Baffinland

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31 March 2019

RE: Mary River Project - Changes to Surveillance Network Program (SNP)
Type 'A' Water Licence 2AM-MRY1325 - Amendment No. 1

In accordance with Part I, Items 6 & 28 of the Baffinland Iron Mines Corporation's (Baffinland) Type 'A' Water Licence – 2AM-MRY1325 - Amendment No. 1 (Type 'A' Water Licence) for the Mary River Project (Project), Baffinland is pleased to submit this request for approval for proposed changes to the Project's Surveillance Network Program (SNP), outlined in Schedule I of the Type 'A' Water Licence.

The SNP outlines the monitoring requirements for Project effluents discharged to the receiving environment and surface water drainage downstream of specific Project areas, and includes monitoring stations, monitoring frequency and station specific water quality criteria and parameters. Current SNP monitoring stations at the Milne Port and the Mine Site, as presented in Schedule I of the Type 'A' Water Licence are presented in Figures 1 and 2.

As shown in Figures 1 and 2, the SNP currently includes monitoring stations for areas and infrastructure originally established for the Exploration Phase of the Project, including the Bulk Sample Program in 2008. Decommissioning of Exploration Phase infrastructure along with continued development and repurposing of the 2008 Bulk Sample Program areas have resulted in several of these monitoring stations becoming inactive during Early Revenue Phase (ERP) operations.

To optimize the SNP and reconcile the SNP monitoring stations with the current Project infrastructure and areas, Baffinland proposes discontinuing SNP monitoring stations MP-MRY-4, MP-MRY-4A, MP-MRY-7, MP-MRY-12, MS-MRY-11 at Milne Port and the Mine Site, and relocating SNP monitoring stations MS-MRY-9 and MS-MRY-10 at the Mine Site. A summary of the proposed changes to the SNP monitoring stations and associated justifications for the changes are presented in Table 1 below.

TABLE 1 – PROPOSED CHANGES TO SNP

Station ID	Station Description	Proposed Change	Reason for Change
Milne Port			
MP-MRY-4	Milne Port Exploration Phase Sewage Treatment Facilities	Discontinue monitoring station. Remove monitoring station from Table 13 (Schedule I).	The Milne Port Exploration Phase Sewage Treatment Facilities have been decommissioned and are no longer in operation at the Project. Treated sewage effluent is currently discharged from SNP Station ID MP-01.
MP-MRY-4A	Milne Port Exploration Phase Sewage Polishing Waste Stabilization Pond (PWSP)	Discontinue monitoring station. Remove monitoring station from Table 13 (Schedule I).	The Milne Port Exploration Phase PWSP has been decommissioned and is no longer in operation at the Project. Effluent from the ERP PWSP is currently discharged from SNP Station ID MP-01A.

Station ID	Station Description	Proposed Change	Reason for Change
Milne Port			
MP-MRY-7	Milne Port Exploration Phase Bladder Fuel Storage Facility - Stormwater	Discontinue monitoring station. Remove monitoring station from Table 13 (Schedule I).	The Milne Port Exploration Phase Bladder Fuel Storage Facility has been decommissioned and is no longer in operation at the Project. Fuel at Milne Port is currently stored at the Bulk Fuel Storage Facility, monitored under SNP Station ID MP-03.
MP-MRY-12	Milne Port Bulk Sample Stockpile Area - Surface Water Drainage/Seepage	Discontinue monitoring station. Remove monitoring station from Table 13 (Schedule I).	Exploration Phase ore stockpiles associated with MP-MRY-12 have been removed and/or capped as a result of ERP construction and development at Milne Port. As shown in Figure 1, surface flows once monitored by MP-MRY-12 are now captured and retained by surface water management ponds associated with the Milne Port Ore Stockpile Facility. The Facility's surface water management ponds are monitored under existing SNP Station IDs MP-05 and MP-06.
Mine Site			
MS-MRY-9	Bulk Sample Open Pit – Surface Water Drainage	Change location of monitoring station to monitor Deposit No. 1 surface water drainage. Change station description in Table 14 (Schedule I).[1]	Continued active mining within the Deposit No. 1 pit area has resulted in the lack of flows at MS-MRY-9. The proposed new location for MS-MRY-9 will allow for the long-term monitoring of Deposit No. 1 surface water drainage.
MS-MRY-10	Bulk Sample Weathered Ore Stockpile – Downstream Surface Water Drainage	Change location of monitoring station to monitor Deposit No. 1 surface water drainage. Change station description in Table 14 (Schedule I).[1]	Exploration Phase ore stockpiles associated with MS-MRY-10 have been removed. The area associated with MS-MRY-10 has been repurposed as a laydown to support ERP mining operations at Deposit No. 1. The proposed new location for MS-MRY-10 will allow for the long-term monitoring of Deposit No. 1 surface water drainage and will be located with the highlighted area identified in Figure 3. Exact location of MS-MRY-10 will be assessed during the summer of 2019.
MS-MRY-11	Bulk Sample Processing Stockpile Area – Downstream Surface Water Drainage	Discontinue monitoring station. Remove monitoring station from Table 14 (Schedule I).	Exploration Phase ore stockpiles associated with MS-MR-11 have been removed. The area associated with MS-MRY-11 has been repurposed as a laydown to support ERP operations.

Notes:

[1]Station description to be changed to "Deposit No. 1 Mining Operations – Downstream Surface Water Drainage".

Proposed new locations for SNP stations MS-MRY-9 and 10 are presented in Figure 3. Coordinates for the new locations of MS-MRY-9 are provided are in Table 2. The new locations/areas for MS-MRY-9 and MS-MRY 10 have been selected to provide sufficient coverage for the monitoring of surface water drainage downstream of active mining operations at Deposit No. 1.

During 2019, Baffinland will assess the MS-MRY-10 monitoring area identified in Figure 3 and determine a suitable location for MS-MRY-10. Factors that will be considered in identifying a suitable location for MS-MRY-10 will include safety, accessibility, the presence of reoccurring surface water flows and the source of flows.

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TABLE 2 – NEW COORDINATES FOR DEPOSIT NO. 1 SNP MONITORING STATIONS

Monitoring Station	MS-MRY-9	MS-MRY-10
Coordinates (UTM; NAD 83)	17 W 561080 7915078	TBD (refer to Figure 3)

Current SNP monitoring requirements for MS-MRY-9 and 10, stipulated in Tables 12 and 14 (Schedule I) of the Type 'A' Water Licence, are summarized in Table 3. To address the Group 1 monitoring requirement, Baffinland will employ weirs equipped with data loggers or other similar methods to quantify flow rates at the proposed locations for MS-MRY-9 and 10. Because the original MS-MRY-9 and 10 monitoring stations were established to monitor active mining and ore processing areas associated with Deposit No. 1, no changes to the current SNP water quality monitoring requirements (Group 3 and 7) are proposed in this submission. Routine water quality monitoring at MS-MRY-9 and 10 will be conducted at the frequencies stipulated by the Type 'A' Water Licence for Group 3 and 7 monitoring requirements.

TABLE 3 – SNP MONITORING REQUIREMENTS – MS-MRY-9 AND MS-MRY-10

Parameter Group	Parameters	Monitoring Frequency
Group 1	Water discharge volume (m^3)	Monthly (summer/periods of flow)
Group 7	**General Parameters:** pH, total suspended solids, total dissolved solids, alkalinity, hardness, turbidity, Total Kjeldahl Nitrogen, ammonia nitrogen, nitrate nitrogen, dissolved organic carbon, total organic carbon, total phosphorus, sulphate, fluoride, chloride. **Total and Dissolved Metals:** Aluminum, arsenic, cadmium, calcium, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, potassium, selenium, sodium, thallium, uranium, zinc. **Field Parameters:** pH, temperature, turbidity, specific conductance.	Monthly (summer/periods of flow)
Group 3	**Acute lethality to Rainbow Trout (*Oncorhynchus mykiss*)** (as per Environment Canada's Environmental Protection Series Biological Test Method EPS/1/RM/13) **Acute lethality to *Daphnia magna*** (as per Environment Canada's Environmental Protection Series Biological Test Method EPS/1/RM/14).	Annually

We trust that this information meets the requirements under Part I of the Type 'A' Water Licence and look forward to the NWB's response. Please do not hesitate to contact the undersigned should you have any questions or comments.

Regards,

Christopher Murray
Environmental & Regulatory Compliance Manager

Cc:
Karén Kharatyan (Nunavut Water Board)
Jared Ottenhof (Qikiqtani Inuit Association)
Bridget Campbell, Ian Parsons, Justin Hack, Jonathan Mesher (Crown-Indigenous Relations and Northern Affairs Canada)

ATTACHMENTS:
Figure 1 – Milne Port – Drainage and Water Licence Monitoring Locations
Figure 2 – Mine Site – Drainage and Water Licence Monitoring Locations
Figure 3 – Mine Site – Water Licence Monitoring Locations – Post Change

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ATTACHMENTS

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502 200 E
502 800 E
503 400 E
504 000 E
504 600 E
505 200 E
7 976 300 N
7 975 700 N
7 975 100 N
7 974 500 N
7 973 900 N

MILNE INLET
PHILLIPS CREEK
ORE DOCK AND SHIPLOADER
SEALIFT BARGE LANDING AREA
MP-01, MP-01A, MP-03 EFFLUENT OUTFLOW POINT (END OF PIPE)
EXISTING HTO CABIN
MP-MRY-12
MP-C-H
MP-06
MP-05
MP-C-E
MP-03
MP-C-F
MP-02
MP-MRY-04A
MP-MRY-7
MP-01A
MP-01
LP2
EQUIPMENT / SUPPLY LAYDOWN
ORE STOCKPILE FACILITY
MP-MRY-04
WEATHERHAVEN (MATRIX CAMP)
MP-C-B
MP-C-B01
LANDFARM FACILITY
MP-04
MP-04A
HELICOPTER LANDING
ORE HAUL TRUCK SERVICES PAD
MP-MRY-2
MP-Q1-02
APPROXIMATE EXTENT OF QUARRY Q1 DEVELOPMENT
CONTAINED REFUELING DEPOT
W10B
MP-Q1-01
380-PERSON CAMP PAD
LP5
LP3
KM2 BORROW SOURCES
TOTE ROAD (NEW ALIGNMENT)
LAYDOWN LP7
OPEN BURN LOCATION
TOTE ROAD (OLD ALIGNMENT)
LAYDOWN R1
COMMERCIAL LEASE BOUNDARY
LAYDOWN R2
COMMERCIAL LEASE BOUNDARY

- MOBILE MAINTENANCE FACILITIES
- ACCOMMODATION COMPLEX
- EMERGENCY RESPONSE OFFICE / GARAGE
- SEWAGE TREATMENT PLANT
- POTABLE WATER TREATMENT PLANT
- WASTE MANAGEMENT BUILDING
- BULK FUEL FACILITY
- CONTAINMENT BERMS:
  - MP-HWB-1
  - MP-HWB-2
  - MP-HWB-3
  - MP-HWB-4

MARINE MANIFOLD BUILDING
WELDING SHOP
CONTAINMENT BERM - MP-HWB-1
MP-C-F
MP-03
BULK FUEL FACILITY
CONTAINED DIESEL TRANSFER STATION
MP-02
MOBILE MAINTENANCE FACILITIES
CONTAINED JET-A TRANSFER STATION
EMERGENCY RESPONSE OFFICE / GARAGE
PWSP NO. 1
MAIN GENERATORS
MP-01A
POTABLE WATER TREATMENT PLANT
ACCOMMODATION COMPLEX
CONTAINMENT BERMS MP-HWB-3 AND MP-HWB-4
WASTE MANAGEMENT BUILDING
MP-01
SEWAGE TREATMENT PLANT
CONTAINMENT BERM - MP-HWB-2

SCALE A 120 60 0 200 400 600 m

LEGEND:

- WATER
- BORROW AREAS
- QUARRY AREA
- INUIT OWNED LAND - SURFACE ONLY EXCLUDING MINERALS
- APPROVED INFRASTRUCTURE TO BE CONSTRUCTED
- DRAINAGE DIRECTION
- RIVER/STREAM/DRAINAGE
- ROAD
- POTENTIAL DEVELOPMENT AREA
- QIA SURFACE COMMERCIAL LEASE IMPACT BOUNDARY
- FORESHORE LEASE BOUNDARY
- SNP
- INACTIVE SNP
- EFFLUENT OUTFLOW POINT (END OF PIPE)

NOTES:

1. COORDINATE GRID IS UTM NAD83 ZONE 17N.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005).
3. CONTOUR INTERVAL IS 10 METRES.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	27MAR'19	ISSUED WITH TRANSMITTAL	AV	AS	AV

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MARY RIVER PROJECT

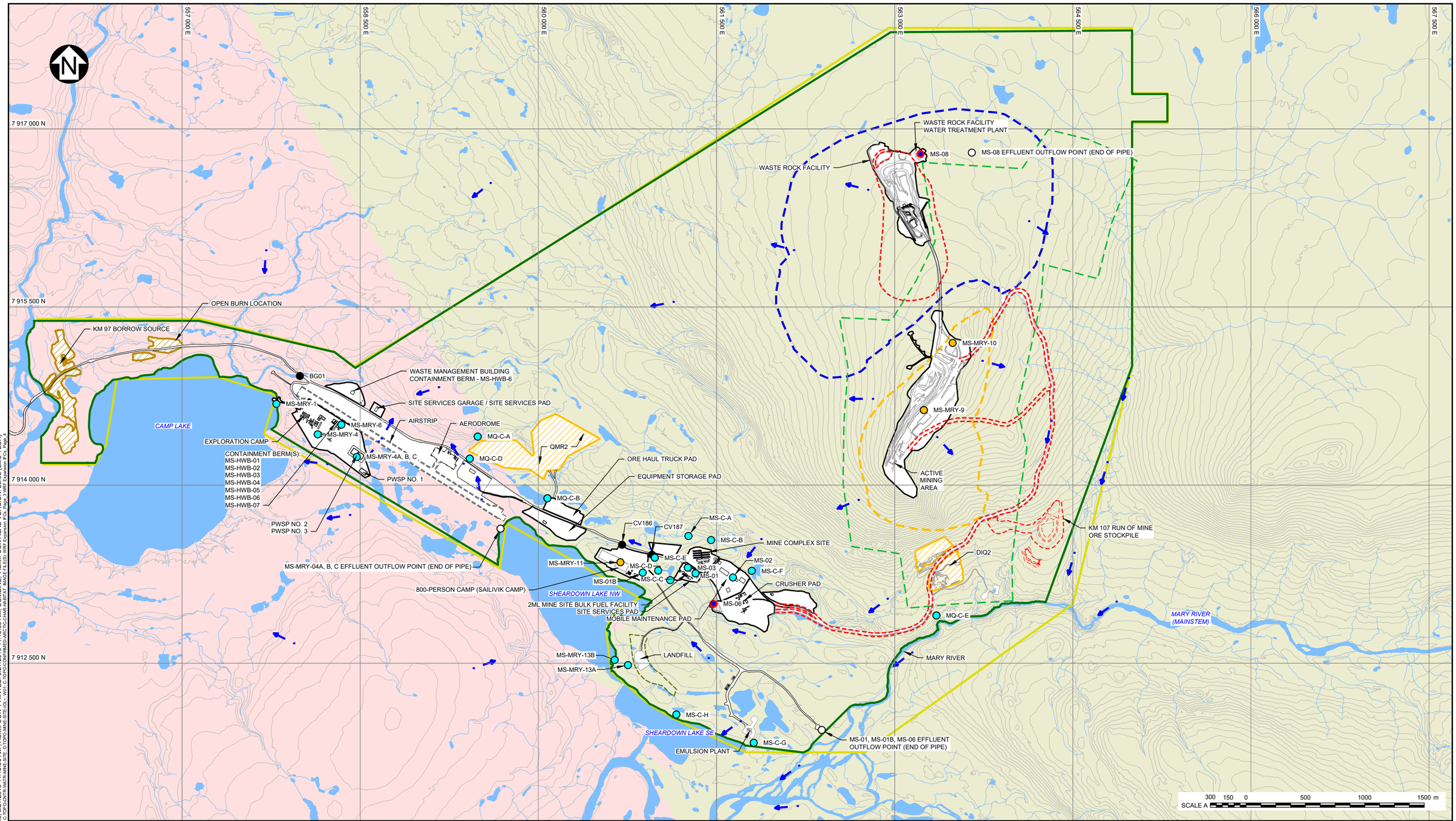
MILNE PORT
DRAINAGE AND WATER LICENCE
MONITORING LOCATIONS

Knight Piésold CONSULTING

P/A NO. NB102-181/54
REF NO. NB19-00254

FIGURE 1

REV 0



LEGEND:

- QUARRY
- BORROW AREA
- INUIT OWNED LAND SURFACE AND SUBSURFACE
- INUIT OWNED LAND SURFACE ONLY
- CONTOUR
- WATER
- QIA SURFACE COMMERCIAL LEASE BOUNDARY
- POTENTIAL DEVELOPMENT AREA BOUNDARY
- ULTIMATE DEPOSIT 1 PIT LIMITS
- ULTIMATE WASTE ROCK STOCKPILE LIMITS
- DEPOSIT NO. 1 MINING LEASE 2484
- ULTIMATE LANDFILL LIMITS
- APPROVED INFRASTRUCTURE UPGRADES TO BE CONSTRUCTED
- CULVERT
- SNP / MDMER
- SNP
- INACTIVE SNP
- EFFLUENT OUTFLOW POINT (END OF PIPE)
- DRAINAGE DIRECTION

NOTES:

1. COORDINATE GRID IS UTM NAD83, ZONE 17.
2. DETAILED WATER AND CONTOURS FROM EAGLE MAPPING (2005). CONTOUR INTERVAL IS 10 m.
3. CURRENT MINE AREA FROM THE WASTE DUMP TO THE CRUSHER PAD, AND DITCHES ALONG THE HAUL ROAD PROVIDED BY BIM (MARCH 12, 2018).
4. ALL OTHER SITE INFRASTRUCTURE PROVIDED BY HATCH (AUGUST 2, 2016). AND SIMPLIFIED BY KP STAFF (JAN, 2018).

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	27MAR'19	ISSUED WITH TRANSMITTAL	AV	AS	RAC

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

MINE SITE DRAINAGE AND WATER LICENCE MONITORING LOCATIONS

Knight Piésold CONSULTING

P/A NO.	REF NO.
NB102-181/54	NB19-00254

FIGURE 2 — REV 0

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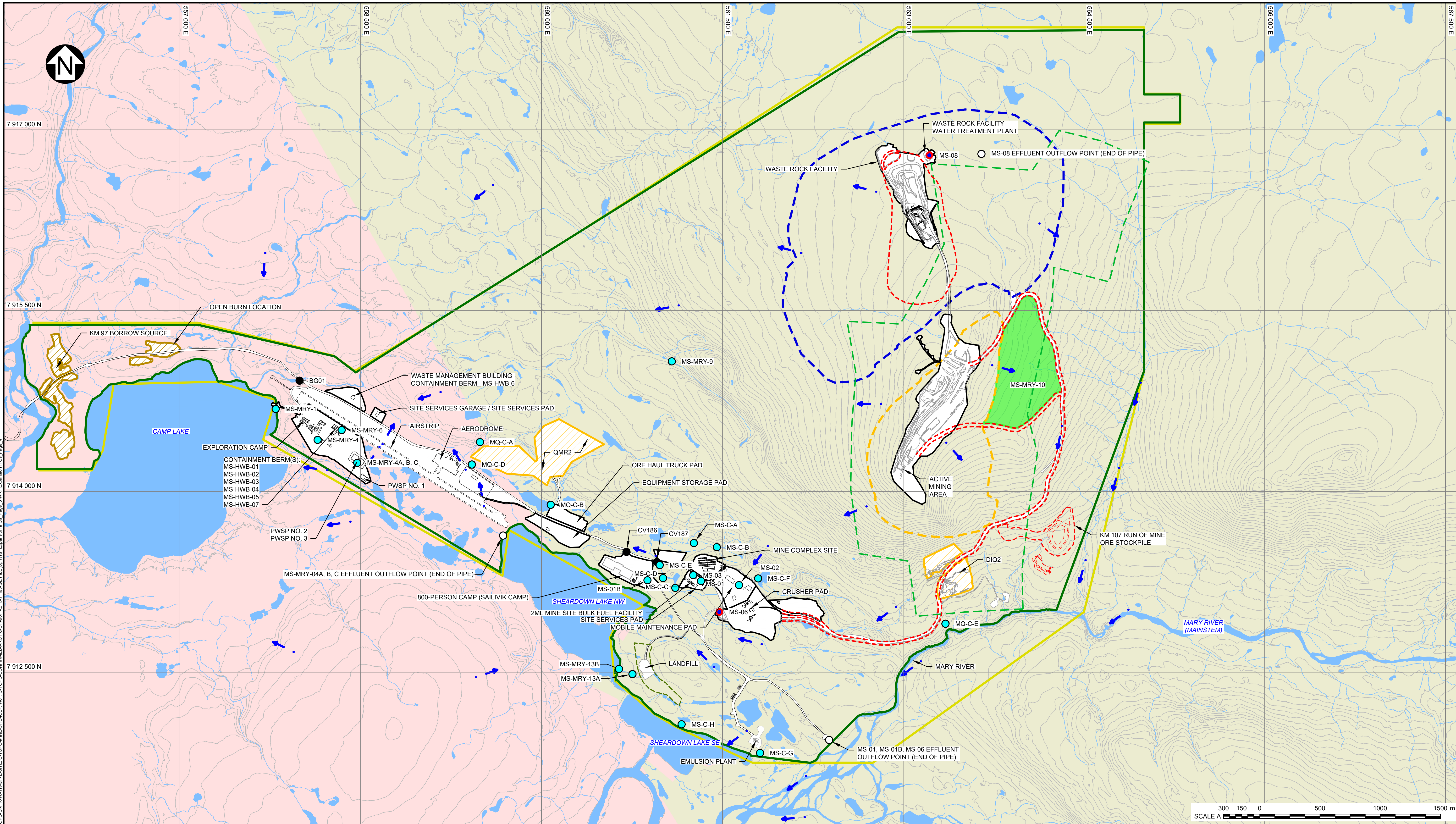

LEGEND:

- QUARRY
- BORROW AREA
- INUIT OWNED LAND SURFACE AND SUBSURFACE
- INUIT OWNED LAND SURFACE ONLY
- CONTOUR
- WATER
- QIA SURFACE COMMERCIAL LEASE BOUNDARY
- POTENTIAL DEVELOPMENT AREA BOUNDARY
- ULTIMATE DEPOSIT 1 PIT LIMITS
- ULTIMATE WASTE ROCK STOCKPILE LIMITS
- DEPOSIT NO. 1 MINING LEASE 2484
- ULTIMATE LANDFILL LIMITS
- APPROVED INFRASTRUCTURE UPGRADES TO BE CONSTRUCTED
- MONITORING AREA FOR MS-MRY-10
- CULVERT
- SNP / MDMER
- SNP
- EFFLUENT OUTFLOW POINT (END OF PIPE)
- DRAINAGE DIRECTION

NOTES:

1. COORDINATE GRID IS UTM NAD83, ZONE 17.
2. DETAILED WATER AND CONTOURS FROM EAGLE MAPPING (2005). CONTOUR INTERVAL IS 10 m.
3. CURRENT MINE AREA FROM THE WASTE DUMP TO THE CRUSHER PAD, AND DITCHES ALONG THE HAUL ROAD PROVIDED BY BIM (MARCH 12, 2018).
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BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

MINE SITE
WATER LICENCE MONITORING LOCATIONS
POST CHANGE

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P/A NO.	REF NO.
NB102-181/54	NB19-00269

FIGURE 3 REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	29MAR'19	ISSUED WITH TRANSMITTAL	AV	AS	RAC