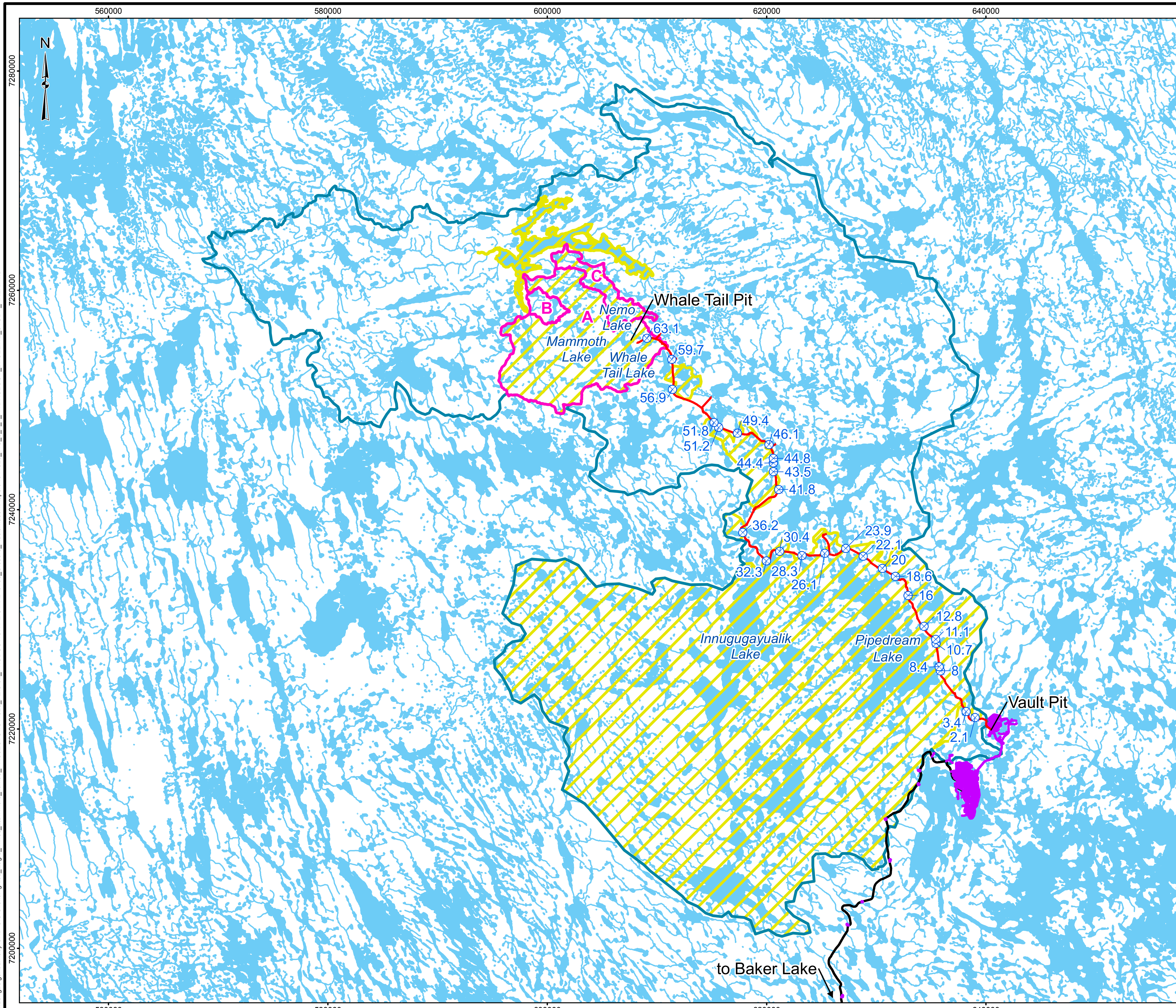


LEGEND

- WATER CROSSING LOCATION
- ALL WEATHER ROAD
- PROPOSED HAUL ROAD
- WATERCOURSE
- MEADOWBANK INFRASTRUCTURE
- SURFACE WATER QUANTITY REGIONAL STUDY AREA
- SURFACE WATER QUANTITY LOCAL STUDY AREA
- WATERSHED
- WATERBODY

REFERENCE

1. MEADOWBANK INFRASTRUCTURE AND PROPOSED WHALE TAIL HAUL ROAD ALIGNMENT OBTAINED FROM AGNICO EAGLE MINES LIMITED.
2. WATERCOURSE AND WATERBODY DATA OBTAINED FROM CANVEC © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED.

DATUM: NAD 83 CSRS PROJECTION: UTM ZONE 14

7000 0 7000

METRES

PROJECT

AGNICO EAGLE MINES LIMITED:
MEADOWBANK DIVISION
WHALE TAIL PIT PROJECT

TITLE

HYDROLOGY BASELINE STUDY AREA

PROJECT		1541520	FILE No.
DESIGN	JL	23 Mar. 2016	SCALE AS SHOWN REV. 0
GIS	MH	18 Apr. 2016	
CHECK	AP	18 Apr. 2016	FIGURE 3.2-1
REVIEW	IM/KAB	18 Apr. 2016	

Golder Associates

\\golder.gds\gal\burnaby\CAD-GIS\Client\Agnico_Eagle_Mines_Ltd\Whale_Tail\99_PROJECTS\1541520_FEIS\02_PRODUCTION\FEIS\MXD\6100_Closure_Reclamation\Report\1541520_FIG_3_2_1_HYDROLOGY_BASELINE_STUDY_AREA.mxd

3.2.6 Geology

Geology characteristics for the Project presented herein were extracted from the Geochemistry Report (Golder 2016b).

The Amaruq property is underlain by Archean supra crustal rocks of the metamorphosed Woodburn Lake Group; the same sequence as at the Meadowbank Mine. These rocks are believed to have been deposited in a continental rift setting. They are comprised of mafic to ultramafic volcanic and volcaniclastic rocks interlayered with clastic sedimentary units that include greywacke, siltstone, mudstone, chert and banded iron formation. This rock sequence has been intruded by granitoid rocks and lamprophyres, and underwent multiple deformation events and metamorphism to the upper greenschists facies. There are four Paleo-Proterozoic aged events of deformation recognised, two of which have significant effects on the geometry of the deposit. There are four Paleo-Proterozoic aged events of deformation, two of which have significant effects on the geometry of the deposit.

The main lithological units associated with the Whale Tail deposit include: ultramafic komatiites, clastic sedimentary rocks, mafic volcanic rocks and felsic to intermediate intrusive rocks. Details on these lithological units are provided in (Golder 2016b).

3.2.7 Hydrogeology

Hydrogeology characteristics for the Project presented herein were extracted from the Section 6.2 – Hydrogeology of the FEIS and Appendix 6-A (Agnico Eagle 2016) and the Water Management Report in Appendix 8-B-2 of FEIS (Agnico Eagle 2016) and are briefly summarized herein.

Two groundwater flow regimes in areas of continuous permafrost are generally present at the Project: a deep groundwater flow regime beneath the base of the permafrost; and a shallow flow regime located in an active (seasonally thawed) layer near the ground surface. With the exception of areas of taliks beneath lakes, the two groundwater regimes are isolated from one another by thick permafrost.

The shallow groundwater regime is active only seasonally during the summer months, and the magnitude of the flow in this layer is expected to be several times less than runoff from snowmelt (Woo 2011). Groundwater in the active layer primarily flows to local depressions and ponds that drain to larger lakes; therefore, the total travel distance would generally extend only to the nearest pond, lake, or stream. Water in the active layer is stored in ground ice during the cold season, and is then released with the ice thaws in late spring or early summer, thus providing flow to surface waterbodies (Woo 2011). During the warm season, groundwater in the active layer is recharged primarily by precipitation.

Groundwater flow within the deep groundwater flow regime is limited to the sub-permafrost zone. This deep groundwater flow regime is connected to the ground surface by open taliks underlying larger lakes. The elevations of these lakes are expected to be the primary control of groundwater flow directions in the deep groundwater flow regime, with density gradients providing a secondary control on groundwater flow directions. The elevations of these lakes in the baseline study area indicate that Whale Tail is likely both a groundwater recharge and discharge zone. Hydraulic gradients are expected to range from slightly downward to slightly upward. The Total Dissolved Solids (TDS) of groundwater (or salinity) is expected to increase with depth, resulting in increased density of groundwater with depth. This increase in density with depth will result in fluid density gradients which will tend to lessen the upward flow of denser groundwater water due to the buoyancy effect.

From late spring to early autumn, when temperatures are above 0˚C, the active layer thaws out. Within the active layer, the water table is expected to be a subdued replica of topography, and is expected to parallel the topographic surface. Project area groundwater in the active layer flows to local depressions and ponds that drain to larger lakes at velocities estimated to range from about 0.004 m/day to 0.08 m/day.

Taliks exist beneath waterbodies that have sufficient depth such that they do not freeze to the bottom over the winter. Beneath small waterbodies that do not freeze to the bottom over the winter, a talik bulb that is not connected to the deep groundwater flow regime will form (a closed talik). When the size of a waterbody is above a critical value, the talik beneath the waterbody will be an open talik, which connects to the deep groundwater flow regime beneath the permafrost. Elongated waterbodies with central pool(s) (where the depth is greater than the range of winter ice thickness), and a width of 300 m or greater are expected to have open taliks extending to the deep groundwater flow regime at the Project site. Circular lakes with a central pool (where depth is greater than the range of winter ice thickness) and a radius of 300 m or greater are expected to have open taliks extending to the deep groundwater flow regime. A review of bathymetric data, ice thickness data, and results of thermal modelling suggests that the northern end of Whale Tail Lake and in the area of the open pit does not have an open talik; whereas, the central portion of the lake (north of the dike) is expected to have an open talik beneath it.

3.2.8 Seismicity

Seismicity characteristics for the Project were extracted from the Water Management Plan (Agnico Eagle 2016).

The mine site is located in an area of relatively low seismic risk. The peak ground acceleration (PGA) for the area was estimated using seismic hazard calculator from the 2010 National Building Code of Canada-Natural Resources Canada (NRC) website (NRC 2010). The estimated PGA is 0.019 g for a 5% in 50-year probability of exceedance (0.001 per annum or 1 in 1,000 year return) and 0.036 g for a 2% in 50-year probability of exceedance (0.000404 per annum or 1 in 2,475 year return) for the area.

3.3 Chemical Environment

3.3.1 Surface Water and Sediment Quality

Baseline surface water quality characteristics presented herein were extracted from Section 6.4 – Surface Water Quality of the FEIS and Appendix 6-G (Agnico Eagle 2016).

Baseline water and sediment quality studies were completed in 2014 and 2015 and presented in the Whale Tail Pit Core Receiving Environment Monitoring Program (CREMP) baseline study report. Water quality data in the Project area were collected and analysed for general parameters (field and laboratory), major ions, nutrients (carbon, phosphorus, and nitrogen), total and dissolved metals, and selected organic compounds. Water quality data were compared to the CCME *Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life* (CWQG; CCME 1999) and the *Guidelines for Canadian drinking water quality* (GCDWQ; Health Canada 2014).

Baseline water quality sampling at Whale Tail Lake (Lake A17), Nemo Lake (Lake C38), and Mammoth Lake (Lake A16), tributaries within the Whale Tail Pit Study Area, tributaries along the proposed haul and reference lakes (Inuggugayualik Lake and Pipedream Lake) was completed by Portt and Associates in 2014, and by Azimuth in 2015 and Golder in 2015. Water samples were collected by Azimuth at the Sentinel stations along the proposed haul road in 2015. Tributaries within the Whale Tail Pit Study Area were sampled by Golder in 2015. Reference lakes were routinely sampled as part of Meadowbank Core Receiving Environment Monitoring Program (CREMP) monitoring.

Water temperature in lake stations ranged from 9°C to 11.5°C during the summer months in 2015 with minor thermal stratification evident at some deeper locations. The water column was generally well mixed with uniform specific conductivity (generally less than 25 µS/cm) and sufficient oxygen to support aquatic life (i.e., above the CWQG threshold). Lakewater pH was neutral was circum-neutral (6.4 to 7.6) in all lakes. Surface water collected during the open water season was characteristic of low productivity headwater lakes in the Arctic; soft, with low alkalinity, low TDS (less than 25 mg/L), low turbidity (and corresponding high Secchi depth) and low total suspended solids (TSS; less than 2 mg/L).

Nutrient concentrations were low in the lakes with results less than the detection limit in most samples. Ammonia was less than the detection limit in most samples, with highest concentration detected in Whale Tail (0.1 mg-N/L) and lowest detected concentration in Nemo Lake (0.006 mg-N/L); ammonia was not detected in the reference lakes. Total phosphorus was less than the detection limit in most samples with maximum concentration of 0.004 mg-P/L detected in Nemo Lake and maximum concentration of 0.003 mg-P/L detected in Whale Tail and Mammoth; maximum TP in the reference lakes was 0.006 mg-P/L.

Metals were below the analytical detection limit in most samples, and when they were detected, concentrations were below the CDWQG and CWQG.

There were a small number of constituents with concentrations that exceeded the Meadowbank trigger values (i.e., conductivity, hardness, calcium, magnesium, and potassium); however, triggers for these constituents were based on baseline/reference data from the Meadowbank project lakes and were provided for context only. Overall, the 2015 water quality results from the lakes in the Whale Tail Pit study area were similar to results from the reference lakes.

In situ water quality measurements taken at the tributary stations in the Whale Tail Pit study area and the hauls road study area show the water to be well oxygenated with dissolved oxygen concentrations consistently above 9.5 mg/L and low specific conductivity at all stations (i.e., less than or equal to 34 µS/cm). Tributary pH was circum-neutral (6.2 to 7.3) across all stations.

Nutrient concentrations were low in the tributaries with results less than the detection limit in most samples. Ammonia was less than the detection limit in most samples with a higher maximum concentration detected in a tributary from the Whale Tail Pit study area (0.007 mg-N/L) as compared to the maximum detected in the haul road study area (0.005 mg-N/L). Phosphorus was detected more frequently in the tributary samples as compared to the lake samples. In the Whale Tail Pit study area, total phosphorus ranged from less than the detection limit to 0.004 mg-P/L and ranged from less than the detection limit to 0.007 mg-P/L in the haul road study area. The median value in tributaries (in both study areas) was 0.002 mg-P/L while the median was less than the detection limit in the lakes.

Metals were below the analytical detection limit in most samples, and when they were detected, concentrations were below the CDWQG and CWQG, with two exceptions. Aluminum was above the CWQG at two stations (A55-A17 and A5-A4) in August; all other detectable metal concentrations were less than the CWQG and the CDWQG.

Concentrations in the tributary samples did not exceed the Meadowbank triggers and thresholds.

Sediments were collected from lakes in the Whale Tail Pit study area and from the reference lakes by Portt and Associates in September 2014 and by Azimuth in August 2015 (Azimuth 2016) according to methods outlined in the Meadowbank CREMP (Azimuth 2015a). Concentrations were generally similar between lakes. Concentrations were less than the ISQG and PEL guidelines for cadmium, copper, lead, and mercury in all samples.

The particle size distribution in the top 3 to 5 cm of sediment from south Whale Tail Lake, Mammoth Lake, Pipedream Lake, and Inuggugayualik Lake was predominantly silt/clay, and characteristic of depositional areas in lakes from this region (Azimuth 2015a). A coarser particle size distribution was evident in samples collected from Nemo Lake and north Whale Tail Lake with sediment collected at similar depth (i.e., 8 m ± 1.5 m) being predominantly silt/sand.

Arsenic and chromium concentrations exceeded the interim sediment quality guidelines (ISQGs) and probable effect level (PEL) concentrations (CCME 2002) in sediment samples collected in 2014 and 2015 from all lakes in the Whale Tail Pit Study Area (Whale Tail Lake, Mammoth Lake, Nemo Lake) and in the references lakes (Inuggugayualik Lake and Pipedream Lake). Sediment chromium concentrations were also above Meadowbank trigger values at Pipedream Lake, Mammoth Lake and select locations in Whale Tail Lake. Sediment arsenic concentrations were above Meadowbank trigger values at Inuggugayualik Lake, Mammoth Lake and Whale Tail Lake. Maximum sediment arsenic and chromium concentrations were observed at Whale Tail Lake (i.e., 1,760 mg/kg arsenic dry weight and 210 mg/kg chromium dry weight). Sediment copper concentrations were above the ISQG in all lakes sampled during 2014 and 2015. Sediment zinc concentrations were above the ISQG, PEL and Meadowbank trigger values at Mammoth Lake.

Sediment concentrations of hydrocarbons and polycyclic aromatic hydrocarbons were consistently low at all lakes sampled and below analytical detection limits.

3.3.2 Groundwater Quality

Baseline surface water quality characteristics presented herein were extracted from Section 6.2 – Hydrogeology of the FEIS (Agnico Eagle 2016).

Groundwater quality at the Project has been inferred to be similar to the Meadowbank Mine based on the similar geology and permafrost conditions (Knight Piésold 2015b). Groundwater quality at the Meadowbank Mine is generally described as being hard to very hard, with neutral to slightly basic pH and good buffering capacity. TDS concentrations range from 193 to 1,900 milligrams per litre (mg/L). Concentrations of fluoride, copper, iron, and selenium are elevated in comparison to guidelines for the protection of aquatic life and drinking water. Only the higher percentile values for nitrogen-containing compounds, aluminum, arsenic, boron, hexavalent chromium, molybdenum, and zinc exceed the CEQGs. Additionally, several of these parameters as well as chloride, manganese and sodium exceed aesthetic drinking water guidelines.

Consistent with other sites in the Canadian Shield, concentrations of TDS in groundwater are inferred to increase with depth, primarily in response to upward diffusion of deep-seated brines. The Meadowbank Mine TDS profile is considered applicable to the Project and is based on the site-specific data from the Meadowbank Mine up to depths of 177 m, and parallels the Diavik profile at deeper depths.

3.3.3 Geochemical Characterization of Waste Rock

Geochemical characterization of waste rock presented herein were extracted from Volume 5, Appendix 5-E, of the FEIS (Agnico Eagle 2016).

The main lithological units that will be mined include: ultramafic komatiites, sedimentary rocks (greywacke, iron formation and chert), mafic volcanic rocks and felsic to intermediate intrusive rocks.

The Whale Tail deposit mineralization is low sulphur but the sulphur carries arsenic which is enriched in all waste rock types along with antimony and bismuth. In addition to arsenic, chromium and nickel enrichment is observed in ultramafic, iron formation and mafic volcanic waste rock.

The majority (73%) of waste rock to be generated by mining is low sulphur and not potentially acid generating (non PAG). This is from low sulphur content and excess carbonate-mineral (reactive) buffering capacity. A limited number of samples from the ultramafic and iron formation units are PAG but the bulk of these lithologies carry sufficient reactive carbonate buffering capacity to neutralize any acidity that could be generated from these samples.

Arsenic is the principal element of environmental interest in Whale Tail mining wastes. No other element is systematically released in leachate from any rock type, tailings, ore or sediments at concentrations that exceed the Meadowbank effluent limits. Arsenic is released at concentrations that exceed the Meadowbank effluent limits from the non PAG rock ultramafic and iron formation lithologies, which comprise approximately 46% of the waste rock to be generated by mining, or 63% of the non PAG waste rock at Whale Tail Pit. The mafic volcanic lithology can leach elevated arsenic at the contact with the ultramafic and greywacke units, but the bulk of the samples are low arsenic. The exceedances noted in static and kinetic leaching tests do not necessarily mean that water contacting this rock at site will necessarily exceed the comparative criteria because conditions at site differ substantially from the aggressive leaching conditions of the laboratory tests. This does suggest, however, that arsenic is likely to be released from this rock upon contact with water and that this drainage should be captured and monitored before discharge to the receiving environment. The ore and lithologies that host to the ore, namely central greywacke and chert waste rock, are PAG. They represent 27% of waste rock to be generated by mining. The central greywacke samples (within the mineralized zone) are more silicified than the southern greywacke unit (outside the mineralized zone). Based on results to date, a total sulphur content of 0.1 wt% appears to be a suitably conservative cut-off criteria below which chert and greywacke waste rock are non PAG. Samples above 0.8 wt% are PAG. The ARD potential of samples having 0.1 to 0.8wt% sulphur is uncertain.

Kinetic leaching tests performed on 1-kg samples and on large bulk lithological samples corroborate results of static testing. Only one of the three PAG greywacke samples generated acid rock drainage (ARD) during testing. This sample represents a high-tier ARD potential end-member of this unit (high sulphur, low buffering capacity). Theoretical mineral depletion calculations and consideration of the field time equivalency of laboratory kinetic tests infers the PAG rock will not begin to generate ARD at site for more than a decade, as a minimum, if no ARD control mechanisms were put in place. This period of time is substantially longer than the 4 years of mine construction and operations.

3.3.4 Geochemical Characteristics of Ore and Tailings

A geochemical characterization program investigated the geo-environmental properties of both waste rock and ore at the Project. Geochemical characterization of ore presented herein were extracted from Volume 5, Appendix 5-E, of the FEIS (Agnico Eagle 2016).

The ore is PAG, and it is enriched in arsenic, antimony, bismuth, chromium, selenium, silver and to a lesser extent, nickel. Some of the ore samples leached arsenic at concentrations that exceed the Portage effluent criterion in static (shake flask extraction) tests but exceedances were short-lived in the first cycles of the kinetic leaching tests. The delay to onset of ARD from ore is expected to be substantially longer than the seven years of mine construction, operations, and closure.

Based on the geochemical testing completed to date, the Whale Tail Pit tailings are expected to be PAG due to their low carbonate-mineral buffering capacity relative to sulphide sulphur content (2.8 wt%). The Whale Tail Pit tailings sample subjected to kinetic testing by humidity cell remained neutral for the 44-week test duration and showed little evidence of active sulphide mineral oxidation. However, mineral depletion calculations on kinetic test results suggest that the buffering capacity will eventually be consumed, after which the tailings may start to oxidize and develop acidic conditions. Therefore, the tailings are anticipated to require ARD control in the long-term.

3.3.5 Geochemical Characterization of Overburden

Geochemical characterization of Overburden presented herein were extracted from the Evaluation of the Geochemical Properties of Waste Rock, Ore, Tailing, Overburden and Sediment from the Whale Tail Pit and Road Aggregate Materials Report (Golder 2016b).

The overburden is NPAG based on the low sulphide sulphur content. The leachable arsenic content in these samples was low, below CCME aquatic life criteria. However the fines content may be amenable to transport as suspended solids in runoff.

3.4 Biological Environment

3.4.1 Vegetation

Baseline vegetation characteristics for the Project presented herein were extracted from Section 5.4 – Vegetation Section of the FEIS (Agnico Eagle 2016).

The 2014 and 2015 vegetation surveys identified 138 vascular plants in the Project area, of which 107 were identified to species level and 31 were identified to genus level. A total of 61 non-vascular plants (20 bryophytes and 41 lichens) were identified from samples collected during 2015 field surveys. Of these, six specimens were identified to genus level.

The most common and widespread vascular species found were the northern Labrador-tea (*Rhododendron tomentosum*) and mountain cranberry (*Vaccinium vitis-idea*), which were both observed in 99 of the 128 plots surveyed and present in all ELC types. The overall findings indicate that the majority of the areas surveyed consist of low-diversity vascular plant communities dominated by fewer than 10 species.

Two federally listed plant species (i.e., the moss species Porsild's bryum [*Haplodontium macrocarpum*] and felt-leaf willow [*Salix silicicola*]) have been identified within Nunavut; these species and suitable habitat were not observed within the LSA during field programs. Of the 107 confirmed vascular species recorded during field programs, six are territorially listed as *Sensitive* (CESCC 2011). A full list of the vascular and non-vascular species recorded during field surveys and their CESCC status is presented in Section 5.4, Appendix 5-C – Vegetation of the FEIS (Agnico Eagle 2016).

3.4.2 Terrestrial Wildlife

Baseline terrestrial wildlife for the Project presented herein were extracted from Section 5.5 – Terrestrial Wildlife of the FEIS (Agnico Eagle 2016).

Wildlife represents important ecosystem components, and some species are protected by legislation and/or are important to IQ. In addition to the environmental monitoring information collected at the Meadowbank Mine, wildlife baseline studies were completed for the Project during 2014 and 2015.

Caribou are an important part of the Arctic ecosystem, and a key part of the culture and traditional economy of Nunavut. There are five migratory barren-ground caribou herds identified in the Kivalliq including the Beverly, Ahiak, Wager Bay, Lorillard, and Qamanirjuaq. As a result, Inuit traditionally did not live at or near the calving grounds but rather chose to remain at a distance, and set up camps along the migration routes. Elders have stated that there are no caribou calving grounds identified near the Project area (Volume 7, Appendix 7-A), and according to Nagy et al. (2011), the nearest calving ground to the Project is over 100 km away.

Other land animals important to the communities include ungulates, such as muskox, and fur-bearing species, such as Artic wolves, Grizzly bears, wolverines and raptors. Small mammals are a significant food resource for a variety of predatory mammals and birds. Several species, including Arctic hare, Arctic ground squirrel, and northern collared lemming, were observed during 2014 baseline studies.

3.4.3 Avifauna

Baseline avifauna for the Project presented herein were extracted from Section 5.5 – Terrestrial Wildlife of the FEIS (Agnico Eagle 2016).

Water birds encompass waterfowl (ducks, geese and swans) and loons. There are few water birds in the area, as confirmed during baseline studies and monitoring for the Meadowbank Mine (CRL 2005a, Gebauer et al. 2013), and during baseline studies for the Whale Tail Project (Agnico Eagle, 2016).

Canada goose, snow goose, long-tailed duck and loons were found to be the most abundant water bird species.

Various upland breeding bird species, including horned lark, American pipit, white-crowned sparrow, savannah sparrow, Lapland longspur, snow bunting, willow ptarmigan, rock ptarmigan, semi-palmated sandpiper, and American golden-plover, are present within the study areas. None of the upland birds occurring within the study area are listed federally (COSEWIC 2016). The red-necked phalarope is listed federally as a species of special concern (COSEWIC 2016) but has not been observed in the Project area.

3.4.4 Aquatic Life

Baseline avifauna for the Project presented herein were extracted from Section 6.5 – Fish and Fish Habitat Section of the FEIS (Agnico Eagle 2016).

Fish and fish habitat baseline studies were completed for both the haul road (formerly called Amaruq Exploration Access Road) (Portt 2015a) and the Whale Tail Pit Study Area (Portt 2015b) by C. Portt and Associates in 2014 and 2015.

Fish habitat was evaluated at 28 watercourses proposed to be crossed by the haul road. Watercourse descriptions are provided in Volume 6, Appendix 6-D– Fish and Fish Habitat Section of the FEIS (Agnico Eagle 2016). Three watercourses (at crossing km 16.0, km 23.9, and km 32.3) were classified as rivers (large, flowing open channels) with potential habitat for VCs, such as Arctic Char and Arctic Grayling. These large rivers provide spawning, rearing, and foraging habitat for small-bodied fish, and provide migratory corridors and various habitat functions for large-bodied fish (e.g., Arctic Char, Arctic Grayling).

Five streams (at km 3.4, km 10.7, km 20.0, km 26.1, and km 43.5) may also provide potential corridors for large-bodied fish. However, the majority of the crossing locations (n = 20) only had the potential for seasonal use by small-bodied fish such as Ninespine Stickleback or Slimy Sculpin. Six watercourses (at km 2.1, km 26.1, km 28.3, km 36.2, km 41.8, km 51.2) are unlikely to support fish due to lack of surface water flows (Volume 6, Appendix 6-D), all of which were characterized by contributing drainage areas of less than 4 km^2 in size. Sixteen crossing locations were on boulder-dominant stream sections, potentially restricting fish passage to upstream locations. Potential spawning habitat for Arctic Grayling (i.e. areas of gravel substrate) was identified at two watercourse crossings: km 16.0 and km 44.8.

A total of 52 fish were captured using 186 mins of fishing effort at 11 watercourse crossing locations along the haul road alignment. Five species were captured. Slimy Sculpin were the most abundant, followed by Arctic Char, Arctic Grayling, Burbot, and Ninespine Stickleback. Arctic Char were captured at three watercourses upstream of Pipedream Lake (Tasirjuaraajuk Lake), a lake that supports Arctic Char, based on IQ (Volume 7, Appendix 7-A).

Bathymetric surveys of 19 lakes in the LSA identified Lake A17 (Whale Tail Lake) as the largest lake by both surface area and volume. Coarse substrates (i.e., gravel, cobble, boulder, and bedrock) dominated the littoral zone of both Lake A16 (Mammoth Lake) and Lake A17 (Whale Tail Lake).The 16 small lakes surveyed for bathymetry ranged in maximum depths from 1.8 m in Lake A55 to 25.0 m in Lake A20. Surface areas ranged from 3.0 ha in each Lakes A47 and A49 to 63.0 ha in Lake A65 (Volume 6, Appendix 6-M). Fish habitat was assessed at 31 headwater streams of the A watershedPotential Arctic Grayling spawning habitat (i.e. gravel substrate) was observed at two locations in Stream A63-A18, however, no Arctic Grayling eggs or adults were observed nor collected (Volume 6, Appendix 6-K). A total of 1,223 fish were captured in lakes and streams in the regional study area near the Whale Tail Pit. Six species were captured in total: Lake Trout, Arctic Char, Round Whitefish, Burbot, Slimy Sculpin, and Ninespine Stickleback.

4.0 SECTION 4 • PROJECT DESCRIPTION

4.1 Location and Access

The Project is located approximately 150 km north of the hamlet of Baker Lake (Figure 2.1-1), additional detail on the location is provided in Section 2.0.

The approved access road that will connect the Vault Pit to the Amaruq exploration camp site in support of exploration activities will be upgraded to a haul road as described in Section 2.0. Agnico Eagle has sole responsibility for the construction and ongoing inspection and maintenance of all of the components of the access road, including the road bed, the bridges, the culverts, and the borrow/quarry sites used in the construction.

Meadowbank Mine relies on marine transportation (to Baker Lake) for most of its supplies including fuel, construction and operation equipment, materials and consumables, including dangerous goods, food, household goods and other non-perishable supplies. The Project requirements will be similar, and no changes will be required to the Baker Lake facilities for this Project.

Personnel (non-local crew) will access the Project site via the currently approved Airport Facilities at the Meadowbank Mine from which they will be transported by the haul road directly to the Project site. There are no anticipated changes to the currently approved Airport Facilities at the Meadowbank Mine. The small airstrip at the Amaruq exploration site will be progressively reclaimed when it is no longer required (when the access road is constructed), and potentially 4,000 m^3 of existing airstrip surface material may be reused as construction material for the proposed infrastructure at the Amaruq site.

The haul road will not be publicly accessible rather only used by Agnico Eagle Exploration Division and employees of its contractors.

4.2 Site History

The Project site history dates back to 2003. Exploration activities by operators are summarized in Table 4.2-1.

Table 2.6-2 in Section 2.6 provides a summary of all existing licenses, permits, and authorizations for Meadowbank Mine and the Project to date, organized by agencies.

Table 4.2-1: Summary of 2003 to 2014 Exploration Works on the Amaruq Property

Date	Activity
March 31, 2003	• Cumberland Resources Ltd. (Cumberland), the original owner of the Meadowbank Mine, submitted a Project Description Report for the Meadowbank Gold project to NIRB (Board)
September 23, 2003	• Following receipt of Cumberland's application, the Board sent a Screening Decision to then-Minister Robert Nault of the Department of Indian Affairs and Northern Development. A review under Part 5 or 6 of Article 12 of the NLCA was proposed.
December 3, 2003	• Minister Nault referred the Meadowbank project to the NIRB for a Part 5 Review
December 18, 2003	• NIRB circulated the Draft Environmental Assessment Guidelines for the Meadowbank project to the Distribution List
February 20, 2004	• The Board issued the Final Environmental Assessment Guidelines (EIS Guidelines) to the proponent. The Proponent was advised to submit a Draft EIS based on the EIS Guidelines issued.
January 4, 2005	• Cumberland filed the DEIS. A Conformity Review of the DEIS was undertaken by NIRB.
March 8, 2005	• Cumberland advised that their feasibility study resulted in adjustments to the Project design. This included an increase in mine throughput tonnage, changes to the water tailings discharge, and a recommendation for a 102 km long all-weather access road from the Hamlet of Baker Lake to the mine site.
March 21, 2005	• NIRB advised the Proponent that the DEIS generally conformed to the EIS Guidelines, meaning that the DEIS captured many, but not all, of the requirements set out in the EIS Guidelines. Detailed information regarding the deficiencies to be addressed prior to the technical review for the preparation of the FEIS was provided to the Proponent
November 8, 2005	• Cumberland submitted the FEIS to NIRB. NIRB's internal conformity review focused on the new content in the FEIS ensuring it responded to the direction provided by the Board in the PHC decision
December 14, 2005	• Cumberland corresponded with INAC, KivIA, GN, and the Hamlet of Baker Lake inquiring specifically about these organizations' interests in the regulation of the all-weather road and in the future of the all-weather road after the Project is completed.
December 15, 2005	• Cumberland submitted a supplemental FEIS submission to address the deficiencies identified in NIRB's conformity review
March 27 to 29, 2006	• Final Hearing was held in Baker Lake
March 30, 2006	• Final Hearing was held Chesterfield Inlet
March 31, 2006	• Final Hearing was held in Rankin Inlet
December 30, 2006	• NIRB approved the Meadowbank Project and this was followed by the Minister issuing the Nunavut Impact Review Board - Project Certificate No.4
2007	• Agnico Eagle purchased the Meadowbank Project from Cumberland and began constructing the all-weather access road from Baker Lake to the Meadowbank Mine
2008	• Mine site construction began
since 2009	• Meadowbank Mine has been operated by Agnico Eagle

Table 4.2-1: Summary of 2003 to 2014 Exploration Works on the Amaruq Property (continued)

Date	Activity
July 2009	• Project Certificate conditions 32 related to the AWAR reconsidered to allow for public access to km 85 of the AWAR from Baker Lake to Meadowbank Mine
May 2010	• Type A 2AM – MEA 1525 Amendment No. 1 to allow an expanded Marshalling Area Bulk Fuel Storage Facility
September 2010	• Meadowbank Airstrip Extension approved.
June 2014	• Type A 2AM – MEA 1525 Amendment No. 3 to allow for an increase in freshwater use to a total amount of 1.87 Million m^3 in 2013 and 1.15 Million m^3 per year after 2013.
July 2014	• Agnico Eagle submitted an FEIS addendum document that presented an overview of the Vault Pit Expansion (BB Phaser and Phaser Pit) to the NIRB.
July 2015	• Issuance of 2AM- MEA1525 NWB Type A renewal and Amendment to not exceed 9.12 Million m^3 annually as per Part E; expiration of renewal is July 22, 2025
March 2015	• Agnico Eagle submits an application for a Type B Amaruq Exploration Access Road
Nov 2015	• NIRB positive screening decision for the Amaruq Exploration Access Road
Nov 2015	• NWB issues Type B 8BC – AEA1525 for the construction, operation and closure of the Amaruq Exploration Access Road (which is the same alignment as the proposed Whale Tail Pit Haul Road)
Mar 2016	• DFO letter of Advice issued to Agnico Eagle to construct bridges and culverts at fisheries crossings along the Amaruq Exploration Access Road
April 2016	• NIRB positive decision for the Vault Pit Expansion (BB Phaser and Phaser Pit); awaiting final Ministerial approval
April 2016	• NWB accepts Agnico Eagle's notification of a modification of the Type A to dewater using approved Vault facilities, deposit waste and mining of Vault Pit Expansion (Phaser Pit and BB Phaser Pit) using the approved Vault Waste Rock facility and Meadowbank Tailings Storage Facility
May 2016	• Agnico Eagle submitted a request to NPC for a conformity determination for the Whale Tail Pit Project: Meadowbank Mine extension that is consistent with previously related determinations made for the Amaruq Exploration Access Road and Amaruq Exploration Activities (where Whale Tail deposit resides).

4.3 Site Geology

The Kivalliq region is considered to have excellent mineral potential. For example, the Rankin-Ennadai-Kaminuriak (Qamanirjuaq) greenstone belt in the central Kivalliq is comparable to the Abitibi greenstone belt in Ontario and Québec for copper, gold, lead, nickel, platinum, silver, and zinc.

Structurally, the Whale Tail deposit lithologies trend ENE-WSW, which may represent the axis of an anticline or syncline. This is the dominant structural orientation. A series of diffuse ductile structures do exist that trend NE-SW, which offsets both the lithologies and the mineralization. A sub-horizontal set of structures has also been identified during the geomechanical site investigation program (Knight Piesold 2015a).

See Section 3.2.6 for additional geology characteristics for the Project site.

The following section provides details on mining resource and footprint.

4.4 Project Summary

Development plans and potential impacts and benefits resulting from the proposed Project have been presented on an ongoing basis to the general public, community organizations, community leaders, businesses, and government. The feedback obtained from this engagement activity was incorporated in the Project planning to optimize the Project from an environmental and socio-economic point of view, including costs and operability. This is part of Agnico Eagle's approach to sustainable development in mining: limit negative environmental and social impacts, and enhance positive impacts. Agnico Eagle has adopted a precautionary approach while developing the Project details for the purpose of evaluating its potential impacts. As such, conservative assumptions have been used for design criteria and performance modelling of the Project, ensuring a robust concept and conservative impact predictions.

As part of the exploration drilling program, some infrastructure has already been developed at the Project site and it will be developed further. The exploration program is being carried out following the approved Type B Water Licence and Land Use Permits. The exploration facilities are listed in Section 1.0. Only the works related to upgrading the exploration road for production use are covered in this ICRP, as the existing and proposed exploration facilities at the Project site are covered under the Exploration Facilities Conceptual CRPs (Agnico Eagle 2015b, 2015c).

The infrastructure proposed at the Project and covered under this ICRP includes:

- Whale Tail Pit;
- a crushing facility;
- supporting infrastructure, including gated access, a communication tower, heli-pad, tank farm, potable water treatment plant, sewage collection and treatment system, effluent water treatment plant (WTP), a permanent camp (Main Camp), maintenance and on-site storage areas, three ore stockpiles, a temporary overburden stockpile, a power plant, two freshwater intakes and a water diffuser;
- a Waste Rock Storage Facility (WRSF) (waste rock and overburden will be co-disposed in the WRSF, the WRSF includes a landfill);
- four water retention dikes (Whale Tail, Mammoth, WRSF, and Northeast);
- two Saddle/Coffer Dams;
- three water diversion channels (Whale Tail, East, and North, if deemed necessary);
- the contact water collection channels and ponds in the different sectors of the Project (Main Camp, Industrial, Attenuation Pond, Open Pit, WRSF);
- transportation routes including internal access and the haul road; and
- quarries and borrow pits.

The Project infrastructure is described in detail below. See Figure 1.1-1 for locations.

Agnico Eagle expects to begin construction in 2018 and to ultimately achieve full production in 2019. Approximately 8.3 Mt of ore will be produced from the Whale Tail deposit over a mine life of about three to four years. Mining activities are expected to end in Year 3 (2021) and ore processing is expected to end during the first quarter of Year 4 (2022). Approximately 46.1 Mt of waste rock and 5.6 Mt of overburden (with very limited organic material) will be generated on site, for a total of 51.7 Mt of waste. The optimal throughput for the crushers will be approximately 9,000 to 12,000 t/day. As ore will be transported to Meadowbank Mine site for processing, tailings (8.3 Mt) will report to Meadowbank Tailings Storage Facilities, which are authorized under the current Meadowbank Mine Certificate and Type A Water Licence.

Table 4.4-1 presents the proposed milling schedule and mine waste production, along with the ore stockpile evolution and its maximum storage tonnage.

Table 4.4-1: Mine Plan by Year

Year	Ore Mined (t)	Waste Rock Excavated (t)	Overburden Excavated (t)	Ore Stockpile Balance (t)
2018	160,020	1,481,594	1,418,078	160,020
2019	2,289,976	13,797,463	4,118,981	807,495
2020	3,352,314	21,504,494	81,300	874,809
2021	2,476,834	9,320,843	0	66,644
2022[a]	0	0	0	0
Total	**8,279,144**	**46,104,394**	**5,618,359**	**-**

[a] Preliminary economics do not include ore mined in 2022.

4.5 Project Components Description

4.5.1 Whale Tail Open Pit

At the end of operations, the proposed Whale Tail Pit is planned to extend approximately 115 m below current water level of Whale Tail Lake (152.5 m). It will have an ultimate footprint area of approximately 50 ha.

As indicated in Section 3.3.3, geochemical testing indicates that the majority (73%) of the total amount of waste rock to be generated by the pit is classified as NPAG (33.6 Mt) based on the low sulphur content and presence of excess carbonate buffering capacity. The remaining 27% of waste rock is classified as PAG. Various lithologies show metal leaching (ML) behaviour (leachable arsenic). The overburden is classified as NPAG based on the low sulphide sulphur content. The leachable arsenic content in these samples was low, below CCME aquatic life. See Section 4.5.2 for waste rock and overburden management details.

Meadowbank experience indicates a preference for steeper bench faces and wider berms in order to comply with the Nunavut regulation of minimum ‘effective’ 8 m berms. The selected pit slope designs copy this approach whenever possible; however, drill and blast trials will be carried out early in the mine development to validate and optimize the design.

The mine design approach selected by Agnico Eagle based on a scoping study carried out for the pit rock zones consists of selective mining using 10 to 14.4 m benches. The final bench height will typically be 21 m and the bench face angle will vary from 65° to 75° depending on the pit wall. The inter-ramp angles will vary from 41° to 53°.

Bench scale stability was assessed by means of Kinematic and Limit-Equilibrium analyses to identify potential bench-scale planar, wedge and toppling instability. The pit design and geotechnical stability will be monitored using the same best practices currently applied at Meadowbank Mine.

The Whale Tail deposit is partly located within Whale Tail Lake. The proposed approach to develop the pit involves isolating the pit area with three dikes (Whale Tail Dike, Mammoth Dike, and Northeast Dike). The isolated area will be dewatered during operations and the dewatered water level will be maintained through the life of the Project by diverting most of the fresh water that would otherwise come in contact with the mine site to other sub-watersheds using diversion channels and by pumping (operational dewatering) the remaining contact water to the WTP for treatment before discharge into Mammoth Lake. Agnico Eagle will work with DFO and Inuit communities to develop a fish-out plan for dewatering the isolated area. Once fish salvage and dewatering has been completed, the pit will be accessed by heavy equipment.

The Whale Tail Dike will be required to retain water upstream from the pit area. The normal water level of Whale Tail Lake (South Basin) will be raised by 4 m to reroute water flow towards the northwest passage through the South Whale Tail Diversion Channel into Mammoth Lake. Mammoth Dike is required for dewatering the pit area and to limit the water flow from Mammoth Lake back into the pit during important flood events. The pit area also needs to be protected from water flowing from the North-East Sector. This natural flow pathway will be blocked by the Northeast Dike, allowing the water level to rise approximately 2 m before overflowing towards Nemo Lake.

Based on bathymetry, the predicted volume of water in Whale Tail Lake (North Basin) is 3.4 Mm^3 at a level of 152.5 m. The bottom of the lake is at 135 m. It is assumed that the top 5 meters will consist of fresh water with low suspended solids. The remaining water volume may contain suspended solids from the re-suspension of lake-bottom sediments which will need to be removed prior to discharge into the environment. It is assumed that approximately 66% of the volume (i.e., approximately 2.2 Mm^3) will be pumped directly to Whale Tail Lake (South Basin) if it meets discharge criteria (Dewatering Phase 1), and the remaining 34% (i.e., 1.2 Mm^3) will be pumped to the WTP first and then discharged to Lake A16 (Mammoth Lake – Dewatering Phase 2).

During the operational phase of the Project, the anticipated average annual volume of water to be managed from the pit will be 0.11 Mm^3.

Contact water from an area of 111 ha, not collected by the North Channel and the East Channel, along with groundwater seepage will be managed to report to the bottom of the pit and will be pumped to the Attenuation Pond and from there to the WTP for treatment. See Section 4.5.7 for additional details on water management components.

4.5.2 Waste Rock and Overburden Storage Facility

Approximately 2.5 Mt of NPAG waste rock will be used for construction of facilities such as roads, pads, and water management facilities (i.e., dikes, berms, rip rap, etc.). The remaining waste rock; not suitable/needed for construction and closure purposes, will be trucked to the WRSF until the end of the pit mining. The overburden will be trucked to the WRSF to be co-disposed with the waste rock or to the temporary overburden stockpile. The WRSF will have two piles.

About 5.5 Mt of overburden will be co-disposed within the WRSF. The remaining overburden, approximately 0.1 Mt, will be temporary stored in the temporary overburden stockpile and this material will be used for different purposes during the construction and operation stages. The temporary overburden stockpile will be located south of the open pit beside the Ore Stockpile 3 and it will have a footprint of approximately 3.2 ha.

The proposed WRSF will be located to the north-west of the open-pit in a sub-watershed allowing capture and control of seepage and runoff in one low topographic point. The locations of the WRSF and temporary overburden stockpile were selected considering environmental, social, economic, and technical aspects.

The WRSF will occupy an area of approximately 110 ha (two piles) and it will be approximately 80 m high, with bench heights of 20 m and an overall slope of 23 degrees (2.5H:1V); an angle generally considered gentle and stable for such facility. Slope stability analyses will be performed and provided 60 days prior to operations. The design is similar to the approved Vault WRSF.

The WRSF is designed to reduce impacts on the environment and to consider both the physical and geochemical stability of the stored waste rock and overburden. The WRSF is designed considering the placement of the waste and overburden in layers spread using a dozer to reduce the footprint and to limit dust generation. Each bench is going to be composed of 4 layers of 5 meters and where the toe will start at a setback distance of 20 meters from the crest of the previous bench.

The overburden will be removed first and placed into the WRSF. As soon as waste rock material is available from the pit, the overburden will be surrounded with run of mine material to control the stability of the pile. Consistent with Meadowbank, a classification system will be used to identify both PAG and metal leaching rock, and PAG mine rock will be stored at designated areas within the WRSF.

The mine landfill will be located within the WRSF (see Section 4.5.6 for landfill details).

A closure cover will be progressively placed over the WRSF to limit acid generating reactions and to control the migration of contaminants. The cover will be 2 to 4 m thick and constructed with NPAG waste rock. The intent of the cover is to contain the yearly active layer inside the thickness of the cover and to maintain a temperature below 0° Celsius for the underlying rock. Experience from the Meadowbank Mine will be used to develop the cover. By the time of permanent closure, it is expected that cover placement will have been completed over most of the sideslope areas. Additional cover placement will be required on the remainder of the sideslopes and on the top surface of the WRSF.

Thermistors will be installed in the WRSF to monitor the rate of freeze back and permafrost development in the facility. The locations for the thermistors will be determined during the final detailed design stage. The measured temperature within the WRSF will provide background information for the study of permafrost development within the facility. Shallow thermistor strings will also be installed to verify that the active layer depth does not exceed that of the cover layer.

4.5.3 Buildings and Equipment

The main supporting facilities for the proposed Project development, described below, will include:

- machinery and equipment for mining activities; and
- supporting infrastructure including: gated access, a communication tower, heli-pad, a power plant, a permanent camp (Main Camp), maintenance and on-site storage areas, a tank farm and three ore stockpiles (Ore Stockpiles 1 to 3).

<u>Machinery and Mobile Equipment</u>

Agnico Eagle will use the machinery and mobile equipment already on site that is currently in use for the Meadowbank Mine operations, with the addition of specialized long-distance haul trucks. Information concerning vehicle types using the haul road is summarized in Table 4.4-2.

Table 4.5-2: Vehicle Information

Make	Model	Year	Weight Empty	Type
Cat	777F	2008	450,000 lbs	Rock haul
Western Star	4800SB	2012	66,000 lbs	Explosive truck
Blue Bird	VISION SL	2014	27,507 lbs	Bus
Kenworth	T800	2013	40,000 lbs	Fuel truck
Ford	F250	2013	10,000 lbs	Pickup
Kenworth	C500B	2006	128,000 lbs	Truck w/float
Western Star	6900XD	2015	188,100 lbs	Road haul truck

lbs = pounds.

Supporting Facilities

The communication tower will occupy an area of approximately 6,400 m^2 with a height of 45.5 m.

The Power Plant will be a diesel-fueled facility using reciprocating engines housed in the modular building with a floor area of 215 m^2. The two 1.8 MW/600 Volt (V) gensets will be relocated from the Vault Mine site to Whale Tail. An initial load estimation has been completed which gives an expected load of 1,358 kW representing less than 85% of the capacity of a single gen set. The second gen set unit will be installed for standby and for service during maintenance.

Due to the remote location of the mine, it will be necessary to provide catered accommodation on-site for up to 350 people. The existing exploration camp will continue to be used during operations and a new camp (Main Camp) will be constructed on-site; the Main Camp will provide accommodation for 210 people. The Main Camp will include rooms, as well as a reception and security area, a kitchen and dining room, a laundry, recreational facilities, an administration building, and a first-aid clinic. The camp complex will be an insulated structural wood frame building resting on a structural steel frame floor on piles. It will be located at the industrial site pad and it will have a floor area of approximately 6,550 m^2.

Primary maintenance of mobile equipment will make use of existing infrastructure at Meadowbank Mine. For light maintenance, the industrial site includes one maintenance shop for mine equipment and one for haul trucks. Agnico Eagle may also include a wash bay, a machine shop, and a welding shop. The concrete foundation will be designed according to the type of bay (e.g., for a wash bay, drains in the foundation will be designed for used water with a sump for an oil separator).

The existing emulsion plant at Meadowbank Mine will be maintained with deliveries to Whale Tail on an as need basis during operations. The haul road will be used to truck explosives between Meadowbank Mine and the Whale Tail site. Explosives truck(s) will be based at the Emulsion Plant at Meadowbank Mine. The emulsion storage capacity at the Whale Tail Pit site will comprise two 30,000 kg tanks.

The Whale Tail site will primarily use emulsion based explosives during construction and operations to minimize the use of ammonium nitrate/fuel oil (ANFO). Presplit explosives will also be used to control the final pit walls, where required.

The explosives storage facilities will be safely located away from vulnerable facilities, as stipulated by the federal and territorial *Explosives Use Act* and *Regulations*. The minimum setback distances between the proposed explosives storage facilities and the other mine site facilities will be governed by the *Quantity-Distance Principles User's Manual,* as published by the Explosives Branch of Natural Resources Canada. Use of these setback distances will ensure that the location of these proposed facilities meet all federal and territorial regulations regarding safe siting of such facilities.

The construction and operation of the Project site will require the use of fuel (P-50 Fuel Diesel ULSD-43). Fuel usage between the Meadowbank Mill and operations at the Whale Tail site is projected to be approximately 66.8 million L/year. The Whale Tail Bulk Fuel Storage Facility will be located east of the Whale Tail Camp adjacent to the mine operations haul road (see Figure 1.2-1). Fuel storage at the Whale Tail site will be in one above ground storage tank with approximately 500,000 L capacity. The bulk fuel tank will be re-filled by a fuel truck on a regular basis throughout the year.The diesel tanks will be single-walled, constructed of welded steel, and designed, constructed, and located to meet the CCME guidelines for *Aboveground Storage Tank Systems Containing Petroleum and Allied Petroleum Products*. The fuel unloading facility will be located within a lined and bermed area sized to hold 110% of the volume of the largest tank. All other petroleum fuel and lubricant products will be delivered and stored in the original packing container from the manufacturer.

There will be three ore stockpile facilities on site; Ore Stockpile 1 and Ore Stockpile 2 will be located north of the Attenuation Pond and Ore Stockpile 3 will be located west of the Attenuation Pond. No ore will remain in the ore stockpiles by the end of operations. The ore stockpiles will have in total a maximum footprint of 156 ha. Evolution of the ore stockpiles by year is summarized in Table 4.4-1.

The mining plan considers that higher grade ores will be processed first, and lower grade ores will be stockpiled and processed at the end of operations. During the last year of operations, only low grade ore material stockpiled from the pit operations will be processed.

4.5.4 Mine Infrastructure

The only onsite mine infrastructure will be the two crushing facilities. (Crushed ore will be transported to the main Meadowbank Mine site for milling.)

The covered crushing facilities will be located east of the pit. Excavated material will be hauled to the one of the crushers using mine trucks. Material will either be dumped into a chute, which feeds the jaw crusher, or dumped on the ground and then dumped into the chute using a wheel loader. The throughput capacity for the crushers will be approximately 9,000 to 12,000 t/day.

4.5.5 Transportation Routes

Haul Road

In November 2015 Agnico Eagle received approval to construct an access road under the Type B Water License (2BE-MEA1318), which will connect the Vault Pit (one of the Meadowbank Mine pits) to the Amaruq exploration camp site in support of exploration activities. Vault Pit is approximately 8 km northeast of Meadowbank Mine site. The proposed access road will be about 64 km long with a top width of 6.5 m. Agnico Eagle is proposing to upgrade the proposed access road to accommodate increased traffic rates and haul trucks. The proposed upgraded road is referred to as 'the haul road'. Agnico Eagle has developed the Whale Tail Haul Road Management Plan in support of the Type A Water Licence Amendment.

The proposed upgrade of the exploration road mainly entails widening the top surface from the current 6.5 m width to 9.5 m width. Road surfacing will be constructed using waste rock, crushed rock aggregates from the quarry sites, or natural aggregate from borrow pits in esker material. The bridges and culverts were already designed at the exploration stage to accommodate potential for use of the exploration road as a haul road. The access road will have 3 bridges, 8 large open bottomed arch culverts and 28 corrugated metal pipe round culverts to pass watercourse crossings. The bridges, open bottom arch culverts and round culverts will allow for normal river and stream flow, and for fish migration at road water crossings. There will also be many other localized drainage culverts to prevent erosion, reduce thaw susceptibility and washout of the road during freshet.

Agnico Eagle has also taken into account for stoppage of haul road closures due to caribou migration and weather by appropriately sizing on-site ore storage stockpile and at Meadowbank Mill.

Internal Access and Haul Roads

A network of roads (service roads and haul roads) on the proposed Project site will be required to connect up and to access the various Project facilities. Project roads will be designed much like the Meadowbank road design as this design is suitable for the Arctic conditions.

4.5.6 Landfill and Other Waste Disposal Areas

Sewage will be treated using a Bionest sewage treatment system (similar to system used at Meadowbank Mine). Sewage will be collected from the camp and change-room facilities and pumped to the sewage treatment system. The treated sewage would then be pumped to the Attenuation Pond and discharged with other site contact water.

The waste management philosophy on-site will be to reduce, reuse, or recycle material where practicable. Non-salvageable, non-degradable, non-hazardous, non-putrescible solid waste material generated during construction, operations, and closure will be disposed of in a solid waste landfill (as described in the Landfill and Waste Management Plan submitted in support of the Type A Water Licence Amendment Application). The exact location of the Landfill in the top of the WRSF are not currently available, but the details will be determined closer to the end of operations as the WRSF approaches its final as-built elevation. The landfill will not receive any waste that will attract birds or wildlife and it will be maintained in such a manner that windblown litter will be minimal. Following the example of Meadowbank, the landfill will be located within the WRSF and it will have berms on the south and east sides to protect debris from the wind. The landfill will be covered with a minimum 2 m of NPAG waste rock at closure. The surface runoff from the landfill will be managed as part of the contact water system for the WRSF.

All organic waste from the Project site will similarly be disposed of using the existing Meadowbank incinerator. Waste oil will be collected and used on-site in waste oil burners. Peak incinerated waste volumes are expected to remain similar to those occurring under current operational conditions at Meadowbank. Similar to the waste management philosophy, plans are to actively work towards minimizing spills through suitable work procedures. When spills cannot be prevented and do occur, the goal will be to limit the spread of the spill, and then to deal with any contaminated material resulting from the spill. Hydrocarbon contaminated soils (HCS) generated during the construction, operation, and closure phases will be adequately addressed. Soil contaminated with light hydrocarbons, such as diesel, will be treated in the Meadowbank Mine landfarm. Materials contaminated with heavy hydrocarbons (not treatable in landfarm) (e.g., hydraulic fluid or grease) will be segregated, packaged and shipped south for treatment and/or disposal.

Hazardous wastes will be packaged for shipment off site to registered hazardous waste management facilities in the south. The accumulation of wastes will be avoided through an active waste management program. Hazardous waste will include the following:

- waste fuel: diesel fuel, oils and solvents, if not incinerated;
- lubricants: greases and other lubricants used for equipment operation and maintenance; and
- antifreeze.

4.5.7 Water Management Facilities

The Project will include construction of the following water management infrastructure:

- four turbidity curtains;
- two contact water collection ponds (Whale Tail Attenuation and Whale Tail WRSF);
- two fresh water collection ponds (Whale Tail Lake (South Basin) and North-East Sector);
- three proposed water diversion channels (Whale Tail, East, and North, if deemed necessary);
- four water retention dikes (Whale Tail, Mammoth, Whale Tail WRSF, and North-East);
- two coffer/saddle dams;
- seven proposed culverts (Culverts 181, 182, 183, 184, 185, 186, and Mammoth Channel Culvert, if deemed necessary);
- a fresh water intake causeway and pump system;
- a Water Treatment Plant and associated intake causeway;
- a water treatment plant for construction;
- a Sewage Treatment Plant;
- pipeline and associated pump system;
- a potable water treatment plant; and
- a discharge diffuser located in Lake A16 (Mammoth Lake).

Figure 4.5-1 presents a schematic diagram of the planned water management strategy during the operational phase. All contact water from the site will eventually be pumped or will flow to the Attenuation Pond. Water stored in the Attenuation Pond will be treated in the WTP and recycled to satisfy water demand for mining process and to minimize freshwater make-up requirements from Nemo Lake. Any excess water from the Attenuation Pond will be also treated in the WTP as required prior to discharge to Mammoth Lake through the effluent diffuser.

For additional details see the Water Management Plan submitted in support of the Type A Water Licence Amendment Application.

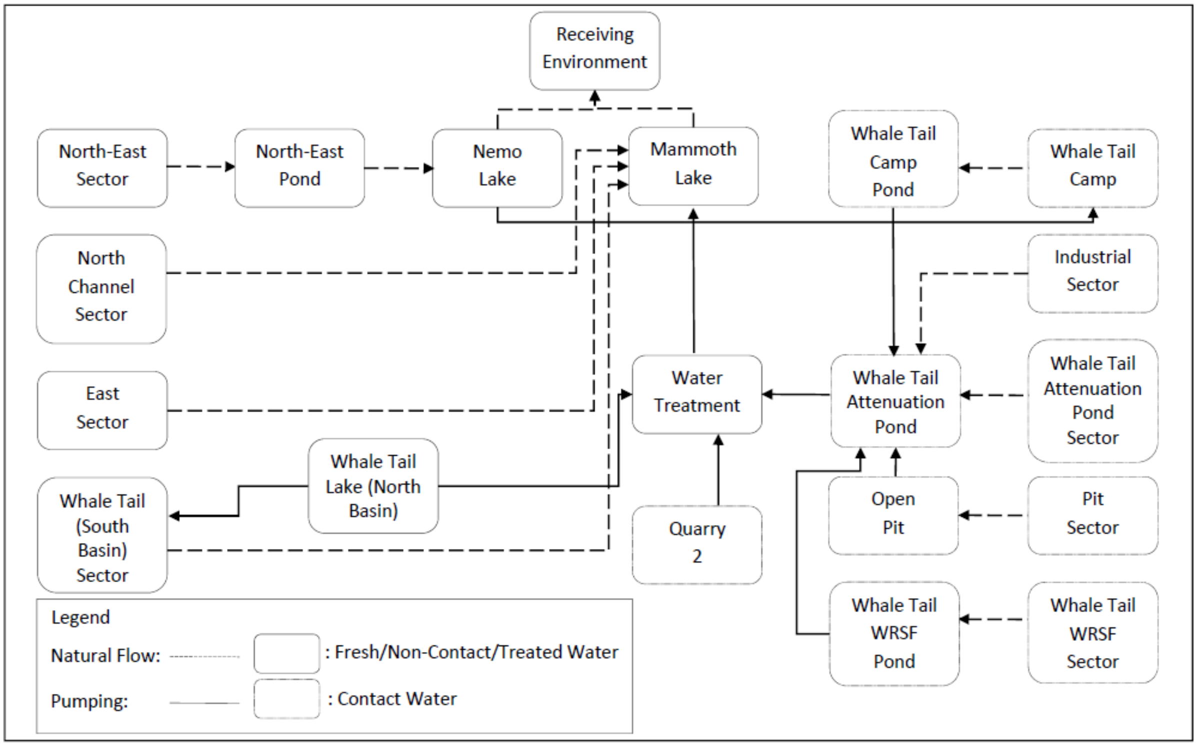


Figure 4.5-1: Water Management Flowsheet during Construction and Operations

<u>Non-Contact Water Management</u>

The non-contact water sectors are:

- South Whale Tail Lake Sector: The water will then flow through the South Whale Tail Diversion Channel and into Mammoth Lake.
- Northeast Sector: The water will be contained using a retaining dike and will flow toward Nemo Lake.
- East Sector: To limit the flow of non-contact water into the Attenuation Pond, a diversion channel (East Channel) will intersect the lake's final effluent. The East Channel will collect and divert the flow of Lake A53 to Whale Tail Lake.
- North Channel Sector: The construction of the road, or if deemed necessary the North Channel, located to the north of the pit will prevent non-contact runoff water from reaching the pit. This runoff water will flow by gravity towards Mammoth Lake.

<u>Contact Water Management</u>

Contact water was categorized into the following five sectors:

- Whale Tail Waste Rock Storage Facility Sector: The water is considered to be contact water, such that a dike is required to contain the water in a pond to prevent flow to Mammoth Lake.

- Industrial Camp Sector: Pads in the industrial sector and in the crushing area will be graded to redirect contact water towards the collection channel. The contact water will then flow by gravity to the Attenuation Pond.
- Main Camp Sector: Water will drain from the camp sector pad will be directed toward the Whale Tail Attenuation Pond.
- Pit Sector: All water not collected within the other sectors upstream of the pit will flow into it. Runoff from precipitation and ground will be pumped out of Whale Tail Pit, into the Attenuation Pond.
- Whale Tail Attenuation Pond Sector: Will collect all the water from the other contact water sectors, as well as the contact water from its own watershed and seepage from the Whale Tail Dike.

Contact water management associated with the existing facilities at Meadowbank Mine (i.e., tailings storage facility) is authorized under the Type A Water Licence No. 2AM-MEA1525 and will continue to the managed in the same way.

Freshwater Intake

Freshwater for the Whale Tail Camp will be sourced from Whale Tail Lake and from Nemo Lake. Freshwater usage includes potable use, fire suppression, dust suppression, drilling water (if contact water is not available), and water for the truck shop. The freshwater source at the Whale Tail site is Whale Tail Lake during the first part of construction (i.e., Q1 and Q2 of 2018) and closure, and Nemo Lake during construction and operations. Freshwater will also be required to refill Whale Tail Lake (North Basin) at closure and will be sourced from the Whale Tail Lake (South Basin), and natural inflows to Whale Tail Lake (North Basin). Agnico Eagle will endeavour to minimize the amount of freshwater required for the Project, where possible.

Freshwater will be sourced from each lake through a fresh water intake and pump system, freshwater use will switch from Whale Tail Lake (Lake A17) to Nemo Lake (Lake C38) for the periods mentioned above. The intakes (at Nemo Lake and South Whale Tail Lake) will consist of vertical filtration wells fitted with vertical turbine pumps that supply water on demand. The intakes will be connected to the pump houses with piping buried under a rockfill causeway. The intake pipe inlets will be located at the bottom of the causeways, and will be fitted with a stainless steel screen. The rockfill causeways will act as a secondary screen to prevent fish from becoming entrained in the pumps. The stainless steel screen design for the water intakes will be consistent with DFO (1995).

Freshwater will be pumped from the lakes through overland pipelines to insulated storage tanks located at the Main Camp for potable water treatment, and south of the camp for other freshwater uses. The freshwater pipelines will be high density polyethylene pipe, which will be insulated and heat traced.

Storage capacity on site will be approximately 150 m^3 for potable water and 400 m^3 for freshwater. The storage tank located at the Main Camp will provide both fire suppression water and freshwater storage prior to potable water treatment. The tank size is adequate for two hours of firefighting.

The design flow rate for the potable water for the Main Camp and accommodations (i.e., kitchen, laundry) is 84 cubic metres per day (m^3/day), based on a 350 people camp capacity, (using both the existing exploration camp and the additional 210 units), and a nominal consumption of 240 L/day/person. In total 118,625 m^3/year will be required during operations from Nemo Lake, with 241 m^3/day required for freshwater use and 84 m^3/day required for potable water use.

Effluent Water Treatment Plant (WTP)

During operations, all site contact water will ultimately flow into or be pumped to the Attenuation Pond. Actiflo Clarifier, having an approximate hydraulic capacity of 2,000 m^3/h, will be used to remove suspended solids. The Actiflo Clarifier process is based on the coagulation, flocculation, and clarification principle. Water will be treated to meet the discharge criteria and pumped to the receiving environment (Mammoth Lake) via the discharge pipeline and the submerged diffuser.

Mammoth Lake Effluent Diffuser

The Project will have only one mine effluent discharge point, where discharge water will be reintroduced to Mammoth Lake after final treatment (from the WTP). This effluent discharge will meet the MMER limits, as well as Water Licence requirements. The discharge diffuser will be conceptually similar to the diffuser for the Vault Pit discharge.

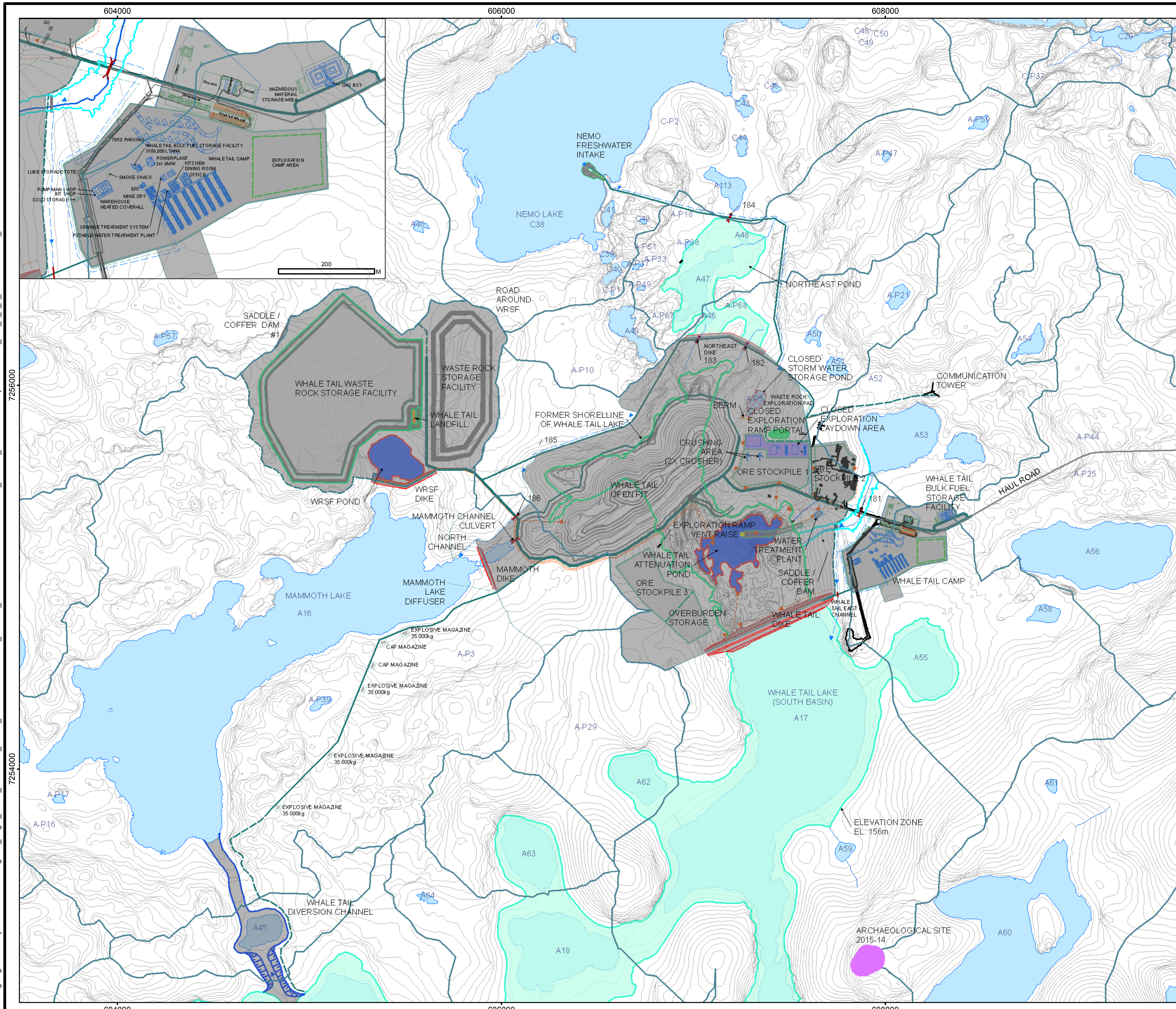
5.0 SECTION 5 • PERMANENT CLOSURE AND RECLAMATION

The area that will be disturbed during construction and operation for the proposed Project is approximately 325.1 ha (Figure 5.2-1). At closure, it is expected that the residual disturbances derived from the Project will be minimal (Figure 1.1-3).

There will be three main stages of closure at the Project. Activities that take place during each stage are:

- *Progressive Reclamation Stage* (Operating Year 1 to Year 3), during which reclamation of the WRSF through cover placement will occur progressively (Figure 1.1-1). Active care, maintenance, and monitoring will be required for the reclaimed areas of the WRSF throughout this stage.
- *Closure Stage* (Year 4 to Year 11), during which the removal of the non-essential site infrastructure and back-flooding of the dewatered area to re-establish the original water level of the Whale Tail Lake will occur (Figure 1.1-2). Active care, maintenance, and monitoring will be required for the decommissioned and remaining facilities throughout this stage.
- *Post-Closure Stage* (Year 11 onwards), will commence as closure is completed in Year 11. During this stage, continued monitoring and maintenance will be carried out at a reduced frequency, depending on the results of the monitoring and measures of success selected for closure (Figure 1.1-3).

The closure measurements for the above stages are described in detailed in the following sections.



\\golder.gds\gal\burnaby\CAD-GIS\Client\Agnico_Eagle_Mines_Ltd\Whale_Tail\99_PROJECTS\1541520_FEIS\02_PRODUCTION\FEIS\MXD\6100_Closure_Reclamation\Report\1541520_FIG_5_2_1_DISTURBANCE_FOOTPRINT.mxd

LEGEND

- ROAD
- TEMPORARY ROAD
- DIVERSION CHANNEL
- COLLECTION CHANNEL
- CULVERT
- INTAKE WATER PIPE
- CONTACT WATER PIPE
- FRESHWATER PIPE
- WATERCOURSE
- DISTURBANCE FOOTPRINT
- FINAL WHALE TAIL WASTE ROCK STORAGE FACILITY
- WHALE TAIL LAKE (SOUTH BASIN) FLOODED LIMIT (WATER LEVEL 156.0m)
- DIKE
- POND/SUMP
- ARCHAEOLOGICAL SITE
- NATURAL WATERSHED
- WATERBODY

REFERENCE

1. INFRASTRUCTURE OBTAINED FROM AGNICO EAGLE MINES LIMITED FROM 6108-600-210-002_R2(2019)s.dwg.
2. WATERCOURSE AND WATERBODY DATA OBTAINED FROM PHOTOSAT

DATUM: NAD 83 CSRS PROJECTION: UTM ZONE 14

400 0 400

METRES

PROJECT

AGNICO EAGLE MINES LIMITED: MEADOWBANK DIVISION WHALE TAIL PIT PROJECT

TITLE

PROJECT DISTURBANCE FOOTPRINT

Golder Associates

PROJECT		1541520	PHASE	6100
DESIGN	AP	27 May 2016	SCALE AS SHOWN	REV. 0
GIS	CDB/CD	05 May 2016		
CHECK	AP	1 June 2016	FIGURE 5.2-1	
REVIEW	IM/KAB	1 June 2016		

5.1 Definition of Permanent Closure and Reclamation

Permanent closure is defined as the final closure of a mine site with no foreseeable intent by the existing proponent to return to either active exploration or mining. Permanent closure indicates that the proponent intends to have no further activity on the site aside from post-closure monitoring and potential contingency actions. Permanent closure does not, however, preclude the proponent or another party from pursuing opportunities at the existing site or in the area at a time beyond the foreseeable future (MVLWB/AANDC 2013).

5.2 Permanent Closure and Reclamation Requirements

This sub-section provides the permanent closure and reclamation requirements for each individual component of the Project. The components are categorized in sub-sections for clarity. The specified closure objectives may be revised with subsequent updates to the Closure and Reclamation Plan, but are considered reasonable at this time to guide the advancement of closure planning. See the Water Management Plan and Mine Waste Rock and Tailings Management Plan, submitted as part of the Type A Water Licence Application, for additional details on the water management plan and water quality predictions, and the mine waste management plan.

See Figure 1.1-1 for Project component locations.

5.2.1 Underground Mine Workings

The proposed underground workings and two vent raises associated with the exploration are covered by another permit which is currently being processed as discussed in Section 1.0.

5.2.2 Open Pit Mine Workings

5.2.2.1 Project Component Description

The proposed Open Pit workings are described in Section 4.5.1.

5.2.2.2 Pre-Disturbance, Existing, and Final Site Conditions

The pre-disturbance site conditions are summarized in Section 3.0. Figure 5.2-2 presents an aerial photo of the proposed mine site area taken in 2015. Pre-disturbance conditions are based on baseline data collection programs carried out since 2013.

The condition of waterbodies that will be impacted by the pit mining activities are presented in the Water Management Plan submitted in support of the Type A Water Licence Amendment Application. All mining components have been located to avoid or reduce impact on the local environment to the extent possible.

The existing conditions at the pit area are the same as the pre-disturbance conditions.

At the end of operations, the proposed Whale Tail Pit is planned to extend approximately 115 m below current water level of Whale Tail Lake (152.5 m). It will have an ultimate footprint area of approximately 50 ha. The ultimate mine development of the Project is shown on Figure 1.1-1.