0603
Barium	mg/L	0.0005	0.0005	0.0244	0.025	2.43	0.0005	0.0235	0.0214	9.35	0.0005	0.0022	0.0285	0.0281	1.41	0.0005	0.0192	0.0005	0.0176
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00	0.00002	0.00002	0.00002	0.00	0.00002	0.00002	0.00002	0.00002	0.00	0.00002	0.00032	0.00002	0.00036
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.00	0.0006	0.0006	0.0006	0.00	0.0006	0.0006	0.002	0.0006	**107.69**	0.0006	0.0007	0.0006	0.0017
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0009	0.0013	**36.36**	0.0005	0.0005	0.0035	0.003	15.38	0.0005	0.0026	0.0005	0.0069
Iron	mg/L	0.01	0.01	2.83	2.83	0.00	0.01	2.48	2.34	5.81	0.02	0.01	1.14	1.05	8.22	0.01	2.22	0.08	2.02
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.0003
Manganese	mg/L	0.0005	0.0005	2.507	2.504	0.12	0.0005	2.148	2.026	5.85	0.0005	0.0005	2.419	2.254	7.06	0.0005	1.942	0.0005	1.889
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.0018	0.00012	*175.00*	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.0005	0.0005	0.2879	0.2683	7.05	0.0005	0.2185	0.2119	3.07	0.0005	0.0005	0.2666	0.24	10.50	0.0005	0.2224	0.0005	0.1942
Nickel	mg/L	0.0005	0.0005	0.0139	0.0133	4.41	0.0005	0.0779	0.0719	8.01	0.0005	0.0005	0.0324	0.0293	10.05	0.0005	0.0142	0.0005	0.0148
Selenium	mg/L	0.001	0.001	0.0049	0.009	**58.99**	0.0005	0.0086	0.0005	*178.02*	0.0005	0.0005	0.0005	0.0055	*166.67*	0.0005	0.0035	0.0005	0.0021
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.0001
Thallium	mg/L	0.0002	0.0025	0.0023	0.0029	**23.08**	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.0002
Zinc	mg/L	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.001
Dissolved Metals																			
Aluminum	mg/L	0.0005	0.0005	0.008	0.005	*46.15*	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.0005	0.00	0.005	0.005	0.005	0.005
Arsenic	mg/L	0.0005	0.0005	0.0058	0.0084	36.62	0.0005	0.0149	0.0137	8.39	0.0005	0.0005	0.0145	0.0166	13.50	0.0005	0.0186	0.0005	0.0045
Barium	mg/L	0.0005	0.0005	0.02	0.0224	11.32	0.0005	0.0202	0.0212	4.83	0.0039	0.0044	0.0218	0.0266	19.83	0.0005	0.0212	0.0005	0.0139
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00	0.0001	0.00002	0.00004	**66.67**	0.00002	0.00002	0.00002	0.00002	0.00	0.00002	0.0003	0.00002	0.00033
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.00	0.0006	0.0006	0.0006	0.00	0.0006	0.0006	0.0006	0.0006	0.00	0.0006	0.0006	0.0006	0.0006
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0007	0.0005	33.33	0.0005	0.0005	0.0005	0.0007	33.33	0.0005	0.0023	0.0005	0.0073

Iron	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.06	0.1	0.06	0.1
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.0003
Manganese	mg/L	0.0005	0.0005	2.284	2.347	2.72	0.0005	1.914	1.79	6.70	0.0005	0.0005	2.13	2.336	9.23	0.0005	2.005	0.0014	1.654
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00066	**194.03**	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00001
Molybdenum	mg/L	0.0005	0.0005	0.2509	0.258	2.79	0.0005	0.2324	0.2229	4.17	0.0005	0.0005	0.2392	0.2498	4.34	0.0005	0.2372	0.0005	0.1709
Nickel	mg/L	0.0005	0.0005	0.0126	0.0133	5.41	0.0005	0.0764	0.0707	7.75	0.0005	0.0005	0.0279	0.0307	9.56	0.0005	0.0146	0.0005	0.0148
Selenium	mg/L	0.0005	0.0005	0.0058	0.006	3.39	0.0005	0.0007	0.004	**140.43**	0.0014	0.0005	0.0005	0.0038	**153.49**	0.0005	0.0043	0.0005	0.003
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.0001
Thallium	mg/L	0.0002	0.0022	0.0024	0.0024	0.00	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.0002
Zinc	mg/L	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.00	0.001	0.002	0.001	0.001	0.00	0.001	0.001	0.001	0.001
% Exceedance*						2.38%				7.14%					0%				

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-83 Meadowbank 2019 Phaser Pit Sump QAQC (ST-41)

Parameter	Sample Date	MDL	2019-07-08			2019-09-09				2019-09-15	
	Unit		Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD	Trip Blank	Original
Conventional Parameters											
Hardness	mg CaCO3/L	1	87	91	4.49	1	104	106	1.90	1	131
Total alkalinity, as CaCO3	mg CaCO3/L	5	28	25	11.32	5	44	43	2.30	5	48
Total dissolved solids	mg/L	1	173	174	0.58	28	226	226	0.00	11	206
Total suspended solids	mg/L	1	10	10	0.00	1	1	1	0.00	2	2
Major Ions											
Chloride	mg/L	0.5	3.3	3.2	3.08	0.5	3.3	3.2	3.08	0.5	3.8
Cyanide	mg/L	0.001	0.002	0.002	0.00	0.001	0.003	0.002	**40.00**	0.001	0.003
Fluoride	mg/L	0.02	0.11	0.11	0.00	0.02	0.16	0.15	6.45	0.02	0.14
Sulphate	mg/L	0.6	60.8	60.7	0.16	0.6	72.2	75.4	4.34	0.6	70.4
Nutrients and Chlorophyll a											
Total ammonia as NH4	mg/L	0.01	2.09	2.07	0.96	0.01	2.05	2.07	0.97	0.01	2.13
Un-Ionized Ammonia, calculated	mg/L	0.01	0.02	0.02	0.00	0.01	0.04	0.04	0.00	0.01	0.04
Total Metals											
Aluminum	mg/L	0.005	0.343	0.351	2.31	0.005	0.082	0.064	24.66	0.005	0.065
Arsenic	mg/L	0.0005	0.002	0.0022	9.52	0.0005	0.0029	0.003	3.39	0.0005	0.003
Barium	mg/L	0.0005	0.0214	0.0197	8.27	0.0005	0.0213	0.0216	1.40	0.0005	0.0327
Cadmium	mg/L	0.00002	0.00007	0.00011	**44.44**	0.00002	0.00005	0.00002	**85.71**	0.00002	0.00005
Chromium	mg/L	0.0006	0.0013	0.0006	**73.68**	0.0006	0.0015	0.0018	18.18	0.0006	0.0006
Copper	mg/L	0.0005	0.0093	0.0093	0.00	0.0005	0.0059	0.0057	3.45	0.0005	0.0059
Iron	mg/L	0.01	0.58	0.6	3.39	0.01	0.16	0.14	13.33	0.01	0.15
Lead	mg/L	0.0003	0.0004	0.0004	0.00	0.0003	0.0003	0.0003	0.00	0.0003	0.0003
Manganese	mg/L	0.0005	0.1432	0.1454	1.52	0.0005	0.096	0.0923	3.93	0.0005	0.1093
Mercury	mg/L	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00	0.00001	0.00001
Molybdenum	mg/L	0.0005	0.0076	0.0082	7.59	0.0005	0.0193	0.0191	1.04	0.0005	0.0136

Nickel	mg/L	0.0005	0.0113	0.0121	6.84	0.0005	0.0061	0.0063	3.23	0.0005	0.0068
Selenium	mg/L	0.0005	0.0042	0.0005	**157.45**	0.0005	0.0012	0.0005	**82.35**	0.0005	0.0008
Silver	mg/L	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.00	0.0001	0.0001
Thallium	mg/L	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.00	0.0002	0.0002
Zinc	mg/L	0.001	0.005	0.005	0.00	0.002	0.006	0.009	**40.00**	0.001	0.001
% Exceedance*					0%				3.85%		

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-84 Meadowbank 2019 BB Phaser Pit Sump QAQC (ST-42)

Parameter	Sample Date	MDL	2019-09-15			
	Unit		Field Blank	Duplicate	Original	RPD
Conventional Parameters						
Hardness	mg CaCO3/L	1	1	105	115	9.09
Total alkalinity, as CaCO3	mg CaCO3/L	5	5	47	45	4.35
Total dissolved solids	mg/L	1	11	175	172	1.73
Total suspended solids	mg/L	1	1	10	8	*22.22*
Major Ions						
Chloride	mg/L	0.5	0.5	3	2.8	6.90
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.00
Fluoride	mg/L	0.02	0.02	0.14	0.14	0.00
Sulphate	mg/L	0.6	0.6	66.7	64.3	3.66
Nutrients and Chlorophyll a						
Total ammonia as NH4	mg/L	0.01	0.02	0.51	0.52	1.94
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.01	0.01	0.00
Total Metals						
Aluminum	mg/L	0.005	0.005	0.092	0.124	29.63
Arsenic	mg/L	0.0005	0.0005	0.0033	0.0033	0.00
Barium	mg/L	0.0005	0.0005	0.0252	0.0292	14.71
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0008	**28.57**
Copper	mg/L	0.0005	0.0005	0.0083	0.0095	13.48
Iron	mg/L	0.01	0.01	0.18	0.19	5.41
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00
Manganese	mg/L	0.0005	0.0005	0.0944	0.1024	8.13
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0073	0.0078	6.62
Nickel	mg/L	0.0005	0.0005	0.0061	0.0065	6.35
Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.00
% Exceedance*						3.85%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-85 Meadowbank 2019 Phaser Attenuation Pond QAQC (ST-43)

Parameter	Sample Date	MDL	2019-07-08				
	Unit		Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters							
Hardness	mg CaCO3/L	1	1	1	74	68	8.45
Total alkalinity, as CaCO3	mg CaCO3/L	2	2	2	12	40	*107.69*
Total dissolved solids	mg/L	1	1	1	148	73	67.87
Total suspended solids	mg/L	1	1	1	13	12	8.00
Major Ions							
Chloride	mg/L	0.5	0.5	0.5	2.6	2.4	8.00
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.001	0.00
Fluoride	mg/L	0.02	0.02	0.02	0.09	0.09	0.00
Sulphate	mg/L	0.6	0.6	0.6	62.8	66.7	6.02
Nutrients and Chlorophyll a							
Total ammonia as NH4	mg/L	0.01	0.01	0.01	2.07	2.05	0.97
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.01	0.01	0.01	0.00
Total Metals							
Aluminum	mg/L	0.005	0.005	0.005	0.902	0.767	16.18
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0022	0.002	9.52
Barium	mg/L	0.0005	0.0005	0.0005	0.0164	0.016	2.47
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00024	0.00035	37.29
Chromium	mg/L	0.0006	0.0006	0.0006	0.001	0.0007	**35.29**
Copper	mg/L	0.0005	0.0005	0.0005	0.0197	0.0179	9.57
Iron	mg/L	0.01	0.01	0.01	0.03	1.38	*191.49*
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.1654	0.1789	7.84
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0021	0.0028	**28.57**
Nickel	mg/L	0.0005	0.0005	0.0005	0.0236	0.0268	12.70
Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0043	**158.33**
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.00
Zinc	mg/L	0.001	0.001	0.001	0.009	0.025	*94.12*
% Exceedance*							7.69%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-86 Meadowbank 2019 Sewage Treatment Plan QAQC (STP)

STP-SEP	Sample Date	MDL	2019-02-04			2019-05-08			2019-10-08	
Parameter	**Unit**		**Duplicate**	**Original**	**RPD**	**Duplicate**	**Original**	**RPD**	**Trip Blank**	**Original**
Biochemical Oxygen Demand	mg/L	**1**	11	11	0.00	5	5	0.00	2	7
Chemical Oxygen Demand	mg/L	**7**	70	77	9.52	72	67	7.19	7	56
Nitrogen	mg/L	**0.05**	36.6	33.4	9.14	24.1	19.1	23.15	0.16	40.8
Total ammonia as NH4	mg/L	**0.01**	29.8	29.4	1.35	4.64	23.8	134.74	0.01	33.9
Total Suspended Solids	mg/L	**1**	10	11	9.52	9	8	11.76	1	7
Un-Ionized Ammonia, calculated	mg/L	**0.01**	0.35	0.31	12.12	0.02	0.15	*152.94*	0.01	0.33
% Exceedance*				0%				33.33%		

STP-LJ-MIX	Sample Date	MDL	2019-02-04			2019-08-05				2019-11-04		
Parameter	**Unit**		**Duplicate**	**Original**	**RPD**	**Trip Blank**	**Duplicate**	**Original**	**RPD**	**Duplicate**	**Original**	**RPD**
Biochemical Oxygen Demand	mg/L	**1**	6	5	18.18	1	11	12	8.70	31	56	57.47
Chemical Oxygen Demand	mg/L	**7**	57	53	7.27	7	85	88	3.47	72	84	15.38
Nitrogen	mg/L	**0.05**	15.6	14.7	5.94	0.05	47.9	49.8	3.89	82.2	73.1	11.72
Total ammonia as NH4	mg/L	**0.01**	13.8	11.3	19.92	0.01	46.5	47.1	1.28	31.7	32.3	1.87
Total Suspended Solids	mg/L	**1**	8	8	0.00	1	11	21	62.50	25	36	36.07
Un-Ionized Ammonia, calculated	mg/L	**0.01**	0.08	0.07	13.33	0.01	0.24	0.21	13.33	0.16	0.12	28.57
% Exceedance*					0%				16.67%			50%

STP-IN	Sample Date	MDL	2019-02-04			2019-11-04			
Parameter	Unit		Duplicate	Original	RPD	Trip Blank	Duplicate	Original	RPD
Biochemical Oxygen Demand	mg/L	1	266	254	4.62	1	123	111	10.26
Chemical Oxygen Demand	mg/L	7	523	510	2.52	7	409	398	2.73
Nitrogen	mg/L	0.05	93.2	89.3	4.27	0.05	137	135	1.47
Phosphorus	mg/L	0.01	8.23	7.75	6.01	0.01	10.1	8.94	12.18
Total ammonia as NH4	mg/L	0.01	76.2	67.6	11.96	0.01	116	116	0.00
Total Suspended Solids	mg/L	1	158	188	17.34	1	92	102	10.31
Un-Ionized Ammonia, calculated	mg/L	0.01	0.8	0.7	13.33	0.01	7.5	5.65	28.14
% Exceedance*				0%					14.29%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-87 Meadowbank 2019 Bulk Fuel QAQC (ST-37, ST-38, ST-40)

Parameter	Sample Date	MDL	2019-06-09				2019-06-09				2019-06-09				2019-06-10			
	Location		ST-38				ST-40.1				ST-40.2				ST-37			
	Unit		Field Blank	Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD
Total Suspended Solids	mg/L	1	1	8	9	11.76	1	12	10	18.18	1	14	8	*54.55*	1	2	4	**66.67**
Total ammonia as NH4	mg/L	0.01	0.01	0.04	0.01	**120.00**	0.02	0.05	0.01	**133.33**	0.01	0.01	0.02	**66.67**	0.01	0.01	0.01	0.00
Oil & Grease, Total Rec	mg/L	1	1	1	1	0.00	1	-	1	-	1	-	2	-	1	1	1	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.00	0.0005	0.0025	0.0024	4.08
Copper	mg/L	0.0005	0.0023	0.0026	0.0015	**53.66**	0.0021	0.0043	0.0059	*31.37*	0.0015	0.0037	0.0037	0.00	0.0005	0.0042	0.0048	13.33
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.00
Nickel	mg/L	0.0005	0.0005	0.0007	0.0005	**33.33**	0.0005	0.0006	0.0007	15.38	0.0005	0.0005	0.0005	0.00	0.0005	0.0018	0.0027	**40.00**
Zinc	mg/L	0.001	0.001	0.02	0.015	28.57	0.001	0.001	0.001	0.00	0.001	0.007	0.081	*168.18*	0.001	0.001	0.001	0.00
Benzene	mg/L	0.0002	-	0.0002	0.0002	0.00	-	0.0002	0.0002	0.00	-	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.00
Ethylbenzene	mg/L	0.0001	-	0.0001	0.0001	0.00	-	0.0001	0.0001	0.00	-	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.00
Toluene	mg/L	0.001	-	0.001	0.001	0.00	-	0.001	0.001	0.00	-	0.001	0.001	0.00	0.001	0.001	0.001	0.00
% Exceedance*						9.09%				0%				0%				0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MD

8.5.7.2 *Whale Tail Site*

The following presents the percentage of duplicate and field samples collected from each of the monitoring programs:

- MDMER and EEM monitoring programs: 20 duplicate samples, 20 field blanks and 17 trip blanks were collected from a total of 86 samples, representing 23.3%;
- Surface water monitoring programs: 23 duplicate samples, 23 field blanks and 25 trip blanks were collected from a total of 131 samples, representing 17.6%;
- STP monitoring program: 9 duplicate samples. 9 field blanks and 7 trip blanks were collected from a total of 75 samples, representing 12.0%;
- Bulk fuel storage facilities monitoring program: no duplicate, field blanks or trip blank samples for 2019; and
- Dike Construction and Dewatering: 51 duplicate, 35 field blanks and 42 trip blanks samples were collected from a total of 307 samples, representing 16.6%

This represents approximately 17.2% of the samples collected, which is higher than the QA/QC duplicate program objective of 10%.

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 8-88 to 8-102 for the MDMER and EEM, Surface Water, STP, respectively and Appendix 19 for the dike construction and dewatering results.. The following is a brief summary of the QA/QC results, per sampling program:

- MDMER and EEM (Tables 8-88 and 8-89): All the duplicate samples collected were considered as having high analytical precision except for two (2) having a medium analytical precision of 12.50%.

- Surface Water (Tables 8-90 and 8-100): All QAQC sampling events conducted within the surface water quality program are rated as having high analytical precision except for one (1) having a medium analytical precision of 10%.

- STP (Table 8-101 and 8-102): All QAQC sampling events conducted within the surface water quality program are rated as having high analytical precision.

- Dike Construction and Dewatering Results (Appendix 19): Analytical precision is rated high for the duplicate sampling event except for three (3) sampling events having a medium analytical precision between 15.4% and 24.00% and four (4) sampling event having a low analytical precision between 33.99% and 195%. However, as the number of parameters analysed is low, one sample with notable variation between field and duplicate samples will trigger a medium or low 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 2019. Agnico 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 datasheet are kept for future reference, if needed.

QA/QC methods and results for specific field programs are discussed separately in their respective reports; these field programs are presented in the Appendices listed below:

- Appendix 35 *Core Receiving Environment Monitoring Program 2019* – Sections 3;

- Appendix 47: *2019 Groundwater Monitoring Report*– Sections 5;

- Appendix 41: *Air Quality and Dustfall Monitoring Report 2019*– Section 4.4.

Table 8-88 Whale Tail 2019 MDMER QAQC (ST-MMER-5-6-7)

ST-MDMER-5	Sample Date		2019-03-11					2019-04-01				2019-10-04				
Parameter	Unit	MDL	Trip Blank	Field Blank	Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters																
Total suspended solids	mg/L	1	1	1	4	4	0.00	1	1	1	0.00	2	1	9	10	10.53
Major Ions																
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.001	0.002	0.002	0.00	0.001	0.001	0.001	0.001	0.00
Total Metals																
Arsenic	mg/L	0.0005	0.0005	0.0005	0.002	0.0018	10.53	0.0005	0.003	0.0028	6.90	0.001	0.001	0.0081	0.0084	3.64
Copper	mg/L	0.0005	0.0005	0.0005	0.0023	0.0014	**48.65**	0.0765	0.0055	0.0062	11.97	0.001	0.001	0.0013	0.0013	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.002	**147.83**	0.0003	0.0003	0.0003	0.00	0.0005	0.0005	0.0017	0.0005	**109.09**
Nickel	mg/L	0.0005	0.0005	0.0005	0.0034	0.0031	9.23	0.0096	0.0031	0.0037	17.65	0.002	0.002	0.002	0.002	0.00
Zinc	mg/L	0.001	0.001	0.001	0.002	0.003	**40.00**	0.58	0.002	0.006	**100.00**	0.007	0.007	0.007	0.007	0.00
Radionuclides																
Radium-226	Bq/l	0.002	0.002	0.002	0.002	0.006	**100.00**	0.004	0.004	0.011	**93.33**	0.005	0.007	0.004	0.007	**54.55**
% Exceedance*							**0%**				**0%**					**0%**

ST-MDMER-5	Sample Date		2019-10-07					2019-11-09					2019-12-02				
Parameter	Unit	MDL	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters																	
Total suspended solids	mg/L	1	1	1	4	3	**28.57**	1	1	9	5	**57.14**	2	1	1	2	**66.67**
Major Ions																	
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.003	0.007	**80.00**
Total Metals																	
Arsenic	mg/L	0.0005	0.001	0.001	0.0082	0.0083	1.21	0.0008	0.0015	0.0097	0.0089	8.60	0.0005	0.0005	0.0008	0.0024	**100.00**
Copper	mg/L	0.0005	0.001	0.001	0.0012	0.0013	8.00	0.0005	0.0005	0.0035	0.0047	**29.27**	0.006	0.0005	0.0005	0.0005	0.00
Lead	mg/L	0.0003	0.0005	0.0005	0.0005	0.0005	0.00	0.0006	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.0003	0.00
Nickel	mg/L	0.0005	0.002	0.002	0.002	0.002	0.00	0.0005	0.0005	0.0031	0.0033	6.25	0.0005	0.0005	0.0028	0.0026	7.41
Zinc	mg/L	0.001	0.007	0.007	0.007	0.007	0.00	0.001	0.001	0.003	0.004	**28.57**	0.001	0.001	0.001	0.004	**120.00**
Radionuclides																	
Radium-226	Bq/l	0.002	0.002	0.002	0.002	0.002	0.00	0.002	0.002	0.007	0.008	13.33	0.002	0.002	0.012	0.012	0.00
% Exceedance*							0%					0%					0%

ST-MDMER-6	Sample Date		2019-06-23					2019-08-19					2019-09-02				
Parameter	Unit	MDL	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters																	
Total suspended solids	mg/L	1	1	1	2	10	**133.33**	1	1	3	3	0.00	1	1	5	5	0.00
Major Ions																	
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.001	0.00
Total Metals																	
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0021	0.0019	10.00	0.0005	0.0005	0.0016	0.0016	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0033	0.0012	**93.33**	0.0005	0.0005	0.0013	0.001	**26.09**
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.0004	0.0003	0.0004	0.0003	**28.57**	0.0003	0.0003	0.0003	0.0003	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0058	0.0044	*27.45*	0.0005	0.0005	0.0023	0.0025	8.33	0.0005	0.0005	0.0027	0.0027	0.00
Zinc	mg/L	0.001	0.001	0.001	0.015	0.008	*60.87*	0.009	0.001	0.017	0.012	34.48	0.001	0.001	0.011	0.006	*58.82*
Radionuclides																	
Radium-226	Bq/l	0.002	0.002	0.002	0.036	0.027	28.57	0.002	0.002	0.006	0.005	18.18	0.002	0.002	0.007	0.006	15.38
% Exceedance*							12.50%					12.50%					0%

ST-MDMER-6	Sample Date		2019-10-02					2019-10-07		2019-10-21	
Parameter	Unit	MDL	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Original	Trip Blank	Original
Conventional Parameters											
Total suspended solids	mg/L	1	1	1	5	4	**22.22**	1	5	1	4
Major Ions											
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.001
Total Metals											
Arsenic	mg/L	0.0005	0.001	0.001	0.0017	0.0018	5.71	0.001	0.0018	0.0005	0.01
Copper	mg/L	0.0005	0.001	0.001	0.001	0.001	0.00	0.001	0.0011	0.0005	0.0007
Lead	mg/L	0.0003	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0003	0.0003
Nickel	mg/L	0.0005	0.002	0.002	0.0026	0.0021	**21.28**	0.002	0.0024	0.0005	0.0024
Zinc	mg/L	0.001	0.007	0.007	0.007	0.007	*0.00*	0.007	0.007	0.001	0.003
Radionuclides											
Radium-226	Bq/l	0.002	0.002	0.008	0.01	0.014	**33.33**	0.002	0.012	0.007	0.021
% Exceedance*							0%				

ST-MDMER-7	Sample Date		2019-09-01					2019-10-14	
Parameter	Unit	MDL	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Original
Conventional Parameters									
Total suspended solids	mg/L	1	1	1	8	6	**28.57**	1	5
Major Ions									
Cyanide	mg/L	0.001	0.001	0.001	0.004	0.005	**22.22**	0.001	0.016
Total Metals									
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0112	0.0108	3.64	0.0005	0.0089
Copper	mg/L	0.0005	0.0005	0.0005	0.0033	0.0111	*108.33*	0.0005	0.0029
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0009	**100.00**	0.0003	0.0003
Nickel	mg/L	0.0005	0.0005	0.0005	0.0139	0.0129	7.46	0.0005	0.0143
Zinc	mg/L	0.001	0.001	0.001	0.002	0.013	*146.67*	0.001	0.001
Radionuclides									
Radium-226	Bq/l	0.002	0.002	0.002	0.028	0.025	11.32	0.002	0.002
% Exceedance*	0%								

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-89 Whale Tail 2019 EEM QAQC

Water Quality Monitoring Effluent characterization (ST-MDMER-5-EEM)						
Parameter	Sample Date		2019-03-11			
	Unit	MDL	Field Blank	Duplicate	Original	RPD
Conventional Parameters						
Hardness	mg CaCO3/L	1	1	85	82	3.59
Total alkalinity, as CaCO3	mg CaCO3/L	2	6	23	23	0.00
Major Ions						
Chloride	mg/L	0.5	0.5	57.2	57.5	0.52
Sulphate	mg/L	0.6	0.6	5.3	3	**55.42**
Nutrients and Chlorophyll a						
Nitrate	mg/L	0.01	0.01	0.01	0.01	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.00
Ammonia	mg/L	0.01	0.01	0.17	0.15	12.50
Total Metals						
Aluminum	mg/L	0.005	0.005	0.075	0.078	3.92
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0015	0.0018	18.18
Cobalt	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Iron	mg/L	0.01	0.01	0.17	0.17	0.00
Manganese	mg/L	0.0005	0.0005	0.0548	0.0508	7.58
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0016	0.0017	6.06
Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00
Uranium	mg/L	0.001	0.001	0.001	0.001	0.00
% Exceedances*						0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Water Quality Monitoring Effluent characterization (ST-MDMER-6-EEM)							
Parameter	Sample Date		2019-08-05				
	Unit	MDL	Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters							
Hardness	mg CaCO3/L	1	1	1	54	54	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	2	41	41	73	74	1.36
Major Ions							
Chloride	mg/L	0.5	0.5	0.5	35.1	34.5	1.72
Sulphate	mg/L	0.6	0.6	0.6	3.9	4.7	18.60
Nutrients and Chlorophyll a							
Nitrate	mg/L	0.01	0.01	0.01	0.2	0.15	28.57
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.02	**66.67**
Ammonia	mg/L	0.01	0.01	0.04	0.01	0.01	0.00
Total Metals							
Aluminum	mg/L	0.005	0.005	0.005	0.128	0.109	16.03
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0015	0.0018	18.18
Cobalt	mg/L	0.0005	0.0005	0.0005	0.0005	0.0006	18.18
Iron	mg/L	0.01	0.01	0.01	0.49	0.5	2.02
Manganese	mg/L	0.0005	0.0005	0.0005	0.1643	0.1642	0.06
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0021	0.0022	4.65
Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.00
Uranium	mg/L	0.001	0.001	0.001	0.001	0.001	0.00
% Exceedances*							6%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Water Quality Monitoring Effluent characterization (ST-MDMER-7-EEM)							
Parameter	Sample Date		2019-08-27				
	Unit	MDL	Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters							
Hardness	mg CaCO3/L	1	1	1	179	184	2.75
Total alkalinity, as CaCO3	mg CaCO3/L	2	5	5	40	46	13.95
Major Ions							
Chloride	mg/L	0.5	0.9	0.8	46.7	45.5	2.60
Sulphate	mg/L	0.6	0.9	0.7	69.5	70.8	1.85
Nutrients and Chlorophyll a							
Nitrate	mg/L	0.01	0.01	0.01	6.90	6.33	8.62
Total phosphorus	mg/L	0.01	0.01	0.01	0.02	0.03	**40.00**
Ammonia	mg/L	0.01	0.04	0.03	1.1	1.17	6.17
Total Metals							
Aluminum	mg/L	0.005	0.005	0.005	0.285	0.311	8.72
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0058	0.0063	8.26
Cobalt	mg/L	0.0005	0.0005	0.0005	0.0019	0.002	5.13
Iron	mg/L	0.01	0.01	0.01	0.5	0.54	7.69
Manganese	mg/L	0.0005	0.0005	0.0005	0.2517	0.261	3.63
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.011	0.0118	7.02
Selenium	mg/L	0.0006	0.0006	0.0006	0.0024	0.0017	**34.15**
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.00
Uranium	mg/L	0.001	0.001	0.001	0.004	0.004	0.00
% Exceedances*							0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Water Quality Monitoring Reference Area Whale Tail Lake South Basin (ST-MDMER-5-EEM-WTSE)										
Parameter	Sample Date		2019-03-11				2019-07-17			
	Unit	MDL	Field Blank	Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD
Conventional Parameters										
Hardness	mg CaCO3/L	1	1	36	34	5.71	1	24	26	8.00
Total alkalinity, as CaCO3	mg CaCO3/L	2	7	17	19	11.11	2	7	7	0.00
Total suspended solids	mg/L	1	1	1	1	0.00	5	6	8	**28.57**
Major Ions										
Chloride	mg/L	0.5	0.5	20.7	21.1	1.91	0.5	16.9	16.8	0.59
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.00
Sulphate	mg/L	0.6	0.6	4	8	*66.67*	0.6	3.2	1.6	**66.67**
Nutrients and Chlorophyll a										
Nitrate	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.11	0.11	0.00
Total phosphorus	mg/L	0.01	0.01	0.02	0.01	**66.67**	0.01	0.01	0.01	0.00
Ammonia	mg/L	0.01	0.01	0.03	0.04	**28.57**	0.01	0.02	0.01	**66.67**
Total Metals										
Aluminum	mg/L	0.005	0.005	0.026	0.029	10.91	0.005	0.009	0.005	**57.14**
Arsenic	mg/L	0.0005	0.0005	0.0006	0.0005	18.18	0.0005	0.0005	0.0006	18.18
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00004	**66.67**	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.00	0.0006	0.0011	0.0012	8.70
Cobalt	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.00
Iron	mg/L	0.01	0.01	0.04	0.04	0.00	0.01	0.05	0.05	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.00
Manganese	mg/L	0.0005	0.0005	0.0132	0.0118	11.20	0.0005	0.0197	0.0189	4.15
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.00
Nickel	mg/L	0.0005	0.0005	0.0013	0.0012	8.00	0.0005	0.0013	0.0012	8.00
Selenium	mg/L	0.0005	0.0013	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.00
Uranium	mg/L	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.00
Zinc	mg/L	0.001	0.001	0.002	0.001	**66.67**	0.001	0.001	0.001	0.00
Radionuclides										
Radium-226	Bq/l	0.002	0.002	0.002	0.002	0.00	0.002	0.002	0.007	**111.11**
% Exceedances*						0%				0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Water Quality Monitoring Reference Area Whale Tail Lake South Basin (ST-MDMER-6-EEM-MAME)								
Parameter	Sample Date		2019-07-17				2019-09-03	
	Unit	MDL	Field Blank	Duplicate	Original	RPD	Trip Blank	Original
Conventional Parameters								
Hardness	mg CaCO3/L	1	1	26	25	3.92	1	52
Total alkalinity, as CaCO3	mg CaCO3/L	2	2	6	6	0.00	5	12
Total suspended solids	mg/L	1	1	1	1	0.00	1	1
Major Ions								
Chloride	mg/L	0.5	0.5	16.8	15.9	5.50	0.5	20.7
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.00	0.001	0.001
Sulphate	mg/L	0.6	0.6	3.7	4	7.79	0.6	10.3
Nutrients and Chlorophyll a								
Nitrate	mg/L	0.01	0.01	0.01	0.01	0.00	0.35	0.35
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.01
Ammonia	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.02
Total Metals								
Aluminum	mg/L	0.005	0.006	0.012	0.022	**58.82**	0.005	0.005
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0009
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00	0.00002	0.00002
Chromium	mg/L	0.0006	0.0006	0.0008	0.001	**22.22**	0.0006	0.0006
Cobalt	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0011	0.0022
Iron	mg/L	0.01	0.01	0.03	0.04	**28.57**	0.01	0.08
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003
Manganese	mg/L	0.0005	0.0005	0.0085	0.0081	4.82	0.0005	0.0218
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.001
Nickel	mg/L	0.0005	0.0005	0.0011	0.0012	8.70	0.0005	0.0016
Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002
Uranium	mg/L	0.001	0.001	0.001	0.001	0.00	0.001	0.001
Zinc	mg/L	0.001	0.001	0.001	0.001	0.00	0.001	0.001
Radionuclides								
Radium-226	Bq/l	0.002	0.002	0.002	0.002	0.00	0.002	0.002
% Exceedances*						0%		

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Water Quality Monitoring Effluent characterization (EEM-7-MAME-2)							
Parameter	Sample Date		2019-09-03				
	Unit	MDL	Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters							
Hardness	mg CaCO3/L	1	1	1	48	49	2.06
Total alkalinity, as CaCO3	mg CaCO3/L	2	5	5	13	10	**26.09**
Total suspended solids	mg/L	1	1	1	1	1	0.00
Major Ions							
Chloride	mg/L	0.5	0.5	0.5	20.3	20.3	0.00
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.001	0.00
Sulphate	mg/L	0.6	0.6	0.6	10.8	8.8	20.41
Nutrients and Chlorophyll a							
Nitrate	mg/L	0.01	0.51	0.28	0.42	0.41	2.41
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.00
Ammonia	mg/L	0.01	0.04	0.01	0.01	0.02	**66.67**
Total Metals							
Aluminum	mg/L	0.005	0.005	0.005	0.005	0.005	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0011	0.0013	16.67
Cadmium	mg/L	0.00002	0.00014	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0008	0.0008	0.00
Cobalt	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0016	0.002	**22.22**
Iron	mg/L	0.01	0.01	0.01	0.06	0.06	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.0175	0.0168	4.08
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0008	0.001	**22.22**
Nickel	mg/L	0.0005	0.0005	0.0005	0.0016	0.0019	17.14
Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0011	**75.00**
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.00
Uranium	mg/L	0.001	0.001	0.001	0.001	0.001	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.00
Radionuclides							
Radium-226	Bq/l	0.002	0.002	0.002	0.002	0.002	0.00
% Exceedances*							3.8%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Water Quality Monitoring Reference Area Third Portage Lake (ST-MMER-3-EEM-TPS)										
Parameter	**Sample Date**		**2019-03-12**				**2019-12-15**			
	Unit	**MDL**	**Field Blank**	**Duplicate**	**Original**	**RPD**	**Field Blank**	**Duplicate**	**Original**	**RPD**
Conventional Parameters										
Hardness	mg CaCO3/L	1	1	10	10	0.00	1	10	10	0.00
Total alkalinity, as CaCO3	mg CaCO3/L	2	6	16	16	0.00	8	16	16	0.00
Total suspended solids	mg/L	1	1	1	1	0.00	1	1	1	0.00
Major Ions										
Chloride	mg/L	0.5	0.5	1.1	1	9.52	0.5	0.8	0.7	13.33
Cyanide	mg/L	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.00
Sulphate	mg/L	0.6	1	6.3	7.8	21.28	0.6	5.9	4.5	**26.92**
Nutrients and Chlorophyll a										
Nitrate	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.00
Ammonia	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.03	0.02	**40.00**
Total Metals										
Aluminum	mg/L	0.005	0.005	0.005	0.005	0.00	0.005	0.005	0.005	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0008	0.001	0.0011	9.52
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.00	0.0006	0.0006	0.0009	**40.00**
Cobalt	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.00
Copper	mg/L	0.0005	0.0174	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.00
Iron	mg/L	0.01	0.01	0.01	0.01	0.00	0.09	0.08	0.08	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.00
Nickel	mg/L	0.001	0.001	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.00
Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0008	0.0005	0.0005	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.00
Uranium	mg/L	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.00
Zinc	mg/L	0.05	0.05	0.002	0.001	**66.67**	0.001	0.001	0.001	0.00
Radionuclides										
Radium-226	Bq/l	0.002	-	-	-	-	0.002	0.002	0.005	**85.71**
% Exceedances*						4%				0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-90 Whale Tail 2019 WRSF QAQC (ST-WT-3)

Parameter	Sample Date	MDL	2019-06-04				2019-08-21					2019-09-15					2019-09-22				
	Unit		Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters																					
Hardness	mg CaCO3/L	1	1	15	16	6.45	1	1	223	209	6.48	1	1	432	452	4.52	1	1	400	424	5.83
Total alkalinity, as CaCO3	mg CaCO3/L	2	3	9	9	0.00	7	5	53	49	7.84	5	5	56	62	10.17	5	5	50	49	2.02
Total Dissolved Solids	mg/L	1	1	15	14	6.90	11	14	387	387	0.00	13	7	600	607	1.16	5	8	557	563	1.07
Total suspended solids	mg/L	1	1	50	47	6.19	2	2	6	11	*58.82*	1	1	20	20	0.00	1	1	5	6	18.18
Major Ions																					
Chloride	mg/L	0.5	0.5	1.4	1.2	15.38	0.5	0.5	26.5	27.2	2.61	0.5	0.5	38.1	43.3	12.78	0.5	0.5	33.4	36.7	9.42
Fluoride	mg/L	0.02	0.03	0.05	0.05	0.00	0.05	0.05	0.11	0.11	0.00	0.02	0.02	0.08	0.08	0.00	0.02	0.02	0.07	0.09	**25.00**
Sulphate	mg/L	0.6	0.6	2.1	2.2	4.65	1.9	0.6	152	149	1.99	0.6	0.6	321	289	10.49	0.6	0.6	273	255	6.82
Nutrients and Chlorophyll a																					
Total phosphorus	mg/L	0.01	0.01	0.06	0.06	0.00	0.01	0.01	0.05	0.04	**22.22**	0.01	0.01	0.05	0.05	0.00	0.01	0.01	0.04	0.05	**22.22**
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.14	0.14	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.03	0.03	0.00	0.01	0.31	0.01	0.01	0.00
Total ammonia as NH4	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.82	0.81	1.23	0.01	0.01	1.41	1.55	9.46	0.01	0.01	1.48	1.65	10.86
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00
Total Metals																					
Aluminum	mg/L	0.005	0.005	3.18	4.28	29.49	0.005	0.005	0.025	0.025	0.00	0.005	0.005	0.493	0.525	6.29	0.005	0.005	0.15	0.156	3.92
Arsenic	mg/L	0.0005	0.0005	0.0099	0.0112	12.32	0.0005	0.0005	0.0074	0.007	5.56	0.0005	0.0005	0.0085	0.0089	4.60	0.0005	0.0005	0.0064	0.0072	11.76
Barium	mg/L	0.0005	0.0005	0.028	0.0445	45.52	0.0005	0.0005	0.0803	0.0809	0.74	0.0005	0.0005	0.1265	0.1369	7.90	0.0005	0.0005	0.1175	0.1253	6.43
Cadmium	mg/L	0.00002	0.00002	0.00006	0.00006	0.00	0.00002	0.00006	0.00002	0.00002	0.00	0.00002	0.00002	0.00004	0.00004	0.00	0.00002	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0255	0.0248	2.78	0.0006	0.0006	0.001	0.0007	**35.29**	0.0006	0.0006	0.0067	0.0084	22.52	0.0006	0.0006	0.0015	0.0015	0.00
Copper	mg/L	0.0005	0.0011	0.0071	0.0068	4.32	0.0005	0.0005	0.0017	0.0012	**34.48**	0.0005	0.0005	0.0033	0.0036	8.70	0.0005	0.0005	0.0022	0.0022	0.00
Iron	mg/L	0.01	0.01	5.5	5.71	3.75	0.01	0.01	0.26	0.27	3.77	0.01	0.01	1.51	1.58	4.53	0.01	0.01	0.62	0.67	7.75
Lead	mg/L	0.0003	0.0003	0.0003	0.0004	**28.57**	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0013	0.0003	**125.00**
Manganese	mg/L	0.0005	0.0005	0.1172	0.1106	5.79	0.0005	0.0005	0.5512	0.503	9.14	0.0005	0.0005	0.8015	0.8317	3.70	0.0005	0.0005	0.5566	0.5891	5.67
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00002	0.00002	0.00	0.00001	0.00003	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0015	0.0013	14.29	0.0005	0.0005	0.0013	0.0011	16.67	0.0005	0.0005	0.0012	0.0012	0.00
Nickel	mg/L	0.0005	0.0005	0.019	0.0183	3.75	0.0005	0.0005	0.0374	0.035	6.63	0.0007	0.0005	0.0472	0.0484	2.51	0.0005	0.0005	0.0544	0.0562	3.25
Selenium	mg/L	0.0005	0.0005	0.0054	0.0043	*22.68*	0.0005	0.0005	0.0046	0.0039	16.47	0.0005	0.0005	0.008	0.0095	17.14	0.0005	0.0005	0.0062	0.0043	*36.19*
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.0001	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.0002	0.00
Zinc	mg/L	0.001	0.001	0.003	0.005	**50.00**	0.002	0.001	0.001	0.002	**66.67**	0.001	0.001	0.002	0.006	**100.00**	0.001	0.001	0.001	0.001	0.00
Dissolved Metals																					
Aluminum	mg/L	0.005	0.005	0.152	0.147	3.34	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.0005	0.00
Arsenic	mg/L	0.0005	0.0005	0.0014	0.0017	19.35	0.0005	0.0005	0.0047	0.0048	2.11	0.0005	0.0005	0.0034	0.0033	2.99	0.0005	0.0005	0.0025	0.0023	8.33
Barium	mg/L	0.0005	0.0015	0.006	0.004	*40.00*	0.0005	0.0005	0.0763	0.0727	4.83	0.0005	0.0005	0.1046	0.1157	10.08	0.0005	0.0005	0.0936	0.0921	1.62
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00	0.00003	0.00002	0.00003	0.00002	**40.00**	0.00002	0.00002	0.00008	0.00004	**66.67**	0.00002	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0007	0.0006	15.38	0.0006	0.0006	0.0006	0.0006	0.00	0.0006	0.0006	0.0006	0.0006	0.00	0.0006	0.0006	0.0006	0.0006	0.00

Copper	mg/L	0.0005	0.0005	0.0014	0.0012	15.38	0.0005	0.0005	0.0012	0.0011	8.70	0.0005	0.0005	0.0016	0.0018	11.76	0.0005	0.0005	0.0016	0.0011	**37.04**
Iron	mg/L	0.01	0.01	0.17	0.15	12.50	0.01	0.01	0.07	0.06	15.38	0.01	0.01	0.05	0.05	0.00	0.01	0.01	0.08	0.07	13.33
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.0003	0.00
Manganese	mg/L	0.0005	0.0005	0.0165	0.0128	25.26	0.0005	0.0005	0.5065	0.4849	4.36	0.0005	0.0005	0.6701	0.806	18.41	0.0005	0.0005	0.4937	0.4758	3.69
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0015	0.0012	**22.22**	0.0005	0.0005	0.0011	0.0018	**48.28**	0.0005	0.0005	0.0005	0.0006	18.18
Nickel	mg/L	0.0005	0.0005	0.0039	0.0037	5.26	0.0005	0.0005	0.034	0.033	2.99	0.0005	0.0005	0.037	0.0449	19.29	0.0019	0.0005	0.0462	0.0465	0.65
Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00	0.001	0.0005	0.004	0.0037	7.79	0.0005	0.0005	0.0061	0.009	38.41	0.0005	0.0005	0.0037	0.0041	10.26
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.0001	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.0002	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.001	0.00
% Exceedance*						6.98%					0%					4.65%					0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-91 Whale Tail 2019 Pit Sump QAQC (ST-WT-4)

Parameter	Sample Date	MDL	2019-06-11					2019-08-11					2019-09-09					2019-10-13		2019-12-12				
	Unit		Field Blank	Trip Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Original	Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters																								
Hardness	mg CaCO3/L	1	1	1	38	38	0.00	1	1	196	186	5.24	1	1	351	333	5.26	1	414	1	1	444	455	2.45
Total alkalinity, as CaCO3	mg CaCO3/L	2	3	3	15	15	0.00	5	5	57	56	1.77	5	5	89	81	9.41	8	75	8	8	74	77	3.97
Total dissolved solids	mg/L	1	1	1	51	52	1.94	5	13	433	430	0.70	21	10	531	528	0.57	1	652	1	1	687	688	0.15
Total suspended solids	mg/L	1	1	1	197	225	13.27	1	1	41	40	2.47	1	1	486	664	30.96	1	28	1	1	8	9	11.76
Major Ions																								
Chloride	mg/L	0.5	0.5	1	11.6	11.3	2.62	0.5	0.5	49.2	48.9	0.61	0.5	0.5	86.8	90.6	4.28	0.5	157	0.5	0.5	263	260	1.15
Fluoride	mg/L	0.02	0.02	0.02	0.06	0.06	0.00	0.05	0.05	0.14	0.15	6.90	0.02	0.02	0.15	0.15	0.00	0.02	0.16	0.02	0.02	0.1	0.14	**33.33**
Sulphate	mg/L	0.6	0.6	0.6	8.1	8.7	7.14	0.9	0.6	130	124	4.72	0.6	0.6	112	108	3.64	0.6	157	0.6	0.6	26.3	26.4	0.38
Nutrients and Chlorophyll a																								
Total phosphorus	mg/L	0.01	0.01	0.01	0.12	0.16	28.57	0.01	0.01	0.05	0.04	**22.22**	0.01	0.01	0.73	0.25	97.96	0.01	0.03	0.01	0.01	0.02	0.02	0.00
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.54	0.53	1.87	0.01	0.01	0.11	0.12	8.70	0.01	0.02	0.03	0.01	**100.00**	0.01	0.05	0.01	0.01	0.02	0.02	0.00
Total ammonia as NH4	mg/L	0.01	0.01	0.01	0.55	0.52	5.61	0.01	0.01	2.46	2.47	0.41	0.02	0.04	3.3	3.4	2.99	0.01	3.81	0.01	0.01	1.37	1.37	0.00
Total Metals																								
Aluminum	mg/L	0.005	0.007	0.005	5.7	5.86	2.77	0.005	0.005	0.966	0.692	33.05	0.005	0.005	8.51	7.83	8.32	0.005	0.41	0.005	0.005	0.065	0.075	14.29
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0133	0.0131	1.52	0.0005	0.0005	0.041	0.0375	8.92	0.0005	0.0005	0.0416	0.0417	0.24	0.0005	0.0415	0.0005	0.0005	0.0317	0.0285	10.63
Barium	mg/L	0.0005	0.0005	0.0005	0.0854	0.0918	7.22	0.0005	0.0005	0.0783	0.074	5.65	0.0005	0.0005	0.1907	0.1845	3.30	0.0005	0.0953	0.0005	0.0005	0.2292	0.2306	0.61
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00004	0.00002	**66.67**	0.00002	0.00002	0.00002	0.00002	0.00	0.00002	0.00006	0.00002	0.00004	**66.67**	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0259	0.0271	4.53	0.0006	0.0006	0.0116	0.0094	20.95	0.0006	0.0006	0.3409	0.3053	11.02	0.0006	0.0128	0.0006	0.0006	0.0033	0.0041	**21.62**
Copper	mg/L	0.0005	0.0005	0.0005	0.0099	0.0103	3.96	0.0005	0.0005	0.0064	0.0059	8.13	0.0005	0.0005	0.0141	0.0136	3.61	0.0005	0.0072	0.0005	0.0005	0.0022	0.0023	4.44
Iron	mg/L	0.01	0.01	0.01	10.8	10.4	3.77	0.01	0.01	1.97	1.62	19.50	0.01	0.01	13.8	13	5.97	0.01	1.16	0.01	0.01	0.19	0.22	14.63
Lead	mg/L	0.0003	0.0003	0.0003	0.0058	0.0062	6.67	0.0003	0.0003	0.0025	0.0022	12.77	0.0003	0.0003	0.0043	0.0039	9.76	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.4505	0.4484	0.47	0.0005	0.0005	0.4511	0.4258	5.77	0.0005	0.0005	0.46	0.4301	6.72	0.0005	0.3417	0.0005	0.0005	0.9411	0.947	0.62
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00035	**188.89**	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00003	0.00001	0.00003	**100.00**
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0009	0.0006	**40.00**	0.0005	0.0005	0.0042	0.0035	18.18	0.0005	0.0005	0.0061	0.0063	3.23	0.0005	0.0094	0.0005	0.0005	0.0045	0.0044	2.25
Nickel	mg/L	0.0005	0.0005	0.0005	0.0226	0.021	7.34	0.0005	0.0005	0.0388	0.0366	5.84	0.0005	0.0005	0.1305	0.1194	8.88	0.0005	0.0377	0.0005	0.0005	0.0179	0.0185	3.30
Selenium	mg/L	0.0005	0.0005	0.0005	0.0087	0.007	21.66	0.0005	0.0005	0.0073	0.0067	8.57	0.0005	0.0005	0.0077	0.0079	2.56	0.0005	0.0032	0.0005	0.0005	0.0005	0.0005	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.00
Zinc	mg/L	0.001	0.001	0.001	0.019	0.022	14.63	0.001	0.001	0.002	0.002	0.00	0.001	0.001	0.011	0.011	0.00	0.001	0.001	0.001	0.001	0.001	0.001	0.00
% Exceedance*							7.69%					7.69%					7.69%							0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-92 Whale Tail 2019 Lake A47 QAQC (ST-WT-6)

Parameter	Sample Date	MDL	2019-08-05			
	Unit		Field Blank	Duplicate	Original	RPD
Conventional Parameters						
Hardness	mg CaCO3/L	1	1	141	140	0.71
Total alkalinity, as CaCO3	mg CaCO3/L	2	35	75	76	1.32
Total Dissolved Solids	mg/L	1	1	229	229	0.00
Total suspended solids	mg/L	1	1	3	4	**28.57**
Total organic carbon	mg/L	0.2	0.55	5.9	6	1.68
Dissolved organic carbon	mg/L	0.2	0.2	8.7	7.8	10.91
Major Ions						
Bicarbonate	mg CaCO3/L	2	35	75	76	1.32
Carbonate	mg CaCO3/L	2	2	2	2	0.00
Chloride	mg/L	0.5	0.5	101	100	1.00
Sulphate	mg/L	0.6	0.6	7.3	11.6	45.50
Reactive silica	mg/L	0.01	0.02	2.15	2.07	3.79
Nutrients and Chlorophyll a						
Total nitrogen	mg/L	0.01	0.12	0.46	0.51	10.31
Total phosphorus	mg/L	0.01	0.01	0.02	0.04	**66.67**
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.01	0.00
Total ammonia as NH4	mg/L	0.01	0.01	0.03	0.02	**40.00**
Total Metals						
Aluminum	mg/L	0.005	0.005	0.005	0.005	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.00
Arsenic	mg/L	0.0005	0.0005	0.006	0.0047	*24.30*
Barium	mg/L	0.0005	0.0005	0.1125	0.1116	0.80
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Boron	mg/L	0.01	0.01	0.01	0.01	0.00
Cadmium	mg/L	0.00002	0.00002	0.00017	0.00002	**157.89**
Calcium	mg/L	0.05	0.03	46.6	45.9	1.51
Chromium	mg/L	0.0006	0.0007	0.0013	0.0009	**36.36**
Copper	mg/L	0.0005	0.0005	0.001	0.0005	**66.67**
Iron	mg/L	0.01	0.01	0.2	0.21	4.88
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00
Magnesium	mg/L	0.05	0.02	6.13	6.34	3.37
Manganese	mg/L	0.0005	0.0005	0.1369	0.1375	0.44
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Nickel	mg/L	0.0005	0.0005	0.0096	0.0093	3.17
Potassium	mg/L	0.05	0.05	4.36	4.59	5.14

Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Sodium	mg/L	0.05	0.05	2.48	2.18	12.88
Strontium	mg/kg	0.005	0.005	0.278	0.286	2.84
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00
Tin	mg/kg	0.001	0.001	0.001	0.001	0.00
Titanium	mg/L	0.01	0.01	0.01	0.01	0.00
Uranium	mg/L	0.001	0.001	0.001	0.001	0.00
Vanadium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Zinc	mg/L	0.001	0.001	0.002	0.003	**40.00**
Dissolved Metals						
Aluminum	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.00
Arsenic	mg/L	0.0005	0.0005	0.0039	0.0039	0.00
Barium	mg/L	0.0005	0.0005	0.0933	0.0915	1.95
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Boron	mg/L	0.01	0.01	0.01	0.01	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Iron	mg/L	0.01	0.01	0.05	0.05	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00
Manganese	mg/L	0.0005	0.0005	0.0873	0.0913	4.48
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Nickel	mg/L	0.0005	0.0005	0.0078	0.0078	0.00
Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Silver	mg/L	0.0001	0.0001	0.0001	0.0001	0.00
Strontium	mg/L	0.005	0.005	0.25	0.246	1.61
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00
Tin	mg/L	0.001	0.001	0.001	0.001	0.00
Titanium	mg/L	0.01	0.01	0.01	0.01	0.00
Uranium	mg/L	0.001	0.001	0.001	0.001	0.00
Vanadium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.00
% Exceedance*						1.52%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL.

Table 8-93 Whale Tail 2019 Lake A45 QAQC (ST-WT-13)

Parameter	Sample Date		2019-07-07			
	Unit	MDL	Field Blank	Duplicate	Original	RPD
Conventional Parameters						
Total suspended solids	mg/L	1	1	3	3	0.00
Major Ions						
Sulphate	mg/L	0.6	0.6	0.6	0.6	0.00
Total Metals						
Aluminum	mg/L	0.005	0.005	0.025	0.024	4.08
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.00
% Exceedance*						0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-94 Whale Tail 2019 Lake A16 Outlet QAQC (ST-WT-14)

Parameter	Sample Date	MDL	2019-08-11			
	Unit		Field Blank	Duplicate	Original	RPD
Conventional Parameters						
Hardness	mg CaCO3/L	1	1	19	20	5.13
Total alkalinity, as CaCO3	mg CaCO3/L	2	5	43	15	*96.55*
Total dissolved solids	mg/L	1	4	48	48	0.00
Total suspended solids	mg/L	1	1	1	1	0.00
Total organic carbon	mg/L	0.2	0.2	1.4	1.5	6.90
Dissolved organic carbon	mg/L	0.2	0.2	2.1	2.2	4.65
Major Ions						
Bicarbonate	mg CaCO3/L	2	5	43	15	*96.55*
Carbonate	mg CaCO3/L	2	2	2	2	0.00
Chloride	mg/L	0.5	0.5	11.5	11.5	0.00
Sulphate	mg/L	0.6	0.6	4.8	4	18.18
Reactive silica	mg/L	0.01	0.02	0.87	0.89	2.27
Nutrients and Chlorophyll a						
Total nitrogen	mg/L	0.05	0.05	0.14	0.24	**52.63**
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.00
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.01	0.00
Total ammonia as NH4	mg/L	0.01	0.02	0.01	0.02	**66.67**
Total Metals						
Aluminum	mg/L	0.005	0.005	0.005	0.005	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Barium	mg/L	0.0005	0.0005	0.0021	0.001	**70.97**
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Boron	mg/L	0.01	0.01	0.01	0.01	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00
Calcium	mg/L	0.05	0.03	5.76	6.3	8.96
Chromium	mg/L	0.0006	0.0006	0.0007	0.0007	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Iron	mg/L	0.01	0.01	0.06	0.01	**142.86**
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00
Lithium	mg/L	0.005	0.005	0.005	0.005	0.00
Magnesium	mg/L	0.05	0.02	1.37	1.51	9.72
Manganese	mg/L	0.0005	0.0005	0.0009	0.0009	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Nickel	mg/L	0.0005	0.0005	0.0009	0.0009	0.00
Potassium	mg/L	0.05	0.05	0.96	1.07	10.84
Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Sodium	mg/L	0.05	0.05	0.72	0.8	10.53
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00
Tin	mg/kg	0.001	0.001	0.001	0.001	0.00
Titanium	mg/L	0.01	0.01	0.01	0.01	0.00
Uranium	mg/L	0.001	0.001	0.001	0.001	0.00
Vanadium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Zinc	mg/L	0.001	0.001	0.001	0.019	*180.00*
Dissolved Metals						
Aluminum	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Barium	mg/L	0.0005	0.0005	0.0023	0.0005	**128.57**

Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Boron	mg/L	0.01	0.01	0.01	0.01	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Iron	mg/L	0.01	0.01	0.01	0.01	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.00
Lithium	mg/L	0.005	0.005	0.005	0.005	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Nickel	mg/L	0.0005	0.0005	0.001	0.0006	**50.00**
Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.00
Tin	mg/L	0.001	0.001	0.001	0.001	0.00
Titanium	mg/L	0.01	0.01	0.01	0.01	0.00
Uranium	mg/L	0.001	0.001	0.001	0.001	0.00
Vanadium	mg/L	0.0005	0.0005	0.0005	0.0005	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.00
% Exceedance*						0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-95 Whale Tail 2019 Lake A15 QAQC (ST-WT-15)

Parameter	Sample Date	MDL	2019-08-11				
	Unit		Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters							
Hardness	mg CaCO3/L	1	1	1	16	18	11.76
Total alkalinity, as CaCO3	mg CaCO3/L	2	35	7	44	15	*98.31*
Total dissolved solids	mg/L	1	3	4	43	45	4.55
Total suspended solids	mg/L	1	1	1	1	1	0.00
Total organic carbon	mg/L	0.2	0.52	0.54	1.5	1.6	6.45
Dissolved organic carbon	mg/L	0.2	0.8	0.2	2.2	1.8	*20.00*
Major Ions							
Bicarbonate	mg CaCO3/L	2	35	7	44	15	*98.31*
Carbonate	mg CaCO3/L	2	2	2	2	2	0.00
Chloride	mg/L	0.5	0.5	0.5	10	9.9	1.01
Sulphate	mg/L	0.6	0.6	0.6	5.9	4.7	**22.64**
Reactive silica	mg/L	0.01	0.02	0.7	1.15	1.18	2.58
Nutrients and Chlorophyll a							
Total nitrogen	mg/L	0.05	0.14	0.05	0.26	0.26	0.00
Total phosphorus	mg/L	0.01	0.01	0.01	0.01	0.01	0.00
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.01	0.01	0.00
Total ammonia as NH4	mg/L	0.01	0.01	0.01	0.01	0.01	0.00
Total Metals							
Aluminum	mg/L	0.005	0.005	0.005	0.005	0.005	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Boron	mg/L	0.01	0.01	0.01	0.01	0.01	0.00
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	0.00
Calcium	mg/L	0.05	0.03	0.03	4.74	5.36	12.28
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0005	0.0007	**33.33**
Iron	mg/L	0.01	0.01	0.01	0.01	0.02	**66.67**
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.00
Lithium	mg/L	0.005	0.005	0.005	0.005	0.005	0.00
Magnesium	mg/L	0.05	0.02	0.02	1.31	1.36	3.75
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.0007	**33.33**
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.001	0.0011	9.52

Potassium	mg/L	0.05	0.05	0.05	0.85	0.91	6.82
Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Sodium	mg/L	0.05	0.05	0.05	0.68	0.71	4.32
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.00
Tin	mg/kg	0.001	0.001	0.001	0.001	0.001	0.00
Titanium	mg/L	0.01	0.01	0.01	0.01	0.01	0.00
Uranium	mg/L	0.001	0.001	0.001	0.001	0.001	0.00
Vanadium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.00
Dissolved Metals							
Aluminum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Antimony	mg/L	0.0001	0.0001	0.0001	0.0001	0.0001	0.00
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Barium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Boron	mg/L	0.01	0.01	0.01	0.01	0.01	0.00
Chromium	mg/L	0.0006	0.0006	0.0006	0.0006	0.0006	0.00
Copper	mg/L	0.0005	0.0005	0.0005	0.0007	0.0005	**33.33**
Iron	mg/L	0.01	0.01	0.01	0.01	0.01	0.00
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.00
Lithium	mg/L	0.005	0.005	0.005	0.005	0.005	0.00
Manganese	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Nickel	mg/L	0.0005	0.0005	0.0005	0.0011	0.0011	0.00
Selenium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0008	**46.15**
Thallium	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.00
Tin	mg/L	0.001	0.001	0.001	0.001	0.001	0.00
Titanium	mg/L	0.01	0.01	0.01	0.01	0.01	0.00
Uranium	mg/L	0.001	0.001	0.001	0.001	0.001	0.00
Vanadium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00
Zinc	mg/L	0.001	0.001	0.001	0.002	0.001	**66.67**
% Exceedance*							0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-96 Whale Tail Dike Seepage 2019 QAQC (ST-WT-17)

Parameter	Sample Date	MDL	2019-08-26			2019-09-03			2019-10-07				2019-10-07		2019-11-08		2019-12-02		2019-12-16	
	Unit		Duplicate	Original	RPD	Trip Blank	Field Blank	Original	Field Blank	Duplicate	Original	RPD	Trip Blank	Original	Trip Blank	Original	Trip Blank	Original	Trip Blank	Original
Conventional Parameters																				
Hardness	mg CaCO3/L	1	46	42	9.09	1	1	41	1	37	37	0.00	1	44	1	44	1	47	1	64
Total alkalinity, as CaCO3	mg CaCO3/L	2	20	21	4.88	5	5	21	7	28	26	7.41	6	26	9	26	5	37	9	60
Total dissolved solids	mg/L	1	77	82	6.29	5	5	76	1	68	68	0.00	1	66	1	66	1	88	1	113
Total suspended solids	mg/L	1	71	70	1.42	1	1	2	6	3	4	**28.57**	3	57	1	57	1	2	1	4
Major Ions																				
Chloride	mg/L	0.5	13	13.3	2.28	0.5	0.5	13.5	0.5	12.5	12.5	0.00	0.5	13	0.5	13	0.5	16.3	0.5	19.8
Fluoride	mg/L	0.01	-	-	-	-	-	-	-	-	-	-	-	0.09	0.02	0.09	0.06	0.11	0.1	0.09
Sulphate	mg/L	0.6	5	5.6	11.32	0.6	0.6	5.2	1	5.4	5.5	1.83	0.6	6.6	0.6	6.6	0.6	11.8	0.6	11.6
Nutrients and Chlorophyll a																				
Total phosphorus	mg/L	0.01	0.09	0.06	**40.00**	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.04	0.01	0.04	0.01	0.01	0.01	0.02
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.02	**66.67**	0.01	0.01	0.01	0.01	0.02	0.02	0.00	0.02	0.1	0.01	0.1	0.01	0.01	0.01	0.01
Total ammonia as NH4	mg/L	0.01	0.07	0.07	0.00	0.01	0.01	0.01	0.01	0.02	0.01	**66.67**	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03
General Organics																				
Total oil and grease	mg/L	1	2	67	*188.41*	1	1	1	1	1	1	0.00	1	2	1	2	3	3	1	1
Total Metals																				
Aluminum	mg/L	0.005	1.32	1.21	8.70	0.005	0.005	0.126	0.01	0.15	0.18	18.18	0.01	0.539	0.005	0.539	0.03	0.059	0.005	0.056
Arsenic	mg/L	0.0005	0.0129	0.0114	12.35	0.0005	0.0005	0.0077	0.001	0.0088	0.0087	1.14	0.001	0.0159	0.0012	0.0159	0.0008	0.013	0.0005	0.0135
Barium	mg/L	0.0005	0.0448	0.0436	2.71	0.0005	0.0005	0.0295	0.002	0.023	0.024	4.26	0.002	0.0275	0.0005	0.0275	0.0005	0.0194	0.0005	0.0318
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00	0.00002	0.00002	0.00002	0.0002	0.0002	0.0002	0.00	0.0002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Chromium	mg/L	0.0006	0.0037	0.0043	15.00	0.0006	0.0006	0.0014	0.005	0.005	0.005	0.00	0.005	0.0099	0.0006	0.0099	0.0006	0.0014	0.0006	0.008
Copper	mg/L	0.0005	0.0042	0.0038	10.00	0.0005	0.0005	0.0016	0.001	0.0014	0.0016	13.33	0.001	0.0059	0.0005	0.0059	0.0005	0.0017	0.0005	0.002
Iron	mg/L	0.01	3.33	3.06	8.45	0.01	0.01	0.3	0.06	0.32	0.33	3.08	0.06	1.26	0.01	1.26	0.04	0.23	0.02	0.07
Lead	mg/L	0.0003	0.0003	0.0003	0.00	0.0023	0.0003	0.0004	0.0005	0.0005	0.0005	0.00	0.0005	0.0009	0.0003	0.0009	0.0003	0.0003	0.0003	0.0003
Manganese	mg/L	0.0005	0.2476	0.2261	9.08	0.0005	0.0005	0.1047	0.001	0.044	0.044	0.00	0.001	0.0798	0.0005	0.0798	0.0005	0.0352	0.0005	0.0237
Mercury	mg/L	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.0001	0.0001	0.0001	0.00	0.0001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00001	0.00002
Molybdenum	mg/L	0.0005	0.0027	0.0026	3.77	0.0005	0.0005	0.0022	0.001	0.0021	0.0022	4.65	0.001	0.0019	0.0005	0.0019	0.0005	0.0022	0.0005	0.0039
Nickel	mg/L	0.0005	0.004	0.0031	**25.35**	0.0005	0.0005	0.0021	0.002	0.002	0.002	0.00	0.002	0.0055	0.0005	0.0055	0.0005	0.0017	0.0005	0.0021
Selenium	mg/L	0.0005	0.0032	0.0032	0.00	0.0005	0.0005	0.0005	0.003	0.003	0.003	0.00	0.003	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Silver	mg/L	0.0001	0.0001	0.0001	0.00	0.0001	0.0001	0.0001	0.001	0.001	0.001	0.00	0.001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Zinc	mg/L	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.007	0.007	0.007	0.00	0.007	0.001	0.001	0.001	0.001	0.001	0.001	0.002
% Exceedance*					0%							0%								

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-97 Whale Tail South Transfer 2019 QAQC (ST-WT-25)

Parameter	Sample Date	MDL	2019-11-04					2019-12-02				2019-12-16	
	Unit		Trip Blank	Field Blank	Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD	Trip Blank	Original
Conventional Parameters													
Total suspended solids	mg/L	1	1	1	3	3	0.00	1	1	1	0.00	1	2
Major Ions													
Sulphate	mg/L	0.6	0.6	0.6	5.1	2.6	**64.94**	0.6	7	6.3	10.53	0.9	9
Total Metals													
Aluminum	mg/L	0.005	0.005	0.005	0.03	0.028	6.90	0.005	0.013	0.01	**26.09**	0.005	0.021
Arsenic	mg/L	0.0005	0.0011	0.0005	0.0017	0.0016	6.06	0.0009	0.0009	0.0025	**94.12**	0.0011	0.0025
Copper	mg/L	0.0005	0.0005	0.0005	0.0006	0.0007	15.38	0.0005	0.0009	0.0013	**36.36**	0.0005	0.0011
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.00	0.0003	0.0003
Nickel	mg/L	0.0005	0.0005	0.0005	0.0017	0.0018	5.71	0.0005	0.0023	0.0021	9.09	0.0005	0.0025
Zinc	mg/L	0.001	0.003	0.001	0.001	0.001	0.00	0.002	0.001	0.001	0.00	0.001	0.002
% Exceedance*							0%				0%		

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-98 Whale Tail 2019 North East Pond Discharge QAQC

Parameter	Sample Date	MDL	2019-08-26					2019-09-23				
	Unit		Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters												
Total suspended solids	mg/L	1	1	1	4	3	**28.57**	1	1	7	6	15.38
% Exceedance*							0%					0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-99 Whale Tail 2019 Quarry 1 Discharge QAQC

Parameter	Sample Date	MDL	2019-08-19					2019-08-26					2019-09-11					2019-10-21	
	Unit		Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Original
Conventional Parameters																			
Hardness	mg CaCO3/L	1	1	1	156	144	8.00	1	1	185	199	7.29	1	1	212	203	4.34	1	223
Total alkalinity, as CaCO3	mg CaCO3/L	2	5	5	30	40	28.57	5	5	36	40	10.53	5	9	43	49	13.04	9	52
Total dissolved solids	mg/L	1	8	9	302	322	6.41	17	12	319	318	0.31	4	17	366	339	7.66	1	358
Total suspended solids	mg/L	1	1	1	8	15	60.87	1	1	8	8	0.00	1	1	9	10	10.53	1	1
Total organic carbon	mg/L	0.2	0.58	0.2	4.3	4.3	0.00	0.3	0.51	3.8	3.7	2.67	0.25	0.25	4	4.1	2.47	0.67	3.3
Dissolved organic carbon	mg/L	0.2	0.2	0.2	4.3	4.3	0.00	0.3	0.32	3.6	3.6	0.00	0.6	0.6	5.8	5.8	0.00	0.3	3.9
Major Ions																			
Bicarbonate	mg CaCO3/L	2	4	4	30	40	28.57	5	5	36	40	10.53	5	9	43	49	13.04	9	52
Carbonate	mg CaCO3/L	2	2	2	2	2	0.00	2	2	2	2	0.00	5	5	2	2	0.00	5	5
Chloride	mg/L	0.5	0.5	0.5	48.5	46.8	3.57	0.5	0.5	49.6	51.3	3.37	0.5	0.5	62.9	59.3	5.89	0.5	80
Potassium	mg/L	0.03	0.05	0.05	16	13.5	16.95	0.05	0.05	21.5	22.9	6.31	0.05	0.05	17	16.6	2.38	-	-
Sodium	mg/L	0.03	0.05	0.05	5.43	4.5	18.73	0.05	0.05	6.47	6.85	5.71	0.05	0.05	5.73	5.58	2.65	-	-
Sulphate	mg/L	0.6	0.6	0.6	69.8	67	4.09	0.7	0.6	67.5	66	2.25	0.6	0.6	78.2	72.7	7.29	0.6	68.5
Nutrients and Chlorophyll a																			
Total Kjeldahl nitrogen	mg/L	0.05	0.06	0.06	1.27	1.37	7.58	0.05	0.05	1.12	1.22	8.55	0.05	0.1	1.22	0.48	*87.06*	0.05	1.18
Total phosphorus	mg/L	0.01	0.01	0.01	0.02	0.04	66.67	0.01	0.02	0.03	0.01	**100.00**	0.01	0.01	0.02	0.03	**40.00**	0.01	0.01
Total orthophosphate (as phosphorus)	mg/L	0.01	0.01	0.01	0.01	0.03	**100.00**	0.01	0.01	0.01	0.02	**66.67**	0.01	0.01	0.01	0.02	**66.67**	0.01	0.01
Total ammonia as NH4	mg/L	0.01	0.02	0.01	1	0.99	1.01	0.01	0.01	1.16	1.04	10.91	0.02	0.01	0.96	0.91	5.35	0.01	1.01
Un-Ionized Ammonia, calculated	mg/L	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.02	0.02	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01
Total Metals																			
Aluminum	mg/L	0.005	0.005	0.005	0.178	0.536	100.28	0.005	0.005	0.215	0.268	21.95	0.005	0.005	0.219	0.17	25.19	0.005	0.072
Antimony	mg/L	0.0001	0.0001	0.0001	0.0017	0.0018	5.71	0.0001	0.0001	0.0031	0.0034	9.23	0.0001	0.0001	0.003	0.0028	6.90	0.0001	0.0023
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0132	0.0147	10.75	0.0005	0.0005	0.0156	0.0168	7.41	0.0005	0.0005	0.0143	0.0137	4.29	0.0005	0.008
Barium	mg/L	0.0005	0.0005	0.0005	0.0818	0.0802	1.98	0.0005	0.0005	0.1046	0.1179	11.96	0.0005	0.0005	0.1527	0.1218	22.51	0.0005	0.104
Beryllium	mg/L	0.0005	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005	0.0005	0.0005	0.00	0.0005	0.0005
Boron	mg/L	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01
Cadmium	mg/L	0.00002	0.00011	0.00002	0.00006	0.00002	**100.00**	0.00002	0.00002	0.00002	0.00002	0.00	0.00002	0.00002	0.00002	0.00002	0.00	0.00002	0.00002
Chromium	mg/L	0.0006	0.0006	0.0006	0.0026	0.0034	26.67	0.0006	0.0006	0.0044	0.0041	7.06	0.0006	0.0006	0.0047	0.0036	**26.51**	0.0006	0.0011
Copper	mg/L	0.0005	0.0005	0.0005	0.002	0.003	40.00	0.0005	0.0005	0.0032	0.0033	3.08	0.0005	0.0005	0.0038	0.0036	5.41	0.0005	0.0031
Iron	mg/L	0.01	0.01	0.01	0.41	1.18	96.86	0.01	0.01	0.45	0.46	2.20	0.01	0.01	0.48	0.43	10.99	0.01	0.25
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003	0.0007	0.0003	**80.00**	0.0003	0.0004
Manganese	mg/L	0.0005	0.0005	0.0005	0.2687	0.2812	4.55	0.0005	0.0005	0.2699	0.2845	5.27	0.0005	0.0005	0.2855	0.2701	5.54	0.0005	0.2903
Mercury	mg/L	0.00001	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001	0.00001	0.00001	0.00	0.00001	0.00001
Molybdenum	mg/L	0.0005	0.0005	0.0005	0.0091	0.007	*26.09*	0.0005	0.0005	0.0116	0.0135	15.14	0.0005	0.0005	0.0138	0.0133	3.69	0.0005	0.0085
Nickel	mg/L	0.0005	0.0005	0.0005	0.0169	0.0176	4.06	0.0005	0.0005	0.0184	0.0203	9.82	0.0005	0.0005	0.0192	0.0183	4.80	0.0005	0.0148
Selenium	mg/L	0.0005	0.0005	0.0005	0.0006	0.0033	**138.46**	0.0006	0.0007	0.0026	0.0025	3.92	0.0005	0.0005	0.0012	0.0016	**28.57**	0.0005	0.0014

Strontium	mg/kg	0.005	0.005	0.005	0.236	0.229	3.01	0.005	0.005	0.285	0.305	6.78	0.005	0.005	0.291	0.276	5.29	0.005	0.314
Thallium	mg/L	0.0002	0.0002	0.0002	0.0004	0.0002	**66.67**	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002	0.0002	0.0002	0.00	0.0002	0.0002
Tin	mg/kg	0.001	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.001	0.00	0.001	0.001
Titanium	mg/L	0.01	0.01	0.01	0.01	0.02	**66.67**	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01
Uranium	mg/L	0.001	0.001	0.001	0.003	0.003	0.00	0.001	0.001	0.005	0.005	0.00	0.001	0.001	0.006	0.005	18.18	0.001	0.004
Vanadium	mg/L	0.0005	0.0005	0.0005	0.0008	0.0008	0.00	0.0005	0.0005	0.0008	0.0009	11.76	0.0005	0.0005	0.0011	0.001	9.52	0.0016	0.0019
Zinc	mg/L	0.001	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.001	0.00	0.001	0.001	0.001	0.001	0.00	0.001	0.001
% Exceedance*							10%					2%					5%		

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-100 Whale Tail 2019 AP-5 Discharge QAQC (MEA-4)

Parameter	Sample Date	MDL	2019-06-16					2019-07-01					2019-09-11	
	Unit		Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Original
Conventional Parameters														
Total dissolved solids	mg/L	1	1	1	365	366	0.27	1	1	468	463	1.07	7	387
Total suspended solids	mg/L	1	1	1	22	22	0.00	1	1	17	17	0.00	1	5
Major Ions														
Chloride	mg/L	0.5	0.5	0.5	145	144	0.69	0.5	0.5	198	185	6.79	0.5	121
Nutrients and Chlorophyll a														
Total ammonia as NH4	mg/L	0.01	0.01	0.01	1.38	1.38	0.00	0.01	0.01	1.11	1.11	0.00	0.04	1.42
General Organics														
Total oil and grease	mg/L	1	1	1	1	1	0.00	1	1	1	1	0.00	1	1
Total Metals														
Arsenic	mg/L	0.0005	0.0005	0.0005	0.0039	0.004	2.53	0.0005	0.0005	0.004	0.0028	**35.29**	0.0005	0.0042
Copper	mg/L	0.0005	0.0005	0.0005	0.0019	0.0026	31.11	0.0005	0.0005	0.0016	0.001	46.15	0.0005	0.0017
Lead	mg/L	0.0003	0.0003	0.0003	0.0003	0.0041	*172.73*	0.0003	0.0003	0.0003	0.0003	0.00	0.0003	0.0003
Nickel	mg/L	0.0005	0.0005	0.0005	0.0101	0.01	1.00	0.0005	0.0005	0.0111	0.0113	1.79	0.0005	0.0109
Zinc	mg/L	0.001	0.001	0.001	0.001	0.006	**142.86**	0.001	0.001	0.001	0.001	0.00	0.001	0.001
% Exceedance*							0%							0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-101 Whale Tail 2019 STP QAQC (ST-WT-11)

Parameter	Sample Date	MDL	2019-05-14					2019-07-09					2019-12-11				
	Unit		Field Blank	Trip Blank	Duplicate	Original	RPD	Field Blank	Trip Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters																	
Hardness	mg CaCO3/L	1	1	1	36	41	12.99	1	1	33	34	2.99	1	1	56	55	1.80
Total alkalinity, as CaCO3	mg CaCO3/L	2	3	3	69	69	0.00	2	2	21	21	0.00	8	9	96	94	2.11
Total dissolved solids	mg/L	1	1	2	504	485	3.84	1	1	339	337	0.59	1	1	379	382	0.79
Total suspended solids	mg/L	1	1	1	1	1	0.00	1	1	1	1	0.00	1	1	1	1	0.00
Major Ions																	
Chloride	mg/L	0.5	0.5	0.5	55.9	56.1	0.36	0.5	0.5	53.8	53.5	0.56	0.5	0.5	74.7	75.6	1.20
Fluoride	mg/L	0.02	0.02	0.02	0.05	0.05	0.00	0.02	0.02	0.06	0.06	0.00	0.02	0.02	0.06	0.07	15.38
Sulphate	mg/L	0.6	0.6	0.6	45.6	50.8	10.79	0.6	0.6	37.2	37.9	1.86	0.6	0.6	42.9	50.8	16.86
Nutrients and Chlorophyll a																	
Total phosphorus	mg-P/L	0.01	0.01	0.01	6.37	6.55	2.79	0.01	0.01	7.48	7.42	0.81	0.01	0.01	4.63	4.65	0.43
Total orthophosphate (as phosphorus)	mg-P/L	0.02	0.02	0.02	6.82	6.74	1.18	0.01	0.01	8.63	8.13	5.97	0.01	0.01	4.84	4.61	4.87
Ammoniacal Nitrogen as NH4	mg/L	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.15	0.14	6.90
Total Metals																	
Aluminum	µg/L	5	5	5	42	55	*26.80*	5	5	5	5	0.00	5	5	11	9	**20.00**
Arsenic	µg/L	0.5	0.5	0.5	1.3	1.7	**26.67**	0.5	0.5	0.5	1.1	**75.00**	0.5	0.5	5.8	6.6	12.90
Barium	µg/L	0.5	0.5	0.5	0.5	0.5	0.00	0.5	0.5	0.5	0.5	0.00	0.5	0.5	0.5	0.5	0.00
Cadmium	µg/L	0.02	0.02	0.02	0.05	0.02	**85.71**	0.02	0.02	0.02	0.02	0.00	0.02	0.02	0.02	0.02	0.00
Chromium	µg/L	0.6	0.6	0.6	1.3	1.6	**20.69**	0.6	0.6	0.6	0.6	0.00	0.6	0.6	1.2	1	18.18
Copper	µg/L	0.5	3.4	14	37.3	37.3	0.00	0.5	0.5	56.4	34.6	47.91	0.5	0.5	7.5	9.3	21.43
Iron	µg/L	10	20	60	60	70	15.38	10	10	20	30	**40.00**	10	50	10	10	0.00
Lead	µg/L	0.3	0.3	0.3	0.3	0.3	0.00	0.3	0.3	0.3	0.3	0.00	0.3	0.3	0.3	0.3	0.00
Manganese	µg/L	0.5	0.5	0.5	1.2	1.3	8.00	0.5	0.5	0.6	0.8	**28.57**	0.5	0.5	1.2	0.9	**28.57**
Mercury	µg/L	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.01	0.01	0.00
Molybdenum	µg/L	0.5	0.5	0.5	0.5	0.5	0.00	0.5	0.5	0.5	0.5	0.00	0.5	0.5	1.2	1.3	8.00

Nickel	µg/L	0.5	1.1	0.5	5.6	5.8	3.51	0.5	0.5	4.2	5.2	*21.28*	0.5	0.5	5.6	5.3	5.50
Selenium	µg/L	0.5	0.5	0.5	0.5	0.5	0.00	0.5	0.5	0.5	0.6	18.18	0.5	0.5	0.5	0.5	0.00
Silver	µg/L	0.1	0.1	0.1	0.1	0.1	0.00	0.1	0.1	0.1	0.1	0.00	0.1	0.1	0.1	0.1	0.00
Zinc	µg/L	5	80	5	43	51	17.02	1	1	62	57	8.40	1	1	52	39	28.57
% Exceedance*							0%					4%					8%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

Table 8-102 Whale Tail Exploration Camp 2019 STP QAQC (MEA-2)

Parameter	Sample Date	MDL	2019-01-07				2019-05-14				2019-08-27				
	Unit		Field Blank	Duplicate	Original	RPD	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters															
Total suspended solids	mg/L	1	1	2	3	**40.00**	1	6	6	0.00	1	1	7	6	15.38
Nutrients and Chlorophyll a															
Biochemical oxygen demand	mg/L	1	1	1	2	**66.67**	1	3	3	0.00	1	1	2	1	**66.67**
General Organics															
Total oil and grease	mg/L	1	1	1	1	0.00	1	2	1	**66.67**	1	2	3	1	**100.00**
% Exceedance*						0%				0%					0%

Parameter	Sample Date	MDL	2019-09-02					2019-09-23					2019-10-08				
	Unit		Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD	Trip Blank	Field Blank	Duplicate	Original	RPD
Conventional Parameters																	
Total suspended solids	mg/L	1	1	1	8	6	**28.57**	2	1	8	7	13.33	1	3	9	11	*20.00*
Nutrients and Chlorophyll a																	
Biochemical oxygen demand	mg/L	1	1	1	1	1	0.00	1	1	1	1	0.00	1	2	7	7	0.00
General Organics																	
Total oil and grease	mg/L	1	1	1	1	1	0.00	1	1	1	1	0.00	1	1	1	1	0.00
% Exceedance*							0%					0%					0%

Footnotes:
RPD = Relative Percent Difference; MDL: Mean Detection Limit
Result below DL were considered as the value of the DL for the RPD calculation
** Percentage of parameters exceeding the QAQC objectives for one sampling event, which corresponds to grey shaded cells.*
Bold values correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are within 10x the MDL.
Grey shaded cells correspond to a RPD higher than 20% and for which concentrations of parent and duplicate samples are above 10x the MDL.
Italic values correspond to a RPD higher than 20% and for which one of the result is within 10X the MDL and the other one exceeds 10x the MDL

8.5.8 Seepage

8.5.8.1 *Meadowbank Site*

As required by NWB Water License 2AM-MEA1526 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-MEA1526 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

As discussed previously, see Sections 8.5.3.1.3 regarding East Dike seepage interpretation and monitoring. More information can also be found in the Water Management Report and Plan (Version 8) in Appendix 11.

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 2019 was estimated to be around 414 m^3/day. The measured flow is decreasing compared to values from the past years. Please refer to Section 8.5.3.1.3 for a discussion regarding East Dike Discharge to Second Portage Lake. This section discus the water quality monitoring results and compliance with MDMER and Water License.

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 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 5 and 25 m^3/day). The reading frequency is approximately once per week during summer time.

8.5.8.1.2 Seepage (of any kind) 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 utilized piezometers, thermistors and a ground water 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.

On April 14th, 2015, Agnico started pumping at the D/S toe of the dike to lower the water level. The water was pumped back to the South Cell TSF. Water quality was closely monitored to foresee any changes from initial conditions in terms of turbidity and clarity. A flowmeter was also installed to monitor the volume of water pumped.

A series of pumping tests were also performed by Agnico during the summer of 2015 to measure the seepage flow according to the head pressure difference between the South Cell and the Central Dike downstream pond (sampling location ST-S-5). In September 2015, mitigation measures were defined with the support of Golder and it was confirmed that the Central Dike could be operated safely under certain conditions. In early November 2015, the downstream pond operational level was set at 115masl following Golder's recommendations (Golder, 2015). At the same time, a permanent and winterized pumping system was put in place to manage and track the water volumes through the winter.

In 2019 Central Dike seepage was pumped back into the South Cell, Goose Pit, and Pit A. The average seepage rate at Central Dike decreased from 230 m^3/h in January 2019 to 54 m^3/hr in December 2019 and is following the trend from the 2017 seepage modelling done by Golder.

The current mitigation strategy to reduce the risk related to seepage include the following :

- maintain a high surveillance frequency (instrumentation review, site observation)
- presence of a backup pumping unit in the downstream area to maintain enough pumping capacity in case of a sudden seepage increase
- revised tailings & water management strategy to minimise the amount of water stored into the South Cell while maximising tailings coverage against Central Dike and Saddle Dam 4. Water in the South Cell is send to the pit when possible.

The Central Dike seepage situation is considered under control as Agnico has the pumping capacity to deal with the seepage flow rate, the integrity of the infrastructure has not been compromised, no tailings were found outside the perimeter of the South Cell TSF and the nature of the orange precipitate was identified as a biological iron precipitate.

Daily visual inspections will continue to be completed. 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 by the Water License. Constant pumping of the downstream pond will continue until required in order to manage the water and ensure that the seepage water does not reach the receiving environment.

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 to 8.5.3.1.13 provide details regarding seepage monitoring at the Portage and Vault Rock Storage Facilities.

8.5.8.1.5 Seepage at pit wall and pit wall freeze/thaw and permafrost aggradation

In 2019, some seepage along the wall face was noted along the south wall of Portage Pit E3. Seepage was observed along fracture planes exposed in the bench faces, particularly near the south end of the as this area was originally talik, beneath the previously existing Third Portage Lake. Seepage faces can be expected to contribute to instability of the ultramafic and other rock types during cyclic freeze-thaw.

No mining activities occurred in Portage Pit A and Goose Pit. Therefore, any seepage is contributing to the re-flooding of the pits. There was no seepage observed in Pit A at the time of the inspection.

Water inflows and seepage were noted in two areas of the Vault Pit in 2019. These are generally related to the dewatering of Vault Lake, to the current lake level, and to release of water stored in the talik beneath the former lakes.

No major seepage inflows were observed in Phaser and BB Phaser pits.

The "2019 Annual Pit Slope Performance Review - Meadowbank Mine" provides more details regarding seepage at pit walls (Appendix 42).

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. In December 2013, Agnico requested Tetra Tech (formerly EBA) to perform an assessment, drilling delineation program and provide a report with recommendations in early 2014. All recommendations made in this report will be completed, prior to closure. 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 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 2019 Water Management Report and Plan (Appendix 11) for more details regarding the monitoring and action taken by Agnico before, during and after the freshet at this seepage area.

The pumping occurs in the warmer months when freshet commences. No flow of water has been pumped during winter months in 2019 in the interception trench and recovery well MW-203 because of frozen conditions. Table 8-103 below presents the volumes of water pumped back to the mill from the seepage from 2014 to 2019. Agnico observed that the flow to the trench increased in 2017 (22,977 m^3) compared to 2016 (11,078 m^3) but is still below 2015 (30,543 m^3) which was required to pump year round, in both the trench and the well. The increase in flow measured in 2017 was likely attributable to increased freshet run offs since no pumping was required in the well or the trench in winter. Volumes pumped in 2018 are similar to those obtained in 2014 and 2015 and may be attributable to a smaller freshet run off. A significant increase was observed in 2019 compared to previous year. This is mainly attributable to the significant higher volume of rainfall received in 2019 compared to previous year. Agnico is confident that the correctives measures implemented in previous year (refer to previous Annual Report for more information) are still effective and prevent potential contaminated water to reach any receiving environment.

Table 8-103 Meadowbank Assay Road Seepage pumped volume 2014-2019

Month	Pumped Volume (m^3)					
	2014	2015	2016	2017	2018	2019
January	0	871	0	0	0	0
February	0	306	0	0	0	0
March	0	500	0	0	0	0
April	0	680	0	0	0	0
May	2,450	347	0	3,025	0	0
June	1,935	10,803	2,588	3,973	5,095	10,058
July	1,158	6,633	2,270	4,961	4,148	17,273
August	3,979	4,467	3,599	3,782	2,912	22,320
September	2,420	4,584	2,109	6,687	1,490	20,225
October	1,043	1,188	512	549	0	1,740
November	842	164	0	0	0	0
December	871	0	0	0	0	0
Total	**14,698**	**30,543**	**11,078**	**22,977**	**13,645**	**71,616**

Daily visual inspections were conducted during freshet. Prior and after freshet, inspection were conducted weekly and after rain events.

Daily visual inspections were conducted during freshet. Prior and after freshet, inspection were conducted weekly and after rain events.

Weekly water samples were collected for CN WAD in the wells and interception trench and analysed at the Meadowbank Assay Lab. In addition, as per the Freshet Action Plan, monthly CN Free, CN total, copper and iron 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 17 below). At KivIA's request, additional monitoring was also conducted monthly during open water at TPL. Tables 8-104 and 8-105 contain monitoring results from the seepage and Third Portage Lake (TPL-Assay), respectively. It should be noted that well MW-04 and MW-08 were dry in 2019.

As per previous year, CN Free results in 2019 were all below 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 licence guidelines at the trench and monitoring wells but all higher than the CCME guideline. Agnico continues to observe a decrease in concentration of elements comparatively to previous years but similar to 2018. Monitoring will be continued in 2020 as per the Freshet Action Plan to identify if trending is maintained. While concentrations in wells downstream of the trench have decreased since 2015, impacts to the environments have been limited 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 2020 in accordance with the 2020 Freshet Action Plan which includes requests made by KivIA in 2014 at the Water Licence renewal hearing.

Figure 17 Meadowbank General Layout of the Assay Road Seepage

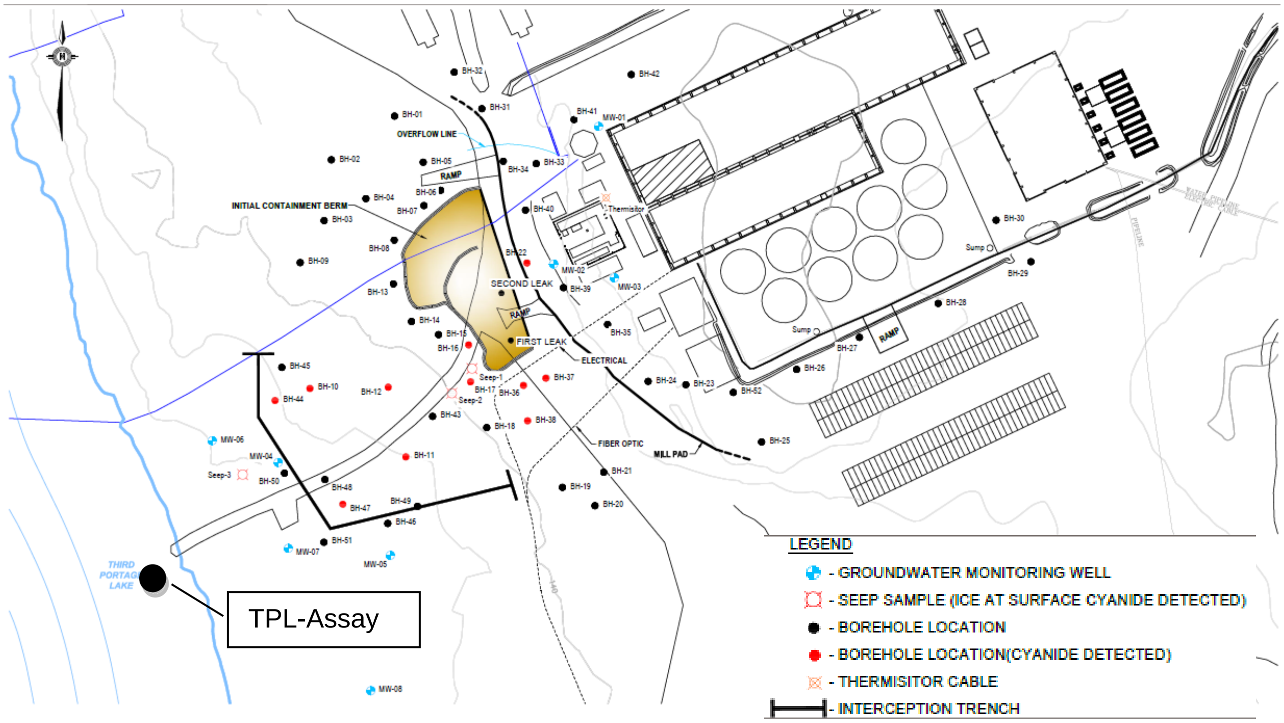

Table 8-104 Meadowbank Assay Road Seepage Trench and Well Water Quality Monitoring 2014-2019

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																								
2014-05-26	0.087		0.01	1	Dry				Dry				Dry				Dry				Dry			
2014-06-17	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
2014-07-21	0.38	0.020	0.031	1.6	Dry				Not enough water				Dry				Dry				<0.005	<0.01	0.014	0.43
2014-08-19	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
2014-09-29	0.03		0.008	0.77													0.0013		0.134	10.9				
2014-11-18	Frozen				Frozen				Frozen				Frozen				Frozen				Frozen			
2015																								
2015-07-29	0.024		0.005	0.72	Dry				<0.005		0.13	1.49	Dry				Dry				<0.005		0.27	2.92
2015-08-04	0.038	<0.005	0.008	0.6	Dry				Dry				Dry				Dry				<0.005	<0.005	0.17	17.2
2015-09-17	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																								
2016-08-08	0.022	0.016	0.0254	0.3	Dry				Dry				Not enough water				<0.005	<0.005	0.2948	39.8	<0.005	<0.005	0.3709	62.8
2016-08-16	No sample taken				Dry				Dry				Not enough water				0.007		0.1811	27.8	<0.005		0.1142	19.8
2016-09-06		0.007			Dry				Dry				Dry					<0.005			Not enough water			
2016-10-14	Frozen				Dry				Dry				Dry					0.005			Dry			
2017																								
2017-06-11	0.057		0.0047	1.33	Dry				Dry				Dry				Frozen				Dry			
2017-07-04	No sample taken				Not enough water					<0.005			Dry					<0.005				<0.005		
2017-07-09	0.024	0.017	0.0042		Dry				Dry				Dry				<0.001				Dry			
2017-07-14	0.028	<0.005	0.0021		Dry								Dry				No sample taken				No sample taken			
2017-07-18	0.013	<0.005	0.003	0.36	Dry				<0.01	<0.005			Dry				0.002	<0.005	0.0668	23.8		<0.005	0.0258	10.5
2017-07-28	0.011	<0.005	0.0039		Dry				Dry				Dry				No sample taken				No sample taken			
2017-08-22	0.021	0.005	0.0026	0.61	Dry				Dry				Dry				0.013	<0.005	0.3535	161	Not enough water			
2017-09-19	0.005	0.005	0.0049	0.05	Dry				Dry				Dry				0.011	<0.005	0.1432	25.9	Dry			
2018																								
2018-06-28	Frozen				Frozen				Frozen				Frozen				Frozen				Frozen			
2018-07-16	0.016	0.014	0.0047	0.18	Dry				Dry				Dry				Equipment broken				Frozen			
2018-08-20	0.014	0.015	0.0052	0.08	Dry				Dry				Dry				Equipment broken				Dry			

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)
2018-09-17	0.006	<0.005	0.0038	0.08	Dry				Dry				Dry				No sample taken				Dry			
2018-09-24	No sample taken				Dry				Dry				Dry				0.004	<0.005	0.0513	20.3	Dry			
2019																								
2019-07-08	0.044	0.013	0.0059	-	Dry				Dry				Dry				Dry				Dry			
2019-07-09	0.047	< 0.001	0.0045	0.04	Dry				Dry				Dry				Dry				Dry			
2019-08-02					Dry				< 0.001	< 0.001	0.0082	1.77	0.042	< 0.001	0.014	2.76	0.002	< 0.001	0.036	17.8	Not enough water			
2019-08-17	0.048	0.01	0.0043	0.03	Not enough water				Not enough water				Not enough water				Not enough water				Not enough water			
2019-08-30	0.008	0.002	0.0043	-	Not enough water				Not enough water				Not enough water				Not enough water				Dry			
2019-09-06	< 0.001	0.001	0.0032	-	Not enough water				Not enough water				Not enough water				Not enough water				Dry			
2019-09-26	0.025	0.011	0.0056	-	Dry				Dry				Dry				Dry				Dry			

Table 8-105 Meadowbank Assay Road Seepage 2019 TPL-Assay Water Quality Monitoring

Parameter	Sample Date	Annual Average					2019-06-17	2019-07-07	2019-07-09	2019-08-13	2019-09-11
	Unit	2015	2016	2017	2018	2019					
Field Measured											
pH	pH units	7.66	7.42	7.56	7.44	7.43	6.9	7.61	7.7	7.59	7.37
Conductivity	uS/cm	93.07	93.98	104.25	105.10	86.17	55.5	-	106.3	-	96.7
Temperature	°C	11.20	15.50	15.05	8.20	11.40	12.5	-	12.6	-	9.1
Dissolved oxygen	mg/L	9.40	9.93	9.58	-	11.57	-	-	-	-	11.57
Turbidity	NTU	1.09	0.62	1.56	0.95	3.20	6.88	-	2.17	-	0.54
Conventional Parameters											
Hardness	mg CaCO3/L	30.33	36.50	33.50	33.00	36.20	8	34	70	28	41
Total alkalinity, as CaCO3	mg CaCO3/L	34.33	26.50	39.25	30.00	21.60	7	20	30	24	27
Total dissolved solids	mg/L	60.67	63.50	62.50	59.00	68.00	17	63	110	72	78
Total suspended solids	mg/L	1.00	1.00	2.00	1.00	2.20	6	2	< 1	1	< 1
Total organic carbon	mg/L	2.83	2.80	3.50	2.55	2.16	1.5	1.8	3.5	2.1	1.9
Dissolved organic carbon	mg/L	2.83	1.63	3.15	2.35	2.18	1.3	1.8	3.7	1.7	2.4
Colour	CU	1.33	3.00	1.50	1.00	1.33	< 1	-	-	< 1	2
Major Ions											
Bromide	mg/L	0.0267	0.0200	0.0675	0.0450	0.063	0.09	-	-	0.07	0.03
Chloride	mg/L	3.7667	3.9750	4.2500	4.4000	3.620	1.1	4	4.6	3.9	4.5
Cyanide	mg/L	0.0050	0.0040	0.0040	0.0010	0.013	< 0.001	< 0.001	< 0.001	0.061	< 0.001
Fluoride	mg/L	0.0967	0.1025	0.1125	0.1200	0.276	0.05	0.09	0.12	0.12	1
Sulphate	mg/L	16.3667	16.1750	12.1500	12.2000	15.480	5	14.1	28.2	14.7	15.4
Reactive silica	mg/L	-	0.4000	0.4950	0.3400	0.492	0.18	0.46	1.2	0.28	0.34
Cyanide (free)	mg/L	0.0050	0.0050	0.0050	0.0050	0.001	0.001	-	-	< 0.001	< 0.001
Cyanide (WAD)	mg/L	0.0050	0.0030	0.0030	0.0010	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Thiocyanate	mg/L	0.0500	0.0775	0.0500	0.0500	0.050	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Nutrients and Chlorophyll a											
Nitrate	mg/L	0.037	0.018	0.023	0.010	0.0660	0.07	0.12	0.12	0.01	<0.01
Nitrite	mg/L	0.010	0.010	0.010	0.010	0.0100	<0.01	<0.01	<0.01	0.01	<0.01
Total Kjeldhal Nitrogen	mg/L	1.123	0.215	0.610	0.160	0.3020	0.56	0.33	0.26	0.15	0.21

Total phosphorus	mg/L	0.010	0.020	0.022	0.014	0.0100	< 0.01	-	-	0.01	< 0.01
Total orthophosphate (as phosphorus)	mg/L	0.010	0.010	0.010	0.010	0.0100	0.01	< 0.01	< 0.01	0.01	< 0.01
Total ammonia as NH4	mg/L	0.010	0.010	0.040	0.010	0.0160	< 0.01	0.03	< 0.01	0.02	< 0.01
Un-Ionized Ammonia, calculated	mg/L	0.010	0.030	0.050	0.015	0.0100	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Total Metals											
Aluminum	mg/L	0.00600	0.00600	0.00600	0.01650	0.01260	0.018	< 0.005	0.03	< 0.005	< 0.005
Antimony	mg/L	0.00010	0.00010	0.00010	0.00010	0.00010	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	0.00370	0.00050	0.00050	0.00050	0.00052	0.0006	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Barium	mg/L	0.00260	0.00247	0.00220	0.00320	0.00652	0.0014	0.0088	0.0078	< 0.0005	0.0141
Beryllium	mg/L	0.00057	0.00050	0.00050	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Boron	mg/L	0.01000	0.01000	0.01000	0.01000	0.01000	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	0.00003	0.00002	0.00002	0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.00163	0.00067	0.00068	0.00060	0.00060	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Cobalt	mg/L	0.00050	0.00050	0.00050	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Copper	mg/L	0.00050	0.00060	0.00078	0.00060	0.00080	< 0.0005	0.0005	0.002	< 0.0005	0.0005
Iron	mg/L	0.01000	0.01000	0.01000	0.01000	0.04600	0.06	0.03	0.08	0.03	0.03
Lead	mg/L	0.00030	0.00030	0.00258	0.00040	0.00030	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Lithium	mg/L	0.00500	0.00500	0.00500	0.00500	0.00500	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Magnesium	mg/L	2.27000	2.68000	2.61500	2.66500	2.99400	0.54	2.6	6.19	2.41	3.23
Manganese	mg/L	0.00050	0.00137	0.00230	0.00065	0.00664	0.0162	0.0048	0.0054	0.0046	0.0022
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	0.00050	0.00050	0.00050	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	0.00050	0.00067	0.00060	0.00055	0.00090	0.0006	0.0006	0.0023	< 0.0005	< 0.0005
Potassium	mg/L	0.00057	1.12000	1.23000	1.09000	1.23000	0.33	1.17	2.11	1.05	1.49
Selenium	mg/L	0.00100	0.00100	0.00100	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Silver	mg/L	0.00010	0.00010	0.00010	0.00010	0.00010	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Strontium	mg/kg	0.04400	0.03600	0.05350	0.04450	0.06700	-	0.045	0.094	-	0.062
Thallium	mg/L	0.00500	0.00080	0.00080	0.00020	0.00020	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Tin	mg/kg	0.00100	0.00100	0.00100	0.00100	0.00100	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Titanium	mg/L	0.01000	0.01000	0.01000	0.01000	0.01000	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Uranium	mg/L	0.00100	0.00100	0.00100	0.00100	0.00100	< 0.001	< 0.001	0.001	< 0.001	< 0.001
Vanadium	mg/L	0.00050	0.00050	0.00050	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	0.00100	0.00100	0.00300	0.00100	0.00100	< 0.001	< 0.001	0.001	< 0.001	< 0.001
Dissolved Metals											
Aluminum	mg/L	0.01067	0.01775	0.00950	0.00900	0.00330	< 0.0005	< 0.0005	0.01	< 0.005	< 0.0005
Antimony	mg/L	0.00010	0.00010	0.00010	0.00010	0.00010	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Arsenic	mg/L	0.00050	0.00050	0.00175	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Barium	mg/L	0.00380	0.00283	0.00325	0.00310	0.00518	< 0.0005	0.005	0.0083	< 0.0005	0.0116
Beryllium	mg/L	0.00050	0.00050	0.00050	0.00050	0.00050	-	< 0.0005	< 0.0005	-	< 0.0005
Boron	mg/L	0.01000	0.01000	0.01000	0.01000	0.01000	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cadmium	mg/L	0.00002	0.00002	0.00002	0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	mg/L	0.00077	0.00128	0.00093	0.00060	0.00060	< 0.0006	< 0.0006	< 0.0006	< 0.0006	< 0.0006
Cobalt	mg/L	0.00050	0.00050	0.00125	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Copper	mg/L	0.00053	0.00070	0.00090	0.00080	0.00050	0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Iron	mg/L	0.03667	0.05750	0.08500	0.02500	0.01000	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Lead	mg/L	0.00030	0.00030	0.00258	0.00040	0.00030	< 0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Lithium	mg/L	0.00500	0.03100	0.00500	0.00500	0.00500	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Manganese	mg/L	0.00597	0.00793	0.00580	0.00345	0.00400	0.0148	0.0018	0.0024	< 0.0005	< 0.0005
Mercury	mg/L	0.00004	0.00002	0.00001	0.00003	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	0.00050	0.00050	0.00050	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	0.00057	0.00073	0.00068	0.00090	0.00054	0.0007	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Selenium	mg/L	0.00100	0.00100	0.00100	0.00055	0.00050	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Silver	mg/L	0.00010	0.00010	0.00010	0.00010	0.00010	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Strontium	mg/L	0.04400	0.06825	0.04275	0.02975	0.04300	0.014	0.041	0.069	0.049	0.042
Thallium	mg/L	0.00500	0.00080	0.00080	0.00020	0.00020	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Tin	mg/L	0.00100	0.00100	0.00100	0.00100	0.00100	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Titanium	mg/L	0.01000	0.01000	0.01000	0.01000	0.01000	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Uranium	mg/L	0.00100	0.00100	0.00100	0.00100	0.00100	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Vanadium	mg/L	0.00050	0.00060	0.00050	0.00050	0.00050	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	mg/L	0.00233	0.00100	0.00250	0.00100	0.00100	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

8.5.8.2 *Whale Tail Site*

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 10*: 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

Dewatering was taking place in 2019. 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 2019. However, as detailed below other kinds of seepages were observed at the WRSF Dike and the Northeast Dike.

8.5.8.2.2 Seepage (of any kind) through Whale Tail Dike

The Whale Tail Dike was commissioned on March 5th, 2019 with the beginning of the dewatering activity of the North Basin.

In July 2019, seepage stream 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 is being installed to collect and manage the non-contact seepage water. 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-WTP1826. If discharge criteria are not met, water will overflow from the pump stations to the North Basin, and then will be pumped through the WTP and discharged via an approved diffuser.

Routine monitoring of the seepage water quality from each pump station will be as per the Water Licence 2AM-WTP1826 Part F Item 6, the Water Quality Monitoring and Management Plan for Dike Construction and Dewatering (Version 1, Jan 2017) and the Metal and Diamond Mining Effluent Regulation (MDMER). This monitoring will allow Agnico Eagle to put mitigation measures (for example, treating the water via the WTP) in place if needed. Turbidity and pH will also be monitored.

Agnico Eagle continues to closely monitor the situation and is conducting an intensive grouting campaign to further reduce the seepage flow.

As discussed in Section 8.5.3.2.8 above, Agnico also pumped water from Whale Tail South to Mammoth Lake in 2019 in order to preserve WTD integrity.

8.5.8.2.3 Seepage and runoff from the landfill

The Whale Tail Landfill was commissioned in October 2019. No seepage monitoring was observed reporting to this infrastructure in 2019.

8.5.8.2.4 Subsurface seepage and surface runoff from waste rock piles

As required by Part H, Item 8b of Water License 2AM-WTP1826, Agnico Eagle Mine Limited – Meadowbank Division ("Agnico") informed regulators via email on August 25th that during an inspection held on August 24th at 10:30hrs of the Whale Tail Waste Rock Storage Facility (WRSF) Dike, a water flow was observed at the toe of the dike entering Mammoth Lake. Following observation of the water flow, special measures were immediately put in place on August 24th to reduce the flowrate by pumping water out of the WRSF collection pond, with the ultimate objective to stop the flow as quickly as possible. Given the nature of the topography at the toe of the WRSF Dike (flat terrain at an elevation close to the lake elevation with the presence of a boulder field), and its difficult access, installing a pumping station at the toe could not be done rapidly and that the best course of action was a rapid head reduction in the pond by emptying it.

The WRSF pond was considered to be essentially empty by September 1st, within one week of the first observation. In the meantime, an access road to the toe of the dike was constructed to allow the installation of a water collection system to pump the water back upstream. The collection system was operated until the onset of freezing conditions on September 30th but after the pond was emptied. By this time it was mostly collecting drainage water downstream of the dike.

The visual detection of this seepage downstream of the dike was difficult because of the presence of a boulder field at the toe which caused the flow to be somewhat diffuse as well as the presence of natural runoff reporting in this area.

A series of samples were taken for analysis on August 26th from the water source (WRSF Pond) as well as from the receiving waterbody (Mammoth Lake). The toxicity test results were provided in the September 13th, 2019 report and showed no mortalities.

Samples were also taken to test the water quality specifically for MDMER related parameters on August 26th. Sampling locations were identified as WRSF flow (water sampled downstream of the dike, where the flow was first observed and where a sump was excavated) and Mammoth Lake receiving (water sampled within a few meters of the shoreline of Mammoth Lake north).

Analysis results from these samples and from subsequent samples taken at both locations showed no exceedances of the MDMER water quality criteria. These results are consistent with the expected water quality for this contact water.

A full complement of samples for extended parameters were also collected on August 27th, 30th, September 2nd and on a weekly basis until freeze up (September 29th, 2019) and sent to the accredited laboratory. No MDMER or Water License exceedances were shown for this complement of sampling.

A series of measures have been or will be implemented to minimize the risk of a similar occurrence in the future:

- The water level in the WRSF pond will be maintained at a low level throughout 2020 as per recommendation from the MDRB as a precautionary measure and to ensure protection of the freeze-back of the key trench;

- Permafrost penetration will be promoted during winter 2019-2020 by implementing a series of additional measures to increase the robustness of the infrastructure and in particular the upstream toe against permafrost degradation:

    - Strategic snow removal to keep the toe more exposed to winter conditions;

    - Keeping a low water level (if any) in the pond during winter and summer months;

    - Placing additional thermal cover material on the upstream portion of the dike; and
    - Assessing freeze back performance with periodic instrumentation review;
- A more robust downstream water collection system will be designed and constructed; and
- Thermistors monitoring will continue.

In addition, the following environmental monitoring will be conducted:

- A monthly limnology profile of Mammoth Lake will be completed over the winter and open water conditions;
- A core receiving environment monitoring program will be carried out, including Mammoth lake; and
- A sediment sampling campaign will be executed in the summer at Mammoth Lake.

Agnico Eagle continues to closely monitor the situation and is working on mitigation measures to ensure adequate performance of the structure. For a complete review, refer to the second follow up report attached in Appendix 44.

8.5.8.2.5 Seepage at pit wall and pit wall freeze/thaw and permafrost aggradation

In 2019 no seepage along the wall face was noted in Whale Tail Pit. In 2019, 285,762 m^3 of water was pumped out of Whale Tail Pit to Quarry 1. Due to the pit's proximity to Whale Tail North and Quarry 1 it is expected that some of the water is from these locations, as well as snowmelt and rainfall. Release of water stored in the talik beneath the former lake has also been observed as the pit is excavated deeper.

8.6 BLAST MONITORING [*]

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 Meadowbank Division 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 conducts monitoring to evaluate blast related peak particle velocity and overpressure to protect nearby fish bearing waters.

The results of the 2019 blast monitoring program are available in the report entitled "2019 Meadowbank and Whale Tail Blast Monitoring Report for the Protection of Nearby Fish Habitat" prepared by Agnico, attached as Appendix 45.

Peak particle velocity (PPV) and overpressure monitoring data was recorded throughout 2019 during blasting activities at the North Portage Pit, South Portage Pit, Vault Pit and BB Phaser Pit. The locations

[*] TSM – Biodiversity and Conservation Management

of the blast monitoring stations are illustrated in Figure 1 and Figure 2 of the report Blast Monitoring Report found in Appendix 45. The Portage stations are located near the shoreline of Second Portage Lake. The Vault Pit station #2 is located near Wally Lake.

No blast monitoring was conducted at Goose Pit as mining has ceased in this pit since April 2015. Vault Pit station #1, located between the Vault Attenuation Pond (dewatered Vault Lake) and the Vault Pit, was also not monitored since 2016 as the nearest potential fish habitat is in Wally Lake and the Vault Pit station #2 is used to monitored the potential impact. These monitoring stations are also illustrated in Figure 1 and Figure 2 of the report Blast monitoring Report found in Appendix 45.

In 2019, 49 blasts were monitored at Meadowbank, including Baker Lake Road. There were no PPV exceedance and IPC measurements were all below the DFO limit of 50 kpa. The average PPV was 0.55mm/s with a maximum of 4.47 mm/s. Table 8-106 present the PPV exceedance from 2013 – 2019 and Table 8-107 contains the maximum and average PPV for 2013-2019 for Meadowbank and Whale Tail.

Table 8-106 Meadowbank and Whale Tail PPV exceedance from 2013-2019

Year	PPV exceedance Meadowbank	PPV exceedance Whale Tail
2013	16	No activities
2014	8	No activities
2015	2	No activities
2016	0	No activities
2017	0	No activities
2018	0	2
2019	0	8
Total	**26**	**10**

Table 8-107 Meadowbank and Whale Tail Maximum and Average PPV from 2013 - 2019

Location	Parameters	2013	2014	2015	2016	2017	2018	2019
Meadowbank (Portage and Vault, Phaser and BB Pit)	Max PPV (mm/s)	32.7	23.8	16.5	9.54	11.9	7.43	4.47
	Average PPV (mm/s)	5.39	3.93	2.38	1.18	0.78	0.43	0.55
Whale Tail Pit	Max PPV (mm/s)	No Activities	No Activities	No Activities	No Activities	No Activities	26.1	20.9
	Average PPV (mm/s)	No Activities	No Activities	No Activities	No Activities	No Activities	4.18	2.16

The average is similar to 2018. The low PPV average can be explained by the fact that Portage and Vault Pits are deeper and increasing the effective distance between the blast and the Instantel monitoring device.

8.6.2 Whale Tail Site*

As required by DFO Authorization 16HCAA-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 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.***

In accordance with NIRB Project Certificate No.008, Condition 22 and DFO 16HCAA-00370 Condition 2.3.3, Agnico 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 conducts monitoring to evaluate blast related peak particle velocity and overpressure to protect nearby fish bearing waters.

Agnico have update the Blast Monitoring Program (Version 4, March 2020 – Appendix 57) to reflect comment from regulators regarding the 2018 Annual Report. This Version 4 is submitted as part of the 2019 Annual Report. Agnico also submitted in 2019 a specific blast memo to DFO regarding the Mammoth Dike construction (Appendix 66) and the Whale Tail South Channel Construction (Appendix 65). Blast for South Channel construction started in Q1 2020, and thus the result will be provided in the 2020 Annual Report.

The results of the 2019 blast monitoring program are available in the report entitled "2019 Blast Monitoring Report for the Protection of Nearby Fish Habitat" prepared by Agnico, attached as Appendix 45.

Peak particle velocity (PPV) and overpressure monitoring data was recorded throughout 2019 during blasting activities at the Mammoth Station, Mammoth Station 2 and Mammoth Dike Temporary Station. The locations of the blast monitoring stations are illustrated in Figure 3, 4 and 5 of the report Blast Monitoring Report found in Appendix 45.

In 2019, 174 blasts were monitored at Whale Tail Project. There were eight (8) PPV concentrations exceeded the DFO limit of 13 mm/s. IPC measurements were all below the DFO limit of 50 kpa. The average PPV was 2.16 mm/s with a maximum of 20.9 mm/s. Table 8-106 and 8-107 above will be updated annually.

The eight exceedances were recorded in 2019 and occurred during period of egg incubation (egg incubation period is from August 15th to June 30th). These events were located at Whale Tail:

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- The first exceedance was recorded at Mammoth Station for the 5137PSW01 with 14.4 mm/s on May 17th, 2019. For this blast, five (5) preshear holes were detonated on the same delay. To mitigate the probability of another exceedance for preshear holes, mitigation technique number four from the Blast Monitoring Plan was used. This technique is to reduce the explosives quantity per delay.

- The second exceedance was recorded Mammoth Station for the 5144MSW32 with 13.5 mm/s on May 22nd, 2019. This blast was close to the blast monitoring station but a bit far from the lake shore. To mitigate the probability of another exceedance, another blast monitoring station was implemented nearer to the lake and further from the pit. This move was done on June 26th, 2019. Since this move, no exceedances were observed.

- The third exceedance was recorded at Mammoth Station for the 5130PSW04 SEQ1 with 20.9 mm/s on June 8th, 2019. For this blast, six (6) preshear holes were detonated on the same delay. To mitigate the probability of another exceedance for preshear holes, mitigation technique number four from the Blast Monitoring Plan was used. This technique is to reduce the explosives quantity per delay.

- The fourth exceedance was recorded at Mammoth Station for the 5130PSW06 SEQ1 with 17.4 mm/s on June 15th, 2019. For this blast, five (5) preshear holes were detonated on the same delay. To mitigate the probability of another exceedance for preshear holes, mitigation technique number four from the Blast Monitoring Plan was used. This technique is to reduce the explosives quantity per delay.

- The fifth exceedance was recorded at Mammoth Station for the 5130PSW06 SEQ1 with 14 mm/s on June 22nd, 2019. There was a working pump very near the blast monitoring station during the blast. The vibration of this pump most likely amplified the vibration recorded during the blast.

- The sixth to eighth events where exceedance were observed are located at Mammoth Dike temporary station during the blasting of the dike’s foundation. They were observed February 20th, 23rd and 26th on the respective patterns 5149DDA01-1, 5149DDA03-1 and 5149DDA05-1.

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 2019 groundwater monitoring program are available in Appendix 46. Below is a summary of the results and Agnico will refer to the report presented in the Appendix for a complete review and discussion of the results.

The 2019 groundwater monitoring program at Meadowbank was conducted in accordance with the Groundwater Monitoring Plan. The objective of this program is to document any effects of mining on groundwater quality, particularly with respect to tailings deposition. This is done by monitoring the salinity of shallow and deep groundwater. The recorded data is also used to update water quality predictions at the site.

The report (Appendix 46) includes a description of the surface water and groundwater sampling and a presentation of the water quality results.

In 2019, surface water and groundwater sampling campaigns were carried out twice from July 9th to July 17th, 2019 and October 7th to October 14th, 2019. The list of samples collected in 2019 are provided in Table 2-1 of the Groundwater Monitoring Report (Appendix 46).

The main activities carried out were:

- Purging of monitoring wells performed by Agnico Eagle staff prior to the arrival of a SNC-Lavalin professional for the July campaign whereas it was done by SNC-Lavalin technician with the help of Agnico Eagle staff during the October campaign;

- Groundwater sampling in monitoring wells (pit wall seepages were not sampled in October due to safety considerations); and

- Surface water sampling (only at specific location).

Each groundwater sample has a distinctive signature defined by its dissolved concentrations of chemical constituents. The interpretation of groundwater chemistry data contributes to improve the understanding of groundwater flow, contaminants migration and transformation processes along pathways as water composition varies. It can also help to identify zones where surface water and groundwater interact and define if the interaction is continuous or is only during permafrost thawing.

Groundwater analytical results were compared to the criteria prescribed in the site Water License 2AM-MEA1526 for the maximum average concentration discharged to Third Portage Lake. Analytical results are found in Appendix D of the report (Appendix 46) and concentrations exceeding these criteria are shaded. Table 3-2 of the report shows the sampling stations and parameters (TSS, total copper, total phosphorus and ammonia nitrogen) that are exceeding these criteria. The main parameter exceeding the Water License criteria is total suspended solids. High turbidity in the water of the monitoring wells MW-IPD-07, MW-IPD-01 (d) and MW-IPD-09 is observed in July following the monitoring well purge. Exceeding parameters as total copper and ammonia nitrogen are related to the reclaim water signature which is sampled at Station ST-21-South (tailings storage facility South Cell reclaim water pump station). Aside from reclaim water sample, high concentrations above Water License criteria is found at monitoring station ST-S-5 (Central Dike seepage) for ammonia nitrogen. Total phosphorus is exceeding Water License criteria at the Storm Water Management Pond (SWMP).

The geochemical composition of groundwater is mainly defined by the concentration of dissolved main anions (HCO3-, SO42-, Cl-) and main cations (Ca2+, Na+, Mg2+, K+). These data are presented on a Stiff diagram for each groundwater sample in Appendix E of the report (Appendix 46). These diagrams are useful to gain a first insight into water chemistry. The water samples can be divided into two groups: samples with a natural groundwater signature and samples with a reclaim water signature.. Stiff diagrams were used to support comparison between the sampling period and the sampling locations nearby mining activities.

The Stiff patterns are similar to 2018 patterns except for Station ST-21-South where the dissolved content seems to be lower in 2019 than in 2018, and also lower in October 2019 than July 2019. This phenomenon might be linked to the interruption of the tailings disposal in the Tailings Storage Facility (TSF) in July 2019.

Historical groundwater quality data starts from 2003. From 2003 to 2019, 17 groundwater monitoring wells were installed to characterize the groundwater in these areas. Refer to Table 3-3 in the Groundwater Report (Appendix 46) for a complete review of the sampling up to 2019.

A Historical Groundwater trends from 2003-20019 for chloride, sulfate, total cyanide, total copper, total iron, total arsenic are presented in Section 3 of the report (Appendix 46).

The groundwater collected in 2019 from four (4) wells (MW-IPD-01(d), MW-IPD-01(s), MW-IPD-07 and MW-IPD-09) installed in 2018 is still within the natural groundwater signature category. The water quality at MW-IPD-07 does not seem to have been impacted by the in-pit tailings deposition which was started in July 2019 in Goose Pit only. As shown in Table 3-5 (Appendix 46), the 2019 mean annual concentrations for key parameters are lower or similar to 2018 values. The Total cyanide value is slightly higher in 2019 than 2018 but the difference is not significant enough for interpretation. For information purpose, the elevation of the surface of the tailings deposited in Goose pit was estimated at 62 m above sea level in October 2019. This elevation is 20 m below the bottom elevation of the screened section of well MW-IPD-07.

Reclaim water sampling station named ST-21-South, was identified in 2017 as the main source of sulfates and calcium found in water and is illustrated by black cross on the graph. As in 2018, the water quality at ST-S-5 (seepage of reclaim water collected in the Central Dike downstream pond) shows higher concentrations than in ST-21-South. Reclaim water signature can still be detected in the groundwater from well MW-16-01, located nearby, downgradient of the South Cell TSF. The diluted signal of reclaim water could be identified along flow path from alternative sampling stations such as pit wall seepage. Refer to Figure 3.7 in report in Appendix 46.

Figure 3-8 (Appendix 46) shows the evolution of the chloride concentration in the South Cell and Central Dike area in surface water and groundwater over the 2014-2019 period. Since 2014, a slow decreasing trend was observed for ST-21 and ST-S-5 whereas, for monitoring well MW-16-01, the concentration was stable or with a slight trend upward. The chloride content in ST-21-South decreased significantly in the fall of 2019, potentially due to the interruption of the tailings deposition in the South Cell. Chloride concentrations did not decrease in ST-S-5 and MW-16-01 in the end of 2019. The effect of the interruption of the tailings deposition at the South Cell on the water quality at the different monitoring stations might potentially be observed during the 2020 monitoring campaigns.

Finally, interpretation of 2019 geochemical data aims to provide a global portrait of groundwater quality at the mine site and its potential linkage to surface water of mining activities. Groundwater collected in 2019 from the four (4) newly installed well fits within the natural groundwater category established on 2017 results and can be use as threshold values to monitor groundwater quality in the future.

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. 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:***

- ***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.

The Groundwater Monitoring Plan was updated as part of the 2019 Annual Report and is submitted in Appendix 61. This updated was to address to address NIRB and CIRNAC comments and provide updated information based on supplemental data collection and modelling.

In Appendix 47, the 2019 Groundwater Management Monitoring Report presented a compilation of the site-specific data collection in 2019 and the review of 2019 monitoring data undertaken by Agnico to meet the requirements established in the Groundwater Monitoring Plan. The following is a summary of the report and Agnico will refer the reader to the whole report in Appendix 47 for an exhaustive comprehension of the program and results for 2019.

Groundwater sampling and hydraulic head measurements of the Westbay multi-level system (AMQ16-626) was undertaken in March 2019. A technical memorandum was prepared documenting the work and is presented as Attachment A of the complete report (Appendix 47).

Groundwater samples were collected from ports 2, 3, 4 and 6 of the Westbay multi-level well in March 2019. During drilling and installation of the Westbay, the drilling fluid was tagged with fluorescein. During collection of the water samples, the fluorescein concentration was measured to estimate the proportion of the sample that could be attributed to drilling fluid.

Given the Westbay well had to be installed through permafrost, removal of groundwater for well development, purging and sampling must be carried out using a small volume sampler which substantially lengthens the time requirement for these activities for each port (months). Consequently, the sampling program prioritizes key ports that optimized groundwater quality data collection; each port is accessed for hydraulic pressure measurements.

The following presents a summary of the data contained in the report (Appendix 47)

- The Westbay multi-level well was re-sampled in March 2019. Considering that the estimated groundwater quality at Ports 6 and 3 are in the same range as estimated in 2016, and that the vertical gradients measured at the Westbay Ports are consistent with the conceptual model in the FEIS, an additional Westbay well installation is not recommended. Reliable TDS data collected at the Westbay well up to the end of 2019 was used in groundwater model update.

- To define horizontal and vertical groundwater flow thermistor, lake water levels and Westbay hydraulic head measurements were used. Thermistor data and modelling confirmed that horizontal groundwater flow below the active layer is restricted by permafrost in at least the upper 425 m. Horizontal groundwater flow in the sub-permafrost is therefore controlled by the relative hydraulic heads of lakes that are sufficiently large and deep to have an open talik beneath them. Hydraulic head measurements in the Westbay multi-level well indicated a downward vertical hydraulic gradient of 0.006 m/m that is consistent with the estimated hydraulic gradient derived form the relative difference in the hydraulic head at Whale Tail Lake and DS1 divided by the distances between these lakes (including the distance down through the open talik beneath Whale Tail lake and up through the open talik of DSI).

- Updated EA Scenario groundwater inflows were provided in support of the annual update to the site wide water quality and water balance models. The updated flows considered the revisions to interpreted bedrock hydraulic conductivity, based on packer testing conducted since the FEIS between 2016 and 2018, updated thermal modelling, and interpreted TDS profile from the Westbay sampling.

- Groundwater inflows to the pit sumps did not occur in 2019; dewatering of the North Basin was occurring. In the absence of groundwater inflow, comparison of observed groundwater inflow to the Whale Tail Pit to the predicted inflows could not be undertaken in 2019.

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*

According to Fisheries and Oceans Canada (DFO) Authorizations NU-03-0191.2, NU-03-0191.3, NU-03-0191.4 and 14-HCAA-01046, Agnico Eagle maintains a Habitat Compensation Monitoring Plan (HCMP;

Version 4, 2017) to ensure that fish habitat compensation features at the Meadowbank site are constructed and functioning as intended. Based on the schedule described in the HCMP, monitoring of compensation features generally occurs every 2 years, until at least 2021. The last monitoring event occurred in 2019, and the complete report is provided in Appendix 40.

In 2019, monitoring was conducted for the constructed spawning pad, located at stream crossing R02 along the all-weather access road (AWAR) to Baker Lake, as well as for the onsite habitat compensation features constructed to date (East Dike exterior, Bay-Goose Dike exterior, Dogleg Ponds). As described in the HCMP, the AWAR study included a visual assessment of stability, as well biological monitoring to confirm use by Arctic grayling. The onsite monitoring included an assessment of periphyton growth and fish use for dike faces, and surface area for the Dogleg Ponds. Interstitial water quality is normally included for dike faces, but was not assessed in 2019 (next assessment will be 2021).

The constructed spawning pads at stream crossing R02 along the AWAR were visually confirmed to be stable as designed. Generally, condition factors of adult fish, population size distributions and timing of migration were within the range of values seen in previous years, confirming continued use of this area by Arctic grayling without significant changes in population structure. Larval drift rates of collection continue to exceed those observed prior to construction of the spawning pad. While these traps are useful to assess spawning rates within the R02 reach generally, Agnico anticipates reviewing HCMP methods prior to the 2021 monitoring event to better assess successful utilization of the spawning pads specifically. Any updated plans will be provided to DFO for review prior to implementation.

Onsite, angling and underwater motion camera monitoring demonstrated continued fish use of the dikes as habitat. A total of 20 fish were caught through angling in 15 hr of effort, and a single fish sighting was captured on camera during the underwater motion camera program (3 hr of footage). Bathymetric surveys were completed for the Dogleg ponds to confirm predictions for minor flooding. However, air photo interpretation combined with bathymetric surveys during the next monitoring event will facilitate comparison with baseline measurements.

Once the minimum monitoring period as described in the HCMP (2017) is reached for each compensation feature (2021+), a weight-of-evidence approach incorporating all data collected to date will be used to determine whether specific criteria for success have been met.

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 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 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***

Agnico has submitted the Fish Habitat Offsetting Plan (Appendix 51 of the 2018 Annual Report) on March 2018. Changes to fish habitat between baseline conditions and predicted conditions during the operations and post-closure scenarios are compared in this plan and will be updated as required.

8.8.2.2 *Fish Habitat Offset Monitoring Plan*

As required by DFO Authorization 16HCAA-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 16HCAA-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 16HCAA-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 16HCAA-00370 Condition 5.1.1.5: ***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***

Agnico submitted the Version 1 of the Whale Tail Fish Habitat Offset Monitoring Plan on March 2018 (Appendix 51 of the 2018 Annual Report).

Agnico did not update of the monitoring plan in fulfillment of the Condition 5.1.2 as Agnico is waiting to receive DFO's comments on Version 1, if any before proceeding. The plan Version 1 was resubmitted to DFO on March 15th, 2019.

The schedule for the implementation of the offsetting measures as per requirement of Condition 5.1.1.3 was submitted to DFO on January 7, 2020 (Appendix 48). Section 8.8.2.4 detailed the complementary measures research.

As per the Fish Habitat Offset Monitoring Plan (March, 2018), no habitat offsets were constructed at Whale Tail since the beginning of the project, and thus no monitoring was required in 2019. However, a complete report on the progress of complementary measures (research programs) and the activities of the Meadowbank Fisheries research Advisory Group (MFRAG) is provided in the 2019 Fish Habitat Offset Monitoring Report (Appendix 49).

Briefly, six research studies are underway as complementary measures for Whale Tail Pit offsetting (Table 8-108). All studies are on track for completion according to original timelines as described in signed research agreements with the academic partners. In 2019, field programs and laboratory analyses entered year one or two for five of these projects. One will be complete in 2020, and the remaining four will continue with additional field studies this summer. One study is not proposed to begin until re-flooding of Vault and Phaser Lakes is complete, beyond 2026. Agnico is also looking for an alternate suitable study site and industry partner for that study, to allow it to be completed in the nearer term.

Table 8-108 Whale Tail Pit Complementary Measures (research projects)

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 – 2022
Study 2: Assessment of impacts of the Baker Lake wastewater outflow on aquatic systems including fish and fish habitat	H. Swanson	2019 – 2024
Study 3: Literature review and field validation of northern lake fish habitat preferences	S. Doka	2018 – 2020
Study 4: Arctic Grayling occupancy modelling	H. Swanson	2018 – 2021
Study 5: End pit lake habitat use	TBD	2027 – 2034 (est.)
Study 6: eDNA methods development	J. Stetefeld	2018 - 2023

As part of the Fish Habitat Offsetting Plan for Whale Tail Pit (March, 2018), the Meadowbank Fisheries Research Advisory Group (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. Refer to Section 8.9 below for a discussion about the MFRAG.

The participant list, agenda, and notes from the inaugural 2019 MFRAG meeting are provided in Appendix A of the 2019 Fish Habitat Offset Monitoring Report (Appendix 49).

8.8.2.3 *Consultation*

As required by DFO Authorization 16HCAA-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***

This 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 Pit*

As required by DFO Authorization 16HCAA-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 16HCAA-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***

8.8.2.4.1 Assessment of changes in aquatic productivity and fish populations due to flooding of Whale Tail South and downstream, lakes during operations

The research plan for this project was provided in Section 8.8.2.4.1 of the 2018 Annual Report, and the Technical Memorandum: 2018 Annual Progress Report on Complementary Measures for the Whale Tail Pit Project (provided by email to DFO on June 21st, 2019). More details regarding this study can be found in the 2019 Fish Habitat Offset Monitoring Report in Appendix 49.

8.8.2.4.2 Assessment of impacts of the Baker Lake wastewater outflow on nutrient status/fish productivity and fish habitat

This study forms a component of a larger, multi-disciplinary project entitled “Validating Environmental and Human Health Improvements Associated with Wastewater Treatment Upgrades in Arctic Communities”, lead by Dr. Rob Jamieson at Dalhousie University. As described in Section 2.2, Appendix C of the Whale Tail Pit Fish Habitat Offsetting Plan (May, 2018) and approved by DFO according to Fisheries Act Authorization 16HCAA-00370, research objectives for this project related to fish health, habitat and productivity (lead by Dr. Heidi Swanson, University of Waterloo) will provide complementary offsets for the Whale Tail Pit project. General research objectives and methods were provided in Section 8.8.2.4.2 of the 2018 Annual Report, and the Technical Memorandum: 2018 Annual Progress Report on Complementary Measures for the Whale Tail Pit Project (provided by email to DFO on June 21st, 2019).

The research agreement for this project was signed in August, 2019, and additional detailed research methods will be provided in the subsequent Annual Progress Report on Complementary Measures for the Whale Tail Pit Project (due to DFO May 31st, 2020).

More details regarding this study can be found in the 2019 Fish Habitat Offset Monitoring Report in Appendix49.

8.8.2.4.3 Literature review and field validation of northern lake fish habitat preferences

The research plan for this project was provided in Section 8.8.2.4.3 of the 2018 Annual Report and the Technical Memorandum: 2018 Annual Progress Report on Complementary Measures for the Whale Tail Pit Project (provided by email to DFO on June 21st, 2019). More details regarding this study can be found in the 2019 Fish Habitat Offset Monitoring Report in Appendix 49.

8.8.2.4.4 Arctic Grayling Occupancy Modelling

The research plan for this project was provided in Section 8.8.2.4.4 of the 2018 Annual Report and the Technical Memorandum: 2018 Annual Progress Report on Complementary Measures for the Whale Tail Pit Project (provided by email to DFO on June 21st, 2019). More details regarding this study can be found in the 2019 Fish Habitat Offset Monitoring Report in Appendix 49.

8.8.2.4.5 End-Pit Lake Habitat Suitability Assessment

As required by DFO Authorization 16HCAA-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***

The requested literature review and preliminary study outline was provided to DFO by email on March 15th, 2019 (Appendix 42 of the 2018 Annual Report).

As indicated by email to DFO on November 7th, 2019: It is Agnico's view that Condition 4.1.2.3 of DFO WT Authorization 16-HCAA-00370 (development of detailed study plans for the end pit lake habitat suitability project) can only be completed once a study site is confirmed, and an academic research partner is identified. As they will be undertaking the study and are considered the subject matter expert, the researcher will want to develop the specific study methodology (to be approved by the MFRAG). At this time, Agnico still considers it to be too early to expect a researcher to commit to the project assuming use of reflooded pits at Meadowbank (7+yrs out), and would propose to develop those detailed research plans 1 – 2 years prior to study initiation, if no alternate collaboration is identified in the meantime. While the approved offsetting plan does describe a general study direction, specific objectives are to be shaped by the eventual researcher & MFRAG. At this time, Agnico plans to include this study as an agenda item at MFRAG meetings, and allow for discussion amongst the members on possible study sites, timelines, and any change in goals, however cannot provide a detailed methodology until a site and a research team are finalized.

More details regarding this study can be found in the 2019 Fish Habitat Offset Monitoring Report in Appendix 49.

8.8.2.4.6 eDNA Methods Development

The research plan for this project was provided in Section 8.8.2.4.6 of the 2018 Annual Report and the Technical Memorandum: 2018 Annual Progress Report on Complementary Measures for the Whale Tail

Pit Project (provided by email to DFO on June 21st, 2019). More details regarding this study can be found in the 2019 Fish Habitat Offset Monitoring Report in Appendix 49.

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 described above in Section 8.8.2.2, the Meadowbank Fisheries Research Advisory Group (MFRAG) was conceptualized to provide a forum for input from key stakeholders on complementary measures (research programs) conducted under the Fish Habitat Offsetting Plan for Whale Tail Pit (March, 2018). 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 (HTO). As planned in the Fish Habitat Offsetting Plan for Whale Tail Pit, Appendix C (May, 2018), Agnico also identified a third party external advisor (Dr. Kelly Munkittrick, University of Calgary) who will participate in all MFRAG activities and provide outside perspective. A draft Memorandum of Understanding and Terms of Reference were developed by Agnico, 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 agreed to provide written comments, if any, by February 28th, 2020. Any written comments are distributed to research study leads for consideration.

The participant list, agenda, and notes from the inaugural 2019 MFRAG meeting are provided in Appendix A of the 2019 Fish Habitat Offset Monitoring Report (Appendix 49).

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;

This will be assessed via a Research Agreement signed between University of Waterloo researchers and Agnico for the complementary measures project assessment of changes in aquatic productivity and fish populations due to flooding of Whale Tail South and downstream lakes during operations (Section 8.8.2.4.1). This study combined with the CREMP conducted annually will be used 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

Changes in ecosystem productivity for Mammoth Lake and downstream lakes (A76) will be investigated through a site-specific study conducted by University of Waterloo (UW) researchers in partnership with Agnico. 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 31st annually). Baseline analyses were completed in 2018, and included small-bodied fish sampling (shoreline electrofishing), and water chemistry sampling in Whale Tail Lake flood zone lakes and Mammoth Lake. Follow-up surveys continued in 2019 during flooding. This study will be ongoing until 2022 at this time.

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 will be monitored in the receiving environment (Mammoth Lake, A76, DS1) through the UW study described above, as well as through the CREMP. 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 35.

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 fishout program occurred in 2019.

8.11.2 Whale Tail Site

As required by DFO Authorization 16HCAA-00370 Condition 2.4: ***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 fishout program occurred in 2019.

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), and has been formally implemented since 2006. In December 2012, the AEMP was restructured to serve as an overarching "umbrella" program that conceptually provides an opportunity to integrate results of individual, but related, monitoring programs in accordance with NWB Type A Water License 2AM-MEA1526 requirements. The scope of the 2005 AEMP has been renamed the Core Receiving Environment Monitoring Program (CREMP). In 2018, Agnico received NWB Type A Water License 2AM-WTP1826 for the Whale Tail Project, which stipulates that the AEMP (Version 3, November, 2015) shall also be implemented for the Whale Tail site. The AEMP was updated in 2020 (Version 4) to include eventual tailings pore water analysis and is included as Appendix 50 of this report.

This 2019 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 8-109 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).

In 2019, all of the potential pathways, exposure media and receptors of concern listed in Table 8-109 were relevant to the AEMP analysis and were evaluated. The 2019 AEMP evaluation is provided for the Meadowbank site in Section 8.12.3, and for the Whale Tail site in Section 8.12.4.

Table 8-109 Primary transport pathways, exposure media, and receptors of concern for the AEMP

Transport Pathways	Exposure Media	Receptors of Concern
g,i Effluent	a,d,f,g,h,i,k,m Water	a, g Phytoplankton
f Groundwater	a Sediments	g Zooplankton
i,k Surface water	h Tissue	d,g,h Fish
m Air		a,h Benthic community
NA Direct		d Periphyton
		a,d,k Fish habitat

Notes:

- 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 AWAR and Quarry Water Quality Monitoring
- l Blast Monitoring
- m Air Quality Monitoring
- NA Direct, so measured in exposure medium.

8.12.3 Meadowbank Site AEMP

8.12.3.1 *Summary of Results of AEMP- Related Monitoring Programs*

In 2019, AEMP-related monitoring programs for the Meadowbank site (excluding Whale Tail, which is assessed in Section 8.12.4) consisted of:

- the Core Receiving Environment Monitoring Program (CREMP);
- Habitat Compensation Monitoring;
- Groundwater Monitoring;

- Metal and Diamond Mining Effluent Regulation (MDMER) Monitoring;
- Minesite Water Quality and Flow Monitoring (and evaluation of NP-2 and mill seepage);
- Visual AWAR and Quarries Water Quality 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 2019 for the Meadowbank site include lake EEM biological studies, dewatering monitoring, dike construction monitoring and fish-out studies.

Air quality monitoring, the EEM Biological Studies and the Habitat Compensation Monitoring Program were 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 Type A Water License; Part I-1. Results are summarized and are used as necessary to inform the identification and discussion of potential risks to the receiving aquatic ecosystem.

Summaries of each AEMP monitoring program are provided below. Table 8-110 further summarizes the results of these programs in 2019 for the Meadowbank site. For detailed results of individual monitoring programs, refer to the appended reports. At an individual level, while some additional monitoring activities are recommended for subsequent years, none of the effects-based triggers or guideline exceedances observed through these programs had the potential to cause significant risks to the aquatic receiving environment requiring immediate changes in management actions.

Table 8-110 Summary of aquatic effect monitoring program results for the Meadowbank site in 2019

	Core Receiving Environment Monitoring Program	Effects Assessment Studies	Dike Construction Monitoring	Habitat Compensation Monitoring	Dewatering Monitoring	MDMER Monitoring	EEM Biological Monitoring	Water Quality and Flow Monitoring	Fish-Out Studies	Visual AWAR and Quarry Water Quality Montoring	Blast Monitoring	Groundwater Monitoring
Completed in 2019?	**Yes**	**Yes**	**No**	**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		NA	NA	○
sediment toxicants	◐	◐		NA		NA		NA		NA	NA	NA
nutrients	○	NA		NA		NA		NA		NA	NA	NA
other physical stressors	○	NA		NA		NA		NA		NA	○	NA
Effects Variables												
Phytoplankton	○	NA		NA		NA		NA		NA	NA	NA
Zooplankton	NA	NA		NA		○		NA		NA	NA	NA
Fish	NA	NA		○		○		NA		NA	NA	NA
Benthic invertebrate community	○	○		NA		NA		NA		NA	NA	NA
Periphyton	NA	NA		○		NA		NA		NA	NA	NA
Fish habitat	NA	NA		○		NA		NA		NA	NA	NA

Notes:

*Interim assessment - a commentary on success of the compensation features will begin in 2021.

○ 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 report for 2019 is provided in Appendix 35, and additionally summarized in Section 8.1. Highlights in the AEMP context are provided below. A spatial and temporal trend assessment for parameters exceeding trigger values is provided in Table 8-111.

Water Quality

The 2019 CREMP for the Meadowbank site determined that, as in the past, there were some statistically significant mine-related changes relative to baseline/reference conditions identified in 2019 at one or more near-field areas. Parameters that exceeded their respective triggers were: alkalinity (TPE, SP); conductivity (TPN, TPE, SP, WAL); hardness (TPN, TPE, SP, WAL); major cations (i.e., calcium, potassium, magnesium, and sodium [TPN, TPE, SP, WAL]); silicon (SP); and total dissolved solids (TDS) (TPN, TPE, SP, WAL).

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. This conclusion is supported by a thorough literature review in 2019 (Appendix J of the 2019 CREMP Report). Consistent with previous reporting cycles, there were no trigger exceedances in 2019 for any water quality parameters with CCME water quality guidelines, including metals.

<u>Sediment - Core and Grab Sample Analysis</u>

The 2019 program consisted of the routine grab sampling (particle size and total organic carbon [TOC]), metals, and organics analysis on the top 3–5 cm of sediment) and a follow-up targeted coring study on chromium at TPE; the next full sediment coring program, which is used to formally test for temporal changes, is scheduled for August 2020.

Grab sampling results, with the exception of chromium at TPE (see below), showed no mining-related temporal or spatial patterns.

The targeted study continued to assess chromium increases at TPE observed between 2009 and 2013. The suspected cause of the increase is ultramafic rock used to construct the Bay-Goose Dike in 2009 and 2010. While sediment concentrations appeared to stabilize after 2013 based on grab sample results, they increased sharply again in 2017, prompting more targeted coring investigation in 2018 and 2019. Natural sedimentation rates in these lakes are low, and the variability of reported chromium concentrations over the last few years suggests chromium concentrations can vary significantly over a small area. There is conclusive evidence that chromium has increased in the sediments at TPE relative to the baseline period; however, high annual variability in chromium concentrations observed between 2017 and 2019 suggests concentrations have stabilized. The ecological significance of these changes are discussed in Sediment Metals Bioavailability further below.

Sediment coring is scheduled for 2020 to coincide with the EEM monitoring cycle and will further support interpretation of the temporal trends in chromium concentrations in TPE.

<u>Sediment – Metals Bioavailability Analysis (Effects Assessment Study)</u>

The targeted study assessing the ecological significance of chromium increases in TPE continued in 2019. While the 2018 results showed limited toxicological effects midge larvae (*Chironomus dilutus*), which are the dominant invertebrates in the Meadowbank study lakes, they also showed substantial effects to amphipod (*Hyalella azteca*) survival and growth. While amphipods are not present in the Meadowbank study lakes, there are other taxa that could respond similarly. As the cause of the observed toxicity in 2018 could not be determined, further studies were conducted in 2019 to verify the toxicity results and to better characterize metals bioavailability. Bioavailability was assessed by measuring metals concentrations in sediment porewater to help determine if porewater chemistry is the probable cause of lower survival and growth for *H. azteca*. Key findings of these targeted bioavailability studies are:

1. *H. azteca* exposed to sediment from TPE for 14-d show reduced survival and growth compared to INUG and PDL field control groups. There was no evidence of corresponding effects to survival in the 10-d toxicity test with *C. dilutus*. Growth was statistically significant lower for chironomids exposed to sediment from TPE compared to the field control.

2. Chromium concentrations have increased in sediment at TPE, but there is no plausible evidence to suggest that chromium is the cause of effects to *H. azteca* survival. Sequential extraction test results in 2015 indicated chromium associated with sediment matrix (inorganic and organic particles) is non-bioavailable; follow-up testing in 2018 was deemed unreliable due to data quality issues, which led to conducting the porewater analysis in 2019. Porewater chromium concentrations were less than concentrations reported at the reference area PDL.

3. Dissolved manganese in porewater is the likely cause of effects in the Hyalella tests in 2015, 2018, and 2019. Sediment manganese concentrations are naturally elevated and highly variable throughout the TPE study area. It’s likely that porewater manganese is elevated in small discrete areas of TPE as a result of localized reducing conditions that favor dissociation of manganese oxides (MnO2) in sediment to dissolved manganese in porewater.

4. The *H. azteca* toxicity test data provide important information about effects to sensitive aquatic invertebrate taxa, but the chironomid toxicity test results from 2015, 2018, and 2019 are more ecologically relevant for assessing potential risks to the benthos community at TPE. Over the three years of testing, chironomid sediment toxicity test results have substantiated the conclusions presented in the CREMP, namely, that there is no evidence to suggest the benthos community at TPE is being adversely affected by activities at the mine. The benthos community present in TPE has adapted to either tolerate elevated porewater manganese or avoid areas where manganese is elevated in porewater.

Results of the benthos community assessment and the targeted bioavailability studies at TPE clearly demonstrate that the increase in sediment chromium at TPE is not adversely affecting the benthos at TPE. No further targeted studies are recommended at this time other than annual monitoring of the benthos community as part of the routine CREMP.

<u>Phytoplankton and Benthic Invertebrate Communities</u>

While some changes to phytoplankton or benthic invertebrate community metrics were observed in the 2019 CREMP analysis, none were identified as mine-related.

Table 8-111 Summary of 2019 CREMP results for the Meadowbank site (Appendix 35: 2019 CREMP Report, Table ES-1). Figure/Table/Section referenced in this Table are the one from the Appendix 35.

Notes
1. Temporal and spatial trends are outlined for Monitoring Components and Variables that exceeded trigger or thresholds (i.e., apparent change from baseline)
2. Spatial scale ratings are: localized = small area within the lake/area; wide-spread = basin to whole lake
3. Causality ratings are: low = no evidence of a mine-related source; moderate = some likelihood of a mine-related source; high = the source of the change is likely mine-related.

Monitoring Component and *Variable* (and report section)	**Summary**	**Temporal and Spatial Trend Assessment**[1, 2]
Limnology Section 4.2 *Oxygen and Temperature*	The limnology profiles collected in 2019 indicated dissolved oxygen and temperature readings are consistent with range of conditions typical of previous monitoring cycles.	There is no evidence to suggest seasonal fluctuation in dissolved oxygen and temperature among the NF study area lakes is attributed to mining site-related activities.
Conductivity	The observations of minor stratification in early year monitoring events followed the pattern from previous years of being well mixed and unstratified by July. The observations of minor stratification in early year monitoring events followed the pattern from previous years of being well mixed and unstratified by July.	**Spatial scale – not relevant;** **Temporal trend – none;** **Causality – none;**
Water Chemistry Section 4.3 *Conventional Parameters and Major Ions*	Alkalinity, conductivity, hardness, major cations and TDS exceed their trigger values at one or more NF areas in 2019. These results are consistent with recent years. The trigger values for these parameters is set at the 95th percentile of concentrations measured during the baseline period. There are no thresholds (i.e., CCME water quality guidelines) for these parameters.	**Spatial scale – widespread**; concentrations have increased lake-wide in Third Portage from TPE to TPN and between lakes (SP and WAL). **Temporal trend – stable**; concentrations are elevated relative to the baseline period according to the BACI analysis, no evidence of-year-over-year increases (i.e., concentrations in 2019 are similar to 2018, 2017, 2016, …). **Causality – high**; the spatial pattern and temporal trend of increasing concentrations in the 'after' period is plausibly attributed to activities at the mine.
Nutrients	No trigger exceedance (i.e., concentrations = baseline)	Ammonia-N was high in 2019 at all study areas and reference lakes. Otherwise nutrient concentrations are similar to baseline as evidenced by no trigger exceedances in 2019.

Monitoring Component and *Variable* (and report section)	**Summary**	**Temporal and Spatial Trend Assessment**[1, 2]
Metals	Metals concentrations (total and dissolved) were consistently low or below their respective MDLs at the NF, MF, and FF locations in 2019. The only exception was the metalloid silicon where the yearly mean at SP exceeded the trigger value. The trigger for silicon was derived in 2019. There are no *before* data to use in the BACI statistical analysis of changes over time, but concentrations appear stable throughout the monitoring period.	**Spatial scale - localized**; Silicon is elevated at SP **Temporal trend - stable**; 2019 silicon concentrations appear to be unchanged over all sample years in SP since 2011 (statistical BACI analysis unavailable because there are no *before* data). **Causality - low**; The long-term stability and the monthly stability in 2019 of silicon concentrations in SP suggest conditions are stable and natural (i.e., not mine related).
Phytoplankton Section 4.4 *Chlorophyll-a*	There is no trigger for chlorophyll-a for the CREMP.	Concentrations in the reference area samples typically range between 0.2 and 0.7 µg/L in summer months, reflecting the oligotrophic, nutrient poor condition of these lakes; a trend that has not changed over time.
Total Biomass	Increases in phytoplankton biomass were detected at NF areas in 2019 relative to baseline/reference conditions but was not confirmed by the time-series plots. The magnitude of the BACI analysis increase ranged up to 80% at SP. The only statistically significant changes (i.e., increase) was at WAL ($p<0.1$) and SP($p<0.1$). There was no discharge to WAL in 2018 or 2019 and nutrient concentrations (i.e., nitrogen and phosphorus) were similar to baseline. The discharge into SP was similar to 2018.	**Spatial scale – widespread**; phytoplankton biomass was elevated in the BACI analysis at all NF areas relative to baseline/reference conditions in 2019. **Temporal trend** – stable; historical biomass for the NF areas (Figure 4-59) do not show obvious visual signs of temporal increases for individual NF study areas. **Causality – low**; SP was the only NF area that received effluent discharge in 2019. The magnitude of the change in biomass at the other NF areas suggests the observed pattern of increase in phytoplankton biomass is likely annual variability in the community rather than mine-related.
Taxa Richness	A statistically significant increase (17%; $p=0.03$) in taxa richness was noted at SP in 2019 relative to baseline/reference conditions; however, this is below the 20% trigger level.	**Spatial scale – localized**; increased taxa richness relative to reference/baseline conditions was only evident at SP. **Temporal trend – sporadic**; richness has remained stable during the 'after' period. The apparent increases richness at SP in 2019 relative to baseline/reference conditions is likely an artefact of natural fluctuation in the community composition rather than a decrease. **Causality – low**; there is no indication that mine activities are influencing taxa richness.

Monitoring Component and *Variable* (and report section)	**Summary**	**Temporal and Spatial Trend Assessment**[1, 2]
Metals	Grab sample chemistry was similar to other years for most analytes at most stations. Zinc exceeded the trigger and threshold at SP in 2019 and exceeded the trigger and threshold for one or more replicates in TPE. Grab sample results are used to support benthic invertebrate interpretation. Core chemistry results were only collected in TPE in 2019 as part of a targeted study. These results were compared to site-specific triggers/thresholds. Parameters with mean concentrations exceeding the trigger value are formally tested using a before-after (BA) statistical model to assess whether concentrations are increasing over time.Targeted coring was completed at TPE in 2019 to verify concentrations of chromium at TPE. **TPE Sediment Chemistry Results** - Chromium concentrations continue to exceed the trigger in core samples collected in 2019. There was a slight increase between 2018 and 2019 but a decrease between 2017 and 2019 study events.	**Spatial scale – localized**; temporal increases in chromium are limited to TPE. Other areas (SP and TPN) are not showing similar trends of increasing chromium in sediment. No statistical analysis to assess potential increase in zinc in SP as observed in the grab samples. 2020 is a coring year when this analyte will be assessed in more detail. **Temporal trend– stable (TPE)**; Chromium concentrations at TPE consistently trended higher between the onset of the mine development in TPE in 2009 (i.e., change in status from before to after) and 2013 (Figure 4-67), The pattern since 2013 has been variable. Chromium concentrations were lower in 2018 (150 mg/kg) compared to 2017 (200 mg/kg) but higher again in 2019 (190 mg/kg; still below 2017 concentrations), demonstrating that concentrations are not likely increasing year-over-year. **Causality – high (TPE)**; increasing concentrations of chromium in sediment at TPE were likely related to use of ultramafic rock for dike construction.
Organics (PAHs)	Sediment hydrocarbon concentrations were below detection for all NF area grab samples in 2018.	Hydrocarbons are not contaminants of potential concern for the CREMP based on recent and historical results. There have been no instances of measured concentrations attributable to site-related activities during the monitoring period.

Monitoring Component and *Variable* (and report section)	**Summary**	**Temporal and Spatial Trend Assessment**[1, 2]
Benthos **Section 4.6** *Total Abundance*	Benthic invertebrate communities at the NF areas were monitored in 2019. Decreased abundance at TPE relative to INUG in the past four years relative to reference/baseline conditions. Statistically significant differences were noted for the 4 after period (2016-2019). The apparent trend does not appear to be supported in the time-series plots. The differences are primarily driven by increased abundance at INUG during the monitoring program while abundance at TPE has been relatively stable and consistent with baseline sampling results.	**Spatial scale – localized (TPE)**; lower abundance (based on the BACI analysis) observed only at TPE. **Temporal trend – stable (TPE)**; abundance (absolute values) at TPE show stable or improving results over the last six years and consistent with the range observed in baseline. Absolute total abundance at TPE in 2019 (~3,800 organisms/m2) was stable relative to the range of values dating back to 2012 (2,220 to 3,100 organisms/m^2) and was well within its baseline range. **Causality – low (TPE)**; the 'apparent' reduction in abundance at TPE in the BACI analysis is partly an artefact of slightly increasing abundance at the reference area INUG while TPE has remained stable during the operation phase.
Total Richness	No changes observed in taxa richness in 2019 at the NF areas compared to reference/baseline conditions.	Richness continues to track higher for most stations. The benthic communities are dominated by chironomids, and the relative proportion of major taxa remains stable at all stations.
Sediment Metals Bioavailability	Sediment toxicity tests and porewater chemistry analyses were completed to assess the bioavailability of sediment metals to 2 benthic invertebrate species (*Chironomus dilutus* and *Hyalella azteca*). **TPE Sediment Toxicity Test Results** - effects to *H. azteca* survival and growth compared to PDL. - minor reduction in growth for *C. dilutus* (ecologically-relevant), but chromium concentrations in sediment were not correlated with reduced chironomid growth. **Porewater Chemistry Analysis** - Porewater chromium concentrations were less than concentrations reported at the reference area PDL. - Dissolved manganese exceeded the CCME acute WQG in porewater samples collected from the TPE sediment toxicity test replicates	**Spatial scale – localized (TPE);** sediments from TPE are naturally-elevated in porewater manganese in discrete areas. The concentrations are highly variable over small-spatial scale, indicating the partitioning of manganese between dissolved and particulate phases is highly dependent on the local sediment conditions (e.g., redox). **Temporal trend – stable (TPE);** sediment manganese concentrations are stable. There is no evidence to suggest activities at the mine have contributed to elevated porewater manganese. **Causality – low (TPE)**; natural (baseline) conditions in the sediment have the potential to affect sensitive taxa. The benthos community at TPE is adapted to naturally-elevated manganese concentrations.

8.12.3.1.2 Meadowbank Habitat Compensation Monitoring

In 2019, monitoring was conducted for the constructed spawning pad, located at stream crossing R02 along the all-weather access road (AWAR) to Baker Lake, as well as for the onsite habitat compensation features constructed to date (East Dike exterior, Bay-Goose Dike exterior, Dogleg Ponds). As described in the HCMP, the AWAR study included a visual assessment of stability, as well biological monitoring to confirm use by Arctic grayling. The onsite monitoring included an assessment of periphyton growth and fish use for dike faces, and surface area for the Dogleg Ponds. Interstitial water quality is normally included for dike faces, but was not assessed in 2019 (next assessment will be 2021).

The constructed spawning pads at stream crossing R02 along the AWAR were visually confirmed to be stable as designed. Generally, condition factors of adult fish, population size distributions and timing of migration were within the range of values seen in previous years, confirming continued use of this area by Arctic grayling without significant changes in population structure. Larval drift rates of collection continue to exceed those observed prior to construction of the spawning pad. While these traps are useful to assess spawning rates upstream of the R02 reach generally, Agnico anticipates reviewing HCMP methods prior to the 2021 monitoring event to better assess successful utilization of the spawning pads specifically. Any updated plans will be provided to DFO for review prior to implementation.

Onsite, angling and underwater motion camera monitoring demonstrated continued fish use of the dikes as habitat. A total of 20 fish were caught through angling in 15 hr of effort, and a single fish sighting was captured on camera during the underwater motion camera program (3 hr of footage).

Periphyton biomass steadily increased on the dike faces in Second Portage and Third Portage Lakes in the post-dike construction phase up to 2017. In 2019, a slight decrease in biomass was observed on all locations in Second Portage and Third Portage Lake except at TPE-G, which showed an increase in biomass compared to previous sampling years. In 2019, the total biomass at each site was still lower compared to the reference areas (particularly at the Bay-Goose Dike HCFs). It is apparent that these communities take time to develop and that a decade is not sufficient for full colonization of new barren rock surfaces to background levels of biomass. The presence of a structurally similar periphyton community at each of the dike face locations relative to their respective reference areas indicates a healthy periphyton community. While total biomass growth is still expected as periphyton community succession progresses, there may be variation from year to year.

Once the minimum monitoring period as described in the HCMP (2017) is reached for each compensation feature (2021+), a weight-of-evidence approach incorporating all data collected to date will be used to determine whether specific criteria for success have been met.

8.12.3.1.3 Meadowbank Dike Construction and Dewatering Monitoring

No dike construction or dewatering occurred in 2019.

8.12.3.1.4 Meadowbank Groundwater Monitoring

Groundwater well installation and sample collection have been a major challenge in the Arctic conditions at Meadowbank. Beginning in 2017, an outside consultant (SNC Lavalin) was contracted to review, expand, and conduct the groundwater sampling program. The resulting program aimed to better characterize natural groundwater chemistry, potential sources of contaminants at the mine site, and potential links between surface and groundwater.

In 2019, two groundwater sampling programs were completed, from July 9th – 17th and October 7th – 14th, using a low-flow sampling method for all monitoring wells. The resulting water quality data was interpreted to document the potential interaction between surface water and groundwater, especially in relation to tailings deposition activities. In total, five (5) monitoring wells were sampled with the addition of three (3) pit wall seepages, three (3) dike seepages, two (2) water ponds and one (1) reclaim pond.

Prior to water sample collection, the following *in situ* physicochemical parameters were recorded: pH, turbidity, salinity and electrical conductivity, oxidation-reduction potential (ORP) and dissolved oxygen (DO). Laboratory-measured analytes included all Group 2 parameters in the Meadowbank NWB Water License: total and dissolved metals, nutrients, conventional parameters, total and free cyanide. No regulatory guidelines or limits apply specifically to groundwater quality in this monitoring program; rather, interpretation of 2019 geochemical data aims to provide a global portrait of groundwater quality at the mine site and its potential linkage to tailings reclaim water.

The reclaim water sampling station (ST-21-South) was identified in 2017 as the main source of sulfates and calcium found in water. As in 2018, water quality at ST-S-5 (seepage of reclaim water collected in the Central Dike downstream pond) shows higher concentrations than in ST-21-South. The reclaim water signature can still be detected in the groundwater from well MW-16-01, located nearby, downgradient of the South Cell TSF. The diluted signal of reclaim water could also be identified along the flow path from alternative sampling stations such as pit wall seepage.

However, groundwater collected in 2019 from the other four (4) wells (MW-IPD-01(d), MW-IPD-01(s), MW-IPD-07 and MW-IPD-09) installed in 2018 is still within the natural groundwater signature category. Concentrations of TSS were elevated above NWB Water License criteria for discharge to Third Portage Lake, but this was expected to be a result of well purging action. The water quality at MW-IPD-07 does not seem to have been impacted by the in-pit tailings deposition which was started in July 2019 in Goose Pit only.

A comparison of historical results for all available groundwater samples indicated that nearly all measured concentrations of parameters considered indicators of reclaim water (chloride, sulphate, total cyanide, total copper, total iron, and total arsenic) have been below the maximum average concentrations identified in the Water License for water discharged to Third Portage Lake. Prior to 2014, three samples exceeded this reference value for chloride, and all cases are thought to be caused by de-icing salt and brine solution used to prevent borehole freezing after installation.

8.12.3.1.5 Meadowbank Site Non-Contact Water and Effluent Monitoring

This section includes discussion of results from water quality monitoring under MDMER (and it's Schedule 5, Environmental Effects Monitoring) and Agnico'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 2019, only East Dike seepage water was discharged to the receiving environment at the Meadowbank site (Second Portage Lake). The total volume discharged in 2019 was 33,026 m^3. There was no exceedance of the TSS MDMER/NWB Water License limit in 2019. In one of two EEM toxicity tests, sub-lethal effects for *Lemna minor* were reported. No acute lethality was observed.

8.12.3.1.5.2 Minesite Water Collection System

Mine site water collection system monitoring locations with discharge to the receiving environment consisted of the East and West diversion ditches. These ditches were constructed on the north side of the minesite to intercept overland flow and direct it (as non-contact water) to NP-2 Lake and Third Portage Lake, respectively. For the East diversion ditch, all results in 2019 complied with NWB license limits (TSS). The TSS result for the West diversion ditch (Table 8-15) exceeded the maximum average concentration (15 mg/L) permitted by the Water License Part F, Item 6. Only a 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 4th (21 mg/L) from the certified laboratory. Internal TSS analyses performed at the Meadowbank Assay Lab during June showed TSS levels below 10 mg/L after June 7th and below 2 mg/L after June 14th until the end of the month.

8.12.3.1.5.3 Seepage

Waste Rock Storage Facility Seepage

In 2013, seepage from the TSF through the Meadowbank WRSF was identified at ST-16, and as a result Agnico initiated a targeted monitoring program for the potential receiving environment in that area (closest receptor being NP-2 Lake). The KivIA requested that Agnico continue monitoring until there is a 5 year period of non-detect cyanide results. 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 will continue to monitoring water quality in NP-2 on a yearly basis. In 2019, CN concentrations were again below detection limits.

Mill Seepage

Monitoring in Third Portage Lake in response to the mill seepage through the assay road (identified in 2013) continues to indicate that there has been no impact to the near shore receiving waters of Third Portage Lake. The seepage appears to be effectively contained through construction of an interception trench (2014) and the source area within the mill has been repaired (2015). In 2019, concentrations at the designated monitoring station in TPL were all below the CCME Guideline for the Protection of Aquatic Life for CN Free, copper and iron, the parameters considered indicators of mill seepage. Follow up monitoring will continue in 2020.

8.12.3.1.6 Meadowbank EEM Biological Monitoring

No EEM biological monitoring or reporting occurred in 2019.

As required by ECCC, a Biological Monitoring Study (EEM Cycle 3 study) was conducted in 2017 to assess impact on fish and fish habitat of Wally Lake (Vault Discharge). The Vault discharge was at this time the effluent which has been determined as the greatest potential to have an adverse effect on the receiving environment. While discharge is occurring, plume/effluent mixing in the exposure area has been assessed during the summer of 2017 in support of the Cycle 3 study design. The study design was submitted to ECCC on February 17th, 2017 (Appendix G3 of the 2017 Annual Report). On April 10th, 2017 Agnico received comments from the TAP regarding the Cycle 3 study design. On April 26th, 2017 Agnico responded to these comments (Appendix G4 of the 2017 Annual Report). The study design was subsequently approved. In June 2018, the Environmental Effect Monitoring Study 3 Interpretative Report was submitted to ECCC. The full data of the study has been processed and results are presented in Appendix 33 of the 2018 Annual Report. On November 26th, 2019, Agnico have received comments from the TAP regarding the EEM Study 3 Interpretative Report. By the end of December 2019, Agnico was still in the process to answered it. Agnico Eagle will continue to provide KivIA and other regulators copies of reports and data submitted to ECCC via the Annual Report.

8.12.3.1.7 Meadowbank Fish-out Studies

No fish-outs were conducted at the Meadowbank site in 2019.

8.12.3.1.8 AWAR and Quarries Water Quality Monitoring

Pre-freshet and freshet inspections were conducted at crossings along the AWAR in 2019. These inspections are conducted to document the presence/absence of flow, erosional concerns and turbidity plumes. A total of thirteen (13) inspections were conducted between May 17th and July 26th, 2019 (5 in May, 5 in July and 3 in July). No flow was observed during the first inspection conducted on May 17th, 2019. On June 4th, 2019, in most of the crossing flow was observed, but no erosional concern or visual turbidity plumes were observed.

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 2019, no visual turbidity plumes or erosion was 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 2019.

8.12.3.1.9 Meadowbank Blast Monitoring

The results of the 2019 blast monitoring program are available in the report entitled “2019 Meadowbank and Whale Tail Blast Monitoring Report for the Protection of Nearby Fish Habitat” prepared by Agnico, attached as Appendix 45.

In 2019, 49 blasts were monitored at Meadowbank. There were no PPV exceedance and IPC measurements were all below the DFO limit of 50 kpa.

8.12.3.1.10Meadowbank Air Quality Monitoring

The complete 2019 Air Quality and Dustfall Monitoring Report is provided in Appendix 41 and results are summarized here.

The objective of the 2019 program was to measure dustfall, NO_2, and/or suspended particulates (TSP, PM_{10}, $PM_{2.5}$) at four monitoring locations around the Meadowbank site. Locations were established in 2011 in consultation with Environment and Climate Change Canada.

For the Meadowbank site, the vast majority of TSP measurements in 2019 were well below the GN 24-h standard of 120 µg/m^3 (64 of 65 samples). The annual average TSP concentration was below the GN guideline of 60 µg/m^3. All PM_{10} results were below the BC Air Quality Objective of 50 µg/m^3 for the 24-h average, and all $PM_{2.5}$ results were below the GN guideline of 30 µg/m^3 for the 24-h average.

Similarly, all measured rates of dustfall onsite at Meadowbank and Whale Tail were below the Alberta recreational area guideline for recreational areas (0.53 mg/cm^2/30 days) and industrial areas (1.58 mg/cm^2/30 d). Relatively low dustfall values overall may reflect continued efforts to manage dust on site roads through use of dust suppressants (calcium chloride application) and water trucks.

The GN annual average standard for NO_2 of 32 ppb was not exceeded at either monitoring location on the Meadowbank site.

Along the Meadowbank AWAR in areas with dust suppression (km 11, 25, 50, 84), no samples collected at and beyond the 100 m distance (smallest assumed zone of influence in the FEIS) exceeded the Alberta Environment recreational area guideline. For samples collected at and beyond 100 m from the AWAR in areas without dust suppression (km 18 and 78), one of ten samples marginally exceeded the guideline in monitoring event 1 (June 24th – July 28th; 0.74 mg/cm^2/30d), and three of ten samples exceeded the guideline in monitoring event 2 (July 28th – September 7th, 0.63, 0.87, 1.98 mg/cm^2/30d). However, only one of these was considered a significant exceedance (1.98 mg/cm^2/30d), and the corresponding sample collected on a stand was less than the guideline. All samples will be collected on stands in 2020, providing a better basis for comparison with the guideline.

For areas without dust suppression, average total dustfall to date at 100 m from the AWAR (for August monitoring events, the highest traffic month) continues to lie below the AB guideline for recreational areas, at 0.39 mg/cm^2/30d (n = 51). In 2019, average dustfall at 100 m was slightly higher than average, at 0.53 mg/ cm^2/30d, but still met the AB guideline for recreational areas.

8.12.3.2 *Integration of Monitoring Results*

The 2019 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 evaluated.

8.12.3.2.1 Identification of Trigger or Guideline Exceedances

As in previous years, two situations occurred where triggers or guidelines were regularly exceeded, likely as a result of mining activities. Both were identified through the CREMP:

1. 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, silicon, and total dissolved solids).

2. Elevated concentrations of chromium continue to be observed in TPE sediment.

Although most water quality and sediment impacts in near-field lakes (TPN, TPE, SP and WAL) in 2019 were similar to findings in previous years and were considered unlikely to cause any adverse effects to the aquatic community, results were reviewed in relation to those from other AEMP programs in Section 8.12.3.2.2 below.

Conceptual site models were developed to assist in linking possible incremental changes in the receiving environment that are evaluated in separate monitoring reports (see Figure 18 and 19).

8.12.3.2.2 Evaluation of Potential Sources and Discussion

8.12.3.2.2.1 Changes in Conventional Parameters and Major Ions in Meadowbank Site Receiving Surface Waters

In 2019, 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 for alkalinity (TPE, SP); conductivity (TPN, TPE, SP, WAL); hardness (TPN, TPE, SP, WAL); major cations (i.e., calcium, potassium, magnesium, and sodium [TPN, TPE, SP, WAL]); silicon (SP); and total dissolved solids (TDS) (TPN, TPE, SP, WAL). In the absence of effects-based thresholds (e.g., CCME water quality criteria) for these parameters, their triggers were set at the 95th percentile of baseline data . 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. In 2019, a literature review was undertaken as a component of the CREMP report to further confirm this interpretation (Appendix J of the 2019 CREMP Report – Appendix 35).

Notwithstanding, consideration was given here to all potential mine-related sources (namely, effluent release, seepage, managed surface water, groundwater, and fugitive dust) that may contribute to changes in general water quality parameters. The conceptual site model presented in Figure 18 assists in understanding the possible linkages (i.e., effect to stressor from the source).

Based on the monitoring results for all potential pathways in 2019, 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).

The text below provides a review of results for both regulated parameters and the non-regulated parameters described above with CREMP trigger exceedances for all potential pathways, to assist in identifying sources.

Effluent Discharge and Seepage Results

In 2019, the only source of effluent discharge for the Meadowbank site was East Dike seepage, which was released to Second Portage Lake. As described in Section 8.12.3.1.5.1, all water quality samples collected in 2019 at this final discharge point (East Dike discharge – ST-8/ST-MMER-3) complied with MDMER/NWB water license criteria for TSS, and only one instance of sub-lethal effects (to *Lemna minor*) was observed in EEM toxicity tests.

Nevertheless, since effluent may be contributing to changes in non-regulated water quality parameters in the receiving environment, available results for those parameters exceeding triggers in the CREMP report were reviewed (hardness/alkalinity, conductivity, major ions, silicon, TDS) for effluent samples in this context. Since these parameters are largely inter-related, results for TDS, conductivity, and/or alkalinity are used as indicator parameters in this review, where available. Silicon is not measured in effluent and seepage samples. While CREMP triggers do not specifically apply to effluent results from an effects assessment perspective, they are used here to understand the potential for a source to be contributing to observations of water quality changes in the receiving environment.

Conductivity results for the East Dike seepage effluent (78.3 – 93.9 µS/cm) did exceed the CREMP water quality trigger (27.4 µS/cm), which was set at the 95th centile of baseline data. Similarly, total alkalinity of the effluent exceeded the CREMP trigger of 8.7 mg $CaCO_3$/L (22 – 39 mg $CaCO_3$/L). For both parameters, exceedances also occurred in the EEM reference area, though to a lesser degree (15.3 – 36.7 µS/cm; 9 – 16 mg $CaCO_3$/L). These results suggest that effluent discharge could be contributing to the observed water quality changes in the CREMP near-field lakes, as determined in previous years.

In addition to effluent, the Waste Rock seepage event in July 2013 during which water migrated through the perimeter rockfill road at sample station ST-16 and into NP-2 Lake should be assessed as a potential historical 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 is monitored, and measured concentrations of the indicator parameters of interest here were reviewed. The TDS annual average for this location (117.5 mg/L in 2 samples) exceeded the CREMP trigger (19 mg/L), which was set at the 95th centile of baseline concentrations. These results suggest that the NP-2 – NP-1 – Dogleg Lake pathway could potentially be contributing to the changes in water quality observed in Second Portage Lake. Water quality is not assessed further downstream in this pathway (i.e. NP-1 Lake, or Dogleg Lake). These lakes receive inputs through overland runoff and directly from the East diversion ditch (discussed below).

Similarly, seepage from the mill migrating under the Assay Lab road (identified in 2013/2014) could be considered a potential source of impacts to Third Portage Lake. However, monitoring in TPL (Section

8.12.3.1.5.3) 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. Therefore, this historical seepage event is not considered a significant source of changes to the surface water quality observed in the CREMP.

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 RSF and direct it to Second Portage Lake via NP-2 (East diversion ditch) and Third Portage Lake (West diversion ditch). Much like results for effluent discharge, no regulatory criteria were exceeded for this managed surface water in 2019 except a single result for the West diversion ditch on June 4 (21 mg/L TSS). However, annual average field-measured conductivity in both locations (181.6 µS/cm; 582.1 µS/cm) exceeded the CREMP trigger (27.4 µS/cm), which again doesn’t apply directly to these locations, but indicates they could be a source of the elevated conductivity observed in Second and Third Portage Lakes. The East diversion ditch discharges into NP-2, where elevated TDS concentrations (relative to CREMP triggers) were also observed, as described above.

Groundwater results

Results of groundwater monitoring have indicated that water quality in wells located just inside the perimeter of the Portage area dewatering dikes is indicative of natural groundwater. Furthermore, the observed CREMP trigger exceedances are not for parameters considered representative of 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.

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 suspended particulates rarely exceed available standards or guidelines at minesite monitoring stations. Therefore it is considered unlikely that dust generation has been great enough to cause the observed changes in water quality parameters, particularly since all near-field lakes monitored under the CREMP are of relatively large surface area and volume.

Summary

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 (Appendix 35) indicates that concentrations of these parameters at Meadowbank remain well below concentrations associated with adverse effects reported in the literature.

This conclusion is further corroborated through results of associated monitoring programs for receptors of concern (phytoplankton, periphyton, benthic invertebrates, zooplankton, fish & fish habitat) in 2019 or the last available year:

- No acute lethality for any species was observed in effluent dischage samples under the MDMER/EEM program (East Dike seepage directed to Second Portage Lake). One test with *Lemna minor* (an aquatic plant which is not present in the Meadowbank lakes) showed sub-lethal effects, but none were observed in a second test and none were observed for other test species in either test.

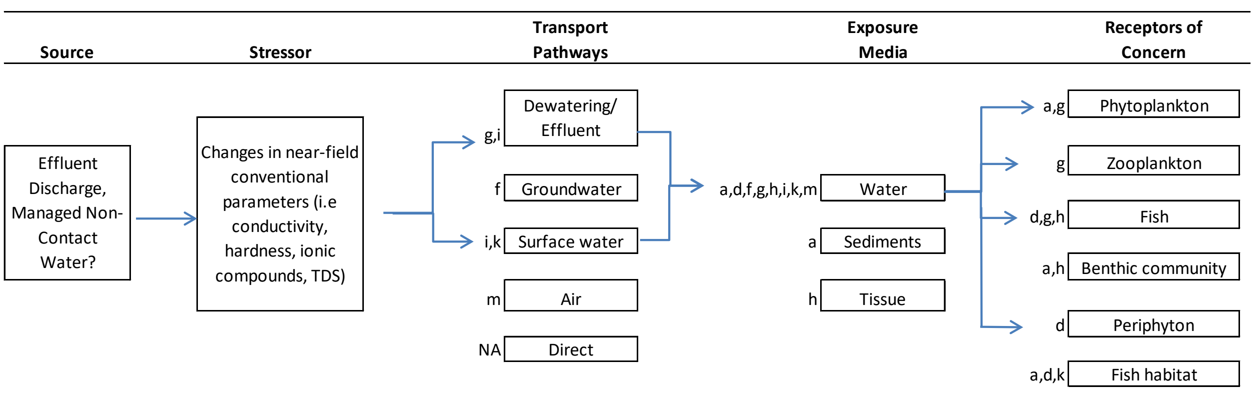
- The most recent (2017 – Wally Lake) EEM biological results indicated no impacts to fish populations. Analysis of the benthic community did not indicate a degraded condition relative to the baseline period.

- 2019 and other recent CREMP results did not detect significant mine-related changes in phytoplankton or benthic invertebrate community metrics in these basins.

- While HCMP monitoring is not yet at a point where final determinations of the success of compensation features can be made, results to date indicate that periphyton growth continues on dike faces (although slowly), interstitial water quality meets CCME criteria in nearly all recent samples (with occasional exceedances for TSS and phosphorus, historically), and fish presence around the dike faces has been confirmed.

Thus, 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 this issue.

Figure 18 Meadowbank integrated conceptual site model for 2019 AEMP assessment of changes in near-field water quality parameters



Notes:

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	Blasting
m	Air quality monitoring
NA	Direct, so measured in exposure medium.

8.12.3.2.2.2 Changes in Chromium in TPE Sediment

The trigger exceedance for chromium in sediment at TPE was identified in 2013 and coring samples in 2014 determined that there was a temporal trend in chromium concentration increases within a localized area of TPE. Although elevated chromium levels have also been found in reference areas of PDL and TPS, the TPE chromium exceedance is likely related to mine activities, more specifically due to Bay-Goose dike capping and construction activity. This may be explained by the fact that ultramafic rock, which is commonly found in the region and was used to construct the Bay-Goose dike, is generally known to contain elevated concentrations of chromium (e.g., on the order of 2000 mg/kg) relative to other rock types (Motzer and Engineers, 2004).

Figure 19 provides the conceptual site model of impacts due to capping and construction of the Bay-Goose dike. Previous reviews of sediment data and historical water quality data have ruled out effluent and dust as the most likely sources of change, and dike construction was identified as the contributing event. Since that time, efforts have focused on determining the extent and ecological significance of the observed changes on receptors of concern (primarily the benthic invertebrate community, as well as fish habitat provided by dike faces).

Sequential extraction tests conducted in 2015 demonstrated that the majority of sediment chromium is sequestered in the non-bioavailable sediment matrix. Furthermore, the fractions that are bioavailable occured at concentrations below effects-based threshold concentrations. This was further demonstrated by toxicity tests conducted on benthic invertebrates; no evidence of contaminant-related effects was noted. In 2016, only sediment grab samples were collected so no formal statistical analysis of data was conducted. Although 2016 grab sample results suggested that concentrations were stabilizing, the full analysis of grab samples and coring completed in 2017 again identified an exceedance of trigger levels, and another full coring and bio-availability study was conducted in 2018. Chromium in sediment cores exceeded the trigger value in 2018, but the concentrations were less than those reported in 2017, and it is suspected that levels are stabilized. Sediment toxicity tests also conducted in 2018 showed significant effects to survival of amphipods, but these were not correlated to measured sediment chromium concentrations. The complete weight-of-evidence assessment determined that currently, concentrations of metals at TPE were not posing risks to the benthic community, but there were uncertainties regarding the exact cause of the observed effects to amphipod survival. Follow-up studies were planned for 2019, including porewater analysis.

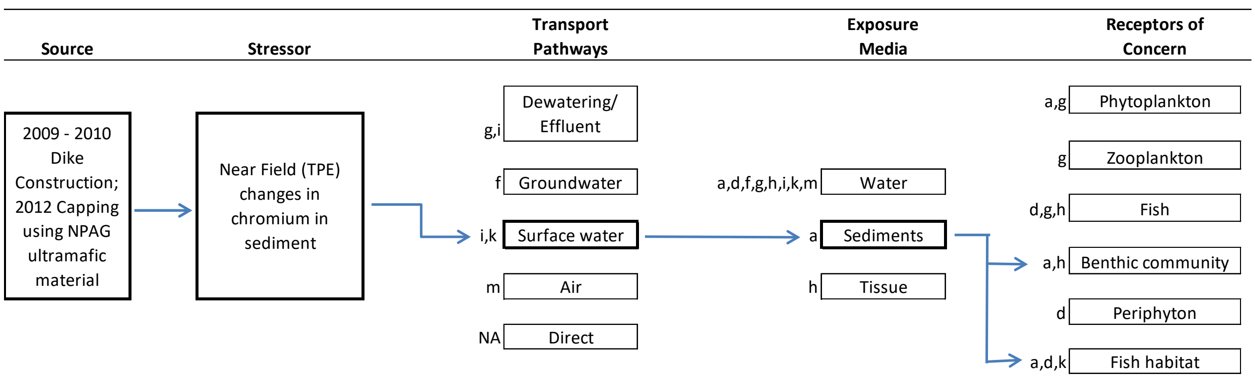
As described in Section 8.12.3.1.1, the sediment coring study was repeated in 2019 to provide a complete 3-year trend analysis. Based on this analysis and historical data, there is conclusive evidence that chromium has increased in the sediments at TPE relative to the baseline period; however, high annual variability in chromium concentrations observed between 2017 and 2019 suggests concentrations have stabilized. The ecological significance of these changes was assessed through continued sediment and porewater toxicity analyses in 2019. While *H. azteca* exposed to sediment from TPE showed reduced survival and growth compared to field control groups, there was no evidence of corresponding effects to survival in the 10-d toxicity test with *C. dilutus* (a more ecologically relevant species for this region). The impacts to *H. azteca* were determined to be a result of naturally variable manganese concentrations in the porewater of test sediment samples, rather than elevated chromium related to mine activities. A complete discussion of observed sediment and porewater toxicity, spatial extents, and causality is provided in Section 4.6.3 of the 2019 CREMP report (Appendix 35).

While sediment chemistry results have indicated increased concentrations of chromium at TPE that are likely related to dike construction, targeted bioavailability studies and the benthos community assessment under the CREMP clearly demonstrate that the change is not adversely affecting the benthos community.

No additional targeted studies are planned for TPE at this time.

The other receptor of concern in this case is fish habitat, which is assessed through the Habitat Compensation Monitoring Program. In 2019, studies assessed fish use of the dike faces and periphyton growth. Although periphyton growth is slow in these ultraoligotrophic lakes and has not yet reached background levels on the dike faces, the presence of a structurally similar periphyton community indicates communities are healthy. Fish presence around the dike faces was also confirmed through targeted angling, though comparisons of CPUE could not be made with reference areas for this monitoring event. The next HCMP event is scheduled for 2021, at which time a commentary on status of the compensation features (in this case, dike faces) will be made.

Figure 19 Meadowbank integrated conceptual site model for 2019 AEMP assessment of elevated chromium in TPE sediment



Notes:

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	Blasting
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 the monitoring programs, the AEMP evaluation did not find an apparent excess risk to the aquatic environment due to mine-related activities. No supplemental management actions are therefore planned for 2020 in relation to results of AEMP programs.

The following management and monitoring programs are planned:

- CREMP
  - o Routine CREMP monitoring (limnology, water quality, phytoplankton, sediment chemistry through coring, benthic community assessment)
- MDMER & Water Quality and Flow Monitoring
  - o Monitoring will continue as per the monitoring plan, license and MDMER requirements in 2020 if any discharge occurs.
- EEM Biological Monitoring Studies
  - o EEM biological monitoring will be conducted for the Meadowbank site in 2020.
- Habitat Compensation Monitoring
  - o No HCMP monitoring is required in 2020.
- Dewatering Monitoring
  - o No lake dewatering is planned for the Meadowbank site in 2020.
- Fish-out Monitoring
  - o No fish outs for the main Meadowbank site are planned for 2020.
- Blast Monitoring
  - o No changes are proposed for blast monitoring methods in 2020.
- Groundwater Monitoring
  - o o A number of recommendations related to new well installation, well maintenance, sampling methods, and analytical parameters are provided in the 2019 Groundwater Monitoring Report for the Meadowbank site (Appendix 46).
- Air Quality Monitoring
  - o No specific recommendations for additional management or monitoring actions related to air quality concerns are made for 2020.

8.12.4 Whale Tail Site AEMP

8.12.4.1 *Summary of Results of AEMP- Related Monitoring Programs*

In 2019, AEMP-related monitoring programs for the Whale Tail site included:

- the Core Receiving Environment Monitoring Program (CREMP);
- Dike Construction and Dewatering Monitoring;
- Groundwater Monitoring;
- Metal and Diamond Mining Effluent Regulation (MDMER) Monitoring;
- Minesite Water Quality and Flow Monitoring;
- Visual WTHR and Quarries Water Quality 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. 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.

Programs that are components of the AEMP but were not required to be conducted for the Whale Tail site in 2019 include fish habitat offsets monitoring (constructed offsets), and EEM biological studies.

Summaries of each AEMP monitoring program conducted in 2019 are provided in Table 8-112, and described below in Sections 8.12.4.1 – 8. For detailed results on individual monitoring programs, refer to the appended reports. At the individual level, while some additional monitoring activities are recommended for subsequent years, none of the effects-based triggers or guideline exceedances observed through these programs had the potential to cause significant risks to the aquatic receiving environment requiring immediate changes in management actions.

Table 8-112 Summary of aquatic effect monitoring program results for the Whale Tail site in 2019

	Core Receiving Environment Monitoring Program	Effects Assessment Studies	Dike Construction Monitoring	Fish Habitat Offsets Monitoring	Dewatering Monitoring	MDMER Monitoring	EEM Biological Monitoring	Water Quality and Flow Monitoring	Visual Whale Tail Haul Road and Quarry Water Quality Montoring	Blast Monitoring	Groundwater Monitoring
Completed in 2019?	**Yes**	**No**	**Yes**	**No**	**Yes**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**
Stressor Variables											
suspended solids	○		○		◍	◍		◍	○	NA	NA
sediment deposition	NA		NA		NA	NA		NA	○	NA	NA
water-borne toxicants	◍		NA		○	NA		○	NA	NA	NA
sediment toxicants	○		NA		NA	NA		NA	NA	NA	NA
nutrients	◍		NA		NA	NA		NA	NA	NA	NA
other physical stressors	○		NA		NA	NA		○	NA	◍	NA
Effects Variables											
Phytoplankton	●		NA		NA	NA		NA	NA		NA
Zooplankton	NA		NA		NA	◍		NA	NA		NA
Fish	NA		NA		NA	○		NA	NA		NA
Benthic invertebrate community	○		NA		NA	NA		NA	NA		NA
Periphyton	NA		NA		NA	NA		NA	NA		NA
Fish habitat	NA		NA		NA	NA		NA	NA		NA

Notes:

○ 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 complete 2019 CREMP report is provided as Appendix 35, and key results in the AEMP context are summarized below. A spatial and temporal trend assessment for parameters exceeding trigger values is provided in Table 8-113.

2019 represents the first full year where most Whale Tail study area lakes were fully under an impact designation and potentially under the influence of mine activities. Whale Tail Lake -South Basin (WTS) and Mammoth Lake (MAM) transitioned from control to impact in 2018 after the onset of construction activities on the Whale Tail Dike. The status of Lake A20, Lake A76, Lake DS1 switched to impact in January 2019, while Nemo Lake (NEM) transitioned in July 2019. This was the first year that formal statistical analysis using the Before/After Control/Impact (BACI) framework at the Whale Tail study lakes. Early warning triggers specific to the Whale Tail study lakes were derived in 2019 for water chemistry and sediment chemistry parameters to facilitate this analysis. Changes were assessed by screening the yearly mean concentrations at each monitoring area against the newly developed trigger values; parameter/area combinations exceeding their respective trigger value were subject to formal BACI analysis to determine if the changes were statistically significant.

Water Quality

Key results, including some parameters that increased but remained below their triggers, were as follows:

Observed increases in ammonia and TKN appeared to be related to regional trends, with elevated concentrations also occurring at the reference areas INUG and PDL. Nitrate and nitrite showed increases at MAM, WTS and NEM but remained below their triggers. Total phosphorous (TP), total organic carbon (TOC) and dissolved organic carbon (DOC) showed a statistically significant increases at WTS, likely the result of inputs from flooded terrestrial habitats following impoundment.

Statistically significant increases above trigger values were observed at near field (NF) areas WTS and/or MAM for total alkalinity, conductivity, hardness, calcium, potassium, magnesium, sodium, and TDS. The statistically significant increases extended to mid-field (MF) area Lake A76 for calcium, potassium and magnesium.

Statistically significant increases above trigger values were observed at NF areas WTS and/or MAM for total and dissolved lithium and for total titanium.

Similar to the results seen over the years at the Meadowbank study lakes, the trends identified above represent increases above baseline/reference conditions only; none of the analytes with statistically significant increases exceeding trigger values in 2019 have CCME effects-based guidelines for the protection of aquatic life. FEIS predictions for MAM were exceeded for TDS, lithium, and the ionic compounds calcium and magnesium. Despite early warning triggers and FEIS predictions being exceeded in 2019, the absolute concentrations of these parameters remain low and far lower than concentrations associated with adverse to aquatic life.

In addition to routine CREMP analyses, additional monitoring targeting spatial-temporal trends in MAM will be initiated in early 2020 to better characterize ongoing changes in water quality in Mammoth Lake.

Sediment

During baseline period, arsenic, cadmium, chromium, copper, and zinc exceeded the CCME interim sediment quality guideline in at least one sample collected. Of these five metals, arsenic is particularly enriched in sediments throughout the study area lakes, with most samples exceeding the CCME probable effect level sediment quality guideline. The newly derived trigger values were provided as lake-specific triggers to acknowledge the natural, between-lake variability in some metals.

Changes in sediment chemistry data are evaluated on a three-year cycle as part of the sediment coring program (timing coincides with the EEM cycle). Coring is scheduled for August 2020. No statistical analysis was completed on sediment chemistry in 2019; however, sediment chemistry data from grab samples were screened against trigger values and, where applicable, threshold values. Concentrations measured in the various lakes in 2019 were comparable to results reported in previous annual monitoring reports. Furthermore, there was no evidence of upwards trends for metals with effects-based thresholds.

Routine sediment grab sampling for TOC, grain size, and hydrocarbons is planned in 2020 to support the benthos community assessment. Sediment coring is planned for 2020 to assess potential changes in sediment metals concentrations.

Phytoplankton and Invertebrate Communities

Results for 2019 did not indicate a change to phytoplankton community structure (e.g., richness), which is a good indicator that there was no significant increase in the concentrations of metals at WTS and MAM (the lakes most likely to be impacted by mine activities). There was, however, a statistically significant apparent increase in biomass in WTS and a notable, but not statistically significant, increase in MAM. While biomass at WTS and MAM were 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 appear due to the combined influence of natural variability and mining-related activities.

Increased nutrient loading due to flooding of WTS is the most likely explanation for increased primary productivity. Interestingly, these changes did not extend to Lake A20 although it too was flooded and connected to Whale Tail Lake. In addition, the increases seen at MAM did not appear to extend down the watershed to Lake A76.

Although total abundance of benthic invertebrates 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). The typical number of taxa identified among the various study areas is 10 to 15. The range observed in 2019 was slightly lower in WTS than 2018 but within the range of baseline conditions. All other study areas were also comparable with baseline conditions. The comparatively high taxa richness, combined with no apparent change in abundance, demonstrates that mine activities did not alter the structure or function of the benthos community in 2019.

Routine monitoring of the phytoplankton and benthos communities will continue in 2020.

Table 8-113 Summary of 2019 CREMP results for the Whale Tail site (Appendix 35: 2019 CREMP Report, Table ES-2). Figure/Table/Section referenced in this Table are from Appendix 35

Notes

1. Temporal and spatial trends are outlined for Monitoring Components and Variables that exceeded trigger or thresholds (i.e., apparent change from baseline)
2. Spatial scale ratings are: localized = small area within the lake/area; wide-spread = basin to whole lake
3. Causality ratings are: low = no evidence of a mine-related source; moderate = some likelihood of a mine-related source; high = the source of the change is likely mine-related.

Monitoring Component and Variable (and report Section)	**Summary**	**Temporal and Spatial Trend Assessment**
Limnology **Section 5.2** *Oxygen and Temperature*	The limnology profiles collected in 2019 show dissolved oxygen and temperature readings are consistent with range of conditions observed in previous monitoring cycles (2015 to 2018).	Spatial and temporal trends were stable in 2019
Conductivity	There was a slight increase in field conductivity in WTS between March and May; however, conductivity returned levels comparable with baseline by August. The conductivity in MAM indicated a spatial trend where the east basin was elevated over the west basin. Conductivity readings in MAM increased to > 150 µS/cm from the baseline of approximately 60 µS/cm. Conductivity within the other Whale Tail study area lakes was similar to baseline. Conductivity in NEM increased over the last two sampling events in 2019.	**Spatial Trends: localized -** No spatial trends within WTS and observed changes did not extend to Lake A20. Spatial trend observed within Mammoth Lake (east basin elevated compared to west basin) and did not extent to downstream stations. NEM is within a separate watershed and there is no spatial trend to review. **Temporal Trends: variable (WTS); stable (MAM)-** Conductivity in WTS appeared to trend upwards in May but declined to levels similar to baseline for the remainder of the year. Apparent increase in conductivity observed in MAM since late 2018 has remained higher than baseline but relatively stable. NEM may be increasing but more results are required to verify results. **Causality: moderate (WTS); high (MAM)**- Short duration spike in WTS followed by a return to conditions similar to baseline. The spike may be associated with mine activities but no direct cause was evident (e.g., construction activity). Spatial and temporal trend at MAM suggests mine activities are influencing conductivity; however, the limited "after" data means assigning causality to one activity is not possible. Dewatering and construction were potentially impacting MAM in 2019. NEM may have been influenced by dewatering activities.

Monitoring Component and Variable (and report Section)	**Summary**	**Temporal and Spatial Trend Assessment**
Water Chemistry Section 5.3 *Conventional Parameters and Major Ions*	Changes observed in WTS and MAM for conductivity, hardness, and some major ions. Minor changes observed for some major ions in A76 and NEM. TOC and DOC apparently increased at WTS and DS (the BACI analysis indicted that the change at DS1 was statistically significant).	**Spatial Trends: localized** – The 2019 results indicated changes to WTS and MAM and to a lesser extent A76. Although in a separate watershed, Nemo Lake also exhibited some changes late in 2019. **Temporal Trends: increasing** – Calcium, magnesium, potassium, and sodium may be trending upwards in NF lakes. Evidence of increases in WTS and MAM and later in 2019 in NEM; however, a longer time interval is required for confirmation. **Causality: high** - These ionic compounds have increased in the Meadowbank study area lakes and it seems likely that the apparent increase observed in the Whale Tail study area lakes in 2019 follows a similar trend; however, the limited *after* period makes it difficult to assign causality.
Nutrients	High variability in the nutrient results observed in 2019. This variability is regional and was observed at the Whale Tail study area lakes but also at the Meadowbank study area lakes, Baker Lake, and the reference lakes. High precipitation in June and July may have impacted nutrient concentrations. Total phosphorous change was statistically significant in WTS in 2019. Ammonia concentrations increased significantly in INUG (reference) in 2019 indicating that some of the increases were natural.	**Spatial Trends: widespread** - Ammonia and other nutrients appeared to increase in most study area lakes including reference in 2019. **Temporal Trend: variable** - No temporal trend was observed except potentially and increase for total phosphorous in WTS. **Causality: low** - the widespread variability in nutrient concentrations in 2019 suggests that mine activities did not adversely impact nutrient concentrations in the Whale Tail study area lakes.

Monitoring Component and Variable (and report Section)	**Summary**	**Temporal and Spatial Trend Assessment**
TOC and DOC	The yearly mean for TOC and DOC exceeded the trigger (TOC trigger = 2.42 mg/L and DOC trigger = 2.43 mg/L) in WTS (mean TOC = 2.9 mg/L; mean DOC = 3.0 mg/L) and DS1 (mean TOC = 2.9 mg/L; mean DOC = 2.8 mg/L) in 2019. The mean concentrations in MAM or A76 did not exceed the trigger; therefore, the apparent increase observed at DS1 may be associated with natural variability.	**Spatial Trends: localized** - TOC and DOC were slightly over the trigger in WTS. The results from DS1 are potentially related to natural variability as these parameters were below the trigger values in lakes upstream (closer to the mine activities). **Temporal Trend: increasing** - WTS appeared to be increasing in 2019. The increase may be associated with the flooding of WTS after the impoundment of WTN. However, there was also an apparent increase in DS1. **Causality: moderate** - The increased TOC and DOC in WTS may be associated with mine activity or increased flooding. However, conditions at A20 (also flooded) were comparable to baseline and the increase in DS1 is likely related to natural sources.
TDS	In 2019, TDS concentrations in MAM were marginally elevated over the previous sample years, but the yearly mean was above the trigger (mean = 87.1 mg/L). The yearly mean at WTS also exceeded the trigger in 2019 (mean = 73.7 mg/L). Both results were statistically significant in the BACI analysis of proportional change. Lake A76 and Nemo Lake also exceeded the trigger in one or more sample in 2019; however, the yearly mean was below the trigger.	**Spatial Trends: localized -** TDS concentrations were elevated in WTS and MAM but to a lesser extent in A76 and NEM and did not extend to A20 or DS1. **Temporal Trend: increasing** - TDS trended upwards in 2019 particularly in MAM but also in WTS. However, conditions were fairly stable for the 2019 season. **Causality: high** - Increased dissolved solids in MAM and WTS is likely related to construction and dewatering activities.
Metals	The yearly mean concentrations for lithium exceeded trigger values in WTS and MAM. Total titanium also exceeded the trigger in WTS.	**Spatial Trends: localized** - Mean lithium concentrations exceeded the trigger value in WTS and MAM but did not extend to Lakes A20 or A76. **Temporal Trend: variable** - The apparent 2019 increase for lithium appeared to stabilize later in the year. There was no temporal trend in WTS for total titanium. **Causality: low** - Causality cannot be determined based on the limited *after* data and no evidence of a temporal trend.

Monitoring Component and Variable (and report Section)	**Summary**	**Temporal and Spatial Trend Assessment**
Phytoplankton Section 5.4 *Chlorophyll-a*	There is no trigger for chlorophyll-a for the CREMP. Chlorophyll-a concentrations varied in 2019 but appeared higher in WTS and MAM. Early season lows for MAM were around 0.11 µg/L in March and in WTS were 0.89 µg/L. By August WTS had risen to 4.5 µg/L and by September MAM was up to 4.0 µg/L. All other area lakes were generally around baseline levels (~1.0 µg/L).	**Spatial Trends: localized** - Chlorophyll-a appeared to increase in WTS and MAM compared with other lakes in 2019. There was no formal BACI analysis on this parameter. **Temporal Trend: variable** - A notable increase in August in WTS was followed by a notable decline in September. MAM increased in August and September. **Causality: moderate** – A potential spatial trend was not supported by a temporal trend in WTS. Conditions in MAM may have been increasing at the end of the year.
Total Biomass	Total biomass results were highly variable in 2019. MAM results were generally comparable with baseline but increased to 660mg/m^3 by September. WTS increased in August to 1117 mg/m^3 but decreased to comparable with baseline conditions in September. These maximum values were notable higher than those observed in 2018. The BACI analysis indicated a statistically significant increase for WTS and non-significant statistical increases for all other study area lakes.	**Spatial Trends: widespread** - Phytoplankton biomass appeared to increase in all study area lakes in 2019. **Temporal Trend: variable (WTS); increasing (MAM)** - Statistical analysis indicated an increase in WTS over baseline/control; however, time-series plots of biomass show biomass falling in September compared to August. MAM appeared to be increasing above baseline in the latter half of 2019 but change was not statistically significant. **Causality: moderate** - The potential increase in biomass is widespread. Natural variability in nutrients (e.g., a region wide increase in ammonia) may have influenced phytoplankton growth.
Taxa Richness	The Whale Tail study area lakes tend to have higher biomass/abundance and greater taxa richness than the Meadowbank study area lakes. In 2019 taxa richness in the Whale Tail study area lakes was comparable with previous years.	**Spatial Trends: None** **Temporal Trends: None** **Causality: Not Applicable**
Sediment Chemistry Section 5.5 *Metals*	2019 was not a coring year at the Whale Tail study area. Grab sample chemistry was screened against triggers to assess for the potential early warning of change and to provide context for potential changes to benthic invertebrate indices. There was no evidence of change over 2018 results.	**Spatial Trends: None** **Temporal Trends: None** **Causality: Not Applicable**

Monitoring Component and Variable (and report Section)	**Summary**	**Temporal and Spatial Trend Assessment**
Organics (PAHs)	There was no evidence of change from 2018 results.	**Spatial Trends: None** **Temporal Trends: None** **Causality: Not Applicable**
Benthos **Section 5.6** *Total Abundance*	Benthic abundance was highly variable between replicates and was variable between stations. Statistical testing indicated an apparent but not statistically significant increase in abundance in MAM and NEM, and to a lesser extent in WTS. Overall, 2019 results are similar to baseline years for all stations.	**Spatial Trends: None** **Temporal Trends: None** **Causality: Not Applicable**
Total Richness	Taxa richness was comparable with baseline years.	**Spatial Trends: None** **Temporal Trends: None** **Causality: Not Applicable**

8.12.4.1.2 Whale Tail Dike Construction Monitoring

The complete 2019 report on Water Quality Monitoring for Dike Construction and Dewatering is provided as Appendix 19, and summarized below.

In-water construction of the Whale Tail Dike concluded in 2018, but monitoring for related construction activities was conducted from January – February, 2019. In-water construction of Mammoth Dike began on February 15th, 2019 and was completed on March 17th, 2019.

Dewatering of Whale Tail Lake – North Basin began on March 5th, 2019, and continued through the end of the year.

Results of water quality monitoring during dike construction are compared to NWB Type A Water License criteria for TSS. Monitoring occurred in five general locations: upstream and downstream of the Whale Tail Dike, downstream of the Mammoth Dike, as well as broad survey locations in Whale Tail Lake (South Basin) and Mammoth Lake. For each location, turbidity depth profiles were recorded at four monitoring stations using a handheld meter, and values were converted to TSS using a site-specific, approved regression equation. All turbidity/TSS monitoring results for all compliance stations were within NWB Water License criteria, so no supplemental management actions were required to be implemented.

Complete laboratory water quality analysis (major ion, nutrients, metals) was conducted periodically at dike monitoring stations in the receiving environment and the impounded area of Whale Tail Lake - North Basin. Occasional exceedances of CCME guidelines occurred, which is similar to construction of the Bay-Goose and East Dikes. As in 2018, most exceedances occurred in Whale Tail Lake - North Basin, so impacts to the receiving environment are considered unlikely. The 2019 CREMP report provides a complete analysis of receiving environment water quality impacts.

Water quality monitoring for dewatering effluent occurred at the water intake pump or after TSS treatment, as required. Results indicated four isolated incidents when individual TSS or turbidity concentrations exceeded NWB Type A Water License criteria for the short-term maximum (STM). One duplicate sample exceeded the STM for total aluminum. The Maximum Monthly Mean (MMM) was not exceeded for any parameter. Based on standard operating procedures identified in the Plan, supplemental management actions were not required.

Due to record rainfall, water levels in the Whale Tail South flood zone exceeded FEIS predictions for July, 2019. Active pumping of water from Whale Tail South Basin to Mammoth Lake began in October, and by mid-November, water levels declined below predictions. Construction of the Whale Tail South Channel between Lake A20 and Mammoth Lake is underway in 2020. This channel will passively manage water levels in WTS moving forward, and ensure they don't exceed the maximum predicted level of 156 masl. While FEIS predictions were not available for quantitative comparison to measured water levels in Mammoth Lake, values in 2019 were within the range of baseline values observed in 2015.

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 MDMER or 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 (under MDMER and NWB Water License)

Whale Tail North Dewatering Phase I

Whale Tail North Basin dewatering water was pumped to Whale Tail Lake South Basin beginning in March, 2019. When water quality was below the MDMER limits, water was discharged back to WTS without any treatment, otherwise it was processed at the Water Treatment Plant for TSS prior to discharge.

Three sampling events exceeded MDMER and/or NWB Water License effluent criteria in 2019:

1. Whale Tail North Basin dewatering effluent was sampled on May 29th, 2019 at 9 am as required by the Water License 2AM-WTP1826. At 9:50 am, another water sample was taken as required by the MDMER regulations. The discharge was already planned to be stopped during the day of May 29th. At 10:00 am the pumps were shut down and remained inactive for the rest of the month. On June 6th, 2019 Agnico Eagle was reviewing preliminary results and noted that the level of TSS at ST-MDMER-5 discharge was at 30 mg/L for the sample taken at 9 am and 88 mg/L for the one taken at 9:50 am on May 29th. Based on a total flow of 500 m^3 between May 29th, 9 am and May 29th 10 am, the quantity of TSS is estimated at 45 kg. The event was reported to regulators on June 6th.

2. The TSS result for October 10th (91 mg/L) was above the Water License Short Term Maximum limit of 22.5 mg/L and the MDMER TSS limit of 30 mg/L.

3. The turbidity result on October 28th (80.1 NTU) was above the Water License Short Term Maximum limit of 30 NTU. On October 29, the TSS result (26 mg/L) exceeded the Water License Short Term Maximum Limit of 22.5 mg/L.

Water quality samples were taken from the discharge location (ST-MDMER-5), the receiving environment exposure area (ST-MDMER-5-EEM-WTSE) and reference area (TPS or ST-MMER-1-EEM-TPS) for toxicity analysis under the EEM program. This data was previously reported to Environment Canada via the MERS electronic database reporting system. Sub-lethal toxicity was not required to be measured for this location.

Whale Tail North Dewatering Phase 2

Whale Tail North Basin dewatering water was also pumped to Mammoth Lake beginning in June, 2019, with TSS treatment as required. All samples were in compliance with MDMER effluent criteria in 2019. Once exceedance of NWB Water License TSS short term maximum (22.5 mg/L) occurred on August 18th.

Two (2) sub-lethal toxicity samples were collected from this location in compliance with MDMER Schedule 5 Section 6. The water quality samples were taken from the discharge location (ST-MDMER-6), the receiving environment exposure area (ST-MDMER-6-EEM-MAME) and reference area (TPS or ST-MMER-1-EEM-TPS). This data was previously reported to Environment Canada via the MERS electronic database reporting system. Sub-lethal effects for *Ceriodaphnia* were noted in one test, while in all other tests no sub-lethal or acute effects were reported.

Quarry 1 Discharge

Quarry 1 water discharged to Mammoth Lake via a submerged diffuser to control erosion and disturbance to bottom sediments. All samples were in compliance with MDMER effluent criteria in 2019.

Water quality samples for toxicity analysis under the EEM program were taken from the discharge location (ST-MDMER-7), the receiving environment exposure area (EEM-7-MAME-2) and reference area (TPS or ST-MMER-1-EEM-TPS). This data was previously reported to Environment Canada via the MERS electronic database reporting system. Sub-lethal toxicity analyses were not required.

In addition, discharge was monitored according to NWB Water License Part F Item 4, and no non-compliance events were observed.

8.12.4.1.3.2 Minesite Water Collection System

Water quality sampling was conducted for various locations involved in onsite water management under the Project's NWB water license. Those locations with actual or potential direct interaction with the receiving environment include:

- Lake A47 (ST-WT-6)
    - No license limits.
- Lake A45 (ST-WT-13)
    - No license limits.
- Lake A16 (Mammoth Lake) outlet (ST-WT-14)
    - No license limits.
- Whale Tail Dike seepage (ST-WT-17)
    - Discharged with Whale Tail North Basin dewatering and monitored accordingly (see "Discharge under MDMER" section above).
- Whale Tail South transfer to Mammoth Lake (ST-WT-25)

  - o As per Water License Part F Item 6, the effluent from this discharge shall not exceed the maximum authorized grab sample TSS concentration of 30 mg/L and maximum monthly mean TSS concentration of 15 mg/L.
  - o No exceedances of the Water License criteria occurred.

- North-East Pond to Nemo watershed
  - o Agnico was not expecting any concerns relating to water quality as this is non-contact water from NE Pond. To ensure compliance with the Water License 2AM-WTP1826 (WL), Agnico monitored the effluent of the NE Pond for TSS as per WL Part F Item 6 (maximum grab sample TSS concentration of 30 mg/L and maximum monthly mean TSS concentration of 15 mg/L).
  - o No exceedances of the Water License criteria occurred.

Complete water quality monitoring results for these locations in 2019 are provided in Section 8.5.3.2.

8.12.4.1.4 Fish Habitat Offset Monitoring

The complete 2019 report on Fish Habitat Offset Monitoring is provided as Appendix 49, and summarized below.

In order to ensure that offsets are functioning fish habitat as projected, assessment of the structure and successful utilization of these features by fish are the primary goals of the monitoring program for habitat enhancement/creation offsets. These offsets include a set of constructed shoals and an elevated water level (approx. 1 m) throughout Whale Tail Lake. Based on the schedule described in the FHOMP, monitoring of these constructed offsetting features will generally occur 1, 3, 5 and 10 years post-construction. In 2019, no monitoring was required to be conducted in relation to habitat enhancement features, because construction of the offsets is not yet complete.

In addition to the 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 determine when criteria for success have been met.

Six research studies are underway through this program (Table 8-108 above). All studies are on track for completion according to original timelines as described in signed research agreements with the academic partners. In 2019, field programs and laboratory analyses entered year one or two for five of these projects. One will be complete in 2020, and the remaining four will continue with additional field studies this summer. One study is not proposed to begin until re-flooding of Vault and Phaser Lakes is complete, beyond 2026. Agnico is also looking for an alternate suitable study site and industry partner for that study, to allow it to be completed in the nearer term.

Once results of these studies become available, they will be used to inform aquatic effects monitoring conclusions.

8.12.4.1.5 Whale Tail Fish-out Studies

No fish-outs were conducted in 2019.

8.12.4.1.6 Whale Tail Haul Road and Quarries Water Quality Monitoring

Pre-freshet and freshet inspections were conducted at crossings along the Whale Tail Haul Road, eskers and quarries in 2019. 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. A freshet leader was hired in 2019 and was only dedicated, on a daily basis, to the inspection of Whale Tail Haul Road including the esker, quarries, culvert and bridges. If needed, mitigation measures, as straw boom or turbidity barrier, were put in place as prevention measures. No issues with runoff water inside the eskers/quarries, culvert or bridge to any waterbodies were noted in 2019. Refer to Section 8.5.3.11 for more details.

Weekly inspections are also conducted along the Whale Tail Haul Road and eskers/quarries on a year round basis. During the freshet and open water season, any visual turbidity plumes or erosion along the road, culverts, bridge or eskers/quarries are documented by Environmental Technicians. In 2019, no visual turbidity plumes or erosion was observed.

8.12.4.1.7 Whale Tail Blast Monitoring

For Whale Tail Pit project, 174 blasts were monitored. All IPC measurements were below the DFO limit of 50 kpa but eight (8) PPV measurements exceeded the DFO limit of 13 mm/s. The eight exceedances occurred during the period of egg incubation (August 15 to June 30). Three of these were recorded at a temporary blast monitoring station near Mammoth Lake, during construction of the Mammoth Dike (February 20th, 23rd, 26th). This station was at 116 m perpendicular to the blast location, while the nearest sensitive fish habitat was at 169 m. In each case an assessment was completed and mitigation measures were implemented according to the approved Blast Monitoring Plan.

8.12.4.1.8 Whale Tail Groundwater Monitoring

For the Whale Tail site, groundwater monitoring was conducted in 2019 to update site water quality and water balance models, primarily in relation to Whale Tail Pit groundwater inflows. This data will support water management activities and water quality planning for pit reflooding. There are no license limits or trigger values for groundwater quality.

8.12.4.1.9 Whale Tail Air Quality Monitoring

The complete 2019 Air Quality and Dustfall Monitoring Report is provided in Appendix 41. According to this plan, year-round sampling is planned to occur for suspended particulates, dustfall, and NO_2 at one onsite location. Suspended particulate samplers were installed at the Whale Tail site monitoring location in 2019, but sampling will begin in 2020. Dustfall was monitored throughout the year using passive static samplers, and the AB recreational/residential area guideline was met in all cases (<0.53 mg/cm^2/30d).

NO_2 was also measured year-round using passive samplers. The annual mean concentration was 1.46 ppb, which is well below the Government of Nunavut Ambient Air Quality Standard of 32 ppb.

Dustfall monitoring is also conducted along the Whale Tail Haul Road during the summer season. In In 2019, dustfall samples were collected twice over one-month averaging periods (June 23rd – July 23rd, 2019; July 23rd – August 31st, 2019). Each transect includes stations at 25 m, 100 m, 300 m and 1000 m upwind, (east/north) and downwind (west/south) of the haul road. Mid-way through round 1 (July 5th, 2019), dust suppressant (Tetraflake) was applied at km 133, 151, and 169 of the Whale Tail Haul Road. These locations coincide with dustfall monitoring transects. No reference location was sampled in 2019, but one is planned to be added in 2020. The Alberta Environment guideline for recreational areas (0.53 $mg/cm^2/30d$) was met in most locations by a distance of approximately 300 m of the road. Occasional exceedances of the AB guideline occurred at the 300 m distance for one location only (km 151). None occurred at the 1000 m distance.

In 2019, non-quantitative thresholds were in place to determine needs for dust mitigation along the Whale Tail Haul Road, including: deterioration of visibility, safety concern, high dust levels evident near significant waterbodies, etc. In 2020, the Air Quality and Dustfall Monitoring Plan has been updated with quantitative trigger values.

8.12.4.2 *Integration of Monitoring Results*

The 2019 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

Outside of the CREMP and the blast monitoring program, no consistent exceedances of relevant guideline values occurred for Whale Tail AEMP monitoring programs in 2019. A review of CREMP results exceeding trigger values and for which BACI trends were statistically significant was conducted in that report (Appendix 35), and results are examined here in the AEMP context, along with blast monitoring exceedances.

The five situations evaluated further are:

1. Total phosphorous (TP) showed a statistically significant increase at WTS, and phytoplankton biomass increased above the CREMP's 50% effect size threshold.

2. Total organic carbon (TOC) and dissolved organic carbon (DOC) showed statistically significant increases at WTS and DS1.

3. Statistically significant increases above trigger values were observed at near field (NF) areas WTS and/or MAM for total alkalinity, conductivity, hardness, calcium, potassium, magnesium, sodium, and TDS. The statistically significant increases extended to mid-field (MF) area Lake A76 for calcium, potassium and magnesium.

4. Statistically significant increases above trigger values with temporal trends were observed at NF areas WTS and/or MAM for total and dissolved lithium.

5. DFO's PPV limit of 13 mm/s was exceeded in 8 blast monitoring measurements.

8.12.4.2.2 Evaluation of Potential Source and Discussion

Overall, four major site activities occurred in 2019 with the potential to impact water quality in the receiving environment. These consisted of:

- Mammoth Dike construction (low potential, due to in-ice construction from February 15 – March 17);
- Northeast sector terrestrial flooding and discharge to tundra adjacent to Nemo Lake (not explored further, as no water quality BACI analyses were required for Nemo Lake);
- Whale Tail North Basin dewatering to Whale Tail South and Mammoth Lake (beginning March 5th, 2019);
- Whale Tail South terrestrial flooding (which began passively upon in-water completion of the Whale Tail dike in September 2018, but more fully upon initiation of WTN dewatering in March 2019).

As described in the 2019 CREMP report, since this was the first complete year of monitoring for the "impact" period, the limited amount of "after" data in the BACI analysis means that assigning causality and identifying the specific source of impacts is difficult. Nevertheless, 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.

8.12.4.2.2.1 Increase in Total Phosphorus and Phytoplankton Biomass in WTS

As described in the 2019 CREMP report, phosphorus is an important component of the nutrient cycle in lake systems. It is an essential nutrient for all living organisms, but typically, even in water bodies with low concentrations of phosphorous, aquatic life is typically relatively diverse and abundant (CCME 2004).

The CREMP threshold for the Whale Tail area study lakes is 0.004 mg/L (CCME guideline for ultra-oligotrophic lakes), which is slightly lower than the trigger (trigger = 0.0045 mg/L). In 2019, 7 out of 10 CREMP water quality samples in WTS exceeded the trigger, and the yearly mean total phosphorous concentration (0.0048 mg/L) also exceeded the trigger. The BACI analysis indicated that the observed change was statistically significant.

Unsurprisingly, there were also statistically significant changes in phytoplankton biomass in WTS in 2019 (190%; $p = 0.009$). This change exceeded the CREMP's 50% effect size threshold for phytoplankton. The increase in total biomass over historical baseline data, the lack of trend uniformity with other Whale Tail study area lakes, and the proportionally large and statistically significant increase over reference lake INUG strongly suggest that mine activities influenced primary productivity in WTS in 2019. A sharp drop was seen in the September event, bringing biomass down to levels more consistent with the baseline period.

These changes in total phosphorus and phytoplankton biomass were identified in the CREMP as likely to be the result of inputs from flooded terrestrial habitats following impoundment and flooding of WTS. This process of flooding began during the 2019 freshet, following construction of the Whale Tail Dike.

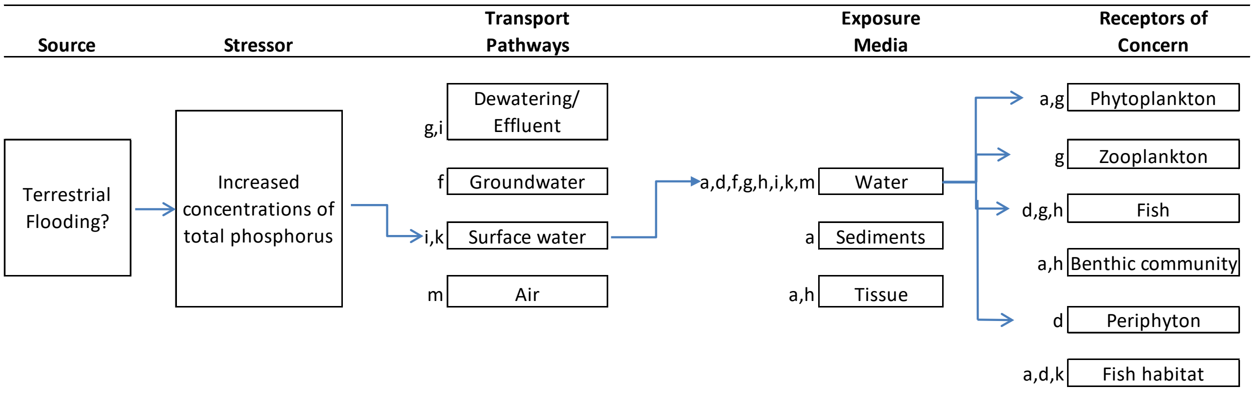
While there were no regulatory limits, total phosphorus was also measured as a component of dike construction monitoring in 2019 (see Water Quality Monitoring for Dike Construction and Dewatering Report, Appendix 19). Total phosphorus results for WTS remained below detection limits during that program (0.01 mg/L). Total phosphorus was also measured under the minesite water quality and flow monitoring program at the Mammoth Lake outlet and A15 outlet, where results were also below or at detection limits (0.01 mg/L). Although this limit (0.01 mg/L) is greater than the CREMP trigger, significant impacts of dike construction on WTS are considered unlikely, since no in-water construction for the Whale Tail Dike occurred, and the Mammoth Dike construction zone is located downstream of WTS.

Interestingly, changes to total phosphorus and phytoplankton biomass did not extend to Lake A20 although it too was flooded and connected to Whale Tail Lake. Of note is that nutrients and phytoplankton biomass did also increase in Mammoth Lake in 2019, although the change was not statistically significant in the BACI model. An increase in productivity in Mammoth Lake was predicted under the FEIS due to effluent discharge during mine operations.

As described in the 2019 CREMP report, the ecological significance of increased primary productivity at WTS (and MAM) will depend on how long these trends continue and how far they extend. Minor changes (e.g., changes in biomass that retain the general structure of the community and are relatively short-lived) are unlikely to be important ecologically, while larger or more extensive changes could start to change food chain dynamics in these typically low productivity lakes. Trends for total phosphorus and phytoplankton will be tracked closely in 2020.

As described in the Whale Tail Pit Fish Habitat Offsetting Plan – Appendix C (Complementary Measures), it was expected that due to release of terrestrial nutrients during flooding of WTS, there would be increases in the lower trophic food base for fish, potentially resulting in numerical increases in forage fish such as Slimy Sculpin (through increases in growth and reproduction rates). To address this uncertainty, a research study in partnership with the University of Waterloo is underway to identify any impacts to fish populations (Section 8.12.4.1.4 and Appendix 49 – Study 1: Assessment Of Changes In Aquatic Productivity And Fish Populations Due To Flooding Of Whale Tail South And Downstream Lakes During Operations). This study is expected to be completed in 2022, at which time full results will be available.

Figure 20 Whale Tail site integrated conceptual site model for 2019 AEMP assessment of increased total phosphorus in Whale Tail South



Notes:

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	AWPAR and Quarry Water Quality Montoring
l	Blasting
m	Air quality monitoring

8.12.4.2.2.2 Increase in DOC and TOC in WTS

The 2019 yearly means for TOC and DOC exceeded the CREMP triggers (TOC trigger = 2.42 mg/L and DOC trigger = 2.43 mg/L) in WTS (mean TOC = 2.9 mg/L; mean DOC = 3.0 mg/L) and far-field site DS1 (mean TOC = 2.9 mg/L; mean DOC = 2.8 mg/L).

The increase in TOC and DOC in WTS was identified in the CREMP report as likely related to the flooding of terrestrial habitat with impoundment of the south basin. As noted there, however, the same results were not evident in Lake A20, which also experienced flooding and was joined to WTS for most of 2019 (similar to how changes in nutrients and phytoplankton biomass did not extend to A20).

Average concentrations of TOC and DOC measured approximately weekly in WTS, MAM and the impounded area of WTN during Mammoth Dike construction were lower than the CREMP trigger values for these parameters. These results support conclusions that observed changes in TOC and DOC in WTS were likely related to flooding and not dike construction.

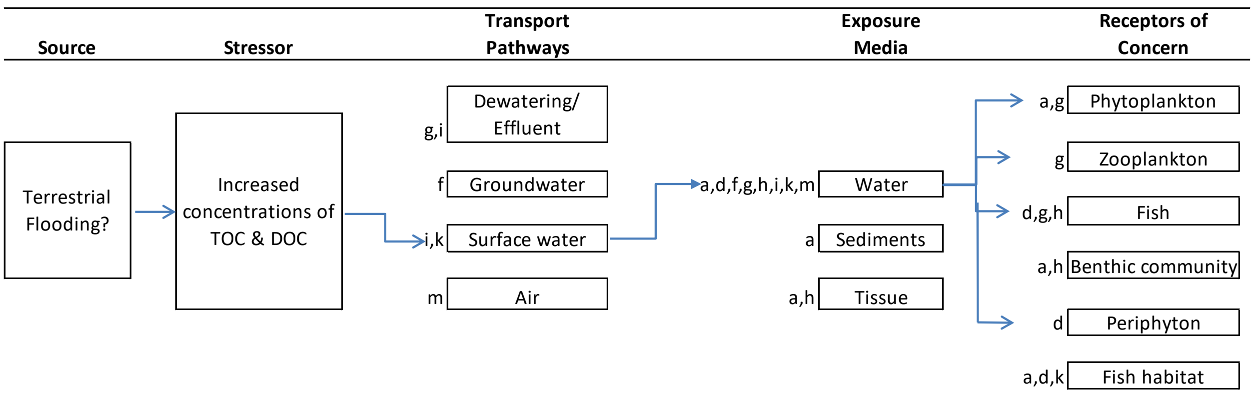
TOC and DOC were not components of effluent or receiving environment monitoring during dewatering. The only monitoring location with release to WTS under the minesite water quality and flow monitoring program is for Whale Tail Dike seepage, and TOC/DOC were not required to be analyzed for that location.

Interestingly, statistically-significant increases in TOC and DOC were also observed in the CREMP at Lake DS1, which is downstream of the site is considered a far-field lake and, therefore, less likely to be impacted by mining-related activities than Mammoth Lake (near-field) and Lake A76 (mid-field), neither of which had statistically significant increases in TOC and DOC in 2019. Therefore, it was determined that the apparent increase observed at DS1 may be associated with natural variability, potentially aided by the significant rainfall which occurred in 2019.

There is no effects-based threshold for TOC or DOC (i.e. CCME guideline), and if changes were in the range of natural variability (as evidenced by results from DS1), associated significant impacts to higher trophic levels are considered unlikely.

These patterns will be tracked closely in 2020 to understand whether trends are mine-related.

Figure 21 Whale Tail site integrated conceptual site model for 2019 AEMP assessment of increased total and dissolved organic carbon in Whale Tail South



Notes:

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	AWPAR and Quarry Water Quality Montoring
l	Blasting
m	Air quality monitoring

8.12.4.2.2.3 Increases in Conventional Parameters, Major Ions, and TDS in WTS and/or MAM

Statistically significant increases above trigger values were observed at near field (NF) areas WTS and/or MAM for total alkalinity, conductivity, hardness, calcium, potassium, magnesium, sodium, and TDS. The statistically significant increases extended to mid-field (MF) area Lake A76 for calcium, potassium and magnesium. Overall, these upward trends in conductivity, hardness, ionic compounds and TDS are similar to those observed in the Meadowbank near-field CREMP lakes.

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. The CREMP trigger for conductivity (trigger = 48.6 µS/cm) was exceeded in all the 2019 samples for both WTS and MAM lakes. The yearly mean also exceeded the trigger (mean conductivity for WTS was 86.1 µS/cm and for MAM was 112.7 µS/cm). The results for hardness followed an identical pattern for both lakes, with all individual samples and the yearly means exceeding the trigger (trigger = 17.4 mg/L; mean concentration for WTS was 30 mg/L and for MAM was 40.7 mg/L).

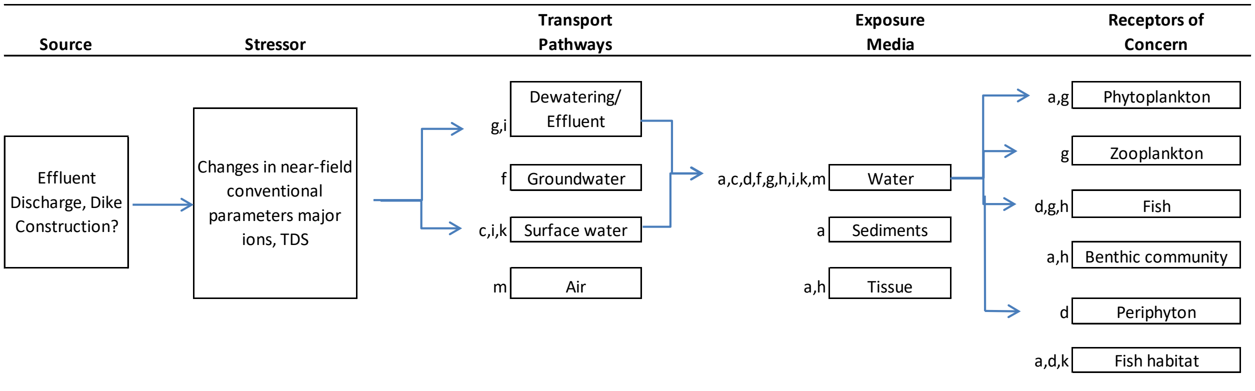
For Mammoth Lake, both conductivity and hardness were higher in the east basin of the lake compared to the west basin. As described in the 2019 CREMP report, it is likely that the increased conductivity and hardness observed in 2019 in MAM is related to mine activity. The spatial patterns observed in MAM confirmed this, because natural phenomena are unlikely to act in a spatially discrete manner in a relatively small lake like Mammoth Lake, especially when ice cover limits water exchange within and between systems. The eastern basin in MAM was also closer to dike construction activities that started at the end of 2018, and it received dewatering discharge from the impounded north basin of Whale Tail Lake and Quarry 1 from June 22nd, 2019. These conclusions are supported by results of the Dike Construction and Dewatering Monitoring program, and the minesite water quality and flow monitoring program. Water from Quarry 1 was discharged to Mammoth Lake from July 20th to October 23rd, 2019. Average conductivity of the discharge during this time was 472 uS/cm. While conductivity was not required to be measured in Whale Tail North dewatering effluent discharged to Mammoth Lake (July 1st – 8th, July 13th – September 28th, and October 2nd – 26th), field-measured conductivity in the receiving environment of MAM during dewatering ranged from 104 – 156 mg/L. In comparison, field-measured conductivity at the Mammoth Lake outflow and downstream lake A15 outflow was consistently lower during minesite water quality and flow monitoring, at 75 µS/cm and 73 µS/cm on average, respectively (monthly samples in July – September).

The south basin of Whale Tail Lake also received discharge water from the impounded north basin (March 5th – April 9th, 2019, May 3rd – 17th, May 24th – 29th, June 17th, June 22nd – 30th, July 9th – 18th, and October 4th – December 31st). Again, while conductivity of effluent was not required to be measured, field-measured conductivity in the receiving environment of WTS during dewatering ranged from 75 – 152 µS/cm (similar to the CREMP laboratory-measured annual average of 86 µS/cm). During 2019 dike construction which occurred earlier in the year, field-measured conductivity ranged from 27 – 62 µS/cm in WTS, which is generally in the range of the CREMP trigger (48.6 µS/cm) for the annual average. Therefore, for WTS, it is likely that lake dewatering activities, coupled with the flooding caused by the impoundment, would have been the route of increased conductivity and hardness.

Primary producer indices do not indicate declining abundance or richness, so any negative impacts of these changes are not evident at lower trophic levels. As described in the 2019 CREMP report, these major cations are essential elements, and all species of aquatic life, 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 (Alstad, et al., 1999).

The apparent upward trend for conductivity and hardness will be monitored closely in 2020. Increased intensity of field limnology profiling is planned for February 2020 and, pending results, may continue in subsequent monthly sampling events. Water chemistry monitoring may also increase.

Figure 22 Whale Tail site integrated conceptual site model for 2019 AEMP assessment of changes in near-field conventional parameters, major ions, and TDS (Whale Tail South and Mammoth Lake)



Notes:

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	Blasting
m	Air quality monitoring

8.12.4.2.2.4 Increase in Lithium in WTS and MAM

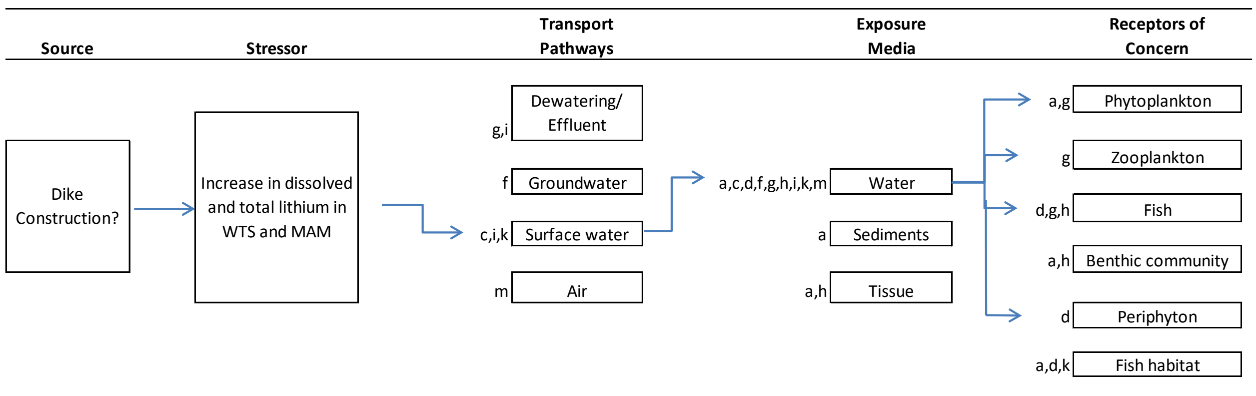
The yearly mean concentrations of total and dissolved lithium exceeded the trigger concentration in both WTS and MAM (total and dissolved lithium trigger = 0.0020 mg/L). Lithium concentrations in both lakes were highest in spring when the maximum concentrations for total lithium in May were 0.0079 mg/L (WTS-39) in WTS and 0.0075 mg/L in MAM (MAM-39). Mammoth Lake exhibited the same spatial pattern noted previously, where the lake's east basin was higher than the west basin. For both lakes, the lithium concentrations trended lower for the remainder of the year to just above the trigger by the last sampling event in September. The BACI analysis indicated that the change compared to reference lake INUG was statistically significant for both lakes.

Concentrations of total lithium measured approximately weekly during Mammoth Dike construction (Feb-Mar) were all below detection limits (0.005 mg/L) in WTS, but were slightly elevated in MAM (up to 0.008 mg/L, similar to the maximum observed in the March and May CREMP sampling), and further elevated in the impounded area of WTN (up to 0.015 mg/L). These results suggest that slightly elevated concentrations of lithium in WTS and/or MAM early in the season may have been caused by dike construction activities. Lithium was not required to be measured as a component of dewatering monitoring, and total lithium in Quarry 1 discharge to Mammoth Lake was non-detectable (<0.0050 mg/L). Similarly, at both the Mammoth Lake outlet and A15 outlet, total lithium measured through the minesite water quality and flow monitoring program was always non-detectable (<0.0050 mg/L).

Lithium does not have an effects-based thresholds (CCME guideline), and no potential toxicity-related impacts to lower trophic levels were observed in the CREMP analysis.

Since in-water dike construction and WTN dewatering activities are complete, concentrations would be expected to further stabilize in 2020 if these were the source of changes to water quality. These parameters will be monitored closely in 2020 to better assess causation.

Figure 23 Whale Tail site integrated conceptual site model for 2019 AEMP assessment of changes in lithium concentrations (Whale Tail South and Mammoth Lake)



Notes:

- 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 Blasting
- m Air quality monitoring

8.12.4.2.2.5 PPV Exceedances

As described in the Blast Monitoring Report (Appendix 45), eight of 174 PPV measurements for the Whale Tail site exceeded DFO's limit of 13 mm/s in 2019. In this case, the source of the stressor is evident (i.e. blasting activities), so causality does not need to be assessed. Potential impacts to receptors of concern (fish and fish habitat) are reviewed in the context of results from related monitoring programs that were conducted in the Whale Tail area in 2019 (as shown in Figure 24, these include the CREMP, and MDMER monitoring).

In 2019, results of receiving environment monitoring under the CREMP and MDMER have not indicated trends of ecological concern to fish. Therefore, there are no changes to the assessment of potential impacts made in the Blast Monitoring Report (Appendix 45):

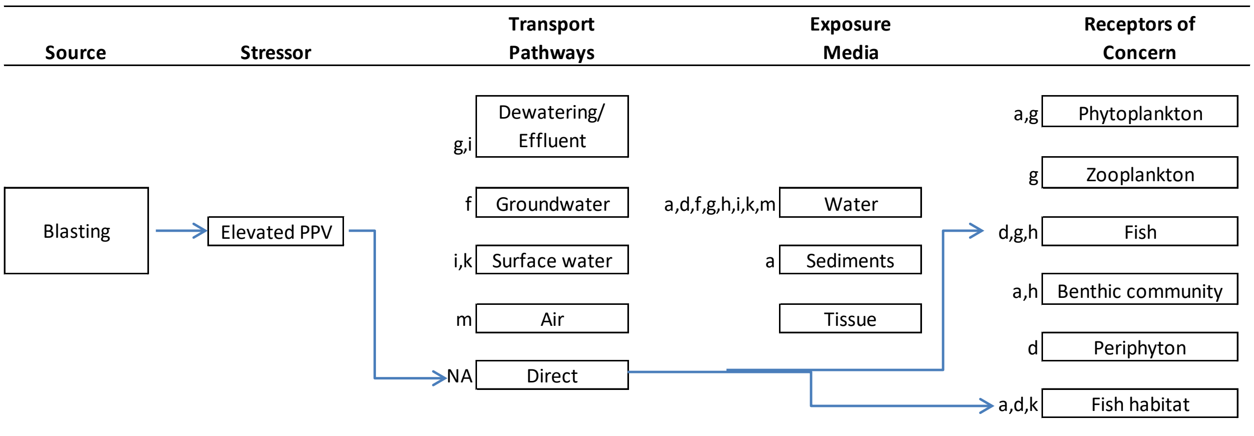
> As discussed in the 2011 report, Wright (1982) determined that peak particle velocity greater than 13 mm/s is potentially damaging to incubating eggs, however Faulkner et al. (2006), found no effects on lake trout eggs due to blasts at Diavik Mine, NWT with maximum PPVs of 28.5 mm/s. Faulkner et al. (2006) measured mean PPV at three exposure stations from September

to July, 2003-2004 and found a mean range of 5.8 - 6.4 mm/s and reported 80 exceedances of 13 mm/s PPV at these stations with a maximum PPV being double the DFO guideline. They found there were no differences in mortality of lake trout eggs in incubators between exposure sites and reference sites that resulted from blasting at Diavik in 2003-2004. As a result, Agnico suggests that additional studies may not be necessary to confirm low PPV at spawning and incubation sites, since results of this study suggest impacts are likely not occurring even if no attenuation of PPV is occurring between blast monitoring sites and spawning habitat.

In all cases an assessment was completed and mitigation measures were implemented according to the approved Blast Monitoring Plan, and no supplemental management action is planned

In all cases an assessment was completed and mitigation measures were implemented according to the approved Blast Monitoring Plan, and no supplemental management action is planned.

Figure 24Whale Tail site integrated conceptual site model for 2019 AEMP assessment of PPV exceedances.



Notes:

a	Core Receiving Environment Monitoring Program
b	Effects Assessment Studies
c	Dike Construction Monitoring
d	Fish Habitat Offsets Monitoring
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	Blasting
m	Air quality monitoring
NA	Direct, so measured in exposure medium.

8.12.4.3 *Recommended Management Actions*

Since any potentially-mine related trigger exceedances were localized (WTS or MAM), and no significant negative impacts to receptors of concern were identified or anticipated, no supplemental management actions are planned in 2020 for the Whale Tail site as a result of this assessment. Minor supplemental water quality sampling is planned under the CREMP.

The following regular actions related to AEMP programs will occur.

- CREMP
  - Water quality – The full CREMP program (through-ice and open water) is planned at the NF, MF, and FF areas 2020. Through-ice limnological profiles are planned at MAM and WTS 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. Additional limnology profiles will be completed in Mammoth Lake in February 2020 to assess the spatial trends observed in 2019.
  - Phytoplankton – Routine sampling with the full water quality sampling program.
  - Sediment chemistry – Routine sediment grab chemistry sampling with the replicate benthos sampling stations in each area. Coring will also be completed at NF areas to coincide with the EEM monitoring program for 2020.
  - Benthos – Sampling at NF areas (WTS and MAM) to monitor for changes in the community due to construction and discharge. Sampling at NEM to monitor potential changes related to the temporary authorized discharge into the Nemo Lake watershed in 2019, and sampling at areas A20, A76 and DS1 to provide more information on the range of normal conditions to support future BACI-style analysis.
- Dike Construction and Dewatering Monitoring
  - No dike construction is currently planned for 2020 under the approved Project. Dewatering will be ongoing to the beginning of 2020.
  - Any required monitoring for future dike construction or dewatering (e.g. under the Whale Tail Expansion Project) will follow approved plans.
- MDMER & Water Quality and Flow Monitoring
  - Monitoring will continue as per the monitoring plan, license and MDMER requirements in 2020.
- EEM Biological Monitoring Studies
  - Cycle 1 EEM Biological Monitoring study will be conducted for Whale Tail in 2020.
- Fish Habitat Offset Monitoring
  - No requirements for physical habitat offset monitoring are anticipated for the Whale Tail site in 2020.
  - Final results are expected from one project: Study 3 - Literature review and field validation of northern lake fish habitat preferences (S. Doka).

- Fish-out Monitoring
    - No fishouts are planned for 2020 based on currently permitted mine plans.
    - Any required monitoring for future fishouts (e.g. under the Whale Tail Expansion Project) will follow approved plans.
- Blast Monitoring
    - Blast monitoring will continue in accordance with the Blast Monitoring Program (updated March, 2020).
- Groundwater Monitoring
    - Groundwater monitoring will continue in accordance with the Groundwater Monitoring Plan (2020).
- Air Quality Monitoring
    - Monitoring will continue in accordance with the Air Quality and Dustfall Monitoring Plan (March, 2020).

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 2019 noise monitoring program at Meadowbank was conducted according to the Noise Monitoring and Abatement Plan (Version 3; 2018). The objective of this program is to measure noise levels at five (5) previously determined monitoring locations around the Meadowbank site, over at least two 24 h periods. Since high winds in the area tend to substantially reduce the quantity of available valid data, Agnico aims to conduct a minimum of two monitoring rounds of two to four days per station. All sites are located at a distance from noise sources to be representative of sound levels in locations where wildlife may be expected to occur, and where noise-related PPE is not required. The measured levels provide a snapshot of the acoustic environment in this phase of project and are considered representative of the current operational activity. Refer to Appendix 51 – 2019 Noise Monitoring Report for a complete review of the 2019 results.

In 2019, one or two monitoring events were successfully completed for all five Meadowbank noise stations. Following 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 FEIS predictions.

Daytime, night-time, and 24 h L_{eq} values calculated from recorded 1-min L_{eq} values for each monitoring event and location are shown in Table 8-114. No exceedances of the target sound levels or FEIS predictions occurred for comparisons to the 24-h L_{eq}. For station R5, the FEIS specified that each 1 h L_{eq} was predicted to be <57 dBA. In 2019, that prediction was marginally exceeded (58 dBA) for one of 32 monitoring hours during a single monitoring event, due to an aircraft flyover.

Historical 24-h L_{eq} measurements (2009 – 2019) for monitoring stations R1 – R5 are shown in Figure 25 in relation to FEIS predictions. No clear trends towards increasing noise levels are evident. For all sites except one instance at R4 in 2018, measured 24-h L_{eq} values have remained below predicted noise levels.

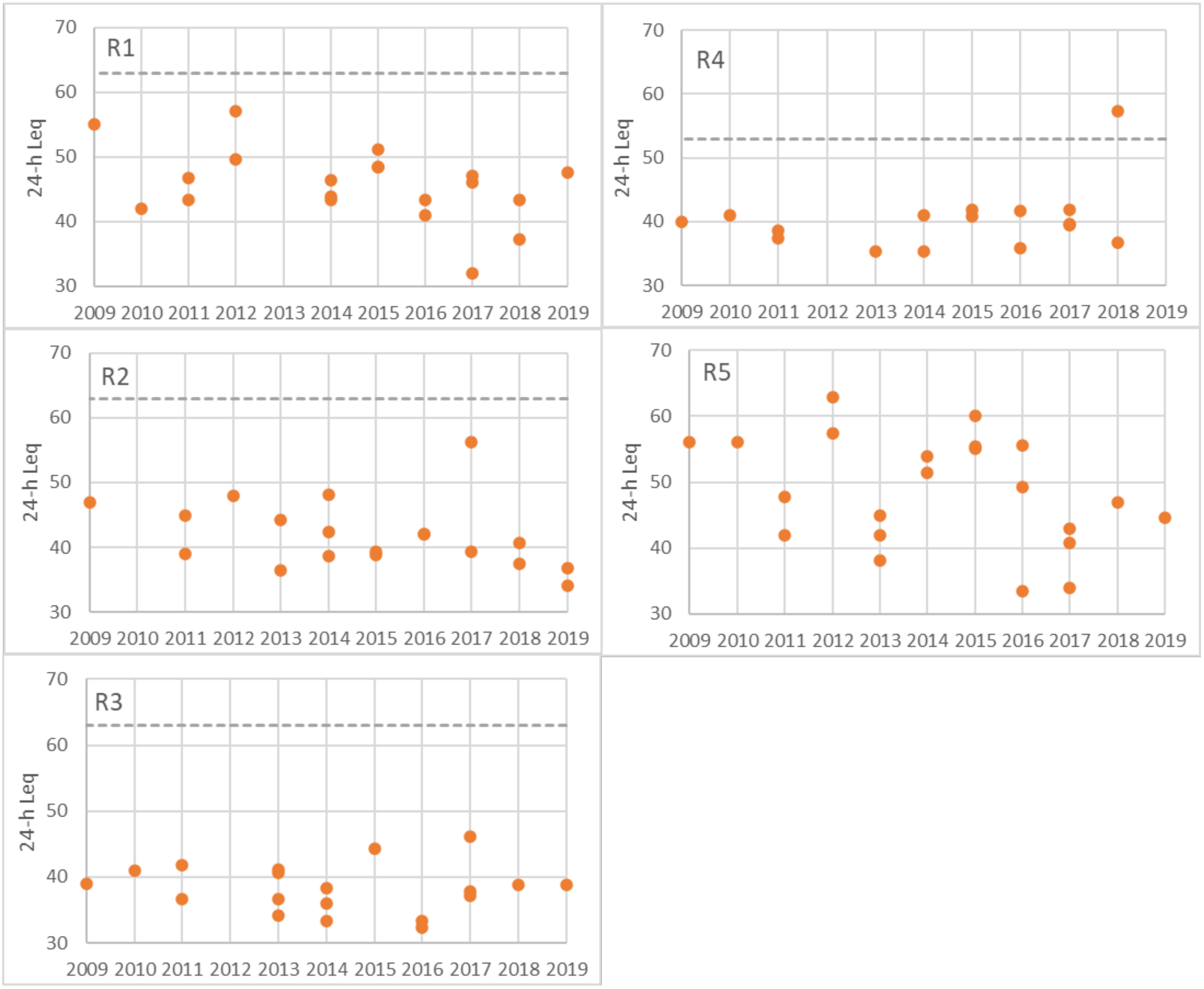
Impacts of sensory disturbance on wildlife are determined through the Terrestrial Ecosystem Monitoring Plan (TEMP), and reported annually in the Wildlife Summary Report. While sensory disturbance of caribou in excess of impact predictions was identified in that report in 2018, the contribution of noise to sensory disturbance cannot realistically be isolated. However, supplemental wildlife monitoring under the recently updated TEMP (June 2019) specifically aimed to quantify the response of caribou to blasts in 2019. These results are discussed in the 2019 Wildlife Monitoring Summary Report (Appendix 52).

Noise monitoring continues annually and will be monitored in 2020.

Table 8-114 2019 Daytime, night-time, and 24-h L_{eq} values for monitoring locations R1 – R5, and hours of valid data (# hours). Day- and night-time periods with fewer than 3 hours of valid data are excluded (-). Noise levels for event 2 at R1 were accidentally not logged in 2019 (NL). **For R5, one of 32 $L_{eq\text{-}1hr}$ values marginally exceeded the prediction, at 58 dBA, during event 2. For R4, throughout the duration of both monitoring events, weather conditions were outside of acceptable ranges due to both high wind speeds and rain events. As a result, no daytime, night-time, or 24-h Leq values were calculated.

Site	Dates (2019)	FEIS Prediction	Measured Values		
		$L_{eq, 24h}$ (dBA)	$L_{eq, day}$ dBA *(Target = 55 dBA)*	$L_{eq, night}$ dBA *(Target = 45 dBA)*	$L_{eq, 24 h}$ dBA
R1	06/24 – 06/28	58-63	48.6	44.6	47.6
	07/19 – 07/21		NL	NL	NL
R2	06/28 – 07/02	58-63	37.8	35.4	36.8
	07/31 – 08/02		34.2	33.9	34.1
R3	08/10 – 08/14	49-53	-	-	-
	07/26 – 07/30		38.0	40.5	38.9
R4	07/04 – 07/06	58-63	-	-	-
	08/03 – 08/06		-	-	-
R5	06/30 – 07/04	(1 h L_{eqs} < 57)**	36.8	-	-
	08/07 – 08/09		45.8	36.1	44.6

Figure 25 Historical 24-h L_{eq} values for monitoring stations R1, R2, R3, R4, and R5 at the Meadowbank site. Dashed line indicates the maximum FEIS prediction for each station, if available.



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 2019 noise monitoring program at the Whale Tail site was conducted according to the Noise Monitoring and Abatement Plan (Version 3; 2018). The objective of this program is to measure noise levels at six (6) previously determined monitoring locations around the Whale Tail site, over at least two 24 h periods. Since high winds in the area tend to substantially reduce the quantity of available valid data, Agnico aims to conduct a minimum of two monitoring rounds of two to four days per station. All sites are located at a distance from noise sources to be representative of sound levels in locations where wildlife may be expected to occur, and where noise-related PPE is not required. The measured levels provide a snapshot of the acoustic environment in this phase of project and are considered representative of the current operational activity. The complete 2019 Noise Monitoring Report is provided in Appendix 51.

Monitoring was conducted for at least two 24-h periods for noise monitoring stations R6 – R11 around the Whale Tail site (with the exception of R10, where only one event was conducted). However, due to an error in settings on the noise meter which was identified after the field season, sound levels were not logged for the duration of monitoring events at R7 – R11. As a result, daytime, nighttime and 24-h L_{eq} values could not be calculated for these stations in 2019. Actions to ensure this type of error is more rapidly detected and remediated moving forward were identified.

Following data processing in accordance with standard methods (Alberta Energy Resource Conservation Board Directive 038), monitoring results for R6 are compared to the site's daytime target sound level (55 dBA), nighttime target sound level (45 dBA), and FEIS predictions. Daytime, night-time, and 24 h L_{eq} values calculated from recorded 1-min L_{eq} values for R6 are shown in Table 8-115. Recorded sound levels did not exceed site targets or FEIS predictions.

A historical comparison will begin for R6 – R11 after two years of monitoring have occurred at these stations.

Impacts of sensory disturbance on wildlife are determined through the Terrestrial Ecosystem Monitoring Plan (TEMP, June 2019), and reported annually in the Wildlife Summary Report. Please refer to the 2019 Wildlife Monitoring Summary Report found in Appendix 52.

Table 8-115 Daytime, night-time, and 24-h L_{eq} values for monitoring location R6. Noise levels at R7 – R11 were accidentally not logged in 2019 (NL)

Site	Dates (2019)	Noise Targets		FEIS Prediction	Measured Values		
		$L_{eq, day}$ (dBA)	$L_{eq, night}$ (dBA)	$L_{eq, 24h}$ (dBA)	$L_{eq, day}$ (dBA)	$L_{eq, night}$ (dBA)	$L_{eq, 24 h}$ (dBA)
R6	07/22 – 07/26	55	45	45.97 – 50.33	42.7	30.4	41.8
	08/18 – 08/21				31.1	23.8	29.5
R7	07/29 – 07/31	55	45	45.14 – 50.04	NL	NL	NL
	08/20 – 08/27				NL	NL	NL
R8	06/30 – 07/03	55	45	40.41 – 45.14	NL	NL	NL
	08/07 – 08/08				NL	NL	NL
R9	07/26 – 07/28	55	45	36.19 – 40.41	NL	NL	NL
	08/12 – 08/14				NL	NL	NL
R10	08/01 – 08/02	55	45	45.14 – 50.04	NL	NL	NL
R11	07/18 – 07/20	55	45	45.14 – 50.04	NL	NL	NL
	07/21 – 07/24				NL	NL	NL
	08/09 – 08/11				NL	NL	NL

8.14 AIR QUALITY MONITORING

The 2019 air quality and dustfall monitoring program at the Meadowbank and Whale Tail sites was conducted according to the Air Quality and Dustfall Monitoring Plan - Version 4 (2019). The complete report is provided as Appendix 41, and results are summarized below for the Meadowbank site, AWAR, Whale Tail site, and Whale Tail Haul Road.

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.*

8.14.1.1 *Air Quality and Dustfall Monitoring Mine Site*

The objective of the 2019 program was to measure dustfall, NO_2, and/or suspended particulates (TSP, PM_{10}, $PM_{2.5}$) at four monitoring locations around the Meadowbank site. Locations were established in 2011 in consultation with Environment and Climate Change Canada.

For the Meadowbank site, the vast majority of TSP measurements in 2019 were well below the GN 24-h standard of 120 µg/m^3 (64 of 65 samples). The annual average TSP concentration was below the GN guideline of 60 µg/m^3. As in recent years, no samples exceeded the BC Air Quality Objective of 50 µg/m^3 for 24-h average PM_{10}, the GN guideline of 30 µg/m^3 for 24-h average $PM_{2.5}$, or the 2015 Canadian Ambient Air Quality Standard of 28 µg/m^3 for 24-h average $PM_{2.5}$ (neither was the 2020 CAAQS of 27 µg/m^3 for 24-h average $PM_{2.5}$ exceeded in any sample). Annual average concentrations of $PM_{2.5}$ were 0.5 (n = 30) and 1.5 µg/m^3 (n = 18) at DF-1 and DF-2, respectively, which are well below the 2015 and 2020 Canadian Ambient Air Quality Standards for annual average $PM_{2.5}$ of 10 µg/m^3 and 8.8 µg/m^3, respectively. It is noted that these comparisons are for reference only, since this CAAQS is based on the 3-year average of the annual average of all 1-hour concentrations, while Meadowbank's suspended particulate samplers analyze 24-h concentrations every 6 days.

Similarly, all measured rates of dustfall onsite were below the Alberta recreational area guideline for recreational areas (0.53 mg/cm^2/30 days) and industrial areas (1.58 mg/cm^2/30 d). Relatively low dustfall values overall may reflect continued efforts to manage dust on site roads through use of dust suppressants (calcium chloride application) and water trucks.

Neither the GN annual average standard for NO_2 of 32 ppb nor the 2020 CAAQS of 17 ppb was exceeded at either monitoring location on the Meadowbank site.

In order to understand trends of suspended particulate concentrations at the Meadowbank site over time, measured values of TSP, PM_{10}, $PM_{2.5}$, dustfall, and NO_2 were plotted since monitoring began in 2012 (Section 5 of the 2019 Air Quality and Dust Monitoring Report, Appendix 41). These results indicate that concentrations of the measured contaminants have not been increasing over time.

Air quality monitoring results are reviewed in the context of FEIS predictions in Section 12.3.4 below.

Estimated greenhouse gas emissions for the Meadowbank site as reported to Environment Canada's Greenhouse Gas Emissions Reporting Program in 2019 were 189,876 tonnes CO_2 equivalent, which is similar to the values reported in recent years. This includes emissions from the Whale Tail site. Incinerator stack testing was performed. The measured concentrations of mercury were below the GN standard of 20 µg/Rm^3 in all three tests. Measured concentrations of total dioxins and furans were also below the GN standard (80 pg TEQ / Rm^3 @ 11 % v/v O_2) in all three tests.

Overall, there are no apparent trends towards increasing air quality concerns at the Meadowbank site.

Mine site road watering at Meadowbank is applied on a daily basis during frost-free season (May to October), as needed. For Meadowbank, the volume of water use for this activity is not recorded as the water tank is the same as the one use by the mill, and thus no distinction is possible.

8.14.1.2 *AWAR Dustfall Monitoring*

In response to community concerns of dust generation, Agnico Eagle has conducted studies of dustfall along the Meadowbank AWAR since 2012. These studies characterize dust deposition rates to help determine the potential for impacts to wildlife in excess of those predicted in the Final Environmental Impact Statement (FEIS). The complete Air Quality and Dust Monitoring Report is provided in Appendix 41.

The goals of the study conducted in 2019 were to continue to track dust deposition rates, and understand the effectiveness of dust suppressant applications.

As in previous years, dustfall samples were collected in open vessels containing a purified liquid matrix provided by an accredited laboratory (Maxxam Analytics). Particles are deposited and retained in the liquid, which is then filtered to remove large particles and analyzed by the accredited laboratory for total and fixed (non-combustible) dustfall.

ASTM methods suggest collection of the dustfall sample at 2-3 m height on a utility pole to prevent re-entrainment of particulates from the ground, and to reduce vandalism and potential for wildlife interaction. However, due to the difficulty of constructing and deploying stands to hold the large number of sample containers used for road-side dustfall sampling, and the remote locations, the 2012 study compared dustfall at ground level and at 2 m height to inform future sampling method decisions. Based on those results and the assumption that any re-entrainment would result in conservatively high estimates of dustfall, all roadside sampling canisters have been deployed at ground level since 2013. Following concerns raised by ECCC, Agnico conducted a supplemental study in 2019 to confirm that dustfall rates measured at ground level continue to align with those measured on stands.

In 2019, Agnico assessed dustfall rates along 2000-m transects at five AWAR locations that received an application of dust suppressant (km 11, 25, 50, 69, 80), as well as at two reference sites without dust suppression (km 18 and 78) that have been monitored since 2012. To assess differences in collection methods, samples at km 78 were collected at ground level as well as on stands (approx.1.8 m) for all monitoring stations. As in past years, dust suppressant (Tetraflake calcium chloride) was applied to five sections of the AWAR (km 10-12, km 24-26, km 48-50, km 68-70 and km 80-84) during the first week of July, 2019. In addition, Agnico Eagle applied dust suppressant in two locations near the hamlet (Agnico spud barge and fuel tank farm) as well as over 7 km of AWAR on the Meadowbank site.

In the Final Environmental Impact Statement for the Project (Cumberland, 2005), all habitat within 100 m from the AWAR was assumed lost due to impacts of the roadway. Thus in order to understand whether FEIS predictions are being exceeded, results of dustfall sampling at and beyond 100 m are compared to the Alberta Environment guideline for recreational areas (0.53 $mg/cm^2/30d$) for reference. However, it should be noted that this guideline is based on nuisance and aesthetic concerns, and not necessarily impacts to vegetation or wildlife. It is also generally considered to apply to a specific dust source, over and above background values. Therefore, this is considered a conservative, screening-level comparison, and any significant exceedances will be further investigated.

Increased traffic rates associated with barge activity occurred in August, 2019, compared to other recent years, due to ongoing construction of the Whale Tail site. Despite this, most measured rates of dustfall along the Meadowbank AWAR continue to lie well within the range of historical values. Even in areas without dust suppression, average total dustfall during the highest-traffic period (August) was equivalent to the AB guideline for recreational areas (0.53 $mg/cm^2/30d$) by a distance of 100 m from the road.

Total dustfall results for the assessment of collection method (ground vs stand) for monitoring rounds 1 and 2 are shown in Figures 2 and 3 of Appendix 41. In all cases, within 300 m of the road, dustfall collected at ground level exceeded that collected on stands. Samples collected at 1000 m are considered background rates, and differences between ground level and stands are marginal. These results support Agnico's assumptions that ground-level sampling results in conservatively high estimates of dustfall. Nevertheless, Agnico has agreed to conduct all future monitoring for dustfall at the 2 m height (approx.).

In 2020, Agnico plans to apply dust suppression throughout the summer months in the same locations as previously, and believes that the identification of these potential areas of concern, application of dust suppressant throughout the summer months, and monitoring of dustfall levels satisfies requirements of the Project Certificate with respect to dust suppression.

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) ***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***
d) ***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.

8.14.2.1 *Air Quality and Dustfall Monitoring Mine Site*

According to the Air Quality and Dustfall Monitoring Plan, year-round sampling is planned to occur for suspended particulates, dustfall, and NO_2 at one onsite location (DF-5). However, the DF-5 station was moved to a new location (now DF-6) in April, 2019, in response to permitting considerations for the Whale Tail Expansion Project.

Suspended particulate samplers were installed at the Whale Tail site in 2019, but sampling will begin in 2020.

Dustfall was monitored throughout the year, and the AB recreational/residential area guideline was met in all cases (<0.53 mg/cm^2/30d).

In addition NO_2 was measured year-round using passive samplers. The maximum monthly mean concentration was 4.4 ppb. The annual mean concentration was 1.46 ppb, calculated using data from both DF-5 and DF-6. This is well below the Government of Nunavut Ambient Air Quality Standard of 32 ppb for the annual average, the 2020 CAAQS of 17 ppb, and is below the FEIS prediction for the annual average (4.4 ppb).

Mine site road watering at Whale Tail is applied on a daily basis during frost-free season (May to October), as needed. The volume of water use for this activity is not recorded as the water tank is the same as the one use by the camp and thus no distinction is possible.

8.14.2.2 *Whale Tail Haul Road Dustfall Monitoring*

According to the Air Quality and Dustfall Monitoring Plan, dustfall transects were established between kilometers 18 & 19, 36 & 37, and 54 & 55 along the Whale Tail Haul Road (WTHR) in 2018. In 2019, the WTHR km markers were re-named as a continuation of the AWAR. The WTHR thus begins at km 115, and the sampling locations were renamed as km 134, 151, and 169, respectively.

In 2019, dustfall samples were collected twice during the summer season over one-month averaging periods (June 23rd – July 23rd, 2019; July 23rd – August 31st, 2019). Each transect includes stations at 25 m, 100 m, 300 m and 1000 m upwind, (east/north) and downwind (west/south) of the haul road. Mid-way through round 1 (July 5th, 2019), dust suppressant (Tetraflake) was applied at km 133, 151, and 169 of the Whale Tail Haul Road. These locations co-incide with dustfall monitoring transects. No reference location was sampled in 2019, but one is planned to be added in 2020.

Unlike the Meadowbank AWAR, quantitative FEIS predictions were made with respect to dust deposition for the Whale Tail Haul Road, and monitoring results are compared to those predictions along with Alberta Environment guidelines. However, comparisons to modeled deposition rates are considered primarily as a screening tool. Since dustfall canister results include particles up to 0.85 mm, while standard air quality models typically assess deposition of particles up to 0.30 µm, canisters are more appropriate for understanding trends, or confirming extremely conservative model predictions, than specific comparisons to model outputs.

During monitoring round 1, the majority of samples exceeded FEIS predictions, especially within 100 m from the road. During monitoring round 2, overall dustfall rates tended to be lower, but more than half of samples still exceeded FEIS predictions within the 100 m distance. The more general FEIS prediction that the Alberta Environment guideline for recreational areas (0.53 mg/cm^2/30d) would be met within approximately 300 m of the road was generally true, especially given the very conservative nature of this comparison (i.e. using samplers at ground-level as opposed to on stands – see Section 8.14.1.2). Occasional exceedances at the 300 m distance occurred for one location (km 151) but none occurred at the 1000 m distance.

In 2020, collection of dustfall on stands will provide a more accurate comparison to FEIS predictions. While the logistics of monitoring at ground level greatly facilitate data collection in remote locations, it is evident from the comparison performed in 2019 along the Meadowbank AWAR that collection on stands helps to eliminate peaks likely caused by re-entrainment from the ground (which are not included in standard deposition modelling). That methodology will be followed in 2020 for all sampling locations, and results in comparison to FEIS predictions will be reviewed at that time.

In 2019, non-quantitative thresholds were in place to determine needs for dust mitigation along the Whale Tail Haul Road, including: deterioration of visibility, safety concern, high dust levels evident near significant waterbodies, etc. The Air Quality and Dustfall Monitoring Plan (V5, March 2020) has been updated to include quantitative triggers for dustfall management actions (see Appendix 62).

Dust mitigation measures that will be employed by Agnico to suppress the production of fugitive dust along the Whale Tail Pit Haul Road included:

- enforcing speed limits;
- grading of road surfaces;
- placement of new coarser material onto the road surface; and
- if necessary, road watering or application of dust suppressants

As detailed in Table 4 of the Air Quality and Dustfall Monitoring Plan (March 2020, Version 5) (Appendix 62), threshold will be used to determine when mitigation measures need to be initiated. Numeric thresholds based on the Alberta Ambient Air Quality Guidelines for dustfall will be used to determine when mitigation measures need to be initiated. Dustfall measurements will be regularly collected using passive sampling methods to record the quantity of dust collected over time and to quantify the success of mitigation measures. The monitoring data will be used to adjust mitigation measures and improve dust management strategies. This numeric threshold will also e used for the AWAR.

For the WTHR no concern for community were received to date.

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 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.

Different projects were held by Agnico in previous years to reduce the energy consumption and increase or evaluate the use of new technologies:

- Use of summer fuel – project ongoing

- Use of solar panel in northern condition operation - test completed and successful
- Identification of energy-saving opportunity in regards 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 underground Power Plant heat recovery study
- Insulation of remote buildings at Meadowbank

The Greenhouse Gas Reduction Plan (Appendix 51 of the 2018 Annual Report) detailed in Section 4 includes some of the reduction initiative above. The initiatives described are for both Meadowbank and Whale Tail Site.

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 (Appendix 51 of the 2018 Annual Report) was submitted as Version 1 on May 2018. Table 8-116 summarizes predictions of GHG emissions for the Meadowbank and Whale Tail Project for the peak year of production in 2020.

Table 8-116 Greenhouse Gas Summary for the Project and the Meadowbank Mill (2020)

Emissions Source	Greenhouse Gas Emissions (kt CO_2e)
Off-road exhaust	52.8
On-road exhaust	4.4
Power plant	4.1
Camp heater	2.9
Whale Tail Project Total [(a)]	64.2
Meadowbank mill	180.0
Whale Tail Project plus Meadowbank Total	244.0

(a) Project Total includes emissions from the Whale Tail Pit and the Haul Road.

kt CO_2e = kilotones of carbon dioxide equivalents; % = percent; <= less than

Source: Modified from Whale Tail FEIS, Volume 4 – Atmospheric Environment (Agnico Eagle, 2016)

Calculated annual GHG emissions for the Meadowbank and Whale Tail sites beginning in 2018 (first year of Whale Tail reporting) are provided in Table 8-117, with comparisons to FEIS predictions. As described in the GHG Reduction Plan (2018) and Table 8-116 above, FEIS predictions were developed for the maximum emission scenario (i.e. peak production; estimated to occur in 2020). Emissions from specific Whale Tail sources only slightly exceeded those predictions in 2019, and emissions from Meadowbank sources were well within the predicted total value. Overall, total emissions from the Meadowbank Complex (Meadowbank and Whale Tail sites) were 186.34 KtCO_2e (excluding minor sources and the incinerator), which is less than the FEIS-predicted maximum value of 244.0 KtCO_2e.

As Agnico emitted more than 50Kt per year of $CO2_e$/yr for the combined Meadowbank and Whale Tail site, a report will be submitted to Environment and Climate Change Canada's Greenhouse Gas Emission Reporting Program by June 1st, 2020. It should be noted that due to differences in calculation methods, total emissions reported under ECCC's Greenhouse Gas Reporting Program (or other regulatory programs) may differ slightly from those provided here for the purposes of comparison with FEIS predictions.

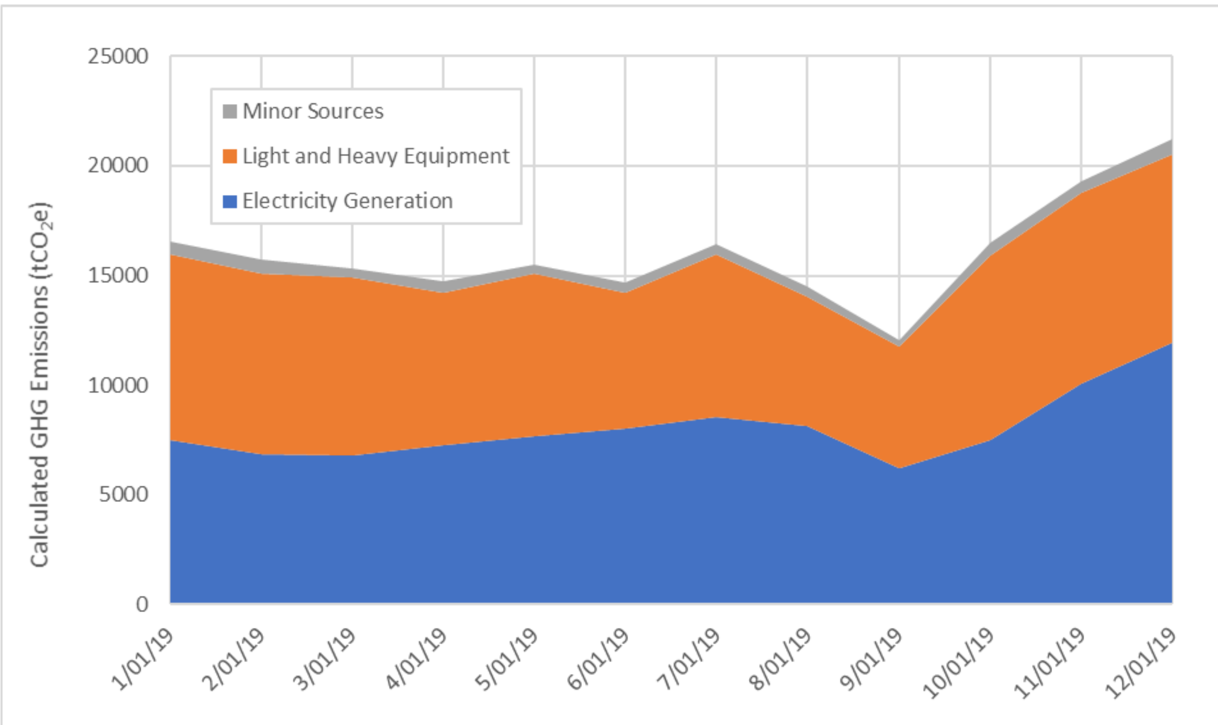
Table 8-117 Predicted and calculated GHG emissions (Kt CO_2e) for the Meadowbank and Whale Tail sites. FEIS predictions are according to the Whale Tail Project FEIS, Volume 4 - Air Quality Impact Assessment (Golder, 2016).*The FEIS estimated total emissions associated with ongoing use of the Meadowbank mill, whereas calculated values are for the same major and minor sources as described for Whale Tail. **Minor sources as identified in the GHG Reduction Plan (2018) and the Meadowbank incinerator; these were not included in FEIS predictions (NP) and are excluded from totals for comparison purposes here.

Site	Source	FEIS Prediction (at peak production)	2018	2019
Whale Tail Site				
	Diesel for electricity generation (power plant and heater)	7.0	-	7.18
	Diesel for light and heavy equipment (on- and off-road exhaust)	57.2	-	58.02
	Minor sources**	NP	-	*(1.04**)*
	Sub-Total	*64.2*	*33.22*	*65.20*
Meadowbank Site*				
	Diesel for electricity generation (power plant and heater)	NP	-	89.31
	Diesel for light and heavy equipment (on- and off-road exhaust)	NP	-	31.83

	Minor sources**	NP	-	*(5.14**)*
	Incinerator**	NP	-	*(1.98**)*
	Sub-Total	*180.0*	*152.90*	*121.14*
Total		**244.0**	**185.53**	**186.34**

Calculated total monthly emissions for both the Whale Tail and Meadowbank sites are shown in Figure 26. Relatively little variation occurred month over month, though a slight trend towards increasing emissions beginning in November for both equipment use and power generation was likely related to increased production.

Figure 26 Calculated monthly GHG emissions for the Whale Tail and Meadowbank sites combined. Minor sources include emissions related to aviation, blasting, propane heating, light truck gasoline, and the used oil furnace. Light and heavy equipment includes diesel-powered on- and off-road equipment. Electricity generation by diesel fuel oil includes camp heating



Agnico is continually seeking to reduce GHG emissions. Greenhouse gas emission reduction programs are identified in Section 8.15.1 above, and further described in the GHG Reduction Plan (2018). Some have already been implemented, while others are currently being assessed.

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 2019 Wildlife Monitoring Report (Appendix 52). The below is a summary of the findings and Agnico will refer to Appendix 52 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 K for 2019 calendar – Appendix 52 of the 2019 Annual 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 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 four times during the year (i.e., March, June, and October 2019, and January 2020) by the harvest study coordinator. During the January 2020 interviews, remaining data from 2019 were collected. The purpose of the interviews is to ensure all harvest data are recorded on the calendars and 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.

Improvements to the 2019 Hunter Harvest Study included: 1) increasing the amount of time researchers spent in the community interacting with participants; 2) building long-term relationships between participants and researchers; 3) increasing engagement with participants on social media platforms such as Facebook and Instagram; and 4) increasing incentives for participating in the study (e.g., prizes).

The number of fisherman reporting successful fishing trips in 2019 was 26, which is higher than the average of 22 fisherman between 2007 and 2015, and higher than the 16 fisherman reporting success in 2015. Interestingly, the highest numbers of fisherman reporting success in 2019 were in the April to June period despite the highest numbers of fish being caught in the winter months by a small group of fisherman.

Three fish species were reported as being caught in 2019: Arctic Char, Lake Trout and Lake Whitefish. The most common fish species captured, Lake Whitefish, represented 58% of the total catch in 2019, which was higher than the average of 34% between 2007 and 2015. In interviews, some fisherman indicated that Lake Whitefish numbers in Baker Lake were particularly high in 2019.

Fishing trips, regardless of success rate, did not generally occur beyond the immediate areas of Baker Lake, Whitehills Lake, and along the AWAR. 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 in close proximity to the Hamlet of Baker Lake.

In 2019, fishing periods with the most active fisherman was from April to June. The periods with the most fish caught included the winter months (especially January), which reflects the high number of Lake Whitefish caught with nets below the ice, and spring (i.e., May and June), when Arctic Char and Lake Trout catches are the highest. This trend is reflected in the overall trend between 2007 and 2015.

The 2019 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 2019 (Section 10.7 of Appendix 52).

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 incident to report in 2019.

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.*

Agnico submitted the TEMP Version 7 in June 2019 (Appendix 58). This new version includes revision 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 site, as condition from Project Certificate no. 004 and 008. TEMP Version 8 will be submitted in 2020 within 60 days of issuance of the amended Project Certificate No.008. Update will comply with commitments made during the Expansion Project NIRB Review Process

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 no. 004 and no. 008, the 2019 Wildlife Monitoring Summary Report represents the 14th of a series of annual Wildlife Monitoring Summary Reports for the Agnico Eagle Mines Ltd. Meadowbank Division. Below is a summary of the program for 2019. The complete report presenting the whole program and complete analysis of the result is presented in Appendix 52. Baseline and monitoring programs were first initiated in 1999 and will continue throughout the life of the mine. Details of the wildlife monitoring program for the project are provided in the Terrestrial Ecosystem Management Plan (Version 7, 2019). The 2019 report provides the objectives, methodology, historical and current year results, and management recommendations for each monitoring program. The 2019 Wildlife Monitoring Summary Report builds on data presented in previous reports and incorporates monitoring recommendations from these reports. Below is a summary of the major activities in 2019 with more details provided in following sections.

The Government of Nunavut's Caribou (*Rangifer tarandus*) collaring program, ongoing for the past 12 years in the Baker Lake area, continued in 2019 with monitoring of existing collared animals. Seasonal Caribou movements within and adjacent to the Meadowbank Regional Study Area (RSA) were tracked and mapped throughout the year. Collared Caribou were present throughout the year but particularly during spring (i.e., April and May), late summer (i.e., August), and fall (i.e., October) migration. No additional collars were deployed on Baker Lake animals in 2019 but by the end of the year, 31 collars from three deployments remained active.

A Hunter Harvest Study (HHS) conducted from 2007 to 2015 was relaunched in 2019. The study included more than 60 participants of which 42 reported harvesting Caribou. Given an estimated 300 to 350 active hunters in the Hamlet of Baker Lake, the HHS represents from 12 to 14% of hunters in the community. With a total reported Caribou harvest of 647, the total Caribou harvest in Baker Lake is estimated to range from 4,621 to 5,392 Caribou. This estimate is likely high because the current study attracted some of the more successful hunters (e.g., Baker Lake Hunters and Trappers Organization members) in the community.

Six active Peregrine Falcon (*Falco peregrinus*) nests were observed and monitored at quarry sites along the AWAR in 2019, with successful nesting confirmed at one nest. Raptor nests were also monitored along the Whale Tail Haul Road and in the vicinity of the Whale Tail Pit in 2019 with occupancy levels similar to 2017 survey results. Raptor nest management plans were not required at any of the active nest sites along the Meadowbank All-Weather Access Road, the Whale Tail Haul Road, or the Whale Tail Pit area since no project-related effects on raptor nesting success were observed and mine-related activities were restricted around sites.

Numerous road closures were implemented on all project roads, particularly in April and May, to ensure safe passage to large groups of migrating Caribou herds. No Caribou fatalities occurred because of

* TSM- Biodiversity and Conservation Management

activities at the mine or along project roads. With the Authorization of the GN officer, one Wolverine (*Gulo gulo*) needed to be euthanized after attempts to deter the animal were unsuccessful.

Appendix C of the TEMP, Section 2.2.2 of the Wildlife Protection and Response Plan describes the mitigation measures in place for prevention of the wildlife attraction. The mitigation measures are related to food wastes and garbage, chemicals (e.g., road salt) and their refuse (e.g., empty fuel containers, wildlife carcasses (e.g., road kills, hunter kills), movement and human activity (e.g., movement of people and equipment outdoors) and roads (which may create preferential travel corridors for wildlife, can lead to vehicle collisions and increased exposure to wildlife encounters at the Project site). Agnico routinely reassesses its measures in relation to prevention and consistently maintains awareness by conducting toolbox meetings to all departments on site. By maintaining awareness on such topics as mentioned in Appendix C of the TEMP (wildlife attractant, garbage management, wildlife health, and wildlife and vehicle, wildlife and buildings, reporting wildlife observations and incidents, protocols for dealing with problem wildlife), Agnico is confident measures in place will ensure to limit potential impacts.

8.18.1.2 *Harvest Study Results*

As required by NIRB Project Certificate No.004 Condition 54

a. Updated terrestrial ecosystem baseline data

See “2019 Wildlife Monitoring Summary Report” attached in Appendix 52.

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. The study approach was similar to previous years but suggestions and guidance received during the consultation period were incorporated into the study.

Refer to Creel Survey Section 8.16 above for the 2019 methodology employed and improvement.

The hunter harvest study included 66 participants by the end of 2019. Of these, Caribou hunting data had been collected from 42 participants, which is considerably higher than the 28 participants that reported Caribou harvests in 2015, and higher than the average of 35 successful hunters between 2007 and 2015.

Based on 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 (NWMB 2005) in which 336 Baker Lake hunters were contacted and interviewed. Recent discussions with Baker Lake HTO members 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 42 hunters reporting Caribou harvest in 2019 conservatively represent from 12 to 14 % of total hunters in the community.

Hunting is concentrated in the Baker Lake area, along the road to approximately KM 85, along the Thelon River system in the vicinity of Schultz and Aberdeen lakes, and on the southwest shore 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 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 RSA. The HHS data (2007 to 2015) fluctuated between 34 and 54% of reported harvest within 5 km of the AWAR, and between 73 and 85% within the RSA. The 2019 HHS data indicated that 34% of reported harvest occurred within 5 km of the AWAR, and 64% occurred within the RSA, representing the lowest proportion of Caribou harvested within 5 km of the AWAR since the road was built. One of the reasons for this may have been because of the large number of Caribou harvested in the vicinity of Baker Lake in fall 2019. As was the case in other years, threshold levels of 20% set for monitoring the effects of the Meadowbank mine development on the distribution of Caribou harvest were not exceeded.

In 2019, a total of 647 Caribou were reported as being harvested by 42 participants. Given that the 42 hunters represent an estimated 12 to 14% of the Baker Lake hunting community, assuming that the average number of Caribou shot per hunter is similar, the total estimated number of Caribou harvested in 2019 ranges from 4,621 to 5,392 animals. This estimate is considered to be conservative (i.e., high) since the Baker Lake Hunter Harvest Study targeted known hunters in the community with some known to be particularly successful.

Based on the NWMB (2005) and HHS results (2007 to 2015; 2019), 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, the majority of Caribou hunting occurs in the vicinity of Baker Lake and along the Thelon River system. Although large numbers of Caribou were moving across the northern part of the AWAR and the Whale Tail Haul Road in April, few Caribou were hunted in this area. During the summer, Caribou were harvested across a much larger area but particularly along the AWAR and in areas along Baker Lake accessible by boat. In the fall, hunting was much more concentrated along the AWAR and in the Baker Lake area. The large numbers harvested just north of Baker Lake in the fall reflects the large herd of Caribou that moved through the area in October 2019. In winter, very few Caribou were hunted along the AWAR, primarily because few Caribou were present. Successful hunters were those that travelled further afield by snowmobile (e.g., Schultz Lake area and southwest end of Baker Lake).

Reported harvests for Muskox remained low, precluding any interpretation of potential mine-related effects; however, most harvests were well away from the AWAR and relatively close to Baker Lake. Most Wolverines were hunted close to Baker Lake and regularly visited areas such as participant's cabins and the Prince River bridge suggesting that they are hunted opportunistically. Wolves were either trapped close to Baker Lake or hunted in larger numbers west of Schultz Lake and north of Aberdeen Lake in winter. Relatively low densities of Wolves and their general aversion to humans requires hunters to hunt well away from the AWAR. The presence of the AWAR is thought to have little effect on participant hunting patterns for Muskox, Wolverine and Wolf.

Arctic Fox was primarily trapped in the vicinity of Baker Lake while one Grizzly Bear was taken near Aberdeen Lake. Duck, goose and swan egg collections were reported in greater numbers in 2019 with primary collection areas being Schultz Lake and the southwest shore of Baker Lake.

The 2019 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 2019 (Section 10.7 of the Appendix 52).

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 Project 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 and 2019 at the Whale Tail site. Please refer to the complete report 2019 Migratory Bird Protection Report found in Appendix M of the 2019 Wildlife Monitoring Report (Appendix 52) and Section 8.18.5 below.

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.

Details of the breeding bird plot surveys are provided in Section 15 of the 2019 Wildlife Monitoring Summary Report (Appendix 52). The breeding bird plot monitoring program is to continue every year during the construction period, for at least the first three full years of mine operation (2010 to 2012) in accordance with the TEMP dated 2006. The most recent PRISM plot survey was conducted in at Meadowbank Site in 2015. The frequency for Whale Tail will be based on the TEMP Version 7 and further discussions with ECCC on synergies with research programs in data collection for plot surveys are ongoing. For 2020, it was agreed that a review and analysis of previous surveys would be completed to enable further discussions on the path forward on future surveys.

The objective of the breeding bird plot monitoring program is to confirm that a mine-related change of 20% function, determined by an increase or decrease in local breeding bird abundance, richness, and diversity, has not occurred. The program uses the widely accepted Canadian Wildlife Service's (CWS) PRISM protocols. A secondary objective of the monitoring program is to determine more effective ways to prevent disturbance to nesting birds based on feedback from mitigation measures and observations.

For the breeding bird PRISM plots, data analysis in 2015 showed that most bird community indices were variable with little difference in overall trends between mine and control plots. Thresholds had not been exceeded and no additional management or mitigation considerations were necessary.

In 2019, the Canadian Wildlife Service requested a detailed analysis of all PRISM and bird transect data to date and a comprehensive report outlining protocols and analytical results. If no effects are evident, bird monitoring can be shifted to: 1) PRISM plots randomly selected by CWS staff; and 2) a Breeding Bird Survey (BBS) as per standard BBS protocols. Agnico Eagle is planning on conducting the analysis and submitting the report in 2020.

For the breeding bird transects, Meadowbank 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.

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.***

Caribou telemetry data and maps are provided in Section 6 of the 2019 Wildlife Monitoring Summary Report (Appendix 52).

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 continues to collaborate with the GN DoE in a Caribou satellite-collaring program that includes data collected within the Meadowbank and Whale Tail RSAs, as per the Memorandum of Understanding (2017) with government partners. The GN biologists discuss collar deployments with hunters and Elders and get approval prior to proceeding. Discussions are ongoing between Agnico, GN, and other partners on the best path forward to ensure Caribou migration maps continue to integrate Elders and local HTO input. Detailed results can be found in Section 6 of the 2019 Wildlife Monitoring Summary Report (Appendix 52). Refer to this report for a complete discussion of the results.

Information pertaining to the identification and location of various herds that use the Meadowbank and Whale Tail RSAs at different times of the year are important components of ongoing monitoring and management efforts at the mine site and along project roads.

The satellite-collaring program was developed to provide information on the distribution of Caribou occurring within the Meadowbank and Whale Tail RSAs and contribute data to ongoing satellite-collaring programs for the Ahiak, Qamanirjuaq, and other herds. 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).

To determine whether Caribou approaching the mine and roads are being disturbed (e.g., if their movement is deflected to avoid the project), a comprehensive analysis of satellite collaring data since 2008 was undertaken by the GN and Agnico Eagle, led by the GN.

At the beginning of the 2019 monitoring year, 35 of the Baker Lake collared Caribou were still active, including three (3) from the 2015 deployment, four (4) from the 2016 deployment, and 28 from the April 2018. By the end of 2019, 31 collars were active, comprised of three (3) from the 2015 deployment, four (4) from the 2016 deployment, and 24 from the 2018 deployment. A summary of 2019 locations and movement patterns for Caribou collared around Baker Lake by season is described in Section 6.6 and Figure 6.1 of the 2019 Wildlife Monitoring Summary report (Appendix 52). Seasonal movements of collared Caribou in close proximity to the Meadowbank RSA and LSA in 2019 are shown in Figure 6.2 of the 2019 Wildlife Monitoring Summary (Appendix 52).

Movements for Qamanirjuaq herd collared animals, a program also supported by Agnico, and animals collared by the Government of the Northwest Territories are provided for context in the 2019 Wildlife Summary Report (Appendix 45). At the beginning of 2019, 40 collars were active (i.e., 11 from the 2016 deployment, 8 from 2016, and 21 from 2017). In late April 2019, an additional 35 animals from the Qamanirjuaq herd were fitted with collars. By the end of 2019, 55 of the Qamanirjuaq collars were active (i.e., 6 from the 2016 deployment, 17 from 2017, and 32 from 2019). Seasonal movements of all collared Caribou are discussed is Section 6 of Appendix 52.

Please refer to the complete report presenting a complete analysis of the result.

8.18.1.5 *Remote Cameras*

The use of remote cameras was first introduced in October 2018 as another technique to monitor Caribou interactions (e.g., behavior) with project roads equipment or other industrial features (e.g., roadside marker flags). The approach is one of several monitoring techniques to ensure that the best Caribou management practices and mitigation are implemented for the project.

The primary objective of using remote cameras is to monitor Caribou behavioral interactions with project roads and equipment, and adapt management practices and mitigation as required.

Remote cameras can be used and set to be triggered based on motion/heat and/or on a time series to view video footage of Caribou interaction with project infrastructure such as roads and equipment. In November 2019, a detailed remote camera protocol was developed by Golder (2019) (see Appendix I of the 2019 Wildlife Monitoring Summary Report – Appendix 52). Results from the 2018 remote camera program have been summarized in a Technical Memorandum by Golder and is included in Appendix J of the 2019 Wildlife Monitoring Summary Report – Appendix 52. Results from the 2019 remote camera program are not yet available.

8.18.1.6 *Blasting Measurement*

The blast measurement study is to collect preliminary data per discussion with the TAG in 2018 and 2019.

The initial goal of this program is to measure noise and vibration from explosive blasts conducted under both summertime and wintertime conditions. Once sufficiently large number of measurement have been collected, measurement data will be use to establish site-specific relationships between noise/vibration levels and:

- Blasting parameters (e.g. charge mass, burden depth)
- Environmental conditions (e.g. air temperature, wind direction)
- Propagation distances

This information will be further used for analysis of caribou behaviour response to explosive blasts in future studies.

The memorandum 'Whale Tail Pit – Blasting Measurements from August, September and December 2019' provides in Appendix 53 provides a summary of the first year of the blasting measurement program.

In 2019, it was possible to collect blasting measurements at four locations. Because one of the primary goal is to establish a relationship between blasting noise/vibration levels and propagation distances, measurement were collected at four different distances from Whale Tail Pit. Please refer to the completed memorandum provided in Appendix 53 for a complete discussion of the results.

8.18.1.7 *Work Stop 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, particularly in April and May, to ensure safe passage to large groups of migrating Caribou herds. No Caribou fatalities occurred because of activities along project roads. Section 3.6.6 of the 2019 Wildlife Summary Report (Appendix 52) detailed and discussed the 2019 road closure. Below is a summary of the results.

Road-related mitigation related to Caribou presence in 2019 resulted in a high number of road closures and a corresponding reduction in total vehicle movements. In some seasons with high numbers of Caribou, road closures were increased to a daily basis or vehicle movements were severely restricted (e.g., light vehicles only, daily ride and convoy, etc.). In many cases, the daily ride (e.g., crew changes, food deliveries, etc.) or an occasional convoy were escorted by Environment staff in collaboration with the Baker Lake HTO wildlife monitor, which had the training to decide whether vehicles could continue along the road when Caribou were sighted. When necessary, Environment staff stopped convoys to let Caribou pass and, in at least one case, vehicles were turned back after encountering Caribou. In some cases, lower speed limits were set.

Traffic on the Meadowbank AWAR was restricted for 27 days during the spring Caribou season and 15 days during the fall Caribou season for a total of 42 days. No road closures were required due to the presence of Muskox herds.

Traffic on the Vault Haul Road was restricted for eight (8) days during the Spring Caribou Season.

Significant movements of Caribou from approximately mid-April to late-May 2019, mid- to late August, and early to mid-October along the Whale Tail Haul Road resulted in multiple closures. Traffic on the Whale Tail Haul Road was restricted for 34 days during the Spring Caribou Season, 11 days during the Summer Caribou Season, and 15 days during the Fall Caribou Season for a total of 60 days.

Use of the decision tree and trigger approach was used on multiple occasions in 2019 (Section 9 of the 2019 Wildlife Monitoring Summary Report – Appendix 52). In many cases where groups of Caribou were observed close to the road, closures or restrictions were implemented.

The number and frequency of road surveys in 2019 demonstrate Agnico’s commitment to avoiding impacts to Caribou from the AWAR, Vault Haul Road, and Whale Tail Haul Road. Mitigation measures such as reduced speeds and multiple road closures appear to be minimizing road-related effects including mortality and restricted caribou passage. Incidental sightings in 2019 and the road survey data showed that Caribou crossed roads during April and May, and July through November, which was supported by collar data.

8.18.1.8 *Raptor Nest Survey*

Refer to Section 13 of the 2019 Wildlife Monitoring Summary Report (Appendix 52) for a complete discussion of the methodology and results.

The raptor nest survey monitoring program has been designed to confirm that mine-related activities do not result in inadvertent negative effects on nesting raptors. Raptor surveys along the proposed AWAR alignment in 2005 (i.e., prior to construction) indicated that only low suitability habitat for nesting raptors was available. During AWAR construction in 2007/2008, excavated and blasted rock materials were extracted from numerous quarries along the alignment, resulting in some moderate and high suitability raptor nesting habitat areas characterized by steep rock walls. Established Peregrine Falcon nests within some of these quarries are monitored on an annual basis to evaluate occupancy.

In the Whale Tail Pit and Haul Road study area, researchers from the University of Alberta identified 56 occupied raptor nests during surveys in 2015, 2016, 2017 and 2019 (see Appendix L for 2019 Wildlife Monitoring Summary Report (Appendix 52)). The most common nesting species was Peregrine Falcon, followed by Gyrfalcon (*Falco rusticolus*) and Rough-legged Hawk. Nests of Common Raven (*Corvus corax*) were also identified during the raptor nest surveys. Most occupied nests (43) were located north of the Whale Tail Pit study area, while the remainder (13) were along the Whale Tail Haul Road. None of the occupied nests will be disturbed by proposed development activities, but four nests (i.e., 1 Peregrine Falcon; 3 Roughlegged Hawk), are located in the Whale Tail LSA.

Surveys from 2011 through 2019 continued this work, focusing particularly on quarries along the AWAR. Sporadic surveys in specific areas (i.e., Portage, Goose, and Vault pits, fuel tank storage) were also conducted when raptors were observed during mine site environmental inspections or employees reported any sightings. Visual checks of active falcon nest sites were conducted during regular ground reconnaissance surveys along the AWAR. Non-disruptive monitoring techniques, which included monitoring nests from a vehicle within the quarry or from the AWAR, ensured that active nests were not approached by Agnico Eagle personnel. Using these techniques, environmental personnel were able to monitor nest success throughout the summer season. Nest monitoring was not completed along the Vault Road since neither quarries nor potential raptor habitat are present. Any observed raptor activity in this area is documented through regular mine site inspection and road surveys. At Meadowbank Site and AWAR, in 2019, six active Peregrine Falcon nests were documented in Quarries 3, 9, 16, 18, 21 and 22, with only the nest at Quarry 9 recorded for the first time. No falcon activity was observed at previous nest sites at Quarry 2 (2018), Quarry 7 (2017), Quarry 8 (2017), Quarry 17 (2017), Quarry 19 (2018), Portage Pit (2013), and Goose Pit (2016). In addition to the six active nest sites documented in 2019, falcon activity was observed at four additional quarry sites (i.e., Quarries 2, 7, 8, and 15) and one pit (Vault) during the monitoring program. Cumulative information on Peregrine Falcon nests from 2009 to 2019 is summarized in in Table 13.1 and Figure 13.1 of the 2019 Wildlife Monitoring Summary Report (Appendix 52).

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. Observations made throughout the nesting season on raptor activity and nesting success are detailed in Table 13.2 of the 2019 Wildlife Monitoring Summary Report (Appendix 52). Nesting success was confirmed through the presence of aggressive adults, eggs, or chicks at the six active nesting sites along the AWAR in 2019. Specific raptor nest management plans were not warranted at any of the active nest sites, as mine-related activity was restricted within the quarries

Additional observations of raptor activity around the mine site are included in Appendix E of the 2019 Wildlife Summary Report, which lists all incidental sightings, and in Table 4.2, which summarizes incidental sightings by month. The first Peregrine Falcon of the season along the AWAR was observed at Quarry 16 on 09 May and individuals or pairs were seen regularly until September. The first Rough-legged Hawk of the year was observed on 14 May and many other individuals were observed through to October. Bald Eagles were occasionally recorded between July and September, and one Snowy Owl was observed along the Vault Haul Road on 09 October. Bald Eagle, Peregrine Falcon, and Rough-legged Hawk were observed during AWAR surveys.

A dedicated raptor nest survey (i.e., search for new nests) was in 2019 at the Whale Tail site (see Appendix L of the 2019 Wildlife Monitoring Summary Report (Appendix 52)), but raptor activity and potential nest locations were also noted on other surveys including road surveys, HOL surveys, freshet monitoring, and on-site environmental monitoring. A dedicated and thorough raptor nest survey is also planned for the Meadowbank and Whale Tail mine sites, and all access roads in 2020. Of note is that the small number of nests monitored annually do not allow for the statistical power to determine whether potential nest failures are mine-related.

For Whale Tail Site, Active raptor nests were monitored within the Whale Tail Pit and Haul Road LSA in June 2019; however, no nests were disturbed by project activities. For the four nest sites within 1.5 km of project facilities, management recommendations were provided (Appendix L). Except for Rough-legged Hawks, occupancy rates were the same as in 2017 (i.e., 23 of 41 known Peregrine Falcon nests occupied; 2 of 4 known Gyrfalcon nests occupied). For Rough-legged Hawks, occupancy rates declined from 16 of 21 known nests in 2017 to 7 of 21 in 2019. Raptor species recorded along the Whale Tail Haul Road between May and September, included Bald Eagle, Peregrine Falcon, Rough-legged Hawk, and Snowy Owl (see Appendix E). One Short-eared Owl was seen on 03 September along the Whale Tail Haul road near the Amaruq site.

The 2019 raptor monitoring data were compared to the impact prediction thresholds to evaluate adherence to impact predictions and provision of adaptive management, as either a necessary or proactive measure. No thresholds were surpassed in 2019.

8.18.1.9 *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 or deterrence of raptor at both the Meadowbank and Whale Tail sites in 2019.

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. For example, at Quarry 22, no remediation of contaminated soils is conducted when falcons are present in the quarry. In addition, to minimize direct disturbance to nesting birds and as per Alistair Franke recommendations, intensive monitoring, which would require approaching nests by foot, is not conducted. Agnico Eagle is also careful not to broadcast locations of nesting birds to avoid inadvertent disturbance by curious mine employees

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, 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 collect additional data on caribou group sizes in proximity to the Project, and shall work with the Terrestrial Advisory Group to refine appropriate caribou group size thresholds that trigger additional mitigation. Initially, the group size thresholds should be set at 110 (fall), 25 (winter and summer), and 12 (spring). The Proponent shall ensure modifications to the group size thresholds are incorporated into the Terrestrial Ecosystem Management Plan 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 2019

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 project. It provides technical oversight on the Project'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 Climate Change Canada. 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 2019 are summarized in Table 8-118 below. These meetings consist of formal 2-day meetings to discuss current topics, and other meetings are as simple as a conference call to discuss documents such as proposals, reports, or other items.

Table 8-118 TAG meeting held in 2019

Date	Type of meeting	Parties attending
January 2019	In-person (Winnipeg)	KivIA, GN
Tentative: February 2019	Site visit and recap of January meeting	Meeting not held. Haven't heard back from HTO on date to meet.
July 2019	Conference call	KivIA, GN, HTO
September 2019	Conference call	KivIA, GN
November 2019	In-person (Winnipeg)	KivIA, GN, HTO, NTI

Discussions held in 2019 were fruitful and led to numerous resolutions on files/brainstorming sessions. To facilitate discussions during meetings or conference calls, where possible, Agnico Eagle provided 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.

The next TAG meeting is planned for June 2020.

8.18.2.1.2 Summary of outcomes

The next section describes the main outcomes arising from TAG meetings and conference calls held in 2019 by topic.

8.18.2.1.2.1 Caribou Crossing Analysis

To support a commitment made during the Whale Tail Expansion Project NRB review process a caribou-Haul Road interaction analysis using baseline data was completed. The analysis was provided to TAG members for review and recommendations. As a result, the report was revised on three occasions to provide additional information and include additional sections of the Haul Road that will be further investigated for additional road design mitigation.

8.18.2.1.2.2 Convoys

Following questions by members, Agnico Eagle presented its convoy program during migration. Convoys are mainly to transport fuel, crew, food, explosive material and equipment between Meadowbank and Whale Tail. As the number of road closure extends, the need to carry equipment and people increases as the two sites were designed and built to be working alongside each other. They are not independent.

Additional discussions were held regarding a long-haul truck pilot program. However, Agnico Eagle committed to provide more details to the TAG prior to implementing such program.

8.18.2.1.2.3 GST and Caribou Protection Measures

Following construction and approval of the Whale Tail Pit Approved Project, following the precautionary principle, more stringent monitoring and mitigations measures were incorporated into the TEMP to ensure caribou protection. As a result, the Whale Tail Haul Road was closed for 60 days in 2019. As a note, the Approved project was designed, assessed and approved based on a maximum of 28 road-closure days annually for weather and caribou migration. This resulted in substantial loss of gold production potential and is inconsistent with the approved Project. At the November 2019 TAG meeting, Agnico Eagle initiated discussions to present this challenge and to brainstorm on alternate solutions to monitor and mitigate potential effects of the Project while at the same time ensuring caribou protection. Agnico Eagle also completed additional analysis to assess the effects of the road on caribou at the population level and is completing a study on parturition rate for caribou that interacted with the road and those who did not. Following release of these reports, additional discussions will be held with TAG members in 2020 to collaboratively work on adaptively managing caribou protection measures.

8.18.2.1.2.4 Snow Study

As part of the Whale Tail Expansion Project NIRB Review process, Agnico Eagle committed to develop and implement a three-year snow monitoring program that measures snow conditions related to removal of Haul Road snow. A proposed program was presented in November 2019 and following comments received from TAG members, the program has been greatly modified to incorporate input. This program is planned to commence in Spring 2020.

8.18.2.1.2.5 Drone and Satellite Pilot Projects

Agnico Eagle has been looking at different technologies, including drones and use of satellite imagery to improve monitoring, ensure efficient mitigation and assess effects of the Project on caribou. Following a drone public demonstration held in Baker Lake in August 2019, Agnico Eagle proposed a drone and satellite pilot project to TAG members during a conference call. Feedbacks received were incorporated into the design of the program. The pilot test was initially planned for the Fall 2019 migration but could not be implemented due to timeline in receiving permits. It is now planned for Spring 2020.

8.18.2.1.2.6 Height-of-Land surveys:

Since 2018, several discussions revolved around caribou detection within and around the mine site and along the Whale Tail Haul Road. A commitment was made by Agnico Eagle during the Expansion Project to work with the TAG to increase the frequency and efficacy of road monitoring to implement mitigation. The objective was to identify appropriate Road survey sites and increase the frequency of Road surveys to cover a greater proportion of each day.

In 2018 and 2019, as part of the caribou monitoring component for the Whale Tail Haul Road, five height of land survey locations were used in areas where caribou have been observed. Caribou monitoring was achieved through roadside surveys while driving along the Haul Road and informally stopping where necessary for a better vantage point, and through HOL surveys. However, although originally perceived to offer the best vantage points for caribou monitoring during migration periods, the HOL locations had some constraints (i.e. small sample size, length of time to access and health and safety risks).

An alternative roadside survey design, developed in collaboration with TAG members was proposed to replace the HOL based surveys. At the November 2019 TAG meeting, all parties agreed to replace the Height-Of-Land survey program with the Roadside survey program.

8.18.2.1.2.7 Methodology for Recording of Observations:

Recommendations were made by members on the need for detailed records of caribou encounters around the Project and how this was translated into mitigation if necessary. Feedback were incorporated and caribou observations are now incorporating this information.

8.18.2.1.2.8 Project-Tolerant Caribou:

In August 2019, Agnico Eagle used the definition of Project-Tolerant caribou included within the TEMP to re-open the Whale Tail Haul Road after a number of days of road closures. Following discussions at the November 2019 TAG meeting, additional data collection was recommended by members to document better caribou behavior after road re-opening. Recommendations were noted and will be implemented in the future.

8.18.2.1.2.9 Incorporation of Outcomes into the TEMP

The TEMP is currently being revised to incorporate these outcomes. As per revised Terms and Conditions of NIRB Project Certificate No.008, version 8 will be submitted to TAG members and NIRB by April 19, 2020, which is within 60 days following issuance of the revised Project Certificate.

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 re-slopped the Whale Tail Haul Road (WTHR) at KM 127 to facilitate the wildlife passage in this area. BLHTO came back once the re-slopping was finalized and didn't not express any other concern.

Within the TAG meetings, permeability and road design discussions are ongoing and will meet satisfaction of all parties. Different projects are also ongoing and are being discussed at the TAG, including monitoring movement of caribou with cameras, a pilot drone study and satellite imagery. All of the above project will be highly useful into the determination of the preferred wildlife passage and behavior on the field.

As part of the Whale Tail expansion project, Agnico 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 submitted to NIRB and TAG member a memo to fulfill this commitment. Following this submission, only the KivIA provided comments. Agnico Eagle submitted a revised version in August 2019 and only received comments from KivIA since submission. Agnico Eagle presented the updated report to the TAG on November 26th, 2019 for final approval. The following step will be to organize a site visit with TAG member to refine further required changes along the Whale Tail Haul Road (and based on sections identified in the report provided). The site visit is tentatively planned for Q2 2020, depending on the ability to properly assess the road sections in relation with snow accumulations. Following this, a Construction Plan, will be provided to TAG members and the NIRB.

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 3.6.8 of the 2019 Wildlife Summary Report (Appendix 52) describe road-related wildlife mortality along the Whale Tail Haul road in 2019. In 2019, three (3) mortalities (Ptarmigan, Sik sik and artic fox) were reported. Wildlife compensation to KivIA were required for the artic fox mortality. Similar information regarding Meadowbank site can also be found in Section 3.6.8 of the 2019 Wildlife Summary Report.

- On November 4th, 2019, the road dispatch advised the environmental department that one driver saw a dead fox on the Whale Tail Haul Road around Km 135. Environmental technician went on the road to locate the fox. The carcass was not located and no blood was observed. Agnico presume that a scavenger took it off. As the dead fox was not located, the real cause of the dead cannot be confirmed but it was assumed that it could be a collision with a truck or other vehicle.

Section 4.5.6 of the 2019 Wildlife Summary Report (Appendix 52) provide a summary of recorded wildlife fatalities near or within the mine site in 2019. The below is summary of the of the project related mortality that occurred at Whale Tail Site in 2019. Similar information regarding Meadowbank site can also be found in Section 4.5.6 of the 2019 Wildlife Summary Report.

- On February 22nd, a wolverine was dispatched following receipt of a GN Wildlife Destruction Authorization Form at Whale Tail. As per the IIBA Schedule J, Item 6, a compensation was sent to KivIA. The complete report regarding this incident can be found in Appendix D of the 2019 Wildlife Summary Report (Appendix 52).
- On August 27th, Agnico notified DFO of incident related to stickleback being impacted by a pumping infrastructure located at the Whale Tail Pit operation. The complete report regarding this incident can be found in Appendix D of the 2019 Wildlife Summary Report (Appendix 52).

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 developed the Migratory Bird Protection plan as an appendix of the TEMP. As recommended by ECCC, Agnico has updated that plan for 2020 based on results of research studies to date. The updated Migratory Bird Protection Plan (V3, March, 2020) is provided as Appendix 64.

The 2019 Migratory Bird Protection report is provided as Appendix M of the 2019 Wildlife Summary Report (Appendix 52), and summarized below.

The Whale Tail Lake (South Basin) diversion was initiated through construction of the Whale Tail Dike. Flooded tributary lakes include Lake A18, Lake A19, Lake A20, Lake A21, Lake A22, Lake A55, Lake A62, Lake A63, Lake A65, Pond A-P1, and Pond A-P53. In-water construction of the Whale Tail Dike was completed September 2018, and dewatering of the North Basin of Whale Tail Lake to advance flooding began in March, 2019. The rise in water levels from baseline (~152.5 masl) to 156.00 masl of this area began in 2019 and will be complete in 2020, causing approximately 157 ha of terrestrial flooding.

The Northeast diversion consists of construction of the Northeast dike to divert Lake A46 and tributary lakes through Lake C44 in the Lake C38 (Nemo Lake) watershed. Flooded tributary lakes include Lake A47, Lake A48, Lake A113, Pond A-P38, and Pond A-P68. The main construction activities for the Northeast dike were carried out from September 2018 to February 2019. Flooding of this area began in spring 2019, and the estimated total flooded terrestrial area is 18 ha at peak water levels (156.6 masl).

Flooding of these two areas has the potential for incidental disturbance and destruction of migratory birds and their nests. As per Nunavut Impact Review Board (NIRB) Project Certificate No.008 Condition 34, the Migratory Birds Protection Plan (the Plan) describes how these impacts will be mitigated through use of visual and audio bird deterrents, and regular sweeps by personnel to discourage nesting. Mitigation was planned to be focused between 2018 and 2020, or until water levels reach their maximum flood plain.

Mitigation measures to reduce impacts of flooding on migratory bird nesting at the Whale Tail site were implemented in 2019 according to the Migratory Bird Protection Plan (July, 2018). Through collaboration with Trent University and ECCC, research studies were simultaneously initiated in 2018 and continued in 2019 to determine the effectiveness of these mitigation measures (audio and visual deterrents). This was the second of three study years, so preliminary results are available for some study objectives.

For the Whale Tail South flood zone, mitigation measures consisted of visual and audio bird deterrents deployed at four locations within the flood zone, covering a total of 24 ha. Regular sweeps of these areas plus an additional 24 ha within the flood zone were conducted by a team of four research personnel every four days during between June 16th and July 14th, for a total of 148 hours of sweeps within the flood zone during the 2019 nesting season.

No deterrents were deployed within the Northeast flood zone, since water levels were already near their maximum predicted elevation (156.6 masl) at the beginning of the nesting season (156.3 masl on June 14th, 2019).

Research studies continued in 2019 to assess the effectiveness of the audio and visual deterrents in mitigating impacts of flooding on nesting migratory birds. Nest surveys and assessments of behavioural responses were carried out between June 5th and July 14th at reference study sites along the Whale Tail Haul Road (without flooding, with and without deterrents), as well as at both flood-zone and upland sites throughout the Whale Tail South area.

Full results will be provided upon study completion, following the final 2020 field season. However, results to date demonstrate that deterrents were not effective at deterring birds from nesting. In addition, deployment and maintenance of the deterrents was extremely time consuming. As a result, the study authors do not recommend the ongoing use of the tested deterrents for mitigating nest loss due to disturbance such as flooding in this region. This approach is supported by the relatively minor increase in water levels expected to occur in 2020 (compared to 2019).

FEIS (2015/2016) and supplemental baseline surveys (2018) estimated that 50 – 98 nest sites occurred within the flood zones and would thus be impacted by flooding (28 – 56 nests/km^2). However, significant flooding in both areas occurred prior to the nesting season in 2019. As a result, birds would not have tried to nest in the already flooded area and direct loss of active nests due to flooding would have been less than predicted (e.g. in 2019, estimated direct losses were 4 nests/km^2). Indirect impacts of flooding on the nesting success of displaced birds is unknown. Studies to be conducted in 2020 will attempt to determine whether birds displaced by flooding are successfully nesting in new shoreline territories or adjacent areas.

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.***

Species of concern include those species identified by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as being At Risk or Threatened, and may be impacted by the Project. As per the Whale Tail FEIS, species of concern for the Project are detailed in Table 8-119 below.

Table 8-119 Species of Concern Meadowbank and Whale Tail Study Areas

Species	COSEWIC Status	SARA Status	Effects Pathways
Barren-ground caribou	Threatened	No schedule	• mortality due to vehicle collisions • habitat loss • change in harvest due to improved access • barriers to movement and changes in behaviour
Grizzly bear	Special Concern	No schedule	• habitat loss • mortality due to attraction or vehicle collisions
Polar Bear	Special Concern	Schedule 1	• None anticipated
Wolverine	Special Concern	No schedule	• habitat loss • mortality due to attraction or vehicle collisions
Short-eared Owl	Special Concern	Schedule 1	• habitat loss
Peregrine Falcon	Special Concern	Schedule 1	• physical hazards to nests on mine infrastructure or in quarries
Red-Necked Phalarope	Special Concern	No schedule	• habitat loss

Agnico will ensure that the mitigation and monitoring strategies developed for Species at Risk Act (SARA) 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. Updates to the SARA 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.

The primary objective of the invasive plant survey was to assess and monitor the potential introduction of non-native plant species in areas where colonization was most likely (e.g., disturbed areas). The non-native plant information collected provides an understanding of the presence or spread of nonnative plant species and informs on the efficacy of current cleaning and protection measures on site as per the TEMP. The results may serve as a basis for the development of a non-native plant management plan (if needed).

Surveys at the Meadowbank Complex were conducted by a Golder Ecologist between August 9th to 16th 2019 and focused on 14 non-native vascular plant species (see Appendix N of the 2019 Wildlife Monitoring Summary Report – Appendix 52). Due to the large extent of the Meadowbank Complex area, non-native plant surveys were executed as targeted surveys focused within high-priority or potential areas. High-potential areas were surveyed, including highly trafficked areas (e.g., fuel station, wastewater discharge area, areas surrounding buildings, shipping containers, and the dump). Due to time constraints, the AWAR was surveyed from the Meadowbank Mine site to KM 70 only at slow speed, while observing for weed infestations along road margins. Periodic stops were undertaken to complete meanders in areas with high potential (i.e., pullouts, work areas, etc.). Observers looked for obvious signs of non-native plant occurrences such as showy inflorescence, fruiting structures, and other key characteristics that distinguished non-native species from endemic plant species.

When non-native or invasive plant species were encountered, the following information was recorded: site ID; surveyor name; GPS coordinates; photos of the occurrence / infestation; species name; estimated area of infestation; estimated number of plants (e.g., <10, 10 to 100, 100 to 1,000, >1,000) of each species; estimated cover of bare ground; growth stage (i.e., seedling, in bud, seed set, expired); recommended action for each species; and record of any hand pulling completed.

A total of 107 locations were surveyed. No non-native plants (i.e., in Canada) were recorded along the Whale Tail Haul Road and AWAR, and within the Whale Tail and Meadowbank Mine footprints; however, populations of Flixweed (*Descurainia sophia*) and Scentless Chamomile (*Matricaria perforata*), both non-endemic to the Arctic, were observed within the surveyed locations.

A single stem of Scentless Chamomile, a species of concern listed as Secondary Noxious and Noxious in the Canadian Weed Seeds Order (Seeds Act 2016) was observed near a building close to the water at the Meadowbank Mine site. The plant was hand pulled and disposed of safely by an Agnico Eagle employee on 15 August 2019.

Flixweed, an introduced agricultural weed (ABMI 2019) that is not native to Nunavut, was observed on the Meadowbank Mine site at a number of locations but particularly along the perimeter of the airstrip (e.g., southwest border; exceeding 1,000 individuals), and the southwest edge of the Meadowbank Mine site around the workshop and shipping container storage areas. Observed Flixweed populations have not encroached onto the tundra and all observations were limited to disturbed areas.

Refer to the complete report presented in Appendix N of the 2019 Wildlife Monitoring Summary Report (Appendix 52).

Furthermore to the study detailed above, Agnico had develop, in accordance with the TEMP, a protocol in 2019 to ensure that all equipment and bulk supplies must arrive to Project 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.*

In keeping with Agnico's Terrestrial Ecosystem Monitoring Plan and Nunavut Impact Review Board Project Certificate 004, Condition 67, a Wildlife Screening Level Risk Assessment (WSLRA) and Human Health Risk Assessment for the Consumption of Country Foods (HHRA) were completed in 2017 to evaluate risks to wildlife and human health from contaminant exposure during operation of the Meadowbank mine. As per the monitoring Wildlife Screening Level Risk assessment Plan (Appendix A of the TEMP (Appendix 58)) there was no monitoring regarding these programs in 2019. The WSLRA is completed every 3 years during mine operation so the next monitoring will be held on 2020 and will included Whale Tail Pit. The full 2017 WSLRA and HHRA reports are provided in Appendix G14 and G15 of the 2017 Annual Report, respectively, and summarized here for purpose information.

WSLRA and HHRA assessments were based on soil, water and plant tissue samples collected from onsite, near-site, AWAR, and reference sites in 2017. Methodology of the risk assessments follows the format of the pre-construction screening level risk assessments (2005), and initial assessments under operational conditions (2011). The WSLRA evaluated risk to wildlife (ungulates, small mammals, waterfowl and songbirds) from dietary ingestion of chemical contaminants. The HHRA evaluated risk to humans from consumption of country food items (caribou meat and organs; Canada goose meat). Both assessments used a hazard quotient approach. As per Condition 67, the 2014 and 2017 HHRA report incorporates recommendations from Health Canada's review of the 2011 assessment, as well as updates from the most recently published federal guidance document (Health Canada, 2012). Updated toxicity reference values and bio transfer ratios were used as available.

8.19.1 WSLRA

Here is a summary of the 2017 finding.

The general approach and methodology of this assessment are based on those presented in the risk assessment of baseline conditions (Azimuth, 2006), using samples of soil, water and plant tissue collected onsite, near-site, along the all-weather access road (AWAR) and at external reference locations. Exposure (estimated daily intake; EDI) was calculated from 95% UCLM concentrations in environmental media for each location, and toxicity reference values (TRVs) were developed from lowest-observed adverse effect levels (LOAELs) from the literature. TRVs were the same as those used in previous assessments.

HQ values were calculated as:

$$HQ = EDI / TRV$$

Where:

EDI = estimated daily intake (ug/kg body weight/day)

TRV = toxicity reference value (ug/kg body weight/day)

Risk was characterized as negligible when HQ ≤ 1.

Key findings were as follows:

- Risk to ungulates (caribou), small mammals (northern red-backed vole), and waterfowl (Canada geese) was found to be negligible (HQ < 1) for all contaminants of potential concerns (COPC) in all locations.
- Potentially unacceptable risks to songbirds from chromium (HQ>1) were identified for all locations, which is consistent with all previous assessments (baseline, 2011, 2014). HQ values exceeded 1 for onsite, near-site, AWAR, and external reference locations, indicating that risk from this COPC is not elevated as a result of mining activities. Chromium is naturally elevated in ultramafic rock, which is common in the region.
- All 90th centile concentrations of COPC in soil samples collected onsite were lower than values measured during the baseline (pre-construction) assessment except beryllium, for which a minor increase of 13% (0.5 to 0.57 mg/kg) was observed.

Overall the operation of the Meadowbank mine does not appear to be contributing excess risk to wildlife via dietary uptake of chemical contaminants.

8.19.2 HHRA

Here is a summary of the 2017 finding.

As recommended by Health Canada, a hazard quotient (HQ) approach was used to classify the risk associated with the consumption of country food items from onsite, near-site, AWAR, and external reference locations. Risk was classified as negligible for each contaminant of potential concern (COPC) if the calculated HQ value was ≤ 0.2 (Health Canada, 2012). For each COPC with an HQ value > 0.2, it was determined whether onsite, near-site or AWAR HQ values exceeded the corresponding external reference HQ value. In those cases, further investigation into the underlying data was performed to understand the potential for incremental risk due to mining activities over and above contributions from background materials.

Overall, calculated hazard quotients were the same as or lower than the previous assessment in 2014, which used identical methods, indicating that excess risk is not occurring as a result of accumulation of chemical contaminants due to mining.

Key findings were as follows.

Caribou Meat (Muscle)

- Negligible risk (HQ ≤ 0.2) is associated with the consumption of caribou muscle (meat) for most COPCs. For chromium, lead, thallium, and zinc, HQ values exceeded 0.2 for some consumption scenarios at all study areas, including the external reference site, which also occurred in previous assessments.
    - For zinc, the exceedance only occurred for heavy consumption by toddlers, and was the same (0.3) for all sites, indicating no incremental risk as a result of mining activities.
    - For chromium, lead, and thallium, onsite or AWAR HQs exceeded the corresponding external reference value under some consumption scenarios. However, the difference in HQ values between impacted and reference sites was not expected to be significant in any case, based on analyses of background variability for each COPC/food item combination. These results indicate that potential incremental risk as a result of mining activities is not distinguishable from background variation.

Caribou Kidney

- Negligible risk (HQ ≤ 0.2) is associated with the consumption of caribou kidney from all study locations for all COPCs except thallium. The HQ value for thallium was 0.3 for the onsite study area for heavy consumption by toddlers, and was 0.2 for the AWAR and external reference locations.
    - This difference is not expected to be significant, considering that HQ values marginally exceed 0.2 and tolerable daily intakes are typically considered to be within an order of magnitude of true values. As a result, incremental risk of the project associated with this COPC is not expected to be significant.

Caribou Liver

- Negligible risk (HQ ≤ 0.2) is associated with the consumption of caribou liver from onsite, AWAR, and external reference study areas for all COPCs except lead, which had HQs > 0.2 for all study areas, including the external reference site under some scenarios (maximum HQ of 0.6).
    - Although HQ values for lead were higher at onsite or AWAR locations compared to the reference site under some consumption scenarios, differences were marginal (0.1). This difference is not expected to be significant, considering that HQ values are low and tolerable daily intakes are typically considered to be within an order of magnitude of true

values. As a result, incremental risk of the project associated with this COPC is not expected to be significant.

Canada Goose Meat

- Negligible risk (HQ ≤ 0.2) is associated with the consumption of Canada goose meat from onsite, near-site, AWAR and external reference study areas for all COPCs except chromium, for which the HQ value for heavy consumption by toddlers was 0.3 for both onsite and reference areas indicating no incremental risk as a result of the project.

Combined Consumption

- The combined consumption analysis produced no additional scenarios under which adverse health effects may potentially occur.

Overall, this analysis indicated that mining activities do not appear to be contributing significant incremental risk from COPCs to consumers of country food items sourced in and around the Meadowbank area. This is consistent with the baseline assessment (2005) which concluded that based on projected concentrations of COPCs in environmental media (soil and water), risk to persons consuming country foods would not increase appreciably following mine development.

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 2019, an archaeological impact assessment was conducted at seven locations along the road between Baker Lake and Meadowbank Mine; six of these are quarry expansions, and one is a pad. The seven locations are:

- Quarry 19
- Quarry 17
- Quarry 11
- Pad KM 46
- Quarry 8
- Quarry 7
- Quarry 6

No archaeological sites were identified during the assessment conducted.

Agnico Eagle has submitted to the GN Cultural and Heritage department the 2019 Archaeological Site Status 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.***

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 8-120 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 does not have a snow gauge but rather a rain gauge. For this reason, snow precipitations are reported as mm of rain.

In 2019, temperatures and winds recorded were similar to annual trends observed from 2009-2018. The coldest temperature was -42.96°C and warmest 20.79°C. The maximum wind speed recorded in 2019 was 26.07 m/s. The maximum wind speed recorded between 2008-2017 was 29.22 m/s in 2015. Total precipitation in 2019 (334.54mm) was higher than previous year: 2018 (154.38 mm), 2017 (268.35 mm) and 2016 (299.45 mm). Figure 27, 28 and 29 below show, respectively, the temperature average, wind speed average and total precipitation data from 2009-2019.

Table 8-120 Meadowbank 2019 monthly climate data

Date	Temperature Average	Temperature Max	Temperature Min	Wind Speed Average	Wind Speed Max	Total Precipitation	Daily Average Precipitation	Max Precipitation
	°C	°C	°C	m/s	m/s	mm	mm	mm
January	-33.89	-18.7	-42.91	5.15	18.21	8.33	0.3	5.4
February	-33.09	-23.44	-42.96	4.9	17.31	3.53	0.18	0.6
March	-23.76	-7.38	-37.15	6.36	20.54	28.03	1.08	6.1
April	-17.73	-4.24	-31.48	4.82	16.78	3.05	0.15	1.7
May	-5.79	1.72	-25.61	6.4	17.97	12.1	0.58	4.4
June	6.44	20.79	-1.84	3.52	17.29	33.1	1.74	26.1
July	10.03	20.71	3.4	NA	NA	68.2	2.62	9.5
August	11.22	20.08	0.072	4.62	22.11	62.8	2.61	34.5
September	3.43	15.01	-5.31	7.36	26.07	68.15	4.01	13.7
October	-4.83	2.21	-15.86	4.81	19.64	31.8	2.28	11.9
November	-19.07	-4.81	-28.69	4.72	17.5	7.15	0.34	2.1
December	-26.33	-5.82	-38.03	5.04	21.46	8.3	0.36	2.7
Total	NA	NA	NA	NA	NA	334.54	NA	NA
Average	-11.11	1.34	-22.19	5.25	19.53	27.88	1.35	9.89

Figure 27 Meadowbank Site Temperature Average 2009-2019

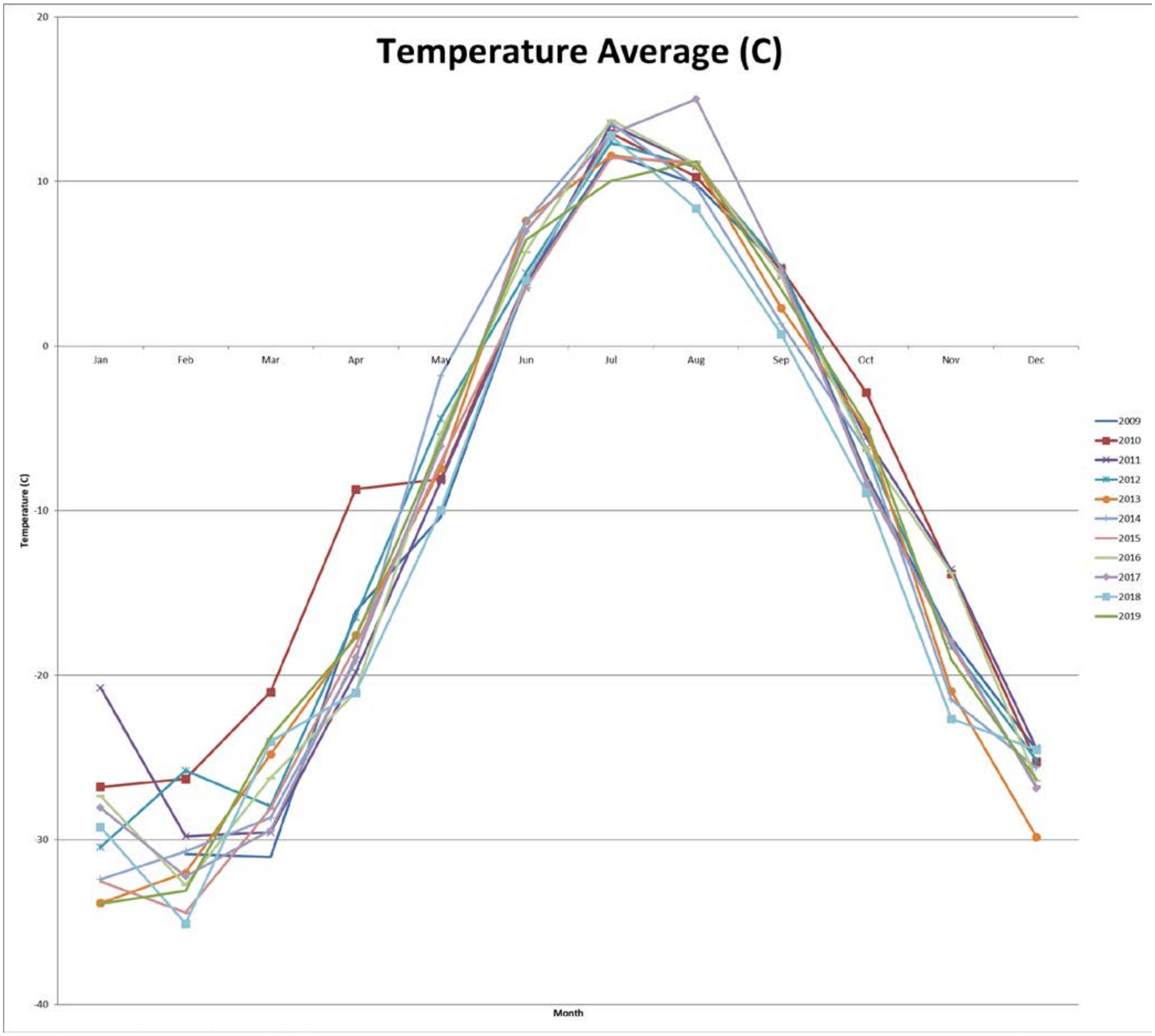


Figure 28 Meadowbank Site Wind Speed Average 2009-2019

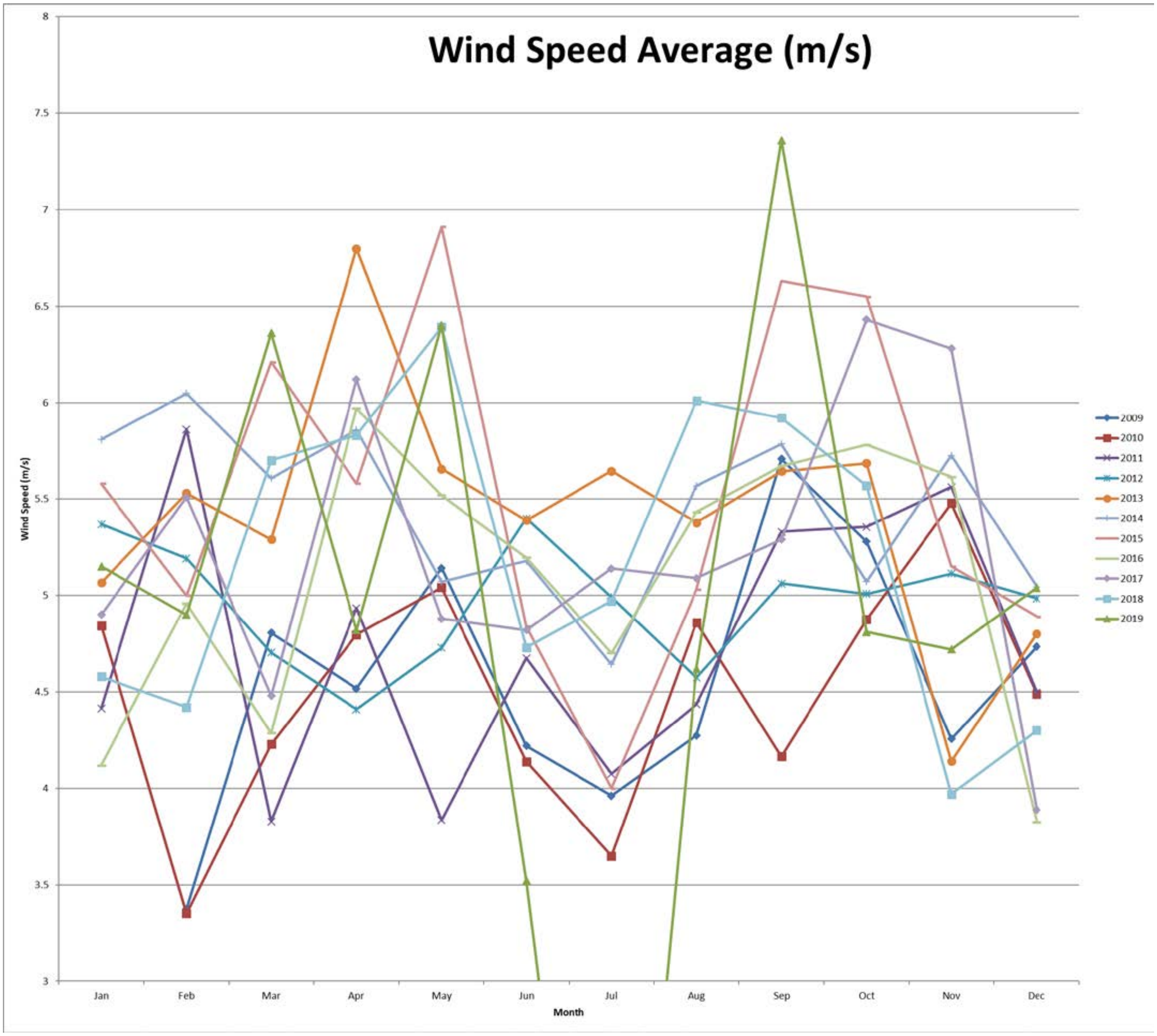
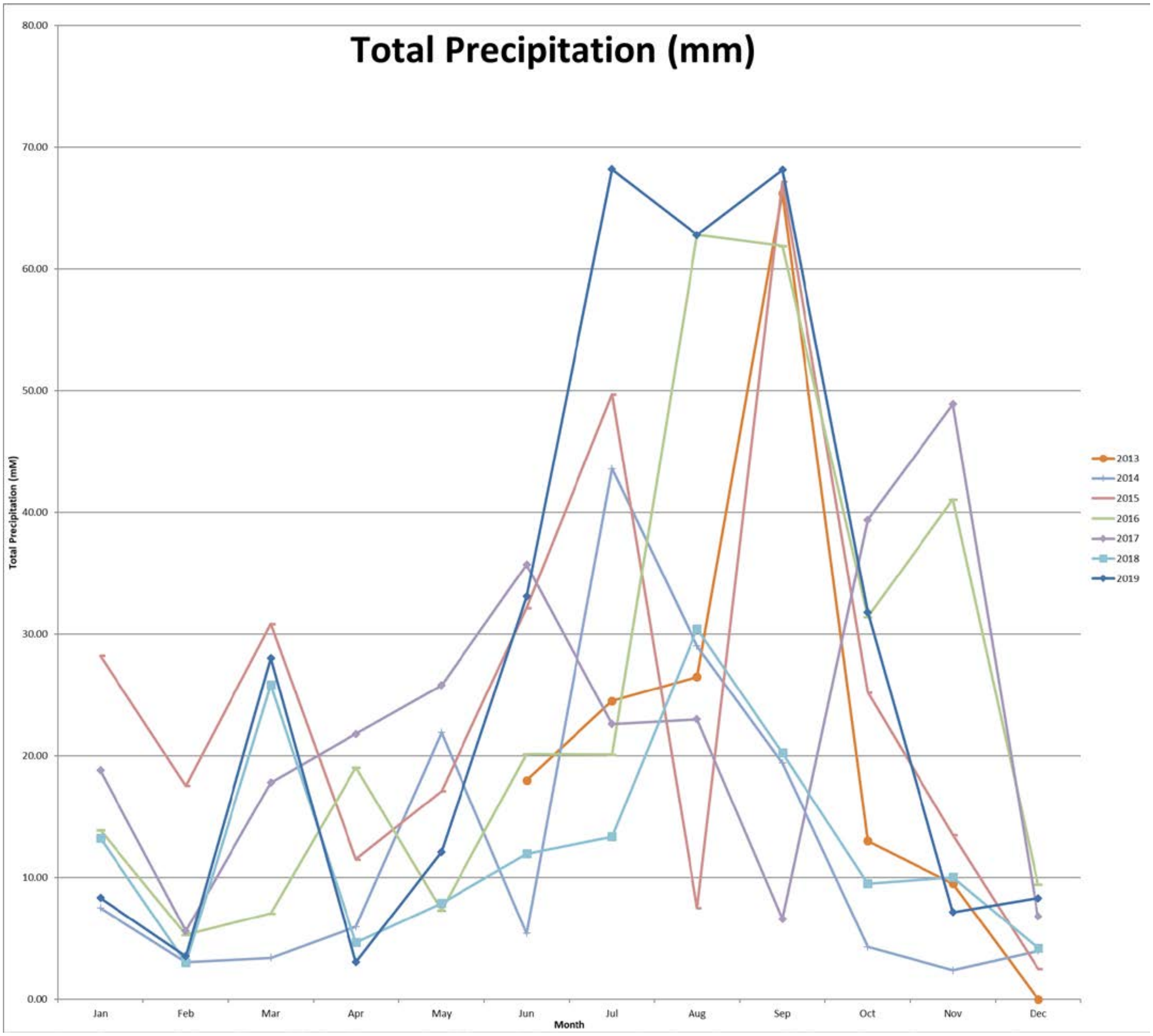


Figure 29 Meadowbank Site Total Precipitation 2013-2019



8.21.2 Whale Tail Site

The meteorological station at Whale Tail was in function for all of 2019. Table 8-121 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 does not have a snow gauge but rather a rain gauge. For this reason, snow precipitations are reported as mm of rain.

In 2019, temperatures and winds recorded were similar to the data obtained for Meadowbank Site and to historic data from Meadowbank and Baker Lake from 2009-2019. Figure 30, 31 and 32 below show, respectively, the temperature average, wind speed average from 2018-2019 and total precipitation data for 2019. The coldest temperature for Whale Tail in 2019 was -43.60 °C and warmest 22.03°C and is similar to data obtained for Meadowbank. The maximum wind speed recorded was in October 2019 with 25.93 m/s compared to 26.07 m/s for Meadowbank. Total precipitation at Whale Tail site (352.58 mm) were higher than Meadowbank in 2019 (334.54 mm). For both site, July was the month with the highest volume of precipitation (MBK – 68.20 mm and WT – 87.90 mm).

Table 8-121 Whale Tail 2019 monthly climate data

Date	Temperature Average	Temperature Max	Temperature Min	Wind Speed Average	Wind Speed Max	Total Precipitation	Daily Average Precipitation	Max Precipitation
	°C	°C	°C	m/s	m/s	mm	mm	mm
January	-34.78	-20.15	-43.25	6.05	19.66	NA	NA	NA
February	-33.61	-21.02	-43.60	5.58	19.05	NA	NA	NA
March	-24.24	-7.09	-37.58	7.28	22.64	NA	NA	NA
April	-17.77	-3.67	-30.9	5.5	17.31	NA	NA	NA
May	-6.94	3.19	-27.7	7.45	20.7	16.1	0.6	4.2
June	6.65	22.03	-2.53	5.3	17.91	50.7	1.69	21.2
July	10.39	21.52	2.33	5.97	19.85	87.9	4	21
August	11.14	21.75	-0.38	5.92	22.68	51.3	1.77	14.6
September	2.64	16.26	-6.36	7.45	25.73	75.2	2.79	14.4
October	-5.86	2.67	-18.55	6.51	25.93	36.28	1.58	10.5
November	-20.18	-5.17	-29.41	5.19	18.07	18.5	0.8	7.4
December	-27.3	-6.63	-39.55	5.76	23.4	16.6	0.83	4.2
Total	NA	NA	NA	NA	NA	352.58	NA	NA
Average	-11.66	1.97	-23.12	6.16	21.08	44.07	1.76	12.19

Figure 30 Whale Tail Site Temperature Average 2018-2019

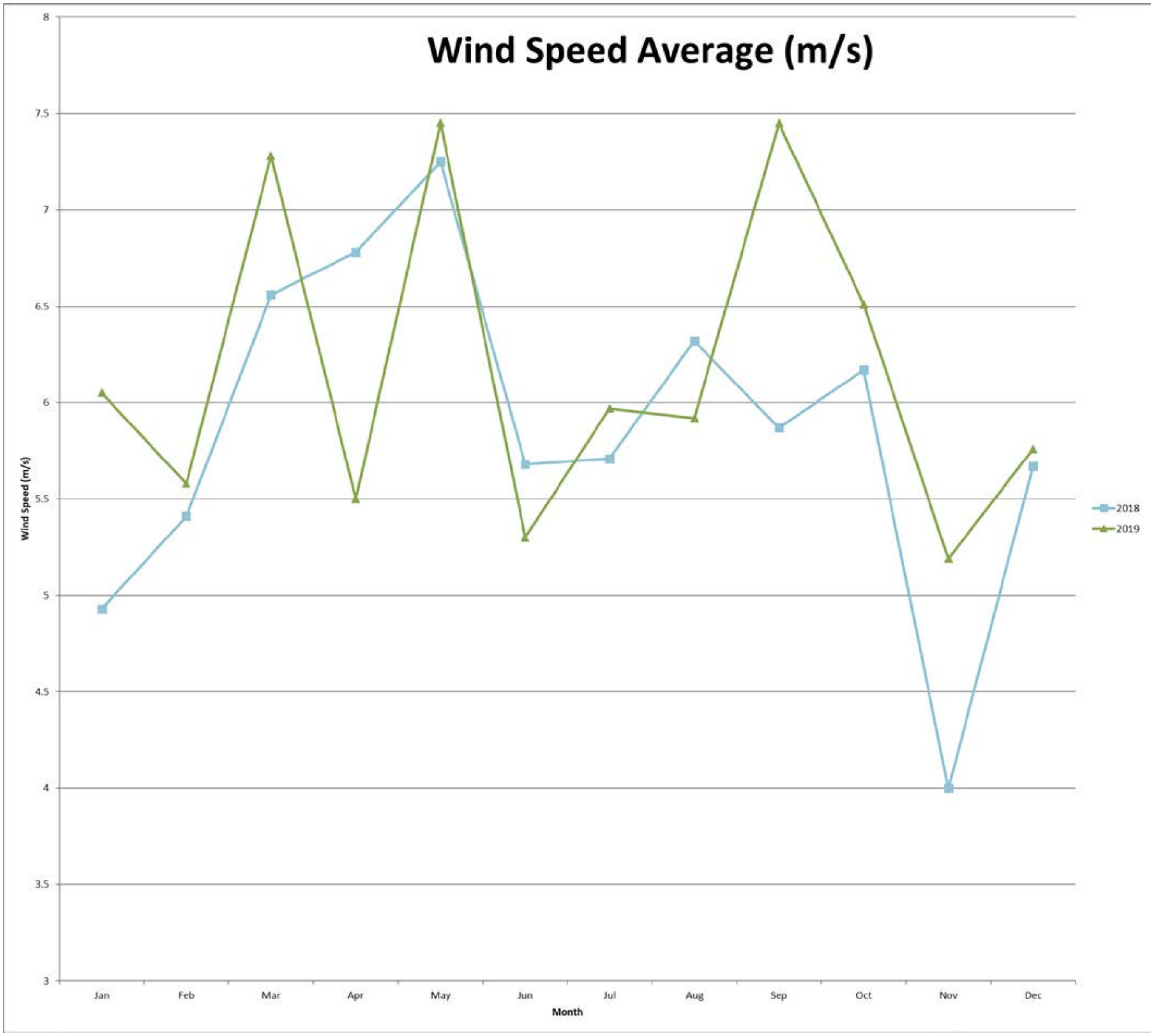


Figure 31 Whale Tail Site Wind Speed Average 2018-2019

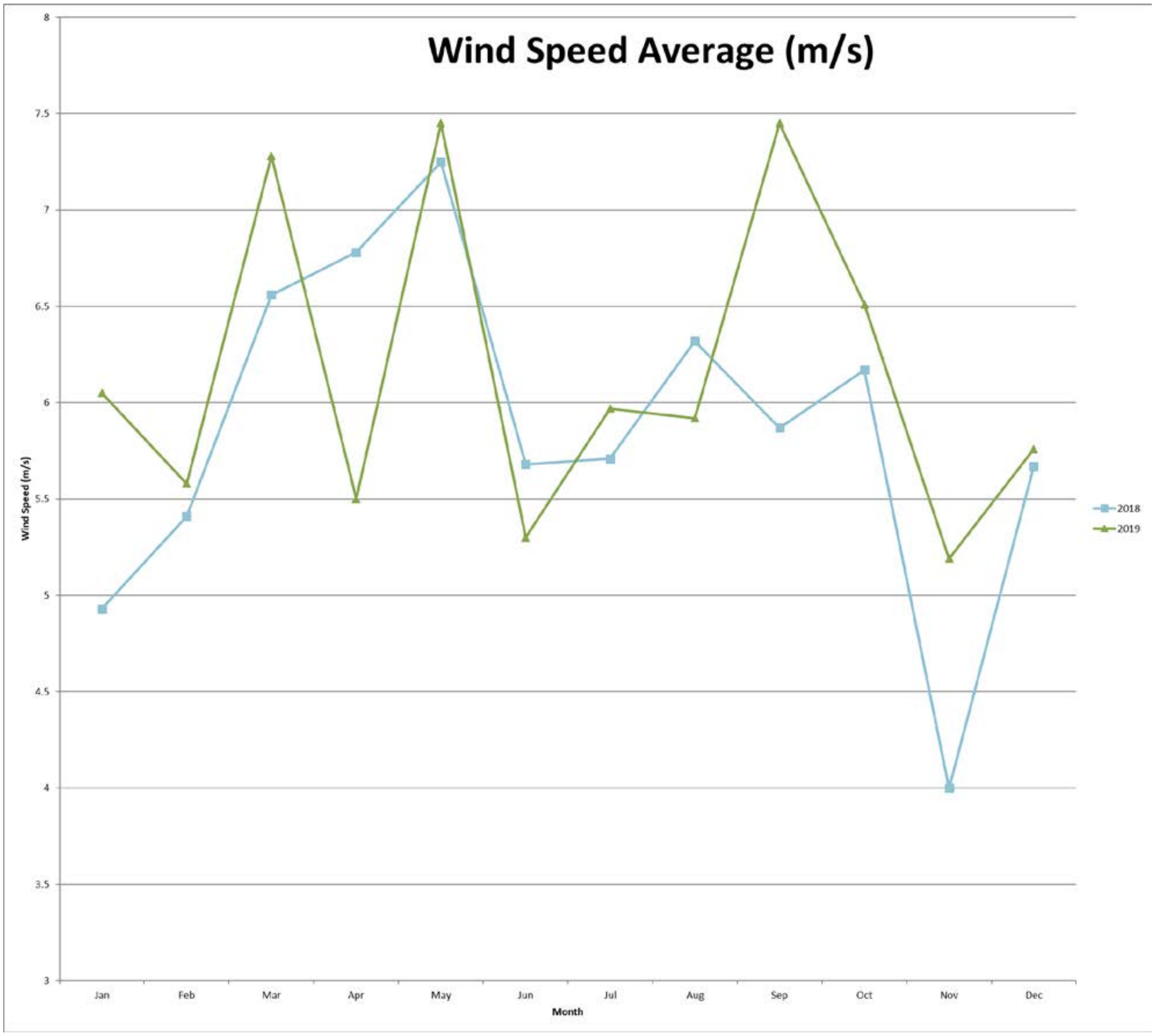
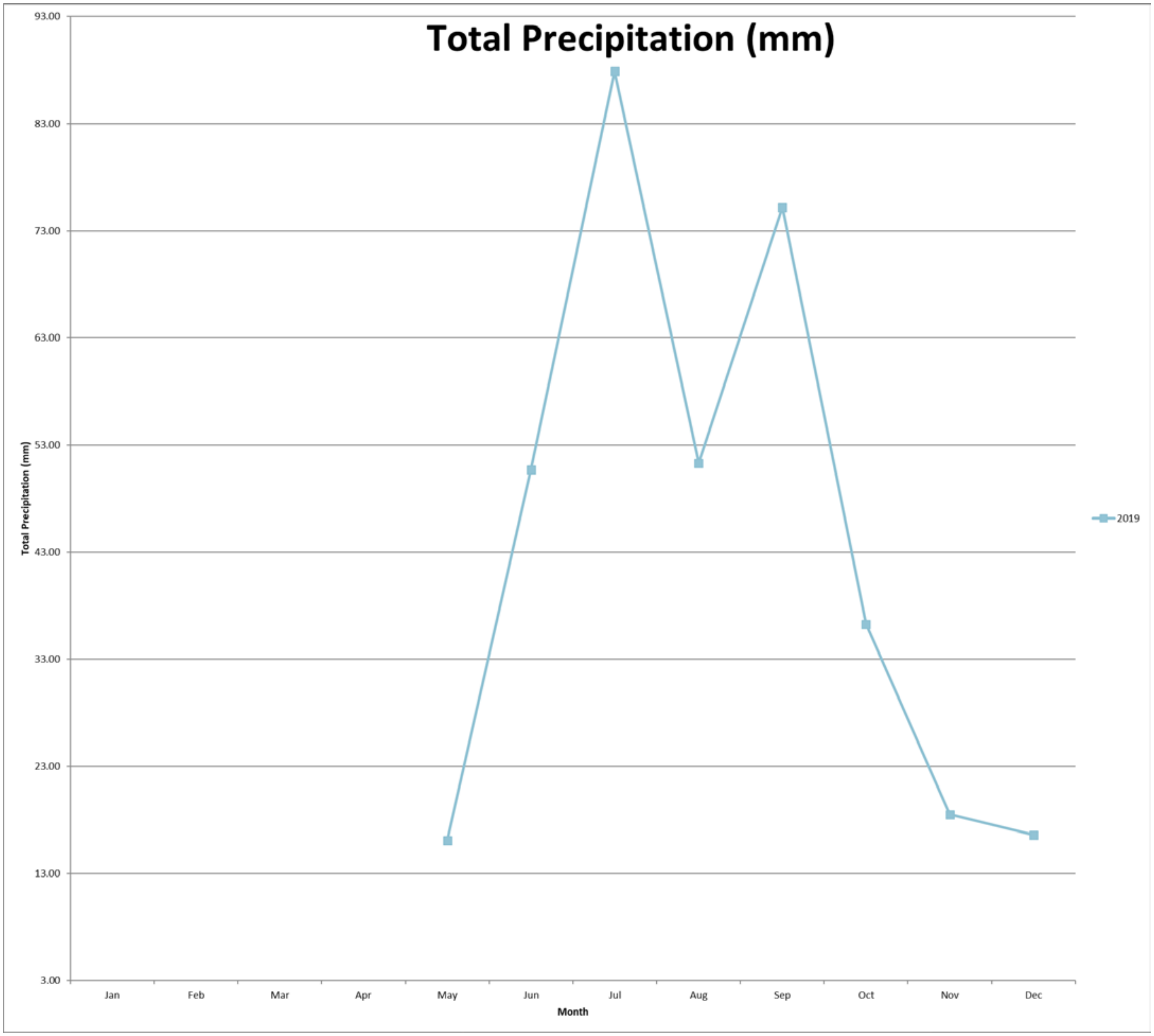


Figure 32 Whale Tail Site Precipitation 2019



Historic average is provided in Table 8-122 and Figures 33 to 35 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's difficult to compare the historic data to Whale Tail for precipitation as the data started to be collected only in May 2019. For the wind speed max, Baker Lake have higher wind speed than Meadowbank and Whale Tail, which are in the same range of values.

Table 8-122 Historic Meadowbank, Whale Tail and Baker Lake monthly climate data

Date	Meadowbank (average 2009-2019)			Whale Tail (average 2018-2019)			Baker Lake (average 2009-2019)		
	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	-29.53	19.25	15.01	-32.22	20.03	NA	-29.61	44.82	10.00
February	-31.19	18.38	6.34	-34.55	18.43	NA	-30.07	44.12	8.28
March	-26.78	19.67	18.83	-24.49	23.97	NA	-25.67	46.24	8.58
April	-17.71	19.53	11.00	-18.63	18.89	NA	-16.85	48.50	15.20
May	-6.78	18.62	15.35	-8.34	20.42	16.1	-5.99	40.27	15.25
June	5.23	17.80	22.35	5.35	19.65	50.7	5.55	40.85	21.33
July	12.40	17.41	34.58	11.93	19.05	87.9	12.10	38.20	27.76
August	10.86	18.02	34.58	9.49	21.15	51.3	10.85	44.81	34.90
September	3.58	21.53	44.25	1.39	22.02	75.2	4.08	48.83	53.44
October	-6.40	20.05	22.09	-7.76	23.69	36.28	-5.77	44.08	25.53
November	-17.96	20.06	18.93	-22.47	18.17	18.5	-17.69	46.16	28.40
December	-25.98	18.88	5.87	-26.23	22.03	16.6	-25.13	46.33	14.87

Figure 33 Historic Comparison Meadowbank, Whale Tail, Baker Lake Site Temperature Average 2009-2019

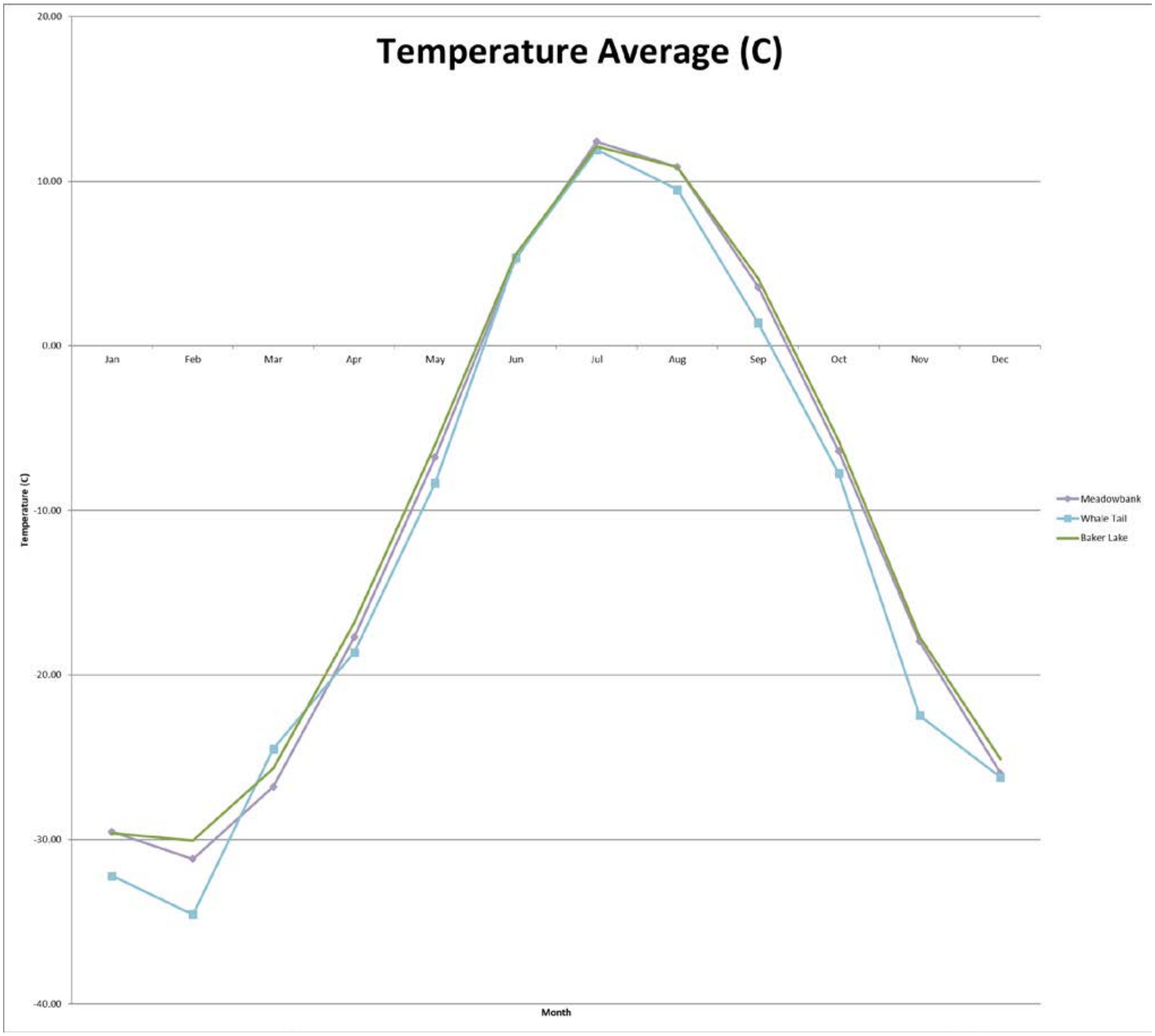


Figure 34 Historic Comparison Meadowbank, Whale Tail, Baker Lake Site Total Precipitation Average 2009-2019

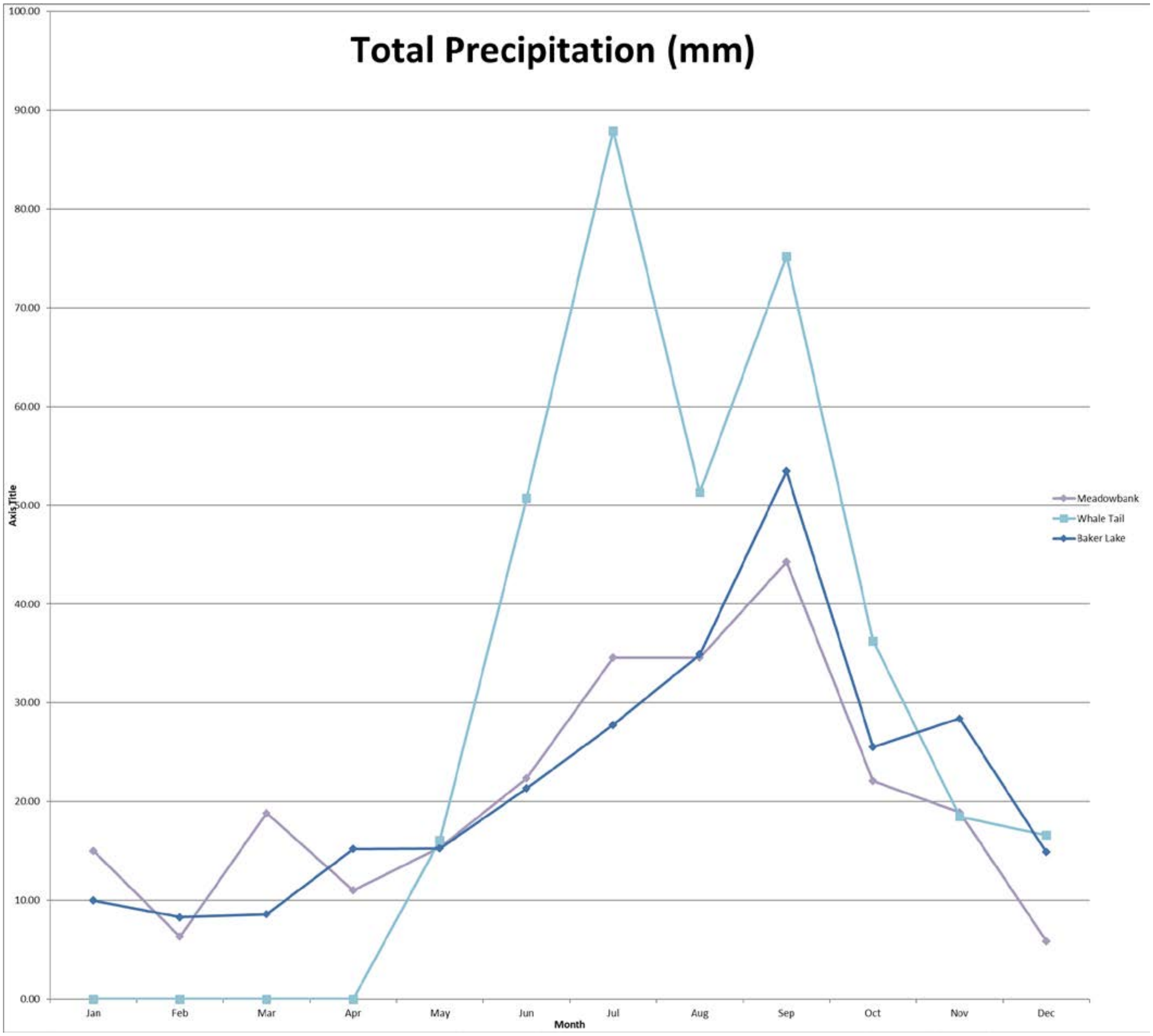
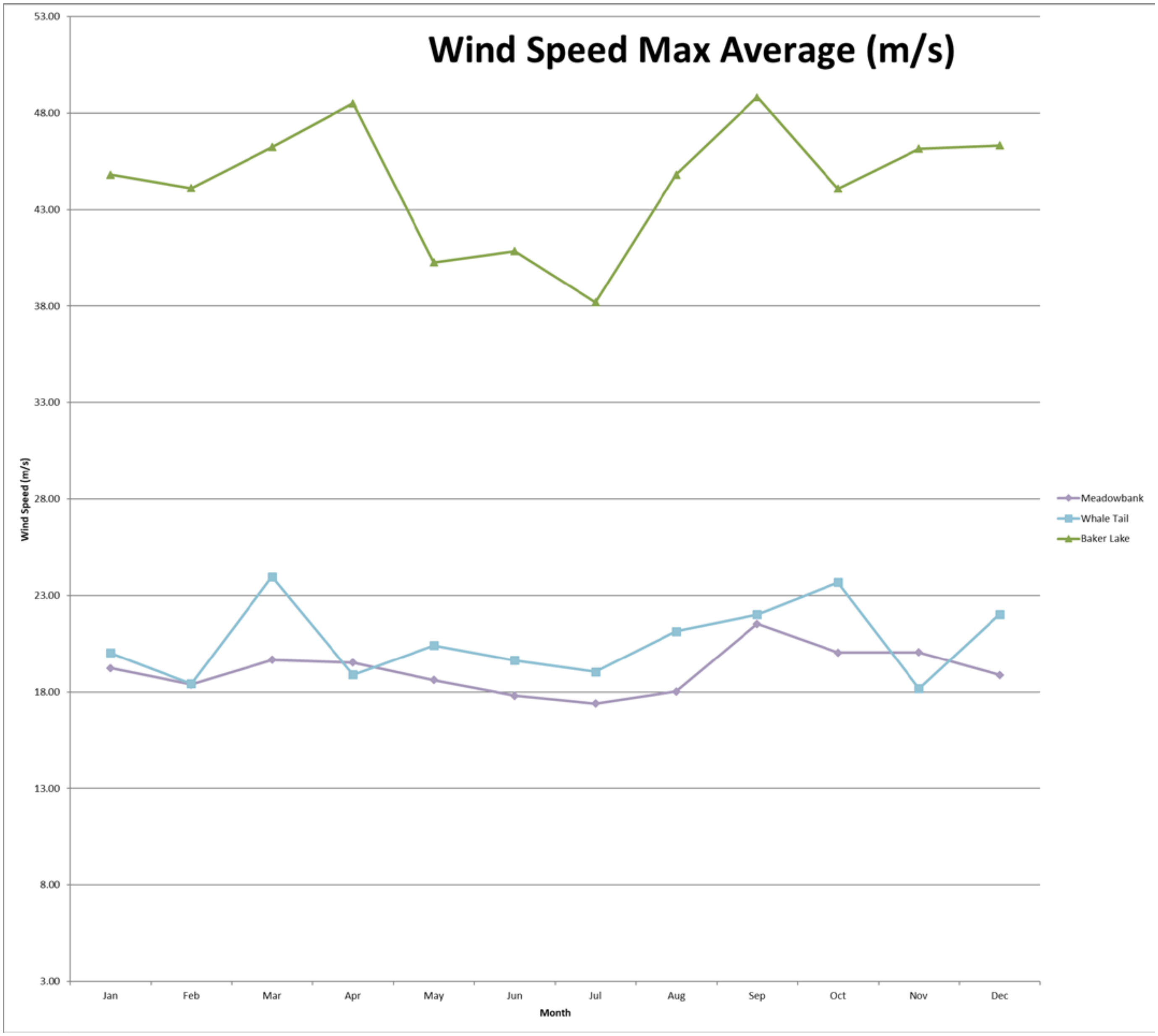


Figure 35 Historic Comparison Meadowbank, Whale Tail, Baker Lake Site Wind Speed Max Average 2009-2019



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-MEA1526 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 29, 2019 to CIRNAC on June 7, 2019 and on July 24, 2019 to the NWB. On October 21, NWB provided to Agnico the approval for this management plan. In March 2020, Agnico made a revision to the Meadowbank Interim Closure and Reclamation Plan – Update 2019 (Appendix 55) to address action items identified by the NWB and submitted it as part of the 2019 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 RSF;
- 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.

No progressive reclamation activities have been identified for the Baker Lake site facilities at this time, as the facilities will be required throughout the operation period and the active closure.

No progressive reclamation activities have been identified for the dikes and permanent structures at this time. Dewatering structures are required for operations in the open pits, for in-pit tailings deposition and also to maintain the pits isolated during the flooding period and prior to opening the dewatering dikes. The TSF structures are required during operations to contain the tailings and will remain in place in the long term.

Following the end of mining activities in Goose Pit in 2015, natural flooding started. No active pumping system is operating in Goose pit and part of the system has been decommissioned. From 2015 to the end of 2017, approximately 1,581,806 m^3 of water have flooded the Goose Pit. This volume includes natural flooding (run off water, seepage, groundwater) and also transfer from the downstream seepage of Central Dike. Natural flooding started also in Portage Pit following the end of the mining activities in October 2019.

In-pit tailings deposition started in Goose Pit in July 2019 and is planned to start in Portage Pit in 2020. Following in-pit tailings deposition in Goose Pit, the reclaim water will be transferred to Portage Pit and flooding will resumed with natural runoff and pumping of water from the Third Portage Lake in summer 2021 during operations.

The flooding of Vault and Phaser/BB Phaser pits with natural flooding and active pumping are planned at the end of their operation; flooding started in 2019 while the Mill is processing ore from Whale Tail Pit and in pit tailings deposition continues in Portage Pit.

Closure and reclamation of the Portage RSF occurred progressively during operations with the placement of the NPAG cover over the side slopes of the PAG RSF. Refer to Section 5.2.5.4 (Appendix 55) for cover design details. Approximately 84% of the Portage PAG RSF has been covered as of the end of 2017. Some work on the NPAG cover for the Portage PAG RSF was also completed in 2018 and 2019. The RSF is designed for long-term stability. Thus no additional re-grading or construction will be required for stability. It will not be possible to progressively reclaim the uppermost bench or the top surface of the Portage RSF as the demolition landfill is located on the RSF. This will be completed in closure. Open pit backfill with waste rock also occurred during operations at Goose and Portage pits, in the mined out sectors. Finally, the RSFs containing NPAG waste rock will be reclaimed in operation or in active closure for closure construction requirements.

Progressive reclamation by capping the tailings in the North Cell was undertaken in winter of 2015 following the completion of the tailings deposition. The construction continued in 2016 and 2017. Capping occurred in sections (perimeter areas) where the tailings were at elevation 149.5 m (design level). This consisted of capping with 2.0 m of NPAG material and represents 750,743 m^3 of placed material. Progressive closure in the North Cell continued in winter 2018 and 2019. During in-pit deposition, there is an opportunity to progressively close the South Cell TSF. This option will be further evaluated by Agnico Eagle based on the current site condition, the in-pit tailings deposition and operating considerations at that time. As part of the closure and reclamation planning, Agnico Eagle has undertaken a research program in collaboration with the RIME (Research Institute in Mine and Environment). The focus of this research program is the reclamation of the tailings storage and rock storage facilities. Test pads were constructed over the North Cell and instrumented to test various type of cover. Additional details are available in Appendix E (Appendix 55).

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. Water management facilities or equipment not used or deemed not necessary could be removed during operations. Some water management systems not required at Meadowbank can be moved at Whale Tail Pit 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 WTP was then demobilized to be installed at Whale Tail Pit.

Potential progressive reclamation activities for the buildings and equipment at Vault could occur during operation after the mining activities. Specific timeline for progressive reclamation at Vault during operation will be eventually defined. Efforts are also made to reduce inventories of consumables leading up to the end of operations.

The landfill 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 RSF during operation, but final closure of the demolition landfill will occur at the end of the active closure stage. The landfarm will be required in operations and active closure for soil decontamination. No specific progressive reclamation activities have been identified for the other waste disposal areas.

For more information regarding these activities, refer to the Interim Closure and Reclamation Plan – update 2019 (revision 1) found in Appendix 55.

9.1.1.2 *AWAR*

As required by CIRNAC Land Lease 66A/8-71-2, Condition 33: ***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.***

And

As required by KIA Right of Way KVRW06F04, Condition 26: ***File annually a progress report for the preceding year, outlining any ongoing restoration completed, in conformity with the Abandonment and Restoration plan*.**

No extensive progressive reclamation has been completed on the AWAR or associated quarries in 2019.

The quarries and granular borrow sites no longer required for operations will be progressively reclaimed during operation, as equipment and resources are available. Quarries and granular borrow sites are required for maintenance work on the AWAR. The AWAR is used in operation, but also in closure and post-closure. The road will be preserved as the main access to the site in a sufficient condition to allow post-closure access 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 during operation. Inactive quarries and borrow pits could be progressively reclaimed during operation, in order to promote natural drainage and minimize the duration of environmental exposure in the vicinity of the AWAR.

9.1.1.3 *Quarries*

As required by CIRNAC Land Lease 66A/8-72-5, 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.***

No restoration work was completed in 2019.

Before the construction of the landfarm facility at the mine site in 2012, contaminated soils from spills occurring on the AWAR were stored in Quarry 5 and 22 along the AWAR. In 2014, Agnico completed assessments in Quarry 5 and 22 to verify if the substrate where contaminated materials (with petroleum hydrocarbons (PHC"S)) were stored met CCME Remediation Criteria for Industrial use of Coarse Material. Quarry 5 was deemed remediated and details were provided in the 2014 Annual Report. Refer to Section 3.4.1.2 for more details regarding Quarry 22.

9.1.2 Whale Tail Site

9.1.2.1 *Mine Site*

As required by NWB Water License 2AM-WTP1826 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.***

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-WTP1826 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 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 submitted the Whale Tail Interim Closure and Reclamation Plan (ICRP) on June 2016. There was no progressive reclamation completed in 2019 as the site construction was ongoing and commercial production just started in September 2019. For details regarding the planned permanent and progressive reclamation, please refer to Section 5 and 6 of the Whale Tail ICRP.

No reclamation work undertaken at Whale Tail mine site in 2019.

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 undertaken at along the Whale Tail Haul Road in 2019.

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 restoration work was completed in 2019. Quarries/eskers may continued to be used in following year for construction project and road maintenance.

9.1.3 Exploration Activity Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part B, Item 6i: *A summary of drilling/trenching activities and progressive reclamation of drill/trench sites.*

And

As required by NWB Water License 2BB-MEA1828 Part B, Item 6k: *A description of all progressive and or final reclamation work undertaken, including photographic records of site conditions before, during and after completion of operations.*

No reclamation work undertaken regarding exploration infrastructure in 2019.

At a drill site, the drill and the equipment are placed in a restrained area and will normally use less than 0.01 hectare. Cuttings generated by drilling are disposed of at a distance of at least 31 meters from a water body where a direct flow to the water is not possible. When drilling on ice, the cuttings generated is also disposed of at a distance of at least 31 meters from a water body using pumps and sludge lines or using settling tanks and transport. Once drilling is completed, the casing is then removed or cut off at ground level.

9.2 RECLAMATION COSTS

9.2.1 MEADOWBANK SITE

9.2.1.1 *Project Estimate*

As required by NWB Water License 2AM-MEA1526 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 in this report and was prepared using RECLAIM Version 7.0, March 2014, for permanent closure of the Project.

Reclamation of the Meadowbank Gold Project facilities can be divided into the following three general stages , as presented in the integrated schedule of closure activities presented in Appendix P (Appendix 55):

- 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.

Agnico Eagle is required to submit a detailed financial security cost estimate for the Meadowbank ICRP - Update 2019 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 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).

This cost estimate provides for the closure measures described in detail in the Meadowbank ICRP – Update 2019. Most closure activities will occur within the active closure period, from 2022 to 2024. The schedule of closure activities presented in Appendix P outlines the major closure measures and their expected timeline.

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.

The updated 2019 estimated closure and reclamation costs for the Meadowbank Project represent a total of $89,427,746. This total includes $62,269,580 of direct costs and $ 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 (Appendix 55).

9.2.1.2 *AWAR and Quarries*

As required by CIRNAC Land Lease 66A/8-71-2, Condition 19: ***The lessee shall submit to the Minister every two years after the commencement date of this lease (January 2007), a report describing any variations from the Abandonment and Restoration Plan and updated cost estimates.***

And

As required by CIRNAC Land Lease 66A/8-72-5, 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 14: ***Submit to KIA every two years on each anniversary of the commencement date (February 2007), a report describing any variations from the Abandonment and Restoration Plan and updated cost estimates.***

No extensive progressive reclamation has been completed on the AWAR or associated quarries in 2019.

No modifications were made in the last updated interim closure plan from 2019 (Rev 1) compared to with the 2019 ICRP (Rev 1). The cost estimate for the reclamation of the AWAR and quarries cost estimated is C$993,078.

9.2.2 Whale Tail Site

9.2.2.1 *Project Estimate*

As required by NWB Water License 2AM-WTP1826 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 NWB Water License 2AM-WTP1826 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 Licence, 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).***

Agnico submitted the Whale Tail Interim Closure and Reclamation Plan on June 2016. A permanent closure and reclamation financial security cost estimate has been prepared to a conceptual level with the present Project layout and infrastructure (Appendix D of the ICRP 2016).

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 2016 estimated closure and reclamation costs for the Whale Tail Project represent a total of C$19,831,405. This total includes C$8,544,799 of direct costs and C$11,286,606 of indirect costs. The cost estimated will be updated as par of the ICRP update to be submitted within twelve (12) months following the commencement of Operation.

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$13,143,000 for a total of C$26,286,000.

As part of the Whale Tail Expansion Project permitting process, an updated ICRP will be submitted.

9.2.3 Exploration Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part B, Item 6h: ***An updated estimate of the current Meadowbank Advanced Exploration Project restoration and liability, as required under Part B, Item 2, based upon the results of the restoration research, project development monitoring, and any modifications to the site plan.***

Agnico submitted the Conceptual Closure and Reclamation Plan for Amaruq and Meadowbank Exploration Project on March 2016 and was not re-updated in 2019.

RECLAIM 7.0 was used in calculating the costs of reclamation and closure. The calculation of costs are conservative. It assumes no reliance on the Meadowbank Mine for services during closure, but does assume that the Meadowbank AWAR from the Meadowbank Mine to Baker Lake will remain available for use. Similarly, it is assumed that the exploration access road from Meadowbank to Amaruq will be used during reclamation and closure as it is scheduled to be completed in 2018. The exploration access road is under a separate Type B License and is therefore not included under the Amaruq Project reclamation and closure costs detailed below.

For RECLAIM purposes it is assumed that the total volume of waste rock to be reclaimed is 200,000 m^3, this representing the maximum volume stored on the operations pad following completion of the ramp. The quantity of ore, which is PAG, is a maximum of 8,000 m^3.

It is assumed that all the water in the storm water storage pond (4000 m^3) and in the quarry sump (1,000 m^3) will be pumped down the ramp after the portal cover is removed.

A summary of costs is provided in Tables 1 and 2 of the 2016 Conceptual Closure and Reclamation Plan for Amaruq and Meadowbank Exploration Project, respectively. Appendices A and B of the plan also provide more detail on the calculated closure costs for the two sites.

From the 2016 estimated, the cost estimate for the reclamation and closure of the Amaruq Exploration Site and amendment to include ramp, quarry and ancillary infrastructure is C$1,824,583. This total includes C$1,346,100 of direct costs and C$478,483 of indirect costs.

From the 2016 estimated, the cost estimate for the reclamation and closure of the Meadowbank Exploration Site is C$84,636. This total includes C$47,958 of direct costs and C$36,678 of indirect costs.

In 2019, Agnico have submitted to the NWB two amendments application to transfer some of the infrastructure/activities under the Whale Tail Water License 2AM-WTP1826 and to change the location of the Exploration Camp as discussed in Section 11.2.3.

RECLAIM 7.0 was updated in 2019. As of December 2019, it was under the CIRNAC and KivIA's approval.

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 include in the Whale Tail ICRP. As per the 2016 Whale Tail ICRP, active revegetation has not been planned at this time as part of the reclamation plan given the cold climate setting of the Project. Furthermore to below, Meadowbank will have in 2020 a baccalaureate student that will make his internship to assess the possibility of revegetation in Northern Arctic Condition. Result of this study will be reported in subsequent annual report and will be use to fulfill NIRB Condition 13 and 26. An update to the ICRP will be completed, as needed.

Agnico Eagle Meliadine Mine Site, as per the 11MN034 Project Certificate Condition 20 and 41, need to make similar study as required by the Whale Tail Project Certificate 008 Condition 13 and 41.

Result of the study conducted by Meliadine mine site will be shared with Meadowbank in order to fulfill the current Project Certificate No. 008 obligations. Below is a summary of the study conducted in 2018-2019 at Meliadine.

On June 1st, 2018 Agnico Eagle Mines and the University of Saskatchewan were successful in receiving a Natural Sciences and Engineering Research Council (NSERC) Collaborative Research and Development grant. The grant entitled "Tundra Restoration: Niche construction in early successional plant-soil systems" will support on-site and laboratory research from June 2018 to June 2022. The primary objective of this research is to address Term and Condition no. 41 of the Project Certificate for the Meliadine site: "Prior to the commencement of operations, the Proponent shall develop a progressive re-vegetation program for disturbed areas that are no longer required for operations, such program to incorporate measures for the use of test plots, reseeding and replanting of native plants as necessary." The specific objective is the characterization of initial and realized niches of biological soil crusts and tundra vascular plants across a chronosequence of naturally recolonized drilling waste dumps.

Work started during the 2018 summer and continued in 2019, with both educational activities and a field revegetation trial.

In May 2019, University of Saskatchewan Alix Conway (Education coordinator) traveled to Baker Lake and taught a class at the Jonas Amitnaaq Secondary School about sampling techniques and in July 2019, a revegetation restoration trial at three different locations on the Meliadine site was established.

More information on the project can be found on the project website: : https://www.tundrarestoration.com/ and additional information regarding the vegetation can be found in the Meliadine TEMMP report in Appendix H-8.

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.***

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.

The Conceptual Socio-Economic Closure Plan was be submitted to NIRB in March 18th, 2019. It is included in the Appendix 52 of the 2018 Annual Report.

SECTION 10. PLANS / REPORTS / STUDIES

10.1 SUMMARY OF STUDIES

10.1.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 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 2019.

10.1.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1826 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 2019.

10.1.3 Exploration Activity Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part B, Item 6l: ***A summary of any specific studies or reports requested by the Board, and a brief description of any future studies planned or proposed.***

No studies were requested by the NWB in 2019.

10.2 SUMMARY OF REVISIONS

10.2.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 Part B, Item 16: ***The Licensee shall review the Plans or Manuals referred to in this Licence 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-MEA1526 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-MEA1526 Part B, Item 16 : '*The Licensee shall review the Plans or Manuals referred to in this Licence 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 2019 and apply to Meadowbank Site:

- Mine Waste Rock and Tailings Management Plan, Version10 (Appendix 24);
- Meadowbank Interim Closure and Reclamation Plan (ICRP) - Update 2019 Revision 1 (Appendix 55);
- Pore Water Quality Management Plan, Version 2 (Appendix 23);
- 2019 Water Management Report and Plan Version 8 (Appendix 11);
- Groundwater Monitoring Plan, Version 11 (Appendix 60);
- Oil Handling Facility: Oil Pollution Emergency Plan, Version 11 (Appendix 38); and.
- Baker Lake Bulk Fuel Storage Facility: Environmental Performance Monitoring Plan, Version 5 (Appendix 18).

The following monitoring and management plans were revised in 2019 and apply to both Meadowbank and Whale Tail sites:

- Aquatic Effects Management Program, Version 4 (Appendix 50);
- Air Quality and Dustfall Monitoring Plan, Version 5 (Appendix 62);
- Hazardous Materials Management Plan, Version 5 (Appendix 36);
- Blast Monitoring Plan, Version 4 (Appendix 57);
- Terrestrial Ecosystem Management Plan, Version 7 (Appendix 58);
- Spill Contingency Plan, Version 10 (Appendix 37);
- Emergency Response Plan, Version 14 (Appendix 34); and
- Quality Assurance / Quality Control (QA/QC) Plan, Version 5 (Appendix 59).

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.

10.2.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1826 Part B, Item 17: ***The Licensee shall review the Plans or Manuals referred to in this Licence 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-WTP1826 Schedule B, Item 21: ***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-WTP1826 Part B, Item 16 : '*The Licensee shall review the Plans or Manuals referred to in this Licence 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 2019 and apply to Whale Tail Project:

- Groundwater Monitoring Plan, Version 3 (Appendix 61);
- Landfill and Waste Management Plan, Version 2 (Appendix 63);
- Thermal Monitoring Plan, Version 3 (Appendix 28);
- Migratory Bird Management Plan, Version 3 (Appendix 64);
- Waste Rock Management Plan, Version 5 (Appendix 25);
- Blasting Activities – Whale Tail South Channel, Version 1 (Appendix 65);
- Blasting Activities – Mammoth Dike Construction, Version 2 (Appendix 66); and
- Water Management Plan, Version 4 (Appendix 12).

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.

The community also have the opportunity to comment and ask questions related to the project 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 submitted the updated Occupational Health and Safety Plan on December 14, 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 for all new employees;
- Presentation from clinic staff at Mandatory Training (also referred to as Site Readiness), which is the pre-employment program for Inuit;
- 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 TV, posters, brochures, etc.

For detailed information on programs, please refer to the annual Agnico Eagle's Kivalliq Projects Socio-Economic Monitoring Report, which is included in the Appendix 69 of this 2019 Annual Report.

10.3 EXPLORATION ACTIVITY WHALE TAIL SITE

As required by NWB Water License 2BB-MEA1828 Part B, Item 6g: ***Any revisions to the Spill Contingency Plan, Water Management Plan, Waste Management Plan, Quarry Management Plan, Abandonment and Restoration Plan, as required by Part B, Item 12, submitted in the form of an Addendum***

And

As required by NWB Water License 2BB-MEA1828 Part J, Item 16: ***The Licensee shall annually review the approved by accredited laboratory Quality Assurance/Quality Control plan and modify it as necessary. Proposed changes shall be submitted to an accredited laboratory for approval***

Only the Spill Contingency Plan (Version 12) (Appendix 67) associated with the Water License 2BB-MEA1828 was updated in 2019. The QAQC plan was reviewed but no updated was required. Last Version 1 January 2017 is still valid.

10.4 EXECUTIVE SUMMARY TRANSLATIONS

10.4.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 22: ***An executive summary in English, Inuktitut and French of all plans, reports, or studies conducted under this Licence.***

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 2019 for Meadowbank site:
  - 2019 Annual Review of Portage and Goose Pit Slope Performance;
  - 2019 Meadowbank Dike Review Board No. 25A Report;
  - 2019 Annual Geotechnical Inspection Report;
  - 2019 Landfarm Report;
  - 2019 Thermal Monitoring Report;
  - 2020 KVPL02D280 Mine Plan;
  - 2019 Habitat Compensation Monitoring Report;
  - 2019 Groundwater Monitoring Report; and
  - 2019 Stack Testing Report.
- Reports or studies submitted in 2019 for both Meadowbank and Whale Tail sites:
  - 2019 Wildlife Monitoring Summary Report;
  - 2019 Marine Mammal and Seabird Observer (MMSO) Report;
  - 2018 Socio-economic monitoring Report;
  - 2019 Socio-economic monitoring Report;
  - 2019 Core Receiving Environment Monitoring Program Report;
  - 2019 Blast Monitoring Report;
  - 2019 Air Quality and Dustfall Monitoring Report;
  - 2019 Noise Monitoring Report;

  - 2019 Baker Lake Community Liaison Committee Annual Report; and
  - 2019 Shipping Tour Consultation Report.

10.4.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 22: ***An executive summary in English and Inuktitut of all plans, reports, or studies conducted under this Licence.***

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 Inuinnaqtum is also provide for reports or studies of interest.:

- All monitoring and management plans listed in Section 10.2.2 above.
- Reports or studies submitted in 2019 for Whale Tail site:
  - 2019 Meadowbank Dike Review Board Report No. 25B
  - 2019 Thermal Monitoring Report;
  - 2019 Annual Geotechnical Inspection Report;
  - 2019 Migratory Bird Protection Report;
  - 2019 Open Pit Annual Inspection;
  - Whale Tail – 1st Biological Monitoring Study Design;
  - Quarry KVCA15Q01 – 2020 Work Plan;
  - Quarry KVCA15Q02 – 2020 Work Plan;
  - Quarry KVCA18Q01 – 2020 Work Plan;
  - WTHR KVRW15F01 – 2020 Work Plan;
  - 2020 KVPL17D01 Mine Plan;
  - 2019 Dike Construction and Dewatering Report;
  - EEM – 1st Biological Monitoring Study Design;

- o 2019 Habitat Compensation Monitoring Report;
- o Caribou Road Crossing Mitigation — Technical Memorandum;
- o Whale Tail Pit - Blasing Measurements from August, September and December 2019;
- o 2019 Groundwater Report; and
- o 2019 Report on the Implementation and Monitoring of Measures to Mitigate and Avoid Serious Harm to Fish – Whale Tail Pit Project.

Some reports detailed in Section 10.4.1 above apply to both Meadowbank and Whale Tail sites. Refer to this section for more details.

SECTION 11. MODIFICATIONS / GENERAL / OTHER

11.1 MODIFICATIONS

11.1.1 Meadowbank Site

As required by NWB Water License 2AM-MEA1526 Schedule B, Item 14: ***A summary of modifications and/or major maintenance work carried out on all water and waste related structures and facilities.***

In accordance with Water License 2AM-MEA1526, Part D, Item 14, Agnico submitted on May 31st, 2019 2018 a copy of the South Cell Permeable Berm As-built Report (Appendix 17).

Refer to Section 10.2.1 for details regarding the In-Pit Disposal Water License Modification.

Refer to Section 3.5.1 and 11.2.4 for details regarding the Baker Lake Tank Farm Modification.

11.1.2 Whale Tail Site

As required by NWB Water License 2AM-WTP1826 Schedule B, Item 14: ***A summary of Modifications and/or major maintenance work carried out on all Water and Waste-related structures and facilities.***

There was no major modification or maintenance work in 2019 at Whale Tail. Refer to Section 3.5.2.2 for a list of the Construction Summary Reports submitted in 2019.

Several structures and pumping systems will complete construction in 2020 and construction summary reports will be submitted accordingly.

11.1.3 Exploration Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part G Item 3: ***The Licensee shall provide as-built plans and drawings of the Modifications referred to in this Licence within ninety (90) days of completion of the Modification. These plans and drawings shall be stamped by an Engineer.***

No as-built plans and drawings submitted in 2019.

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.***

11.2.1 Meadowbank In-Pit Disposal Project

Agnico Eagle currently places all tailings at the Meadowbank Mine in the Meadowbank Tailings Storage Facility (within the former Second Portage Lake northwest dewatered arm), where tailings have been deposited sub-aerially as slurry and water from the ponds reclaimed during operation. Since mining began, Agnico Eagle has continued to evaluate alternative options for tailings deposition, in order to ensure that best practices are followed and to ensure appropriate long term planning to optimize the site footprint. In 2016, the Meadowbank Dike Review Board, an Independent Geotechnical Expert Review Panel established in accordance with Type A Water Licence 2AM-MEA1526, supported the use of early in-pit tailings disposal as an appropriate alternative in addition to current practices at Meadowbank Mine. Specifically, in-pit disposal of tailings has advantages with respect to health and safety, quality of life, water, air, capital cost, technology, natural hazards and adaptability. The Meadowbank Dike Review Board accepted that in-pit disposal would be recognized as the best available technology. As a result, Agnico Eagle has proposed to dispose of tailings in three pits, Portage Pit A, Portage Pit E, and Goose Pit, all within the footprint of the assessed and approved Meadowbank Mine.

The project was submitted to the NPC on December 21st, 2017 and on March 22nd, 2018, the NPC issued a positive conformity determination. On March 22nd, 2018, the file was referred to the NIRB. A technical meeting was held on June 12th, 2018; information requests were received on July 4th; 2018, final written submissions were provided on August 2nd, 2018 and final concerns were received on August 20th, 2018. On August 31st, 2018 and November 27th, 2018, Agnico Eagle received positive NIRB and ministerial decisions, respectively.

A request to amend Water Licence 2AM-MEA1526 was submitted to the NWB on December 17th, 2018. Final written submissions from Parties were received on February 15th, 2019. No public hearing was held for this Project. The Amended Water Licence was forwarded by the NWB to the Minister for approval on March 29th, 2019. Ministerial approval was received on May 17th, 2019 which ended this Permitting activities for this proposed Project.

11.2.2 Whale Tail Pit Expansion Project

Agnico Eagle currently operates the Meadowbank Mine and is developing the Whale Tail Pit Project. Agnico Eagle is proposing to expand and extend the Whale Tail Pit Project to include:

- Expansion of the Whale Tail Pit
- IVR Pit;
- IVR Waste Rock Facility;
- IVR Attenuation Pond;
- Underground mine;
- Groundwater storage pond system; and,
- Saline water treatment plant.

The project proposal was submitted to the NPC on October 15th, 2018. On October 16th, 2018, the review was completed stating that previous conformity determinations provided still apply for this project but as the project proposal is a significant modification, it requires screening by NIRB.

On November 23rd, 2018, the project was submitted to NIRB and following requests for additional information and documentation, Agnico Eagle submitted an updated Final Environmental Impact Statement on December 18th, 2018. Information requests were received on February 21st, 2019 and technical review comments were received on May 15th, 2019. A technical meeting was held in Baker Lake from June 11th to 13th, 2019. Final written submission were received on July 30th and a public hearing was held in Baker Lake from August 26th to 29th, 2019. The NIRB submitted its reconsideration report on October 19th, 2019 and forwarded its positive recommendation to the minister. As of December 31st, 2019, this Permitting Project is still ongoing as Agnico Eagle is awaiting a ministerial decision and if approved, amended Project Certificate.

Parallel to this, Agnico Eagle submitted an application to amend Water Licences 2AM-MEA1526, 2AM-WTP1826 and 2BB-MEA1828 to the Nunavut Water Board on May 16th, 2019. Information requests were received on July 18th, 2019 and technical review comments were received on September 16th, 2019. A technical meeting and pre-hearing conference was held in Yellowknife (due to weather conditions) on October 29th-30th, 2019. As a result of commitments made during the Technical Meeting, Agnico Eagle submitted a number of documents to the NWB on December 20th, 2019. They included revised modeling results, the WRSF final design report and a revised ICRP. As of December 31st, 2019, this Permitting Project is still ongoing. The final NWB public hearing is planned for February 12th-13th, 2020.

11.2.3 Water License 2BB-MEA1828 Transfer of Activities

In addition to the amendment to NWB Water Licence 2AM-WTP1826, Agnico Eagle also submitted an application to transfer Whale Tail underground development activities, operation of the A-P5 (which will be converted into GSP-1 for the Expansion Project) and handling and storage of waste rock and ore on pads, and a few other associated activities from the NWB Water Licence 2BB-MEA1828 to the NWB Water Licence 2AM-WTP1826. As of December 31st, 2019, this amendment application is still ongoing.

Secondly, an amendment application was submitted to NWB to request a change in location of the Amaruq exploration camp. As of December 31st, 2019, this amendment application is still ongoing.

11.2.4 Baker Lake Fuel Farm Expansion Project

As a result of ore hauling from the Approved Whale Tail Pit Project to Meadowbank, and the addition of a Power Plant and heating facilities at the Whale Tail site, diesel fuel needs have increased and calculations made prior to the Approved Project permitting process underestimated the requirements of fuel. To address the upcoming shortage, Agnico Eagle proposed to add two (2) 10 million L diesel fuel storage tanks to the Marshalling Area Bulk Fuel Storage Facility in Baker Lake for a total of 80 million litres. Proposed infrastructures were planned to start building in April 2019 pending all regulatory approvals have been received by then.

The project was submitted to the NPC on August 22nd, 2018. On August 28th, 2018, the NPC referred Agnico Eagle to the positive conformity determination dated February 20th, 2002 and referred Agnico Eagle to the NWB for further steps. On December 21st, 2018, Agnico Eagle submitted a written notification to the NWB with regards to a planned modification to the Baker Lake Marshalling Area Bulk Fuel Storage Facility which is an approved facility under Water Licence 2AM-MEA1526. Approval from the NWB was received on January 28th, 2019.

Following NPC and NWB's approvals, Agnico Eagle obtained all other permits as requested (i.e. Hamlet Development Permit, Amended Lease). This permitting Project was completed on April 17th, 2019 when final permits were received.

11.3 EXLORATION 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 2019 on the Amaruq Property comprised delineation, exploration, conversion, geotechnical, metallurgical and service targets. 2019 drill holes done on the Amaruq property resulted in an improved geological model, a better understanding of the regional geology and expansion of the Whale Tail zone in its shallow dipping eastern plunge. This work was based out of the Amaruq exploration camp situated 50 kilometers north-northwest of the Meadowbank mine site. The 2019 drilling campaign totalled 229 diamond drill holes totalling 60,946 meters. Particular attention was paid to the delineation drilling of the Whale Tail pit in the first phase of the 2019 drilling campaign. More conversion drilling of underground resources, extension drilling at depth and regional exploration drilling was undertaken later on in the drilling campaign.

11.3.2 2019 Drill Hole Location

As required by NBW Water License 2BB-MEA1828, Part J item 8:*The Licensee shall determine the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all drill holes located within thirty-one (31) metres of the ordinary High Water Mark, as per Part F, Item 2, and provide these locations on a map of suitable scale for review as part of the annual report.*

Table 11-1 and Figure 36 detailed the drill hole location for 2019 within the thirty-one meters of the High Water Mark. Both drilling were thought the ice.

Table 11-1 Whale Tail Exploration GPS co-ordinates for drilling on ice hole locations

Names	X	Y
M199	602927	7255353
M219	602927	7255353

Figure 36 Whale Tail Drilling on ice Water Quality Monitoring

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 received full ICMC certification in March 2016.

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/. Information on cyanide transportation and management was also provided and discussed during the May 2019 Shipping Consultation Tour to Chesterfield Inlet and Coral Harbour, as well as during the 2019 Baker Lake Open House on August 20th, 2019.

As per previous years shipments, the transport of cyanide in 2019 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 July 2019, and the public was kept advised of road closures on radio and Facebook throughout the transportation process. In 2019, 16 convoys of cyanide was needed during the barge season.

Recertification was initiated in 2018 to ensure Agnico maintains it's compliance with ICMI requirements. A full third-party audit was performed from June 21st to 28th 2018. Full recertification was received on January 15th 2019. The full certification information can be found at :

https://www.cyanidecode.org/sites/default/files/pdf/AgnicoEagleMeadowbankMineSAR2019.pdf

11.5 INSPECTIONS AND COMPLIANCE REPORTS

11.5.1 Meadowbank, Whale Tail and Exploration

As required by NWB Water License 2AM-MEA1526 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-WTP1826 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.***

11.5.1.1 *CIRNAC*

CIRNAC Inspector conducted three (3) sites visit in April, June and September 2019. Details are provided below and inspection report are attached in Appendix 70.

On April 9th, 2019 CIRNAC conducted an inspection at the Whale Tail site. Purpose of this visit was to ensure compliance with the water licence 2AM-WTP1826. Whale Tail Site and Whale Tail Haul Road were inspected. No non-compliance were observed but 2 action were required:

- ensure all hazardous material be held in secondary containment as required by the licence Part H Item 3
- remove all unauthorized items/ material from the landfill bin as these items are considered hazardous material, as required by the licence Part F Item 16

All required action item were completed.

On April 8th-9th, 2019 CIRNAC conducted an inspection at the Meadowbank site. Purpose of this visit was to ensure compliance with the water licence 2AM-MEA1526. Meadowbank Site, AWAR and Vault area were inspected. No non-compliance were observed but 5 action were required:

- remediate all spills identified during the course of this inspection
- perform weekly inspection of all Hazardous material containers held on the Agnico property to ensure no leaks and settlement and keep a log of written inspection and made available to the inspector upon request, as per Part H Item 4 of the Water License
- place all fuel and chemicals within adequate secondary containment as required by the license Part H Item 3.
- remove all unauthorized material with in the Landfill as these are considered to be hazardous waste. As per the Water License Part F Item 16.
- complete daily inspections of vehicles at all laydowns and ensure drip trays or suitable form of secondary or spill containment is in place as per the Nunavut Water Board approved spill contingency plan.

All required action item were completed.

On April 8th-9th, 2019 CIRNAC conducted an inspection of the Crown Lease 66A/8-71-2 (AWAR Lease), 66A/8-72-5 (AWAR Quarry Lease), 66H/8-01-1 (WTHR Quarry Lease) and 66H/8-02-1 (WTHR). There were no concerns with the used of Crown Land during this inspection.

On June 15th, 2019 CIRNAC conducted an inspection at the Whale Tail site. Purpose of this visit was to ensure compliance with the water licence 2AM-WTP1826 and the Acts; Nunavut Planning and Project Assessment Act (NUPPA), Nunavut Waters and Nunavut Surface Rights Tribunal Act (NWNSRTA), and Arctic Waters Pollution Prevention Act (AWPPA). No non-compliance were observed but 1 action was required:

- ensure signs are posted at all appropriate areas as stated in the Water Licence 2AM-WTP1826 Part B Item 10

All required action item were completed.

From June 14th-17th, 2019 CIRNAC conducted an inspection at the Meadowbank site. Purpose of this visit was to ensure compliance with the water licence 2AM-MEA1526 and the Acts; Nunavut Planning and Project Assessment Act (NUPPA), Nunavut Waters and Nunavut Surface Rights Tribunal Act (NWNSRTA), and Arctic Waters Pollution Prevention Act (AWPPA). Meadowbank Site and Baker Lake Marshalling Facility were inspected. No non-compliance were observed but 1 action was required:

- remove all hazardous material from garbage bins prior to being deposited to the Landfill

All required action item were completed.

CIRNAC also conducted an inspection of Meadowbank and Whale Tail on September 25th, 2019. No non-compliance were observed. No inspection report received to date.

11.5.1.2 *Environment and Climate Change Canada*

ECCC inspector conducted two (2) sites inspection in 2019. Details are provided below. No inspection report were received.

- inspection regarding Whale Tail WRSF flow on August 30th, 2019. No major concern. Supplemental information requested during the inspection were provided.

- ECCC Inspection of Meadowbank and Whale Tail on September 23rd - 24th, 2019. No inspection report received. Observed a discharge from A-P5 pond that may be subject to MDMER regulation. Received email from ECCC inspector on October 3rd to confirm this discharge is subject to MDMER regulation and thus need to submitted in writing to the Minister of the Environment the information required by MDMER Section 9 for this Final Discharge Point. Agnico provided the information on October 31st, 2019

11.5.1.3 *Kivalliq Inuit Association*

KivIA also conduct site inspection of Meadowbank and Whale Tail on June 9th -10th, 2019. No inspection reports received. No concern associated with this inspection

On August 29th, 2019 KivIA also came at Whale Tail site to conduct an inspection regarding Whale Tail WRSF Flow. No major concern associated with the inspection. KivIA sampled sediment in Mammoth Lake during the inspection.

11.5.1.4 *Nunavut Impact Review Board*

Annual NIRB inspection of the Meadowbank and Whale Tail site was conducted from August 22nd to August 24th. Inspection Report in attached in Appendix 70. Agnico have provided to NIRB responses to their concern along with the responses to the Nunavut Impact Review Board's 2018-19 Annual Monitoring Report for the Meadowbank Gold Project (Project Certificate No. 004) and the Whale Tail Pit Project (Project Certificate No. 008) with Board's Recommendations provided on November 25th, 2019. Agnico's responses can be found on the NIRB public registry.

Find below a list of the main subjects that were discussed in the report:

Meadowbank Gold Project

- Legal deterrents to deter carnivores and/or raptors at all landfill and waste storage areas
- Suppression of surface dust

Whale Tail Project

- Ensure sufficient spill response equipment/material are put in place along the Haul-road at each major waterbody crossing
- Suppression of surface dust
- 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

11.5.1.5 *HTO*

- HTO Board members were on site on April 26th, 2019 to have a look at the caribou migration – no concern
- HTO member on-site on October 17th to complete a site visit of Whale Tail site and Haul Road during migration. No concern

11.5.1.6 *Government of Nunavut – Conservation Officer*

- A Site tour of Whale Tail and Meadowbank was held in January 2019 with Conservation Officers from Arviat and Baker Lake Offices for wildlife relate purpose
- GN Conservation Officer at Meadowbank for a site visit on July 30th for wildlife relate purpose

11.5.1.7 *DFO*

DFO did not conduct any site inspections at Meadowbank and Whale Tail in 2019.

11.6 NON-COMPLIANCES 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.***

In 2019, two (2) exceedances/non-compliance occurred related to the Water License 2AM-MEA1526 and MDMER regulation.

- No sample was collected at the East Dike Discharge Effluent sample for the week of January 13th to January 19th, 2019 as required by MDMER Division 2 Section 12(1). Due to unexpected event related to cold temperature, the discharge pipe had frozen around 03:30 on January 14th, 2019. No regulatory sample were taken on January 13th as the 14th was the planned sampling date. Corrective work was undertaken to unfreeze the discharge pipe, but Agnico was not able to thaw it by the end of January 19th, thus preventing Agnico from taking the weekly sample. The last sample collected from East Dike final discharge point was on January 7th. The Total Suspended Solids (TSS) result was 2 mg/L and was below the authorized limit discharge as per Schedule 4. The discharge to the receiving environment was restarted on January 20th around 15:30 p.m. and the next regulatory sample was collected on January 22nd, 2019. ECCC Inspector was notified on January 22nd, 2019 by email.

- TSS result for West Diversion Ditch (ST-6) exceeded the maximum average concentration (15 mg/L) permitted by the Water License. Only a 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 4th (21 mg/L) from the certified laboratory. Internal TSS analyses performed at the Meadowbank Assay Lab during June showed TSS level below 10 mg/L after June 7th and below 2 mg/L after June 14th until the end of the month.

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.***

Four (4) exceedances occurred in 2019 related to the Water License 2AM-WTP1826 and MDMER regulation. From this amount, two (2) exceedances were reported to the GN Spill hotline as a spill as described in Section 7.1.2 above.

- Whale Tail North Basin dewatering water (ST-MDMER-5 / ST-DD-7) discharged to Whale Tail South was first sampled on May 29th, 2019 at 9:00 a.m. as required by the Water License 2AM-WTP1826. At 9:50 am, another water sample was taken as required by the MDMER regulations. The discharge was already planned to be stopped during the day of May 29th. At 10:00 a.m. the pumps were shut down and remain inactive for the rest of the month. On June 6th, 2019 Agnico Eagle was reviewing preliminary results and noted that the level of TSS at ST-MDMER-5 discharge was at 30 mg/L for the sample taken at 9:00 a.m. and 88 mg/L for the one taken at 9:50 a.m. on May 29th. Result on May 29th, 2019 exceeded the MDMER Schedule 4 and Water License short term maximum authorized concentration in a grab sample (30 mg/L).

- Whale Tail North Basin dewatering water (ST-DD-9) discharged to Mammoth Lake exceeded the Water License short term maximum limit of 22.5 mg/L for the sample taken on August 18th, 2019 (30 mg/L). Agnico is of the opinion that the high result is related to a punctual event given the results before and after August 18th.

- Whale Tail North Basin dewatering water (ST-MDMER-5 / ST-DD-7) discharged to Whale Tail South was sampled on October 10th, 2019 at 5:00 p.m. as required by the Water License 2AM-WTP1826. Results from the external laboratory were received and showed TSS result at 91 mg/L. The station was sampled again on the 11th at 6:50am and the result was 1 mg/L. Previous day's result (October 9th) showed TSS to be at 1 mg/L. As a preventive measure, internal sampling frequency were increased. Result on October 10th, 2019 exceeded the MDMER

Schedule 4 and Water License short term TSS maximum authorized concentration in a grab sample (30 mg/L).

- Whale Tail North Basin dewatering water (ST-DD-7) discharged to Whale Tail South exceeded the turbidity Water License short term maximum limit of 30 NTU on October 28th (80.1 NTU). On October 29th, TSS result (26 mg/L) exceed the Water License short term maximum limit of 22.5 mg/L.

11.6.3 Exploration Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part B, Item 6f: ***A list of unauthorized discharges and a summary of follow-up actions taken***

Six (6) exceedances occurred in 2019 related to the Water License 2BB-MEA1828. From this amount, five (5) exceedances were reported to the GN Spill hotline as a spill as described in Section 7.1.2 above.

- A Fecal coliform exceedance occurred on January 15th, 2019 and was reported to the Government of Nunavut Spill Line. The sample had a concentration of 4,000 CFU/100 ml (Water License 2BB-MEA1828 limit:1,000 CFU/100ml)
- A Fecal coliform exceedance occurred on February 11th, 2019 and was reported to the Government of Nunavut Spill Line. The sample had a concentration of 42,000 CFU/100 ml (Water License 2BB-MEA1828 limit:1,000 CFU/100ml)
- A Fecal coliform exceedance occurred on March 4th, 2019 and was reported to the Government of Nunavut Spill Line. The sample had a concentration of 12,000 CFU/100 ml (Water License 2BB-MEA1828 limit:1,000 CFU/100ml)
- A Fecal coliform exceedance occurred on August 12th, 2019 and was reported to the Government of Nunavut Spill Line. The sample had a concentration of 9,000 CFU/100 ml (Water License 2BB-MEA1828 limit:1,000 CFU/100ml)
- A Fecal coliform exceedance occurred on August 19th, 2019 and was reported to the Government of Nunavut Spill Line. The sample had a concentration of 2,000 CFU/100 ml (Water License 2BB-MEA1828 limit:1,000 CFU/100ml)
- A Total Oil and Grease exceedance occurred on September 16th, 2019. The sample had a concentration of 6 mg/L (Water License 2BB-MEA1828 limit:5 mg/L)

Corrective measures put in place included:

- Remind technician to make sure to eliminate the possibility of cross-contamination during the sampling
- Preventative maintenance was done on the unit including cleaning and disinfecting all sampling lines, changing UV lights on Newterra system and installed UV light on Bionest system
- Reminder to technicians and operators to flush the lines prior to sampling

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 Gold Project 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 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 2019 is provided in Table 11-2. In 2019, 2,163 non-mine authorized road uses were recorded. This is higher than previous year but mainly caused the number of driver and passenger were counted as road user, which was not the case in previous years. Table 11-3 below show the ATVs and snowmobiles usage from 2012-2019. In 2019, two incidents involving non-mine authorized use occurred:

- In the afternoon of June 29th, 2019, two (2) impaired ATV drivers and two impaired passengers were escorted out of the AWAR by the Baker Lake RCMP
- On November 24th, a woman took her mother's car, who was working at Meadowbank, because she missed her. She left Baker Lake for MBK and made the travel in 1h30. Traffic along the AWAR stayed on the edge of the road to give her the right of way to avoid any accident.

Although these isolated incident occurred, Agnico 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.

Table 11-2 2019 Monthly AWAR ATVs and Snowmobile Usage Records

Month	# of ATV's
January	0
February	0
March	0
April	0

May	22
June	435
July	249
August	309
September	614
October	475
November	57
December	0
Total 2019	**2,163**

Table 11-3 2012-2019 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

Agnico'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 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 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 March 2017 and can be found in Appendix I1 of the 2016 Annual Report.

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 has provided and implemented the Whale Tail Haul Road Management Plan to meet Condition 31 of the NIRB Project Certificate No. 008 and Water License requirement. The Security staff monitors the safety, traffic and security of all personnel using the road. Table 11-4 below shows the traffic data for 2019 along the Whale Tail Haul Road. Starting in Q1 2019, road dispatchers were engaged and recorded all the traffic data along the road (for all type of vehicles/truck).

Table 11-4 Whale Tail Haul Road 2019 Traffic Data

Month	Haul	Medium Equipment	Light Equipment	Total
January	632	92	140	**864**
February	762	241	735	**1,738**
March	760	115	627	**1,502**
April	148	107	232	**487**
May	522	164	565	**1,251**
June	828	187	642	**1,657**
July	686	227	353	**1,266**
August	1176	169	178	**1,523**
September	2958	287	911	**4,156**
October	1280	276	448	**2,004**
November	2928	496	863	**4,287**
December	2778	318	584	**3,680**
Total	**15,548**	**2,679**	**6,278**	**24,415**

Table 11-5 below provided the FEIS daily vehicle traffic on the haul road based on an estimated number of days that there will be traffic on the road is 337 days. In 2019, the road was close for wildlife migration for a total of 61 days, and thus the road was open for a total of 304 days. In order to make comparison to FEIS, explosive truck, fuel, cargo and oversize were categorized as medium equipment. Pickup, bus and maintenance were categorized as light equipment. Based on data collected in 2019, there is currently no exceedance to the FEIS as per the Table 11-6.

Table 11-5 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
Maintenance	0	2	4

Table 11-6 2019 Daily WTHR Traffic Comparison to Average FEIS

Category	FEIS	2019 Data
Long Haul	154	51
Medium Equipment	14	9
Light Equipment	24	21

There is no non-mine uses 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 (HTO). 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 Pit 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;
- This intersection has a stop sign on the traditional land use crossing locations to give way to the mine haul trucks. 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 2019, no incidents involving non-mine authorized use occurred. Agnico 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.004Condition 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.***

On August 20th, 2019, Agnico held an Open House in Baker Lake to provide an update of Agnico Eagle activities and review safety information. Included in the Open House was a review of Policies and Procedures of the All Weather Access Road from Baker Lake to the Meadowbank Mine site, as well as a reminder about Whale Tail Haul Road not being available for public use, to use marked snowmobile crossings and yield to heavy equipment. Agnico also discussed AWAR and WTHR use and safety at the May 23rd Baker Lake Community Liaison Committee meeting. Agnico Eagle also did Facebook posts on the AWAR procedure and the community can access the procedure via the website www.aemnunavut.ca/community/roads.

Two incident involving non-mine authorized use occurred in 2019. Refer to Section 11.7.1.1 above for more information.

There have been no accidents to date involving mine related truck traffic and locals using ATV's/snowmobiles.

Only one (1) environmental spill occurred along the AWAR in 2019. Table 7-3 provides details on this spill. The spill was managed appropriately according to Agnico's spill contingency plan. The spills were remediated and contaminated material was deposited at the Meadowbank Landfarm. There were no impacts to any watercourses.

In 2019, there was three (3) mortality project-related along the AWAR. They were all arctic hare mortalities. One (1) caribou were reported dead along the AWAR and presumably killed by wolves. All the incident/mortality reports can be found in 2019 Wildlife Report (Appendix 52). 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.***

On August 20th, 2019, Agnico held an Open House in Baker Lake to provide an update of Agnico Eagle activities and review safety information. Included in the Open House was a review of Policies and Procedures of the All Weather Access Road from Baker Lake to the Meadowbank Mine site, as well as a reminder about Whale Tail Haul Road not being available for public use, to use marked snowmobile crossings and yield to heavy equipment. Agnico also discussed AWAR and WTHR use and safety at the May 23rd Baker Lake Community Liaison Committee meeting. Agnico Eagle also did Facebook posts on the AWAR procedure and the community can access the procedure via the website www.aemnunavut.ca/community/roads.

No incident involving non-mine authorized use occurred in 2019.

There have been no accidents to date involving mine related truck traffic and locals using ATV's/snowmobiles.

A total of fifteen (15) environmental spills occurred along the Whale Tail Haul Road in 2019. Table 7-5 provides details on each of these spills. All spills were managed appropriately according to Agnico's spill contingency plan. The spills were remediated and contaminated material was deposited in roll-off containment on Whale Tail Site before disposal at the Meadowbank Landfarm. There were no impacts to any watercourses.

In 2019, there was three (3) mortality project-related along the Whale Tail Haul Road: Ptarmigan, Sik sik and artic fox, most likely from collision with a vehicle. All the incident/mortality reports can be found in the 2019 Wildlife Report (Appendix 52). To continue to avoid 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 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 closure in 2019 that may impact the local usage as the road is not public. There were road closures due to bad weather and wildlife migration (Wildlife Summary Report Section 3.6.6 in Appendix 52) at various intervals throughout the year. When this situation occurred, the road status was provided to all Agnico and contractor's employees with regulars update. No incident related to adverse weather were reported.

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 has developed and maintained a Shipping Management Plan (Version 1, April 2018) in advance of the 2018 shipping activities. The plan is provided in Appendix 51 of the 2018 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.***

A total of nine Transport Desgagnés vessels serviced the Project via Baker Lake between July to early November during the 2019 shipping season. Two of the nine vessels serviced Baker Lake twice during the shipping season; Acadia Desgagnés and Rosaire A. Desgagnés. one of the nine vessels serviced Baker Lake every month of the 2019 shipping season: Thorco Isadora. In 2019, only one Transport Desgagnés vessels (Acadia Desgagnés) had a single passage north of Coats Island due to safety concerns for the vessel, crew and cargo due to weather and sea conditions (i.e. high winds) during the 2019 shipping season. Figures 3, 4, 5 and 6 provided in the Marine Mammal and Seabird Observer (MMSO) Report - 2019 Shipping Season (Appendix 71) show the shipping tracks from July to October and support this conclusion. Based on this result, Agnico can confirm that the use a routing south of Coats Island as the primary shipping route, subject to vessel and human safety considerations.

Setback polygons were created to support the compliance of the Whale Tail Pit Project Certificate No. 008, Term and Condition 39. Project vessels must follow a setback distance of 500 m from colonies and aggregation of seabirds and marine mammals while transiting through the Hudson Strait, Hudson Bay, and Chesterfield Inlet. Two Transport Desgagnés vessels tracks cross through 500 m setback polygons. In September, Thorco Isadora tracks crossed through the Marble Island setback polygon. In October, Rosaire A. Desgagnés tracks crossed through the Marble Island setback polygon. However, in all cases no shiptrack points were located in the 500 m setback polygons. The two closest ship track points were recorded by the Rosaire A. Desgagnés on 10 October 2019 3.89 km south of the Marble Island setback polygon and on 18 October 2019 5.1 km north of Digges Sound Important Bird Area (IBA) setback polygon. All, ship track intersections occurred due to lack of ship track resolution and the intersection of existing points to create a continuous shipping track (i.e., the shipping track points don't have the resolution to illustrate ship location at a fine temporal scale, and are only used to demonstrate coarsescale straight line shipping tracks). In July and August, no shipping tracks or ship track points intersected setback polygons. Refer to Figures 3, 4, 5 and 6 provided in the Marine Mammal and Seabird Observer (MMSO) Report - 2019 Shipping Season (Appendix 71) for visual illustration of the finding.

Mitigation measures detailed under Project Certificate No. 004 Condition 41 were followed in 2019. No marine mammal-vessel interactions or birds-vessel interactions (e.g., strikes) were recorded in 2019. Refer to the complete report regarding the Marine Mammal and Seabirds Observer (MMSO) in Appendix 71 for a complete discussion of the observations/results.

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 1, April 2018) found in Appendix 51 of the 2018 Annual Report.

A complete report, Marine Mammal and Seabird Observer (MMSO) Report 2019 Shipping Season, detailing the 2019 mammal and seabird observations during the shipping season can be found in Appendix 71. Below is a summary of the report and Agnico will refer the reader to the report in Appendix for a complete review.

The 2019 MMSO program recorded five marine mammal species: killer whale (*Orcinus orca*), harp seal (*Pagophilus groenlandicus*), fin whale (*Balaenoptera physalus*), bowhead whale (*Balaena mysticetus*), and polar bear (*Ursus maritimus*). The total temporal (hr) and spatial (km) survey effort of the 2019 MMSO program was greater than 2018 and included six vessels, compared to two vessels in 2018. The 2019 MMSO Program was conducted over five months (July to November), while the program in 2018 was conducted over two months (June to July). Marine mammal observer effort in 2019 was greater than previous years. In 2019, observer effort during transit was 62.82 hours and 1,898.30 km. A total of 59.25 hours of effort was conducted while anchored and incidental wildlife monitoring observation effort was 30.51 hours and 572.18 km in 2019. No marine mammal sightings or marine mammal-vessel interactions (e.g., strikes) were recorded in 2019. Incidental wildlife monitoring observation refer to the observations between Chesterfield Inlet and Baker Lake, during fuel transfer, collected onboard by a local as per NIRB Project Certificate no.004 Condition 36.

Seabird monitoring was conducted on 80 days from 26 June to 2 November 2019. Moving platform seabird monitoring effort was 2,136.5 km over 84.8 hours and stationary platform survey effort was 28.9 hours at 12 locations in 2019. A total of 953 individuals from 18 identified species and four unidentified species groups were observed during moving platform surveys in 2019. Stationary platform surveys recorded 364 individuals from 14 identified species and four unidentified species groups. The probability of detecting seabirds from moving platforms in 2019 was 0.24 (95% Confidence Interval: 0.17 to 0.36). Detection probabilities and density estimates could not be calculated for stationary platforms in 2019 (12 locations) or moving platforms in 2018 (35 transects) due to small sample sizes. Seabirds were recorded throughout the shipping route with no apparent areas of concentration. No seabird interactions (e.g., strikes) with vessels were recorded in 2019.

Overall, a greater total survey effort was completed during the 2019 program than in 2018. ECCC has provided to Agnico a presentation that was given in the past to some observers industry. In this presentation, there is a component on bird identification and instruction for the protocol. For the 2019 season, a poster was created to improve bird identification and the presentation provided by ECCC was forwarded to our shipping company, which was used to increase the effectiveness of the bird survey. Agnico also held a in-person vessel crew training in 2019.

In 2019, Agnico was able to recruit only one local wildlife monitor from Chesterfield Inlet. Monitor was present on barge from September 19th to 24th from Chesterfield Inlet to Baker Lake during the second fuel campaign. Agnico remains committed to meet compliance with Project Certificate No.004 Condition 36 and is intending to seek out monitors from the Chesterfield Inlet when possible. For multiple reasons (sickness, family related matters, personal issues, alternative work), availability of possible monitors being challenging in that area, Agnico would hire monitors from other local communities to ensure the condition is met.

Recruitment is also done within 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 or changed their minds at the last minute. Some monitors that accepted to board the vessels did not appreciate the very different marine life and requested to unboard the vessel on short notice and did not want to pursue this type of work any further. Some monitors had health issues while onboard and could not continue their work. A plethora of personal reasons was also given to stop monitoring work. As an improvement further on, in March 2019, 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. Meetings included sessions with the hamlet counselors and mayor and local HTO representatives. This will be repeated in 2020.

Being a concern from Chesterfield, Agnico Eagle is still committed to include local monitors but alternatively, local helpers from the Kivalliq region have been hired full-time by the Environmental Department in the fall of 2019 and in cases where monitors from Chesterfield prove to be impossible or very challenging, theses helpers would be used to supplement coverage when needed.

Agnico has, as part of Condition 40 of the Whale Tail Project Certificate, to develop and implement a Marine Mammal Management and Monitoring Plan (MMMMP). Desgagnés Group, the contractor responsible of fuel and goods delivery at Baker Lake, has been collaborating on the voluntary whale watching data collection project of the Marine Mammal Observation Network (MMON) since 2015. Each year, training is given by MMON to ship officers to train them in marine mammal identification and observation. Desgagnés, in collaboration with MMON, also developed a Poster and a manual with supporting documents for marine mammal identification. Those tools are available on each ships to increase the effectiveness of the marine mammal survey. Currently, Desgagnés Group applies the Marine Mammal and Seabird observer (MMSO) as described in the MMMMP. As an alternative to ensure data collection as per Condition 36, Agnico will evaluate with Desgagnés Group the possibility to pursue, in the following years, the marine mammal monitoring from Helicopter Island to Baker Lake infrastructures.

Agnico Eagle has also created a 2020 action plan to improve the effectiveness of the MMSO Program in compliance with Whale Tail Pit Project Certificate No. 008 Term and Conditions 38, 39, 40 and Meadowbank Project Certificate No. 004, Term and Condition 36. The action plan includes the hiring of a third-party to summarize and simplify both the Marine Mammal Management and Monitoring Plan (MMMMP) and Shipping Management Plan (SMP), as well as update and facilitate in-person MMSO program training for Groupe Desgagnés, Inuit environmental monitors, and vessel crew.

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.***

During May 2019, Agnico Eagle did its shipping consultation tour, meeting with stakeholders and public in Chesterfield Inlet and Coral Harbour to discuss the shipping season, receive feedback, and provide an update on the upcoming season schedule, including how Agnico Eagle will notify the communities. This topic was also covered during the annual Open House meetings in Baker Lake (August 2019) and Rankin Inlet. A summary of the shipping tour consultation is included in Appendix 72.

In order to provide communities with ongoing shipping information, Agnico Eagle did multiple Facebook posts on Agnico Meadowbank Complex and Agnico Meliadine Complex Facebook pages, as well as provided updated information on http://aemnunavut.ca/sealift_season/, where community members could also track the live vessel position, view answers to frequently asked questions, and view a brochure with specific information on the shipping season.

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.***

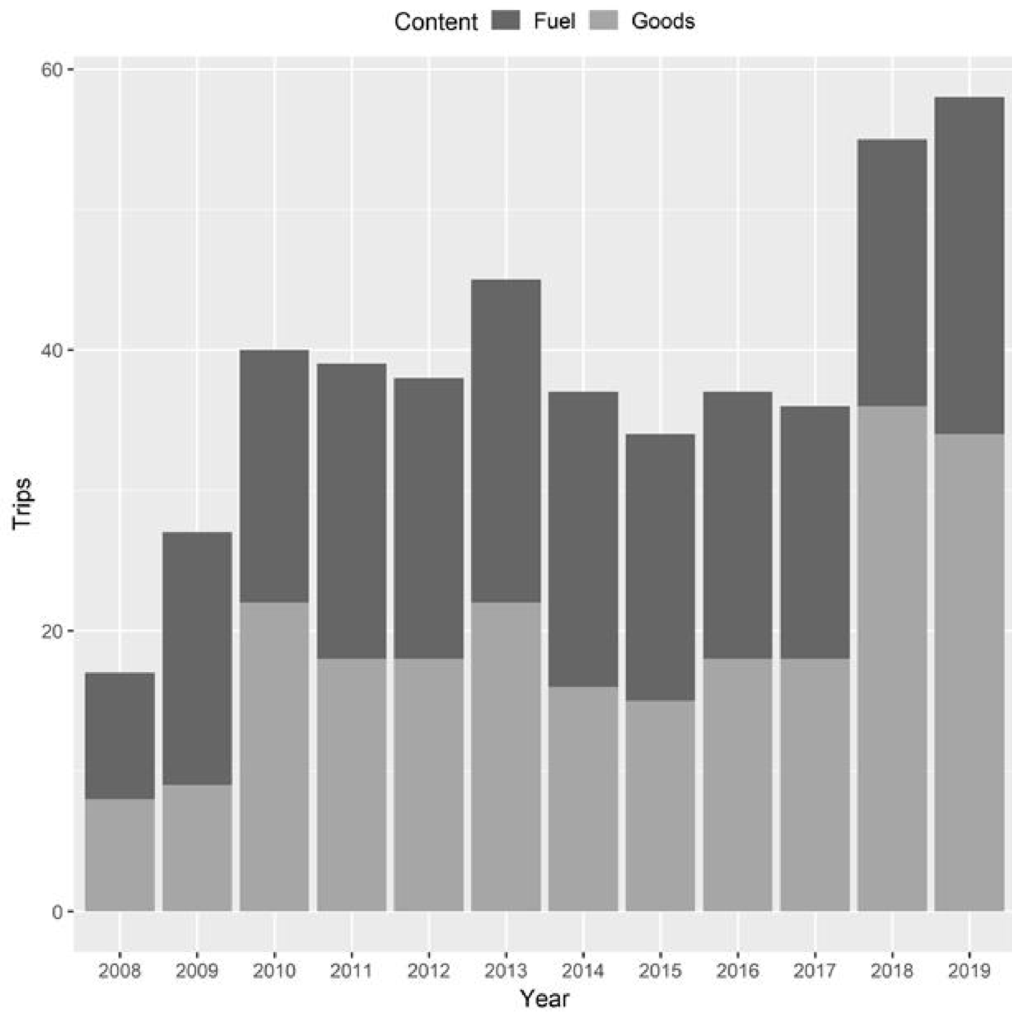
And

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 2019, Agnico monitored the ingress/egress of ship cargo at Baker Lake and the results are summarized in the below Figure 37. There is a small increase for material containers but relatively similar to the 2018 shipping season. The significant increase in 2018 and 2019 compare to previous years was due to the construction of the Whale Tail Project.

Only certified vessels were hired to carry the cargo at Meadowbank. Annual meeting were held with the dry cargo and fuel carriers to review the shipping and emergency plan.

Figure 37 Barge traffic (number of trips/year) arriving in Baker Lake from Chesterfield Inlet since 2008



In 2019, no spills occurred during the ship cargo ingress/egress.

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.

No claim was reported by our marine or trucking shippers in 2019.

11.9 CONSULTATION, ENGAGEMENT AND COMMUNICATION

As required by NWB Water License 2AM-MEA1526 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 73 for more information regarding the public consultation and participation with local organization and the residents of the nearby communities. Appendix 73 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.***

In accordance with NIRB Project Certificate, Agnico conducted its shipping consultation tour in Chesterfield Inlet and Coral Harbour on May 27th and 28th, 2019. Meetings with Hamlets, HTOs, and public were scheduled. Note that, due to communication challenges in Coral Harbour (community radio and hamlet phone lines were not working), no public attended the information session.

During the stakeholder and public meetings in both Chesterfield Inlet and Coral Harbour, Agnico Eagle collected the following concerns and Inuit Quajimajatunqangit:

- Belugas are getting stuck in the river and not making it out to sea, possible due to shipping traffic, which affects their fat

- Inuit cadets used to do monitoring are not always hired from the area, or are young, and therefore may not know the wildlife

- Concerned about compensation (ex. for wildlife fatality, impact on wildlife habits due to noise pollution, traffic, shipping routes)
- Concerned about oil spills, especially with strong currents in the area, and want to ensure that captains are aware of the dangerous areas around the inlet, including rocky areas or sharp navigational turns
- Concerned about noise during the offloading at Helicopter island
- There is a strong current between Coats Island and Walrus Island that captains should be aware of
- It disrupts hunting practices when traffic is going between Walrus and Coats Island, captains should stay south of Coats
- Concerned that commercial cruise ships around Walrus Island are impacting the walrus population and that global warming will mean increased tourist traffic around Coral Harbour
- In order to continue to address these concerns, the following outcomes were decided upon:
- Provide more information on the cadet program and advertise within Chesterfield Inlet and collaborate on ways to make the wildlife monitoring program more effective
- Bring a ship captain and navigational maps to the next meeting, to discuss shipping routes with HTO/Elders
- Reinforce message to captains about taking the route south of Coats whenever possible

For the full consultation report, please refer to Appendix 72.

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.”***

11.9.2.1.1 Baker Lake HTO

In 2019, three (3) meetings were held with the Baker Lake HTO, plus two (2) informal meetings with the Baker Lake HTO manager. Agnico Eagle did continue regular informal engagement on project activities throughout 2019, including regular communication between the Project Environment team and HTO. Baker Lake HTO is also represented on the Baker Lake Community Liaison Committee.

Meeting topics included:

- Wildlife Monitoring Program (including the Wildlife Coordinator position established within the MOU with the Baker Lake HTO)
- Baker Lake Fuel Farm Expansion and cabin access
- Project tolerant caribou at Amaruq
- Whale Tail Expansion project
- 2019 exploration and archaeological activities update
- Other topics: drone project, search and rescues

Additionally, the Baker Lake HTO board requested and was invited to do a tour of Amaruq on October 17th, 2019. Unfortunately due to the long-running search and rescue occurring during this time, all board members were rendered unable to attend. A Baker Lake HTO Elder member as well as an HTO office staff were, however, able to participate in the tour.

11.9.2.1.2 Other HTO

In 2019, Agnico Eagle also met with Chesterfield Inlet HTO during the annual shipping meeting. Please refer to the previous section for more information.

11.9.3 Community Liaison Committees

In 2019, Agnico Eagle continued to facilitate meetings with the Meadowbank Community Liaison Committee in Baker Lake, which was established to inform stakeholders on the activities at the mine and to consult them on specific issues and projects.

The Community Liaison Committee's objective is to favour dialogue and exchange between Agnico Eagle and its local stakeholders such that all parties gain a better understanding of the issues associated with mining activities and provides a venue for stakeholders to provide advice to Management for solutions. The Committee consists of various representatives including Agnico Eagle, the Elders Society, youth, the business community, adult education committee, the Hamlet, the Nunavut Arctic College, the RCMP and the Hunters and Trappers Organization of Baker Lake. The meetings are chaired by the Agnico Eagle Community Liaison Coordinator.

Meetings are scheduled quarterly in both English and Inuktitut, with the understanding that the minimum number of meetings is two (2) annually. In 2019, Agnico Eagle faced challenges in securing attendance from CLC members in order to hold meetings, therefore only one (1) Community Liaison Committee meetings was held, and one (1) visit to Amaruq for Nunavut Day to participate in celebrations.

A report summarizing consultation with the Community Liaison Committee in 2019 is attached in Appendix 74.

11.9.4 Elders

In 2019, Agnico Eagle continued to consult with Elders on the Meadowbank and Whale Tail Projects through their involvement in the Community Liaison Committee and Baker Lake HTO meetings. Additionally, on March 26th, 2019, Agnico Eagle met with Elders in Baker Lake as part of consultations for the Whale Tail Expansion Project as well as consultations about the fuel farm expansion.

11.9.5 Baker Lake

11.9.5.1 *Community Meetings in Baker Lake*

The following public community meetings took place in Baker Lake in 2019:

- On March 26th, 2019, a public community consultation for Whale Tail expansion project and the fuel farm expansion

- Agnico Eagle held a community Open House in Baker Lake on August 20th, 2019 on the Whale Tail Expansion Project, cyanide transportation, shipping season, safety reminders on the AWAR, and general project updates

Additionally, the Amaruq Official Opening was celebrated in Baker Lake on August 24th, 2019.

More details regarding Baker Lake community engagement can be found in in the Appendix 73.

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 Site. The list below outlines the major visits to the site during 2019:

- Each year in August, Agnico Eagle invites the residents of Baker Lake to come on a site tour at Meadowbank Mine. In 2019, Meadowbank welcomed four (4) tours;

- In September 2019, Agnico Eagle held its second “Take Out Kids to Work Day”, which brought grade 9 students from Baker Lake to visit the mine site to learn about the operations, explore job possibilities, and see their parents in their workplace;

- In September 2019, participants of the Kivalliq Science Educators’ Community Science Camp visited Meadowbank. This included about 40 children from all seven (7) Kivalliq communities; and

- In May 2019, Agnico Eagle hosted Nunavut Artic College (NAC) at Meadowbank for a site tour.

For a full list of site tours given in 2019, please refer to Appendix 73.

11.9.6 Community Engagement Initiatives

Community engagement and consultation initiatives that Agnico Eagle held or participated in during 2019 are summarized in the Appendix 73.

11.9.6.1 *Community Coordinators Program*

The Community Coordinators program consists of full or part-time Agnico Eagle Coordinators in all Hamlets in the Kivalliq Region, including in Agnico Eagle’s offices in the communities of Rankin Inlet and Baker Lake.

The objective of the community-based Agnico Eagle Coordinators is to provide a point of contact in each community to facilitate communications, provide services, and coordinate activities in the following areas:

- Support to the HR department by:
    - Assisting HR and other Agnico Eagle departments to locate employees or potential employees as required
    - Contact employees in advance of their shift departure times;
- Support to the Recruitment team by guiding interested individuals in the application process outlined by the Labour Pool Process;
- Provide advice and assistance to Agnico Eagle to organize and hold information sessions in the community on Agnico Eagle projects and initiatives, including those Labour Pool and business opportunities initiatives outlined in the Meliadine IIBA;
- Provide updates to the Hamlet Council on Agnico Eagle activities; and
- Distribute Agnico Eagle information and promotional materials.

The increase of community involvement requirements for Agnico Eagle to achieve recruitment goals and the obligations for the NIRB and IIBA renders the Community Coordinators essential for Agnico Eagle’s Nunavut operations.

11.9.7 Communication

As required by 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.***

Agnico Eagle's website has a page where monitoring and reporting information can be posted, http://aemnunavut.ca/media/documents/. Agnico is planning to update its website and will be evaluating in 2020 ways to integrate the data.

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. The Facebook page was actively used in 2019.

11.9.8 Exploration Activity Whale Tail Site

As required by NWB Water License 2BB-MEA1828 Part B, Item 6m: ***A summary of public consultation/participation, describing consultation with local organizations and residents of the nearby communities, if any were conducted***

Refer to table in Appendix 73 for more information.

One meeting was conducted with Baker Lake HTO members on June 10th, 2019 regarding the exploration projects associated with Meadowbank and Whale Tail. Other public consultations in 2019 were more axed on general exploration in Nunavut.

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.***

In 2019, Agnico Eagle continued to meet the requirements in the above conditions through its work in the following:

- 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. Agnico Eagle developed and submitted the Agnico Eagle Kivalliq Projects Socio-Economic Monitoring Program (SEMP) to NIRB on June 29th, 2019, which included both the Meadowbank SEMP, Meliadine SEMP, and Whale Tail SEMP.

- The Socio-Economic Monitoring Working Group (SEMWG), which includes GN and CIRNAC, aims to support Agnico Eagle's SEMP and the KvSEMC. The SEMWG submitted its most recent Terms of Reference on March 11th, 2019. Agnico Eagle met with the SEMWG on February 26th, 2019 to discuss the 2018 Socio-Economic Monitoring Report, the update of the Terms of Reference of the Working Group to include Whale Tail Project Certificate requirements, to prepare for the 2019 Kivalliq SEMC, and to receive an update on the GN Territorial Monitoring Project.

- 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. Agnico Eagle is an active participant in the KvSEMC. In 2018, the Kivalliq Socio-Economic Monitoring Committee meeting was held on April 16th, 2019 in Baker Lake.

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). It is reviewed by both the SEMWG and the KvSEMC prior to its submission, to allow for those groups to provide insight or data. It is submitted to NIRB on or by June 30th annually as per the SEMWG Terms of Reference. The 2018 SEMR (Appendix 68) was submitted to NIRB on June 29th, 2019.

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; and***
- ***Include a process for adaptive management and mitigation to respond if unanticipated impacts are identified.***

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.***

In 2019, Agnico Eagle met the requirements in the above conditions:

- After receiving approval to an extension request sent to NIRB on November 30th, 2018, Agnico Eagle submitted the Whale Tail Socio-Economic Monitoring Program on June 29th, 2019, along with the 2018 Socio-Economic Monitoring Annual Report.

- The SEMWG submitted an updated Terms of Reference (Appendix 57 of the 2018 Annual Report) on March 11th, 2019, which included the Whale Tail Project.

11.10.3 Socio-Economic Monitoring Report (SEMR)

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 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 those data that are mandated by the Project Certificate. It is reviewed by both the SEMWG and the KvSEMC prior to its submission, to allow for those groups to provide insight or data. It is submitted to NIRB on or by June 30 annually as per the SEMWG Terms of Reference. The 2018 SEMR was submitted to NIRB on June 29th, 2019 (Appendix 68).

At a SEMWG meeting on February 6th, 2020, Agnico Eagle proposed to move the deadline of the SEMR to meet the NIRB Annual Report submission deadline. This was based on past discussions with the SEMWG. This effectively moves the deadline from June 30 to March 31. The main impact of the change in reporting deadline is that some community-level data would not be available, and therefore some community-level data would be reported with a year-delay annually, however the benefit would be to better align reporting and review processes for Agnico Eagle and reviewers. The change was approved by the SEMWG. Therefore, Agnico Eagle is appending both the 2018 Agnico Eagle Kivalliq Projects Socio-Economic Monitoring Report (Appendix 68), which was submitted to NIRB on June 29th, 2019, as well as the 2019 Agnico Eagle Kivalliq Projects Socio-Economic Monitoring Report (Appendix 69).

The section below represents 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 69.

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 (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 31, 2019 was 1,033, of which 355 employees were Inuit employees. (The respective full-time equivalencies were 870 Agnico Eagle employees in total, with 241 full-time (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 2019 there were 616 full time equivalent (FTE) contractor positions.

Taken together, there were 1,486 active employees (Agnico Eagle permanent, temporary, on-call, students and contractors), working full- and part-time jobs, at the end of 2019.

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 of time.

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

The following tables shows the employment demographics for community of hire by headcount:

Table 11-7 Home communities of Agnico Eagle Inuit employees (by headcount)

Community of Hire	2018 Agnico Eagle headcount	2019 Agnico Eagle headcount
Arviat	74	84
Baker Lake	174	190
Naujaat	13	15
Rankin Inlet	15	21
Chesterfield Inlet	10	6
Whale Cove	9	7
Coral Harbour	19	11
Outside of Kivalliq	22	21
Total	**336**	**355**

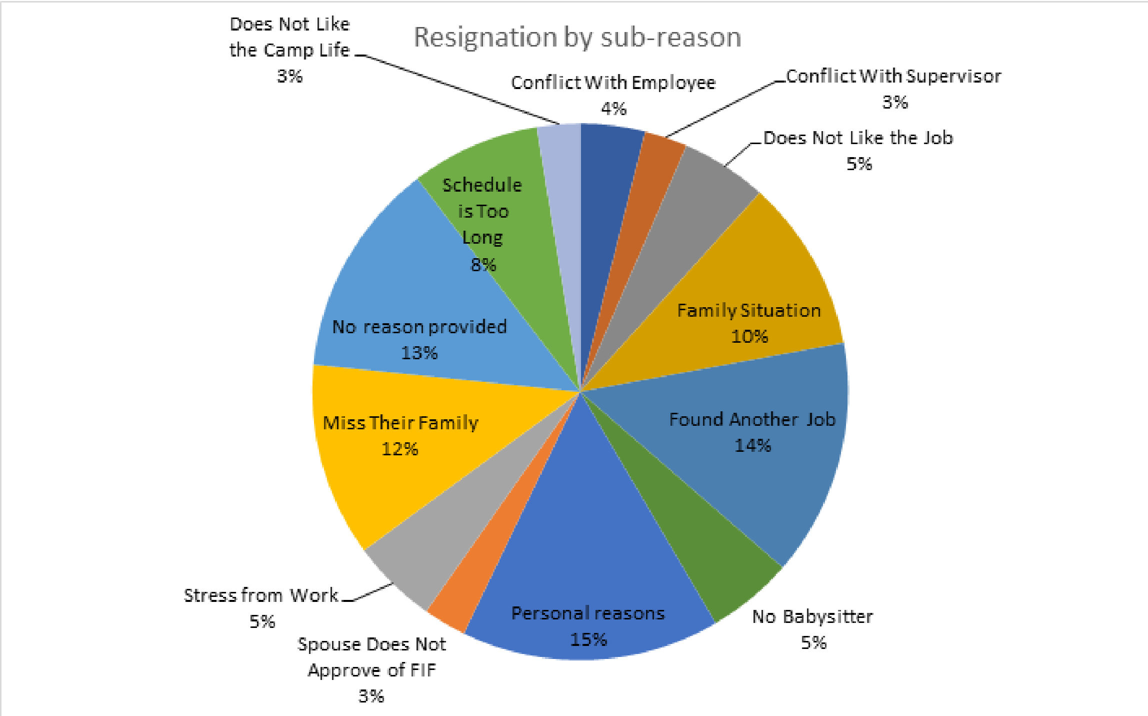
Agnico Eagle pays for the transportation of all Kivalliq-based employees from their home community to the mine for each work rotation. For employees coming from Arviat, Chesterfield Inlet, Rankin Inlet and/or Whale Cove, Agnico Eagle has a service contract with Calm Air to transport employees by charter 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. 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

Based on Agnico Eagle's past experience and testimonies of former employees, it was noted that many Inuit have never had full time work in their home communities, where full time employment opportunities are potentially limited. Many such individuals want a job, but working away from home for two weeks at a time in a structured industrial environment is a change that many have difficulty adapting to.

Exit interviews support this assumption and the table provides the reasons given for voluntary terminations.

Table 11-8 Reasons given for voluntary terminations



Agnico Eagle developed a new approach and has rolled out new initiatives with a focus on providing information, skills, and education to job applicants to ensure that they are better informed about what working life is like at a remote mine site, and to be better prepared to adapt, cope, and be successful in employment. The result is the development and implementation of a Labour Pool Program that consists of a linked series of activities, including:

- Community-based information sessions
- Community-based Work Readiness training
- E-learning for mandatory training
- Site Readiness training at Meadowbank
- On-Call Contract Program (optional)
- Employment with Agnico Eagle or contractors

The Labour Pool Program consists of a suite of activities that provide future employees with information, skills, and education for working life and conditions in a remote, fly in/fly out, industrial workplace. The On-Call Contract Program allows new employees opportunities to experience and adapt to a new work environment by practicing camp life for short periods of time.

Supervisors have commented that due to the suite of Labour Pool activities, on-call employees are better prepared to cope with the mine employment environment. The On-Call Program allows participants to discuss employment and upward mobility opportunities, gain a variety of employment experiences and decide if the mining work life is for them. The program also allows Agnico Eagle to assess employees to ensure proper placement within the Company.

Employee Turnover = (# of terminations / (Average # of employees for the year))

In 2019, Agnico Eagle had a total turnover of 21%. Non-Inuit turnover was 11% and Inuit turnover was 39%.

11.10.3.1.1.3 Summer Student Employment Program

Agnico Eagle offers two summer employment programs that are accessible to students. Firstly, Agnico Eagle's company-wide policy offers a summer employment program to the children of all Agnico employees (both Inuit and non-Inuit) that are undertaking postsecondary education. Secondly, in 2019 Agnico Eagle also offered the Inuit Summer Employment Opportunities postings, which is targeted to Inuit students in high school or post-secondary and tries to match students to positions in their areas of interest. In 2019, Agnico Eagle had one (1) Inuk employee hired through this posting. Agnico Eagle will continue to offer both programs in 2020 and continue to work in collaboration with the KivIA to encourage Kivalliq applicants to apply for the programs.

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.

11.10.3.2.1 Pre-employment training

The Labour Pool Process (formerly 'Labour Pool Initiative'), implemented in 2014 and revised in 2015, is based on an agreement between Agnico Eagle and the KivIA through the IIBAs to offer pre-employment opportunities to Inuit from all Kivalliq communities.

The goal of the program is to pre-qualify candidates from Kivalliq communities through 5 steps: employment information sessions, online application (facilitated by Employment Information Sessions), the Work Readiness Program, mandatory trainings (more details provided below), and the Labour Pool List (facilitated by the Labour Pool Coordinator).

All applicants that have the minimal requirements to be hired (must be at least 18 years old and have a clean record of employment with Agnico Eagle) are required to complete mandatory training by e-learning as well as participate in the 5-day Work Readiness and Site Readiness training programs. The objective is to create a pool of candidates ready to work that Agnico Eagle and its contractors can draw future employees from.

Figure 38 Labour Pool Process

11.10.3.2.1.1 Work Readiness Training Program

Agnico Eagle continues to utilize the Work Readiness Training program that was developed as a pre-employment initiative. In 2019, the Work Readiness Training was delivered in collaboration between Aglu Consulting. The Work Readiness program is the first step of the Labour Pool Process for those individuals who have applied online who do not have work experience relevant to the positions for which Agnico Eagle hires.

The objective of the program is for Inuit applicants to be better prepared for the work environment in an industrial setting. Graduates of the program are eligible to continue the Labour Pool Process and attend the mandatory trainings given on-site. The program provides coaching on a range of issues including: awareness of employers' unspoken expectations, communication in the workplace, and problem-solving skills for resolving workplace issues.

The program was implemented in April 2013. The program is delivered over a five-day period at the community level and is scheduled throughout the year. The program is delivered over a five-day period at the community level and is scheduled throughout the year. In 2019, the program was delivered by a visiting instructor in all seven Kivalliq communities resulting in 138 participants from various communities.

11.10.3.2.1.2 Mandatory Training (Site Readiness)

Participants that have successfully completed the Work Readiness Program will be retained for the Mandatory Training Program (called "Site Readiness") and then will become part of the Labour Pool.

The Mandatory Training Program is a five-day training provided at the Meadowbank and Meliadine site. Throughout the week, participants are enrolled in diverse activities such as mandatory training sessions, site visits, job initiation, information sessions on training and career opportunities, as well as interviews and discussions on employment opportunities with a Human Resource representative to assess career ambitions and identify work interest.

Afterwards, candidates wanting to work for the Camp Department are given short term on-call assignments. All other applicants become part of the Labour Pool list until a job opportunity matching their interest and competencies becomes available.

In 2019, 178 candidates participated in the Mandatory Training.

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 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.

- Education

- Emergency Response Training (ERT)

The following table provides the training hours provided to Agnico Eagle employees at Meadowbank and Whale Tail (excluding contractors) in 2019.

Table 11-9 2019 Training hours

Type of Training	Inuit	Non-Inuit	Total
Mandatory	1,599	7,116	8,715
General	783.5	1,792	2,576
Specific	14,238	10,303	24,541
Education	430	0	430
ERT	276	2,312	2,588
Total	**17,326.5**	**21,523**	**38,850**

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, as well as information on the IIBAs and archaeological awareness. The e-learning training material has been translated into English, French, and Inuktitut.

In 2019, the revision of the 6 e-learning modules of the Mandatory Training started. They will be re-built in 2020.

11.10.3.2.3.2 Cross-Cultural

Implemented in 2010 at Meadowbank, the Cross Cultural Training Program has been provided to numerous employees. It is a 5 hour in-class training course. This course allows employees from different cultures and backgrounds to understand each other's culture in order to improve understanding and communication at the workplace.

The program was revisited with the assistance of the Nunavut Literacy Council in 2013, and a revised program was initiated in 2014. This program is mandatory for all Agnico Eagle employees and contractors who will be on site for six months or more. The training is in English, Inuktitut and French, and is offered at both Meadowbank and Whale Tail (and it is possible for employees to attend sessions at the other site).

In 2019, Meadowbank and Whale Tail held 14 sessions.

11.10.3.2.3.3 Career Paths

The Career Path Program was designed in 2012, with the intention of supporting upward mobility of Inuit employees at Meadowbank and Whale Tail. This program identifies the incremental steps that any employee is required to complete to advance in their chosen career of interest.

The objective is to have only internal promotions of employees, with external candidates being hired only as an entry level position to feed the trainee programs at the base.

In 2019, five (5) Career Paths were used at Meadowbank: Energy and Infrastructure, Process Plant, Underground, Mine, and Drill & Blast. This year, the Mine Career Path was updated in order to show the evolution of the operations by adding a section for the Long Haul Truck.

11.10.3.2.3.4 Haul Truck Trainee

The Haul Truck Trainee program is a 28-day (336 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 (dishwashers, janitors, chambermaids, etc.). In order to provide the best training possible to all the trainees, there is a maximum of 4 trainees at a time with one trainer.

This year, 8 trainees (4 men and 4 women) were enrolled in the Haul Truck Trainee Program. Among those, a total of 6 trainees successfully completed the program.

11.10.3.2.3.5 Process Plant Trainee/Super Operator Program

With the success of the Haul Truck Trainee Program, a Process Plant Trainee Program was developed in 2015. The 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.

Implemented in the second half of 2016, the Super Operator Program is an extension of the Process Plant Trainee Program. This 168-hour training is provided to employees who have successfully completed the Process Plant Trainee Program. The extension of the Process Plant Trainee Program will consist in teaching the basics of maintenance principles in order to have employees with more diversified skills in the Process Plant Department. These employees will eventually be able to perform specific basic maintenance repairs throughout the plant.

In 2019, no trainees were enrolled in the Process Plant Trainee/Super Operator Program. No trainee programs were run this year due to the transition between Meadowbank Operation to Whale Tail.

11.10.3.2.3.6 Long Haul Trainee

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 mine department. In order to provide the best training possible to all the trainees, there is a maximum of 4 trainees at a time with one trainer.

The 2019, the pilot program was still in development, so no trainees were enrolled in the Long Haul Truck Trainee Program.

11.10.3.2.3.7 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 also have the opportunity to challenge their Red Seal Exam. Currently, we offer (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 2019, one (1) employee completed his apprenticeship training with Agnico. Two (2) apprentices went to technical training in Nunavut and six (6) in Alberta. At the end of 2019, there were 8 apprentices and pre-apprentices at Meadowbank and 2 apprentices and pre-apprentices at Meliadine.

Since 2015 a total of (6) six employees, completed their apprenticeship training within Agnico Eagle.

11.10.3.2.3.8 Adult Educator

A permanent Adult Educator (based on-site at Meadowbank) was hired in June 2018 to support Agnico Eagle employees in developing their numeracy, literacy, and soft skills in order to assist employees in accessing higher job positions and to be successful in their apprenticeships. The Adult Educator works with pre-apprentices to help them gain the academic skills and confidence to successfully pass their trade’s entrance exam, as well as apprentices to support them in their level exams. Instruction takes place during an employee’s workday and is specific to their learning needs.

The Adult Educator is also tasked with planning and implementing school-based initiatives such as TASK week.

11.10.3.2.3.9 Emergency Response Team (ERT) training

At Agnico Eagle Mines Ltd., the most important priority is to keep employees safe. Meadowbank and Whale Tail Emergency Response Team (ERT) consists of internal employees that volunteers to respond to emergencies such as fire. Currently there are 94 active ERT members out of which 9 are Inuit members. In 2019, 4 basic mine rescue courses were given in order to on-board new ERT members for Meadowbank and Whale Tail site. In addition, 45 training sessions were given that included weekly practices, mock scenarios and trainings for two competitions held in Yellowknife and Fernie.

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 2nd, 2018 and Operations Phase staff schedules have been sent to NIRB on April 25th, 2019 with an updated Version on June 25th, 2019 (Appendix 54).

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 2019, Agnico Eagle and the Government of Nunavut's Acting Regional Manager of Career Development met at Meadowbank site. Items discussed were job ads and online applications, summer employment, gap year/high school graduate opportunities, OETIO and trades training, contractor information, college student opportunities, and work readiness and career paths.

GN provided many suggestions on improvements or areas for collaboration. A follow up meeting is scheduled in the new year.

11.11.1.3 *Listing of Formal Certificates and Licences*

As required by NIRB Project Certificate No.008, Condition 52: ***The Proponent should develop and maintain an easily referenced listing of formal certificates and licences that may be acquired via on-site training or training during project employment. The listing shall indicate which of these certifications and licences 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.***

The LMA and IWBS was submitted to NIRB on March 6th, 2019. Additionally, results was presented to KvSEMC in April 2019, and incorporated into the 2018 SEMR submitted on June 29th, 2019. LMA and IWBS Reports can be respectively found in Appendix 60 and 61 of the 2018 Annual 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.***

The Meadowbank and Whale Tail clinics collaborate with the health centres on STI referrals and treatment and transport of workers. Agnico Eagle has not heard concerns from community health care providers about the process of transitioning the employee from site-care to community care, however, Agnico Eagle would like to be able to consistently reach and exchange information with community health centres, which is currently a challenge. Unfortunately, no Government of Nunavut Department of Health representative attended the 2019 Kivalliq SEMC, where health impacts and collaboration are normally discussed. Agnico Eagle will look to establish a forum under TC58 where improvements can be discussed in 2020.

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.***

Agnico Eagle actively engaged with Nunavut Housing Corporation (NHC) in throughout 2019 through the GN MOU Housing Committee. An additional meeting took place on April 12th, 2019. NHC is currently working on a curriculum and tools for financial literacy that will be shared with Agnico Eagle.

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, 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's 2017 and 2018 PEAMP reports, and discussions by phone with NIRB representatives in November 2019, Agnico 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;

3) Agnico recognizes the following recommendation, but asserts at this time that it is not a requirement of the PEAMP according to the Project Certificate:

4) 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.

12.2 PEAMP EVALUATION

To fulfill Items A through D described in Appendix D of the Meadowbank Project Certificate, 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 Project and the Whale Tail Project (Cumberland, 2005; Golder, 2016). A conceptual model of the PEAMP evaluation process is provided in Figure 39. 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.

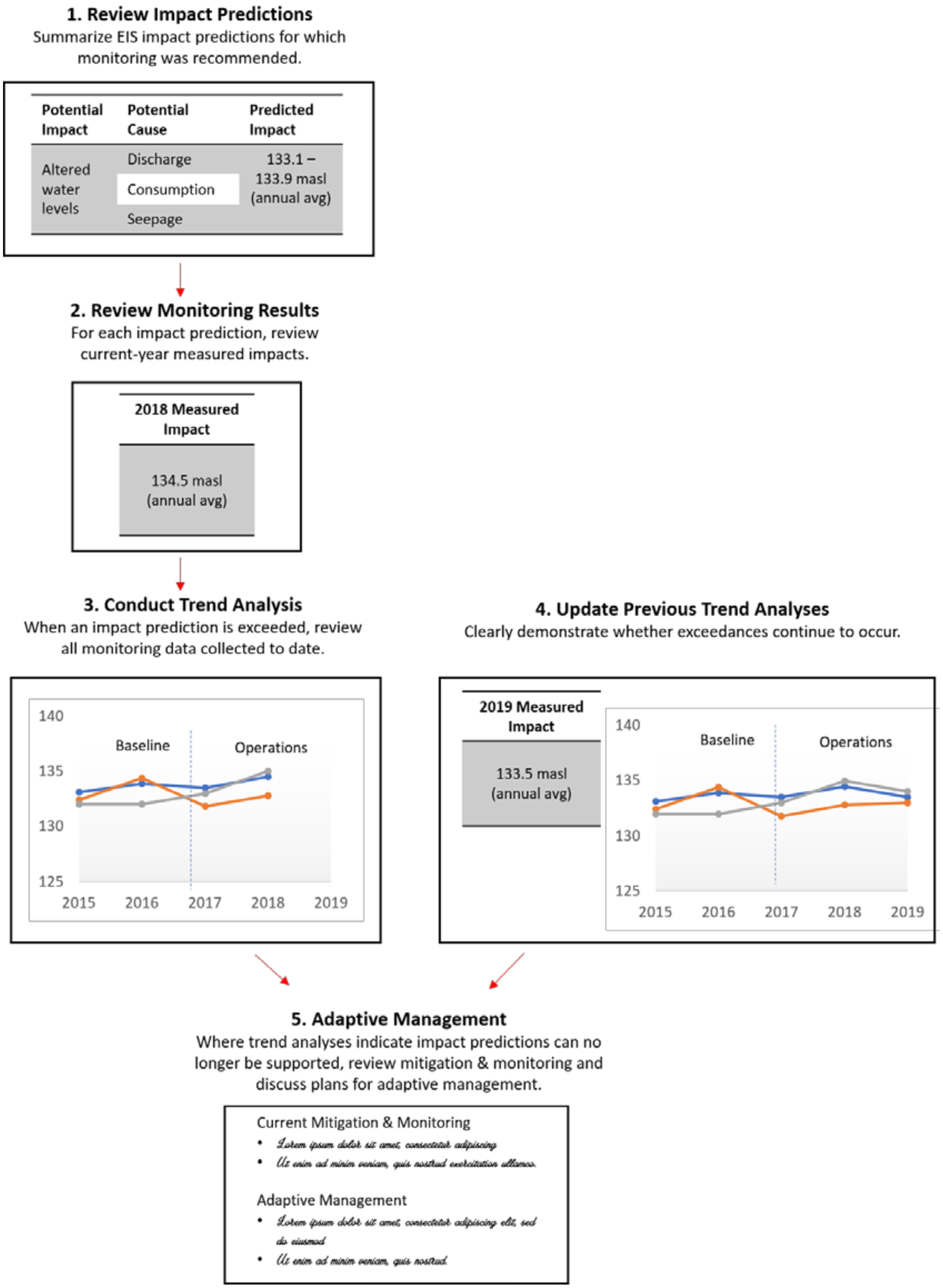
Part 3: When current monitoring results do not support an impact prediction (i.e. current-year measured impacts are outside of the range of predicted impacts), a trend analysis is conducted to review baseline and all monitoring data to date. A discussion of those results is provided.

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 39 Conceptual model of the PEAMP evaluation process



12.3 MEADOWBANK PEAMP EVALUATION

For each VC, the completed PEAMP evaluation is presented in Sections 12.3.1 – 12.3.6, below, according to the six categories of assessment included in the EIS (Aquatic Environment, Wildlife and Terrestrial Environment, Noise Quality, Air Quality, Permafrost, and Socio-Economics).

References for the original impact predictions within the Project FEIS are provided in Appendix A, Table A-1.

12.3.1 Aquatic Environment

Key mine development activities that could result in changes to the aquatic receiving environment include: East Dike construction (2008), Bay-Goose Dike construction (2009-10), dewatering of both lakes and impoundments (2009-11, 2013), effluent discharge (2012 to present), and general site-related mining activities that mostly generate dust (e.g., rock crushing, blasting, ore and waste hauling; 2008 to present).

Within the FEIS, impacts to the aquatic environment potentially generated through these activities are described for water quantity, water quality, and fish/fish habitat. Predicted and measured residual impacts for each of these areas are described below.

12.3.1.1 *Water Quantity*

12.3.1.1.1 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 accuracy of these predictions in 2018 & 2019 (measured impacts) are provided in Table 12-1. 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 12.3.1.1.2. 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 12-1 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 12.3.1.1.2. **Impact prediction not well defined – trend analysis provided in Section 12.3.1.1.2.

Potential Impact	Potential Cause(s)	Proposed Monitoring	Actual Monitoring	Predicted Impact	Measured Impact	
					2018	2019
Altered (reduced) water levels in Third Portage Lake	Potentially high seepage rates (from lakes into pits)	Monitor pit seepage rates	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 See Section 12.3.1.1.2
	Freshwater consumption (Third Portage Lake)	Monitor freshwater use	Freshwater use monitored	FEIS: 0.53 M m^3/yr (Year 5 – 8) NWB Water License 2AM-MEA1526 Part E, Item 1: 4,935,000 m^3	1,027,159 m^3	2,229,589 m^3
	Discharge from Portage Attenuation Pond	Monitor discharge volumes and timing	Discharge volumes monitored	458,400 m^3/yr (max)	No discharge in 2018	No discharge in 2019
	Non-contact water diverted from Second Portage Lake drainage into TPL	Monitor discharge volumes of non-contact water	Lake levels monitored	No change in lake level (modeled range = 133.82 – 134.19 masl)	133.55 – 133.86 masl	133.46 – 133.74 masl See Section 12.3.1.1.2
Altered water levels in Second Portage Lake	Potentially high seepage rates (from lakes into pits)	Monitor pit seepage rates	Lake levels monitored	Dike seepage rates predicted at 10^{-2} – 10^{-4} L/s/m of dike; Minor effect on lake level (baseline = 133.1 masl)**	132.86 – 133.10 masl**	132.75 – 133.07 masl**
	Non-contact water diverted from Second Portage Lake drainage	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**
Increased water levels in Wally Lake	Discharge from Attenuation Pond	Monitor discharge rates	Monitored discharge rates	Minimal increase in water levels** Total average annual discharge is approximately 456,450 m^3 during open water months	No discharge; 139.25 - 139.66 masl**	No discharge; 139.34 – 139.65 masl** See Section 12.3.1.1.2
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** See Section 12.3.1.1.2

12.3.1.1.2 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.

12.3.1.1.2.1 ***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).

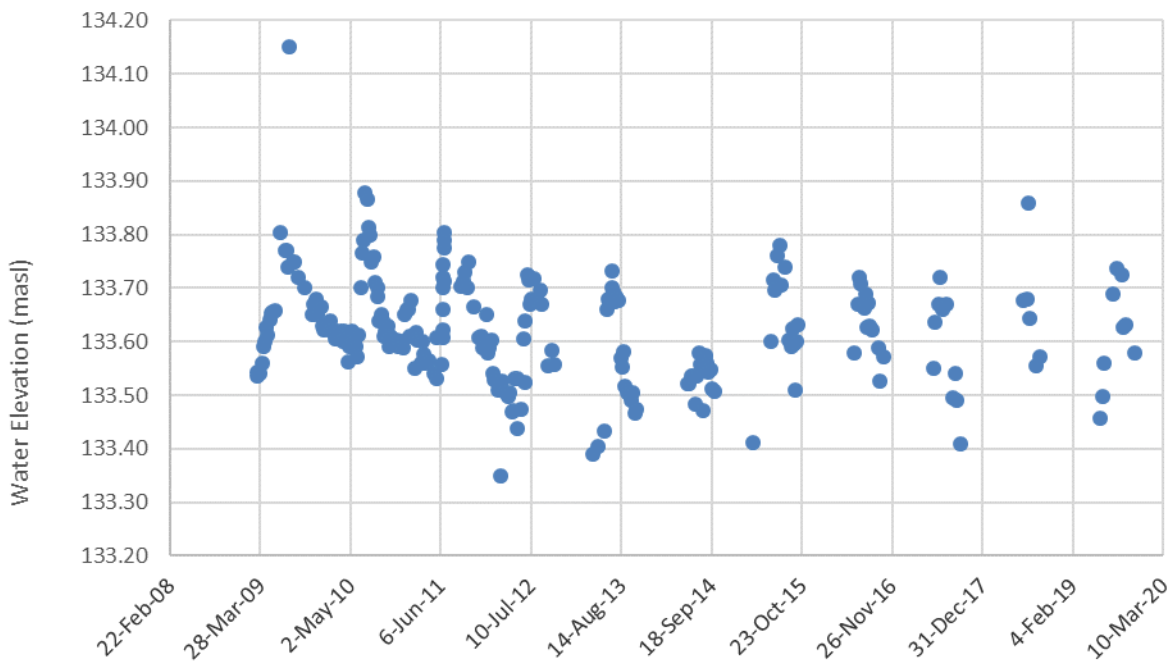
Turn Lake – no significant impact (not quantitative).

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 14th, 2009 (133.54 masl). Pumping rates of freshwater from Third Portage Lake remained well within license limits in 2019, and water levels do not appear to have changed significantly since monitoring began (2009) (see Figure 40). 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.

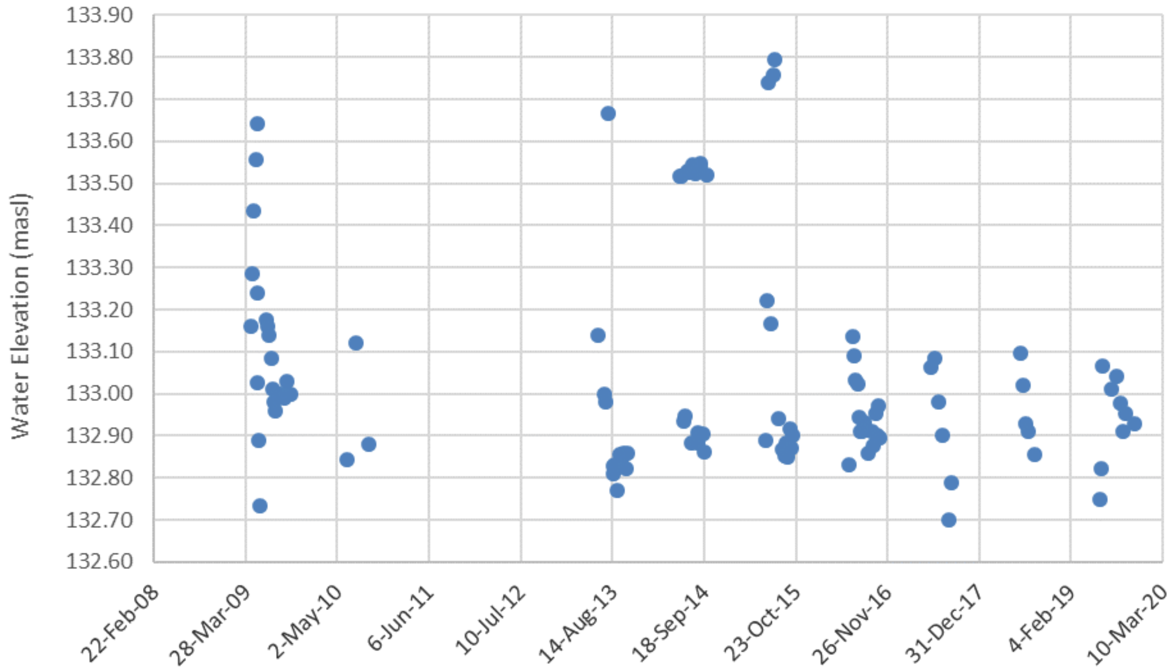
Figure 40 Measured water levels in Third Portage Lake (2009 – 2019)



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 41).

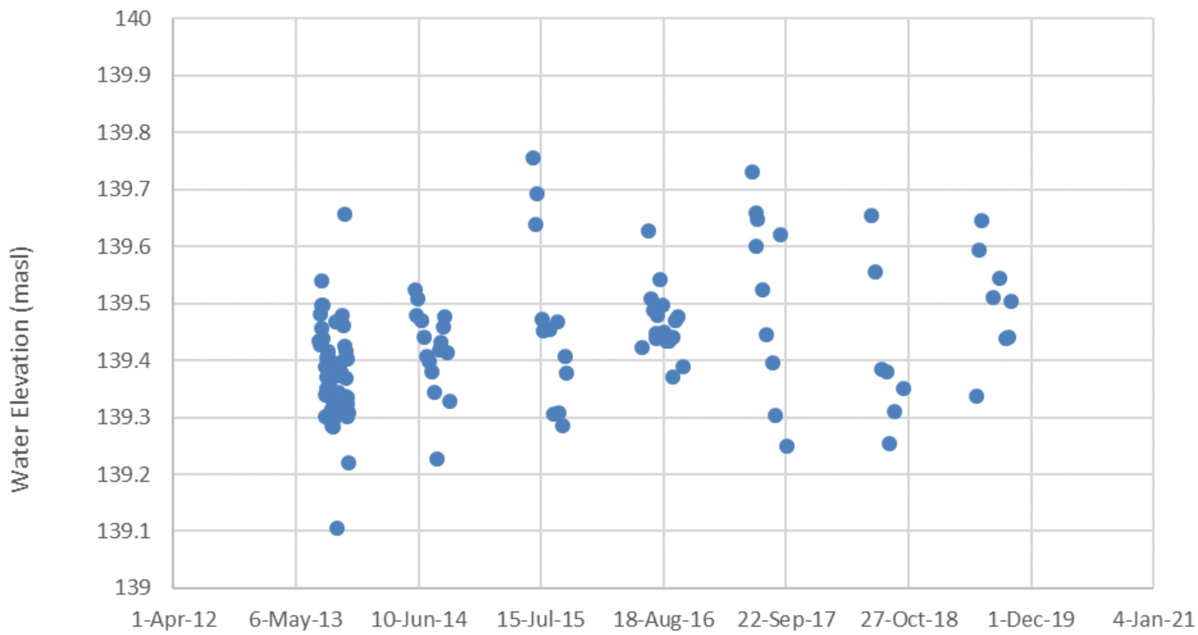
Figure 41 Measured water levels in Second Portage Lake (2013-2019)



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 42).

Figure 42 Measured water levels in Wally Lake (2013-2019)



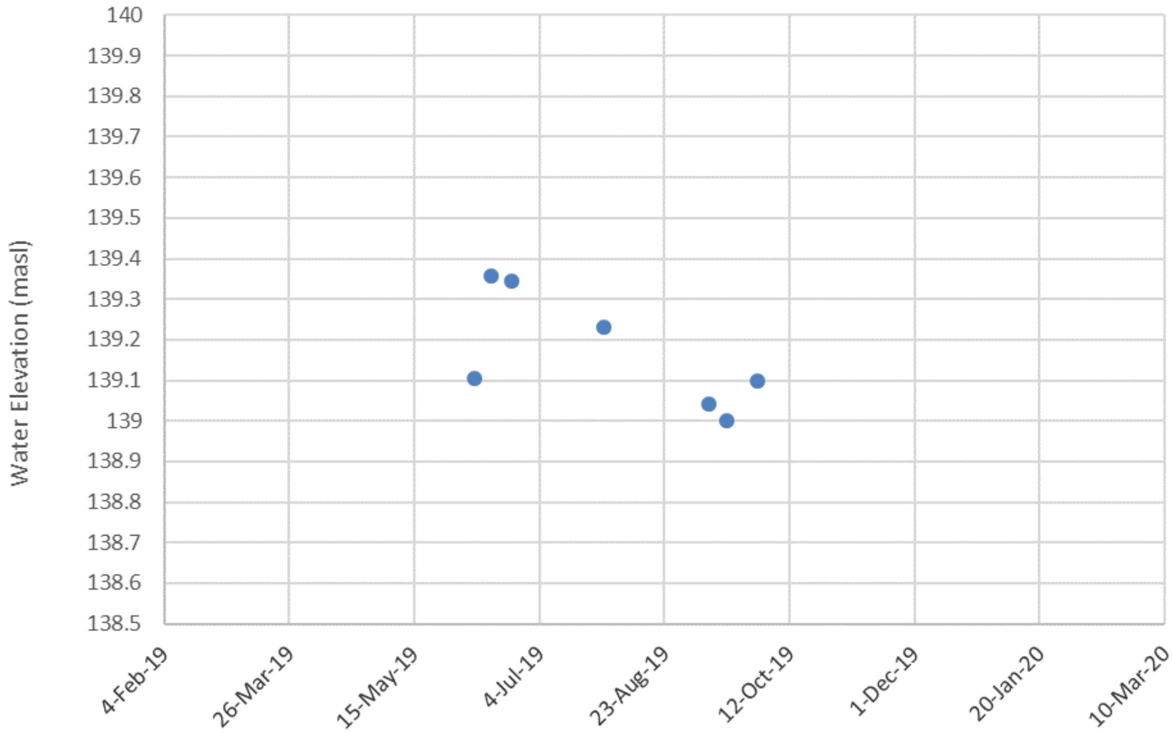
Turn Lake

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 43). Trends will begin to be assessed after at least two years of monitoring.

Figure 43 Measured water levels in Turn Lake (2019)



12.3.1.1.3 Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management

Effectiveness of Monitoring

Although FEIS predictions for changes to water quantity were rarely quantitative, the monitoring programs being implemented at the Meadowbank site 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 2019 is provided in Table 12-2. Mitigation measures related to water quality and fish and fish habitat are provided in Section 12.3.1.2 and 12.3.1.3, respectively.

Table 12-2 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 (2019)
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.

Adaptive Management

Since no exceedances of FEIS predictions or updated license limits occurred, existing mitigation measures are considered to be effective as designed, and no adaptive management measures are proposed for 2019.

12.3.1.2 *Water Quality*

12.3.1.2.1 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 12-3, 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 2019 CREMP report (2018 Annual Report; Appendix 35) 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 of the 2019 Annual Report.

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 12-3 below. If exceedances occurred, cells are highlighted in grey and a discussion is provided in Section 12.3.1.2.2.

In addition, annual Meadowbank CREMP water chemistry data 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 2019 CREMP report; Appendix 35). Exceedances of these model predictions are noted in Table 12-3, and a full discussion is provided in Section 12.3.1.2.2.

Table 12-3 Predicted and measured impacts to water quality. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.3.1.2.2. Potential impacts as described in Cumberland, 2005; Table B5.2 and the Physical Environment Impact Assessment Report (2005) for receiving environment water quality

Potential Impact	Potential Cause(s)	Proposed Monitoring	Actual Monitoring	Predicted Impact	Measured Impact	
					2018	2019
Impaired Wally Lake water quality	Vault attenuation pond effluent discharge; dike leaching	Effluent and receiving environment monitoring	Receiving environment: CREMP water quality monitoring	CREMP results <CWQG except arsenic and cadmium.	CREMP results all <CWQG	
				Measured concentrations within model predictions	Some exceedances of model predictions* - see Section 12.3.1.2.2	
			Effluent monitored under MDMER, NWB Water License	Effluent: <MDMER	No effluent discharged.	
Impaired Second Portage Lake water quality	Portage Attenuation pond effluent discharge; dike leaching; (East Dike seepage)	Effluent and receiving environment monitoring	Receiving environment: CREMP water quality monitoring	CREMP results <CWQG except cadmium	CREMP results all <CWQG	
				Measured concentrations within model predictions	Some exceedances of model predictions*- see Section 12.3.1.2.2	
			Effluent monitored under MDMER, NWB Water License	Effluent: <MDMER, Water License	Effluent: <MDMER and Water License Criteria	
Impaired Third Portage Lake water quality	Portage Attenuation pond effluent; dike leaching	Effluent and receiving environment monitoring	Receiving environment: CREMP water quality monitoring No effluent monitoring required.	CREMP results <CWQG except cadmium	CREMP results all <CWQG	
				Measured concentrations within model predictions	Some exceedances of model predictions*- see Section 12.3.1.2.2	

12.3.1.2.2 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.

12.3.1.2.2.1 FEIS Model Predictions for Water Quality

FEIS Prediction: Concentrations <CCME water quality guidelines; “low” magnitude of effects.

Discussion: As described in the 2018 and 2019 CREMP Reports, a number of measured parameters 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 results 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.

In 2018 and 2019, parameters with results commonly exceeding concentrations predicted in the FEIS water quality model were: ionic compounds (calcium and magnesium), hardness, and total alkalinity. Historical results for these constituents are shown in Figures 44-47 (from 2019 CREMP Report, Section 4.7). 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, Appendix J) 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.

Chloride, fluoride, nitrate, and sulphate also exceeded the FEIS predictions for Third Portage Lake, Second Portage Lake, and Wally Lake in at least one sample in 2018 and 2019, along with ammonia in 2019. For chloride, nitrate, and sulphate, no results exceeded CREMP triggers (95^{th} percentile of baseline) indicating current concentrations are representative of pre-development conditions. Occasional exceedances of triggers occurred for ammonia and fluoride, but exceedances also occurred at reference stations, indicating there were other regional factors influencing concentrations of these parameters throughout the watershed, so these constituents are also considered to represent a “low” magnitude of impact. Historical results for these parameters are provided in Figures 48 - 52.

Most metals were below the FEIS model predicted concentrations except for silicon (all three lakes), strontium (Third Portage Lake) and isolated instances of aluminum, copper, iron, manganese (2018 and 2019), silver (2018) and chromium (2019). Silicon and strontium consistently exceeded the model predictions, but importantly did not exceed the CREMP triggers (95th percentile of baseline) indicating current concentrations are representative of pre-development conditions. Historical results for silicon and strontium are provided in Figures 53 and 54. Golder was consulted regarding the accuracy of the FEIS predictions for silicon and strontium given that current concentrations in Third Portage Lake, Second Portage Lake, and Wally Lake consistently exceed the predicted concentration. In water quality modeling, constituents such as silicon and strontium that were not reported in the 2003 baseline dataset were assumed to be zero (V. Bertrand, pers comm, March 30th, 2020). The full suite of analytes currently included in the CREMP water quality analysis weren’t available in the early stages of the program, hence, the absence of concentration data for silicon and strontium during the baseline phase. The predicted silicon and strontium concentrations are, therefore, an underestimate of the actual baseline concentrations. Silicon and strontium are not suitable for evaluating the accuracy of the FEIS predictions, and moving forward, both parameters will be excluded from the FEIS assessment.

While occasional measurements of aluminum, copper, iron, manganese, and silver also exceeded FEIS water quality modelling predictions, no measurements exceeded CREMP trigger values (95th centile of baseline) or CCME guidelines. A single sample exceeded the CREMP trigger for chromium (TPE, September, 2019), so these constituents are also considered to be consistent with a “low” magnitude of impact. Historical results for these parameters are provided in Figures 55 - 60.

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.

Figures of historical results for all other water quality parameters measured under the CREMP are provided in the 2019 CREMP Report (Appendix 35 of the 2019 Annual Report - Section 4.7 and Appendix B1, Figures B1-1 – B1-34).

Figure 44 Total calcium (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value

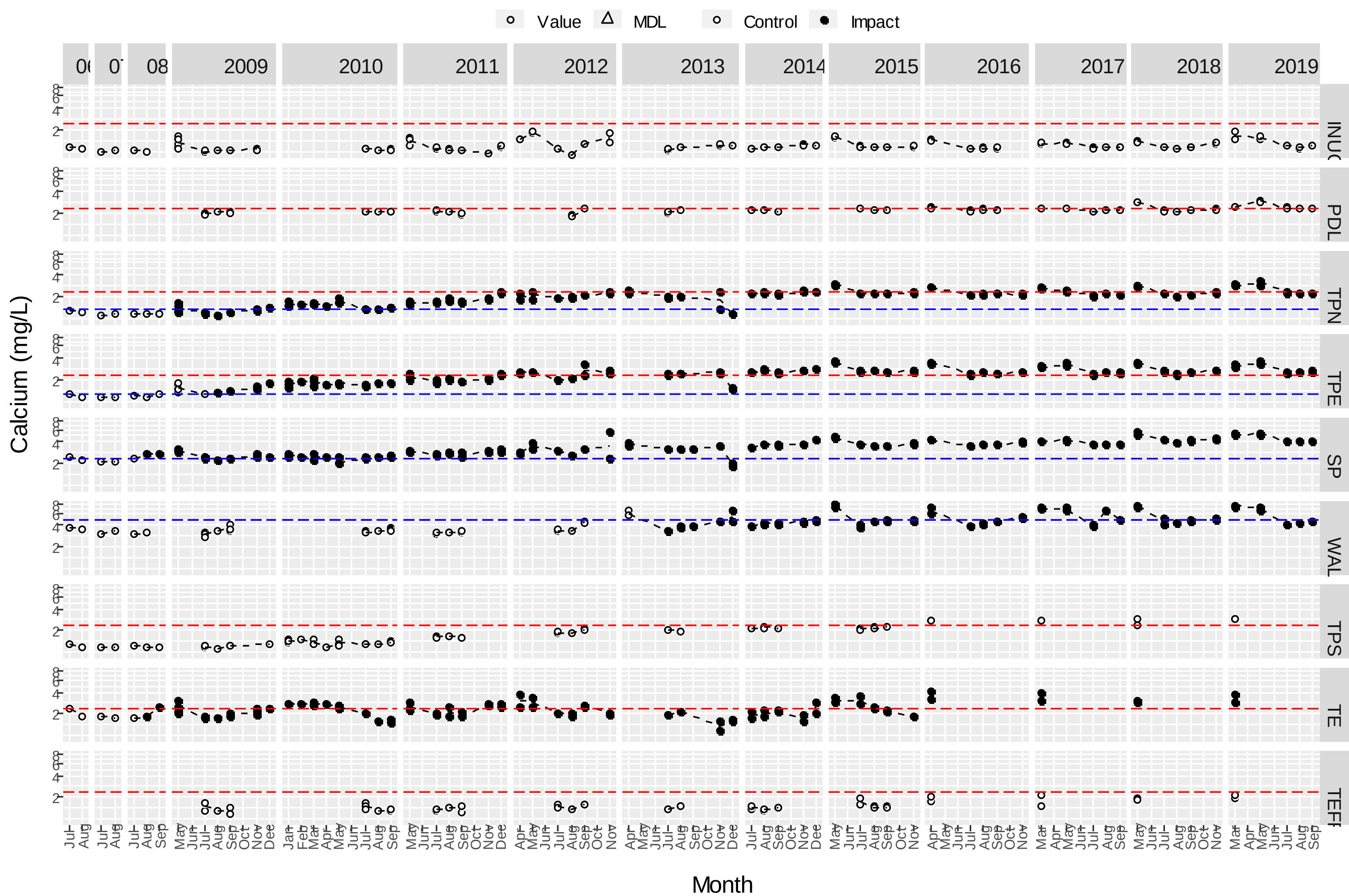


Figure 45 Total magnesium (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value

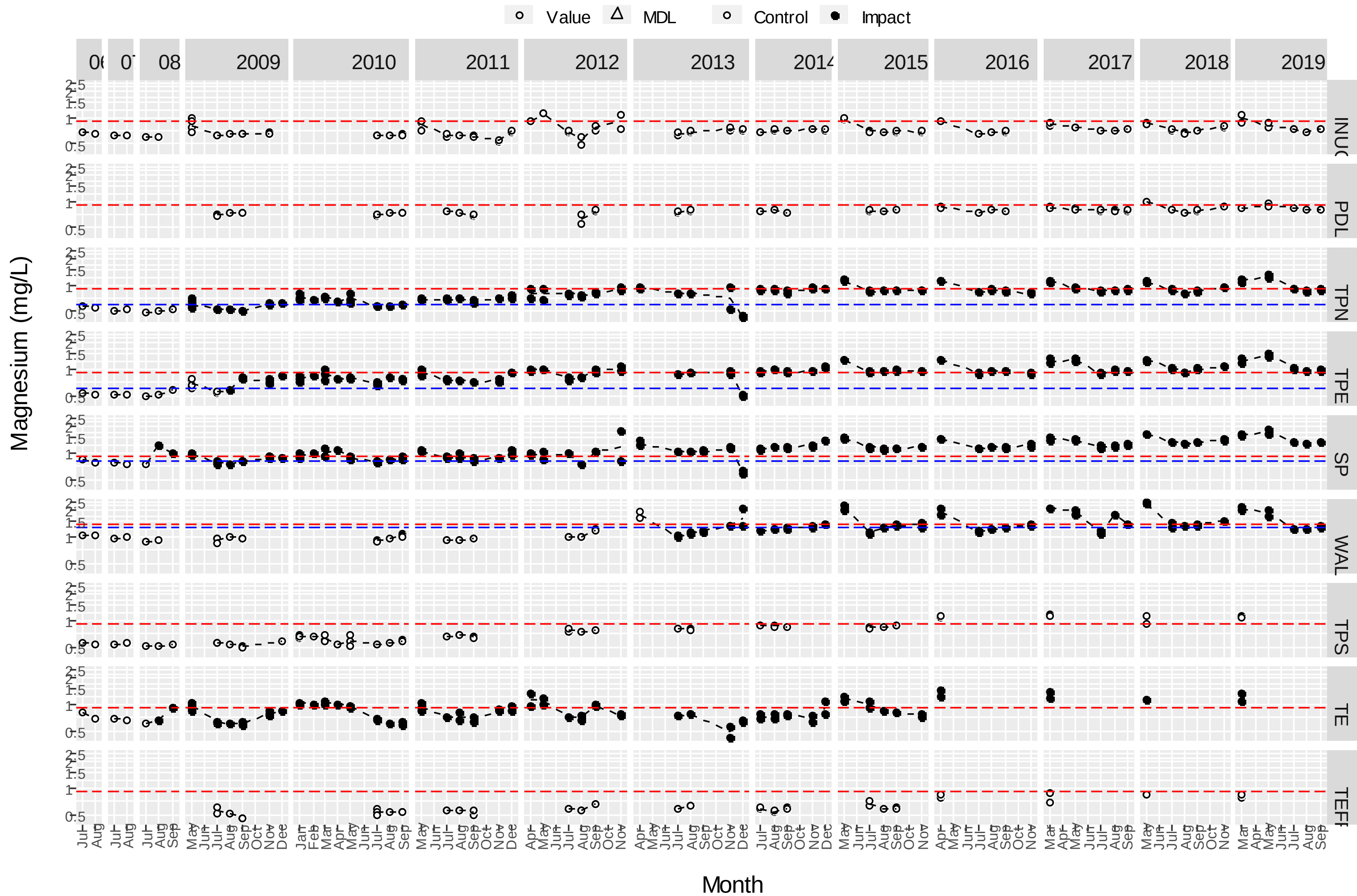


Figure 46 Laboratory-measured hardness (mg/L) in water samples from Meadowbank Study lakes since 2006. Note: The red dashed line = CREMP trigger value

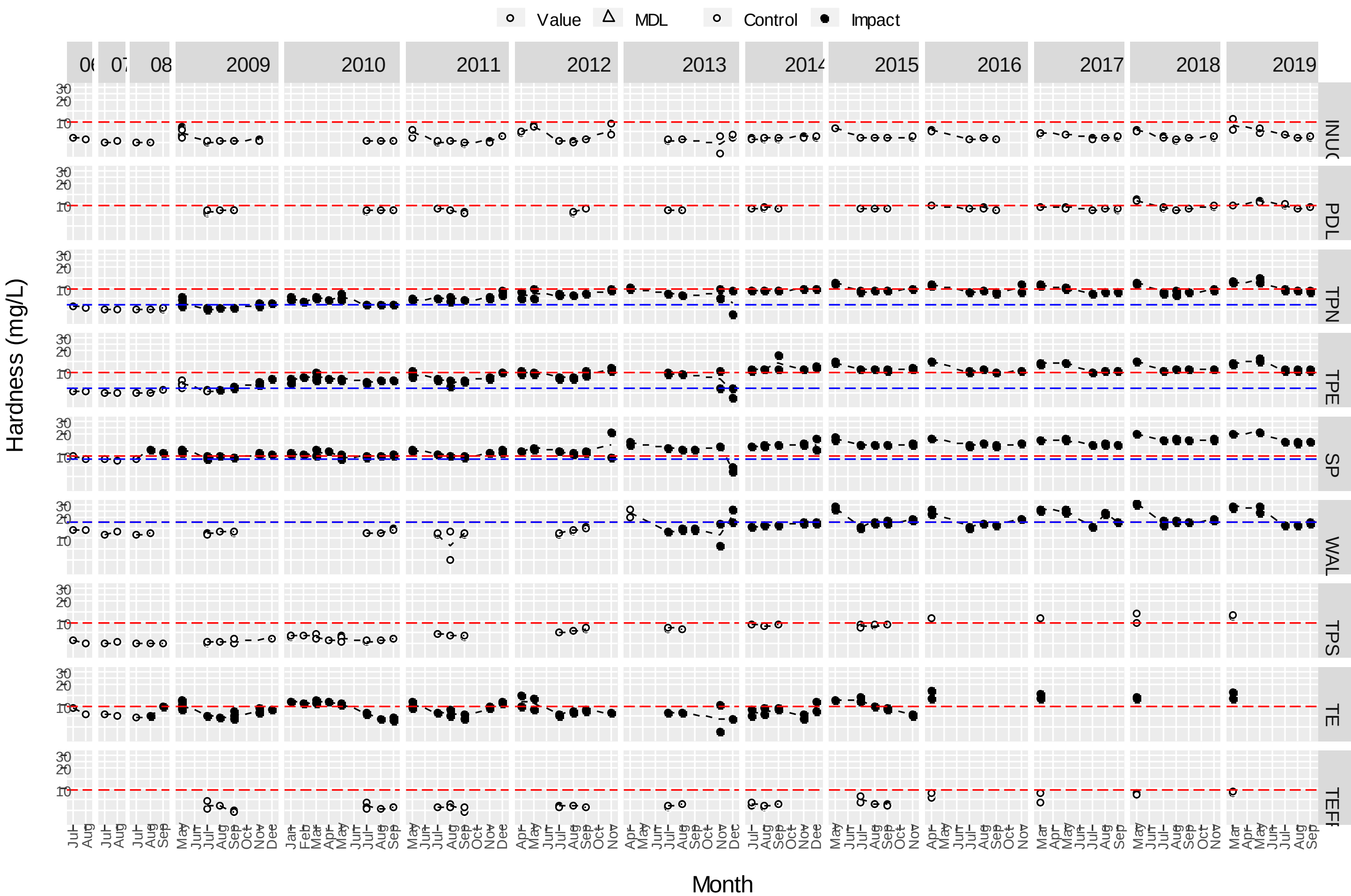


Figure 47 Total alkalinity (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value

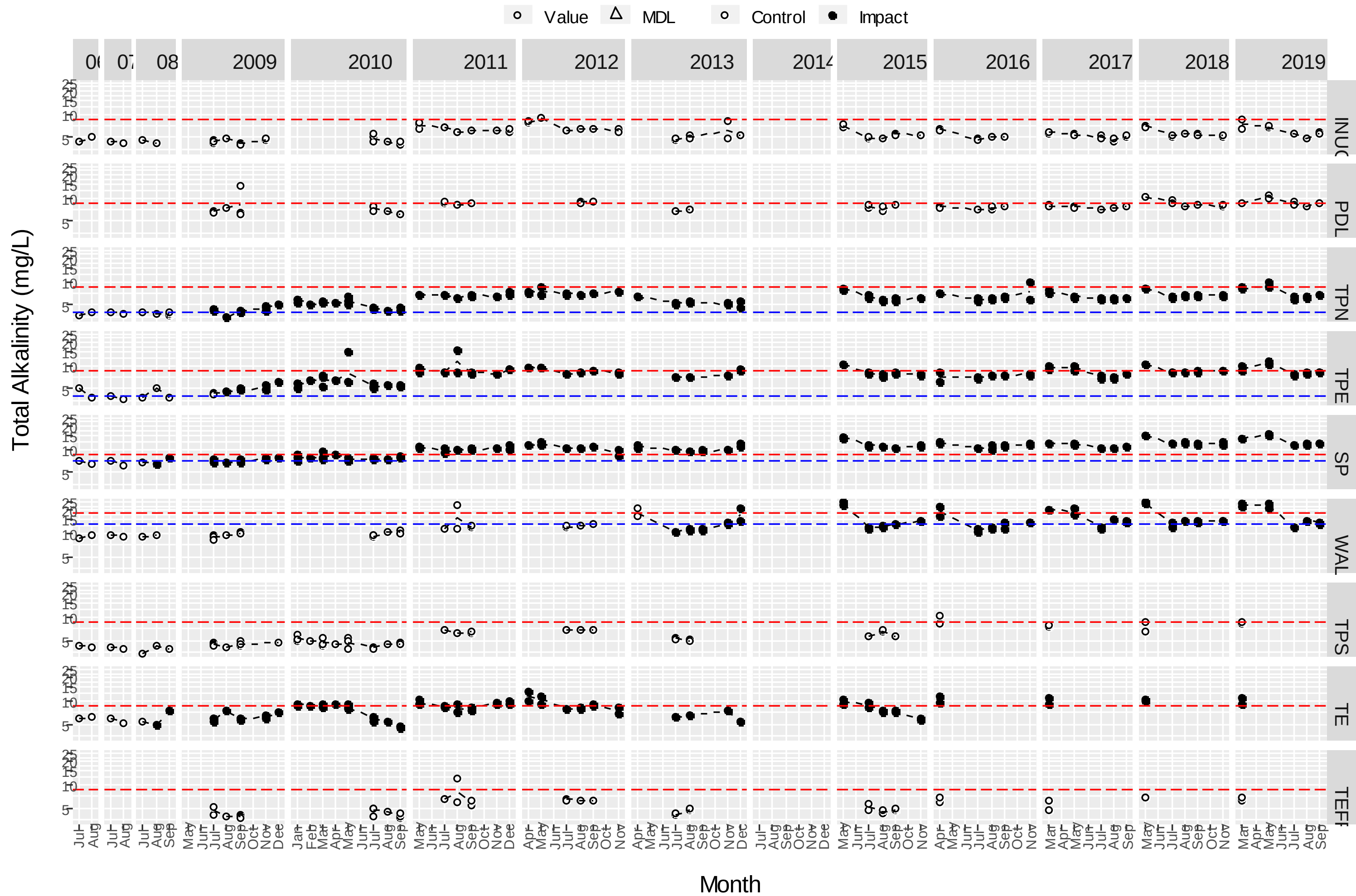


Figure 48 Chloride (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value

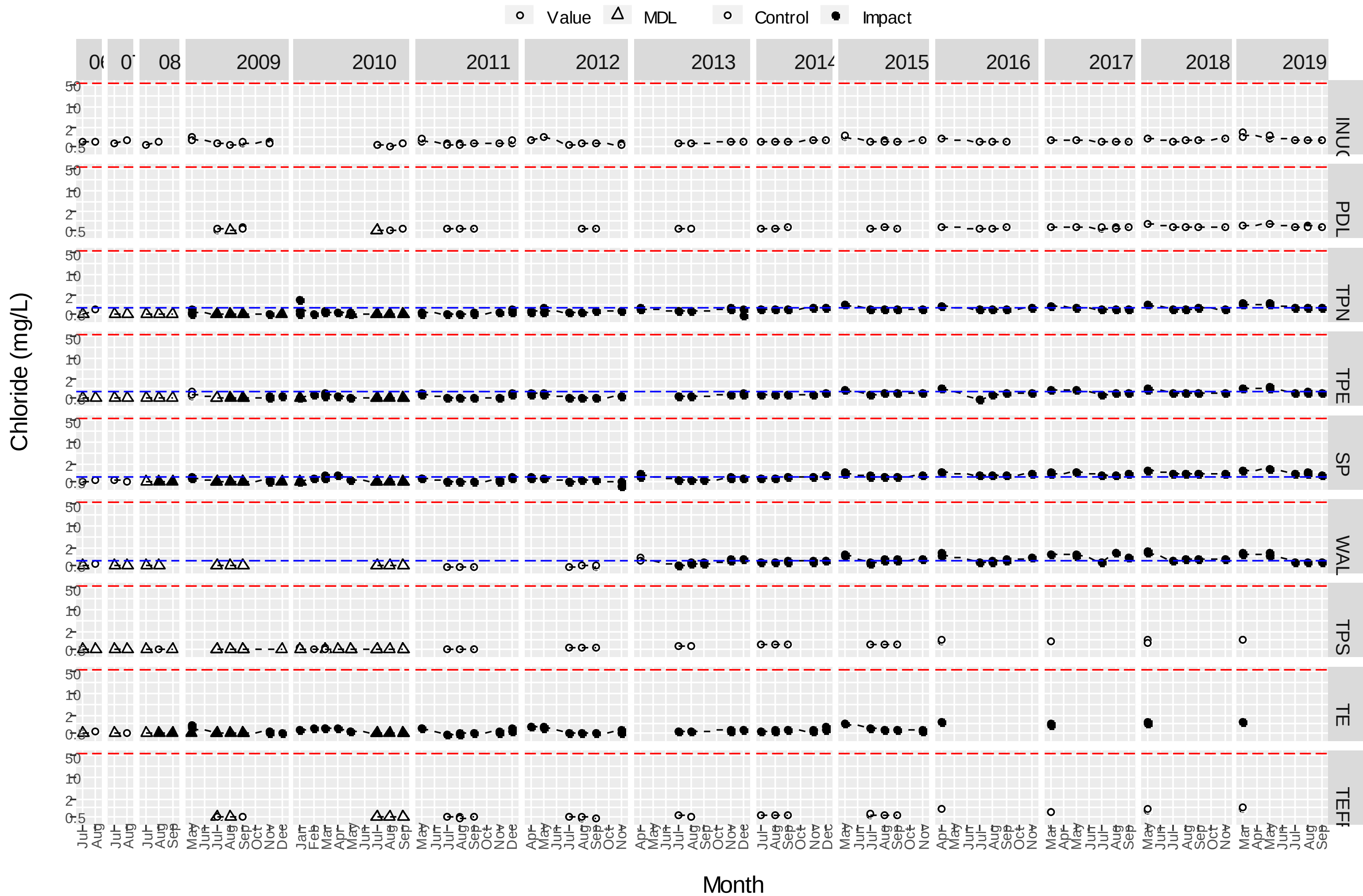


Figure 49 Fluoride (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value

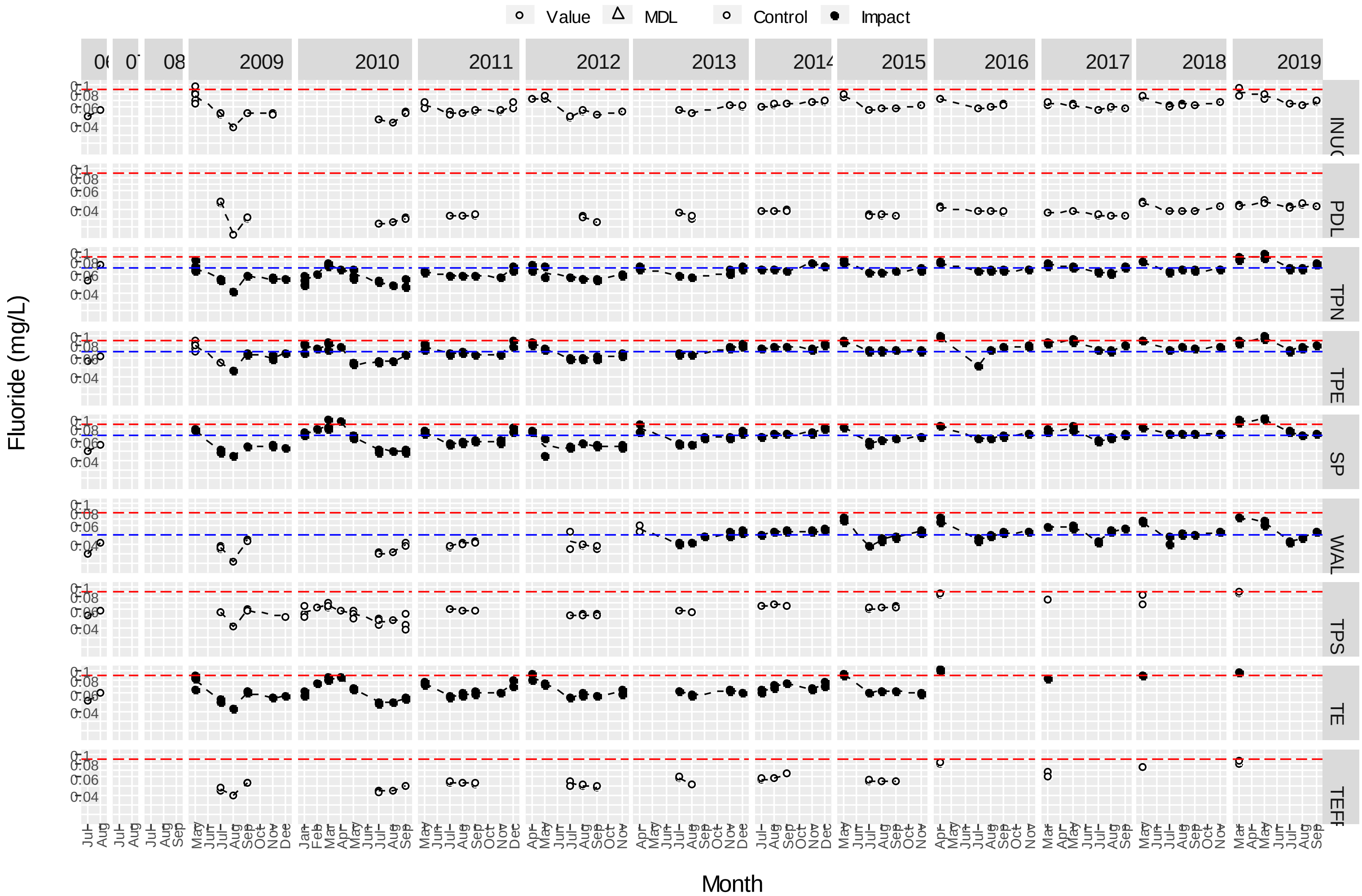


Figure 50 Nitrate-N (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value

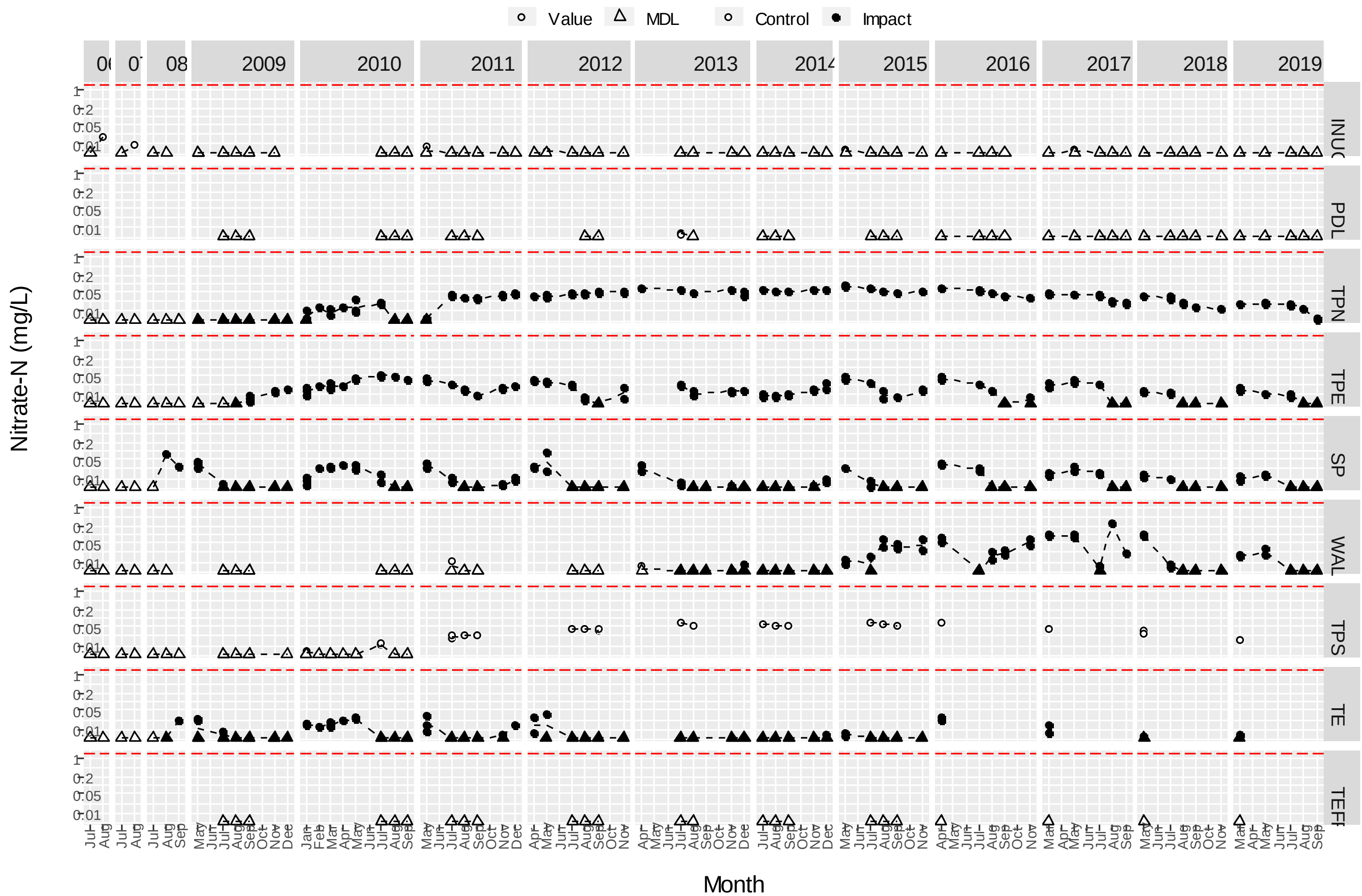


Figure 51 Ammonia-N (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value

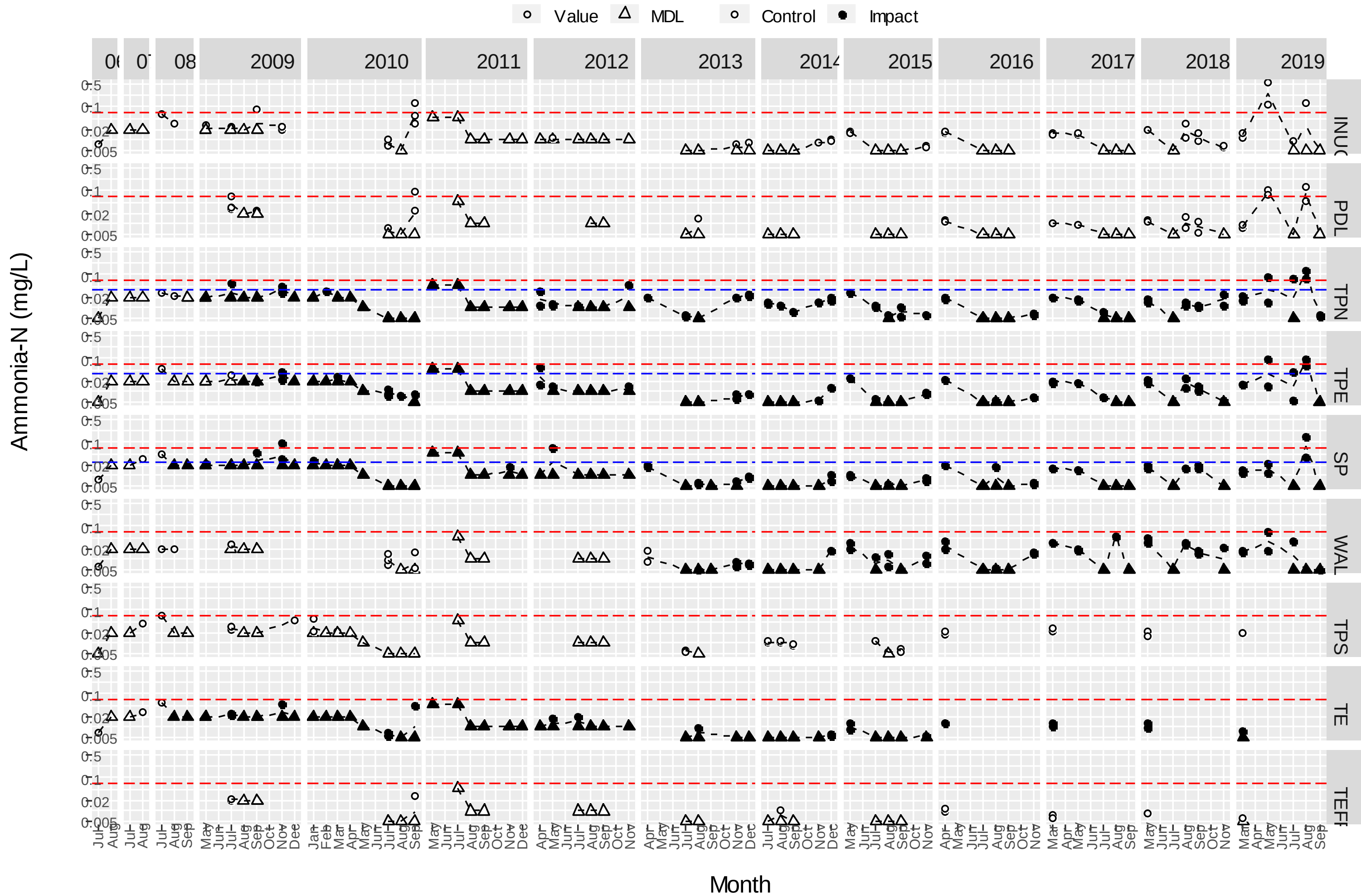


Figure 52 Sulphate (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value

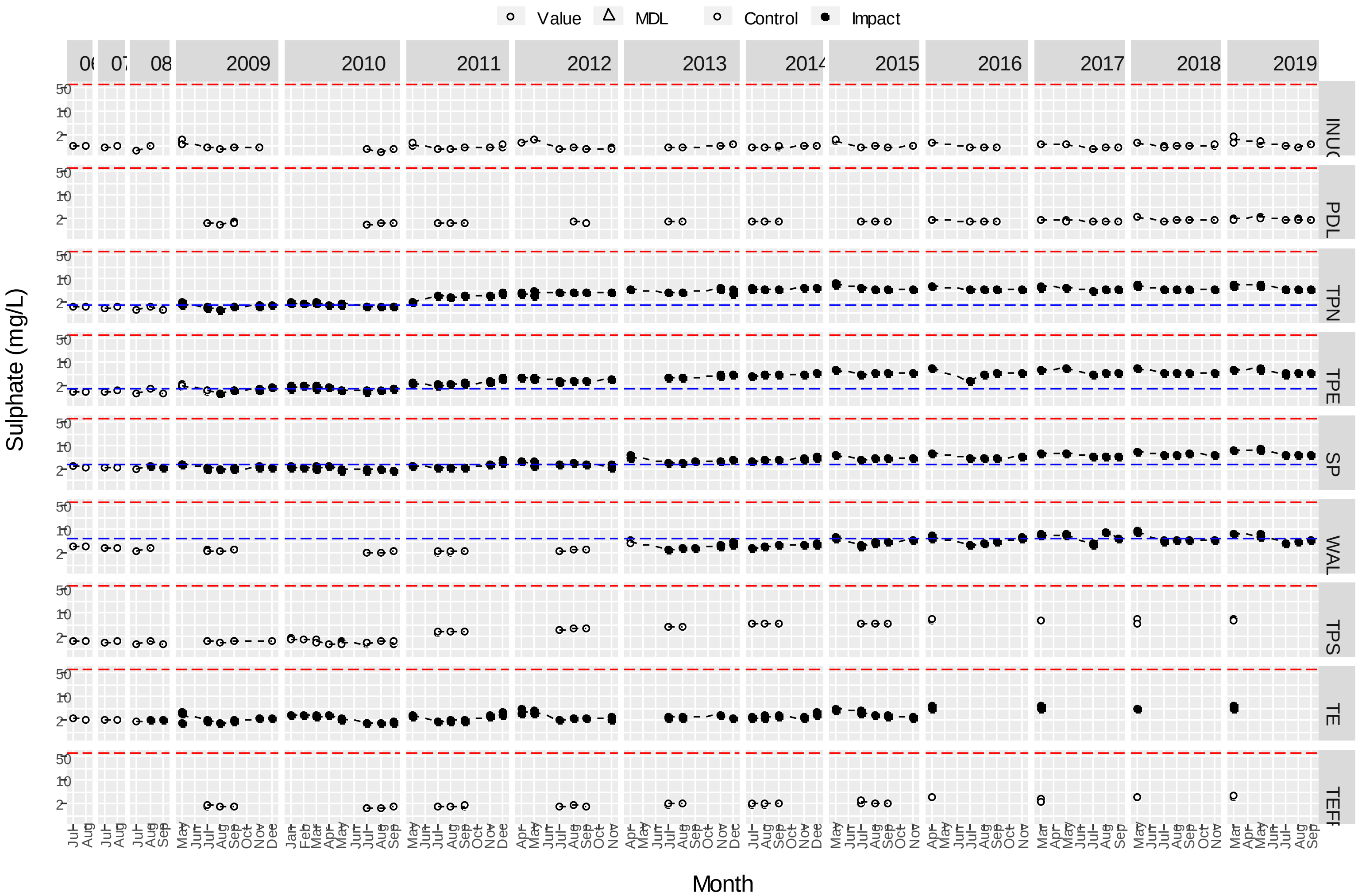


Figure 53 Total silicon (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value

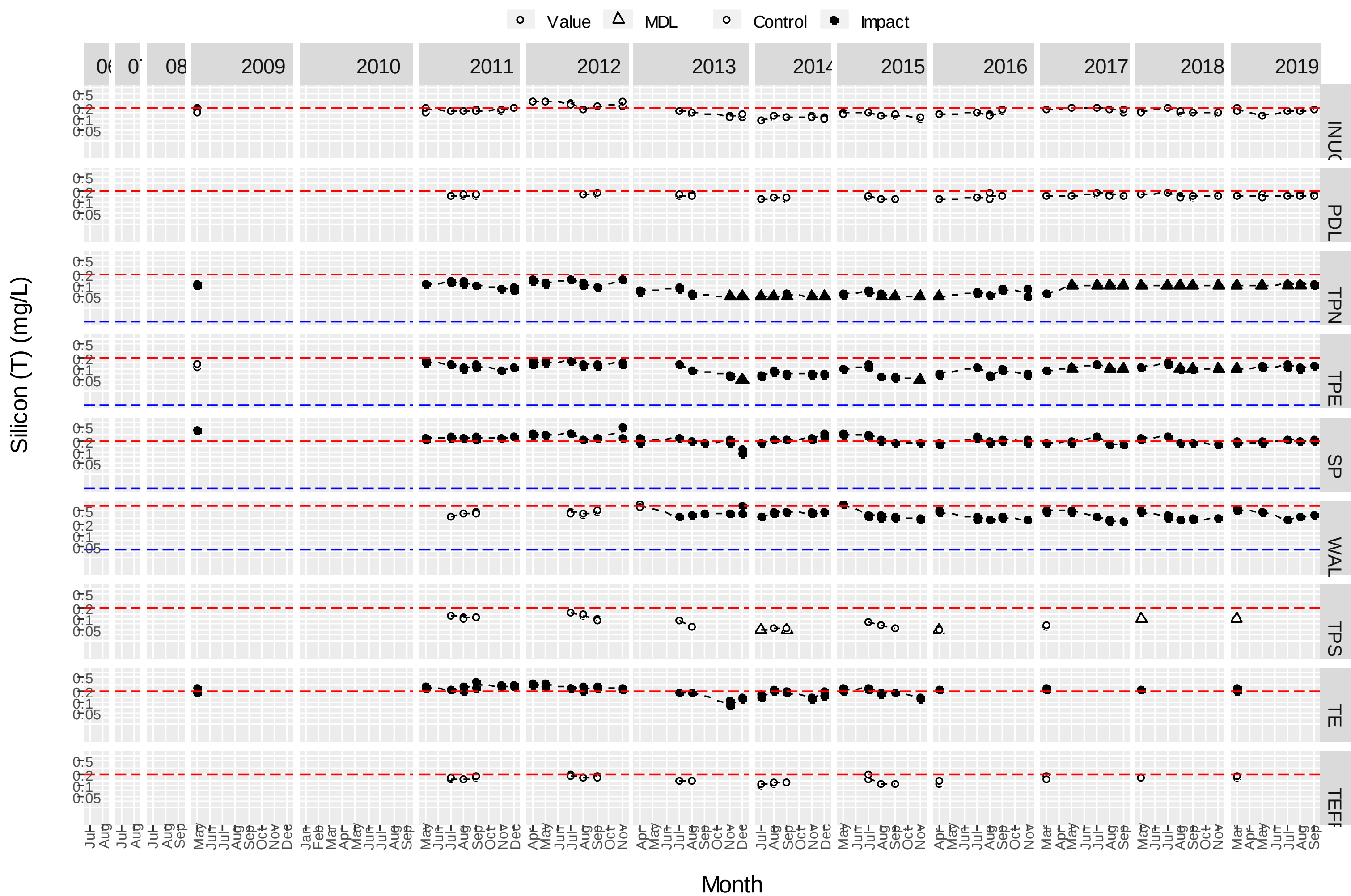


Figure 54 Total strontium (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value

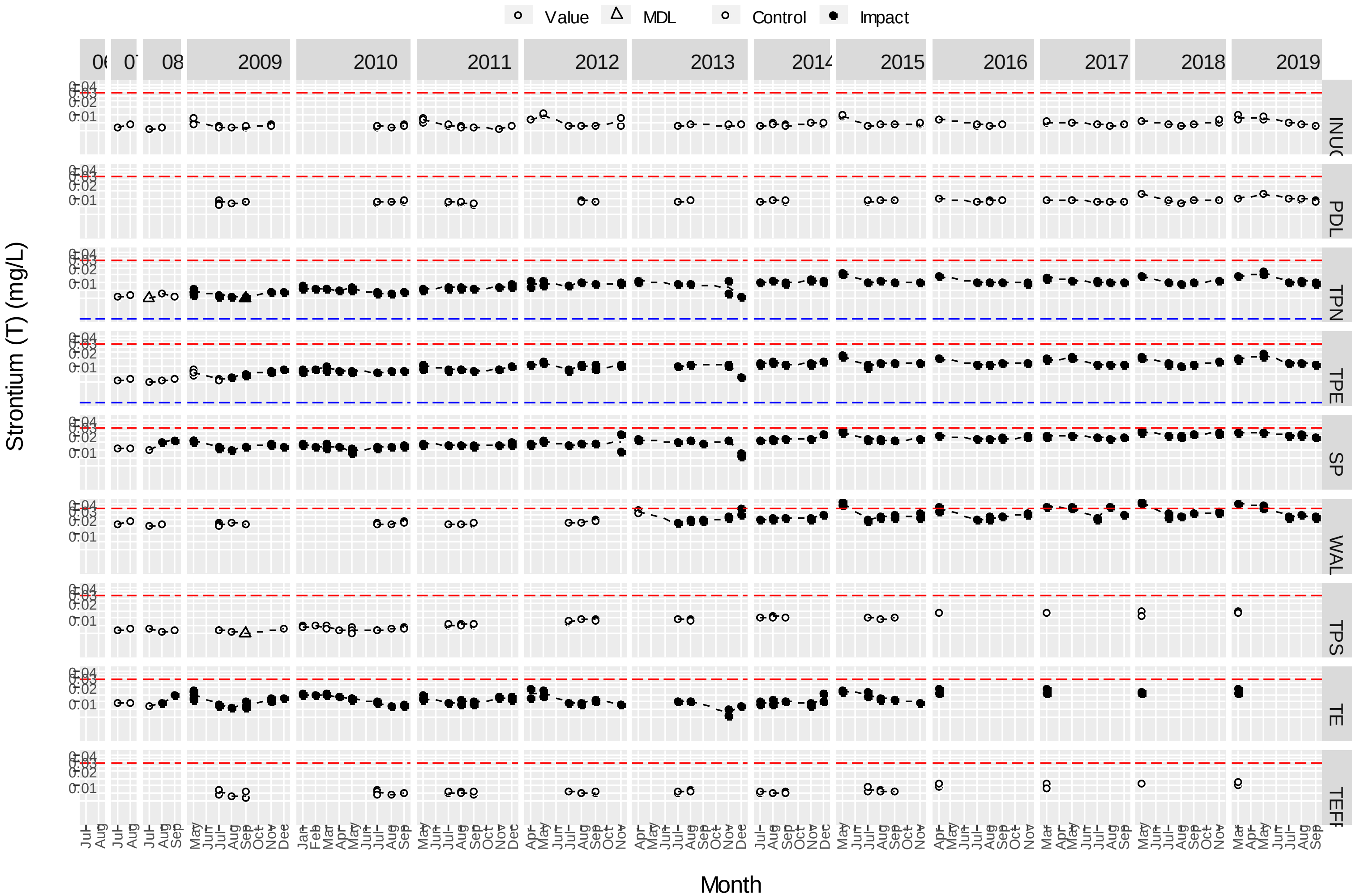


Figure 55 Total aluminum (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value

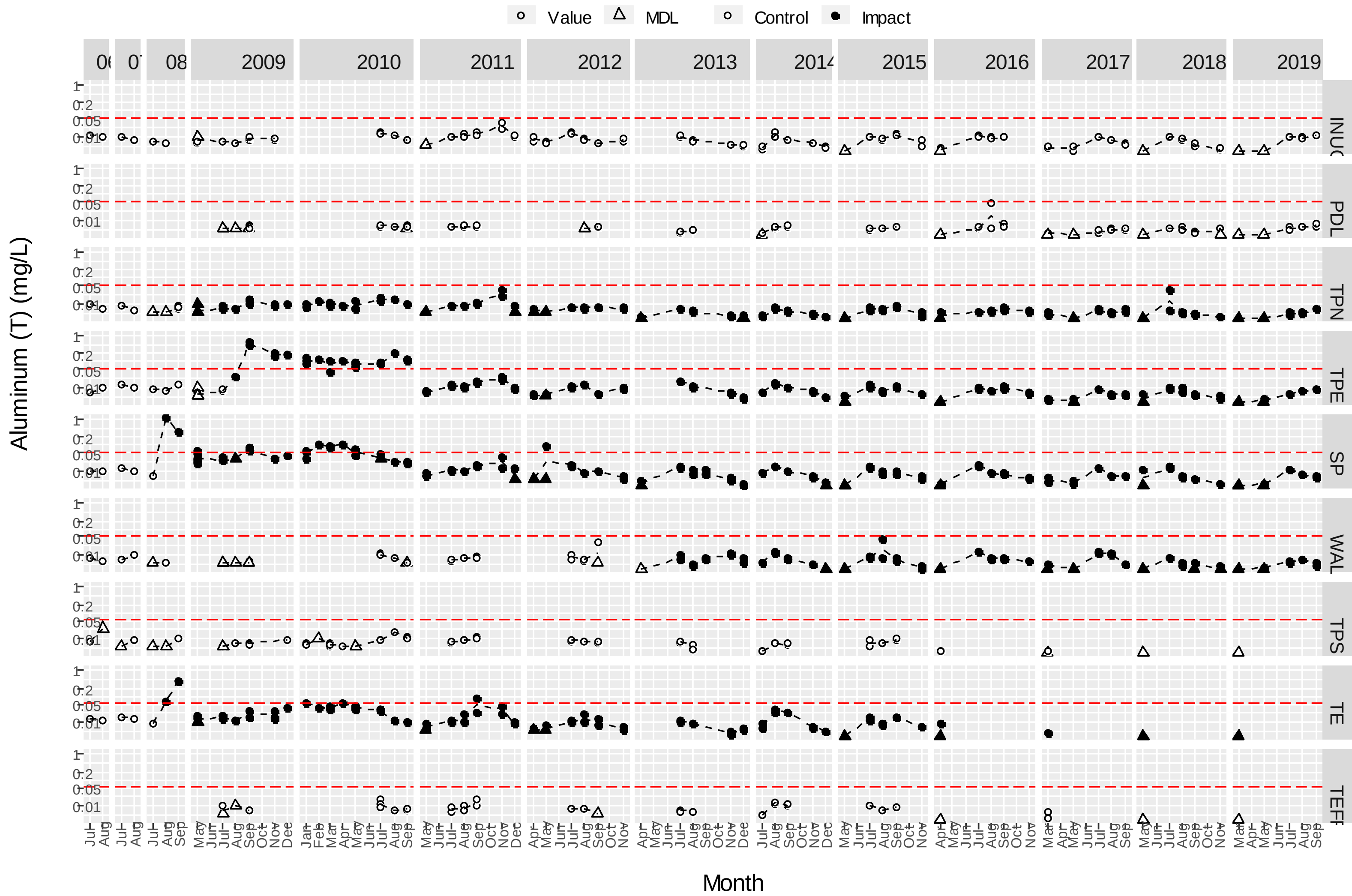


Figure 56 Total chromium (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value

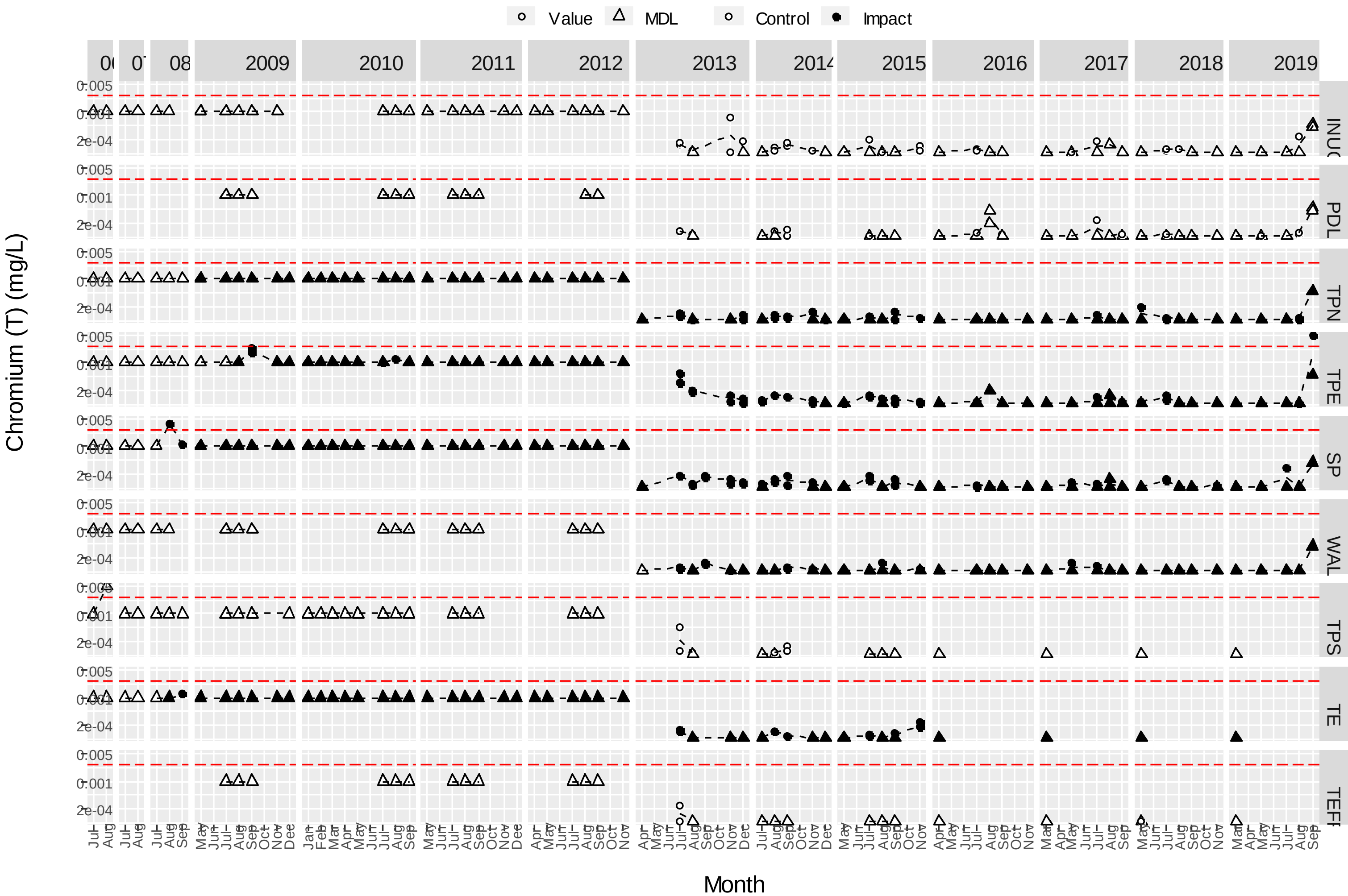


Figure 57 Total copper (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value

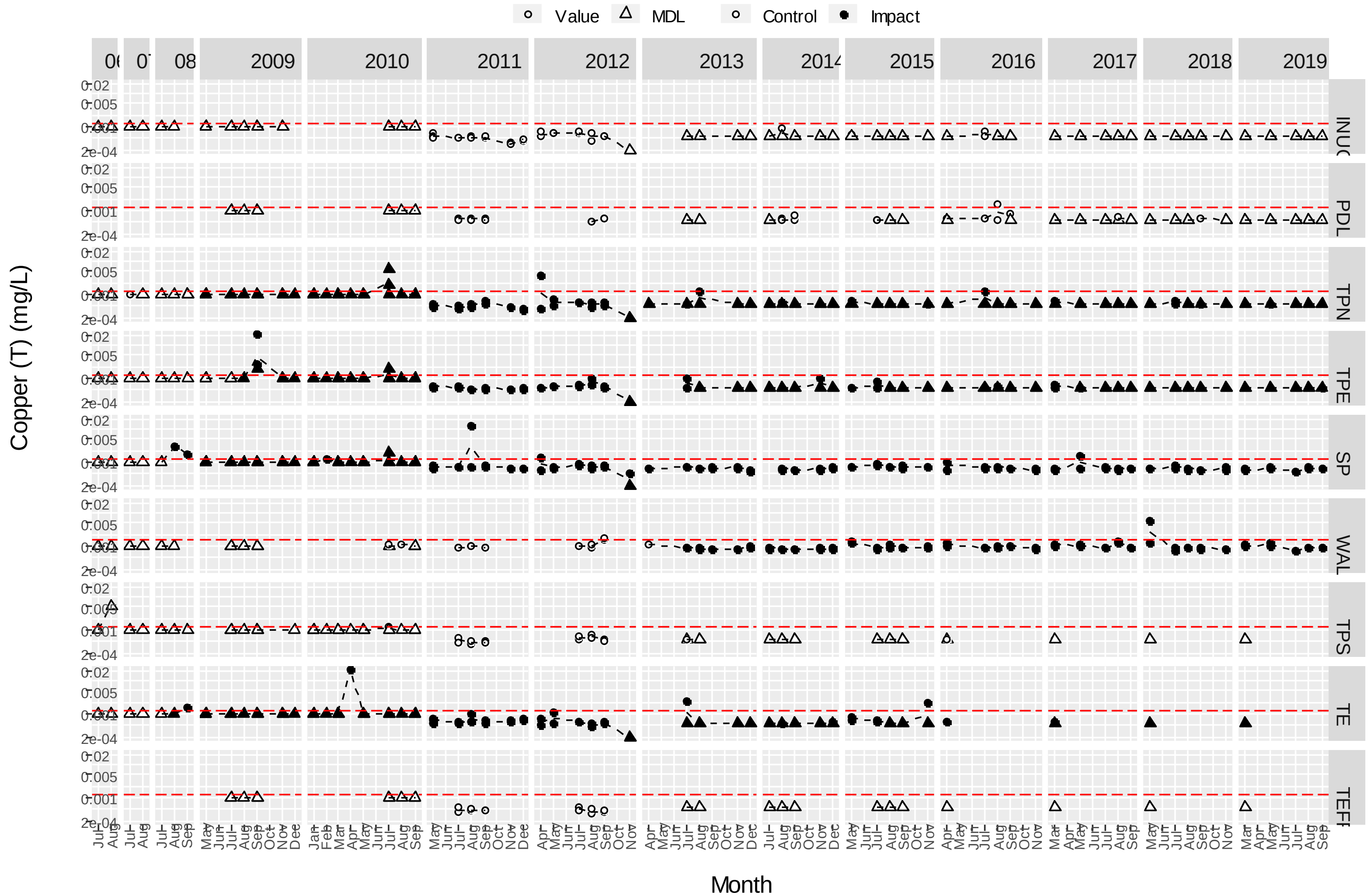


Figure 58 Total iron (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value

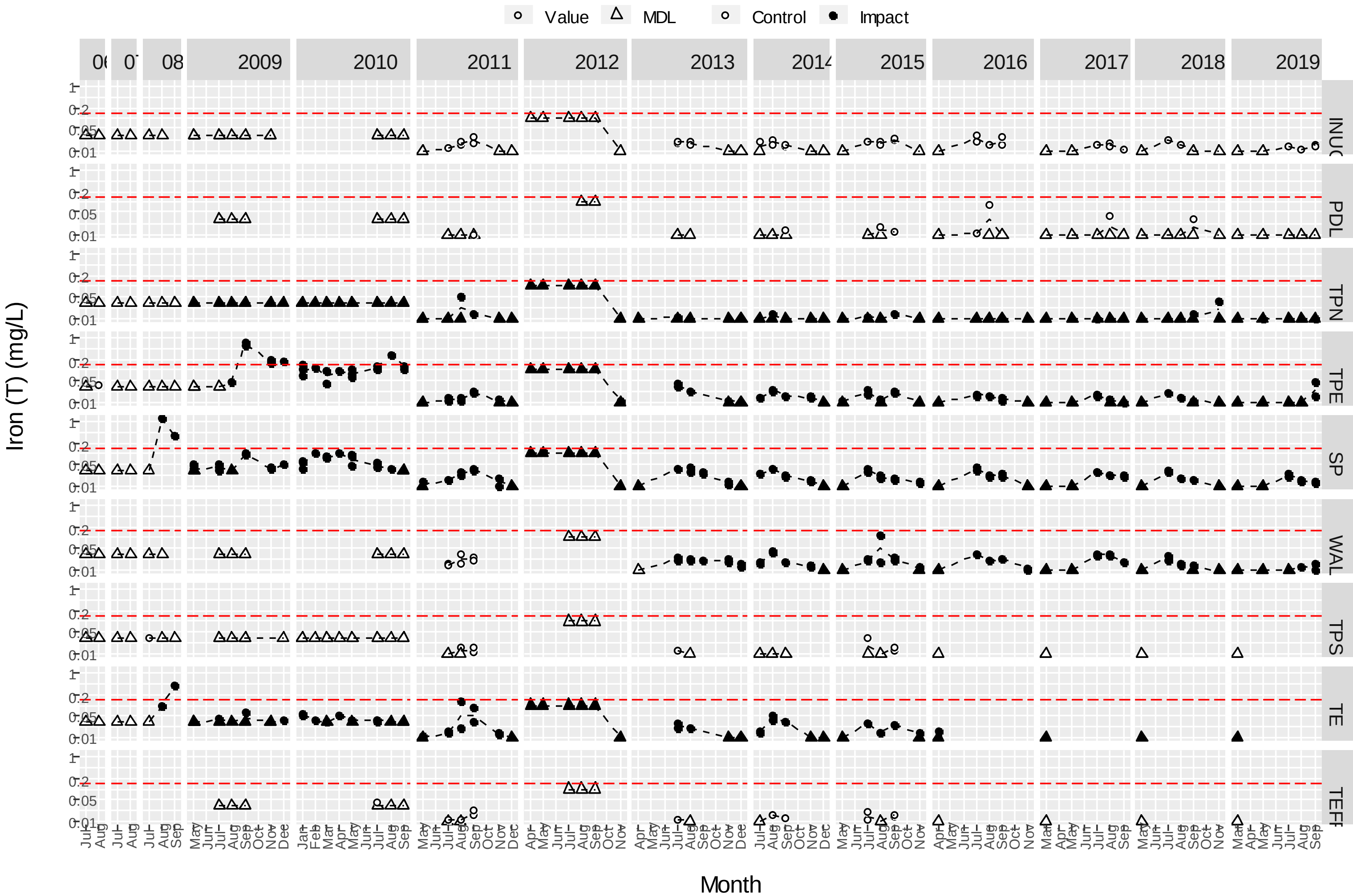


Figure 59 Total manganese (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value

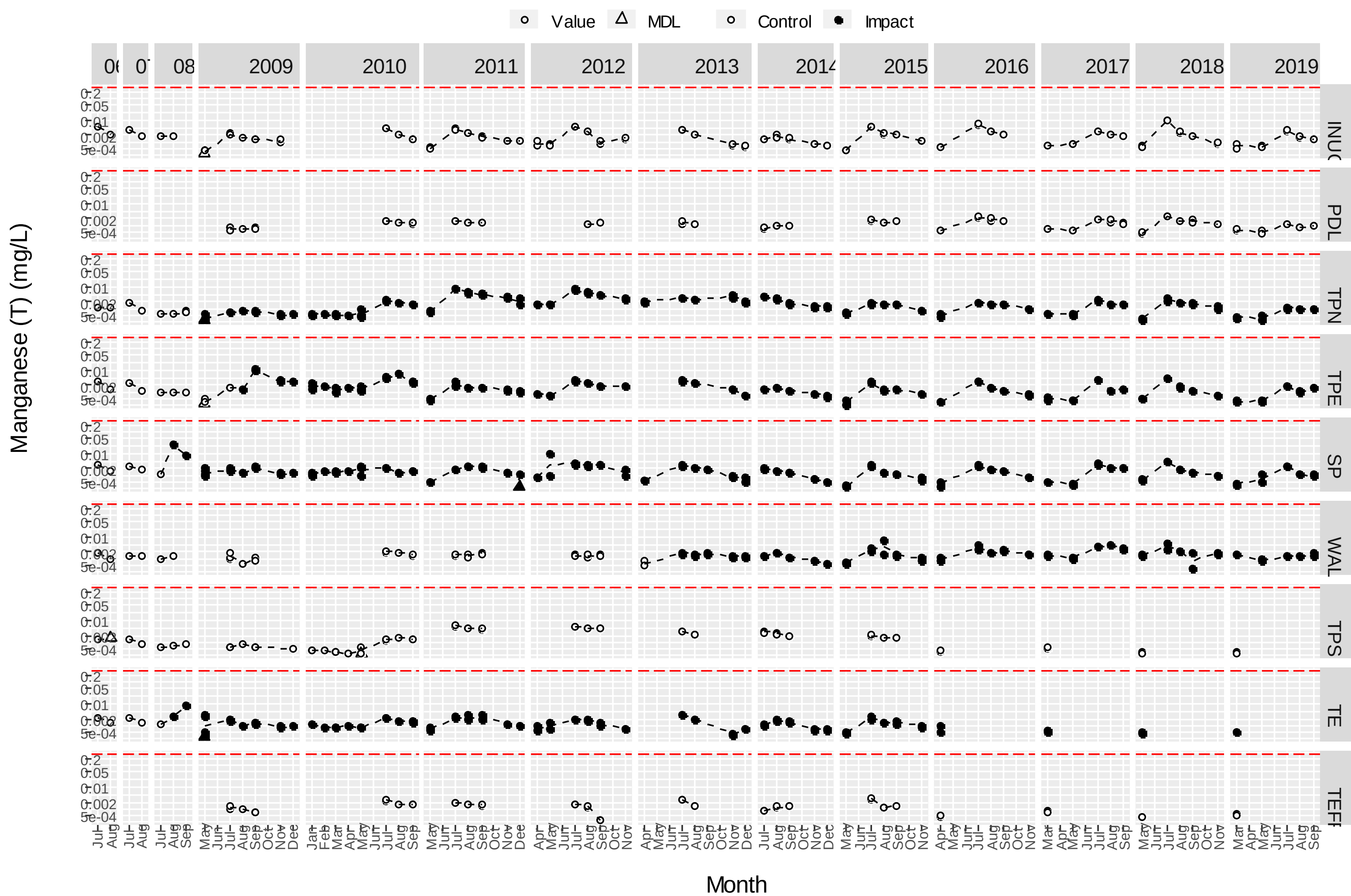
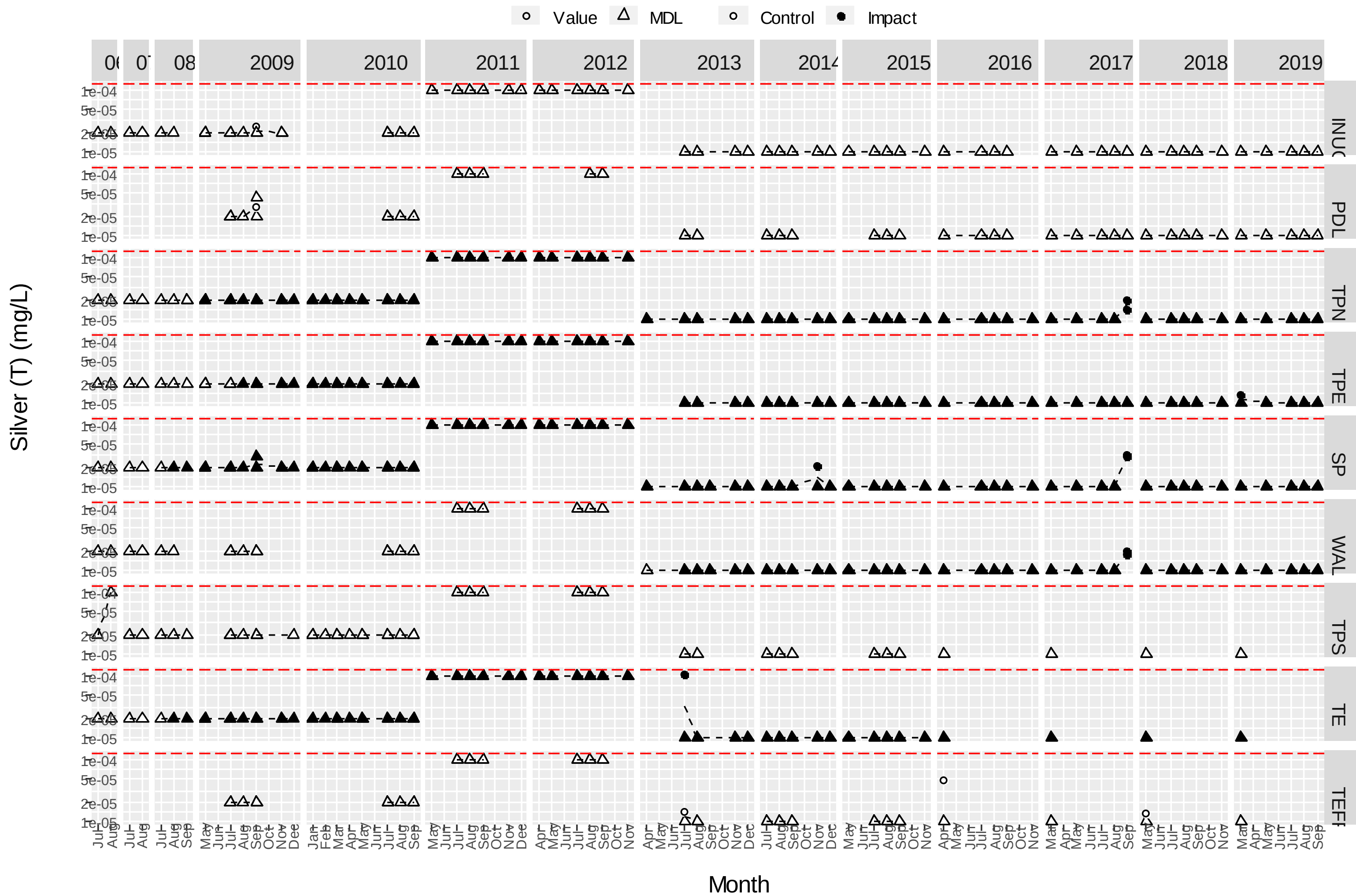


Figure 60 Total silver (mg/L) in water samples from Meadowbank study lakes since 2006. Note: The red dashed line = CREMP trigger value



12.3.1.2.3 Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management

Effectiveness of Monitoring

Based on the results in Table 12-3, 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 2019 is provided in Table 12-4. Mitigation measured related to water quantity, and fish and fish habitat are provided in Section 12.3.1.1 and 12.3.1.3, respectively, though some overlap may occur.

Table 12-4 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 (2019)
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 Section8.5.3. 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 Section5.1.
Monitoring quality of discharges	**Yes** – Minesite effluent is monitored according to NWB/MDMER criteria, as described in Section8.3.
Adjusting management practices if monitoring results indicate discharge quality does not meet discharge criteria	**Yes** – In cases where discharge criteria are not met, discharge is ceased until results are within acceptable limits. E.g. Section8.3.1.
Winter culvert installation	**N/A –** item not constructed in 2019
Sediment control (e.g. use of geotextile for Baker Lake marine barge landing facility)	**N/A –** item not constructed in 2019
Use of riprap to stabilize shorelines around culverts and anchor pipes	**N/A –** item not constructed in 2019
Treatment of effluent discharge	**Yes** – Minesite effluent is monitored according to NWB/MDMER criteria, as described in Section8.3, and treated as required for TSS prior to release
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

Historically and in 2019, 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 (Appendix 35). 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 a result, mitigation measures associated with water quality impacts (Table 12-4) are determined to be effective, and no supplemental mitigation is planned at this time.

As an additional adaptive management measure, Agnico 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.

12.3.1.3 *Fish and Fish Habitat*

12.3.1.3.1 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 12-5, below.

Table 12-5 Predicted and measured impacts to fish and fish habitat. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.3.1.3.2. Potential impacts according to Cumberland, 2005; Table B13.2.

<table>
<tr><th rowspan="2">Potential Impact</th><th rowspan="2">Potential Cause(s)</th><th rowspan="2">Proposed Monitoring</th><th rowspan="2">Monitoring Conducted</th><th rowspan="2">Predicted Impact in FEIS</th><th colspan="2">Measured Impacts</th></tr>
<tr><th>2018</th><th>2019</th></tr>
<tr><td rowspan="2">Loss/impairment of fish habitat</td><td>Construction of temporary and permanent in-water features (e.g. TSF, dikes, pits).</td><td>Monitoring of compensation features per NNLP (targeted studies under AEMP for dike “pore water” (interstitial water) quality, periphyton growth, fish use).</td><td>Structure, interstitial water quality, periphyton growth, fish use under HCMP (see Appendix 40)</td><td>Dikes will provide a medium for lower trophic growth; habitat for non-spawning life functions except Goose Island dike where spawning may occur.</td><td>N/A</td><td>Compensation features appear to be functioning as intended (continuing periphyton growth, fish presence around dikes). Interstitial water quality not assessed in 2019.</td></tr>
<tr><td>Construction of barge facility in Baker Lake</td><td>Annual monitoring of shoreline stability and integrity (proposed 2016)</td><td>CREMP monitoring at Baker Lake barge dock</td><td>Negligible impact</td><td colspan="2">No impacts of barge activity on water quality, sediment quality, phytoplankton, benthic invertebrates observed to date.</td></tr>
<tr><td>Reduced fish egg survival</td><td>Metals and particulates from dike leachate, effluent, and road dust.

Blasting</td><td>Dike leachate: Targeted studies under AEMP (“pore water” (interstitial water) sampling during year 1

Effluent: Water quality monitoring under MDMER.

Dust: Whole-lake water quality under CREMP

Blasting: Blast monitoring</td><td>Dike leachate: Interstitial water quality under HCMP

Effluent: MDMER monitoring

Dust: Whole-lake water quality under CREMP

Blasting: Blast monitoring</td><td>Dike leachate: Dissolved metals may reduce fish egg survival and larval development during overwinter incubation.

Effluent: < MDMER (2002) regulations

Dust (whole-lake water quality under CREMP): negligible ecological effect, <CWQG for aquatic life (CCME) except cadmium (TPL), and arsenic and cadmium (Wally Lake)

Blasting: Most blasts will not exceed DFO overpressure guideline (50 kPa); no exceedances of PPV guideline (13 mm/s)</td><td colspan="2">Dike leachate: N/A

Effluent: < MDMER

Dust (whole-lake water quality under CREMP): CREMP results <CWQG.

Blasting: No exceedances of DFO overpressure guideline (50 kPa); no exceedances of PPV guideline (13 mm/s)</td></tr>
<tr><td>Mortality of fish and</td><td>Blasting</td><td>Blast monitoring</td><td>Blast monitoring</td><td>Most blasts will not</td><td colspan="2">No exceedances of DFO</td></tr>
</table>

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted	Predicted Impact in FEIS	Measured Impacts	
					2018	2019
fish eggs				exceed DFO overpressure guideline (50 kPa); no exceedances of PPV guideline (13 mm/s)	overpressure guideline (50 kPa); no exceedances of PPV guideline (13 mm/s)	
	Worker fishing in project area, despite no-fishing policy; increased fishing in area due to AWAR	Worker fishing: Staff interviews AWAR fishing: Creel survey	Worker fishing: None AWAR fishing: None - creel survey updates in development	Unknown	Worker fishing: Not assessed AWAR fishing: N/A	
	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	No offsite impact to any watercourses as a result of spills.	
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 Effluent: Monitoring under MDMER program	Dust: Whole-lake water quality under CREMP 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 Lake) Effluent: < MMER criteria	Dust (whole-lake water quality under CREMP): CREMP results <CWQG, no exceedance of TSS trigger. Effluent: < MDMER	
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	Program not required in 2018	Not sampled in 2019
	Sedimentation through dust/particulate dispersion (road dust, wind dispersal, terrain disturbance)	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	CREMP results <CWQG, no mine-related impairment of phytoplankton, benthic invertebrate communities. Some exceedances of CREMP sediment thresholds. See Section12.3.1.3.2.	

Potential Impact	Potential Cause(s)	Proposed Monitoring	Monitoring Conducted	Predicted Impact in FEIS	Measured Impacts 2018	Measured Impacts 2019
	and effluent discharge			(Wally Lake)		
		Effluent MDMER monitoring	Effluent MDMER monitoring	Settling of TSS and altered sediment chemistry may impact benthos.	Effluent < MDMER	
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	N/A - 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.	

12.3.1.3.2 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.

12.3.1.3.2.1 Exceedance of CREMP sediment thresholds

FEIS Prediction: Negligible ecological effect on lower trophic levels.

Discussion: Historical and 2019 CREMP results have indicated a potential for mine-related sediment toxicity due to elevated chromium concentrations in 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 continued in 2019. While 2018 results showed limited toxicological effects on midge larvae (*Chironomus dilutus*), which are the dominant invertebrates in the Meadowbank study lakes, they also showed substantial effects to amphipod (*Hyalella azteca*) survival and growth. While amphipods are not present in the Meadowbank study lakes, there are other taxa that could respond similarly. As the cause of the observed toxicity in 2018 could not be determined, further studies were conducted in 2019 to verify the toxicity results and to better characterize metals bioavailability. Bioavailability was assessed by measuring metals concentrations in sediment porewater to help determine if porewater chemistry is the probable cause of lower survival and growth for *H. azteca*. Key findings of these targeted bioavailability studies are:

- *H. azteca* exposed to sediment from TPE for 14-d show reduced survival and growth compared to INUG and PDL field control groups. There was no evidence of corresponding effects to survival in the 10-d toxicity test with *C. dilutus*. However, growth was significantly lower for chironomids exposed to sediment from TPE compared to the field control.

- Chromium concentrations have increased in sediment at TPE (Figure 61), but there is no plausible evidence to suggest that chromium is the cause of effects to *H. azteca* survival. Sequential extraction test results in 2015 indicated chromium associated with sediment matrix (inorganic and organic particles) is non-bioavailable; follow-up testing in 2018 was deemed unreliable due to data quality issues, which led to conducting the porewater analysis in 2019. Porewater chromium concentrations in 2019 were less than concentrations reported at the reference area PDL.

- Dissolved manganese in porewater is the likely cause of effects in the *Hyalella* tests in 2015, 2018, and 2019. Sediment manganese concentrations are naturally elevated and highly variable throughout the TPE study area. It’s likely that porewater manganese is elevated in small discrete areas of TPE as a result of localized reducing conditions that favor dissociation of manganese oxides (MnO_2) in sediment to dissolved manganese in porewater. Factors such as organic carbon and pH that can influence the bioavailability and toxicity of manganese to aquatic invertebrates appear stable, indicating the mine is not indirectly contributing to changing redox conditions that favor formation of Mn(II).

- The *H. azteca* toxicity test data provide important information about effects to sensitive aquatic invertebrate taxa, but the chironomid toxicity test results from 2015, 2018, and 2019 are more ecologically relevant for assessing potential risks to the benthos community at TPE. Over the three years of testing, chironomid sediment toxicity test results have substantiated the conclusions presented in the CREMP in-field benthos surveys (Figures 62 and 63), namely, that there is no evidence to suggest the benthos community at TPE is being adversely affected by activities at the mine. The benthos community present in TPE has adapted to either tolerate elevated porewater manganese or avoid areas where manganese is elevated in porewater.

Results of the benthos community assessment and the targeted bioavailability studies at TPE 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 recommended at this time other than annual monitoring of the benthos community as part of the routine CREMP**.**

A complete description of this investigation is provided in Section 4.6 of the 2019 CREMP Report.

Figure 61 Total chromium (mg/kg) in sediment samples (grabs & cores) from Meadowbank project lakes since 2006. Note: Grab samples = dots; Core samples = box and whisker. The red dash line represents CREMP trigger values.

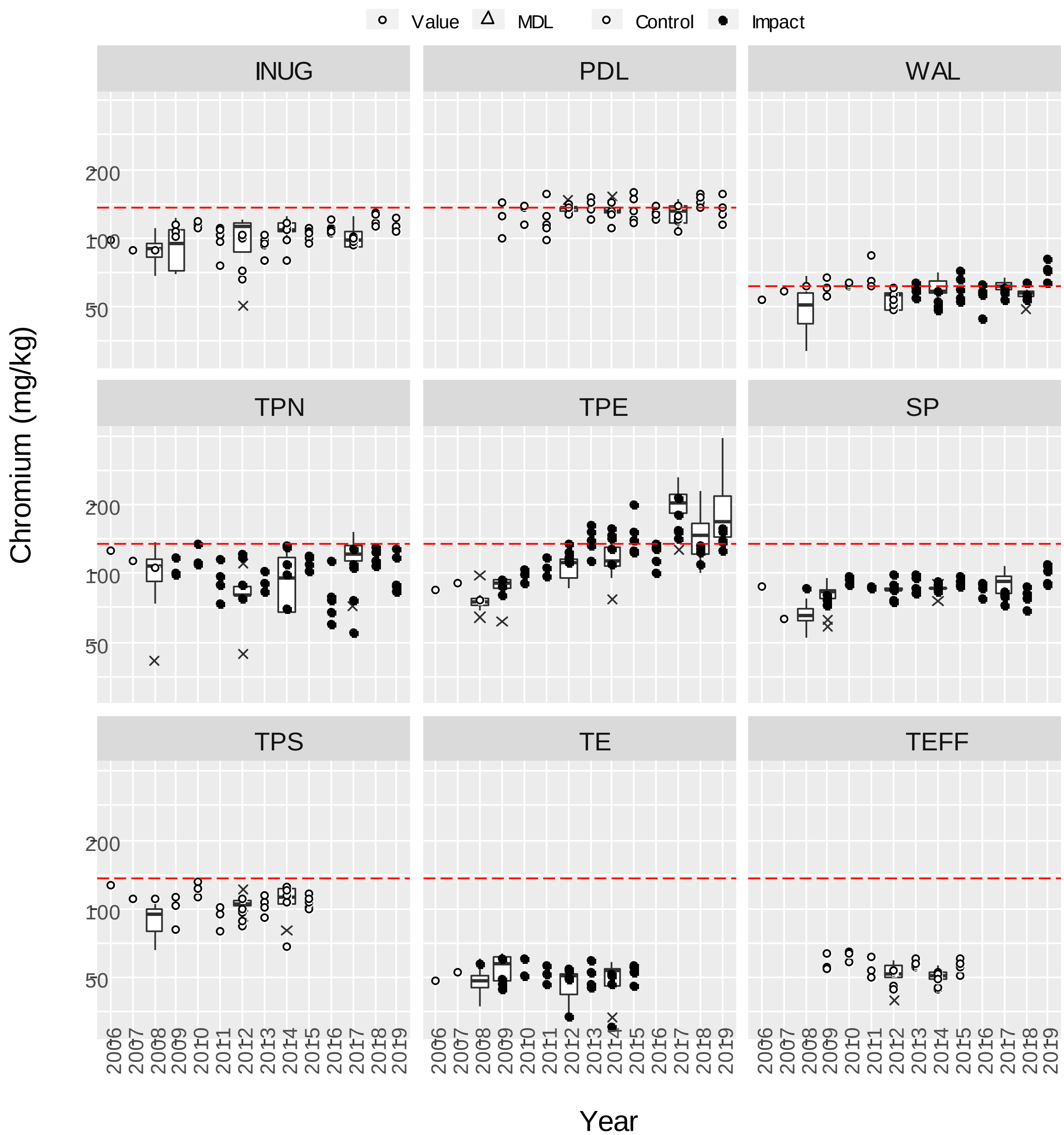


Figure 62 Benthic invertebrate total abundance (#/m^2) from Meadowbank study area lakes since 2006.

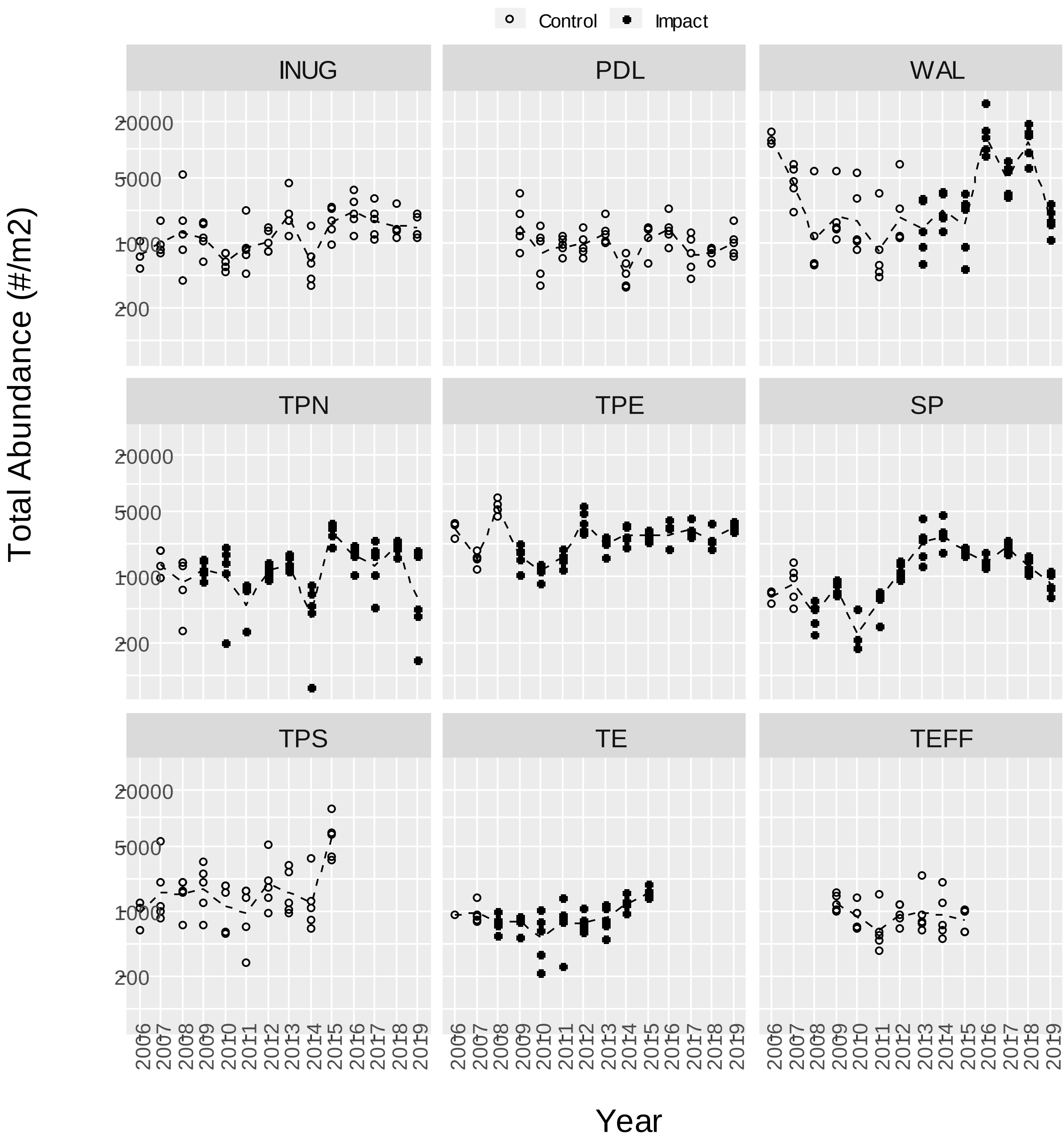
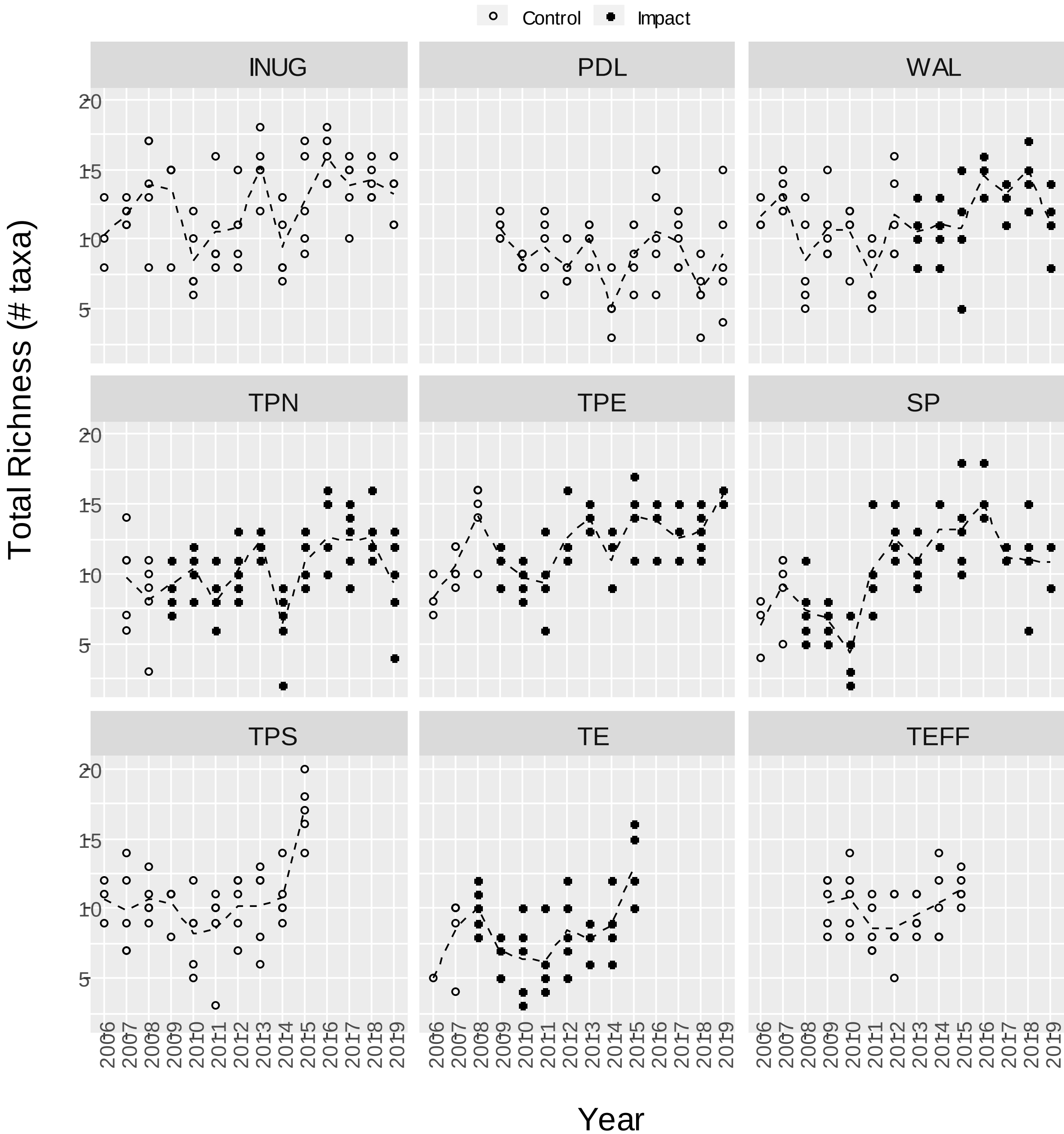


Figure 63 Benthic invertebrate total richness (# taxa) from Meadowbank study area lakes since 2006



12.3.1.3.3 Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management

Effectiveness of Monitoring

In 2019, monitoring was able to address all potential causes of impacts identified in the FEIS (i.e. monitoring was considered effective), except dike interstitial water quality and worker fishing.

Dike interstitial water quality was not included in sampling events for the Habitat Compensation Monitoring Plan in 2019. Interstitial water quality will be sampled during the next event in 2021, prior to making any determination of success as fish habitat for these features.

While the FEIS proposed staff interviews to assess any fishing being conducted despite a strict no-fishing policy onsite, in practice it has become clear 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 2019 is provided in Table 12-6. Mitigation measured specifically related to water quantity and water quality are provided in Sections 12.3.1.1.3 and 12.3.1.2.3, respectively, though some overlap may occur.

Table 12-6 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 (2019)
Winter culvert installation	**N/A –** item not constructed in 2019
Sediment control (e.g. use of geotextile for Baker Lake marine barge landing facility)	**N/A –** item not constructed in 2019
Use of properly sized screens for freshwater intake	**N/A –** item not constructed in 2019
Use of riprap to stabilize shorelines around culverts and anchor pipes	**N/A –** item not constructed in 2019
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** – minesite effluent is monitored according to NWB/MDMER criteria, as described in Section 8.3, and treated as required for TSS prior to release
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

Historical and 2019 CREMP results have indicated a potential for mine-related sediment toxicity in one receiving environment location (TPE), likely originating from ultramafic rock used to construct the Bay-Goose Dike in 2009-2010 (see 2014 CREMP Report for initial investigation and discussion). Since that time, various studies have been ongoing to confirm the source and potential for toxicity. In 2018, targeted studies (whole-sediment toxicity tests for benthic invertebrates) and routine analyses (benthic community field surveys) were completed, but supplemental investigations were planned to help understand the cause of observed toxicity in whole-sediment laboratory tests observed. Results of those supplemental studies along with routine analyses in 2019 demonstrate conclusively 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 recommended at this time other than annual monitoring of the benthos community as part of the routine CREMP, and no supplemental mitigation is required.

12.3.2 Terrestrial and Wildlife Environment

12.3.2.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

The 2019 Wildlife Monitoring Summary Report (Appendix 52) provides a complete assessment of wildlife monitoring programs including a comparison to monitoring thresholds detailed in the Terrestrial Ecosystem Management Plan (TEMP Version 6; March 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 12-7. Thresholds for the implementation of adaptive management, as developed in the Terrestrial Ecosystem Management Plan (TEMP Version 6; March 2019) were used in this comparison because most impact predictions in the Terrestrial Ecosystem Impact Assessment of the FEIS (Cumberland, 2005) were qualitative only. The 2019 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 site and AWAR in 2019.

Table 12-7 Predicted and measured impacts to terrestrial VECs, according to the 2018 and 2019 Wildlife Monitoring Summary Reports (Appendix 52). Measured impacts exceeding or potentially exceeding impact predictions/thresholds are shaded grey and further discussed in Section 12.3.2.2. 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 (2019), 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
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: Mine Site – 867/1532 ha + 5% AWAR/Vault Haul Road – 281/348 ha + 5%	Mine Site - 1,129 ha AWAR – 173 ha	NM (next assessed in 2021)
Habitat Degradation by Contamination	Dust from roads, TSF, airstrip	Vegetation and Soil Samples (SLRA)	Vegetation and Soil Samples (SLRA)	No excess mine-related risk	NM	NM (next assessed in 2020)
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 12.3.2.2	NA
Project-related Mortality	Mine-related activities (e.g., falling into pits, tailing, sludge or other means)	Pit and mine-site ground surveys	Pit and mine-site ground surveys	Two (2) Caribou or Muskoxen mortalities per year^	None	None
Vehicle Collisions	Vehicular collisions	Pit and mine-site ground surveys, Incidence reports	Pit and mine-site ground surveys, Incidence reports	Two (2) Caribou or Muskoxen mortalities per year^	None	None

Potential Impact	Potential Cause(s)	Proposed Monitoring	Current Monitoring	Threshold/ Prediction	Measured Impact	
					2018	2019
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: Growing – 240/531 ha + 10% Winter – 191/407 ha + 10%	Growing – 372 ha (70%) Winter – 280 ha (68.8%)	NM (next assessed in 2021)
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
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	NM	NM (next assessed in 2020)
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, Height-of-Land Surveys	Destruction of two (2) problem Grizzly Bear, Wolverine, or Wolf per year^	One wolverine dispatched	One wolverine dispatched at Amaruq Camp
	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
Sensory Disturbance*	Blasting, vehicles, and ground personnel near active dens	Active den site surveys (WT FEIS)	Active den site surveys as required	No threshold - development of Den Management Plan when active dens are identified in project vicinity.	NA	NA (not conducted in 2019 - no potential for impacts identified)
SMALL MAMMALS						

Potential Impact	Potential Cause(s)	Proposed Monitoring	Current Monitoring	Threshold/ Prediction	Measured Impact	
					2018	2019
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
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	NA
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	NM	NM (next assessed in 2020)
RAPTORS						
Healthy Prey Populations	Mine Footprint, dust and exhaust, noise (road, airstrip, mine site, Baker Lake barge area)	Vegetation and Soil Samples; PRISM plot surveys; ELC habitat mapping	Vegetation and Soil Samples	Thresholds are qualitative, and can be achieved through management and maintenance of vegetation and healthy prey communities.	NA	NA
Disturbance of Nesting Raptors	Noise and Activity	Active Nest Monitoring	Pit and mine site ground surveys; Incidental wildlife reporting; Dedicated raptor nest surveys; Road surveys	One nest failure per year^	Threshold not exceeded (note - limited data on nesting success – See Section12.3.2.3)	Threshold not exceeded (note - limited data on nesting success – See Section12.3.2.3)
Project-related Mortality	Vehicle collisions	Road/Ground Surveys, Incidence reports	Road surveys, Incidence reports	One mortality per year^	Threshold not exceeded	None
WATERBIRDS						
Disturbance of Nesting Waterfowl	Noise and Activity; dewatering	Waterfowl Nest Surveys	Waterbird Nest Surveys; Pit and mine site ground	One nest failure per year^	Threshold not exceeded	None

Potential Impact	Potential Cause(s)	Proposed Monitoring	Current Monitoring	Threshold/ Prediction	Measured Impact	
					2018	2019
			surveys			
Habitat Loss and Degradation	Mine site footprint, pits, roads, water management and collection systems	Ground Surveys, Mapping, GIS Analysis	Ground Surveys, Mapping, GIS Analysis	High Suitability Habitat Predicted/Permitted Area + threshold over prediction: Mine Site – 518/417 ha + 10% AWAR/Vault Haul Road – 22/348 ha +10%	NM	NM (next assessed in 2021)
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	NM	NM (next assessed in 2020)
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
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 Section12.3.2.2.	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
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: Mine Site – 322/736 ha + 10%	-	NM (next assessed in 2021)

Potential Impact	Potential Cause(s)	Proposed Monitoring	Current Monitoring	Threshold/ Prediction	Measured Impact	
					2018	2019
				AWAR/Vault Haul Road – 170/348 ha +10%		
Exposure to Contaminated Water or Vegetation	Mine site dust	Vegetation and Soil Samples (SLRA)	Vegetation and Soil Samples (SLRA)	No excess mine-related risk	NM	NM (next assessed in 2020)
Changes in Breeding Bird Populations	Mine Footprint, dewatering dust and exhaust, noise (road, airstrip, mine site, Baker Lake barge area)	Breeding Bird Prism Plots and Transects	Suspended in 2015. Analytical report to be completed for CWS in 2020 to determine ongoing monitoring requirements.	For PRISM plots, threshold was > 20% from control plots.	NA	NA

12.3.2.2 *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 2019, no thresholds were exceeded. The discussions below are retained from previous years.

1. Sensory Disturbance of Ungulates

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 12-8). 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 nine 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 12-8 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. 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.

2017	0	-
2018	2	Two ducks killed after apparently flying into a building.
2019	0	0

12.3.2.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

Effectiveness of Monitoring

Based on the results in Table 12-7, current TEMP monitoring programs are able to address most FEIS impacts for which monitoring was recommended (i.e. monitoring is considered effective), with the exception of raptor nesting success, due to limited statistical power. Monitoring programs are in place to assess impacts to raptors, but the small number of nests monitored annually do not allow for the statistical power to determine whether potential nest failures are mine-related. Although this threshold cannot be specifically assessed, management and mitigation approaches are enacted according to the 'Peregrine Falcon Management and Protection Plan on the Meadowbank Gold Project Site' (see Appendix E of the 2019 TEMP).

Some monitoring requirements have been eliminated in the TEMP since the FEIS was developed, in consultation with regulators (habitat loss for small mammals).

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 was most recently updated in June, 2019 (Version 7), and a mitigation audit is a component of this plan. The audit is to be undertaken annually, with results summarized in the annual Wildlife Monitoring Summary report, and focuses specifically on mitigation listed in Section 2 of the June 2019 TEMP.

The audit will evaluate:

- 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.

In 2019, Agnico Eagle took a staged approach to the mitigation audit (e.g., review of safety barriers, berms, and designed crossings along the Whale Tail Haul Road). A complete mitigation audit may be conducted in 2020 but this will be part of discussions within the TAG.

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 site in 2019, mitigation is considered effective.

Adaptive Management

Although no TEMP thresholds were exceeded in 2019, several management recommendations are planned to be implemented in 2020 along with continued implementation of all TEMP monitoring and management programs. As described in the 2019 Wildlife Monitoring Summary Report (Appendix 52), these management recommendations consist of:

- Gather detailed information (e.g., sex; age) on deceased animals and include in incident reports.
- Replace Height-of-Land surveys with Roadside Observation Points, developed in consultation with the TAG.
- Decisions and outcomes resulting from the use of the decision tree approach in 2019 should be analyzed to determine whether adjustments to the approach need to be made and discussed in TAG meetings. A dedicated log of decisions and outcomes should be kept in 2020 to facilitate future analyses of the effectiveness of this monitoring approach.
- The Hunter Harvest Study should be continued on an annual basis to monitor the hunting patterns of Baker Lake residents and the potential effects of the mine. Quarterly meetings with participants are particularly important in maintaining contact, building relationships, expanding the study and collecting good harvest data.
- In 2020, Agnico Eagle will be conducting a comprehensive raptor nest survey of the Meadowbank and Whale Tail sites, including areas along the Whale Tail Haul Road.
- In 2019, the Canadian Wildlife Service requested a detailed analysis of all PRISM and bird transect data to date and a comprehensive report outlining protocols and analytical results. If no effects are evident, bird monitoring can be shifted to: 1) PRISM plots randomly selected by CWS staff; and 2) a Breeding Bird Survey (BBS) as per standard BBS protocols. Agnico Eagle is planning on conducting the analysis and submitting the report in 2020.

Non-native plants – While no thresholds for non-native plants are included in the TEMP, in 2019, Agnico initiated a non-native plant monitoring study to assess and monitor the potential introduction of non-native plant species, including weeds or invasive species. Surveys at the Meadowbank Complex were conducted by a Golder Ecologist between August 9th to 16th, 2019 and focused on 14 non-native vascular plant species. Based on results, surveys for the 14 non-native plant species identified by CESCC and other non-native species should be completed annually. Mechanical control, such as mowing or hand pulling, is recommended for any identified non-native plant species.

12.3.3 Noise

12.3.3.1 *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 site's Noise Monitoring Plan.

Table 12-9, below, compares FEIS predictions for area sound levels (Cumberland, 2005 – Noise Impact Assessment) with the results of monitoring conducted in 2018 & 2019 (measured sound levels). 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 12.3.3.2.

Although only one impact prediction was exceeded in 2018 & 2019 for one monitoring location, a discussion and historical trend analysis of noise levels for all sites are provided in Section 12.3.3.2.

Table 12-9 Predicted and measured sound levels for the Meadowbank site. *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 12.3.3.2.

Project Component	Potential Impact	Proposed Monitoring	Monitoring Station	FEIS Predicted Value (dBA)*	Measured Value $L_{eq,\ 24\text{-}h}$ (dBA)	
					2018	2019
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
Goose Island Pit					43.4	NL
Vault Pit			R2	58-63	40.7	36.8
Borrow Pits					37.5	34.1
Tailings Facilities			R3	49-53	38.8	-
						38.9
Mine Plant & Facilities			R4	58-63	57.3	-
					36.7	-
			R5	All 1 hr L_{eqs} < 57**	All <57	All <57
					1/22 @ 58	1/32 @ 58

12.3.3.2 *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.

12.3.3.2.1.1 Noise Levels at R5

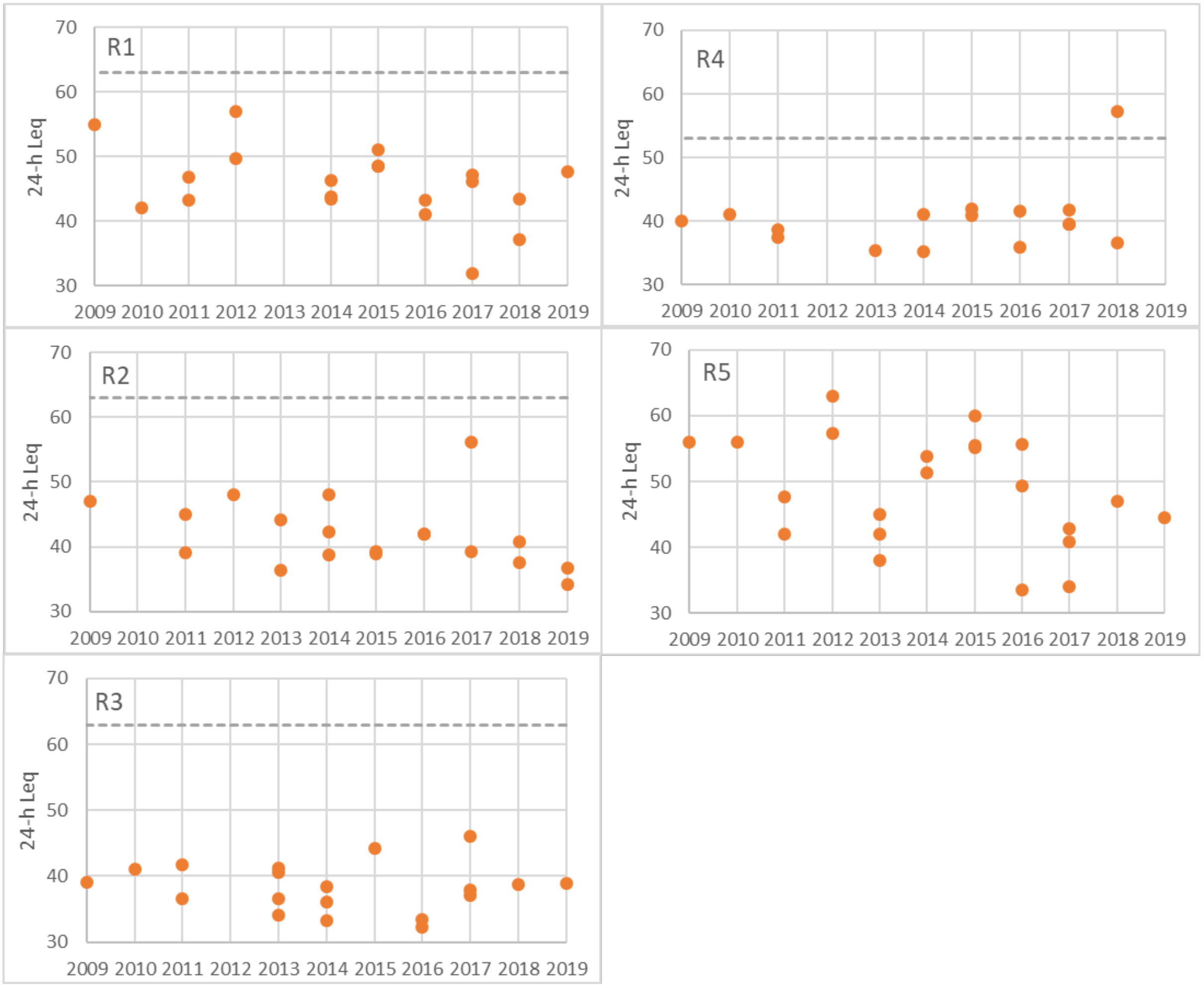
***FEIS Prediction*:** For station R5, FEIS predictions assumed that all one-hour L_{eq} values would not exceed 57 dBA.

***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 is planned.

However, 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 (Figure 64). The upper level of predicted values is shown for R1 – R4. No prediction with respect to a 24h L_{eq} was made for R5. As shown in this figure, there is no clear trend towards increasing sound levels at any site, with the highest sound levels generally occurring in 2012. 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 2019 are provided in the 2019 Noise Monitoring Report (Appendix 51).

Figure 64 Historical 24-h L_{eq} values for monitoring stations R1, R2, R3, R4, and R5 at the Meadowbank site. Dashed line indicates the maximum FEIS prediction for each station, if available.



12.3.3.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

Effectiveness of Monitoring

Based on the results in Table 12-9, current monitoring programs are able to address all FEIS impacts for which monitoring was recommended (i.e. monitoring is considered effective).

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 plan was most recently updated in June 2018 (2018 Annual Report; Appendix 51) so mitigation measures as described in that document were relevant and in practice in 2019. Measures are generally consistent between the FEIS version and updated management plan.

A summary of the mitigation measures in place to ensure impacts to area noise levels are minimized is provided in Table 12-10.

Table 12-10 Mitigation measures described in the Noise Abatement and Monitoring Plan (June, 2018) to reduce impacts of the project on area noise levels, and implementation in 2019.

Noise Source	Planned Mitigation Measure (Noise Abatement and Monitoring Plan, June 2018)	Implementation (2019)
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 tools)	Avoid operating numerous pneumatic tools at the same time, and spread operation throughout working periods	**Yes –**Best practices
Stationary equipment (compressors, generators, pumps)	Keep equipment in good condition	**Yes –**Preventive maintenance
Blasting	Use delays, both surface and down hole	**Yes –**Blast monitoring plan
	Preference for daytime blasting	**Yes –**Blast monitoring plan
	Blasting in depressed pits (normal production practice)	**Yes –**Blast monitoring plan
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

Noise Source	Planned Mitigation Measure (Noise Abatement and Monitoring Plan, June 2018)	Implementation (2019)
	Enclose conveyors where necessary	Completed
Utilities and services	Ensure that a rotating biological contactor treatment system operates quietly	Completed
	Dump solid waste behind barriers	N/A

Adaptive Management

Since only minor departures from noise impact predictions have occurred historically, and there are no clear trends towards increasing noise levels around the Meadowbank site, no associated changes to noise monitoring or management programs are planned in 2020.

12.3.4 Air Quality

12.3.4.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

In order to estimate potential impacts of the Project on air quality, modeling exercises were conducted as a component of the FEIS to determine emission rates and dispersion of various criteria air contaminants from different sources (Air Quality Impact Assessment, Cumberland, 2005).

This included modeling emissions of three size fractions of suspended particulates ($PM_{2.5}$, PM_{10} and TSP) originating from the TSF, WRSF, and ore stockpile, for 24h and annual averaging times. 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 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 1h, 24h 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.

Based on available FEIS modelling results, the following predicted values were able to be compared to measured values: NO_2 (annual average), $PM_{2.5}$, and PM_{10}. Monitoring results for these parameters are considered adequately comparable to FEIS predictions, since modelling included all reasonably significant emission sources for these parameters. FEIS predictions for TSP and dust deposition (30 d rate) are not suitable for comparison to field measurements (i.e. monitoring results) since only emissions from three specific point sources were required to be modeled (TSF, WRSF, ore stockpile). For reference, all results for TSP and dustfall monitoring are provided in the 2019 Air Quality and Dustfall Monitoring Report (Appendix 41), along with comparisons to regulatory guidelines and historical measurements.

Even for those measured parameters which are comparable 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 lower 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:

- 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.

- A recent impact assessment for the Whale Tail Pit project at Meadowbank calculated background values for $PM_{2.5}$ of 6.7 and 3.6 µg/m^3 for 24-h and annual averaging times, respectively (Whale Tail Pit EIS, 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 12-11 summarizes the predicted residual impacts to air quality and results of the most comparable monitoring conducted in 2018 and 2019.

Despite the generally conservative nature of these comparisons, no exceedances occurred for NO_2, $PM_{2.5}$, or PM_{10}. In addition, GHG emissions were below the predicted value.

Table 12-11 Predicted and measured impacts to air quality for the Meadowbank site. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.3.4.2. Predicted impacts according to the Air Quality Impact Assessment, Cumberland, 2005. *Addition of background values described above in Section 12.3.4.1.

<table>
<tr><th rowspan="2">Project Component</th><th rowspan="2">Potential Impact</th><th rowspan="2">Proposed Monitoring (FEIS)</th><th rowspan="2">Monitoring Conducted</th><th rowspan="2">Max. Predicted Value (FEIS) + Est. Partial Background*</th><th colspan="2">Measured Value</th></tr>
<tr><th>2018</th><th>2019</th></tr>
<tr><td>Dike construction</td><td>Generation of dust during placement of dike material</td><td>Static dustfall</td><td>N/A (no dikes constructed)</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Dewatering</td><td>Generation of dust from exposed lake sediment</td><td>Static dustfall</td><td rowspan="4">Static dustfall, NO_2 (four locations) and suspended particulates (two locations) under Air Quality Monitoring Plan</td><td rowspan="4">NO_2 (ppb; annual avg.) = 4.97

$PM_{2.5}$ ($\mu g/m^3$; 24 h avg.):
DF-1: 20+6.7 = 26.7
DF-2: 10+6.7 = 16.7

$PM_{2.5}$ ($\mu g/m^3$; annual avg.)
DF-1: 1+3.6 = 4.6
DF-2: 0.5+3.6 = 4.1

PM_{10} ($\mu g/m^3$; 24 h avg.):
DF-1: 20+6.7 = 26.7
DF-2: 40+6.7 = 46.7</td><td rowspan="4">NO_2 (ppb; annual avg.; DF-2) = 1.81

$PM_{2.5}$ ($\mu g/m^3$; 24 h avg.):
DF-1: all < 26.7
DF-2: all < 16.7

$PM_{2.5}$ ($\mu g/m^3$; annual avg.)
DF-1: 0.2
DF-2: 1.4

PM_{10} ($\mu g/m^3$; 24 h avg.):
DF-1: all < 26.7
DF-2: all < 46.7</td><td rowspan="4">NO_2 (ppb; annual avg.; DF-2) = 1.47

$PM_{2.5}$ ($\mu g/m^3$; 24 h avg.):
DF-1: all < 26.7
DF-2: all < 16.7

$PM_{2.5}$ ($\mu g/m^3$; annual avg.)
DF-1: 0.5
DF-2: 1.5

PM_{10} ($\mu g/m^3$; 24 h avg.):
DF-1: all < 26.7
DF-2: all < 46.7</td></tr>
<tr><td>Pits</td><td>Generation of dust and gases from blasting, excavation etc.</td><td>Static dustfall</td></tr>
<tr><td>Waste Rock Facility and Tailings Storage Facility</td><td>Generation of dust from material deposited on waste rock pile or tailings</td><td>Static dustfall</td></tr>
<tr><td>Onsite Roads and Traffic, Airstrip</td><td>Generation of dust and emissions from use of roads and airstrip</td><td>Static dustfall</td></tr>
<tr><td>Mine Plant and Facilities</td><td>Release of pollutants from incineration</td><td>Report emissions</td><td>GHG emissions reported</td><td>Updated for Whale Tail Project – see Section 1.4.4</td><td>-</td><td>-</td></tr>
<tr><td>All Weather Access Road</td><td>Generation of dust and emissions from frequent activity by service and vehicles accessing staging facility</td><td>Static dustfall</td><td>Static dustfall (52 locations)</td><td>< Vault Haul Road</td><td>-</td><td>< Vault Haul Road; See discussion, Section 12.3.4.2</td></tr>
</table>

12.3.4.2 *Parts 3 & 4: Discussion*

If air quality impacts were exceeded or potentially exceeded based on monitoring results (as identified in Parts 1 & 2, above), a discussion would be provided here.

However, where quantitative comparisons to field monitoring results were feasible, no exceedances of air quality impact predictions occurred in 2018 or 2019.

Nevertheless, in further response to NIRB comments requesting a discussion of whether the predictions in the Final Environmental Impact Statement may have potentially underestimated the amount of dust produced on the mine site including along the all weather access road (AWAR), Agnico has conducted a review of FEIS modelling, and supplemental comparisons of dustfall results.

Review of FEIS Air Quality Modelling

In response to NIRB comments in their 2018-2019 Annual Monitoring Report for the Meadowbank Gold Project and the Whale Tail Pit Project, Agnico conducted a review of air quality modelling in the FEIS and offered the following response (Agnico Eagle's response to the 2018-2019 NIRB Recommendations, Section 1.1.3, November 25th, 2019):

> The modelled predictions of fugitive dust emissions from the mine site, or any unpaved haul road generally should not be considered definitive. Rather, these predictions should be considered as a tool to be used to evaluate the potential for dust deposition to occur in the vicinity of the haul roads and fugitive dust generating activity locations. The methodology used to evaluate the dustfall deposition rate and ambient concentrations in the FEIS remains consistent with methods being used today in air quality assessments. The emissions from traffic were quantified using the industry-standard emission factors presented in the US EPA AP-42 Chapter 13.2.2: Un-paved Roads, which considers vehicle traffic parameters (number and size of vehicles) and road surface parameters (silt content and natural mitigation) and follow-on predictions were made using standard models and methodology. The fleet was estimated using the best available information.
>
> If the input parameters to the model were to change, it could reasonably be assumed that a commensurate change in the predicted deposition rates next to the roads and other fugitive dust sources could be expected. With this context considered, there is no reason to suggest that the FEIS predictions underestimated fugitive dust deposition rates.
>
> The above notwithstanding, of the compounds that are routinely evaluated by air quality assessors, the one with arguably the highest level of uncertainty is likely fugitive dust deposition. One of the considerations to be mindful of is that the standard emission factors used consider particles in the size range of approximately 30 microns (µm) in aerodynamic diameter and smaller. Dustfall, measured in the collection jars, often contains particles considerably larger than 30 µm. What this means in practice is that when dustfall deposition rates are measured and found to be lower than the modelled predictions, the modelled predictions can be considered exceptionally conservative as they have not included the largest particles and still over-predict the measured values. If there was a standard method to calculate the largest

particle size emission rates and include them in the modelling, neither of which is possible using methods available then or now, the predicted values would be higher.

The Board is asked to consider the dust (airborne and deposited) monitoring results in their full context, which shows the vast majority of the data being widely compliant with the applicable guidance with only a few outliers and no trend toward increasing concentrations or deposition rates. The Board is also asked to consider the extensive monitoring results as a whole when evaluating the ongoing applicability of the modelling results and to give priority to the monitoring results above the modelling predictions. For dust evaluation in particular, there is more certainty in the monitoring than in the modelling.

Considering all of the above and based on a careful re-evaluation of the modelling and assumptions used to make predictions for dust deposition and ambient particulate concentrations, Agnico asserts that the modelling methods and results can continue to be relied on to provide guidance on dust management for the Project including the associated roads.

Review of FEIS Dustfall Predictions

Having re-confirmed that air quality modeling was conducted in a manner consistent with current best practices, Agnico has further evaluated FEIS documents to identify any specific predictions that were made with respect to dust generation along the AWAR. The feasibility of comparing those predictions with monitoring results was then identified.

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 comparable locations with respect to the AWAR (km 18 and 78; 300 m west of the road) are provided in Figure 65. 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 along the AWAR are at ground level, due to logistical constraints. As described in the 2019 Air Quality and Dustfall Monitoring Report, ground level samples have always been elevated in comparison to 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. Results at 300 m are likely somewhat elevated compared to those at 500 m.
- 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

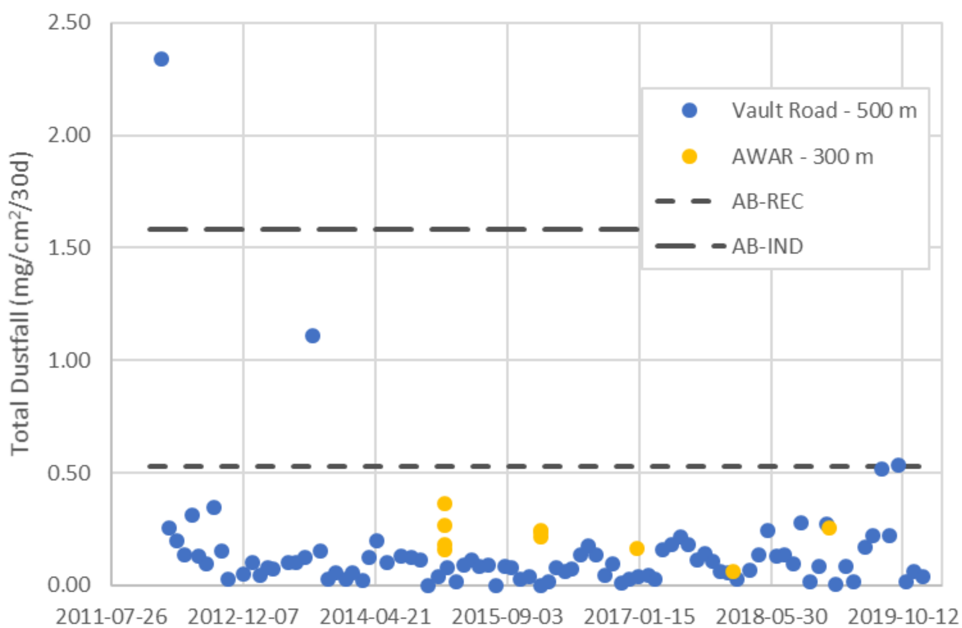
event only. These results can therefore be considered peak values, and averages based on these are likely inflated compared to the true annual average (as calculated for the Vault Haul Road dataset).

- 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.

Despite these differences which generally result in a very conservative comparison of dustfall rates between the Vault Haul Road location and AWAR samples, dustfall rates in both locations are historically similar. Overall, average total dustfall rates are 0.22 mg/cm^2/30d at DF-4, and 0.21 mg/cm^2/30d at AWAR-300m W locations. Moreover, with the exception of three samples along the Vault Haul Road (2012 and 2013), all measured rates of dustfall in both of these locations are within the range of background values observed in the area (0.007 – 0.357 mg/cm^2/30d), and are lower than Alberta Environment Department recreational area guideline for total dustfall (August, 2013) of 0.53 mg/cm^2/30d.

While the AWAR dataset for this purpose is limited, the above review of historical dustfall data suggests that the FEIS assumption of lower air quality impacts along the AWAR as compared to the Vault Haul Road were accurate.

Figure 65. 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, along with the range of background samples (grey)



12.3.4.3 *Effectiveness of Monitoring and Mitigation, and Adaptive Management*

Effectiveness of Monitoring

As described in Section 12.3.4.1, only a subset of FEIS air quality predictions are readily comparable to monitoring results. However, air quality monitoring at the Meadowbank site is well suited to understanding ambient air quality at the site in relation to regulatory criteria, and is therefore considered effective as designed in plans approved at the FEIS stage of the Project. A complete analysis of air quality monitoring results in comparison to regulatory criteria is provided in the 2019 Air Quality and Dustfall Monitoring Report (Appendix 41).

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 12-12, along with a commentary on current implementation.

Table 12-12 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 (2019)**
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	- NA
	Use low sulphur content diesel fuel to mitigate SO2 emissions	- Use of summer fuel
	Collect and vent any process emissions (flotation, CIP circuit, carbon treatment, gold refining, and cyanide detoxification) into the atmosphere	- 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	- Design to meet engineering practice
	Implement fleet maintenance program to ensure that all diesel-powered equipment will operate efficiently, thereby reducing air emissions	- 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.)	- Filter installed at major dust generating equipment
	Install enclosure of feed conveyor to avoid fugitive emissions during windy weather	- All conveyer are enclosed
	Provide crushed ore stockpile enclosure to limit any dust to indoor environment	- Enclosed in a dome
Transportation	Impose vehicle speed limit on Vault haul road to mitigate fugitive dust and reduce engine emissions	- 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	- Dust suppressant applied on mine site and roads
	To reduce vehicle emissions, do not let motors idle, except when necessary	- No idle policy implemented - 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	- 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	- Blasting follow the approved Blast Monitoring Program
	Cover dewatered tailings with non-potentially acid-generating (non-PAG) aggregates to control wind erosion	- Progressive reclamation of the North Cell Tailings Pond ongoing

Emission Source	**Planned Mitigation Measure** (Air Quality and Noise Management Plan, 2005)	**Implementation (2019)**
		with a cover of NPAG material
Miscellaneous	Provide pressure valves to control fuel vapour fugitive emissions from the storage tanks	- 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	- 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	- Construction of the incinerator included a secondary combustion chamber. - Annual testing of the incinerator stack to confirm compliance with applicable limit
	Apply vegetation cover on stripped areas and long-term stockpiles	- Natural revegetation to occur during the reclamation phase - Revegetation option to be considered in the final Closure Plan

Adaptive Management

Since no exceedances of impact predictions occurred, no adaptive management actions or supplemental monitoring programs are planned for 2020.

12.3.5 Permafrost

12.3.5.1 *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 12-13 below. A complete description of monitoring results is provided in the 2019 Geotechnical Inspection Report (Appendix 9), which reviewed instrument data collected between September 2018 and July 2019.

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 12-13 Predicted and measured impacts to permafrost for the Meadowbank site. Predicted impacts according to Cumberland, 2005, Table B1.2. Measured impacts according to the 2019 Geotechnical Inspection Report (Appendix 9)

Potential Impact	Potential Cause(s)	Proposed Monitoring	Current Monitoring	Predicted Impact in FEIS	Measured Impacts	
					2018	2019
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. Vault Dike: frozen foundation Central Dike: similar to historical trends, partially frozen foundation SD1&2: frozen foundations; SD3,4,5: partially frozen foundations; Stormwater Dike: partially frozen foundation	East Dike, Bay-Goose Dike, South Camp Dike: similar to historical trends, partially frozen foundations. Vault Dike: frozen foundation Central Dike: similar to historical trends, partially frozen foundation SD1&2: frozen foundations; SD3,4,5: partially frozen foundations; 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	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	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.

Potential Impact	Potential Cause(s)	Proposed Monitoring	Current Monitoring	Predicted Impact in FEIS	Measured Impacts	
					2018	2019
		polygons.			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, particularly in low lying areas.	Frozen ground conditions under the Portage RSF for all thermistor locations. Rockfill temperature below 0 °C for at least 10m above ground surface for all instruments.	Frozen ground conditions under the Portage RSF for all thermistor locations. Rockfill temperature below 0 °C for at least 10m above ground surface for all instruments. 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 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.	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.	No ground temperature measurements but no observations of thawing due to pipelines.

12.3.5.2 *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 Appendix 26 of the 2019 Annual Report.

12.3.5.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

Effectiveness of Monitoring

Based on Table 12-13, 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 2019 is provided in Table 12-14. 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 12-14 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 (2019)
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	- Annual geotechnical inspection completed by third party - Annual revision of the Waste Rock and Tailings Management Plan
Tailings Storage Facility	Management of ice entrapment	- 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	- Silt fences not required as of yet
Freshwater intake & pipeline	Use insulated pipe with heat tracing; elevate pipeline across thaw sensitive terrain	- Insulated pipe and elevated (freshwater line)
Discharge facilities & pipeline	Use insulated pipe with heat tracing; elevate pipeline across thaw sensitive terrain	- 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	- 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	- No maintenance as required

Adaptive Management

No changes to permafrost monitoring or management programs are planned in 2020.

12.3.6 Socio-Economic

A comprehensive assessment of socio-economic indicators, comparison to FEIS predictions, and review of management/mitigation measures is provided in the 2019 Socio-Economic Monitoring Report (Appendix 69) and summarized here in the PEAMP format. Since, in many cases, is it not possible to distinguish impacts of the Meadowbank project from those of the Whale Tail project, the PEAMP evaluation is combined for this sector.

12.3.6.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

Based on results of the 2019 Socio-Economic Monitoring Report (SEMR), the accuracy of Project impacts as predicted in the FEIS documents (Cumberland, 2005 - Table B15.2; Golder, 2016) is assessed for each identified valued socio-economic component in Table 12-15, below. For each metric assessed, 2019 results are presented along with the overall trend since the Project construction phase. When specific impact predictions are not being met, further discussion is provided in Section 12.3.6.2.

Table 12-15 Summary of FEIS predictions for socio-economic VCs, observed trends, and interpretation of monitoring results in comparison to FEIS predictions (Cumberland, 2005 - Table B15.2; Golder, 2016). Measured impacts that are trending in a negative manner outside of predictions are further discussed in Section 12.3.6.2. Plus symbol (+) indicates a result that is measured outside of impact predictions in a manner that is considered positive – these results are not discussed further here, but explained in detail in the corresponding section of the 2019 SEMR.

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2019 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
1. Employment	1.1 Total project employment (Agnico Eagle & contractors)						
MEADOWBANK: "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) WHALE TAIL: "The project will result in direct, indirect and induced employment opportunities" (Golder Associates, 2016, pp. 3-C-38)	Project employment (permanent & temporary, on-call, students & co-op & contractor)	N/A	↑	↑	Employment at Meadowbank / Whale Tail grew by 15% overall in 2019 to 1,649, with both Agnico Eagle and contractor employees increasing from 2018. Contractors account for 37% of Meadowbank & Whale Tail employment.	MEADOWBANK "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) WHALE TAIL "The project will require a workforce of around 900 and so will create around 200 new direct employment opportunities (Golder Associates, 2016, pp. 7-45)	MEADOWBANK – Prediction exceeded (+) WHALE TAIL – Prediction supported or exceeded
	1.2 Project Inuit employment (Agnico Eagle and contractors)						
	Project Agnico Eagle employment (Inuit & non-Inuit)				Across both projects in 2019, Agnico Eagle and contractors employed 476 Inuit FTEs, an increase of 9% from 2018 and accounting for 18% of the workforce. At Meadowbank & Whale Tail there were 292 Inuit FTEs. While this is a 5% increase from 2018, Inuit as a percentage of the workforce dropped 1% to 20%.	MEADOWBANK – none WHALE TAIL (inc. contractors) 25% of direct construction positions will be sourced locally, and are expected to be filled by the existing Meadowbank Mine workforce (Golder Associates, 2016, pp. 7-51) Operational employment is expected to be 931 positions… of these nearly half (392 or 42%) are expected to be filled by Nunavummiut (Golder Associates, 2016, pp. 7-52)	MEADOWBANK – N/A **WHALE TAIL - Prediction is generally supported after further interpretation (see Discussion, Section12.3.6.2.1)**
	Inuit FTEs	N/A	↑	↑			
	Inuit FTE rate	N/A	→	↓			
	Project contractor employment (Inuit & non-Inuit)						
	Inuit employees / FTEs	N/A	→	→			
	Inuit employee / FTE rate	N/A	↓	↓			
	1.3 Project Agnico Eagle employment by Kivalliq community						
	Project employment by Kivalliq community	N/A	↑	↑	The number of Kivalliq-based employees has risen by at least 5% every year since 2016, reaching 334 and 72 at Meadowbank / Whale Tail and Meliadine, respectively, in 2019.	MEADOWBANK – none WHALE TAIL The FEIS estimates 217 positions will be filled by employees from Baker Lake. (Golder Associates, 2016, pp. 7-53)	MEADOWBANK – N/A WHALE TAIL - Prediction supported
	1.4 Project employment by gender						

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2019 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
	Project employment (gender)				Agnico Eagle female employment at Meadowbank / Whale Tail remained fairly stable, declining slightly (by 1%) to 21% in 2019 after steadily increasing since 2013 from a low of 10%. It significantly surpasses the Canadian mining sector average of 15% in 2018.	MEADOWBANK – none WHALE TAIL - none	N/A
	employees	N/A	↑	↑			
	rate	N/A	→	→			
	1.5 Project turnover						
	Agnico Eagle Inuit employee turnover by reason	N/A	→	→	The turnover rate for Inuit employees at all Agnico Eagle projects is consistently higher than that for non-Inuit employees. Turnover rates at Meadowbank and Whale Tail increased in 2019 for both Inuit (+5% to 39%) and non-Inuit (+1% to 11%), the highest levels since 2011 and 2012, respectively. Resignations (57%) and Dismissals (35%) account for the vast majority of Inuit terminations across the sites.	MEADOWBANK – none WHALE TAIL - none	N/A
	Turnover rates	N/A					
	Inuit rates	N/A	→	↑			
	Non-Inuit rates	N/A	→	→			
	Turnover rate by community	N/A	→	↓			
2.Income	2.1 Income paid to projects' Inuit employees						
MEADOWBANK: "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	Income paid to Agnico Eagle project Inuit employees	N6/A	↑	↑	Total income paid to both project's Inuit employees (excluding contractors) in 2019 was $33.4M, an increase of 43% from 2018. Inuit income at Meadowbank / Whale Tail rose by 33% in 2019.	MEADOWBANK "Direct project wages paid to people in Kivalliq Region, primarily Baker Lake, could exceed $4 M annually" WHALE TAIL "Project construction will result in $14.1 million (cumulatively) of direct labour income in Nunavut. When indirect and induced incomes are included, the Project's total territorial construction labour income is predicted to be $22.1 million between 2017 and 2019" (Golder Associates, 2016, pp. 7-54)	MEADOWBANK - Prediction exceeded (+) WHALE TAIL - Prediction supported
	2.2 Income by Kivalliq community						

Sector and Overarching FEIS Prediction	**Metric**	**MBK / WT Trends**			**2019 Overview**	**Specific FEIS Prediction**	**Accuracy of the FEIS Prediction**
		Pre-dev	Post-dev	Last year			
	Median employment income of tax filers by Kivalliq community	→	↑	N/A	Median income in Baker Lake and Rankin Inlet have been above the median income for the Kivalliq region during several years since Meadowbank opened, including 2016 (the latest year for which data is available). Baker Lake in particular has experienced a large rise in median income from 2014 to 2016 (up from $23K to $34K). Growth in median employment income has been most positive among communities with the highest levels of Agnico Eagle employment.	MEADOWBANK 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. WHALE TAIL - none	MEADOWBANK - Prediction supported WHALE TAIL - Prediction supported
3. Contracting and Business Opportunities	3.1 Contract expenditures						
MEADOWBANK: "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. 121) WHALE TAIL: The Project will generate "continued local economic activity" (Golder Associates, 2016, p. 68) and is expected to have "high positive impacts…" (Golder Associates, 2016, p. 68) on local procurement.	Contract expenditures on NTI-registered businesses				Inuit business spending at Meadowbank and Whale Tail increased in 2019 to $309M, although as a percentage of total spend it is down slightly to 62% (from 65%).	MEADOWBANK "With continuing preferential contracting, local business participation in the project is expected to grow with time." (Cumberland Resources Ltd., 2006, p. 7) WHALE TAIL "Average annual procurement in the territory is expected to amount to over $270 million…" (Golder Associates, 2016, p. 307, 308)	MEADOWBANK - Prediction supported WHALE TAIL - Prediction supported
	NTI expenditures	N/A	↑	↑			
	Proportion NTI	N/A	↑	↓			
	NTI-registered business expenditures by Nunavut community	N/A	N/A	N/A	Significant changes in NTI-registered business expenditures within communities included a sizable decrease in Baker Lake, which dropped from $93M in 2017 to $38M in 2018 and $30M in 2019, and Rankin Inlet which increased from $286M to $295M from 2018 to 2019. The amount spent in non-Kivalliq Inuit communities increased from 2017 to 2019, from $99M to $170M.		
	Contract expenditure on Nunavut-based businesses				Meadowbank / Whale Tail contract expenditures on Nunavut-based businesses (including NTI-registered		
	Nunavut-based expenditures	N/A	↑	↑			

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2019 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
	Proportion Nunavut-based	N/A	/	↓	businesses) increased to $393M in 2019.		
	Contract expenditures from Meadowbank / Whale Tail on Baker Lake-based businesses and from Meliadine on Rankin Inlet-based businesses	N/A	↓	↓	Meadowbank / Whale Tail's contract expenditures on Baker Lake businesses dropped from $30M to $21M in 2019.		
4. Education and Training	4.1 Investment in school-based initiatives						
MEADOWBANK: "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) WHALE TAIL: "The Project will provide training opportunities for its workforce… The project will contribute to community education" (Golder Associates, 2016, pp. 3-C-38)	Agnico Eagle investments in school-based initiatives	N/A	N/A	N/A	In 2019, Agnico Eagle made $796,000 in contributions to education-based initiatives, with investments since the beginning of operations totalling over $2.4 million.	MEADOWBANK "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. This education and training initiatives [sic] will also include an element to address motivational issues around getting children through high school. Such measures would be intended to contribute to encouraging a commitment to education on the part of youth." (Cumberland Resources Ltd., 2006, p. 121) WHALE TAIL "The Project will provide workforce training and support community education" (Golder Associates, 2016, pp. 7-55)	MEADOWBANK - Prediction supported WHALE TAIL - Prediction supported
	4.2 Secondary school graduation by region						
	Secondary school graduation rate by region	↑	↑	N/A	The graduation rate in Kivalliq region fluctuates from year to year, though shows an overall upward trend that began in 2008. Rates have been at all-time highs for the region, and consistently higher than those in the other two regions, since 2010.	MEADOWBANK – none WHALE TAIL - none	N/A
	4.3 Project training and education						
	Agnico Eagle investments in mine training and education programs	N/A	→	→	Agnico Eagle's financial investments in externally delivered training programs	MEADOWBANK "Cumberland and KIA will address the need for	MEADOWABNK - Prediction

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends Pre-dev	MBK / WT Trends Post-dev	MBK / WT Trends Last year	2019 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
	Average mandatory training hours provided to Agnico Eagle Inuit employees	N/A	→	→	have dropped substantially since 2016; internal spending has increased accordingly to maintain a minimum of $3.68M in training spending as per the IIBA with the KIA. Mandatory training per Inuit FTE was 10 hours at Meadowbank / Whale Tail.Specific training per FTE was 56 hours at Meadowbank / Whale Tail.. There were 93 TASK week participants in Baker Lake, Chesterfield and Arviat, up from 48 in 2018. There were 10 active Inuit apprentices at Meadowbank / Whale Tail in 2019, down from 18 in 2018.	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) WHALE TAIL "The Project will continue the workforce training programs in place at Meadowbank Mine" (Golder Associates, 2016, pp. 7-55)	supported WHALE TAIL - Prediction supported
	Average specific training hours provided to Agnico Eagle Inuit employees	N/A	→	↓			
	Participation in career and skills programs	N/A	/	/			
	Meadowbank pre-apprenticeship and apprenticeship participation by type	N/A	→	↓			
	4.4 Project employment by skill level						
	Project Agnico Eagle Inuit employees by skill-level	N/A	↑	↑	In 2019 there were 14 Inuit employees working at Agnico Eagle projects in positions classified as 'skilled' or 'management and professional', an increase of 1 from 2019. The majority of these positions are at Meliadine (11 of the 14). The number of skilled workers at both projects has fluctuated since 2014, between 5 and 10, with 6 employed in 2019. Meadowbank and Whale Tail have struggled to increase the number of skilled Inuit, with the highest number being 6 since 2014 and a current low of 2. The overall number of semi-skilled Inuit employed has increased steadily from 2014,	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, 2016, pp. 7-55)	MEADOWBANK – N/A **WHALE TAIL -** **Prediction supported overall but further discussion is provided (see Discussion, Section 12.3.6.2.2)**

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2019 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
					with a 19% increase in 2019 to 222. Despite increases in the number of semi-skilled Inuit at both sites, the proportion of Inuit in this role declined slightly from 2018 to 2019. This may be due in part to a tight labour market for semi-skilled Inuit mixed with an increasing demand for these positions. The number of unskilled Inuit workers has also steadily increased, to a total of 2016 in 2019 – a 4% increase on 2018 and accounts for all of the unskilled positions at both sites.		
5. Culture and Traditional Lifestyle	5.1 Perceptions of culture and traditional lifestyle						
MEADOWBANK: "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) WHALE TAIL: "Project activities may affect continued opportunities for traditional wildlife harvesting… fishing…plant harvesting…the use of	Self-reported effect of project on culture and traditional activities	N/A	N/A	N/A	This is the first year an Inuit employee survey was conducted. A large majority of survey respondents strongly agree (59%) or somewhat agree (21%) that knowledge and respect of Nunavut's environment and land is valued by Agnico Eagle. When asked about the impact of the mine on their ability to participate in cultural and traditional activities, 10% said they participated more, 34% felt they participated the same amount, 31% indicated their participation had decreased.	MEADOWBANK – none WHALE TAIL - none	N/A
	5.2 Culture and traditional lifestyle						
	Proportion of total population identifying Inuktitut as their mother tongue by community	➔	🡣	N/A	The proportion of the population identifying Inuktitut as their mother tongue has remained relatively stable in the smaller Kivalliq communities from 2006 to	MEADOWBANK "The project will not significantly restrict access to or productivity of lands used for traditional activity." (Cumberland Resources Ltd., 2006, p. 122) WHALE TAIL	MEADOWBANK Prediction supported WHALE TAIL: TBD (cannot be

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2019 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
culturally important sites… [and it may] change access to traditional use area." (Golder Associates, 2016, pp. 3-C-33-37)					2016, but has declined in Rankin Inlet, Baker Lake, and Chesterfield Inlet (by 10 to 18 percentage points) over this period.	"Project activities may affect continued opportunities for traditional wildlife harvesting…fishing…plant harvesting…the use of culturally important sites… [and it may] change access to traditional use areas" (Golder Associates, 2016, pp. p. 3-C-33-37)	determined at this time)
	Use of AWAR by community	N/A	↑	/	There was a decrease in usage of the Meadowbank AWAR from 2015 to 2018, but a jump in 2019 to the second-highest usage on record		
	5.3 Country food use at project						
	Country food kitchen usage	N/A	→	↓	The number of meals served featuring country food has remained steady at Meadowbank since 2011; this number represents one serving of country food per month to all on-site staff. The country food kitchens and events have seen steady use at Meadowbank / Whale Tail, although there was a drop in the use of the country food kitchen in 2019.	MEADOWBANK – none WHALE TAIL - none	N/A
	Country food night events	N/A	/	↑	Meadowbank / Whale Tail hosted 12 country food night events in 2019		
6. Population Demographics	6.1 Employee migration						
MEADOWBANK: "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	Project Agnico Eagle Inuit employees residing outside Nunavut				At Meadowbank / Whale Tail, the number of Inuit employees residing outside Nunavut has remained stable since 2015, currently at 21 which accounts for 7% of Inuit workforce.	MEADOWBANK The Meadowbank FEIS suggests that in-migration of Southerners to Baker Lake would be the primary concern. WHALE TAIL "Project is not expected to generate employment-driven migration." (Golder Associates, 2016, 3-C-38)	MEADOWBANK: Prediction is not supported (+) WHALE TAIL: Prediction supported
	Total Inuit employees	N/A	→	↓			
	Proportion of Inuit employees residing outside Nunavut	N/A	→	↓			
	6.2 Population estimates in Kivalliq communities						
	Population estimates of				Yearly population estimates do not indicate an increase in the population growth rate of Baker	MEADOWBANK "It is not likely that migration to any other community than Baker Lake would be significant,"	MEADOWBANK: N/A
	Estimates in communities	↑	↑	N/A			

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2019 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
Ltd., 2006, p. 126) WHALE TAIL: "The Project may contribute to intra- and/or inter-territorial migration and associated population and demographic change in communities." (Golder Associates, 2016, p. 3-C-38)	*Annual percent change*	→	→	N/A	Lake or of other communities with significant Agnico Eagle employment (Arviat, Rankin Inlet) since the mine opened, or relative to other communities in the region. If other factors (births and deaths) are assumed constant, the population data does not suggest significant migration to Arviat, Baker Lake (or other communities with high Agnico Eagle employment).	but does not provide any specific predictions on changes to populations in Kivalliq communities. WHALE TAIL "No Project employment-driven migration or population change is anticipated." (Golder Associates, 2016, 3-C-38)	WHALE TAIL: Prediction supported
7. Individual and Community Wellness	7.1 Agnico Eagle's Programs						
MEADOWBANK: Potential impacts on individual and community wellness are complex, far reaching, and given human nature, difficult to predict with certainty. 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."	Agnico Eagle wellness programs offerings & utilization by project employees	N/A	N/A	N/A	Agnico Eagle continues to offer a variety of wellness programs to both employees and community members. Where data can be and are collected, all programs have seen some usage by their intended audience.	MEADOWBANK - none WHALE TAIL "The Project will continue existing individual and family wellness programming (e.g., Employee Family Assistance Program)." (Golder Associates, 2016, p. 3-C-38)	MEADOWBANK: N/A WHALE TAIL: Prediction supported
	Agnico Eagle wellness programs offerings & utilization by community members	N/A	N/A	N/A			
	7.2 Perceptions of health & wellness						
	Self-reported effect of project on health & wellness	N/A	N/A	/	At least 80% of Inuit employee survey respondents believe Agnico Eagle has created a positive work environment driven by respect, indicate they are happy at work, and say they have shared positive work values with youth at home or in the community. There do not appear to be significant systemic impacts on relationships related to working at Agnico Eagle (based on survey responses), as nearly half reported no change, and an equal and smaller number reported either a positive or negative impact.	MEADOWBANK – none WHALE TAIL - none	N/A

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends: Pre-dev	MBK / WT Trends: Post-dev	MBK / WT Trends: Last year	2019 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
(Cumberland Resources Ltd., 2006, p. 123) WHALE TAIL: "Project incomes may adversely affect family and community cohesion through social ills (e.g., substance abuse, sexual misconduct, family violence, crime);" Incomes may also "exacerbate income inequality, social disparity, and, potentially, related conflict in families and crime in communities." (Golder Associates, 2016, 3-C-38). Project rotational employment may adversely affect family and community cohesion related to extended time away from family and community." (Golder Associates, 2016, 3-C-38)					Inuit employee survey respondents worry the most about family and financial situations, and some struggle with loneliness; work-related difficulties impact fewer than 25%. Nearly 60% of Inuit survey respondents reported that they did not save any money over the last year, and two thirds of survey respondents reported that they did not seek or receive financial advice in the past year.		
	7.3 Criminal violations						
	Criminal violations per hundred people by Kivalliq community	/	/	/	Total criminal violation rates in Baker Lake and Rankin Inlet reached historic high levels in 2011 and 2012, following the opening of Meadowbank. Recent data (2017) indicates a continuing downward trend (since 2012) in criminal violations in Baker Lake, along with those in Arviat. However, Rankin Inlet has seen sharp rises in criminal violations from 2015 to 2017, the latest year for which data is available.	MEADOWBANK – none WHALE TAIL "Project incomes may exacerbate …crime in communities." (Golder Associates, 2016, p. 3-C-38)	MEADOWBANK: N/A WHALE TAIL: TBD (cannot be determined at this time)
	Criminal violations per hundred people by type (Baker Lake, Rankin Inlet, Chesterfield Inlet)						
	Baker Lake	→	↓	↓			
	Rankin Inlet	→	↓	↑			
	Chesterfield Inlet	↑	→	↑			
	7.4 Health centre visits						
	Health centre/clinic visits by Kivalliq community by reason for visit	↓	↑	N/A	Changes in the number of individual visits to health centres by reason for the visit can provide some indication of individual and community wellness. From 2009 to 2016, the number of health centre visits increased for a number of different types of services, including for: mental health and behavioural disorders (240% increase), signs of symptoms of	MEADOWBANK "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) WHALE TAIL "Project-induced migration can increase demand for social and healthcare services…[but] no Project	**MEADOWBANK: Impact of Agnico operations cannot be determined – (see Discussion, Section 12.3.6.2.3)** WHALE TAIL: TBD (cannot be

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2019 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
					illness (cause unknown; 76% increase), musculoskeletal system diseases (60% increase), and injuries and poisonings (39% increase). A number of factors may be contributing to these changes, including but not limited to: increased needs for medical care due to changes in community health, increased capacity of health centres (size, services), greater awareness of available health services, and willingness to seek help.	employment-driven migration or population change is anticipated." (Golder Associates, 2016, pp. 3-C-39)	determined at this time due to lack of employment-driven migration)
	7.5 Housing						
	Persons on waitlist for public housing by community	/	/	/	While there is potential for mining projects to impact housing supply and demand, (e.g. through changes in income, increased in and out migration, private investment) there is not enough data to draw conclusions on impacts to housing in the territory.	MEADOWBANK – none WHALE TAIL "Project-induced migration can increase demand for housing and associated crowding...[but] no Project employment-driven migration or population change is anticipated" (Golder Associates, 2016, pp. 3-C-39)	MEADOWBANK: N/A WHALE TAIL: TBD (cannot be determined at this time due to lack of employment-driven migration)
	7.6 Food security						
	Food security by region or community	N/A	N/A	N/A	While there is no available year-over-year data on food security in Kivalliq communities, Agnico Eagle projects offer potential pathways that may positively impact food security in the Kivalliq. This includes providing employees with healthy food choices while on site; increasing household incomes, allowing for greater food purchasing; and enhancing availability and accessibility of country food. However, 59% of Inuit survey respondents reported that they were worried	MEADOWBANK – none WHALE TAIL "Project incomes may enhance individual and community wellness by providing access to… nutritious food." (Golder Associates, 2016, p. 3-C-38)	MEADOWBANK: N/A WHALE TAIL: TBD (cannot be determined at this time)

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2019 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
					their food would run out before they got more money all, most or some of the time, and only 22% never worried about running out of food.		
	7.7 Suicide						
	Suicides per 10,000 people by region	/	/	/	There is a persistent and territory-wide suicide crisis in Nunavut. The factors contributing to suicide are numerous and complex, so it is difficult to assess impacts of Agnico Eagle's projects on suicide rates. Community suicide rates (e.g. for Baker Lake) are highly variable from year to year. Trends are more apparent in long-term and/or regional data.	MEADOWBANK – none WHALE TAIL - none	N/A
8. Health and Safety	8.1 Health and safety training						
MEADOWBANK: The FEIS considers both the health and safety of workers and the public and recognizes that one may affect the other. "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) WHALE TAIL: "The	Average (per FTE) mandatory training hours provided to Agnico Eagle Inuit employees	N/A	➔	➔	Mandatory training hours remained the same at Meadowbank / Whale Tail in 2019 and have been steady since 2017.	MEADOWBANK – none WHALE TAIL "The Project may improve health and safety awareness amongst employees, their families, and their communities." (Golder Associates, 2016, p. 3-C-38)	MEADOWBANK: N/A **WHALE TAIL: Prediction supported but further discussion is provided (see Discussion, Section 12.3.6.2.3)**
	8.2 Health and safety on-site						
	Average (per-FTE) visits by project Agnico Eagle employees to clinic for work-related or other reasons	N/A	↑	↑	Since they have been offered, approximately 75% of visits to Agnico Eagle clinics, at both Meadowbank / Whale Tail and Meliadine, have been for non-work-related conditions. This indicates that these clinics serve an important function in addressing the general non-work-related health/medical	MEADOWBANK – none WHALE TAIL "The Project may result in accidental injury or emergencies." (Golder Associates, 2016, 3-C-38)	MEADOWBANK – N/A WHALE TAIL - Prediction supported

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2019 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
Project may improve health and safety awareness amongst employees, their families, and their communities." (Golder Associates, 2016, 3-C-38)					needs of workers. Clinic visits at Meadowbank / Whale Tail rose significantly in 2019, with work-related visits more than doubling. Additional visits were likely driven by the addition of a clinic at Whale Tail, as well as significant activity at Whale Tail since February 2019		
	Project combined lost-time and light duty accident frequency (per 200,000 person-hours)	N/A	/	↓	The lost time and light duty accident frequency rate (incidents per 200,000 person-hours worked) at Meadowbank and Whale Tail remained relatively stable at 2.62 (up marginally from 2.55 in 2018) and declined by 47% to 1.64 at Meliadine. Note that 2019 still involved a significant amount of construction. Compared to mining industry benchmarks, the injury rate is higher than the ICMM member company average of 0.68 in 2018; however, individual ICMM member company injury rates ranged as high as 2.02 per 200,000 person-hours worked.		
9. Community Infrastructure and Services	9.1 Use of GN health services						

Sector and Overarching FEIS Prediction	**Metric**	**MBK / WT Trends** Pre-dev	Post-dev	Last year	**2019 Overview**	**Specific FEIS Prediction**	**Accuracy of the FEIS Prediction**
MEADOWBANK: "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) WHALE TAIL: "Project-induced migration can increase demand on physical infrastructure…[but] no Project employment-driven migration or population change is anticipated." (Golder Associates, 2016, p.3-C-39)	Kivalliq community health centre visits per capita	/	/	N/A	It is unclear whether and to what extent Agnico Eagle's projects have impacted health centre usage in Kivalliq communities. In 2019, 86 employees were referred to community health care centres, down from 105 in 2018. Since 2010, approximately 75% of visits to Agnico Eagle clinics have been for non-work-related conditions. This indicates that these clinics may lessen the local health infrastructure burden. Incidents requiring use of GN health services decreased at both Meadowbank / Whale Tail (down from 21 to 16) and Meliadine (down from 5 to 0) in 2019.	MEADOWBANK "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) WHALE TAIL "Project-induced migration can increase demand for… healthcare services…[but] no Project employment-driven migration or population change is anticipated." (Golder Associates, 2016, p. 3-C-39)	MEADOWBANK – TBD (cannot be determined at this time) WHALE TAIL - TBD (cannot be determined at this time due to lack of employment-driven migration
	Employees referred to community health care centre (personal and work-related) (2018)	N/A	N/A	↓			
	Incidents requiring use of GN health services	N/A	↓	↓			
	9.2 Use of public infrastructure						
	Estimates of use of public physical infrastructure directly related to Project (airports, port, meeting facilities, roads)	N/A	N/A	N/A	The use of public physical infrastructure by Meadowbank / Whale Tail and its employees consists primarily of the use of airports and has been relatively consistent since operation began in 2010. There are no indications of significant positive or negative impacts on this infrastructure. Both Meliadine and Meadowbank AWARs continue to see significant community usage.	MEADOWBANK "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) WHALE TAIL "Project-induced migration can increase demand on physical infrastructure, [however, employees] fly-in/fly out to and from Kivalliq communities." (Golder Associates, 2016, p. 3-C-39)	**MEADOWBANK – Prediction not supported or refuted (see Discussion, Section 12.3.6.2.5)** WHALE TAIL - TBD (cannot be determined at this time due to lack of employment-driven migration)
	All-weather access road (AWAR)	N/A	↓	/			
	9.3 Social assistance						
	Per capita social assistance expenditures by community	↓	/	N/A	Per capita social assistance expenditures declined in all Kivalliq communities in 2018 (the latest year for which data is available) following an increase across communities	MEADOWBANK "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	**MEADOWBANK – Impact of Agnico operations cannot be determined – (see Discussion,**
	Percentage of households receiving social assistance by community	↓	↓	N/A			

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2019 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
					starting in 2012, though current levels are still above the historical average. The percentage of households receiving social assistance has been remaining steady or declining for most Kivalliq communities over the past 10 years. Despite declines from historical highs, social assistance data does not show a clear correlation between Agnico-related employment and social assistance requirements in Baker Lake or Arviat. Data suggests that both expenditures and percentage of households receiving social assistance have been declining in Rankin Inlet since Meadowbank began operation.	delivery.” (Cumberland Resources Ltd., 2006, p. 128) WHALE TAIL - none	**Section 12.3.6.2.6).** WHALE TAIL N/A
10. Nunavut Economy	10.1 Royalties and taxes						
MEADOWBANK: “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) WHALE TAIL: “The Project will contribute to territorial economic activity via expenditures, procurement and Gross Domestic Product contributions.” It will also “contribute to government	Project payments, royalties and taxes	↑	↑	↑	Agnico Eagle continues to pay taxes, royalties and other payments to the Government of Nunavut, Government of Canada, NTI and the KIA. Total values paid across the two sites rose from $68.9M in 2018 to $89M in 2019.	MEADOWBANK – none WHALE TAIL “The Project will contribute to government revenues through the payment of taxes and royalties, [which will be]…large relative to [the] territorial economy.” (Golder Associates, 2016, p. 3-C-38)	MEADOWBANK – N/A WHALE TAIL - Prediction supported
	10.2 Trade Balance						
	Nunavut trade balance	↓	↓	↓	Nunavut’s trade balance held fairly steady from 2011 to 2016 but has since dropped $317M to -$1,385M in 2018 (the most recent year for which data is available). This coincided with the construction of Meliadine, as large construction projects tend to increase the trade deficit.	MEADOWBANK – none WHALE TAIL - none	N/A

Sector and Overarching FEIS Prediction	Metric	MBK / WT Trends			2019 Overview	Specific FEIS Prediction	Accuracy of the FEIS Prediction
		Pre-dev	Post-dev	Last year			
	10.3 Nunavut GDP						
	Nunavut GDP by all industries and mining, quarrying and oil & gas	↑	↑	N/A	Coinciding with increased mining activity in the Kivalliq and the rest of Nunavut, the territory's GDP has grown at an average annual rate of approximately 7.5% from 2009 to 2018. Given that Meadowbank was the only operating mine in Nunavut from 2010 to 2015 (Baffinland's Mary River Project began operations in 2015), the GDP growth data suggest that Meadowbank's contribution to GDP has exceeded the FEIS prediction. The increase in Nunavut's GDP (10%) in 2018 may in part be attributed to construction activities at Meliadine and Whale Tail, most notably a large increase in contract expenditures for the two construction projects. 2019 data is not currently available.	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) WHALE TAIL "The Project will contribute to territorial economic activity via expenditures, procurement and Gross Domestic Product contributions." (Golder Associates, 2016, p. 3-C-38)	MEADOWBANK – Prediction exceeded (+) WHALE TAIL – Prediction supported

12.3.6.2 *Parts 3 & 4: Discussion*

For each metric with a specific FEIS prediction that has experienced a negative trend (away from the predicted goal/impact) in the post-development period, a trend analysis and discussion is provided here from the 2019 Socio-Economic Monitoring Report (Appendix 69; Aglu-Stratos Inc., 2020). That report further provides trend analyses and discussions for every metric assessed in Table 12-15, above. In addition, discussions are provided here for special cases, as noted in Table 12-15.

12.3.6.2.1 Project Inuit Employment (Agnico Eagle and Contractors)

After interpretation as summarized below (see Appendix 69, Section 1.2), predictions around Project Inuit employment are considered generally supported by the data collected to date.

FEIS Prediction:

> MEADOWBANK – none
>
> WHALE TAIL (including contractors) -
>
> > 25% of direct construction positions will be sourced locally, and are expected to be filled by the existing Meadowbank Mine workforce (Golder Associates, 2016, pp. 7-51)
> >
> > Operational employment is expected to be 931 positions… of these nearly half (392 or 42%) are expected to be filled by Nunavummiut (Golder Associates, 2016, pp. 7-52)

Discussion: Trends in Agnico Eagle and contractor employment numbers are provided in Figures 66 and 67. At Meadowbank & Whale Tail there were 292 Inuit FTEs (including Agnico Eagle and contractors), a 5% increase from 2018. The number of Agnico Eagle Inuit employees rose by 15, while the number of contractor Inuit employees fell by 1. Inuit represent 20% of the total workforce, down from 21% in 2018 and lower than the 42% predicted. There are several factors to consider when comparing actual percentage achieved to the prediction. First, the prediction was based on headcount, which results in higher numbers than FTEs: the actual headcount of Inuit employees at Meadowbank & Whale Tail is 391, virtually identical to the prediction of 392 Inuit positions. Second, with the total number of employees at Meadowbank & Whale Tail much higher than predicted, it is more challenging to meet the predicted Inuit percentage given the existing pool of Inuit workers to draw from.

Figure 66 Project Agnico Eagle employment (Inuit & non-Inuit)

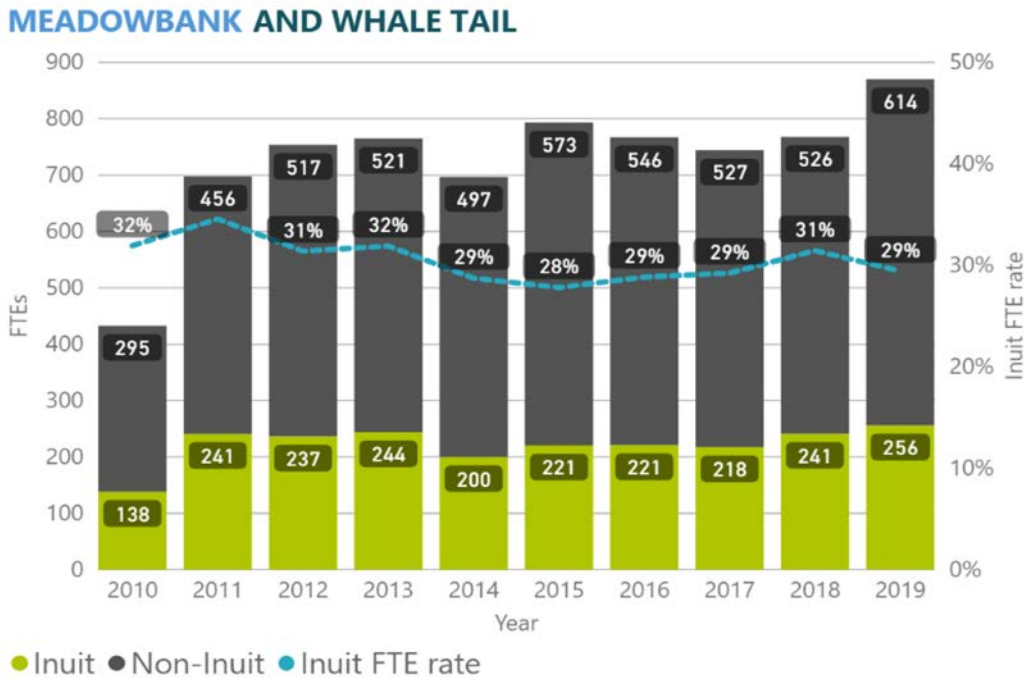
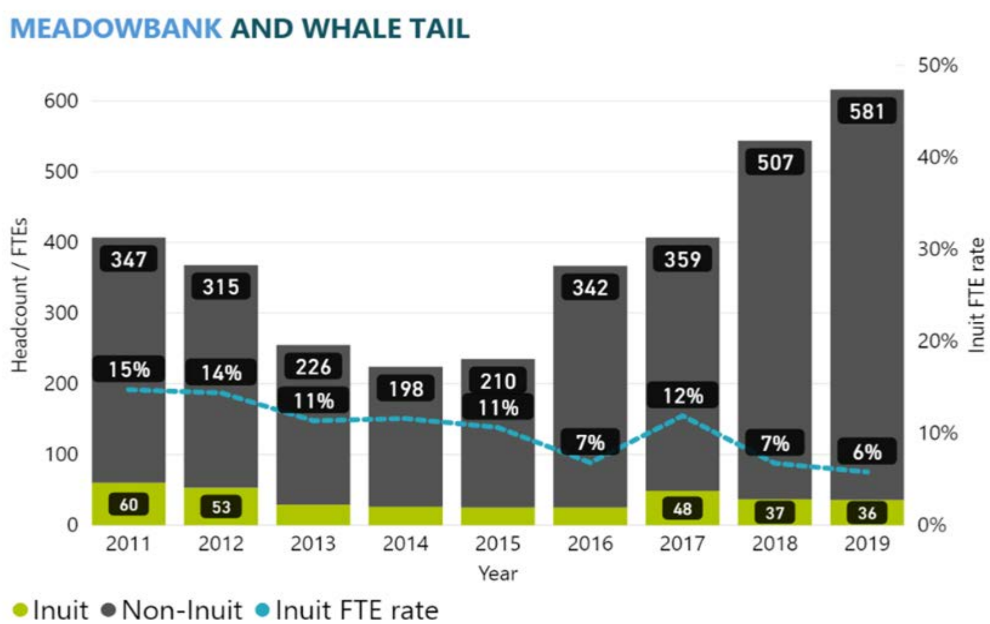


Figure 67 Project contractor employment (Inuit & non-Inuit) [6]



[6] 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.

12.3.6.2.2 Project Employment by Skill Level

Overall predictions regarding Project employment by skill level are considered supported by the data collected to date, but since the prediction is not quantitative or specific, a summary of the interpretation is provided (see Appendix 69, Section 4.4)

***FEIS Prediction*:**

MEADOWBANK - none

WHALE TAIL –

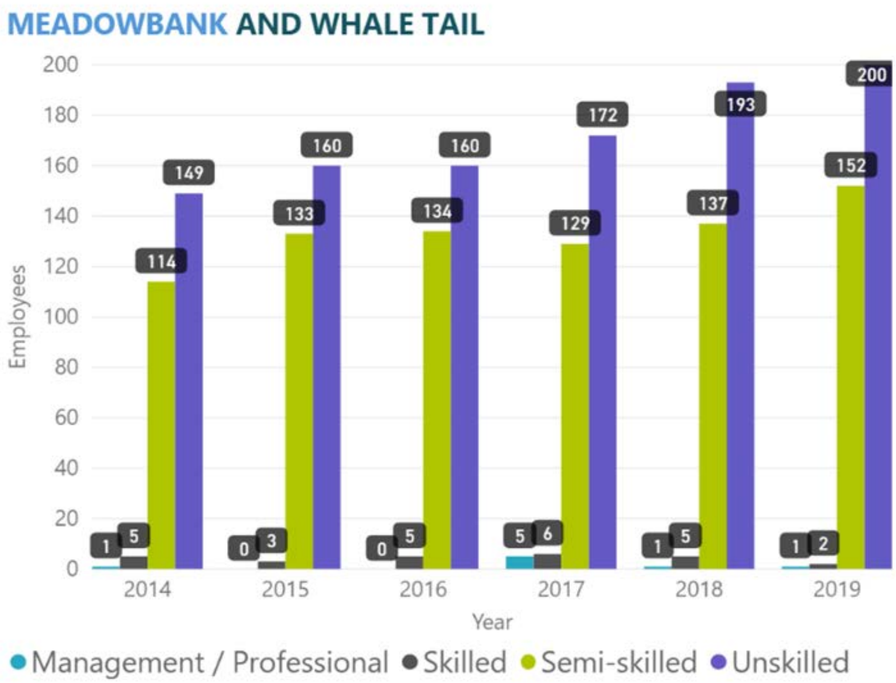
> "As Nunavummiut employees achieve further training and education, it is expected that they will be better poised to advance to more skilled positions as they arise, thereby increasing representation of Nunavut residents in the skilled, professional and management employment categories" (Golder Associates, 2016, pp. 7-55)

***Discussion*:** Overall this prediction was identified to be generally supported at this point, but since it is not quantitative, further discussion is provided here. Figure 68 shows the number of Inuit employees at each skill level between 2014 and 2019. Note that Agnico Eagle changed how various skill levels are classified in 2013 and 2014. Due to these changes, year over year trends of Inuit employment by skill level cannot be drawn pre-2014.

Meadowbank and Whale Tail have struggled to increase the number of skilled Inuit, with the highest number being 6 since 2014 and a current low of 2. The overall number of semi-skilled Inuit employed has increased steadily from 2014, with a 19% increase in 2019 to 222, but despite increases at both sites, as a percentage of total semi-skilled workers the figure declined to 29%. This may indicate a tightening labour market for semi-skilled Inuit. The number of unskilled Inuit workers has also steadily increased, to a total of 2016 in 2019 – a 4% increase on 2018 and accounts for all of the unskilled positions at both sites.

Management and mitigation initiatives are discussed in Section 4.4 of the Socio-Economic Monitoring Report (Appendix 69).

Figure 68 Project Agnico Eagle Inuit employees by skill-level



12.3.6.2.3 Health Centre Visits

While overall changes in community health centre visits can be assessed, the specific contribution of Agnico's operations to those changes cannot be determined with the available data to comment on the accuracy of FEIS predictions. A summary of that interpretation is provided below (see Appendix 69, Section 7.4).

FEIS Prediction:

MEADOWBANK

> "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)

WHALE TAIL

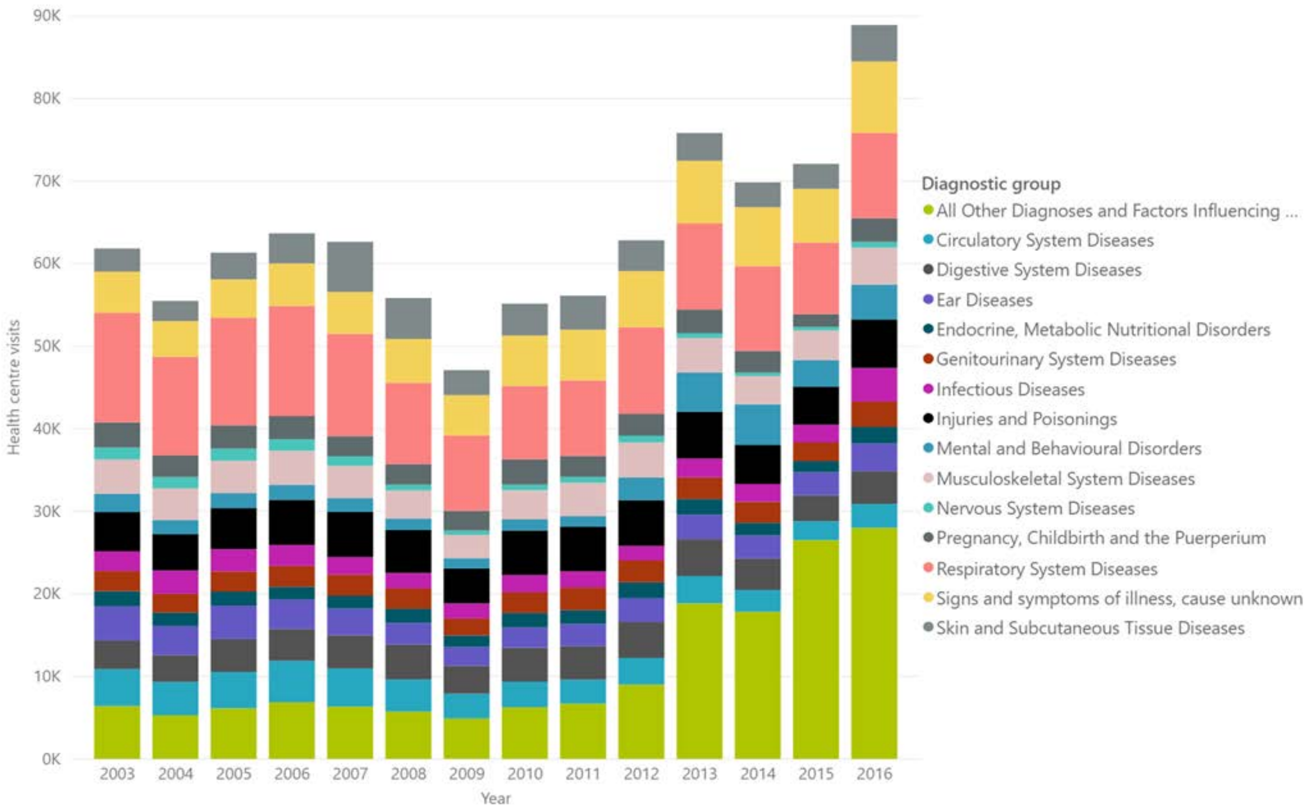
> "Project-induced migration can increase demand for social and healthcare services…[but] no Project employment-driven migration or population change is anticipated." (Golder Associates, 2016, pp. 3-C-39)

Discussion:

Figure 69 provides an overview of health center visits by reason for visit to 2016, the latest year for which data is available. Changes in the number of individual visits to health centres by reason for the visit can provide some indication of individual and community wellness. From

2009 to 2016, visits for mental health and behavioural disorders more than tripled, signs of symptoms of illness (cause unknown) increased by 76%, musculoskeletal system diseases increased by 60%, and injuries and poisonings increased by 39%. A number of factors may be contributing to these changes, including but not limited to: increased needs for medical care due to changes in community health, increased capacity of health centre (size, services), greater awareness of the health services, and willingness to seek help. Without additional information, it is difficult to attribute changes in health centre use to Agnico Eagle's Kivalliq Projects.

Figure 69 Kivalliq community health center visits by reason for visit (GN Department of Health, 2018)



12.3.6.2.4 Health and Safety Training

FEIS predictions related to health and safety awareness are considered to be supported but since the primary metric (mandatory training hours) does not directly assess the prediction, a summary of the interpretation is provided (see Appendix 69, Section 8.1).

FEIS Predictions:

MEADOWBANK – none

WHALE TAIL

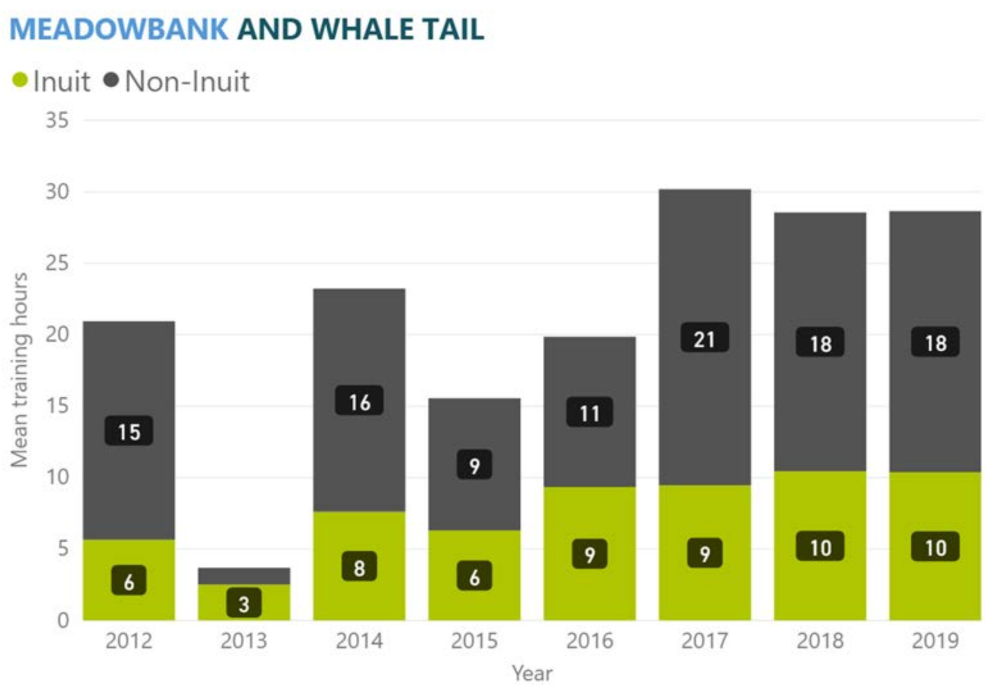
> "The Project may improve health and safety awareness amongst employees, their families, and their communities." (Golder Associates, 2016, p. 3-C-38)

Discussion:

This prediction is considered to be supported but since the primary metric (mandatory training hours) does not directly assess the prediction, a discussion is provided. Mandatory training hours remained the same at Meadowbank / Whale Tail in 2019 and have been steady since 2017 (Figure 70). However, training hours is a leading indicator that does not directly inform an assessment of the impacts of Agnico Eagle's projects on the health and safety status of workers and their families outside the workplace. As discussed in the SEMR, Section 4, training may offer additional benefits to employees in terms of life skills – especially young adults. Training data may inform the interpretation of data on health and safety outcomes (e.g. accident rate).

Encouraging data from the Inuit employee survey indicates that 80% of Inuit employees report that they have discussed important work values – including being safe – with children and youth in their homes and communities.

Figure 70 Average (per FTE) mandatory training hours provided to Agnico Eagle Inuit employees



12.3.6.2.5 Use of Public Infrastructure

The complete interpretation of this metric is provided in Appendix 69 (Section 9.2), with a summary below. The predictions are not specifically supported or refuted by the available data.

FEIS Prediction:

MEADOWBANK

> "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)

WHALE TAIL

> "Project-induced migration can increase demand on physical infrastructure, [however, employees] fly-in/fly out to and from Kivalliq communities." (Golder Associates, 2016, p. 3-C-39)

Discussion:

The use of public physical infrastructure by Meadowbank / Whale Tail and its employees consists primarily of the use of airports and has been relatively consistent since operation began in 2010. There are no indications of significant positive or negative impacts on this infrastructure.

12.3.6.2.6 Social Assistance

Changes in community use of social assistance are discussed in Appendix 69, Section 9.3, and summarized below. While the FEIS predicted Meadowbank's impacts would be largely positive, available data does not allow the specific effect of Agnico's operations to be identified.

FEIS Prediction:

MEADOWBANK

> "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)

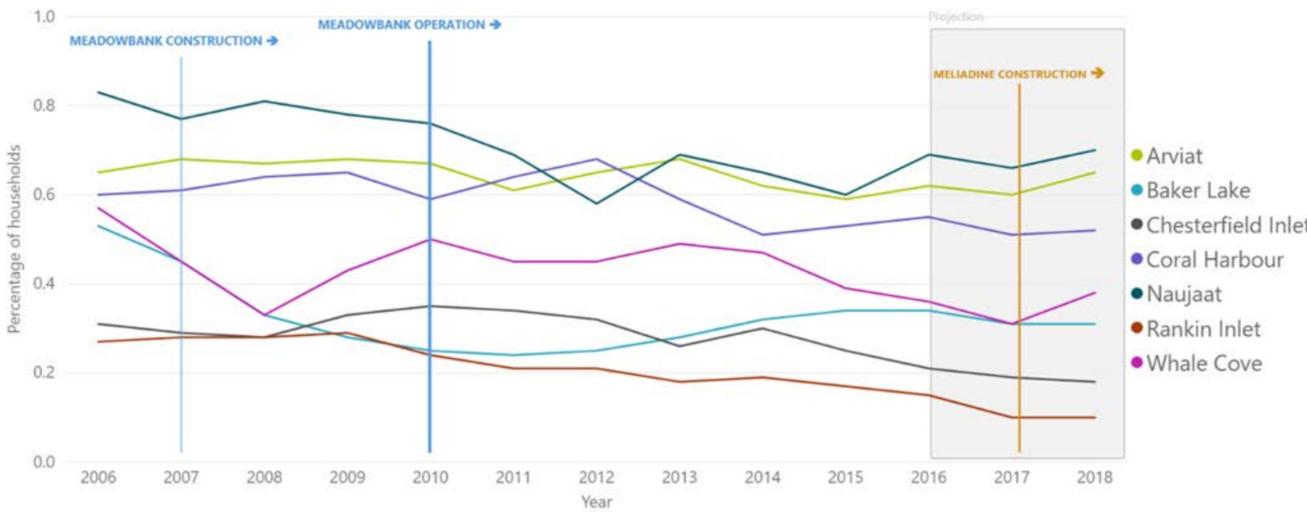
WHALE TAIL - none

Discussion:

Figure 71 shows the percentage of households receiving social assistance by Kivalliq Community. 2018 is the last year for which data was available. Per capita social assistance expenditures declined in all Kivalliq communities in 2018 following an increase across communities starting in 2012, though current levels are still above the historical average. The percentage of households receiving social assistance has been remaining steady or declining for most Kivalliq communities over the past 10 years. Despite declines from historical highs, social assistance data does not show a clear correlation between Agnico-related employment and social assistance requirements in Baker Lake or Arviat. Data suggests that both expenditures and percentage of households receiving social assistance have been declining in Rankin Inlet since Meadowbank began operation.

The need for social assistance is often determined by a diverse range of factors. Due to this, along with an inability to observe a correlation between project activities and social assistance data, any impact between Agnico Eagle projects and social assistance cannot be determined at this time.

Figure 71 Per capita social assistance expenditures by community



(Department of Family Services, 2019; Statistics Canada, 2006a; Statistics Canada, 2011a; Statistics Canada, 2016a)

12.3.6.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

Effectiveness of Monitoring

Existing monitoring programs are able to address most FEIS predictions (Table 12-15), 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'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 2019 is provided in Table 12-16.

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 2019 is provided in Table 12-17.

Overall, no significant departures from FEIS predictions were identified in Section 12.3.6.1, so these measures are considered effective.

Table 12-16 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 B, Table B.15-2)	Implementation (unless indicated, reference to 2019 Socio-Economic Monitoring Report, Appendix 69)
Employment, training, and business opportunities	
Preferential employment and contracting	**Yes -** see Section 1.1, 3.1 and "Existing Management and Mitigation"
Preferential hiring	**Yes -** see Section 1.1, 3.1 and "Existing Management and Mitigation"
Preferential procurement	**Yes** - see Section 3.1
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 9.2
Income and workforce management practices that value and provide opportunity for traditional activity	**Yes** – Section 5
Workforce management and community initiatives in support of traditional activity	**Yes** – Section 5
Individual and community wellness	
Assistance to individuals experiencing problems and their families, zero tolerance policies	**Yes** – Section 7.1
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 7
Infrastructure and social services	
Employment at good wages	**Yes** – Section 1
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 12-17 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**
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.	N/A,
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.

Planned Mitigation Measure (FEIS Table 3-C-1)	**Implementation**
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.	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	
In-stream works will be constructed in winter, when possible, to avoid increased TSS and turbidity, and changes to water and sediment quality.	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	**Yes** - Mine Waste Rock and Tailings Management

Planned Mitigation Measure (FEIS Table 3-C-1)	**Implementation**
potentially problematic waste rock/overburden material. Implement the Mine Waste Rock and Tailings Management Plan.	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 Dustall 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**
Best Management practices for controlling equipment noise emissions, including: • Use of silencers on all trucks • Enforcing speed limits • 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.	
Continue existing training initiatives for the Project's workforce.	**Yes –** see 2019 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: Adherence to the • Air Quality Monitoring Plan. • Enclosures are used to reduce fugitive emissions at the processing facility. • Adherence to the Incinerator Waste Management Plan •Adherence to the AWAR and Whale Tail Pit Haul Road Dustfall Monitoring Plan (Appendix B of the TEMP). • Best Management practices for controlling equipment noise emissions, including use of silencers on all trucks • Enforcing speed limits. • Regular maintenance will be implemented for equipment and vehicle.	**Yes**- Air and Noise reports

Adaptive Management

No major departures from impact predictions were identified in 2019. Existing management and mitigation is described in the 2019 SEMR (Appendix 69), with any comments for changes to implementation in 2020.

12.4 WHALE TAIL PEAMP EVALUATION

For each valued component (VC), the completed PEAMP evaluation is presented in Sections 12.4.1 – 12.4.6, below.

VCs for the Whale Tail Pit and Haul Road FEIS (Golder, 2016) include Climate, Air Quality, Noise, Permafrost, Terrestrial Environment (vegetation, wildlife and birds), Aquatic Environment (surface water quantity, surface water quality, fish and fish habitat), Archaeology, Traditional Land Use, and Socio-Economics (employment, training, business opportunities, community wellness, infrastructure and social services). These are generally the same VCs as identified and assessed for the original Meadowbank FEIS (Cumberland, 2005).

References for the impact predictions within the Project FEIS are provided in Appendix A, Table A-2.

12.4.1 Aquatic Environment

Key mine development activities that could result in changes to the aquatic receiving environment in 2019 include: Whale Tail and Mammoth Dike construction, dewatering of Whale Tail Lake – North Basin, effluent discharge, and dust generated through onsite activities including roads.

Within the Project FEIS (Golder, 2016), impacts to the aquatic environment potentially generated through these activities are described for water quantity, water quality, and fish/fish habitat. Predicted and measured residual impacts for each of these sectors 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 (FEIS Volume 6, Section 6.3, as summarized in Volume 3, Table 3-C-5) and the accuracy of these predictions in 2019 (measured impacts) are provided in Table 12-18. 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 12-18 Predicted and measured impacts to surface water quantity for the Whale Tail Site during the constructions and operations period (primary pathways according to FEIS Volume 3, Table 3-C-5). Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.4.1.1.2.

Effect Pathway	Proposed Monitoring	Actual Monitoring	Predicted Impact	Measured Impact
				2019
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	Monitoring of flows and water levels at key locations All piped and/or pumped discharges to waterbodies will be monitored continuously 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. Whale Tail Pit Haul Road Management Plan - specifically addresses hydrology monitoring prior to spring freshet and after major precipitation events	Whale Tail Lake water level	See discussion, Section 12.4.1.1.2below	See discussion, Section 12.4.1.1.2 below
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	Construction (2018): Decrease from baseline Dewatering (2019): Slight decrease from baseline Operations (2020/2021): Slight increase from baseline	See discussion, Section 12.4.1.1.2 below
		Northeast Sector/A46 and Nemo Lake water level	Operations (2020+): Increase by 3.5 m from 154.43 masl to 156.66 masl See discussion, Section 12.4.1.1.2 below	See discussion, Section 12.4.1.1.2 below
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		Whale Tail Lake dewatering discharge monitoring	Dewatering (2019): 4,643,712 m^3	4,940,198 m^3 See discussion, Section 12.4.1.1.2 below
		Freshwater withdrawal monitoring (Nemo Lake)	FEIS: Construction/Dewatering: 8,760 m^3/yr Operations: 118,625 m^3/yr NWB Water License 2AM-WTP1826: 237,500 m^3	50,559 m^3

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 Whale Tail Lake Water Level and Dewatering Discharge

A complete discussion of measured and predicted water levels in the Whale Tail South flood zone is provided in the 2019 Water Quality Monitoring for Dike Construction and Dewatering Report (Appendix 19) and summarized here.

From March to October, 2019, Whale Tail Lake – North Basin was dewatered with discharge to Whale Tail Lake – South Basin, and Mammoth Lake. Total dewatering discharge volume was 4,940,198 m^3, which is within 7% of the predicted value (4,643,712 m^3).

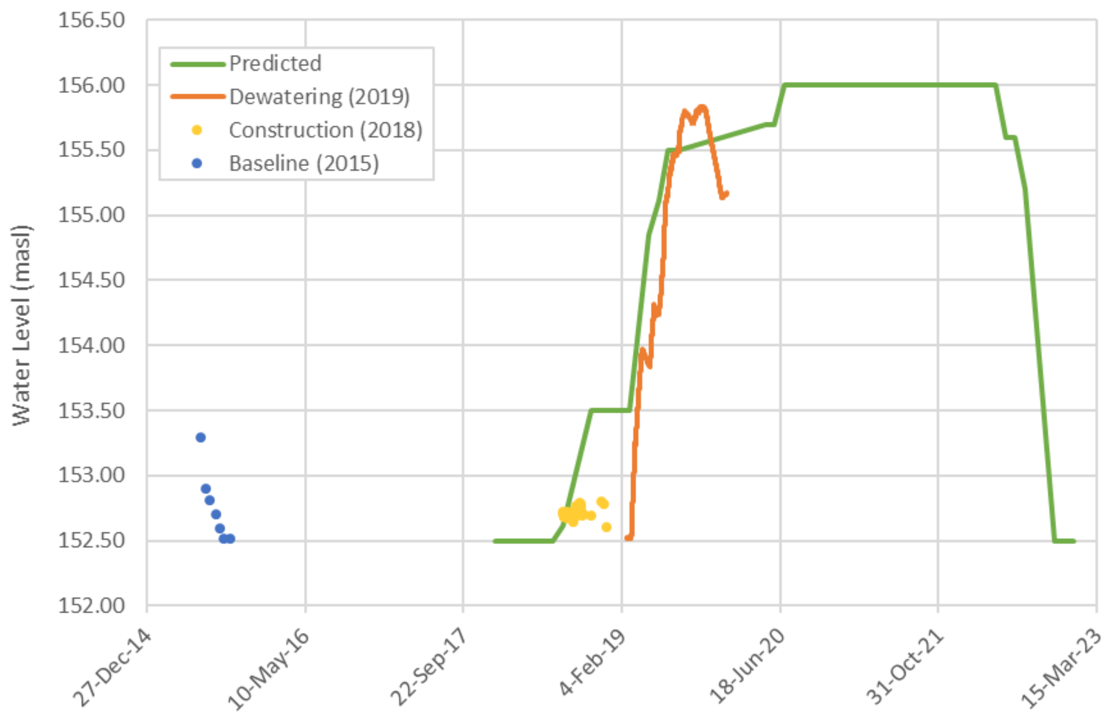
Water levels in Whale Tail Lake South Basin as measured throughout 2019 using piezometric data are shown in Figure 72, below, along with measurements during the construction phase (2018; measured by GPS survey), available baseline measurements (2015), and FEIS predictions (from FEIS Appendix 6-F).

Likely due to record rainfall, peak water levels in 2019 exceeded predictions in July, 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 temporarily pumped non-contact water from the Whale Tail South (WTS) flood zone directly to Mammoth Lake. This pumping activity was planned to lower and then maintain water level in WTS in order to allow for the construction of the Whale Tail South Channel (SWTC) and preserve dike integrity. This activity temporarily substituted for the passive flow which will eventually occur through the SWTC, and complied with the original intent of the approved water balance and Water License 2AM-WTP1826 (same origin and destination of water). Water quality monitoring was conducted in accordance with Water License 2AM-WTP1826 Part F Item 6 and Schedule I Table 1 - Group 3, as required for water flowing though the SWTC. These results are reported under the Water Quality and Flow Monitoring Plan.

Beginning on October 21st, 2019, 332,239 m^3 were pumped from Whale Tail Lake South Basin to Mammoth Lake. Construction of the SWTC began in December 2019, and is expected to be completed prior to freshet in 2020, which will ensure water levels remain within the maximum predicted range of 156.0 masl.

Overall, although flood levels temporarily exceeded predictions from approximately July 29th – November 14th, 2019, they are not expected to exceed the maximum flood level prediction of 156.0 masl.

Figure 72 Measured and FEIS-predicted water levels in Whale Tail Lake South. Predicted water levels from FEIS Appendix 6-F



Mammoth Lake Water Level

Water levels in Mammoth Lake as measured throughout 2018 (construction period) and 2019 (dewatering period) by GPS survey are shown in Figure 73, along with available baseline measurements (2015).

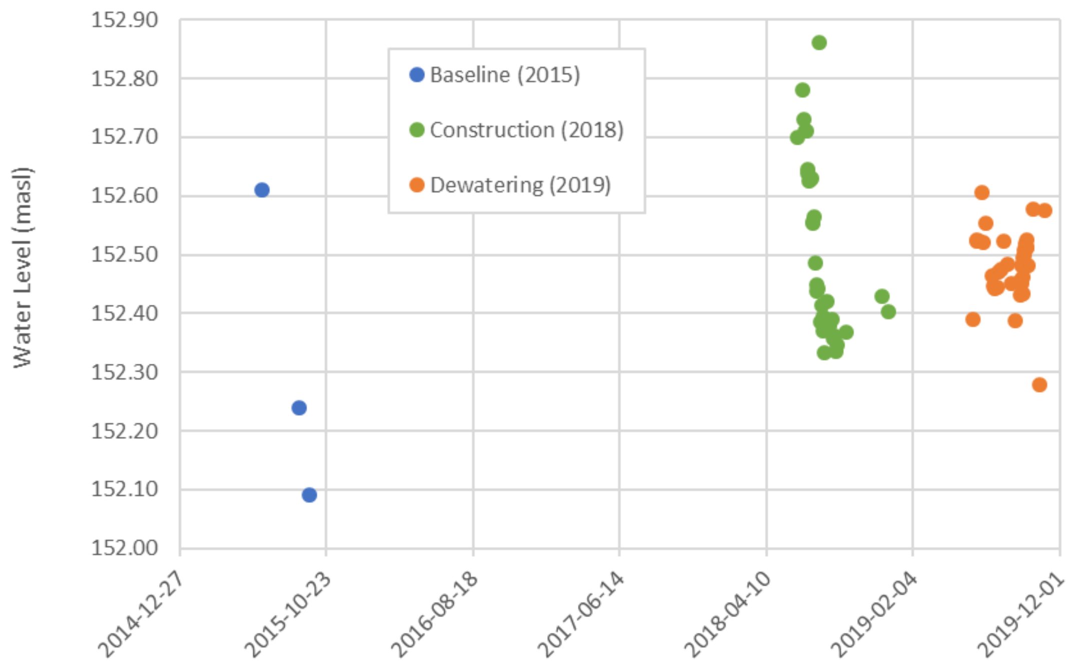
As shown in Table 7, FEIS predictions (FEIS Appendix 6-F) indicated that mean monthly water levels in Mammoth Lake would decline up to 12 cm below baseline values during the dewatering period (2019). However, measured baseline data for Mammoth Lake is only available for 3 time points in 2015, and baseline water levels were not modeled as a component of the FEIS. As a result, quantitative comparisons of measured values to FEIS predictions are not feasible.

Overall, however, measured water levels in 2019 were within the range of minimal baseline measurements that are available (2015), so impact predictions are not being exceeded.

Table 12-19 Predicted change in water levels (m) compared to baseline in Mammoth Lake during the dewatering phase (2019). From FEIS Appendix 6-E

Project Phase	m above Baseline				
	June	July	August	September	October
Construction	-0.16	-0.16	-0.11	-0.14	-0.13
Dewatering (2019)	-0.12	-0.04	-0.05	-0.09	-0.10
Operations (2020+)	+0.01	-0.02	0.00	+0.01	0.00

Figure 73 Measured water levels in Mammoth Lake



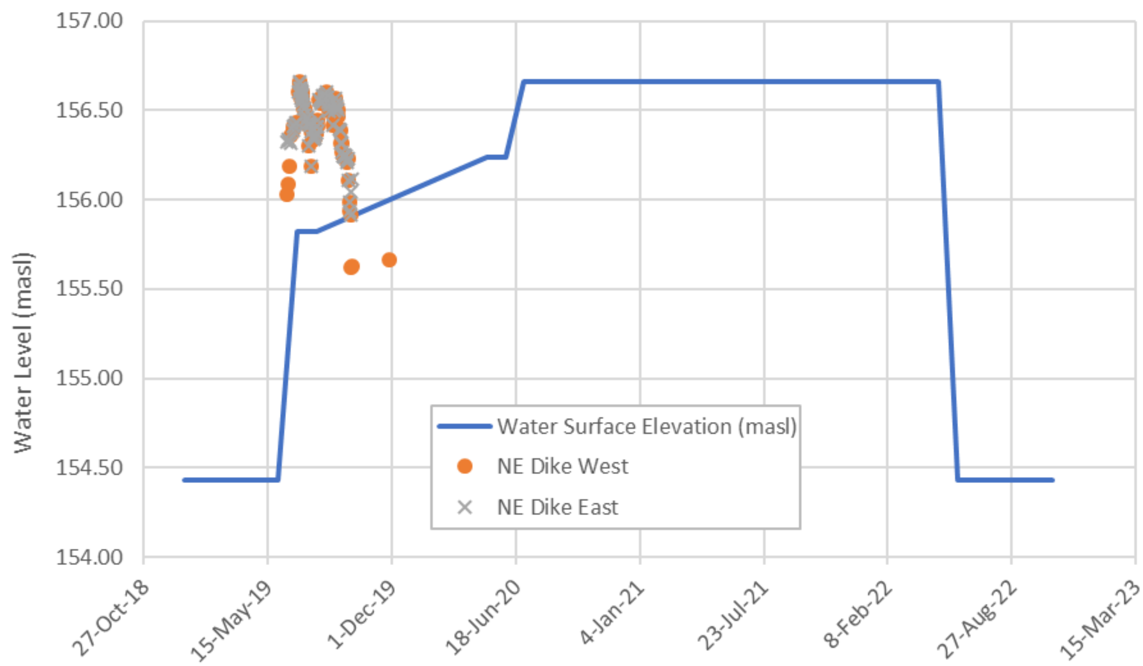
12.4.1.1.2.2 Northeast Sector, A46, and Nemo Lake Water Levels

A complete discussion of measured and predicted water levels in the Northeast Sector flood zone is also provided, along with figures, in the 2019 Migratory Bird Protection Report (Appendix M of the Wildlife Summary Report Appendix 52), and summarized here.

The Northeast Dike was constructed from September 2018 to February 2019, causing flooding of a terrestrial zone and diverting non-contact water in this area from the Whale Tail Lake (A) watershed to the Nemo Lake (C) watershed. FEIS water management plans indicated that this flood water would increase to the maximum elevation of 156.66 masl following freshet in 2020, and then flow naturally through a tundra pond system to Nemo Lake. For Lake A46, adjacent to the Northeast dike and within the flood zone, this represents an increase in water levels by 3.5 m, from approximately 154.43 masl to 156.66 masl.

However, the maximum predicted flood level in this area (156.66 masl) was reached on July 6, 2019 (Figure 74). At that point, it was observed that the topography toward Nemo Lake would not allow water to overflow naturally before overtopping the dike liner. As a result, water has been pumped out of that area since July 2019 (initially towards Whale Tail Lake North Basin and A-P5 Stormwater Management Pond, but then to Nemo Lake as non-contact water, beginning in August, 2019).

Figure 74 Measured and FEIS-predicted water levels in the Northeast Diversion flood zone. Predicted water levels from FEIS Appendix 6-F.



12.4.1.1.3 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 specific, and some available predictions did not align with monitoring methods (particularly for Mammoth Lake water levels), the monitoring programs being implemented at the Meadowbank site 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 2019 is provided in Table 12-20. This summary excludes Environmental Design Features, which are incorporated into construction plans but are not ongoing mitigation measures included in this annual review.

Mitigation measures related to water quality and fish and fish habitat are provided in Sections 12.4.1.2.3 and 12.4.1.3.3, respectively.

Table 12-20 Mitigation measures described in the Whale Tail Pit and Haul Road FEIS 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 (FEIS, Volume 3, Table 3-C-5)	Implementation (2019)
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.	N/A
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	-

Adaptive Management

To handle flood levels that increased beyond predictions in 2019, adaptive management measures have already been implemented in consultation with regulatory agencies.

For the Whale Tail South flood zone, as described above, following discussions with NWB, Agnico temporarily pumped non-contact water from the Whale Tail South (WTS) flood zone directly to Mammoth Lake. This pumping activity was planned to lower and then maintain water level in WTS in order to allow for the construction of the Whale Tail South Channel (SWTC) and preserve dike integrity. This activity temporarily substituted for the passive flow which will eventually occur through the SWTC, and complied with the original intent of the approved water balance and Water License 2AM-WTP1826 (same origin and destination of water).

For the Northeast Sector flood zone, water has been pumped out of that area since July 2019. Initially, this water was pumped towards Whale Tail Lake North Basin and A-P5 Stormwater Management Pond and managed as site contact water. However, following discussions with NWB in August, flood water was pumped to Nemo Lake as non-contact water, beginning in August, 2019. Since permitting is currently ongoing for Phase 2 of the Whale Tail project which will impact water management in this area, pumping in this manner will continue as the primary water management option until a decision on the Phase 2 project is made.

No additional adaptive management measures are proposed for 2020, since these measures were effective at mitigating impact prediction exceedances.

12.4.1.2 *Water Quality*

12.4.1.2.1 Parts 1 & 2: Summary of Predicted and Measured Residual Impacts

A summary of predictions for impacts to surface water qualtity (FEIS Volume 6, Section 6.4, as summarized in Volume 3, Table 3-C-6) and the accuracy of these predictions in 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.

While a number of pathways were assessed in the FEIS for impacts to surface water quality, this PEAMP evaluation focuses on water quality model predictions (FEIS Section 6.4.3.3), which were developed as the primary quantitative impact assessment tool for this discipline. Water quality model predictions were developed for locations within the mine footprint (Whale Tail Attenuation Pond, flooded Whale Tail Pit, Whale Tail Lake [North Basin], and the WRSF Pond) and for the downstream receiving environment (Mammoth Lake, Lake A15, Lake A12, Downstream Node 1, and Downstream Node 2) (FEIS Volume 6, Table 6.4-4 and Figure 6.4-1). For the receiving environment, FEIS water quality model predictions are compared to overlapping results of the Core Receiving Environment Monitoring Program (Mammoth Lake). 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 tested for compliance with MDMER/NWB criteria, and discussed under Section 8 of this report. However, a commentary is provided here on overall compliance with those criteria.

Given the uncertainties associated with the FEIS 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 Section 6.4). This uncertainty is considered in comparisons of annual water quality monitoring data with FEIS predictions.

The 2019 CREMP report (Appendix 35) 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. In 2019 specifically, water chemistry data (annual mean concentrations for each parameter) from Mammoth Lake were compared to water quality predictions in the Whale Tail FEIS. Mammoth Lake is the only downstream lake for which both model predictions and monitoring results are available.

Exceedances of FEIS water quality model predictions are noted in Table 12-21, and a full discussion is provided in Section 12.4.1.2.2.

Table 12-21 Predicted and measured impacts to surface water quality for the Whale Tail Site during the constructions and operations period (primary pathways according to FEIS Volume 3, Table 3-C-6). Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.4.1.2.2. *FEIS Volume 6, Appendix 6-H – as described in Volume 6, Section 6.4, these are expected to be accurate within an order of magnitude. **Mercury Monitoring Plan (V2, 2019). ***While water quality in relation to MDMER/NWB criteria was not an explicit assumption of the FEIS, that comparison is made here since it is the primary assessment tool in the referenced FEIS-proposed monitoring programs.

Effects Pathway		FEIS Proposed Monitoring	Current Monitoring	Predicted Impact	Measured Impact
					2019
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	Water Quality Monitoring Plan for Dike Construction and Dewatering	Dewatering effluent & dike construction monitoring: <MDMER/NWB criteria***	Dewatering effluent & dike construction: mostly <MDMER/NWB criteria – see discussion, Section 12.4.1.2.2
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* Total Mercury in WTS: <0.1 µg/L**	Receiving environment: Comparable to FEIS water quality model predictions – see discussion, Section 12.4.1.2.2 Total Mercury in WTS: <0.1 µg/L (see 2019 CREMP Report)
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.		Water Quality and Flow Monitoring Plan	Water Quality and Flow Monitoring Plan	Effluent <MDMER/NWB criteria***	Effluent <MDMER/NWB criteria – see discussion, Section 12.4.1.2.2
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.					

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), or require further explanation, a discussion is provided here.

12.4.1.2.2.1 MDMER/NWB Compliance Monitoring for Effluent Discharge and Dike Construction

In 2019, water quality compliance monitoring in accordance with MDMER and NWB criteria was conducted for effluent discharge and dike construction, with results as summarized below.

Among these programs, only four water quality samples exceeded MDMER and/or NWB Water License criteria. All were for TSS or turbidity in Whale Tail North basin dewatering effluent. This low number of exceedances is not expected to constitute a significant departure from overall FEIS predictions of water quality.

Whale Tail North Dewatering

- 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. See Sections 8.3.2 and 8.5.2.2 for complete details.

Quarry 1 Discharge

- Quarry 1 water was discharged to Mammoth Lake between July and October 2019. All samples were in compliance with MDMER and NWB Water License criteria. See Section 8.3.2.4 and 8.5.3.2.10 for complete details.

Whale Tail South Water Transfer to Mammoth Lake

- This temporary pumping activity was in place to lower and then maintain water level in WTS in order to allow for the construction of the Whale Tail South Channel (SWTC) and preserve Whale Tail dike integrity (see Section 8.5.3.2.8 for details). Water quality monitoring follows the NWB Water License 2AM-WTP1826 Part F Item 6 and Schedule I Table 1 - Group 3 (as required for water flowing though the Whale Tail South Channel). No exceedances of the NWB Water License criteria occurred.

North East Pond to Nemo Watershed

- This water management strategy was developed in 2019 to empty the North East Pond when required (see Section 8.5.3.2.9 for details). As per Water License Part F Item 6, the effluent from this discharge shall not exceed the maximum authorized TSS concentration grab of 30 mg/L and the maximum authorized monthly mean TSS concentration of 15 mg/L. In 2019, no exceedances of these NWB Water License criteria occurred.

Effluent Discharged from AP-5 and Trench-water Containment Pond

- This pond is used for site non-contact water management and is discharged to tundra in the Nemo Lake watershed as required. All results in 2019 were compliant with Part D, Item 14 of the NWB 2BB Water License. See Section 8.5.3.2.12 for complete details.

Whale Tail and Mammoth Dike Construction

- Results of water quality monitoring during dike construction are compared to NWB Type A Water License criteria for TSS. Monitoring occurred in five general locations: upstream and downstream of the Whale Tail Dike, downstream of the Mammoth Dike, as well as broad survey locations in Whale Tail Lake (South Basin) and Mammoth Lake. For each location, turbidity depth profiles were recorded at four monitoring stations using a handheld meter, and values were converted to TSS using a site-specific, approved regression equation. All turbidity/TSS monitoring results for all compliance stations were within NWB Water License criteria. See the Water Quality Monitoring for Dike Construction and Dewatering Report (Appendix 19) for complete details.

12.4.1.2.2.2 Receiving Environment Water Quality Predictions

Within the receiving environment where water quality monitoring is conducted, impact predictions in the form of water quality model outputs are available for Mammoth Lake only.

In the 2019 CREMP Report (Appendix 35), average annual concentrations of all water quality parameters were compared to the FEIS predictions for Mammoth Lake. Concentrations for parameters that exceeded predictions are shown in Table 12-22, below, and the complete comparison for all parameters is provided in the 2019 CREMP Report (Appendix 35). As described in Section 6.4.3.3.1 of the FEIS, these model predictions are estimated to be accurate within one order of magnitude. While some parameters exceeded exact model outputs in 2019, none were outside of that range of uncertainty. In addition, no results exceeded CCME Water Quality Guidelines for the Protection of Aquatic Life, which was the primary comparison used in drawing impact conclusions in the FEIS (dissolved phosphorus was predicted to exceed CCME guidelines for total phosphorus, but did not in 2019). These results therefore indicate that overall, available impact predictions for water quality in Mammoth Lake are not being exceeded.

Further discussions of water quality results in relation to CREMP trigger and threshold values are provided in the 2019 CREMP Report (Appendix 35), along with figures for all historical water quality results in relation to FEIS predictions. Since FEIS predictions have not been exceeded, historical trends are not reviewed here.

Table 12-22 FEIS screening predictions (FEIS Appendix 6-H) for Mammoth Lake compared to 2019 measured mean concentrations for parameters exceeding predictions. *FEIS Volume 6, Appendix 6-H – as described in Volume 6, Section 6.4, these are expected to be accurate within an order of magnitude.

Parameter	FEIS Model Prediction* (mg/L)	2019 Mean (mg/L)
Ammonia (as N)	0.015	0.046
Chloride	6.73	22.4
Calcium	6.32	12.7
Magnesium	1.93	2.48
TDS	54.3	87.1
Aluminum (Total)	0.0050	0.011
Barium (Total)	0.012	0.022
Lithium (Total)	0.0016	0.0037
Strontium (Total)	0.041	0.11

12.4.1.2.3 Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management

Effectiveness of Monitoring

Based on the results in Table 12-22 and discussed above in Section 12.4.1.2.2, 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 2019 is provided in Table 12-23. Mitigation measured related to water quantity, and fish and fish habitat are provided in Sections 12.4.1.1.3 and 12.4.1.3.3, respectively, though some overlap may occur.

Table 12-23 Mitigation measures described in the Whale Tail Pit and Haul Road FEIS 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, Volume 3, Table 3-C-6)	Implementation (2019)
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	**Yes** – Dike construction Dewatering monitoring plan

Project Activity	Planned Mitigation Measure (FEIS, Volume 3, Table 3-C-6)	Implementation (2019)
	release downstream.	
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 Dewatering monitoring 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** – Dike construction Dewatering monitoring plan
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
	Road contact water will be monitored during construction.	**N/A**
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 AWAR and Whale Tail Pit Haul Road Dustfall Monitoring Plan (Appendix B of the Terrestrial Ecosystem Management 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**
Mining and supporting infrastructure for the Whale Tail Pit and haul road	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	**Yes** – Air Quality and

Project Activity	Planned Mitigation Measure (FEIS, Volume 3, Table 3-C-6)	Implementation (2019)
	managed through regular and routine maintenance of vehicles.	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** – Dike construction Dewatering monitoring plan
	The dike will be constructed using non-potentially acid-generating rock or low potential for metal leaching material	**Yes** – Dike construction Dewatering monitoring plan
	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
	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
	Where applicable, construction runoff will be captured and managed to minimize suspended solids.	**Yes** – Erosion Management Plan
	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
	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 and Tailings Management 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	Regular road inspections to check for ponding	**Yes** – Site Inspections

Project Activity	Planned Mitigation Measure (FEIS, Volume 3, Table 3-C-6)	Implementation (2019)
roads	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
	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 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** – 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**
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 Licence 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

Project Activity	Planned Mitigation Measure (FEIS, Volume 3, Table 3-C-6)	Implementation (2019)
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** – Dike construction Dewatering monitoring plan
	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** – Dike construction Dewatering monitoring plan
	Erosion and sedimentation control (e.g., silt curtains, runoff management, armouring of banks, sloping of banks), where needed	**Yes** – Dike construction Dewatering monitoring plan
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 significant exceedances of FEIS predictions occurred for water quality programs in 2019, no new adaptive management measures are planned.

12.4.1.3 *Fish and Fish Habitat*

12.4.1.3.1 Parts 1 & 2: Summary of Predicted and Measured Residual Impacts

The FEIS for the Whale Tail Pit Project assessed potential direct and indirect effects to fish and fish habitat as a result of Project activities. Residual impacts were associated with dike construction, lake dewatering, water diversion (terrestrial 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) and the accuracy of these predictions in 2019 (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.

Table 12-24 Predicted and measured impacts to fish and fish habitat for the Whale Tail Site during the constructions and operations period (primary pathways according to FEIS Volume 3, Table 3-C-7). NA = not assessed. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.4.1.3.2. *FEIS values differ slightly from those calculated under the Whale Tail Pit Fish Habitat Offsetting Plan (March, 2018). Both are provided for comparison purposes. Baseline water elevations used for the FEIS calculation were not specified, and these are an important factor in footprint calculations. **Azimuth (2017) Whale Tail Pit project: Predicted changes in Fish Mercury Concentrations in the Flooded Area of Whale Tail Lake (South Basin). Prepared for Agnico Eagle Mines Ltd., Meadowbank Division. February 2017.

Effects Pathway	FEIS Proposed Monitoring	Current Monitoring	Predicted Impact		Measured Impact
					2019
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 upon construction completion	FEIS values (footprints during operations phase, baseline water elevations not specified)*: Mammoth Dike: 0.07 ha Mammoth Lake dewatering: 0.93 ha Whale Tail Dike: 3.98 ha Whale Tail dewatering: 64.58 ha	Offsetting Plan values (footprints during operations phase, with baseline water elevations)*: Mammoth Dike area above water + dewatering: 1.2 ha (152.57 masl) Whale Tail Dike area above water + dewatering: 69.5 ha (153.02 masl)	NA – to be calculated following completion of the as-built reports for Whale Tail and Mammoth Dikes (est. 2020)
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	NA (post-flooding hydroacoustic surveys to be completed prior to drawdown)	Minor effect on fish population abundance		NA (post-flooding hydroacoustic surveys to be completed prior to drawdown)
During the construction 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.	None	Water level monitoring	Slight decrease in Mammoth Lake water level and discharge flows from baseline; moderate effect to population abundance and distribution of VC fish species		Mammoth Lake water levels within baseline (see Section12.4.1.1.2)
Water diversions for the Whale Tail and Northeast dikes during construction and operations will	None	Water level monitoring & surface area	FEIS operations phase prediction:	Offsetting Plan operations phase assumption:	Northeast flood zone: See Water Quantity discussion, Section

Effects Pathway	FEIS Proposed Monitoring	Current Monitoring	Predicted Impact		Measured Impact 2019
flood tributary lakes and streams, and will result in the alteration of habitat.		calculation	Northeast flood zone: Lake A46 +3.5 masl to 34 ha, consuming lakes A47, A48, A113, Pond A-P38, and Pond A-P68 including 412 m of flooded streams. Whale Tail South flood zone: +3.5 masl (to 156 masl), surface area increase from 369 ha (all flood zone lakes) to 513 ha, consuming Lakes A18, A19, A20, A21, A22, A55, A62, A63, A65, Pond A-P1, and Pond A-P53; resulting in new lake habitat. 1988 m of stream habitat flooded causing decrease in forage fish.	Northeast flood zone is assumed lost fish habitat. Whale Tail South flood zone: +3.5 masl (to 156 masl), resulting in 130.9 ha of habitat gains	12.4.1.1.2 Whale Tail South flood zone: NA – flooding not complete in 2019
Flooding of Whale Tail South could result in increased total mercury concentrations in fish.	None	Fish tissue analysis under CREMP's Mercury Monitoring Plan (MMP)	0.9 – 1.75 µg/g ww (95% CI) for a 550 mm Lake Trout**		NA (will be assessed in 2020 per MMP)
The dewatering of the diked area in Lake A17 (Whale Tail Lake) and Lake A16 (Mammoth Lake) 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	Est. loss: 870 kg or 3346 fish		776.6 kg and 3078 fish
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.	Water Quality Monitoring Plan for Dike Construction and Dewatering Water Quality and Flow Monitoring Plan CREMP	CREMP	See Section 12.4.1.2 for predicted water quality impacts, mainly a predicted increase in dissolved phosphorus concentrations.		No exceedance of FEIS water quality predictions for phosphorus - see Section 12.4.1.2.
		CREMP	Increase in sediment-bound phosphorus.		Sediment – NA - no statistical analysis in 2019.
		CREMP	Increase in phytoplankton biomass and altered species composition in Mammoth Lake and downstream lakes.		Increase in phytoplankton biomass. See discussion, Section 12.4.1.3.2, below.
		None	Increase in secondary production (zooplankton) and altered species composition in Mammoth Lake and		NA

Effects Pathway	FEIS Proposed Monitoring	Current Monitoring	Predicted Impact	Measured Impact
				2019
			downstream lakes.	
		CREMP	Possible delayed increase in benthic invertebrate abundance and biomass.	No mine-related impacts on benthic invertebrate community.
		Fish Habitat Offsetting Plan – Complementary Measures	Possible increase in fish abundance due to food resources.	NA (post-flooding hydroacoustic surveys to be completed prior to drawdown)
		CREMP	Possible moderate reduction in overwintering habitat due to DO depletion (closure phase).	NA (closure phase monitoring)

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. Most FEIS predictions for fish were based on changes to habitat areas as a result of dewatering of Whale Tail Lake North and associated terrestrial flooding. Since flooding is anticipated to be complete in 2020, final validation of those predictions has not yet been made. Where quantitative comparisons could be made in 2019 (Northeast Pond water levels, Mammoth Lake water levels, fishout results, changes to water and sediment quality), impacts have not exceeded predictions. However, 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 primarily stem from a predicted increase in nutrient concentrations due to water management and effluent discharge to Mammoth Lake. In 2019, concentrations of nutrients generally increased compared to baseline values in Mammoth Lake (2019 CREMP Report, Section 5.3.2). However, FEIS predictions were only exceeded for the annual average ammonia-N concentration, and this exceedance was likely due to natural variability. Phosphorus concentrations are predicted in the FEIS to increase beyond the meso-eutrophic trigger (>0.035 mg/L) in Mammoth Lake during the operations phase. However, results to date indicate concentrations are still just above the ultra-oligotrophic trigger (0.004 mg/L), as shown in Figure 75.

While phytoplankton results for 2019 did not indicate a change to community structure (e.g., richness), there was a statistically significant apparent increase in biomass in Whale Tail South and a notable, but not statistically significant, increase in Mammoth Lake (Figure 76). 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 appear due to the combined influence of natural variability and mining-related activities.

No significant mine-related changes in benthic invertebrates were observed in 2019, although FEIS predictions indicated impacts may be delayed, and sediment quality will be assessed formally in 2020.

Overall, FEIS predictions for changes to lower trophic levels were not quantitative, but nutrient concentrations and primary production have increased, as anticipated. Observed changes at this point appear to be relatively minor.

Figure 75 Measured concentrations of total phosphorus for the Whale Tail Site CREMP lakes and reference lakes. Red dashed line indicate the CREMP trigger value

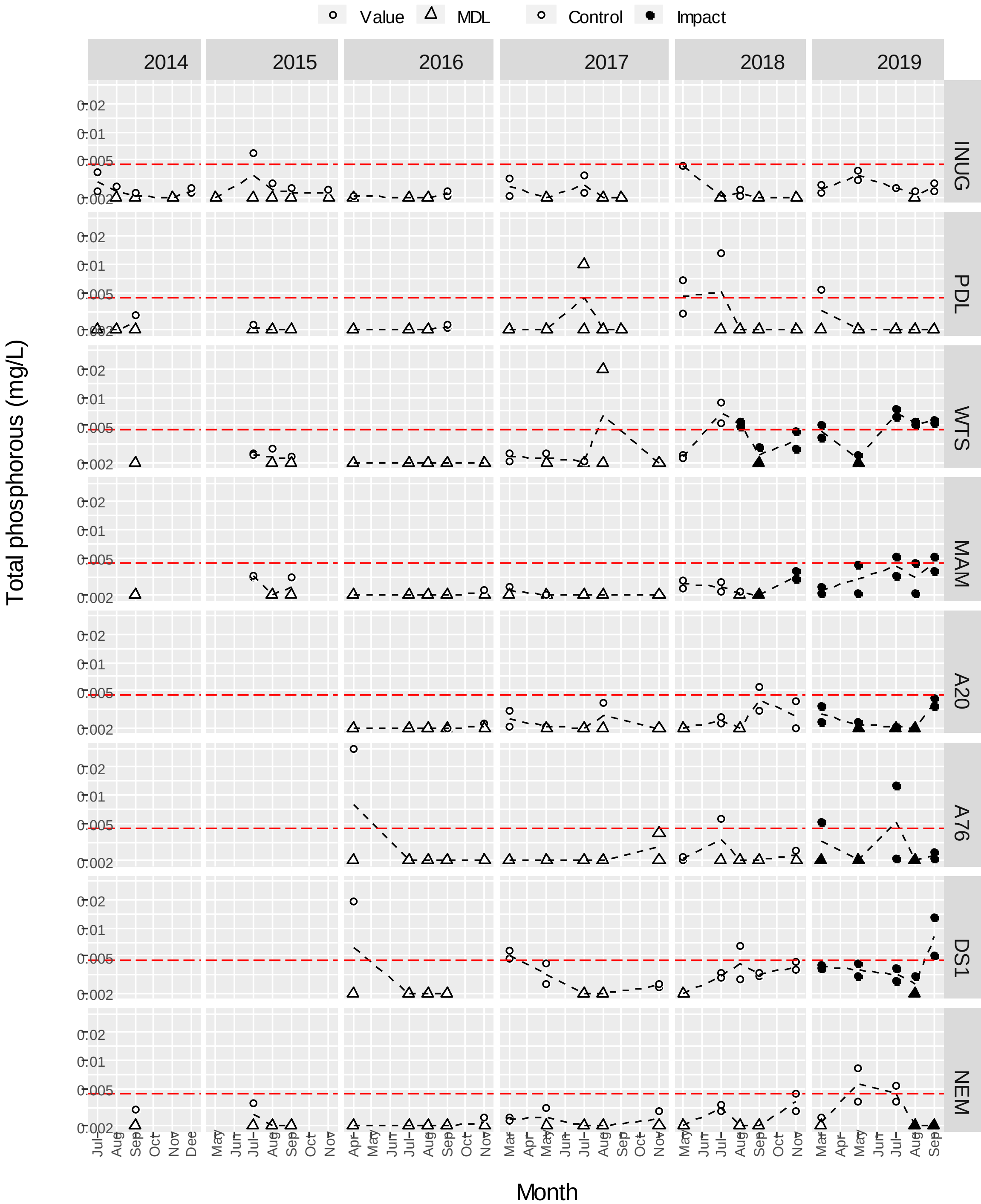
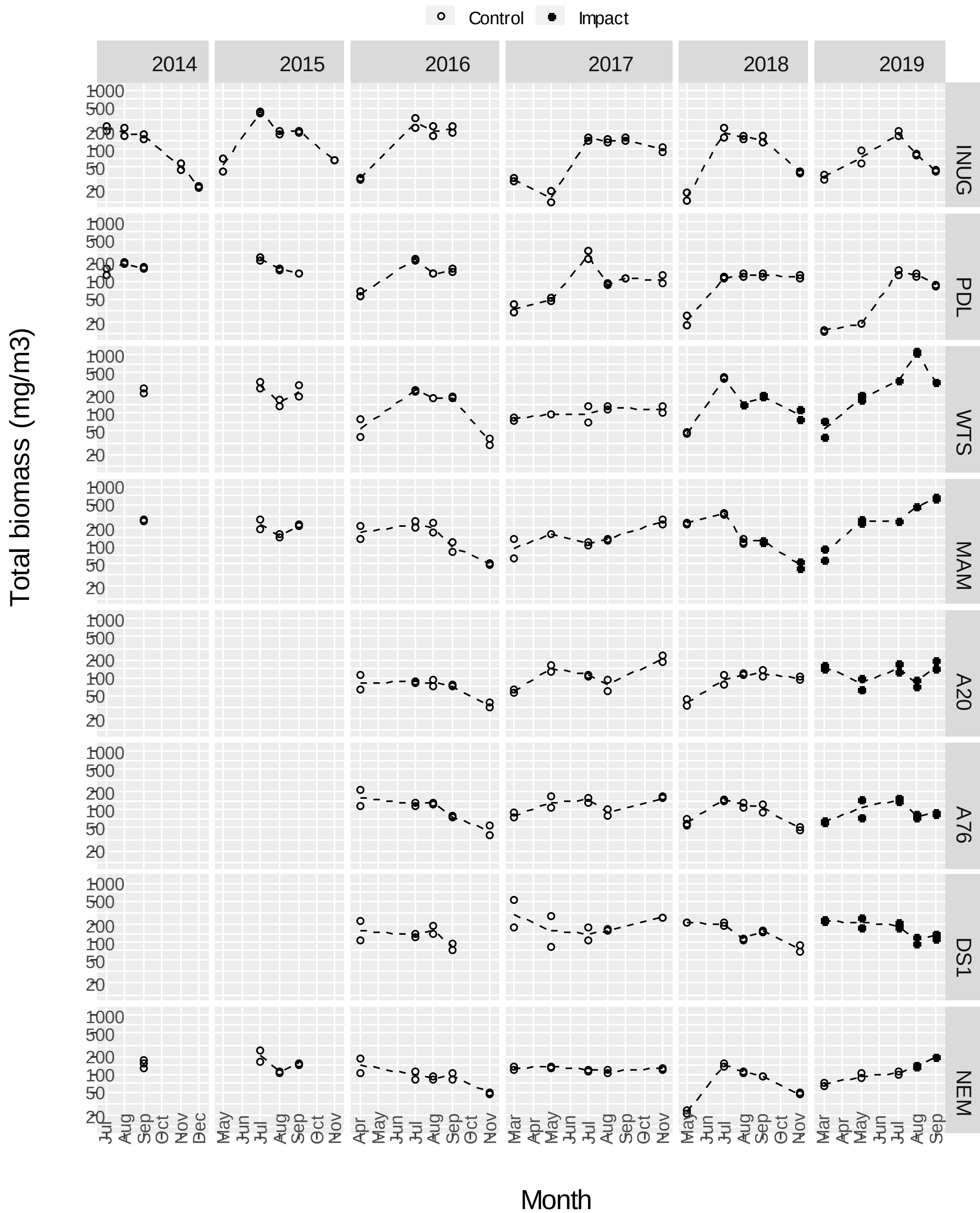


Figure 76 Total phytoplankton biomass in Whale Tail Site CREMP lakes and reference lakes



12.4.1.3.3 Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management

Effectiveness of Monitoring

Based on the results in Table 12-24, 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.

Zooplankton has not been included in standard CREMP monitoring due to difficulties obtaining sufficient statistical power due to very high natural variability. As part of a two-year consultative process to ensure that the program was meeting its intended goal of protecting the aquatic receiving environment, the study design of the CREMP was formally reviewed in 2010-2012, culminating in the preparation of the CREMP Design Document 2012 (Azimuth, 2012). This review included zooplankton (based on data collected in 2010 and 2011) to formally assess it's suitability as a monitoring component in the CREMP. The CREMP Design Document 2012 (Azimuth, 2012) included recommendations on each component with regards to sample timing, frequency, and number of samples required (sampling effort). These recommendations (which were subsequently approved) were derived from statistical testing using the BACI or BA framework and used power analysis to determine the adequacy of statistical power to detect a change in a particular variable from baseline levels to the relevant trigger value. The review supported the initial decisions regarding zooplankton, due to low statistical power to detect effects.

Effectiveness of Mitigation

A summary of the FEIS-planned mitigation measures related to fish and fish habitat, along with a commentary on implementation in 2019 is provided in Table 12-25. Mitigation measured specifically related to water quantity and water quality are provided in Sections 12.4.1.1.2 and 12.4.1.2.2, respectively, though some overlap may occur.

Table 12-25 Mitigation measures described in the FEIS to reduce impacts of the project to fish and fish habitat, and commentary on current implementation

Project Activity	Planned Mitigation Measure (FEIS, Volume 3, Table 3-C-7)	Implementation (2019)
Whale Tail Haul Road construction and 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
	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**
	Detailed mitigation is provided in the Whale Tail Pit Haul Road Management Plan, the TEMP and is condition of the NIRB PC No 4 that will continue to be enforced.	N/A
	Watercourses will be inspected upstream and downstream of the crossings for, erosion, scour, and flow blockages	**Yes** – Road Inspection
	Clear span bridges at crossings km 3.4, 10.7, 16.0, 20.0, 23.9, 26.1, 32.3, 43.5, 44.8 and embedded culvert at crossing 11.1 will maintain fish passage or will be used to minimize blockages to fish movement.	**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	**Yes** – Road Inspection

Project Activity	Planned Mitigation Measure (FEIS, Volume 3, Table 3-C-7)	Implementation (2019)
	protection and prevent localized erosion from concentrated high velocity flows above the peak 1:10 year rainfall event.	
	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 Plan
	Applicable guidelines for set-back distances and quantities of explosives will be followed.	**Yes** – Blast monitoring Plan
	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 and Tailings 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 and Tailings Management Plan
	Borrow pits and quarry will be excavated and sloped for positive drainage	**Yes** - Mine Waste Rock and Tailings Management Plan
	Quarries will be inspected on a regular basis to monitor water ponding, particularly at spring melt.	**Yes** - Mine Waste Rock and Tailings Management Plan
	Drainage from borrow pits and quarry will not flow directly into any waterbodies or watercourses.	**Yes** - Mine Waste Rock and Tailings 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 and Tailings 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 Plan
	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 and Tailings 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 and Tailings 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 and Tailings Management Plan
	In-stream works will be in winter, when possible, to avoid increased TSS and turbidity, and changes to water quality	N/A
	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)	N/A
	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
	Bridge abutment installation will span majority of the active channel (i.e., outside of the high-water mark), and if feasible,	N/A

Project Activity	Planned Mitigation Measure (FEIS, Volume 3, Table 3-C-7)	Implementation (2019)
	construction will occur in winter	
	Disturbed areas along the streambanks will be stabilized and allowed to revegetated upon completion of work	N/A
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** – Dike construction Dewatering monitoring plan
	Best management practices for erosion and sedimentation control (e.g., ground cover, silt fences and curtains, runoff management), where needed.	**Yes** – Dike construction Dewatering monitoring 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** – Dike construction Dewatering monitoring plan
	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** – Dike construction Dewatering monitoring plan
	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** – Dike construction Dewatering monitoring plan
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**
	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 AWAR and the Whale Tail Pit Haul Road Dustfall Monitoring Plan (Appendix B of the Terrestrial Ecosystem Management 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 CREMP to detect changes in water quality	**Yes** - CREMP
	Construction equipment and trucks will be equipped with industry-standard emission control systems.	
	Compliance with regulatory emission requirements will be met.	**Yes –** Air Quality and Dustfall Monitoring Plan
	Exhaust emissions from non-road vehicles will be managed through regular and routine maintenance of vehicles	**Yes** – Maintenance logs
	SO2 emissions from non-road vehicles and stationary equipment will be reduced through the use of low emission diesel fuel.	**Yes**
	Adherence to the Air Quality Monitoring Plan to detect changes in air quality	**Yes –** Air Quality and Dustfall Monitoring Plan
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 Attenuation Ponds.	**Yes** – Water Management Plan
	Seepage will be captured at sumps and diverted to the Attenuation Pond.	**Yes** – Water Management Plan

Project Activity	**Planned Mitigation Measure** (FEIS, Volume 3, Table 3-C-7)	**Implementation (2019)**
	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 fresh water 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
	Surface Water Management Plan will be implemented	**Yes** – Water Management Plan
	A fish-out of the diked area of Whale Tail and Mammoth lakes 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).	N/A
	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
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**
	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	Adherence to Water Management Plan	**Yes** – Water

Project Activity	Planned Mitigation Measure (FEIS, Volume 3, Table 3-C-7)	Implementation (2019)
and Water Management – effluent release		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	Completed
	Water quality in attenuation ponds will be monitored and managed such that the discharge entering Mammoth Lake meets discharge limits. If water quality does not meet discharge limits, it will be circulated and re-treated	**Yes** – Water Management Plan

Adaptive Management

No impact predictions for fish and fish habitat were exceeded in 2019, so no adaptive management actions are planned.

12.4.2 Terrestrial and Wildlife Environment

12.4.2.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

The 2019 Wildlife Monitoring Summary Report (Appendix 52) provides a complete assessment of wildlife monitoring programs including a comparison to monitoring thresholds detailed in the Terrestrial Ecosystem Management Plan (TEMP Version 6; March 2019) and impacts predicted in the Whale Tail Pit Project FEIS (Golder, 2016). 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 12-26. Thresholds for the implementation of adaptive management, as developed in the TEMP (Version 6; March 2019) were used in this comparison because most impact predictions in the Terrestrial Ecosystem Impact Assessment of the FEIS (Golder, 2016) were qualitative only. The 2019 TEMP thresholds were developed in consultation with the Terrestrial Advisory Group (TAG), and represent quantitative measurement endpoints that trigger management action. While the Wildlife Monitoring Summary Report was completed for the Whale Tail site in 2018, only 2019 results are reported here since this is the first year of the PEAMP for Whale Tail.

Of note is that Table 12-26 below presents only TEMP results for monitoring conducted in relation to predicted residual impacts for the Whale Tail Site. Results for all additional TEMP monitoring endpoints have thresholds that were developed for the Meadowbank complex (i.e. Meadowbank and Whale Tail Sites combined), and these results are described in the Meadowbank Terrestrial and Wildlife Environment PEAMP evaluation, Section 12.3.2.

Overall, no TEMP thresholds were exceeded for the Whale Tail site and haul road in 2019.

Table 12-26 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 3, Table 3-C-2 (vegetation) and Table 3-C-3); thresholds according to the Terrestrial Ecosystem Management Plan (Version 6; March, 2019); and measured impacts according to the 2019 Wildlife Monitoring Summary Report (Appendix 52). NM = not required to be measured in the identified year. NA = no threshold.

Effect Pathway	Proposed Monitoring	Current Monitoring	Threshold/ Prediction	Measured Impact
				2019
VEGETATION (WILDLIFE HABITAT)				
Physical loss of plants and Vegetation communities	Ground Surveys, Mapping, GIS Analysis	Ground Surveys, Mapping, GIS Analysis	Predicted/Permitted area + threshold over prediction (Whale Tail site and haul road): 820/1473 ha + 5%	NM (next assessed in 2021)
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	Vegetation and Soil Samples (SLRA)	Vegetation and Soil Samples (SLRA)	Threshold: No excess mine-related risk Prediction (FEIS Volume 3, Appendix 3-B, Section 3.B-3.3.1): Measured soil concentrations <CCME/USEPA guidelines or max. baseline + 10%	NM (next assessed in 2020)
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
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: Growing – 30/76 ha + 10% Winter – 342/602 ha + 10%	NM (next assessed in 2021)
Barriers to migration, which may affect population connectivity and distribution	-	Remote camera	None	NA
PREDATORY MAMMALS				

Effect Pathway	Proposed Monitoring	Current Monitoring	Threshold/ Prediction	Measured Impact
				2019
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 M of the Wildlife Summary Report Appendix 52)	Prediction (FEIS Volume 5, Section 5.5.3.5): 10 waterbird and 88 upland bird nests were predicted to be impacted by Whale Tail and Northeast Diversion flooding (56 nests/km^2)	Est. 4 nests/km^2
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	None	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.	NA
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 M of the Wildlife summary Report Appendix 52)	Prediction (FEIS Volume 5, Section 5.5.3.5): 10 waterbird and 88 upland bird nests were predicted to be impacted by Whale Tail and Northeast Diversion flooding (56 nests/km^2)	Est. 4 nests/km^2

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 2019, no thresholds were exceeded.

12.4.2.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

Effectiveness of Monitoring

Based on the results in Table 12-26, 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 (Golder, 2016). This plan was most recently updated in March, 2019 (Version 6), and a mitigation audit is a component of this updated plan. The audit is to be undertaken annually, with results summarized in the annual Wildlife Monitoring Summary report, and focuses specifically on mitigation listed in Section 2 of the June 2019 TEMP.

The audit will evaluate:

- 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.

In 2019, Agnico Eagle took a staged approach to the mitigation audit (e.g., review of safety barriers, berms, and designed crossings along the Whale Tail Haul Road). A complete mitigation audit may be conducted in 2020 but this will be part of discussions within the TAG.

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 site in 2019, mitigation is considered effective.

Adaptive Management

Although no TEMP thresholds were exceeded in 2019, several management recommendations are planned to be implemented in 2020 along with continued implementation of all TEMP monitoring and management programs (see Meadowbank Terrestrial and Wildlife Environment PEAMP – Section 12.3.2.3).

12.4.3 Noise

12.4.3.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

In the Project FEIS, 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. While noise impacts were recognized in association with construction of the Whale Tail Pit, they were expected to be comparable or less than similar emissions and activities during pit operations. Modelling of the operations case therefore provided a conservative estimate of the maximum noise scenario, thereby eliminating the need to model pit construction.

Monitoring sites were established around the site and along the Whale Tail Haul Road, as described in the site's Noise Monitoring and Abatement Plan (Version 3, 2018). Measured sound levels in those locations are used to verify model predictions for ambient noise made in the FEIS. However, there are no measurable assessment endpoints for noise effects in the FEIS, so any potential effects of noise are captured in the assessment of other VCs, specifically wildlife, birds, (Section 12.4.2) and fisheries (Section 12.4.1).

Table 12-27, below, will compare FEIS predictions for area sound levels with the results of monitoring conducted under the Noise Monitoring and Abatement Plan. For all monitoring stations comparable FEIS predictions were derived from the summertime, operations scenario (Volume 4, Figure 4.2-2 and Figure 4.2-4). Measured background concentrations (Volume 4, Appendix 4-D) were added to all predicted sound levels.

In 2019, monitoring was conducted according to the schedule in Table 12-28, but sound levels were not recorded, due to an error in operation of the noise meter, so results are not available. The reason for the error has been identified, and steps will be taken in 2020 and moving forward to ensure proper data collection (see Adaptive Management, below).

Table 12-27 UTM coordinates and monitoring dates for the Whale Tail noise monitoring locations. Due to an error in noise meter settings, sound levels were not logged for these stations during the 2019 monitoring events.

Monitoring Location	Easting	Northing	Start Time	Stop Time
R7	620194	7239038	7/29/19 14:10	7/31/19 8:15
			8/20/19 16:15	8/27/19 10:19
R8	610725	7256677	6/30/19 14:45	7/03/19 14:13
			8/07/19 8:20	8/08/19 15:45
R9	602488	7255946	7/26/19 14:55	07/28/2019
			8/12/2019 12:40	8/14/19 13:08
R10	609516	7254055	8/01/19 7:30	8/02/19 14:35
R11	608786	7257008	7/18/19 13:40	7/20/19 16:30
			7/21/19 15:13	7/24/19 9:54
			8/09/19 8:10	8/11/19 8:40

Table 12-28 Predicted and measured sound levels for the Whale Tail Site and Haul Road. *Values estimated from sound level contour plots in Golder, 2016, Volume 4 (Figures 4.2-2 and 4.2-4) plus background (Appendix 4-D). Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.4.3.2. NM = not measured.

Effect Pathway	Monitoring Station	FEIS Predicted Value (dBA)*	Measured Value $L_{eq, 24\text{-}h}$ (dBA)
			2019
Noise emissions from vehicles on the haul road can increase ambient noise levels.	R6 R7	R6: 45.97 – 50.33 R7: 45.14 – 50.04	NM
Noise emissions from mining equipment can increase ambient noise levels. Blasting can result in ground vibration and increase ambient noise levels.	R8 R9 R10 R11	R8: 40.41 – 45.14 R9: 36.19 – 40.41 R10: 45.14 – 50.04 R11: 45.14 – 50.04	NM

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 will be provided here.

As discussed in Section 12.4.3.1, sound levels were not recorded at Whale Tail Site and Haul Road locations in 2019.

12.4.3.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

Effectiveness of Monitoring

While it is recognized that monitoring in 2019 did not effectively address FEIS predictions of noise, this was due to an error in operation of the monitoring equipment that will be corrected moving forward. The noise monitoring program that is normally implemented will be able to address all FEIS impacts for which monitoring was recommended (i.e. overall, the monitoring program is considered effective).

Effectiveness of Mitigation

FEIS-planned mitigation measures to limit impacts of the Project on area noise levels are described in the FEIS Volume 3, Table 3-C-1. These measures are summarized in Table 12-29, along with a commentary on current implementation.

Table 12-29 Mitigation measures described in the Whale Tail Pit FEIS (Volume 3, Table 3-C-1) to reduce impacts of the project on area noise levels during the construction and operations periods, and implementation in the current year.

Project Activity	Planned Mitigation Measure (FEIS Table 3-C-1)	Implementation (2019)
Traffic on the haul road from the Whale Tail Pit to the Meadowbank Mine	Best Management practices for controlling equipment noise emissions, including use of silencers on all trucks.	**Yes** – Noise Monitoring and abatement Plan
	Enforcing speed limits.	**Yes**
	Regular maintenance will be implemented for equipment and vehicles.	**Yes** – Maintenance Logs
Construction of the Whale Tail Pit	Best Management practices for controlling equipment noise emissions, including use of silencers on all engines	**Yes** – Noise Monitoring and abatement Plan
	Regular maintenance will be implemented for equipment and vehicles.	**Yes** – Maintenance Logs
	Adherence to the Noise Monitoring and Abatement Plan	**Yes** – Noise Monitoring and abatement Plan
Mining of the Whale Tail Pit	Best Management practices for controlling equipment noise emissions, including use of silencers on all trucks.	**Yes** – Noise Monitoring and abatement Plan
	Periodic far-field noise monitoring to validate modelling and confirm adherence with applicable limits.	**Yes** – Noise Monitoring and abatement Plan
	Regular maintenance will be implemented for equipment and vehicles.	**Yes** – Maintenance logs
	Adherence to the Noise Monitoring and Abatement Plan	**Yes** – Noise Monitoring and abatement Plan

Project Activity	Planned Mitigation Measure (FEIS Table 3-C-1)	Implementation (2019)
Additional 3 years of processing and use of supporting infrastructure at the Meadowbank mine site and the existing AWAR for delivery of materials.	See Noise PEAMP for the Meadowbank site.	**Yes** – Noise Monitoring and abatement Plan

Adaptive Management

In order to ensure noise levels are adequately measured in 2020, Agnico is planning the following adaptive management actions:

- Noise equipment re-training for environment technicians, as necessary, to ensure complete data collection at all monitoring stations.

- Review of noise data immediately following initial monitoring events (early in the season) to ensure no logging errors occurred and sufficient valid data was collected.

12.4.4 Air Quality and Climate

12.4.4.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

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 to determine emission rates and dispersion of various criteria air contaminants (CACs) from different Project sources (Air Quality Impact Assessment, Golder, 2016). These included assessments for the Whale Tail Site and the Whale Tail Haul Road. Qualitative assessments were performed for ongoing use of the Meadowbank mill and AWAR, but no quantitative changes to original FEIS predictions were included, and those sources are assessed under the Air Quality section of the Meadowbank PEAMP.

For the Whale Tail Haul Road, calculation of CAC emissions included the following sources:

- Exhaust from vehicles operating on the haul road; and
- Un-paved road dust from the 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 drilling and blasting;
   - in pit material handling;
   - un-paved road dust from the pit; and
   - exhaust from off-road equipment operating in the pit;
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.

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 (2018), 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, 2018)

Monitoring Location	Measured Parameters
Onsite (DF-5/DF-6)	TSP, PM_{10}, $PM_{2.5}$, NO_2, dustfall
Whale Tail Haul Road km 134	Dustfall
Whale Tail Haul Road km 151	Dustfall
Whale Tail Haul Road km 169	Dustfall

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 < 0.30 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 extremely 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 2019 Air Quality and Dustfall Monitoring Report for further details).

For the Whale Tail Site, concentrations of suspended particulates will be assessed using automated air samplers such as the Partisol 2025 Sequential Air Samplers currently used for the Meadowbank site. These samplers measure concentrations of suspended particulates over a 24-h period every 6 days.

Onsite concentrations of NO_2 by volume (ppb) are analyzed over one month periods using a passive sampling device provided by an accredited laboratory. 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 2019 Air Quality and Dustfall Monitoring Report (Appendix 41), along with comparisons to regulatory guidelines, FEIS predictions, and historical measurements.

Impact predictions associated with these air contaminants and monitoring locations are identified in Table 12-31, along with measured results in 2019. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.4.4.2.

Table 12-31 Predicted and measured impacts to air quality and climate for the Meadowbank site. Predictions from the FEIS Air Quality Impact Assessment, Golder, 2016. NA = not assessed. Measured impacts exceeding or potentially exceeding predictions are shaded grey and further discussed in Section 12.4.4.2. *Addition of background values described above.

Effect Pathway	Proposed Monitoring (FEIS)	Monitoring Conducted	FEIS Prediction + Background	Measured Value
				2019
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) 25 m: 1.46 100 m: 0.83 300 m: 0.53 1000 m: 0.38	Max. dustfall (mg/cm^2/30d) 25 m: 8.04 100 m: 2.24 300 m: 1.42 1000 m: 0.46
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	NO_2 Static dustfall (TSP, PM_{10}, $PM_{2.5}$ will begin in 2020)	NO_2: 4.4 ppb (annual average) Static dustfall: none TSP: 174 µg/m^3 (24-h average) 16.9 µg/m^3 (annual average) PM_{10}: 52.4 µg/m^3 $PM_{2.5}$: 20.1 µg/m^3 (24-h average) 4.3 µg/m^3 (annual average)	NO_2: 1.46 ppb (annual average) TSP, PM_{10}, $PM_{2.5}$ - NA
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 $C0_2$e/yr Meadowbank Mill: 180 kt CO_2e/yr	189,867 t CO_2e total

12.4.4.2 *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.

12.4.4.2.1.1 Whale Tail Haul Road Dustfall

In 2019, measured rates of dustfall along the Whale Tail Haul Road commonly exceeded FEIS-predicted rates of dust deposition. Complete results for total dustfall are shown in Figures 77 and 78. However, as described in Section 1.4.4.1, comparisons of measured dustfall using static monitors to dust deposition rates modeled in the FEIS are considered valuable as a screening tool only. Since dustfall canisters measure particles up to 0.85 mm (after laboratory pre-filtration), while FEIS models typically assess deposition of particles only up to 0.30 µm, canisters are more useful for understanding trends or validating extremely conservative models, than specific comparisons to model outputs.

However, as further described in the 2019 Air Quality and Dustfall Monitoring Report, adaptations to sampling methods will be made in 2020 to improve comparisons to FEIS predictions. Historically, dustfall samples along the AWAR and WTHR have been collected with canisters sitting on the ground, to facilitate logistics. Results of comparison studies in 2012 and 2019 indicated samplers on the ground provide conservatively high estimates of dustfall compared to elevated containers. However, samples collected on stands (approx. 2-m height) according to ASTM methods provide a better basis for comparison to model predictions, because they help to eliminate peaks likely caused by re-entrainment from the ground (which are not included in standard dispersion modelling). That methodology will be followed in 2020 for all sampling locations.

Figure 77 Monitoring Round 1 (June 23 – July 23) - Measured values of total dustfall for transects at km 134, 151 and 169 along the Whale Tail Haul Road, FEIS predictions, and Alberta Environment's guidelines for recreational and industrial areas. Negative values denote locates on the east side of the road, while positive values denote locations on the west side of the road.

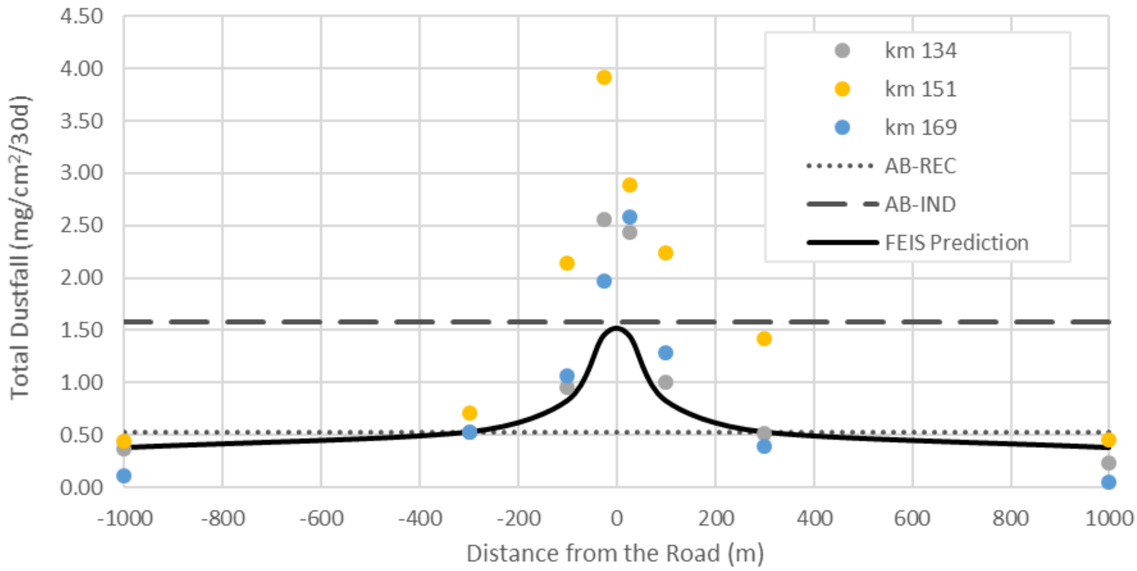
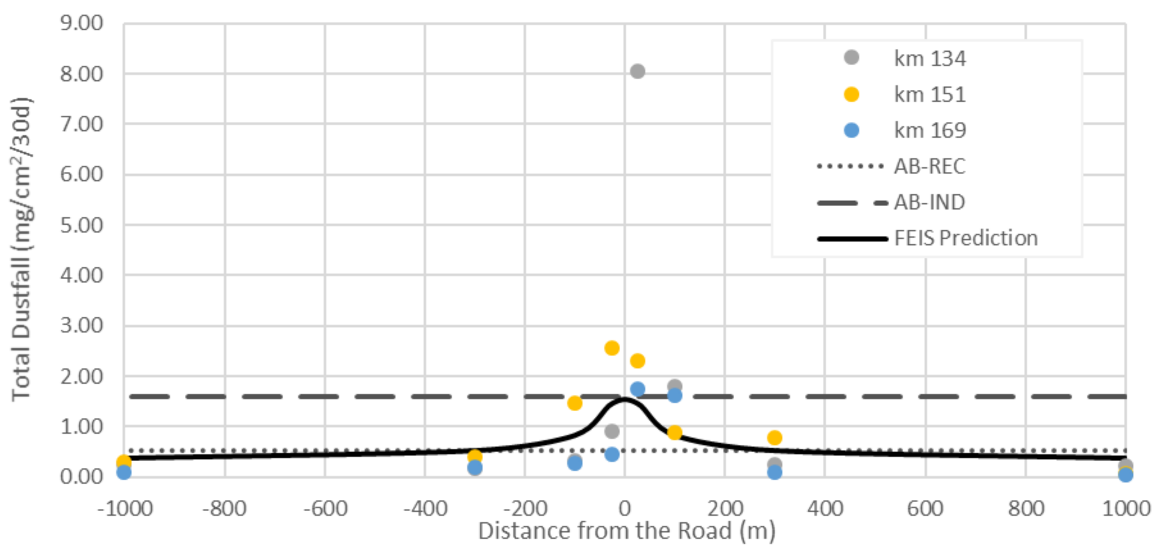


Figure 78 Monitoring Round 2 (July 23 – August 31) - Measured values of total dustfall for transects at km 134, 151 and 169 along the Whale Tail Haul Road, FEIS predictions, and Alberta Environment's guidelines for recreational and industrial areas. Negative values denote locates on the east side of the road, while positive values denote locations on the west side of the road



12.4.4.3 *Effectiveness of Monitoring and Mitigation, and Adaptive Management*

Effectiveness of Monitoring

Although suspended particulate monitoring had not yet begun in 2019, all other monitoring recommended in the FEIS to assess air quality impacts is being conducted according to the Air Quality and Dustfall Monitoring Plan (2018).

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, provided all meteorological conditions are understood. However, air quality modelling is not appropriate for determining single-event concentrations, such as comparing a single hour of modelled data to monitoring data collected at the same time. 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 Meadowbank site is able to effectively measure ambient concentrations of CACs, and when these values are lower than model results or regulatory criteria, those predictions can be confirmed as conservative.

For most CACs at the Meadowbank and Whale Tail Sites, measured concentrations have been well below regulatory guidelines and FEIS predictions when available, so existing monitoring programs are able to effectively to validate those predictions. While static dustfall results for the Whale Tail Haul Road in 2019 tended to exceed impact predictions, dustfall methods in particular are not well aligned with deposition modelling outputs, as discussed in Section 12.4.4.2, above. Adjustments will be made in 2020 to improve the effectiveness of that program for the purposes of EIS comparisons (also see Adaptive Management, below).

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.

Table 12-32 Mitigation measures described in the Project FEIS (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 Volume 3, Table 3-C-1)	**Implementation (2019)**
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**
	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

Project Activity	Planned Mitigation Measure (FEIS Volume 3, Table 3-C-1)	Implementation (2019)
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 –** Air Quality and Dustfall Monitoring Plan
	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** – Air Quality and Dustfall Monitoring Plan
	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** – Air Quality and Dustfall Monitoring Plan
	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

Based on measured concentrations of dustfall along the Whale Tail Haul Road in 2019, an adaptive management approach will be implemented to refine monitoring results and provide better comparisons with model predictions. This will involve the collection of dustfall data on stands at approx. 2 m height, rather than at ground level, corresponding with ASTM methods for static dustfall collection. This adjustment is in keeping with recommendations from ECCC during the Whale Tail Phase 2 permitting process, and associated commitments made by Agnico.

12.4.5 Permafrost

12.4.5.1 *Parts 1 & 2: Summary of Predicted and Measured Residual Impacts*

Although primary pathways of effects were identified for permafrost, no residual impact predictions were made because permafrost does not itself have measurable effects endpoints. Any potential effects associated with the primary pathways for permafrost are captured in the assessment of the potential effects to, and residual impact classifications for other VCs.

12.4.5.2 *Parts 3 & 4: Discussion*

N/A – residual impacts are not measured for permafrost directly. Potential effects are captured in the assessment of other VCs.

12.4.5.3 *Part 5: Effectiveness of Monitoring and Mitigation, and Adaptive Management*

Effectiveness of Monitoring

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. If impacts to other VCs are occurring beyond FEIS predictions and those effects are potentially due to impacts on 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
		2019
Mine infrastructure footprint	Implement slope stability criteria to manage erosion.	Slopes were designed and built to angle of repose to minimize erosion. 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.	Silt curtains not required as of yet. Infrastructure was designed and built with erosion and sedimentation control as needed (such as channels and dikes).
Earthworks: Drilling, blasting, grading, trenching, excavation and backfilling, crushing activities, and dike	Minimize footprint areas for stripping and removal of material. Use appropriately designed structural fill and thickness to maintain and promote permafrost conditions.	All footprint areas were minimized as much as possible. Fill thicknesses were designed with maintaining permafrost in mind.

Project Activity	Planned Mitigation Measure (FEIS Table 3-C-2)	Implementation 2019
construction	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.	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.	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.	Snow removal took place before any fill was placed.
	Minimize depth of excavations to limit impact on active layer.	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)	Thermistors and piezometers were installed at Whale Tail Dike and are regularly monitored and analyzed.
	Minimize depth of quarrying to limit impact on active layer. Maximum quarry depths of 3 m are currently planned.	Quarry depths were limited as much as possible.
	Appropriate design of quarry walls to promote stability, and to minimize annual slope degradation.	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.	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.	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.	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	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.	Design drawings were submitted to the Nunavut Water Board for approval prior to construction.
	Where possible, use thaw-stable road fills for construction.	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.	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.	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.	Snow removal took place before any road fill was placed.
Mine Site Operations and Maintenance,	Stockpile snow on thaw-stable materials, or in areas that are insensitive to thaw	Snow was placed in designated snow dump areas on pads made of rockfill.

Project Activity	Planned Mitigation Measure (FEIS Table 3-C-2)	Implementation 2019
including use of existing facilities and AWAR	settlement.	
	Use appropriate drainage and water diversion structures to minimize water ponding during thaw.	Water ponding was minimized through pumping during the spring thaw.
	Stock pile snow on thaw-stable materials.	Snow was placed in designated snow dump areas on pads made of rockfill.
	Use snow fencing where appropriate to minimize snow clearing requirements.	Snow fencing was not required yet.
	Annual road maintenance as required.	All roads are maintained and inspected frequently.
	Continue to use appropriate facilities management methods to reduce the amount of ice trapped within the facility.	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).	At the Meadowbank TSF the deposition point was switched regularly to allow tailings to freeze in thin layers.
Waste Rock Storage Areas and Stockpiles	Where possible begin construction during winter months, when active layer is frozen.	Starting construction of the WRSF and stockpiles was planned for winter months whenever possible.
	Place waste rock in lifts to promote freezing of pile.	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.	Water ponding and erosive flows were minimized through pumping during the spring thaw.
	Manage snow accumulation locally	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.	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.	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.	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.	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.	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.	Water inflows to the pit were directed to sumps and pumped to approved location (Whale Tail North, Quarry 1)

Project Activity	Planned Mitigation Measure (FEIS Table 3-C-2)	Implementation
		2019
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.	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.	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	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.	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.	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.

Adaptive Management

Adaptive management consists of changes to permafrost 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 are measured through effects on other VCs (since no quantitative residual impacts were predicted for permafrost). 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.

12.4.6 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 12.3.6.

12.5 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 12-34. 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 12-34 Contributions of the Meadowbank Division 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, KIA, appointed external advisor, and AEM.	2019 - present
Regional Monitoring Studies	GN Caribou Collaring Program	Meadowbank continues to contribute to the GN DOE caribou collaring program which started in 2008. Seven deployments, with a total of 117 collars, have been completed in the area around Baker Lake since Agnico Eagle became involved in the collaring program. In 2017, Agnico Eagle finalized discussions with the GN and entered into a renewed Memorandum of Understanding (MOU) to commit to another term contribution in support of the regional GN caribou monitoring program. This agreement will continue to assist the GN- DOE-Wildlife branch in directing the implementation, data analysis and management of caribou populations in the Kivalliq region.	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 and publications are expected in the near term. This project continues to be reviewed by the TAG.	
	Caribou Road Crossing Study	In 2018, review of caribou data lead to a TAG project to explore the link between caribou road crossings and road closures. Results are expected to be presented to the TAG in 2019, and used to inform ongoing monitoring and mitigation.	
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's Fish Habitat Offsetting Plan for the Whale Tail Pit project. Projected total contributions from Agnico of $1.6 M. 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	2019 – 2023

Program Type	Program Title	Contribution/Program Summary	Dates
		Communities". Total contributions from Agnico of $590,000.	
	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. 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). 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 - 2020
Other Information Sharing Programs	DFO Fishout Database	Agnico contributes raw data files from all fishout programs to DFO's Fishout Database.	2009 – 2018 (last fishout program)

APPENDIX A – MEADOWBANK AND WHALE TAIL FEIS REFERENCES FOR IMPACT PREDICTIONS

Table A- 1 Summary of FEIS VECs, potential impacts, and references for impact predictions for the Meadowbank project (as in Cumberland, 2005)

VEC	Summary of Potential Impacts	Reference (Cumberland, 2005)
Surface water quantity	Reduced water level and flow in receiving lakes	FEIS, Section 4.21.2.3 FEIS App B, Table B4
Surface water quality	Contamination of receiving lakes	FEIS, Section 4.21.2.3 FEIS App B, Table B5 FEIS App E FEIS - WQ
Fish populations	Direct impacts through blasting. Indirect impacts through habitat changes.	FEIS, Section 4.21.2.7 FEIS App B, Table B13
Fish habitat	Direct impacts through habitat destruction or alteration. Indirect impacts through introduction of contaminants.	FEIS, Section 4.21.2.7 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 FEIS App B, Table B6
Ungulates	Habitat loss, mortality	FEIS, Section 4.21.2.5 FEIS App B, Table B7
Predatory mammals	Habitat loss, mortality	FEIS, Section 4.21.2.5 FEIS App B, Table B8
Small mammals	Habitat loss, mortality	FEIS, Table 4.24 FEIS App B, Table B9
Raptors	Habitat loss, mortality	FEIS, Section 4.21.2.6 FEIS App B, Table B10
Waterfowl	Habitat loss, ingestion of contaminants, mortality	FEIS, Section 4.21.2.6 FEIS App B, Table B11
Other breeding birds	Habitat loss, mortality	FEIS, Section 4.21.2.6 FEIS App B, Table B12
Air Quality	Contamination of aquatic environment by dust. Contamination of terrestrial environment by dust. Poor air quality. Odours may attract scavengers. Production of greenhouse gases, other gaseous contaminants and particulate matter.	FEIS, Section 4.21.2.2 FEIS App B, Table B2
Noise	General disturbance of wildlife as a result of regular noises (behavioural changes, displacement). Reduced habitat effectiveness.	FEIS, Section 4.21.2.2 FEIS App B, Table B3
Permafrost	Thaw instability. Changes in permafrost depth in various areas (increase/decrease). Ice entrapment in tailings/reclaim.	FEIS, Section 4.21.2.1 FEIS App B, Table B1
Traditional Ways of Life (personal and community)	Reduced access to land. Reduction in traditional activities including harvesting. Undervaluing traditional ways and loss of knowledge.	FEIS Section 4.21.4.4 FEIS App B, Table B15
Employment, Training, and Business Opportunities	Financial expenditures of $23 million annually for 10 years. Employment of at least 60 workers.	FEIS Section 4.21.4.3 FEIS App B, Table B15

VEC	Summary of Potential Impacts	Reference (Cumberland, 2005)
	Goods and services contracts for local businesses. Overall increased economic activity, including indirect and induced effects. Increased capacity of local labour force to participate in formal economy. Increase in interest of school on part of youth. Increased individual, family, and community wellness.	
Wellness (personal and community)	Poor financial decision making. Increased income disparity. Increased public health and safety risks. Stress from rotational employment. Increased traffic accidents and emergencies. Disturbance by project activities.	FEIS Section 4.21.4.5 FEIS App B, Table B15
Infrastructure and social services	Shortage of housing and other infrastructure. Increased demand for social services.	FEIS Section 4.21.4.6 FEIS App B, Table B15
Sites of heritage significance	Potential degradation of historically significant sites.	FEIS Section 4.21.4.7 FEIS App B, Table B15
Contributions to economy of Nunavut and Canada	$92M annually during operations phase.	FEIS Section 4.21.4.8

Table A- 2 Summary of FEIS VECs (sub-headings in italics), effect pathways, impact predictions, and references for impact predictions for the Whale Tail project (as in Golder, 2016).

Effect Pathway (Volume 3, Appendix 3-C)	Predicted Impact	Reference (Golder, 2016)
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	See discussion, Section12.3.1.1.2.	FEIS Appendix 6-F
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	Construction (2018): Decrease from baseline Dewatering (2019): Slight decrease from baseline Operations (2020/2021): Slight increase from baseline	FEIS Volume 6, Section 6.3.4 and Appendix 6-E
	Operations (2020+): Increase by 3.5 m from 154.43 masl to 156.66 masl See discussion, Section 12.3.1.1.2	Volume 6 Section 6.3.3.1.4.2 App 6-F
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	Dewatering (2019): 4,643,712 m^3	FEIS App. 6-E, Section 5.2
	Construction/Dewatering: 8,760 m^3/yr Operations: 118,625 m^3/yr	FEIS Volume 6 Section 6.3.3.1
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 flooding and dewatering, water levels, channel/bank stability in streams, and disturb lakes and may affect water quality and sediment quality	Effluent/dike construction: <MDMER/NWB criteria Receiving environment: Comparable to water quality model predictions	FEIS Volume 6, Appendix 6-H
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		

Effect Pathway (Volume 3, Appendix 3-C)	Predicted Impact		Reference (Golder, 2016)
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.			
Fish and Fish Habitat			
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.	FEIS values (footprints during operations phase, baseline water elevations not specified)*: Mammoth Dike: 0.07 ha Mammoth Lake dewatering: 0.93 ha Whale Tail Dike: 3.98 ha Whale Tail dewatering: 64.58 ha	Offsetting Plan values (footprints during operations phase, with baseline water elevations)*: Mammoth Dike area above water + dewatering: 1.2 ha (152.57 masl) Whale Tail Dike area above water + dewatering: 69.5 ha (153.02 masl)	FEIS Volume 6, Section 6.5.3.2.2 and Table 6.5-5 Whale Tail Pit Fish Habitat Offsetting Plan, Table B-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.	Minor effect on fish population abundance		FEIS Volume 6, Section 6.5.3.2.2
During the construction 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.	Slight decrease in Mammoth Lake water level and discharge flows from baseline; moderate effect to population abundance and distribution of VC fish species		FEIS Volume 6, Section 6.5.3.3.2
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 operations phase prediction: Northeast flood zone: Lake A46 +3.5 masl to 34 ha, consuming lakes A47, A48, A113, Pond A-P38, and Pond A-P68 including	Offsetting Plan operations phase assumption: Northeast flood zone is assumed lost	FEIS Volume 6, Section 6.5.3.2.2 Whale Tail Pit Fish Habitat Offsetting Plan, Table B-2

Effect Pathway (Volume 3, Appendix 3-C)	Predicted Impact		Reference (Golder, 2016)
	412 m of flooded streams. Whale Tail South flood zone: +3.5 masl (to 156 masl), surface area increase from 369 ha (all flood zone lakes) to 513 ha, consuming Lakes A18, A19, A20, A21, A22, A55, A62, A63, A65, Pond A-P1, and Pond A-P53; resulting in new lake habitat. 1988 m of stream habitat flooded causing decrease in forage fish.	fish habitat. Whale Tail South flood zone: +3.5 masl (to 156 masl), resulting in 130.9 ha of habitat gains	
Flooding of Whale Tail South could result in increased total mercury concentrations in fish.	0.9 – 1.75 µg/g ww (95% CI) for a 550 mm Lake Trout		Azimuth (2017) Whale Tail Pit Project: Predicted changes in Fish Mercury Concentrations in the Flooded Area of Whale Tail Lake (South Basin). Prepared for Agnico Eagle Mines Ltd., Meadowbank Division. February 2017.
The dewatering of the diked area in Lake A17 (Whale Tail Lake) and Lake A16 (Mammoth Lake) will result in the removal and subsequent mortality of fish from the area during the proposed fish-out	Est. loss: 870 kg or 3346 fish		FEIS Volume 6, Section 6.5.3.2.2
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 Mammoth Lake in operations and closure.	(See above for predicted water quality impacts, mainly a predicted increase in dissolved phosphorus concentrations) Increase in sediment-bound phosphorus. Increase in phytoplankton biomass and altered species composition in Mammoth Lake and downstream lakes. Increase in secondary production (zooplankton) and altered species composition in Mammoth Lake and downstream lakes. Possible delayed increase in benthic invertebrate abundance and biomass. Possible increase in fish abundance due to food resources. Possible moderate reduction in overwintering habitat due to DO depletion (closure phase).		FEIS Volume 6, Section 6.4.3.3.2 (sediment) Section 6.5.3.3.2 (lower trophic levels & fish)
Terrestrial and Wildlife Environment			
Vegetation/Wildlife Habitat: Physical loss of plants and vegetation communities	820 ha		FEIS Volume 5, Section 5.5.3.2
Vegetation/Wildlife Habitat: Air	Measured soil concentrations <CCME/USEPA		FEIS Volume 3, Appendix

Effect Pathway (Volume 3, Appendix 3-C)	Predicted Impact	Reference (Golder, 2016)
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	guidelines or max. baseline + 10%	3-B, Section 3.B-3.3.1
	Qualitative assessment: Accumulation of dust produced from the Project may result in direct changes to vegetation, but effects will be restricted to the LSA. Most impacts restricted to 100 m from haul road. Reversible during closure phase.	FEIS Volume 5, Section 5.4.3.1.2
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	Qualitative assessment: While sensory disturbance is anticipated to reduce the amount of available preferred habitat within the LSA, the effect of this indirect habitat loss on caribou is anticipated to be limited.	FEIS Volume 5, Section 5.5.3.3
Ungulates: Direct loss and fragmentation of wildlife habitat from the Project footprint	High Suitability Habitat loss: Growing – 30 ha Winter – 342 ha	FEIS Volume 5, Section 5.5.3.2
Ungulates: Barriers to migration, which may affect population connectivity and distribution	Qualitative assessment: The Project haul road is expected to be a potential barrier to wildlife (primarily caribou), which may affect population connectivity and distribution. AWAR crossings based on collaring data analysis are expected to be representative of the haul road. An estimated 98% of caribou entering the LSA will cross the haul road (0.6 caribou per km).	FEIS Volume 5, Section 5.5.3.4
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	10 waterbird and 88 upland bird nests were predicted to be impacted by Whale Tail and Northeast Diversion flooding (56 nests/km^2)	FEIS Volume 5, Section 5.5.3.5
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	Upland bird density will decrease by 50% within 200 m of project facilities. At baseline estimates of 1.41 birds/ha, 6000 birds may be impacted.	FEIS Volume 5, Section 5.5.3.3
Noise		
Noise emissions from vehicles on the haul road can increase ambient noise levels.	R6: 45.97 – 50.33 R7: 45.14 – 50.04	FEIS Volume 4 (Figures 4.2-2 and 4.2-4) plus background (Appendix 4-D)
Noise emissions from mining equipment can increase ambient noise levels. Blasting can result in ground vibration and increase ambient noise levels.	R8: 40.41 – 45.14 R9: 36.19 – 40.41 R10: 45.14 – 50.04 R11: 45.14 – 50.04	
Air Quality and Climate		
Vehicle emissions and fugitive dust from traffic on the haul road can affect air quality	Max. deposition rate* (mg/cm^2/30d) 25 m: 1.46 100 m: 0.83 300 m: 0.53 1000 m: 0.38	FEIS Volume 4, Table 4.3-3
Blasting, stationary and mobile combustion sources, and fugitive dust from mining activities in the	NO_2: 4.4 ppb (annual average) Static dustfall: none	FEIS Volume 4, Table 4.3-4

Effect Pathway (Volume 3, Appendix 3-C)	Predicted Impact	Reference (Golder, 2016)
Whale Tail Pit can affect air quality.	TSP: 174 µg/m^3 (24-h average) 16.9 µg/m^3 (annual average) PM_{10}: 52.4 µg/m^3 $PM_{2.5}$: 20.1 µg/m^3 (24-h average) 4.3 µg/m^3 (annual average)	
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	-	-
Greenhouse gas emissions from the Project can contribute to climate change.	Whale Tail Site: 64.2 kt $C0_2$e/yr Meadowbank Mill: 180 kt CO_2e/yr	FEIS Volume 4, Table 4.2-2
Permafrost		
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)	Effects from earthworks in considered minor due to the implementation of environmental design and mitigation features.	FEIS Volume 3, Table 3-C-2
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.	Where the pit is land based, excavation of the open pit will result in the retreat of permafrost into the walls and floor of the pit. The open pit will expose deeper bedrock to ambient air temperatures, likely resulting in the development of an active layer with an annual freeze/thaw cycle. A talik zone approximately 100 to 200 m in depth currently exists below the proposed open pit that is currently under water (Volume 6, Appendix 6-A, Attachment A). As material is removed from the pit, the talik may reduce in size due to the loss of the thermal heat source maintaining the talik open.	FEIS Section 5.3.3.1

SECTION 13. REFERENCES

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