

EQE BAY EXPLORATION PROGRAM

Draft Inspection and Monitoring Plan
July 2018

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ABBREVIATIONS

Ege Bay Exploration Program	the project
AAQS	Ambient Air Quality Standards
AEMP	Aquatic Effects Monitoring Plan
ARD	acid rock drainage
Baffinland	Baffinland Iron Mines Corporation
CLARC	community lands and resources committee
CCME	Canadian Council of Ministers of the Environment
CO	carbon monoxide
CWS	Canada-wide Standard
DFO	Fisheries and Oceans Canada
ECCC	Environment and Climate Change Canada
EIS	environmental impact statement
EPP	Environmental Protection Plan
FEIS	Final Environmental Impact Statement
GN	Government of Nunavut
IIBA	Inuit Impact and Benefit Agreement
INAC	Indigenous and Northern Affairs Canada
IOL	Inuit-Owned Land
LOA	Letter of Advice
masl	metres above sea level
MUAR	mean annual unit runoff
ML	metal leaching
NO _x	nitrogen oxides
NPC	Nunavut Planning Commission
NTI	Nunavut Tunngavik Inc.
NU	Nunavut
NWB	Nunavut Water Board
PGA	peak ground acceleration
PM	particulate matter
pXRF	Portable X-ray Fluorescence
QA/QC	Quality Assurance / Quality Control
QIA	Qikiqtani Inuit Association
SCP	Spill Contingency Plan
SO ₂	sulphur dioxide
TEMMP	Terrestrial Environment Mitigation and Monitoring Plan
TSP	total suspended particulate
TSS	total suspended solids
VEC	valued ecosystem component

1 – INTRODUCTION

1.1 OVERVIEW

Baffinland Iron Mines Corporation (Baffinland) plans to establish an exploration camp at its Ege Bay Prospect to carry out drilling and other exploration activities over the next five years. The name of the project is the Ege Bay Exploration Program.

Exploration will be undertaken within a portion of Inuit Owned Land (IOL) Parcel IG-03 for which Baffinland holds an Exploration Agreement with Nunavut Tunngavik Inc. (NTI), and on adjacent mining claims held by Baffinland on Crown Land (Figure 2).

Baffinland plans to conduct archaeological surveys of the proposed exploration area in the summer of 2018, prior to establishing an exploration camp and conducting any work. Equipment and materials will be delivered to Ege Bay by sealift and the camp will be established in the fall of 2018. No drilling is planned in 2018.

An initial drill program will begin in the late winter or spring of 2019. Other exploration activities to be undertaken in 2019 includes detailed geological mapping, till sampling, and a backpack drill program.

The initial drill program will be supported by an approximate 50-person trailer camp and other outbuildings. The camp will be equipped with an incinerator, a potable water treatment plant, and a sewage treatment plant. Helicopters will be used to move drills and to transport workers between the drill and camp. Diesel and Jet fuel will be stored in drums within lined secondary containment areas. Workers and supplies will be delivered to the camp from either Mary River, Hall Beach or Igloolik using Twin Otter or similar aircraft. The aircraft will land at the Ege Bay exploration area either on floats on a small lake within the exploration area, or on the tundra if equipped with tundra tires.

Based on the results of the initial drill program in 2019, Baffinland may seek to expand the scale of its exploration program at Ege Bay. Over the subsequent 5 years, the exploration program may be expanded as follows:

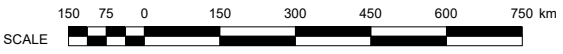
- Operate up to nine (9) drills
- Expand the initial camp to 100-persons
- Implement bulk fuel storage using double-walled tanks
- Source construction materials from one or two quarries
- Construct access trails to connect the camp to exploration areas to reduce helicopter use
- Construct a small airstrip to improve air access to the site

At the conclusion of the exploration program, a closure and reclamation plan will be followed to remove all equipment and materials from the site and restore the area to the extent practical.

1.2 REGULATORY CONTEXT

This plan has been prepared prior to Baffinland receiving the following permits:

- **Inuit Land Use Licence** - Baffinland will apply to the Qikiqtani Inuit Association (QIA) for an Inuit Land Use Licence to secure surface land rights within the exploration area. Quarry Concession Agreements will be sought from the QIA when Baffinland plans to proceed with that activity.
- **Type B Water licence** - Baffinland will also apply to the Nunavut Water Board (NWB) for a Type B Water Licence to address water use and waste disposal requirements associated with the exploration program. Baffinland currently holds Type A Water Licence 2AM-MRY1325 and Type B Water Licence 2BE-MRY1421 for its other exploration activities.



LEGEND

- COMMUNITY
- EQE BAY EXPLORATION AREA
- NUNAVUT SETTLEMENT AREA
- NORTH BAFFIN PLANNING REGION
- SIRMILIK NATIONAL PARK
- IOL SURFACE AND SUBSURFACE INCLUDING MINERALS
- IOL SURFACE ONLY EXCLUDING MINERALS

NOTES

1. BASE MAP: © ESRI DATA AND MAPS (ONLINE) (2016). REDLANDS, CA: ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE. ALL RIGHTS RESERVED.
2. NORTH BAFFIN PLANNING BOUNDARY FROM NUNAVUT PLANNING COMMISSION (2017).
3. IOL SURFACE AND SUBSURFACE INCLUDING MINERALS - MAPPING OF IOL SURFACE AND SUBSURFACE INCLUDING MINERALS (2017).
4. IOL SURFACE ONLY EXCLUDING MINERALS - MAPPING OF IOL SURFACE ONLY EXCLUDING MINERALS (2017).



EQE BAY EXPLORATION PROGRAM

PROJECT LOCATION MAP
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PIA NO. NB102-181/46	REF NO. NB18-00244
FIGURE 1	
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- **Letter(s) of Advice** - Baffinland will consult with Fisheries and Oceans Canada (DFO) regarding two culverts that are planned for installation within streams assumed to be fish habitat, as well as a proposed barge ramp; it is expected that formal approval will not be required and that DFO will issue a Letter of Advice (LOA) to Baffinland, or refer Baffinland to LOAs already issued to the company.

The preparation of the plan is based upon Baffinland's judgement and experience with permit requirements under other projects. Once the permits have been obtained the plan will be updated to ensure it meets all requirements set forth in the applicable permits.

1.3 APPLICABLE MANAGEMENT PLANS

Two management plans have been developed specific to the Ege Bay Exploration Program:

- Draft Ege Bay Spill Contingency Plan (Baffinland, 2018b)
- Draft Ege Bay Environmental Protection Plan (Baffinland, 2018c)

These plans will be submitted to the NWB as part of the application for a Type B Water Licence.

DRAFT

2 – INSPECTION PLAN

Baffinland will conduct regular inspections of its facilities and operations to ensure adherence to internal procedures, permit requirements and applicable legislation. A number of documents provide activity-specific instructions or procedures and/or guidance on recommended inspections:

- Environmental Protection Plan (EPP; Baffinland, 2016b) – The EPP contains Operational Environmental Standards (OES) that provide procedures and other guidance, inspection checklists and inspection forms.
- Other sources of this information include vendor operation and maintenance manuals management plans listed in Section 1.3 may also provide this information.

Table 1 identifies the facilities and activities to be inspected, the relevant procedures or OES and proposed frequency of inspection.

Table 1 Proposed Inspection Schedule

Facility/Activity	Inspection Details	Guidance ¹	Frequency
Earthworks (i.e., quarrying, road and airstrip construction)	Inspect earthworks operations for compliance with	OES 3.11 Active Migratory Bird Nest Search Form OES 2.3 Land disturbance OES 2.9 Sediment and Erosion Control OES 2.17 Road Construction and Borrow Development	Prior to ground disturbance activities (nest survey); weekly
Quarries	Inspect quarry operations relative to various OES and quarry-specific management plan(s) to be developed.	Earthworks OESs listed above OES 2.20 Drilling, Blasting and Crushing OES 2.25 Quarry and Borrow Pit Operation Quarry-specific management plan (to be developed)	Weekly
Fuel storage and handling	Inspect for damage, leaks and spills	OES 2.7 Fuel Storage and Handling	Daily or as recommended by Environmental staff based on risk
Waste management	Confirm proper waste management practices	OES 2.14 Solid Waste Management OES 3.12 Off-site Waste Disposal Log	Weekly; prior to waste shipments by sealift
Incinerator	Confirm operating properly: system temperature, capacity (waste inflow type and quantity), or as recommended by vendor.	OES 2.14 Solid Waste Management Vendor Operation and Maintenance Manual (forthcoming)	As recommended by vendor
Hazardous materials containment area	Conduct a sight inspection of containment areas.	OES 2.16 Hazardous Material and Hazardous Waste Management	Daily
Sewage treatment plant	Confirm operating properly	OES 2.15 Wastewater Treatment Vendor Operation and Maintenance Manual (forthcoming)	As recommended by vendor

Water treatment plant	Confirm operating properly	Vendor Operation and Maintenance Manual (forthcoming)	As recommended by vendor
Greywater sump	Inspect greywater sump is working properly	OES 2.3 Ground Disturbance	Before construction; weekly
Exploration drilling	Confirm proper drill operation, cuttings disposal and water use	OES 2.4 Water Use OES 2.21 Exploration Drilling Operations OES 3.5 Drill Inspection Forms	Weekly
Spills	Spills will be reported to the NWT/NU Spill Line, and will be documented and monitored in accordance with the Spill Contingency Plan(Baffinland, 2018b).	OES 2.33 Spill Control Measures and Reporting OES 3.6 NT-NU Spill Report Forms Spill Contingency Plan (Baffinland, 2018b)	When a spill occurs
Polar bear protection	Confirm protection measures (bear monitors and/or electric fence) are in place	OES 2.10 Polar Bear Encounters OES 3.9 Polar Bear Readiness Audit Form	Before camp occupancy; weekly
Prevention of attracting wildlife	Confirm wildlife attractants are not present.	OES 2.11 Fox and Wolf Encounters	Before camp occupancy; weekly

NOTE:

1. Numbered items without references are Operational Environmental Standards (OES) from the Environmental Protection Plan (Baffinland, 2016b).

General compliance inspections will be conducted in accordance with OES 2.32 Compliance Inspections. This OES states that the frequency of inspections should be determined by environmental site staff based on potential risk of an incident. The frequency of general compliance inspections will be based upon the proposed frequency of inspections identified in Table 1, which will be reviewed by environmental staff once the exploration program is underway.

All compliance inspections will be documented using OES 3.16 Environmental Inspection Forms.

3 – MONITORING PLAN

3.1 PROJECT ACTIVITIES TO MONITOR

Baffinland will conduct monitoring of the following activities and facilities as part of their requirements under the water licence. Proposed monitoring at the Ege Bay Exploration Program is summarized in Table 2.

Table 2 Activities Requiring Environmental Monitoring

Facility/Activity	Proposed Monitoring	Guidance ¹
Camp Water Supply	Water sampling to ensure compliance with applicable drinking water standards. Record daily volumes of water extracted.	OES 2.4 Water Use
Exploration Drilling	Record daily volumes of water extracted.	OES 2.4 Water Use OES 2.21 Exploration Drilling Operations
Sewage Treatment Plant	Effluent volume and quality. Record daily volumes of sewage discharged.	OES 2.15 Wastewater Treatment OES 3.13 Wastewater Log
Incinerator	Monitor operational parameters including temperature and capacity. Test bottom ash to determine if hazardous waste.	Incinerator Operation Procedure, in Waste Management Plan (Baffinland, 2018a)
Containment Water	Containment water will be tested prior to discharge to land.	OES 2.7 Fuel Storage and Handling
Quarries	Geochemical testing prior to development, as described in Baffinland’s Borrow Pit and Quarry Management Plan (Baffinland, 2014). Runoff water quality testing during development.	Borrow Pit and Quarry Management Plan (Baffinland, 2014)
Culvert installations	Environmental monitoring during construction to ensure conformance with culvert design and any applicable Letter of Advice (LOA) from Fisheries and Oceans Canada (DFO); water sampling turbidity levels upstream and downstream of the crossing under construction.	Culvert Design Memo (Knight Piesold, 2018) OES 3.14 Watercourse Crossing Data Monitoring Form OES 3.15 Turbidity Monitoring Data Form Future DFO Letter of Advice (may prompt updates to the OES listed above).
Spills	Spills will be reported to the NWT/NU Spill Line, and will be documented and monitored in accordance with the Spill Contingency Plan(Baffinland, 2018b).	OES 2.33 Spill Control Measures and Reporting OES 3.6 NT-NU Spill Report Forms Ege Bay Spill Contingency Plan (Baffinland, 2018b)
Wildlife	Wildlife sightings will be recorded in a Wildlife Log.	OES 2.23 Wildlife Log Instructions OES 3.10 Wildlife Log
Visitors	Visitors will be asked to sign-in upon arrival at site. Observed land users will be recorded in the Visitor / Land Use Log.	OES 3.2 Human Use Log

NOTE:

2. Numbered items without references are Operational Environmental Standards (OES) from the Environmental Protection Plan (Baffinland, 2016b).

Monitoring of water volumes and water/effluent quality are described in Sections 3.2 and 3.3, respectively.

3.2 WATER USE MONITORING

Baffinland will record daily water use as outlined in Table 3.

Table 3 Water Use Monitoring

Station Identification	Station Name / Location	Frequency	Parameters
Eqe-LakeEB-1	Water Supply Lake EB-1	Daily	Volume (m ³)
Eqe-LakeEB-2 ¹	Water Supply Lake EB-2		
Eqe-Pond-1 ¹	Water Supply Pond 1		
Eqe-Pond-2 ¹	Water Supply Pond 2		
Eqe-STP-1	Sewage Treatment Plant – Final Effluent Discharge		

NOTE:

3. Water consumption will be recorded by drill rig water supply pump; but will be collated by source.

Water use will be recorded using in-line flow monitors. In the absence of an in-line flow monitor, the maximum pumping rate will be used.

3.3 WATER QUALITY MONITORING

Baffinland will undertake water quality monitoring to ensure it complies with all discharge limits. Table 4 details the proposed locations and frequency of water quality monitoring, as well as the parameters to be tested.

Figure 3 shows the proposed site layout. This figure will be updated to show the actual layout in an update to this plan, once the exploration program is underway.

The NWB requires monthly and annual reporting of water quality and effluent monitoring under Type B Water Licences.

Water volumes and water/effluent sampling must be reported monthly. Monthly reports must be submitted by the last day of the month following (i.e., the monthly report for January is due by the end of February).

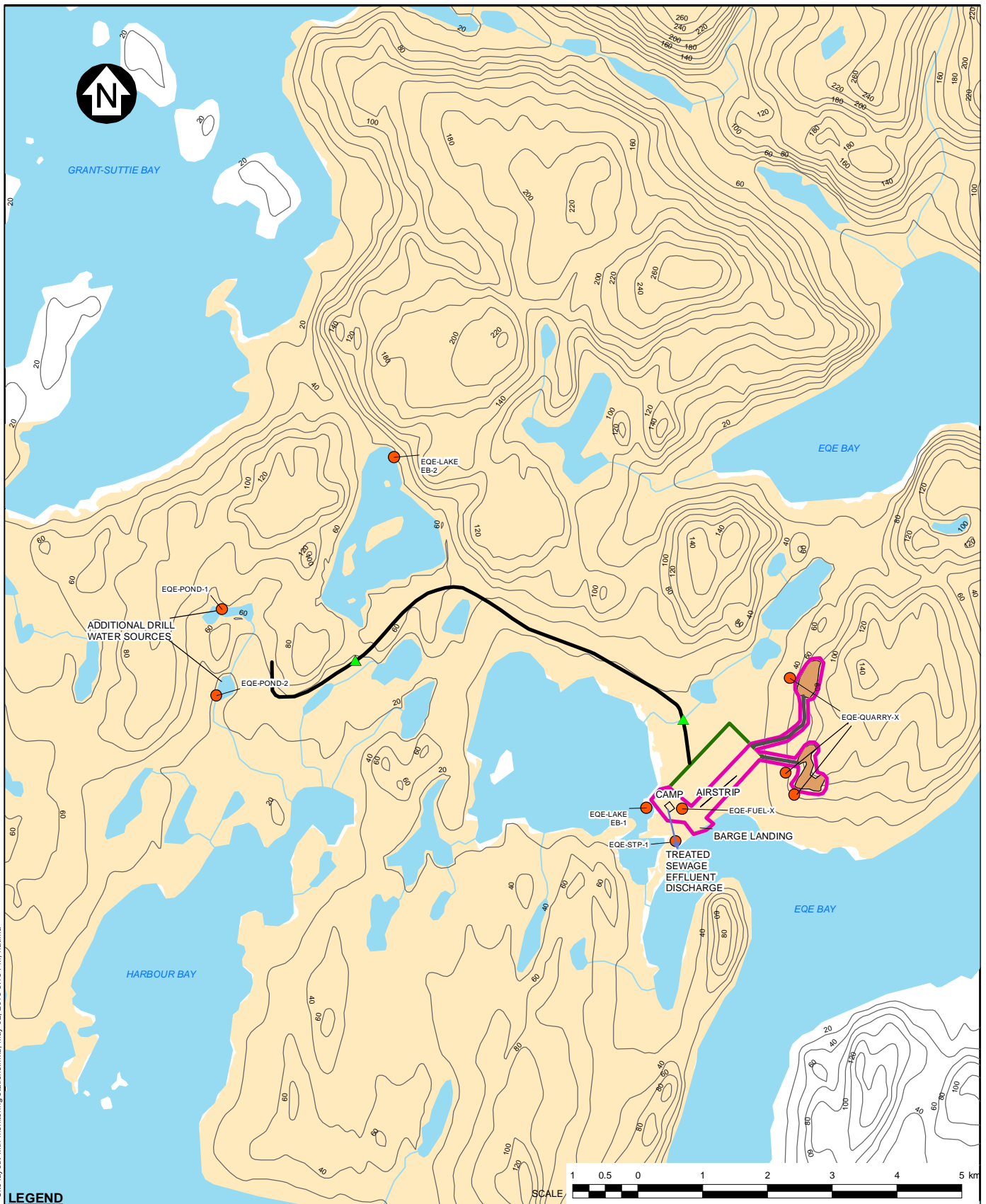
The contents of Annual reports are required by March 31 of the following year.

Table 4 Proposed Water Quality and Effluent Monitoring Program

Station Identification	Station Name / Location	Parameters	Frequency
Eqe-LakeEB-1	Water Supply Lake EB-1	Parameters in the Canadian Drinking Water Guidelines (Health Canada, 2017)	Once
Eqe-STP-1	Sewage Treatment Plant – Final Effluent Discharge	Volume of sewage discharged	Daily
		Biological Oxygen Demand (BOD ₅) pH Total Suspended Solids (TSS) Faecal Coliform Oil and Grease Ammonia-Nitrogen Total Kjeldahl Nitrogen (TKN) Total Phosphorous	Monthly
		Acute lethality to Rainbow Trout; acute lethality to <i>Daphnia magna</i> ²	Annually
Eqe-Quarry-X ¹	Runoff from quarry(s)	TSS Oil and Grease Ammonia Nitrate pH Conductivity Demonstrate to be non-acutely toxic	Monthly during summer
EQE-Fuel-X ¹	Fuel and hazardous waste containment berms	Benzene Toluene Ethylbenzene Lead Oil and Grease	Prior to discharge

NOTE:

4. "X" in the sampling station identification refers to possible multiple sampling stations.
5. Acute lethality determined by reference methods published by Environment Canada (2016a,b)



LEGEND

- CULVERTS
- PROPOSED MONITORING STATION
- CONTOURS
- PROPOSED ACCESS ROAD/TRAIL
- QUARRY ACCESS ROAD
- WATER
- POTENTIAL QUARRY
- POTENTIAL DEVELOPMENT AREA
- INITIAL EXPLORATION AREA
- CAMP LAND USE FOOTPRINT
- NTI EXPLORATION AGREEMENT SUB-AREA

NOTES:

- COORDINATE GRID IS IN METRES.
COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N.
- CONTOUR INTERVAL IS 20 METRES.
- LOCATIONS AND SIZING OF PROJECT FACILITIES IS APPROXIMATE ONLY.

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EQE BAY EXPLORATION PROGRAM

**PROPOSED EXPLORATION AREA LAYOUT
SHOWING MONITORING STATIONS**

<i>Knight Piésold</i> CONSULTING		P/A NO. NB102-181/46	REF NO. NB18-00255
FIGURE 3		REV 0	

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3.4 RESPONSIBILITIES

During construction of the camp, Baffinland will mobilize environmental staff from its Mary River Project operations to conduct the requisite inspections and monitoring. Dedicated environmental staff will be established at the camp during regular operation. Baffinland ensures that its environmental department staff are appropriately qualified to complete the work assigned, with training provided as required. The positions and corresponding responsibilities of environmental department staff are described in Section 3.1 of the *Sampling Program – Quality Assurance and Quality Control Plan* (Sampling QA/QC Plan; Baffinland, 2016e).

3.5 SAMPLING PROCEDURES

Baffinland's Sampling QA/QC Plan (Baffinland, 2016e) provides guidance on the following:

- Sampling of water, sediment and benthic invertebrates
- Handling, storage and shipment of samples
- Laboratory accreditation, analytical methods, method detection limits and laboratory QA/QC procedures
- Data management and reporting

The Sampling QA/QC Plan will be followed at the Ege Bay Exploration Program when undertaking sampling of water and waste discharges.

3.6 LABORATORY TESTING

Laboratory testing of water, waste and effluent samples collected at the Ege Bay Exploration Program will be conducted by ALS Canada Ltd. (ALS). Most analyses will be conducted at the ALS Environmental Laboratory in Waterloo, Ontario. Contact details are available at: <https://www.alsglobal.com/ca/locations/americas/north-america/canada/ontario/waterloo-environmental>.

Details on the lab's accreditation are available in Appendix C of the Sampling QA/QC Plan. The latest accreditation details are maintained on the Waterloo Laboratory's webpage referenced above.

ALS also operates an accredited analytical laboratory at the Mary River Project's mine site. The Mary River laboratory conducts analyses of a basic set of analytical parameters such as pH, total suspended solids, turbidity, etc.). While sampling is conducted by Mary River Project staff, samples may be brought back to the Mary River laboratory for on-site testing or for storage and shipment to the Waterloo laboratory.

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- Baffinland Iron Mines Corporation (Baffinland), 2016c. *Terrestrial Environment Mitigation and Monitoring Plan*. Ref. No. BAF-PH1-830-P16-0027, Rev. 1, March 14.
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