



Baffinland Iron Mines Corporation

BIM-5200-PLA-0004 SAMPLING PROGRAM- QUALITY ASSURANCE AND QUALITY CONTROL PLAN

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 1 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
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BAFFINLAND IRON MINES MANAGEMENT PLAN
BIM-5200-PLA-0004 SAMPLING PROGRAM- QUALITY ASSURANCE AND
QUALITY CONTROL PLAN

DOCUMENT REVISION RECORD

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TRACK CHANGES TABLE
Index of Major Changes/Modifications in Revision 7

Item No.	Description of Change	Relevant Section
1	Edited COC information to match EQUIS COC's not ALS COC's	8.3 COC and Appendix A

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 2 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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TABLE OF CONTENTS

1. PURPOSE	5
2. APPLICATION	5
2.1 Regulatory Requirements	5
2.2 Relationships to Other Management Plans & Policies	5
3. DEFINITIONS AND ABBREVIATIONS	6
3.1 Abbreviations	6
3.2 Definitions	6
4. WATER SAMPLE COLLECTION	7
4.1 General	7
4.2 Water Quality Monitoring Locations	7
4.3 Water Sampling Methods and Equipment	8
5. SEDIMENT AND SOIL SAMPLE COLLECTION	13
5.1 Sediment and Soil Monitoring Locations	13
5.2 Sediment and Soil Sampling Methods and Equipment	13
6. BENTHIC INVERTEBRATES SAMPLE COLLECTION.....	16
6.1 Benthic Invertebrate Monitoring Locations	16
6.2 Benthic Invertebrate Sampling Methods and Equipment	16
7. QAQC.....	17
7.1 Sampling Programs with Multiple Sampling Stations	17
7.2 Sampling Programs with Limited Sampling Stations.....	17
7.3 QAQC Data Analysis	17
8. SAMPLE MANAGEMENT.....	19
8.1 Sample Labelling	19
8.2 Sample Storage and Handling	20
8.3 Sample Submission and COC.....	20

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 3 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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8.4 Sample Shipments..... 21

9. **LABORATORY ANALYSIS** 22

9.1 Laboratory Accreditation 22

9.2 Analytical Detection Limits 22

9.3 Laboratory Analytical Methods..... 22

9.4 Analytical Laboratory QAQC Procedures 22

10. **DATA MANAGEMENT**..... 23

11. **RESPONSIBILITIES**..... 23

12. **PRE-REQUISITE COMPETENCY SKILLS** 24

13. **RELATED DOCUMENTS** 25

TABLE OF FIGURES

N/A

TABLE OF TABLES

Table 1 QAQC Sample Types – Purpose, Description and Frequency 18

TABLE OF APPENDICES

Appendix A COC Example 27

Appendix B Analytical Laboratory Certificate and SScope of Accreditation..... 29

Appendix C Laboratory Analytical Methods..... 31

Appendix D Analytical Laboratory Quality Control Protocols..... 32

Appendix E ALS Sample Collection Guide for Sample Volumes, Preservatives and HOld Times..... 33

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 4 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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1. PURPOSE

As required by Baffinland Iron Mines Corporation’s (Baffinland) Type ‘A’ Water Licence No. 2AM-MRY1325 – Amendment No. 1 (Type ‘A’ Water Licence), issued by the Nunavut Water Board (NWB), the Sampling Program – Quality Assurance and Quality Control Plan (QAQC Plan) is updated to reflect current operations at the Mary River Project (the Project).

The purpose of this Plan is to identify Baffinland’s framework for accurate and effective QAQC management by providing instruction for standardized field sampling and laboratory analytical procedures. The QAQC best practices outlined in this management plan are designed to provide guidance to field staff and analytical laboratories in order to maintain a high level of confidence in the water quality, soil, and benthic data generated from Project Sites.

2. APPLICATION

In accordance with the Type ‘A’ Water Licence, this QAQC Plan has been prepared following the general recommendations presented in *Quality Assurance (QA) and Quality Control (QC) Guidelines for use by Class “A” Licensees in Meeting SNP Requirements and for Submission of a QAQC Plan* (INAC, 1996).

This Plan will be revised, as required, based on changes to operations, QAQC procedures and protocols, and feedback received from relevant stakeholders. Updates to this Plan will be completed in accordance with the Project’s water licences issued by the NWB, Commercial Lease – Q13C301 (Commercial Lease) between Baffinland and the QIA, the Project Certificate No. 005 (Project Certificate) issued by the Nunavut Impact Review Board (NIRB), applicable regulations (e.g. Metal & Diamond Mining Effluent Regulations; MDMER), and any subsequent requirements which may be issued.

2.1 REGULATORY REQUIREMENTS

This Plan is regulated by the NWB and is subject to Baffinland’s Type ‘A’ Water Licence 2AM-MRY1325, as amended, which provides specific terms and conditions for the management of QAQC for the Project’s water quality monitoring programs. To provide a more comprehensive QAQC framework for the Project’s aquatic ecosystem monitoring programs, other applicable requirements have been included in this Plan, such as the MDMER, sediment quality, and benthic invertebrate monitoring components of the Project’s Aquatic Effects Monitoring Plan (AEMP).

2.2 RELATIONSHIPS TO OTHER MANAGEMENT PLANS & POLICIES

This Plan is intended for use in conjunction with the following Plans:

- Aquatic Effects Monitoring Plan (BIM-5200-PLA-0023)
- Environmental Protection Plan (BIM-5200-PLA-0003)
- Fresh Water Supply, Sewage and Wastewater Management Plan (BIM-5200-PLA-0022)

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 5 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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- Surface Water and Aquatic Ecosystem Management Plan (BIM-5200-PLA-0009)
- Roads Management Plan (BIM-5200-PLA-0027)
- Snow Management Plan (BIM-5200-PLA-0006)

Baffinland’s Health, Safety and Environment Policy (BAF-PH1-800-POL-0001) is the company’s commitment to achieve a safe, health and environmentally responsible workplace.

Baffinland’s Sustainable Development Policy (BAF-PH1-800-POL-0002) identifies the company’s commitment internally and to the public to operate in a manner that is environmentally responsible, safe, fiscally responsible and respectful of the cultural values and legal rights of the Inuit.

All employees and contractors are expected to comply with the contents of both policies.

3. DEFINITIONS AND ABBREVIATIONS

3.1 ABBREVIATIONS

Statement	Definition
AEMP	Aquatic Effects Monitoring Plan
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
COC	Chain of Custody
DQO	Data Quality Objective
ECCC	Environment and Climate Change Canada
EEM	Environmental Effects Monitoring
EQiS	Environmental Quality Information System
FDP	Final Discharge Point
GEVP	Group Executive Vice President
LOR	Limits of Reporting
MDL	Method Detection Limit
MDMER	Metal & Diamond Mining Effluent Regulations
NIRB	Nunavut Impact Review Board
NWB	Nunavut Water Board
QAQC	Quality Assurance and Quality Control
RPD	Relative Percent Difference
SNP	Surveillance Network Program
SWAEMP	Surface Water and Aquatic Ecosystem Management Plan
WWTP	Water/ Wastewater Treatment Plan

3.2 DEFINITIONS

Statement	Definition
EQiS	An Earthsoft Product, EQiS is an advanced environmental data management system that supposed task management, field data collection, analytical data

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 6 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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Statement	Definition
	checking, data verification and validation, reporting, graphics, and visualization.
FDP	The FDP is a designated sampling port in a location beyond which Baffinland does not have control over the quality of the effluent discharged to the environment, and coordinates of this FDP are registered with ECCC. Samples taken from designated sampling ports can be composite samples or grab samples.
Quality Assurance	System of activities used to achieve quality control.
Quality Control	Set of best practice methods and procedures used to ensure quality of data in terms of precision, accuracy, and reliability.
sys_sample_code	The EQulS terminology for the Sample ID Code; a unique identifier assigned to every sample collected. It is typically a concatenation of the sample location [sys_loc_code] and the sample date.

4. WATER SAMPLE COLLECTION

4.1 GENERAL

The samples will be collected following the general recommendations presented in *Quality Assurance (QA) and Quality Control (QC) Guidelines for use by Class “A” Licensees in Meeting SNP Requirements and for Submission of a QAQC Plan* (INAC, 1996).

A summary of recommended water sample containers, sample volumes, sample preservatives and maximum sample holding times is presented in Appendix E. Laboratory parameters such as pH, turbidity, BOD, nitrite, nitrate, total phosphorus, faecal coliforms, chlorophyll-a and pheophytin typically have maximum sample storage times varying from four (4) to 72 hours.

Required water sample analyses for each of the Project’s water quality monitoring stations are documented in the following documents:

- NWB Type ‘A’ Water Licence 2AM-MRY1325, as amended
- MDMER
- AEMP (BIM-5200-PLA-0023)

4.2 WATER QUALITY MONITORING LOCATIONS

This Plan addresses the collection of water quality samples at the Project, including the following:

- Surface water samples from Project area lakes, streams and rivers.
- Groundwater samples from piezometer monitoring wells.
- Effluent samples from Project water treatment facilities (e.g. sewage, oily water, etc.).
- Drinking water samples from camp potable water sources.
- Storm water runoff samples from ore processing and stockpiling facilities.

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 7 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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- Storm water runoff samples from waste rock management facilities.
- Storm water runoff samples from mining areas (e.g. Deposit No. 1).
- Storm water samples from Project fuel and waste containment areas.
- Storm water from sumps at maintenance shops.
- Surface water samples downstream of Project areas (e.g. landfills, quarries, etc.).
- Surface water samples representative of general site drainage before, during and after construction at Project areas.
- Snowmelt runoff samples from snow management stockpiles.
- Surface water samples from ponded borrow pit areas.
- Surface water samples from ponded sources for reclaimed and/or recycled water.
- Surface water samples from water bodies affected by spills.

Locations and sampling frequency for designated water quality monitoring stations are presented in the:

- NWB Type 'A' Water Licence 2AM-MRY1325, as amended
- SWAEMP (BIM-5200-PLA-0009)
- AEMP (BIM-5200-PLA-0023)
- Roads Management Plan (BIM-5200-PLA-0027)
- Snow Management Plan (BIM-5200-PLA-0006)
- Fresh Water Supply, Sewage and Wastewater Management Plan (BIM-5200-PLA-0022)

4.3 WATER SAMPLING METHODS AND EQUIPMENT

4.3.1 General Sampling Procedures

General water sampling procedures include the following QAQC measures. For water sampling procedural details, refer to the Water Sampling Procedure (BIM-5200-SOP-0017).

1. Sampler will wear a fresh pair of disposable nitrile gloves for each sampling event.
2. A new sample bottle(s) will be used at each monitoring station. Sample bottles will not be re-used.
3. Sampling will be carried out by one of the following steps:
 - a. Rinsing the sample bottle with source water three (3) times before immersing the sample bottle to fill it (after which preservative is added, as required).
 - b. If the sample bottles are provided pre-charged with preservatives then it is generally convenient to transfer water sampled from the source to pre-charged sample bottles using a large transfer bottle. The transfer bottle will be provided by the lab and will be rinsed in the source water three (3) times before filling the sample bottles. Different transfer bottles will be used for different sample types (e.g. sewage effluent, hydrocarbon-impacted stormwater) and will be replaced on a regular basis.

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 8 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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4. Rinse water will be disposed of so that it does not contaminate the source water where the sample will be collected (e.g. downstream of the sampling location or on the shore or berm edge).
5. Bottles labeled as “certified sterile” do not need to be rinsed.
6. For samples requiring preservatives, the sample bottle will be filled to the top (or to the indicator line marked on the bottle), the preservative will be added and the bottle securely sealed. For some volatile compounds, including BTEX, the sample bottle must be filled with zero headspace.
7. Care will be taken to avoid disturbance of sediments and inclusion of disturbed suspended solids in the sample.
8. Sample details (e.g. date, time, sample ID [sys_sample_code] and analyses) will be clearly marked on the bottle in permanent ink.
9. For dissolved metals analyses, the water sample will be filtered in the field while sampling using a 0.45µm disposable filter and syringe. A fresh syringe and filter must be used at each monitoring station. In the event that the sample cannot be filtered in the field, the sample will be promptly filtered at the on-site lab. Such exceptions will be documented in the field notes.
10. All samples will be sealed by ensuring the bottle caps are tightly secured before placing the bottles into a cooler that contains ice packs. Glass bottles will be protected with bubble wrap or other cushioning material.
11. All field parameters, notes, photo references and general observations will be recorded in a field notebook or tablet to be uploaded to Baffinland’s environmental database.
12. All samples will be placed in an iced cooler or refrigerator as soon as possible after collection.

4.3.1.1 SAMPLE PRESERVATION

Sample bottles and preservatives will be stored under clean conditions on site. Sample bottles will have the appropriate volume of preservative added in the field immediately after sample collection to minimize chemical alterations. Alternatively, sample bottles will be supplied by the analytical laboratory with preservatives already added. Ensure that the preservative container does not come in contact with the sample or inside of the sample bottle/lid. If a water sample requires filtration (e.g., analysis of dissolved metals), preservative must be added following filtration.

4.3.2 Lake Sampling

Lake water sampling procedures include the following QAQC measures. For lake water sampling procedural details, refer to the AEMP Sampling Procedure (BIM-5200-SOP-0010).

1. Depth samplers that are used will be suitable for collection of water samples for ultra-low metals analyses (e.g. have acrylic or PVC construction and silicone seals).

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 9 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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Generally, depth samplers consist of a clear polycarbonate sample tube with two spring mounted rubber bungs, one located at each end.

2. Sampling station locations will be dependent upon the monitoring program objectives and the lake dimensions. When sampling from a watercraft, all efforts will be made to anchor the boat to maintain its position over the sampling location. Map coordinates for lake sampling stations will be recorded using a handheld GPS unit.
3. A vertical stratification profile (if required), profiling in-situ water quality measurements (e.g. pH, temperature, dissolved oxygen, conductivity and turbidity), will be determined using a water quality multi-meter (e.g. YSI Sonde) equipped with a long cord with metre intervals marked on it.
4. Depending upon the purpose of the monitoring program, water quality samples may be collected from the different stratified layers. The depth sampler must be slowly lowered in the 'open' position until it reaches the required depth.
5. The depth sampler will be held at this depth temporarily to allow flushing of water inside the apparatus.
6. When collecting samples close to the lakebed, care must be taken to ensure that the depth sampler does not disturb lakebed sediments. When possible, staff will reference the depth recorded at each sampling location from the previous sampling event in preparation to avoid disturbing the lakebed.
7. YSI measurements will be collected after the water samples, to ensure the lakebed is not disturbed during field readings prior to water quality samples having been collected.
8. Depending upon the surface area and depth of a lake, multiple sampling stations will likely be required to characterize representative water quality for the lake.

4.3.3 River Sampling

River and stream water sampling procedures include the following QAQC measures in addition to those in Sections 4.3.1 and 4.3.2. For water sampling procedural details, refer to the Water Sampling Procedure (BIM-5200-SOP-0017).

1. When selecting water quality monitoring station locations on rivers, care will be taken where a tributary joins a river, since complete mixing of the two waters may not be occur within several hundred metres or farther downstream of the confluence. When in doubt, vertical profile monitoring across the cross-section of the river using a field parameter such as pH, temperature or conductivity will be used to assess if complete mixing has occurred.
2. Grasp the bottle well below the neck and remove the lid, taking care not to touch the inside of the lid.
3. Facing upstream, plunge the bottle beneath the surface of the water to a depth of 20 cm (if possible) with the opening facing downward, then tilt the bottle opening upward into the current to fill.

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 10 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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4. To avoid inclusion of floating detritus in the sample, sample bottles must be fully immersed in the water column when they are filled. Care will be taken to ensure that disturbed sediments are not included in the sample.
5. Once the bottle is full, remove the bottle from the water in one motion by forcing the opening upward and into the current and seal the bottle cap securely.

4.3.4 Groundwater Sampling

Groundwater at the Project will be monitored using drive-point piezometers, HDPE tubing and peristaltic pumps. Groundwater wells will be established by advancing drive-point piezometers by hand to the depth of refusal (e.g. permafrost) or other known confining layer, both in the known or assumed up-gradient (e.g. reference) and down-gradient (e.g. exposure) area of interest. Consideration must be given to the depth of the active layer, therefore groundwater samples will be collected during late August to early September, such that samples are near the depth of the active layer (approximately 1 to 2 metres). Where hydrocarbon impacts are known or suspected and if conditions allow, samples will be collected across various depths to assess for the presence of, and capture, potential non-aqueous phase liquids (NAPL). Sampling procedures outlined in this section consider the shallow and discontinuous nature of high arctic groundwater regimes observed at the Project Sites.

General groundwater sampling procedures include the following:

1. When new piezometers/groundwater wells are installed, installation will be completed with sufficient time for the well to charge and fill with groundwater from the active layer prior to sampling.
2. Before sampling a well, the well will be purged for the appropriate volume, outlined in the sampling program documentation. A YSI flow cell or similar alternative will be used during the purge to gauge when parameters (e.g. pH, conductivity, turbidity) have stabilized.
3. Groundwater samples will be collected, preserved, stored and submitted for analysis as outlined in Section 4.3.1.
4. A field notebook or tablet will be used to document the groundwater sampling program, including any deviations from established protocols, that will be uploaded to Baffinland’s environmental database.

4.3.5 MDMER

Water samples from stations that fall under the MDMER must be taken from the defined FDP for that appropriate facility.

The general sampling procedures of Section 4.3.1 must be followed, and the following additional considerations will be taken into account to ensure MDMER QAQC requirements are met:

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 11 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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1. MDMER sampling should be performed by trained personnel, and if possible, a second person should be present for verification purposes.
2. Notification must be given ahead of time to a certified laboratory to ensure MDMER acute lethality and sub-lethal toxicity samples can be analysed.
3. In-situ water quality monitoring will accompany all external samples taken (refer to Section 4.3.6)
4. All sampling activities, notes, flow volumes, photo references and general observations shall be kept in a dedicated MDMER field logbook and/or tablet, and will be uploaded to Baffinland’s environmental database.
5. MDMER samples shall be sent to the certified laboratory with their own COC and should not be combined with samples from other monitoring programs.

For more information and technical guidance, ECCC’s 2001 *Guidance Document for the Sampling and Analysis of Metal Mining Effluents* should be consulted.

4.3.6 Sampling for Toxicity Testing

Sampling for lethal toxicity is a condition of the Type ‘A’ Water Licence for various monitoring programs. Sub-lethal toxicity testing is a condition of EEM under the MDMER. Depending upon the objectives of the toxicity testing, variables that will require confirmation prior to testing include the following:

- Type of effluent sample to be collected (e.g. instantaneous grab sample vs. composite sample).
- Type of dilution water to be used by the certified laboratory (e.g. standard synthetic laboratory dilution water, receiving water collected upstream of the discharge, etc.).
- Required test organism (e.g. *Daphnia magna* and/or Rainbow Trout).

Details concerning laboratory methods are presented in Appendix C. For further details concerning acute lethality testing, refer to Environment Canada (2002) and USEPA (2002). For further details concerning sub-lethal testing, refer to Environment Canada (2012).

4.3.7 In-Situ Water Quality

Measurement of field parameters (e.g. temperature, pH, conductivity, redox potential, or dissolved oxygen, etc.), where warranted, will be carried out for each sample at the time of sampling. The required set of field parameters will vary according to sample type and monitoring objectives. The exact methods used for monitoring field parameters will depend upon the type of monitoring probes being used. Environmental staff will read and be familiar with the instruction manual and/or procedure for the equipment being used on site, and follow manufacturer’s instructions for specifics on proper calibration, use, storage, and maintenance.

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 12 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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Environmental staff will rinse the monitoring probe three (3) times with the water to be monitored before immersing the probe in the water. When possible, the probe is to be immersed directly in the stream or lake water. Environmental staff will ensure that the probe being used has had sufficient time to equilibrate in the water and the reading has stabilized before the reading is taken.

Field parameter data will be recorded in the appropriate program field form or tablet designed for this purpose and saved in Baffinland’s environmental database.

4.3.7.1 MONITORING PROBE CALIBRATION

Monitoring probes will be stored and calibrated in accordance with manufacturers’ instructions. All probes will be calibrated regularly per sampling program requirements and a written record of the calibration results will be maintained on site. Environmental staff will ensure that calibration solutions are of the correct specification and that they have not passed their expiration date (if applicable). Monitoring probes will be stored as per manufacturers’ recommendations.

5. SEDIMENT AND SOIL SAMPLE COLLECTION

Sediment and soil sampling programs and associated logistics will be planned ahead of time to ensure samples collected are analyzed within the appropriate holding times. A summary of recommended sediment and soil sample containers, sample volumes, and maximum sample holding times is presented in Appendix E. Field observations and any exceptions to established protocols (e.g. exceedance of holding time) will be documented.

5.1 SEDIMENT AND SOIL MONITORING LOCATIONS

This Plan addresses the collection of sediment samples at the Project, including the following:

- Sediment samples from Project area lakes, streams and rivers. For a complete list of the required sample analyses for pre-established sediment monitoring stations, refer to the AEMP (BIM-5200-PLA-0023).
- Soil samples from Project fuel and waste facilities.
- Soil samples from Project landfarm facilities.
- Soil samples to inform remediation and reclamation projects.
- Soil samples to evaluate spills and releases.

5.2 SEDIMENT AND SOIL SAMPLING METHODS AND EQUIPMENT

Sediment samples specified under the Project’s AEMP (BIM-5200-PLA-0023) are characterised by the following procedures.

5.2.1 General Sampling Procedures

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 13 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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Generally, sampling procedures will consist of the following:

1. Sampler will wear a fresh pair of disposable nitrile gloves for each sampling event.
2. A fresh sample bottle(s) will be used at each monitoring station and sample bottles will not be re-used.
3. Sample details (e.g. date, sample ID [sys_sample_code] and analysis) will be clearly marked on the sample jar in permanent ink.
4. All samples will be sealed by ensuring their lids are tightly secured before placing each sample bottle into a cooler.
5. All samples will be placed in an iced cooler or refrigerator as soon as practicable after collection.

5.2.2 River and Grab Sampling

The collection of river and grab samples will follow the general procedures stated in Section 5.2.1 and will entail the following additional QAQC considerations:

1. Sampling station locations will be dependent upon the monitoring program objectives and the sample location.
2. Clean equipment will be utilized to obtain a representative sample of the sediment for analyses.
3. If composite samples are required by the monitoring program, a sterile container will be utilised to deposit and homogenize the subsamples, until the composite sample is fully mixed. The composite sample will then be transferred to the identified sample jars by alternating aliquots.
4. The quantity and holding time of samples obtained will depend on the prescribed analyses.

5.2.3 Lake Sampling

For monitoring of sediment character and quality in lakes, a depth sampler will be used. The preferred sample apparatus for lake sediment samples are gravity percussion corers, since they allow for retrieval and analysis of sediment profiles. A Petite Ponar can also be used, but will not provide sediment profiles. Generally, forms of gravity percussion corers consist of a clear polycarbonate sample core tube attached to a weighted upper head assembly and a seal mechanism. The top two centimeters of sediment from the core samples will be retained for laboratory analysis unless sampling objectives state otherwise.

Sediment lake sampling procedures will follow the general procedures stated in Section 5.2.1 and the following additional QAQC considerations for a gravity percussion corer:

1. Sampling station locations will be dependent upon the monitoring program objectives and the lake dimensions. When sampling from a watercraft, all efforts will be made to

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 14 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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- anchor the boat stationary over the sampling location. Map coordinates for all lake sampling station locations will be recorded using a handheld GPS unit.
2. The corer will be positioned perpendicular to the water surface prior to release. The penetration depth of the core tube is affected by the depth of water, angle of corer deployment and substrate type.
 3. Once the corer is embedded in the substrate, the stainless steel messenger will be sent down the corer rope to release the ball-type seal. This seal creates a vacuum in the core tube, retaining the sampled sediment.
 4. Upon retrieval, the bottom of the core tube will be plugged using an extruding plug prior to breaking the air-water interface. This procedure will prevent sample loss.
 5. An extruding apparatus will be used to force the extruding plug through the core tube moving the sediment sample to the end of tube allowing the top two centimetres (2 cm) to be scooped out and placed in a clean stainless steel bowl for sample homogenization.
 6. Multiple core samples (generally three or more) are required per sample station to obtain the required sample volume. The multiple core samples are homogenized in the stainless steel bowl, removing any excess water or debris.
 7. The sample containers will be filled by alternating aliquots between each of the containers.
 8. After the top two centimeters (2 cm) are retained, the remaining, unused sediments within the core tube will be placed into a bucket and only released once all core sampling is complete at that particular station.
 9. Depending upon the lake area and depth, multiple sampling stations will likely be required to adequately characterize lake sediment quality.

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 15 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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6. BENTHIC INVERTEBRATES SAMPLE COLLECTION

For a complete list of required analyses at pre-established monitoring stations, see Baffinland’s AEMP (BIM-5200-PLA-0023). Samples will be submitted to an analytical laboratory for processing and taxonomic identification. Laboratory methods for benthic invertebrate samples will be in accordance with guidance provided by Environment Canada (2012). Field observations and parameters if warranted should be recorded during the collection of benthic invertebrate samples.

6.1 BENTHIC INVERTEBRATE MONITORING LOCATIONS

This Plan addresses the collection of benthic invertebrate samples at the Project, including the:

- Collection of benthic invertebrate samples from the Project area and reference lakes, streams and rivers to determine potential mine related effects on benthic invertebrate communities.

6.2 BENTHIC INVERTEBRATE SAMPLING METHODS AND EQUIPMENT

Benthic invertebrate samples follow the same general procedures outlined in Section 5.2.1. Benthic invertebrates can be collected from either depositional (lake) or erosional (stream) sample locations. A Petite Ponar is utilised when sampling depositional environments while a Surber sampler is utilised when sampling erosional environments. For a complete list of depositional and erosional sample methods, refer to the AEMP (BIM-5200-PLA-0023). Benthic invertebrate samples will be carefully sieved through 500-µm mesh. All materials, including invertebrates, retained by the mesh will be transferred to labeled plastic jars and fixed with 10% buffered formalin. Fixed and labeled samples will be shipped to an analytical laboratory for processing and archiving.

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 16 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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7. QAQC

For monitoring of QAQC during sample collection and shipping, a set of QAQC samples will be routinely submitted for analysis from prescribed sampling programs. Sampling programs will each have separate QAQC samples submitted with the regular water samples. Descriptions of the QAQC samples that will be used are presented in Table 1. Ten percent (10%) of all samples will consist of QAQC samples including field blanks, travel blanks and field duplicates. For example, a monitoring program with 30 samples would consist of 27 monitoring samples and three (3) QAQC samples. Equipment blanks, if required i.e. for Kemmerer use, are performed on an as needed basis to ensure sampling equipment is properly cleaned and maintained and free of contaminants, and do not count towards the ten percent (10%) QAQC samples requirement.

7.1 SAMPLING PROGRAMS WITH MULTIPLE SAMPLING STATIONS

For sampling programs with multiple sampling locations (i.e. SNP and AEMP), QAQC samples will be performed randomly to avoid bias and care will be taken to ensure that the same stations are not sampled repeatedly for QAQC samples.

7.2 SAMPLING PROGRAMS WITH LIMITED SAMPLING STATIONS

Sampling programs with limited sampling stations (e.g. MDMER) will require at least one QAQC sample per sampling round. A field duplicate, field blank or travel blank must be taken during each sampling session. This may result in over sampling for QAQC, but will ensure there is sufficient data to identify any anomalies.

7.3 QAQC DATA ANALYSIS

In the interest of transparency, the analytical laboratories will also be instructed to report the results of their own in-house QAQC testing (e.g. results of random replicate analyses of submitted samples).

The results of QAQC analyses will be routinely reviewed by Baffinland or their designate, and any anomalous results will be promptly investigated with the assistance of the analytical laboratory if required. The following data quality objectives (DQOs) will be used; the purpose of comparing data to the DQO is to evaluate whether the data adequately reflects the actual conditions and can be used with confidence to derive study conclusions.

Field, Trip and Equipment Blanks:

- Concentrations should be non-detectable, with a DQO of within five (5) times the respective laboratory lowest reportable detection limit for that parameter.
 - If sample results are less than or equal to five (5) times the respective external laboratory’s lowest detection limit (LDL) for that parameter, it is considered that such small differences account for generic noise around the limit.

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 17 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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- If sample results are five (5) times greater than the respective external laboratory's LDL for that parameter, the detected concentration is considered significant and any atmospheric and/or sample handling influences should be investigated.

In compliance with the Canadian Council of the Ministers of Environment, Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment - Volume 4 Analytical Methods (CCME, 2016) field duplicates will be analysed as follows:

- Field duplicate and the parent sample pairs should meet the DQO of $\leq 20\%$ RPD in parameter concentrations of individual parameters analyses.
 - RPD will be calculated where $RPD = (ABS[Result1 - Result2] / Mean) * 100$.
 - If calculations include a result that is below detection limits, the value of the detection limit will be used.
- If the RPD is $>20\%$, the samples results should be compared against the laboratory lowest reportable detection limit for that parameter.
 - If sample results are less than or equal to (10) times greater than the respective external laboratory's LDL for that parameter, it is considered that such small differences between sample results resulted in a relatively high RPD.
 - If sample results are ten (10) times greater than the respective external laboratory's LDL for that parameter, the RPD is considered significant and the methodology of the sampling should be investigated.

Once the reason for the anomalous results is identified, Baffinland will ensure that operating procedures of field staff and/or the analytical laboratory will be altered in order to address the issue. Compliance monitoring and data management for water licence sampling will be conducted by Baffinland, with the assistance of a designate as required.

TABLE 1 QAQC SAMPLE TYPES – PURPOSE, DESCRIPTION AND FREQUENCY

QAQC Sample Type	Purpose	Description	Frequency	Prepared By
Field Blank	Identification of potential contaminants arising from sample collection, such as atmospheric contaminants. The field blank bottle is filled with laboratory supplied deionized water and the bottle is opened and preserved in the field, and is handled concurrently and in the same manner as other sample bottles in the field. The bottle is then submitted as a routine sample.	Bottle contains prefilled deionized water. Bottle is handled the same as one would handle the samples.	Ten percent (10%) of all samples collected will be QAQC.	Analytical laboratory or Field Staff

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 18 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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QAQC Sample Type	Purpose	Description	Frequency	Prepared By
Travel Blank	Identification of potential contaminants arising from sample storage, shipping and laboratory handling. The travel blank accompanies the samples to the field and laboratory but are left unopened.	Sealed bottle containing deionized water provided by analytical laboratory.	Ten percent (10%) of all samples collected will be QAQC.	Analytical laboratory or Field Staff
Field Duplicate	Assesses sample variability and precision of laboratory analytical methods. Collected from a randomly selected location, split from a homogenized sample or collected simultaneously and analyzed separately in the laboratory. The duplicate samples are handled and analyzed in an identical manner in the laboratory.	Duplicate sample selected at random. A large sterile bottle is used to collect the water and transfer it equally into two sets of pre-labeled bottles; alternatively, samples are collected simultaneously from a stream etc. Duplicate samples labeled with a unique ID such that the analytical laboratory cannot determine the matching sample ID.	Ten percent (10%) of all samples collected will be QAQC.	Field Staff
Equipment Blank	Assesses cross contamination from field water sampling equipment (e.g. Kemmerer). Rinse deionized water through water sampling equipment and transfer to sample bottles, then preserve and ship to the laboratory.	Bottle contains deionized water that has been rinsed through the sampling equipment.	Collected prior to and after completion of sampling program (if required/ as needed). Not included in the ten percent (10%) calculation of other QAQC samples.	Field Staff

8. SAMPLE MANAGEMENT

8.1 SAMPLE LABELLING

Accurate sample labeling is essential for subsequent interpretation of field data. Ensure that labels are legible and written with permanent ink (pen, marker, etc.). For a complete list of the predetermined location names of monitoring stations, please refer to the Type 'A' Water Licence and AEMP (BIM-5200-PLA-0023).

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 19 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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A consistent format for identifying samples must be followed if a predetermined sample label does not exist in order to facilitate accurate sample tracking and to ensure sample labels are interpreted in the same manner by all personnel involved in the program.

Samples must be uniquely identified with the following information:

- Sample ID (sys_sample_code)
- Sampling date and time
- Project identifier
- Company name

8.2 SAMPLE STORAGE AND HANDLING

Physical, chemical and biochemical reactions may take place in the sample container between the time of sample collection and laboratory analysis. Samples will be placed in iced coolers and shipped to the analytical laboratory as soon as possible after collection, consulting stipulated analytical holding times (Appendix E), to minimize these changes. Samples that are not shipped offsite the same day that they are collected will be refrigerated until they are ready to be shipped offsite in iced coolers. Coolers and sample bottles will be kept clean and free of debris to prevent sample contamination during shipment. Care will be taken to ensure that bottles are stored upright and are packed securely within the cooler and glass bottles are wrapped in bubble wrap or similar cushioning materials. Leak-proof ice packs or loose ice secured in sealed plastic bags will be used for keeping samples at a cool temperature during shipping. It is important to prevent melt water from accumulating in the bottom of the cooler, which can cause labels to peel and become illegible. Additional plastic bags may be required to separate melt water from the bottles.

Biological samples (e.g. benthic invertebrates) preserved using formalin or Lugol’s solution can be held at room temperature until submission to the analytical laboratory.

8.3 SAMPLE SUBMISSION AND COC

A COC will accompany all samples being submitted to ensure that the required analyses are completed and to confirm receipt of samples by the laboratory (see example form presented in Appendix A). Prior to shipment, samples should be carefully prepared for shipping and sample bottles listed on the COC must be reconciled with what has physically been placed in the shipping container. The collection of samples that are time sensitive needs to coincide with shipping schedules, travel time to the laboratory, and laboratory business hours; refer to section 8.4. A record of all COCs submitted for laboratory analytical testing must be kept on site. Information on the COC must include the following details that are required both for lab use and for data validation purposes to enable uploading into an environmental database (see example form presented in Appendix A):

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 20 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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- Unique COC ID – usually the date and project name “yy mm dd Project”; e.g. 24 08 20 SNP Weekly
- Project name (Job Reference)
- Address of analytical laboratory, name of contact person and contact details.
- Initials of sampler(s)
- List of sample I.D.’s and Locations
- Sampling date and time
- Matrix (e.g. surface water (WS), wastewater effluent (WW) or potable/ water (WP))
- Number of sample bottles per sample
- Analysis Requested (analytes or analyte packages)
- Urgency of analysis (e.g. rush or normal) – for rush samples the analytical laboratory should be notified ahead of time
- Submission date and time and relinquishers name
- Comments on any unusual conditions and other important information

8.4 SAMPLE SHIPMENTS

Sampling programs and associated logistics will be planned ahead of time to ensure samples collected are analyzed within the appropriate holding time (refer to BIM-5200-SOP-0013 – Environment Shipping Procedure). Considerations for sample shipment logistics that are outlined in the Shipping Procedure include, but are not limited to:

- Timing of sample arrival at external laboratories, impacted by courier abilities and lab closures on weekends or holidays
- Availability of flights leaving site, impacted by weather, weight restrictions and flight delays
- Poor weather; impacting flight times and courier abilities to ship samples
- Contingency time remaining in the week or month that includes available contingency flights for any required re-sampling (sample program dependent)
- Advanced shipment notifications to logistics personnel, such as aircraft cargo personnel and couriers, including the requirement for logistics personnel to notify BIM of any delays or discrepancies in the shipment processes

The timing of sample collection must coincide with outbound flights offsite in such a way that samples will arrive at the external laboratory within hold times outlined in Appendix E. Timing of sample collection must also account for shipment logistics considerations, such as those outlined above.

Every effort will be made to prevent inadvertent freezing of water samples (due to on-site climatic conditions) which could affect analytical results for parameters.

Exceptions to these protocols will be documented.

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 21 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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9. LABORATORY ANALYSIS

9.1 LABORATORY ACCREDITATION

Laboratory analysis of samples is performed by an on-site analytical laboratory and off-site accredited analytical laboratories. The on-site laboratory is operated by ALS Canada LTD. and is located at the Mine Site. A select set of general chemistry analytical parameters (e.g. pH, TDS, TSS, turbidity, etc.), are performed by the on-site laboratory. The off-site laboratory, ALS Environmental, located in Waterloo, ON, run by ALS Canada Ltd. performs the majority of analyses required. Toxicity testing is typically performed by Aquatox Testing & Consulting Inc., located in Guelph, ON. Details of ALS analytical laboratory licencing and accreditation are presented in Appendix B.

9.2 ANALYTICAL DETECTION LIMITS

ALS LORs are established using rigorous experimental and statistical procedures that begin with the determination of the MDL at 99% confidence. When detected at or above the MDL, ALS test results are considered qualitatively accurate, and a parameter can be reported with 99% confidence as being present in the sample.

It should be noted that on occasion, a loss of analytical sensitivity could be encountered due to excessively high concentrations of parameters within a sample or lack of provided sample matrix. If this is encountered, Baffinland or their designate will work with the analytical laboratory to try to resolve the problem and new samples will be collected if required. The detection limits on ALS analytical reports contains the LORs. The LORs may be the MDL as calculated, or a higher value. Required analytical laboratory detection limits are provided in Appendix C.

9.3 LABORATORY ANALYTICAL METHODS

Analytical methods used by the analytical laboratories for water analyses generally conform to the standard methods outlined in *Standard Methods for the Examination of Water and Wastewater* (APHA et al, 1989). Standard analytical methods for available analyses through ALS Environmental are provided in Appendix C.

9.4 ANALYTICAL LABORATORY QAQC PROCEDURES

ALS Environmental adheres to a designated QAQC Management System, which includes documentation and document control, staff training and internal audits. The practices exceed accreditation requirements for high confidence in data reliability utilizing but not limited to the following:

- Calibration verification standards and drift control standards.
- Surrogate standards and internal standards.
- Replicate analyses and blanks on submitted samples.

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 22 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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- Use of standard reference materials (SRMs) and matrix spikes.
- DQOs are established for each QC sample, based on a combination of reference method objectives, customer requirements and historical test method performance. Where applicable, prescriptive elements of reference methods take precedence over internal DQOs.

Additional details on the analytical laboratories in-house QAQC protocols are presented in Appendix D.

10. DATA MANAGEMENT

All sample data collected by Baffinland or designate consultants from the various environmental programs required on Project sites will be stored electronically in a spreadsheet database (Microsoft Excel) or in the environmental data management system (EQuIS).

QAQC measures relating to data validation will include the following:

1. Designation of a suitable person to act as the Database Manager (DM).
2. Upon receipt, laboratory analytical data will be reviewed by the DM to check for completeness, typos, outlying values, etc. The analytical laboratory will be immediately notified of any anomalous results.
3. At a suitable frequency (e.g. once per month) the spreadsheet database should be updated by the DM using: i) results provided in electronic format by the analytical laboratories, and ii) copies of the field parameter monitoring records forwarded from site; or the data will be confirmed to be present in the environmental database.
4. The DM will be responsible for ensuring that a third party (e.g. another staff member) carries out a QAQC check on a minimum of ten percent of newly entered data.

11. RESPONSIBILITIES

Role	Responsibility
GEVP/ General Manager	<ul style="list-style-type: none"> • Reports to the Chief Executive Officer • Responsible for providing oversight for all Project operations and allocating the necessary resources for the operation, maintenance and management of Project infrastructure.
Environmental Superintendent/ Manager	<ul style="list-style-type: none"> • Reports to the Environmental Manager/ Senior Director – Health, Safety, Environment, Security and Training. • Serves as the onsite lead for all environmental monitoring programs. • Responsible for ensuring this Plan is up-to-date and reflects current Project operations and regulatory requirements.
Environmental Coordinator	<ul style="list-style-type: none"> • Reports to the Environmental Superintendent.

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 23 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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Role	Responsibility
	<ul style="list-style-type: none"> Responsible for ensuring environmental monitoring programs adhere to this Plan. Reviewing this Plan with environmental technicians and providing necessary training as required. Conducting field audits of sampling methodology and QAQC analysis on samples and data. Management of field notes (including review and commitment to the environmental database).
Database Manager	<ul style="list-style-type: none"> Responsible for managing analytical results in the environmental database, including review for typos and acceptance into the database.
Environmental Technician	<ul style="list-style-type: none"> Reports to the Environmental Coordinator. Responsible for being familiar with this Plan and adhering to the relevant protocols while collecting and managing samples. Responsible for entering data in field notebooks or tablets accurately and comprehensively
Site Services Superintendent/ Manager	<ul style="list-style-type: none"> Reports to the Site Services Manager/ General Manager. Responsible for providing oversight for all Site Services operations, including the operation, maintenance and management of the Project's water and waste water treatment facilities Responsible for ensuring that Site Services personnel operating and managing the Project's water and waste treatment facilities receive the appropriate training.
WWTP Operator	<ul style="list-style-type: none"> Reports to the Site Services Department. Responsible for being familiar with this Plan and adhering to the relevant protocols while collecting and managing samples.

12. PRE-REQUISITE COMPETENCY SKILLS

All personnel performing environmental monitoring programs will be required to understand and be proficient in the protocols outlined in this Plan. Training will involve Environmental Coordinators and Specialists conducting routine reviews of this Plan with environmental personnel and leading in-field training sessions. Environmental personnel will also be trained and proficient in the operation, calibration and maintenance of any necessary sampling equipment (e.g. YSI Sonde).

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 24 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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13. RELATED DOCUMENTS

- BAF-PH1-800-POL-0001-Baffinland’s Health, Safety and Environment Policy (found here: <https://www.baffinland.com/media-centre/document-portal/>)
- BAF-PH1-800-POL-0002-Baffinland’s Sustainable Development Policy (found here: <https://www.baffinland.com/media-centre/document-portal/>)
- BIM-5200-PLA-0003-Environmental Protection Plan (previously *BAF-PH1-830-P16-0008*)
- BIM-5200-PLA-0006-Snow Management Plan (previously *BAF-PH1-830-P16-0002*)
- BIM-5200-PLA-0009-Surface Water and Aquatic Ecosystem Management Plan (previously *BAF-PH1-830-P16-0026*)
- BIM-5200-PLA-0022-Fresh Water Supply, Sewage, and Wastewater Management Plan (previously *BAF-PH1-830-P16-0010*)
- BIM-5200-PLA-0023-Aquatic Effects Monitoring Plan (previously *BAF-PH1-830-P16-0039*)
- BIM-5200-PLA-0027-Roads Management Plan (previously *BAF-PH1-830-P16-0023*)
- BIM-5200-SOP-0010-AEMP Sampling Procedure (previously *BAF-PH1-830-PRO-0012*)
- BIM-5200-SOP-0013-Environment Shipping Procedure (previously *BAF-PH1-830-PRO-0015*)
- BIM-5200-SOP-0017-Water Sampling Procedure (previously *BAF-PH1-830-PRO-0011*)
- Canadian Council of Ministers of the Environment (CCME), 2016. Guidance manual for environmental site characterization in support of environmental and human health risk assessment, volume 4 analytical methods. Online: https://ccme.ca/en/res/guidancemanual-environmentalsitecharacterization_vol_4_epn1557.pdf
- ECCC, 2022. Metal and Diamond Mining Effluent Regulations, SOR/2002-222. Online: <https://laws-lois.justice.gc.ca/PDF/SOR-2002-222.pdf>.
- ECCC, 2001. Guidance Document for the Sampling and Analysis of Metal Mining Effluent, Final Report. Online: <http://publications.gc.ca/collections/Collection/En49-24-1-39E.pdf>
- ECCC, 2014. Metal mining technical guidance for Environmental Effects Monitoring. Online: <https://www.ec.gc.ca/eseee-em/default.asp?lang=En&n=AEC7C481-1&printfullpage=true>.
- Indigenous and Northern Affairs Canada (INAC), 1996. Quality Assurance (QA) and Quality Control (QC) Guidelines for Use by Class “A” Licences in Meeting SNP Requirements and for Submission of a QAQC Plan. Prepared by Department of Indian and Northern Affairs Canada Water Resources Division and the Northwest Territories Water Board, July 1996.

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 25 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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Nunavut Water Board (NWB), 2015. Nunavut Water Board Licence No. 2AM-MRY1325 – Amendment No. 1. Issued by the Nunavut Water Board, July 2015.

Rice, E.W., Baird, R.B. and Eaton, A.D., editors, 2017. Standard Methods for the Examination of Water and Wastewater; 23rd Ed., American Public Health Association, American Water Works Association, Water Environment Federation.

United States Environmental Protection Agency (USEPA), 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms; 5th Ed., USEPA, ref. No. EPA-821-R-02-012. Online: https://www.epa.gov/sites/production/files/2015-08/documents/acute-freshwater-and-marine-wet-manual_2002.pdf.

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 26 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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APPENDIX A COC EXAMPLE

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 27 of 43
Environment/Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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APPENDIX B ANALYTICAL LABORATORY CERTIFICATE AND SCOPE OF ACCREDITATION

[Scope of Accreditation](#) available upon request

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 29 of 43
Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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Canadian Association for Laboratory Accreditation Inc.



Certificate of Accreditation

ALS Environmental (Waterloo)
ALS Canada Ltd.
60 Northland Rd.
Unit 1
Waterloo, Ontario

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Accreditation No.: 1003149
Issued On: 1/19/2023
Accreditation Date: 1/3/2005
Expiry Date: 7/19/2025



President and CEO



This certificate is the property of the Canadian Association for Laboratory Accreditation Inc. and must be returned on request; reproduction must follow policy in place at date of issue.
For the specific tests to which this accreditation applies, please refer to the laboratory's scope of accreditation at www.cala.ca.

APPENDIX C LABORATORY ANALYTICAL METHODS

Available upon request; saved [here](#).

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 31 of 43
Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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APPENDIX D ANALYTICAL LABORATORY QUALITY CONTROL PROTOCOLS

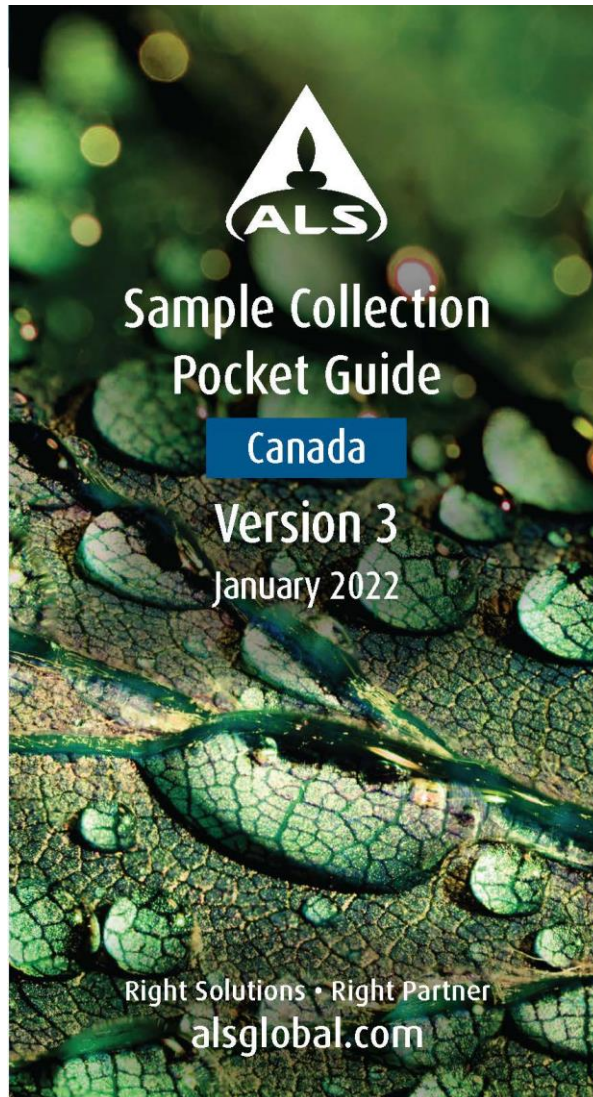
Available upon request; saved [here](#).

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 32 of 43
Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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**APPENDIX E ALS SAMPLE COLLECTION GUIDE FOR SAMPLE VOLUMES,
PRESERVATIVES AND HOLD TIMES**

Available at: <https://www.alsglobal.com/en/Search#q=Sample%20Collection%20Pocket%20Guide%202022>

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 33 of 43
Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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Important Information

GENERAL > This pocket guide is to be used for all Canadian Environmental testing. Additional or alternate instructions may apply for Ontario drinking waters. Coolers and ice packs plus labelled pre-dosed colour-coded sample containers are provided for all analyses conducted by ALS. Pre-dosed colour-coded preservative vials are also available upon request. ALS Account Managers are available to assist and provide guidance as required.

CONTAINER VOLUME AND QUALITY CONTROL REQUIREMENTS > Some containers exist in several sizes to accommodate varying suites of analyses while focusing on minimizing weight (OH&S and sampling benefits). Please refer to the notes section under each sample container. According to CCME Volume 1 Guidance Manual, the recommended minimum frequency for testing laboratory duplicate samples is 1 in 20 samples and 1 in 10 samples for field duplicates.

SAMPLING AND PRESERVATION > Care must be taken not to rinse out or spill preservatives during sampling for OH&S reasons and to avoid cross contaminating other bottles (e.g. Nitric acid used for metals can contaminate nitrate analysis). Field filtration is recommended for "dissolved" tests and chlorophyll, and may be required by some jurisdictions. Samples should generally be chilled to <4°C and transported to the laboratory with enough ice packs to keep the temperature of samples to <10°C, but without freezing. ALS recommends placing samples in ice immediately upon sampling for best practice chilling, with either repacking into another cooler or draining of free water and replacement of ice just prior to dispatch. Chilling overnight in a fridge may also benefit. The post-chilling addition of ice packs is also recommended where samples are shipped by air or long distances and where couriers will not accept loose ice. Samples taken from chlorinated water sources require the addition of sodium thiosulfate for microbiological, volatile organics, and semi volatile organics tests. Please advise ALS accordingly to facilitate supply of appropriate containers.

HEALTH AND SAFETY > Although the quantities of preservative dosed into containers is minimal, it is important to observe safe chemical handling practices while using bottles. Use of appropriate Personal Protection Equipment such as chemical resistant gloves and safety glasses is recommended. Bottle labels indicate preservative type, hazard pictograms, and signal words based on the Globally Harmonized System of Classification and Labelling of Chemicals (GHS). Safety Data Sheets are available on the ALS website or can be provided upon request along with Safety information and First Aid instructions. All our preservatives can be shipped LIMITED or EXCEPTED quantity under Transportation of Dangerous Goods (TDG) requirements. None of the preservatives, except for methanol, are considered Dangerous Goods (DG) after mixing with the sample in the designated sample bottle. Search 'SDS' on ALS website alsglobal.com.

HOLDING TIMES > ALS recommended holding times are indicated. Failure to comply with these Holding Times may impact data validity. Samples and COCs should be submitted (preferably by email from remote locations to assist login) with at least half the analytical holding time remaining unless prior arrangements are made. Short holding times are shaded in yellow to assist.

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 34 of 43
Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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BAFFINLAND IRON MINES MANAGEMENT PLAN

BIM-5200-PLA-0004 SAMPLING PROGRAM- QUALITY ASSURANCE AND QUALITY CONTROL PLAN

WATER	WATER	WATER	WATER	WATER	WATER
General Water Quality	TSS & TDS (Low Level)	BOD <u>or</u> CBOD	SPECIALTY ORGANICS	NAPHTHENIC ACID	RESIN & FATTY ACIDS
SAMPLE CONTAINER 250 mL hdpe 60 mL hdpe (Anions only)	SAMPLE CONTAINER 500 mL hdpe 145 mL hdpe (Whole Bottle TSS)	SAMPLE CONTAINER 500 mL hdpe	SAMPLE CONTAINER 2 x 1L amber glass	SAMPLE CONTAINER 100 mL amber glass	SAMPLE CONTAINER 2 x 100 mL amber glass (C ₆ H ₆ O ₄ +NaOH)
PRESERVATION Nil Chill to ≤10°C	PRESERVATION Nil Chill to ≤10°C	PRESERVATION Nil Chill to ≤10°C	PRESERVATION Nil Chill to ≤10°C	PRESERVATION Nil Chill to ≤10°C	PRESERVATION Ascorbic acid + Sodium hydroxide Chill to ≤10°C
TEST PARAMETER(S) Acidity, Alkalinity, Anions (Cl, Br, SO ₄ , F, NO ₂ , NO ₃), Colour, Conductivity, ORP, Orthophosphate, pH, Silica, Tannin & Lignin, TIC/DIC, Turbidity, UV Abs/Trans, Routine Level TDS (10 mg/L LOR) and Routine Level TSS (3 mg/L LOR) or NTA or Total VFA	TEST PARAMETER(S) TSS Low (1 mg/L LOR) + all General Water Quality tests, or Whole Bottle TSS	TEST PARAMETER(S) BOD or CBOD	TEST PARAMETER(S) Dioxins, PBDE, PBB or Explosives	TEST PARAMETER(S) Naphthenic Acid	TEST PARAMETER(S) Resin and Fatty Acids
NOTES pH should be tested in the field as per CCME, BC ENV.	NOTES	NOTES Please submit immediately to the lab.	NOTES	NOTES	NOTES
HOLDING TIME pH - 15 mins; 4 days (ON-MISA); 28 days (ON); Alkalinity/Acidity - 14 days; EC/Br/Cl/F/SO ₄ - 28 days; EC - 4 days (ON-MISA); TSS/TDS - 7 days; Colour/Turbidity - 3 days, 2 days (ON); Orthophosphate/NO ₂ /NO ₃ /NH ₃ - 3 days; 7 days (ON); NTA - 30 days (ON); 24 hours (BC); Total VFA - 7 days.	HOLDING TIME TSS/TDS - 7 days see General Water Quality for other tests.	HOLDING TIME BOD/CBOD - 48 hours (AB, MB, Pulp and Paper); 3 days (BC); 4 days (ON).	HOLDING TIME Dioxins/PBDE/PBB - unlimited; Explosives - 7 days.	HOLDING TIME 14 days	HOLDING TIME 14 days GHS - Danger Corrosive
GREEN	GREEN	GREEN	ORANGE	ORANGE	DARK BLUE

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 35 of 43
Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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BAFFINLAND IRON MINES MANAGEMENT PLAN
BIM-5200-PLA-0004 SAMPLING PROGRAM- QUALITY ASSURANCE AND QUALITY CONTROL PLAN

WATER	WATER	WATER	WATER	WATER	WATER
HORMONES/ STEROIDS/PPCPs/ NEONICOTINOIDS	ORGANOTINS	PFAS	PESTICIDES (LC/MS/MS)	MICRO-BIOLOGY	MICROTOX
SAMPLE CONTAINER 100 mL <u>or</u> 250 mL amber glass	SAMPLE CONTAINER 250 mL opaque hdpe (Na ₂ S ₂ O ₈)	SAMPLE CONTAINER 60 mL hdpe (no liner) (Na ₂ S ₂ O ₈)	SAMPLE CONTAINER 60 mL hdpe <u>or</u> 100 mL amber glass (Na ₂ S ₂ O ₈)	SAMPLE CONTAINER 250 mL sterile hdpe <u>or</u> 120 mL sterile hdpe (Winnipeg) (Na ₂ S ₂ O ₈)	SAMPLE CONTAINER 100 mL amber glass
PRESERVATION Nil Chill to ≤10°C	PRESERVATION Nil Chill to ≤10°C	PRESERVATION Sodium thiosulfate Chill to ≤10°C	PRESERVATION Sodium thiosulfate Chill to ≤10°C	PRESERVATION Sodium thiosulfate Chill to <10°C, Do Not Freeze	PRESERVATION Nil Chill to ≤10°C
TEST PARAMETER(S) Hormones/Steroids <u>or</u> PPCPs/ Neonicotinoids	TEST PARAMETER(S) Organotins (MBT, DBT, TBT)	TEST PARAMETER(S) PFAS	TEST PARAMETER(S) Diquat/Paraquat, Glyphosate/ AMPA <u>or</u> Phenoxy Herbicides, Aldicarb/Diuron, Soil Sterilants	TEST PARAMETER(S) E. coli /Fecal/Total Coliforms (Coli-ert) <u>or</u> Pseudomonas aeruginosa (MF) and Enterococcus, <u>or</u> Legionella, <u>and</u> HPC	TEST PARAMETER(S) Microtox
NOTES 100 mL - Routine levels (all tests); 250 mL - Low level Steroids/ Hormones.	NOTES Leave 10% headspace to allow for expansion if frozen. Protect from light.	NOTES Please provide 2 x 60 mL hdpe containers for low and trace level PFAS. Avoid exposure to Teflon.	NOTES 60 mL hdpe - Diquat/ Paraquat, Glyphosate/AMPA; 100 mL amber glass - Aldicarb/Diuron, Phenoxy Herbicides, Soil Sterilants.	NOTES Please submit immediately to the lab. HPC can be sub-sampled from another sterile Microbiology sample bottle.	NOTES Minimize headspace, store in dark.
HOLDING TIME 28 days	HOLDING TIME 3 days - unpreserved, or freeze within 3 days; 28 days - frozen.	HOLDING TIME 28 days	HOLDING TIME Aldicarb/Diuron - 7 days; Diquat/Paraquat - 7 days; Glyphosate/AMPA - 14 days; Phenoxy Herbicides - 7 days; Soil Sterilants - 7 days.	HOLDING TIME E.coli/coliforms - 30 hours, 48 hours (ON); HPC - 24 hours, 48 hours (ON); Pseudomonas/Enterococcus - 30 hours; Legionella - 48 hours.	HOLDING TIME 3 days
GREY	BLACK	LIGHT BLUE	LIGHT BLUE	LIGHT BLUE	GREY

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 36 of 43
Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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BAFFINLAND IRON MINES MANAGEMENT PLAN

BIM-5200-PLA-0004 SAMPLING PROGRAM- QUALITY ASSURANCE AND QUALITY CONTROL PLAN

WATER	WATER	SOIL/SOLID/SEDIMENT	SOIL/SOLID/SEDIMENT
RAINBOW TROUT/ DAPHNIA MAGNA	CRYPTO/ GIARDIA	PFAS & ORGANOTINS	GENERAL PARAMETERS
SAMPLE CONTAINER 2-4 x 10 L lined pails (trout) 1-2 x 1 L hdpe (daphnia)	SAMPLE CONTAINER 1 x 10 L pail, no liner	SAMPLE CONTAINER 120 mL hdpe jar (Teflon™ free)	SAMPLE CONTAINER <i>Organics tests</i> °: 1 x 120 mL glass jar <i>Specialty Organics tests</i> °: 1 x 250 mL amber glass jar (Dioxins/PBBs/PBDEs) <i>Inorganics/Metals tests</i> °: 1 x 120 mL glass jar (Ontario: 1 x 250 mL) <i>°double recommended amounts for high moisture sediment, sludge, gravel/rocky soil, peat/muskeg, or low density solids (e.g. fly ash).</i> TCPL, SPLP, mSPLP (ON), MLEP (BC), Corrosivity, Flashpoint+Paint Filter: 1 x 250 mL glass jar per test or test group (includes leachate VOCs/ZHE) + extra 250 mL jar if dioxins by TCPL is required. <i>SAR/Salinity (sat. paste):</i> 1 L ALS ldpe bag (may include metals). <i>Particle Size:</i> 1 x 250 mL glass jar (typical soils), or 1 L ALS ldpe bag (coarse materials), or from SAR/Salinity soil bag. <i>Asbestos:</i> Double-bag bulk material/soil in 1 L ALS ldpe bags. Label with "may contain asbestos".
PRESERVATION Nil Chill to ≤10°C, Do Not Freeze	PRESERVATION Nil Chill to ≤10°C, Do Not Freeze	PRESERVATION Nil Chill to ≤10°C	PRESERVATION Nil Chill to ≤10°C Cr(VI) must be stored in the dark (ON).
TEST PARAMETER(S) Rainbow trout: LC50 or Pass/Fail (standard or pH stabilized) Daphnia magna: LC50 or Pass/Fail	TEST PARAMETER(S) Cryptosporidium/Giardia	TEST PARAMETER(S) PFAS and Organotins	TEST PARAMETER(S) All parameters except volatiles, PFAS, organotins.
NOTES Rainbow trout: LC50 (4x10L), or Pass/Fail (2x10L) Daphnia magna: LC50 (2x1L), or Pass/Fail (1x1L) Fill with zero headspace. Volume requirements are the same for the pH stabilized trout tests.	NOTES Fill with zero headspace.	NOTES	NOTES <i>For Flashpoint, Sulfide (AVS), & Leachate VOCs (TCPL/SPLP/MLEP), please fill with zero headspace.</i> <i>Please submit nutrient samples immediately to the lab.</i>
HOLDING TIME 5 days. Samples should be chilled to ≤10°C if transportation time greater than 2 days.	HOLDING TIME 4 days	HOLDING TIME 28 days	HOLDING TIME Cl, Cr(VI), EC, pH, PSA - 30 days (CCME); Nutrients (NO _x , NO _y , NH ₃) - 3 days ; Metals - 180 days; Mercury, Methyl Mercury, TN, TOC/FOC - 28 days; Dioxins, PCBs, PBBs, PBDEs - unlimited; Asbestos (bulk materials) - unlimited; SVOC, LEPH/HEPH, F2-F4, Glycols, PAH, OCP, OPP, CPs, Cyanide, Sulfide (AVS) - 14 days; SVOC, CPs, OCP, OPP, PAH - 60 days (ON); pH, N, P, K+S, TOC/FOC- unlimited if dried; Flashpoint - 7 days.
GREY	GREY	ORANGE	ORANGE

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan		Issue Date: 2025-05-27	Page 37 of 43
Site Wide		Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent		Document Approver: General Manager	
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BAFFINLAND IRON MINES MANAGEMENT PLAN

BIM-5200-PLA-0004 SAMPLING PROGRAM- QUALITY ASSURANCE AND QUALITY CONTROL PLAN







SOIL/SOLID/SEDIMENT	AIR SAMPLE CONTAINERS	AIR SAMPLE CONTAINERS	WATER	WATER	WATER
VOLATILES	STACK & STATIONARY SOURCE TESTING	DUSTFALLS	SULFIDE	CYANATE	CYANIDE
SAMPLE CONTAINER 2 x 40 mL glass vials (5g Soil core)/Methanol) or 2 x Hermetic samplers	SAMPLE CONTAINER PUF, Impingers, Filters, XAD Trap	SAMPLE CONTAINER 2L hdpe	SAMPLE CONTAINER 60 mL hdpe (Zn(OAC) ₂ +NaOH)	SAMPLE CONTAINER 250 mL hdpe (NaOH)	SAMPLE CONTAINER 60 mL opaque hdpe (NaOH)
PRESERVATION Methanol Chill to ≤10°C	PRESERVATION Nil Chill to ≤10°C, method dependent	PRESERVATION Nil Chill to ≤10°C	PRESERVATION Zinc acetate + Sodium hydroxide Chill to ≤10°C	PRESERVATION Sodium hydroxide Chill to ≤10°C	PRESERVATION Sodium hydroxide Chill to ≤10°C
TEST PARAMETER(S) BTEX/VOC, F1/VH/VP, Cl-Aromatics, VFAs, 1,4-Dioxane, C1-CS Gases	TEST PARAMETER(S) PAH, PCB, Dioxins, Aldehydes, Isocyanates, Particulates, Hexavalent Chromium, Metals, Mercury, VOCs	TEST PARAMETER(S) Dustfalls - All tests	TEST PARAMETER(S) Sulfide, Total <u>or</u> Dissolved (field flocculated) Tick the applicable test on the label.	TEST PARAMETER(S) Cyanate Tick the applicable test(s) on the label.	TEST PARAMETER(S) Cyanide, Total/SAD, WAD, Free Tick the applicable test(s) on the label.
NOTES Additional 120 mL glass jar required for moisture. Verify methanol level is at 10 mL fill line before use. Use 2 soil plugs per sample for peat/muskeg samples.	NOTES Shipping and storage temperatures are dependent on the test and method required. Please contact the lab for specific recommendations.	NOTES Use isopropanol (if sampling below freezing point) <u>or</u> algaeicide (if sampling above freezing point).	NOTES Dissolved Sulfide: AlCl ₃ field flocculation kit is provided with instructions. Filtration is not recommended due to oxidation risk.	NOTES	NOTES
HOLDING TIME Field Methanol - 40 days, 14 days (ON); Hermetic Samplers - 48 hours, 7 days (frozen).	HOLDING TIME PAH/VOCs (VOST), Aldehydes/ Formaldehyde - 14 days; Dioxins/PCBs - 7 days to 1 year; Cr(VI) - 30 days; Metals - 180 days; Mercury - 28 days; Isocyanate Impingers - 30 days.	HOLDING TIME Metals, particulates - 6 months; Mercury - 28 days.	HOLDING TIME 7 days	HOLDING TIME 14 days	HOLDING TIME 14 days
GHS - Danger Flammable, Toxic & Health hazard. 			GHS - Danger Corrosive & Environmental hazard 	GHS - Danger Corrosive 	GHS - Danger Corrosive
ORANGE	NAVY BLUE	NAVY BLUE	PINK	DARK GREEN	DARK GREEN

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 38 of 43
Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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BAFFINLAND IRON MINES MANAGEMENT PLAN





BIM-5200-PLA-0004 SAMPLING PROGRAM- QUALITY ASSURANCE AND QUALITY CONTROL PLAN

AIR SAMPLE CONTAINERS	AIR SAMPLE CONTAINERS	AIR SAMPLE CONTAINERS	WATER	WATER	WATER
SOIL VAPOUR	AMBIENT/ INDOOR AIR	INDUSTRIAL HYGIENE TESTING	CHLORATE/ BROMATE/ CHLORITE	CHLOROPHYLL -A	NUTRIENTS
SAMPLE CONTAINER Primarily 1.4L Canisters <i>Sampling times: 4, 10, 20, 60 mins</i>	SAMPLE CONTAINER Primarily 6L Canisters <i>Sampling times: 1, 4, 8, 12, 24 hrs TWA</i>	SAMPLE CONTAINER Filters, Tubes, Pre-Treated Cr(VI) Filters	SAMPLE CONTAINER 60 mL UV-inhibited hdpe (EDA)	SAMPLE CONTAINER 15 mL opaque tube (filters) 250 mL opaque hdpe	SAMPLE CONTAINER 100 mL amber glass (H2SO4)
PRESERVATION Nil	PRESERVATION Nil	PRESERVATION Nil Chill to ≤10°C method dependant; Cr(VI) Freeze to ≤ -18°C	PRESERVATION Ethylenediamine Chill to ≤10°C	PRESERVATION Nil Chill to ≤10°C, Freeze filters	PRESERVATION Sulfuric acid Chill to ≤10°C
TEST PARAMETER(S) VOC (60+ compounds TO15), F1-F2, Aliphatic/ Aromatic Fractionation, BTEX+Naphthalene, C1-C5 Hydrocarbons, Fixed Gases, Reduced Sulfur Compounds	TEST PARAMETER(S) VOC (60+ compounds TO15), F1-F2, Aliphatic/ Aromatic Fractionation, BTEX+Naphthalene, C1-C5 Hydrocarbons, Fixed Gases, Reduced Sulfur Compounds, Chlorinated Degradation Compounds	TEST PARAMETER(S) PAH, PCBs, VOC, Dioxins, Aldehydes/Formaldehyde, Metals, Isocyanates, Asbestos Filters, Particulates, Metals, Mercury, Cr(VI) Ambient Air Filters	TEST PARAMETER(S) Bromate, Chlorate and Chlorite	TEST PARAMETER(S) Chlorophyll a	TEST PARAMETER(S) Nutrients, Total <u>or</u> Dissolved (COD, NH3, TKN/DRN, TN/ DN, TOC/DOC, TP/TDP, Total Phenols) Tick the applicable checkbox on the label.
NOTES Canisters should not be held >30 days prior to sampling. Check Canister pressure before deployment.	NOTES Canisters should not be held >30 days prior to sampling. Check Canister pressure before deployment. 1 L or 1.4 L Canisters may be used for sampling events ≤ 60 mins.	NOTES Shipping and storage Temperatures are dependent on the test and method required. Please contact the lab for specific recommendations.	NOTES For drinking water systems that use chlorine dioxide treatment only, samples should be sparged with an inert gas (helium, argon, nitrogen) for approximately 5-10 minutes. Ethylenediamine (EDA) must be added immediately after sparging.	NOTES Field filter minimum 250 mL sample. Place filter(s) in tube & record filtered volume on CoC. Freeze before shipping to the lab. For lab filtration, ship immediately to the lab.	NOTES Field filtration is recommended for Dissolved Parameters (preserve after filtration).
HOLDING TIME VOCs including BTEX (TO15), F1-F2 - 30 days Reduced Sulfur Compounds - 7 days	HOLDING TIME VOCs including BTEX (TO15), F1-F2 - 30 days Reduced Sulfur Compounds - 7 days Fixed Gases - 30 days (Canisters), 72 hrs (Tedlar bag) Confirm Tedlar bag samples with lab before submission.	HOLDING TIME PAH/Aldehydes/ Formaldehyde - 14 days; Asbestos/Particulates - unlimited; Isocyanate filters - 15 days; Dioxins/ PCBs - 7 days; Metals - 180 days; Mercury - 28 days; Cr(VI) - 10 days.	HOLDING TIME Bromate/Chlorate- 28 days; Chlorite-14 days.	HOLDING TIME 48 hours (lab filtered); 28 days (field filtered, frozen).	HOLDING TIME 28 days
GHS - Warning Irritant 	GHS - Danger Corrosive 	GHS - Danger Corrosive 	GHS - Warning Irritant 	GHS - Danger Corrosive 	GHS - Danger Corrosive 
NAVY BLUE	NAVY BLUE	NAVY BLUE	BEIGE	BLACK	PURPLE

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 39 of 43
Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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BAFFINLAND IRON MINES MANAGEMENT PLAN






BIM-5200-PLA-0004 SAMPLING PROGRAM- QUALITY ASSURANCE AND QUALITY CONTROL PLAN

WATER	WATER	WATER	WATER	WATER	WATER
THIOCYANATE	METALS	MERCURY	METALS (Lab Preserved)	MERCURY (Lab Preserved)	METHYL MERCURY
SAMPLE CONTAINER 60 mL hdpe (HNO ₃)	SAMPLE CONTAINER 60 mL hdpe (HNO ₃) 1 L hdpe (HNO ₃), ON Pb DW	SAMPLE CONTAINER 40 mL glass (HCl)	SAMPLE CONTAINER 60 mL hdpe	SAMPLE CONTAINER Routine - 40 mL glass Low - 125 mL Teflon™ or glass Trace - 125 mL Teflon™ or glass (precleaned)	SAMPLE CONTAINER 250 mL amber glass (HCl) - freshwater or (H ₂ SO ₄) - seawater
PRESERVATION Nitric acid Chill to ≤10°C	PRESERVATION Nitric acid	PRESERVATION Hydrochloric acid Chill to ≤10°C	PRESERVATION Nil Chill to ≤10°C	PRESERVATION Nil Chill to ≤10°C	PRESERVATION Hydrochloric acid or Sulfuric acid Chill to ≤10°C
TEST PARAMETER(S) Thiocyanate	TEST PARAMETER(S) Metals, Total or Dissolved (field filtered) Tick the applicable test on the label. O.Reg. 243 & 170/03 15.1 require Total Lead. Tick the 'Field Filtered' checkbox if applicable.	TEST PARAMETER(S) Mercury, Total or Dissolved (field filtered) Tick the applicable test on the label. Tick the 'Field Filtered' checkbox if applicable.	TEST PARAMETER(S) Metals (lab preserved), Total or Dissolved (field filtered). Recommended for Ultra-Trace Metals. Not applicable in Ontario. Tick the applicable test on the label. Tick the 'Field Filtered' checkbox if applicable.	TEST PARAMETER(S) Mercury (lab preserved), Total or Dissolved (field filtered). Not applicable in Ontario. Tick the applicable test on the label. Tick the 'Field Filtered' checkbox if applicable.	TEST PARAMETER(S) Methyl Mercury, Total or Dissolved (field filtered) Tick the applicable test on the label. Tick the 'Field Filtered' checkbox if applicable.
NOTES	NOTES Field filtration is recommended for Dissolved Parameters. Lab Preserved option is recommended for Trace Metals.	NOTES Field filtration is recommended for Dissolved Parameters. Lab Preserved option is recommended for Low and Trace Mercury.	NOTES Field filtration is recommended for Dissolved Parameters. Not recommended for rush testing.	NOTES Field filtration is recommended for Dissolved Parameters. Not recommended for rush testing.	NOTES Field filtration is recommended for Dissolved Parameters. Freshwaters Preserve with hydrochloric acid. Seawaters (>500 ppm chloride or >1 ‰ salinity); Preserve with sulfuric acid.
HOLDING TIME 14 days	HOLDING TIME 180 days 60 days (ON), 30 days (ON-MISA).	HOLDING TIME 28 days	HOLDING TIME 180 days	HOLDING TIME 28 days	HOLDING TIME 180 days
GHS - Danger Corrosive 	GHS - Danger Corrosive 	GHS - Danger Corrosive & Irritant 			GHS - Danger Corrosive & Irritant 
RED	RED	YELLOW	RED/GREEN	RED/GREEN	YELLOW









BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 40 of 43
Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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BAFFINLAND IRON MINES MANAGEMENT PLAN

BIM-5200-PLA-0004 SAMPLING PROGRAM- QUALITY ASSURANCE AND QUALITY CONTROL PLAN

WATER	WATER	WATER	WATER	WATER	WATER
FERROUS IRON	SELENIUM SPECIATION	ARSENIC SPECIATION	ALDEHYDES	HALOACETIC ACIDS	OIL & GREASE
SAMPLE CONTAINER 60 mL opaque hdpe (HCl)	SAMPLE CONTAINER 60 mL opaque hdpe	SAMPLE CONTAINER 60 mL opaque hdpe (EDTA/Acetic acid)	SAMPLE CONTAINER 2 x 40 mL glass vials (NH ₄ Cl+CuSO ₄)	SAMPLE CONTAINER 100 mL amber glass (NH ₄ Cl)	SAMPLE CONTAINER 2 x 250 mL <u>or</u> 2 x 100 mL amber glass (HCl)
PRESERVATION Hydrochloric acid Chill to ≤10°C	PRESERVATION Nil Chill to ≤10°C Keep in dark	PRESERVATION EDTA + Acetic acid Chill to ≤10°C	PRESERVATION Ammonium Chloride + Copper sulfate Chill to ≤10°C	PRESERVATION Ammonium Chloride Chill to ≤10°C	PRESERVATION Hydrochloric acid Chill to ≤10°C
TEST PARAMETER(S) Dissolved Ferrous Iron (field filtered)	TEST PARAMETER(S) Speciated Selenium (non-volatile), Dissolved (field filtered) Tick the 'Field Filtered' checkbox if applicable.	TEST PARAMETER(S) Speciated Arsenic, Dissolved (field filtered) Tick the 'Field Filtered' checkbox if applicable.	TEST PARAMETER(S) Formaldehyde	TEST PARAMETER(S) Haloacetic Acids	TEST PARAMETER(S) Total Oil+Grease and Mineral Oil+Grease <u>or</u> Oil+Grease (FTIR)
NOTES Field filtration is recommended.	NOTES Field filtration (0.2 µm) is recommended for dissolved parameters.	NOTES Field filtration is recommended for dissolved parameters. Fill bottle (contains EDTA) with sample, then add acetic acid preservative from separate vial provided.	NOTES Fill with zero headspace.	NOTES Fill with zero headspace.	NOTES 2 x 250 mL - Gravimetric; 2 x 100 mL - FTIR.
HOLDING TIME 7 days - if field filtered using 0.45 µm filters.	HOLDING TIME 30 days	HOLDING TIME 28 days	HOLDING TIME 7 days	HOLDING TIME 14 days	HOLDING TIME 28 days
GHS - Danger Corrosive & Irritant		GHS - Danger Corrosive & Irritant	GHS - Warning Irritant	GHS - Warning Irritant	GHS - Danger Corrosive & Irritant
					
YELLOW	GREEN	CHERRY	BROWN	BROWN	YELLOW

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 41 of 43
Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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WATER	WATER	WATER	WATER	WATER	WATER
HEXAVALENT CHROMIUM	HEXAVALENT CHROMIUM (Ontario only)	RADIOCHEMISTRY	VOC	HYDROCARBONS / PAH	PHENOLICS
SAMPLE CONTAINER 60 mL hdpe (NaOH)	SAMPLE CONTAINER 60 mL hdpe [NaOH/(NH ₄) ₂ SO ₄ /NH ₄ OH]	SAMPLE CONTAINER 250 mL hdpe (HNO ₃) <u>or</u> 1 L hdpe (HNO ₃)	SAMPLE CONTAINER 2 x 40 mL glass vials (NaHSO ₄)	SAMPLE CONTAINER 2 x 100 mL amber glass (NaHSO ₄)	SAMPLE CONTAINER 2 x 500 mL amber glass (NaHSO ₄)
PRESERVATION Sodium hydroxide Chill to ≤10°C	PRESERVATION Sodium hydroxide + Ammonium sulfate + Ammonium hydroxide, Chill to ≤10°C	PRESERVATION Nitric acid Ambient temperature	PRESERVATION Sodium bisulfate Chill to ≤10°C	PRESERVATION Sodium bisulfate Chill to ≤10°C	PRESERVATION Sodium bisulfate Chill to ≤10°C
TEST PARAMETER(S) Hexavalent Chromium, Total <u>or</u> Dissolved (field filtered)	TEST PARAMETER(S) Hexavalent Chromium, Total <u>or</u> Dissolved (field filtered)	TEST PARAMETER(S) Gross alpha/beta Radium 226, Gamma, Isotopes (Th, U, Pb, Sr, Po, Pu)	TEST PARAMETER(S) BTEX/VOC/THM, F1/VH/ VPH, VFAS, 1,4-Dioxane, Chlorinated Aromatics, C1-C5 Gases, Glycols	TEST PARAMETER(S) EPH, LEPH/HEPH, F2-F4, PAHs <u>or</u> Alkylated PAHs <u>or</u> NTA (BC, preserved)	TEST PARAMETER(S) Phenolics, Chlorinated and Non-chlorinated
Tick the applicable test on the label. Tick the 'Field Filtered' checkbox if applicable.	Tick the applicable test on the label. Tick the 'Field Filtered' checkbox if applicable.				
NOTES Field filtration is recommended for dissolved parameters.	NOTES Field filtration is recommended for dissolved parameters.	NOTES 250 mL - Gross alpha/beta 1 L - Ra 226, gamma or isotopes (+ extra 1 L per listed isotope).	NOTES Fill with zero headspace. For chlorinated water (except C1-C5 gases), use sodium thiosulfate preservative (light blue label).	NOTES If sample volume is limited, VOCs may also be tested from this bottle (zero headspace required for VOCs).	NOTES
HOLDING TIME 28 days	HOLDING TIME 28 days	HOLDING TIME 180 days	HOLDING TIME 14 days;	HOLDING TIME 14 days	HOLDING TIME 14 days
GHS - Danger Corrosive 	GHS - Danger Corrosive, Irritant & Environmental hazard   	GHS - Danger Corrosive 	GHS - Danger Corrosive 	GHS - Danger Corrosive 	GHS - Danger Corrosive 
DARK GREEN	DARK GREEN	RED	BLUE	BLUE	BLUE

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 42 of 43
Site Wide	Next Review date: 2025-01-01	Revision: 7.03
Document Owner: Environmental Superintendent	Document Approver: General Manager	
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BAFFINLAND IRON MINES MANAGEMENT PLAN

BIM-5200-PLA-0004 SAMPLING PROGRAM- QUALITY ASSURANCE AND QUALITY CONTROL PLAN

WATER	WATER	WATER	WATER	WATER	WATER
SEMI VOL ORGANICS (ROUTINE)	SEMI VOL ORGANICS (LOW LEVEL)	ALCOHOLS/ GLYCOLS	General Water Quality	TSS & TDS (Low Level)	BOD <u>or</u> CBOD
SAMPLE CONTAINER 1 <u>or</u> 2 x 100 mL amber glass	SAMPLE CONTAINER 2 x 500 mL amber glass	SAMPLE CONTAINER 2 x 40 mL glass vials	SAMPLE CONTAINER 250 mL hdpe 60 mL hdpe (Anions only)	SAMPLE CONTAINER 500 mL hdpe 145 mL hdpe (Whole Bottle TSS)	SAMPLE CONTAINER 500 mL hdpe
PRESERVATION Nil Chill to ≤10°C	PRESERVATION Nil Chill to ≤10°C	PRESERVATION Nil Chill to ≤10°C	PRESERVATION Nil Chill to ≤10°C	PRESERVATION Nil Chill to ≤10°C	PRESERVATION Nil Chill to ≤10°C
TEST PARAMETER(S) OCP/PCB/OPP/Toxaphene <u>or</u> NDMA/Nitrosamines <u>or</u> Alkanolamines (MEA, DEA, DIPA) <u>or</u> Nonylphenol Ethoxylates <u>or</u> Sulfolane <u>or</u> Bisphenol A <u>or</u> Carbamates	TEST PARAMETER(S) SVOC (Low-Level) <u>or</u> NDMA/Nitrosamines (Low-Level) <u>or</u> PCBs (Low-Level)	TEST PARAMETER(S) Alcohols and Glycols	TEST PARAMETER(S) Acidity, Alkalinity, Anions (Cl, Br, SO ₄ , F, NO ₃ , NO ₂), Colour, Conductivity, ORP, Orthophosphate, pH, Silica, Tannin & Lignin, TIC/DIC, Turbidity, UV Abs/Trans, Routine Level TDS (10 mg/L LOR) and Routine Level TSS (3 mg/L LOR) <u>or</u> NTA <u>or</u> Total VFA	TEST PARAMETER(S) TSS Low (1 mg/L LOR) + all General Water Quality tests, <u>or</u> Whole Bottle TSS	TEST PARAMETER(S) BOD <u>or</u> CBOD
NOTES 2 x 100 mL - OCP/PCB/OPP/Toxaphene; 1 x 100 mL - All other tests.	NOTES	NOTES	NOTES pH should be tested in the field as per CCME, BC ENV.	NOTES	NOTES Please submit immediately to the lab.
HOLDING TIME PCBs - unlimited, 14 days (ON); OCP/OPP/Toxaphene - 7 days, 14 days (ON); NDMA/Nitrosamines - 14 days; Alkanolamines/Carbamates/ NPE/Sulfolane - 7 days; Bisphenol A - 28 days.	HOLDING TIME SVOC - 7 days, 14 days (ON); NDMA/Nitrosamines - 14 days; PCBs - unlimited, 14 days (ON)	HOLDING TIME 7 days	HOLDING TIME pH - 15 mins, 4 days (ON-MISA), 28 days (ON); Alkalinity/Acidity - 14 days; EC/Br/Cl/F/SO ₄ - 28 days; EC - 4 days (ON-MISA); TSS/TDS - 7 days; Colour/Turbidity - 3 days, 2 days (ON); Orthophosphate/NO ₂ /NO ₃ /NH ₃ - 3 days, 7 days (ON); NTA - 30 days (ON); 24 hours (BC); Total VFA - 7 days.	HOLDING TIME TSS/TDS - 7 days see General Water Quality for other tests.	HOLDING TIME BOD/CBOD - 48 hours (AB, MB, Pulp and Paper); 3 days (BC); 4 days (ON).
ORANGE	ORANGE	ORANGE	GREEN	GREEN	GREEN

BIM-5200-PLA-0004 Sampling Program- Quality Assurance and Quality Control Plan	Issue Date: 2025-05-27	Page 43 of 43
Site Wide	Next Review date: 2025-01-01	Revision: 7.03
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