

Appendix 3

Project Description and Scope of the Amended Type “B” Water Licence

Appendix 3 – Project Description

Application for Renewal and Amendment to Type “B” Water Licence 8BC-MRY1314

1.0 Introduction

Baffinland Iron Mines Corporation (“**Baffinland**”) is applying for renewal and amendment to Type “B” Water Licence 8BC-MRY1314 (the “**Type B Water Licence**”) to accommodate expected temporary water use demands during peak preparation and earthworks activities associated with the Early Revenue Phase (ERP), as well as any associated deposit of “waste” (as that term is used in the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*).

As background, currently under its Type “A” Water Licence 2AM-MRY1325 (the “**Type A Water Licence**”), Baffinland is authorized to obtain 68.5 m³/day from Phillips Creek during the summer period and 68.5 m³/day from km 32 Lake on the Milne Inlet Tote Road during the winter period. This water use is for, but not limited to, the continued operation of the construction camp built in 2013 (Matrix Camp) as well as to utilize for dust suppression on the Tote Road, and such use will continue as permitted during 2014.

Baffinland very recently identified the need to add additional ‘Weatherhaven’ tents to expand the Matrix Camp in order to accommodate the additional manpower needed to construct infrastructure at Milne Port, which increases the water use requirements in the vicinity of Milne Port. Certain facilities associated with the Matrix Camp (e.g. an additional polishing pond) require expansion in order to ensure that all discharge requirements continue to be met. In addition, use of water will be required in order to prepare construction materials (concrete) for the ore dock. Construction and operation of an ore stockpile and an ore dock and ship loading facilities will also occur at Milne Port, including associated earthworks activities. As such, Baffinland is requesting that the renewed and amended Type B Water Licence permit the use of to 299 m³/day of water for combined domestic and construction use.

Baffinland intends the renewal and amendment of the Type B Water Licence to act as a ‘bridging’ water licence until the Type A Water Licence is amended to include the changes to the Mary River Project included in the ERP. At that time, it is anticipated that items in the Type B Water Licence would transition to the Type A Water Licence. Until the Type A Water Licence is amended, all activities permitted under the Type B Water Licence will remain within the water use limit described in the Type B Water Licence. It is anticipated that an application for the amendment to the Type A Water Licence will be submitted to the Nunavut Water Board within 60 days after the submission of this application. This will ensure to the extent possible that any design changes necessary for the ERP are communicated to the Board in one application under the Type A Water Licence, which will in turn support regulatory efficiency.

The facilities and infrastructure proposed to be constructed for the ERP were considered by the Nunavut Planning Commission (“**NPC**”) and by the Nunavut Impact Review Board (“**NIRB**”) as part of the Early Revenue Phase for the Mary River NIRB Project Certificate review undertaken from July 2013 to March 2014. Approval by the Minister of Aboriginal Affairs and Northern Development (“**AANDC**”) of the amendment to Project Certificate No. 005 and approval by the Minister of AANDC as well as the territorial Minister of Environment of amendments to the North Baffin Regional Land Use Plan triggered by the ERP were received on April 28, 2014.

As assessed and reviewed during the NIRB review process, the planned construction activities of the ERP will have minimal additional effects on Nunavut waters and will not generate significant increases in waste, (refer to Section 6.0 of this Project Description and Appendix 4 of the Application for Renewal and Amendment of Type “B” Water Licence 8BC-MRY1314 for more information on the supporting hydrological assessment). Baffinland has considered the potential for cumulative effects arising from total withdrawals expected during 2014 under the existing approved water use under the Type A Water Licence as well as the renewed Type B Water Licence and confirms there will be no negative impacts on either Phillips Creek or km32 lake. All water withdrawn under the Type B Water Licence would be from the locations that are already authorized under the Type A Water Licence, and all associated requirements set out in the Type A Water Licence would be followed in relation to the Type B Water Licence.

The formal application form for the renewal and amendment of the Type B Water Licence is attached in Appendix 1 of the Application for Renewal and Amendment of Type "B" Water Licence 8BC-MRY1314.

2.0 Development of the ERP Facilities

The changes to the Mary River Project (ERP) primarily arise from trucking, stockpiling and shipping of 3.5 MT/a of iron ore from Milne Port. During 2014, a permanent ore dock, ship loading facility, ore stockpile and associated sedimentation ponds, and ore reclaiming conveying equipment will be constructed at Milne Port. Related activities are anticipated to commence in July 2014.

Baffinland wishes to clarify that since the completion of the NIRB hearings on the ERP, it has determined that it will not deposit sediment from dredging activities on any land above the high water mark during construction of the ore dock. All dredged material will be deposited at sea under the conditions defined in Department of Fisheries and Transport Canada authorizations, and in accordance with the NIRB Certificate.

It is also noted that all surface runoff from the ore dock and stockpile facilities during construction and operation will be deposited to the ocean and regulated in accordance with the *Fisheries Act* and its regulations.

Fresh Water Use during ERP Development

Peak fresh water demand for construction/industrial use will occur annually during the period of June to November when fresh water is required for site preparation and earthworks activities such as concrete truck wash down, concrete production, compaction of laydown areas and dust suppression at Milne Port and along the Tote Road. In order to maximize earthworks and to allow for concrete production activities during above freezing temperatures, up to 249 m³/day of fresh water for site preparation/industrial purposes may be required for a number of consecutive days during the peak water demand period (see the table below).

Peak domestic use occurs during the sealift activities, from July through to the end September annually. The labour force at Milne Port is expected to occasionally exceed 350 persons during the site preparation period (short term during the sealift), however on average over the year, there will be fewer than 225 persons at Milne Port during the construction phase. In order to accommodate this larger labour force (approved facilities under the Type A Water Licence can accommodate up to 240 individuals), Baffinland will re-open an existing construction 50 person trailer 'Shanco' camp facility equipped with a standalone (RBC) sewage treatment plant at Milne Port, in accordance with the current Type A Licence. The construction of the Matrix Camp was originally permitted under the Type B Water Licence and is currently permitted to operate under the Type A Water Licence. With the completion of the proposed amendments to the Type B Water Licence, remaining required bed capacity will be achieved by deploying additional construction camp 'Weatherhaven' soft wall structures to the existing 120 person Matrix Camp.

The domestic water demand for all the camps at Milne will peak at 108.5 m³/day (see the table below). If there are any periods of maintenance or treated effluent being off specification, then Baffinland will store the off spec effluent in the existing Polishing Waste Stabilization Pond (PWSP) with the potential for additional off-spec sewage effluent storage capacity to be developed if needed. Please see Appendix 5 for the plan view and drawings of this additional off-spec sewage effluent storage capacity that is proposed and may be required.

The following table summarizes expected maximum water use for the ERP construction period.

Usage	Type "A" Licence 2AM-MRY1325	Type "B" Licence 8BC-MRY1314	Total Expected Water Use (Type "A" + Type "B")
Domestic	58.5 m ³ /day	50 m ³ /day	108.5 m ³ /day
Construction/Industrial	10 m ³ /day	249 m ³ /day	210 m ³ /day
Total	68.5 m ³ /day	299 m ³ /day	367.5 m ³ /day

Waste Generation

All waste generated by the construction activities will be managed in accordance with the terms and conditions of the Type A Water Licence.

3.0 Scope of Amended Type "B" Licence 8BC-MRY1314

Baffinland requests amendments to the Type B Water Licence in order to proceed with the following activities in relation to the ERP:

- The combined withdrawal not to exceed 299 m³/day of fresh water from Phillips Creek and/or from km 32 Lake (during the summer season) and the withdrawal not to exceed 299 m³/day of fresh water from km 32 Lake during the winter months for both domestic and construction use;
- Additional off-spec sewage effluent storage capacity in the form of construction of one (1) additional polishing waste stabilization pond, if required (see Appendix 5 for detail); and
- Any water licensing required in relation to construction and operation of a permanent ore dock, ship loading facility, ore stockpile and associated sedimentation ponds, and ore reclaiming conveying equipment.

It is important to note that km 32 Lake has sufficient capacity to support summer and winter water withdrawal (see hydrological assessment in Appendix 4 of this Application). Therefore, this licence amendment requests the ability to withdraw from km 32 Lake during both the summer and winter months as this source will be more central to some water uses such as dust suppression along the Tote Road. The total combined amount requested under the Type B Water Licence amendment would not exceed 299 m³/day from either of the two water sources annually.

The fresh water withdrawal, the operation of the sewage treatment facilities (both existing and re-commissioned) as well as additional off-spec sewage effluent storage capacity will be subjected to the terms and conditions of the Type A Water Licence, and as such in the interim Baffinland proposes that such terms be also included in the Type B Water Licence. The updated management plans already approved under the Type A Licence are proposed to be applicable for this renewed/amended Type B Water Licence.

Related Authorizations

As indicated above, all activities and facilities included in this Type B Water Licence application have previously been considered by the NIRB and NPC during regulatory processes relating to the ERP.

All required surface approvals for the portion of the ERP facilities located on Crown Lands in the marine physical environment will be obtained prior to construction in accordance with the *Territorial Lands Act* and its regulations. Surface approvals for all on-land facilities have already been granted by QIA pursuant to the Commercial Lease.

Additionally, the authorization under the *Fisheries Act* and approval under the *Navigation Protection Act* will be obtained prior to commencement of in-water works for applicable marine infrastructure.

4.0 Volume of Water Required for the Amended Type "B" Licence 8BC-MRY1314

Baffinland requests that the Type B Water Licence permit use of up to 299 m³/day (average) of fresh water.

5.0 Term of the Renewed and Amended Type "B" Licence 8BC-MRY1314

Baffinland requests that the amended Type B Water Licence be renewed for a period of two (2) years, which is anticipated to provide sufficient timing to complete any processes associated with amendment to the Type A Water Licence.

Regarding amendment of the Type A Water Licence, Baffinland will submit to the Board an application for an amendment to its Type A Water Licence within 60 days after the submission of this application. Baffinland's intention is that the amended Type A Water Licence will include all activities permitted under this Type B Water Licence.

6.0 Hydrological Overview of Phillips Creek and km 32 Lake Watersheds

Knight Piésold has reviewed the hydrology on Phillip's Creek and km 32 Lake and determined a maximum allowable water take that remains protective to the aquatic ecosystems in Phillip's Creek and km 32 Lake. This memorandum is attached in Appendix 4 of this Application.

The lowest flow conditions in Phillips Creek occur during September, and the 10-year return period dry mean monthly discharge for September is estimated to be $0.96 \text{ m}^3/\text{s}$ or $83,000 \text{ m}^3/\text{day}$. It is assumed that a water taking of up to 10% of the discharge would have a negligible impact on the aquatic ecosystem as removing this proportion of water from Phillip's Creek is within the expected daily variation in flow. A water usage of 10% of the September low-flow estimate is $8,300 \text{ m}^3/\text{day}$. In comparison, Baffinland is only requesting up to an additional water take of $299 \text{ m}^3/\text{day}$ under the Type B Water Licence.

The total overwinter under-ice water body volume reduction is estimated to be 0.19% under the proposed increased water withdrawal limit from km 32 Lake. In comparison, withdrawal of $68.5 \text{ m}^3/\text{day}$ results in a 0.03% water body volume reduction (as indicated in the FEIS). It should be noted however that an increase to 0.19% water body volume reduction is still well below the DFO limit of 10% extraction from under ice. In summer, the proposed water body volume reduction from withdrawal is below what could be measured (less than 0.3%) and therefore will result in a negligible and immeasurable effect on the downstream aquatic ecosystem. For further detail see the memorandum attached in Appendix 4.

7.0 Details of Impacts

The conclusion of the hydrological assessment presented in Appendix 4 of this Application is that the increased water withdrawal of up to $299 \text{ m}^3/\text{day}$ will have no significant effects on the aquatic ecosystems of either Phillips Creek or km 32 Lake. The water withdrawal being proposed for this licence amendment is negligible.

The potential for impacts from facilities and infrastructure constructed for the ERP were considered by the NPC and by the NIRB as part of the Early Revenue Phase for the Mary River NIRB Project Certificate review undertaken from July 2013 to March 2014. Approval by the Minister of AANDC of the amendment to Project Certificate No. 005 was issued on April 28, 2014.

8.0 Proposed Mitigation Measures

All pump intakes used for fresh water withdrawal will be screened in accordance with the Fisheries and Ocean Canada (DFO) Freshwater Intake End-of-Pipe Fish Screen Guidelines¹ to prevent entrapment of fish as per Part E, Item 6 of the Type A Water Licence.

As required under the Type A Water Licence, Baffinland will strive to minimize its water use for both construction activities and domestic use. However, the harsh climatic conditions of the Northern Baffin region necessitate greater construction activities during the above freezing periods (concrete production,

¹ Fisheries and Ocean Canada, *Freshwater Intake End-of-Pipe Fish Screen Guidelines*. 1995

concrete truck wash, dust suppression), and, the surge in work force during the open water season sealift. These combined activities necessitate increased water consumption over the short summer period.

The RBC sewage treatment facility that will be brought back into commission will operate in accordance with the terms and conditions of the Type A Water Licence.

Surface water management and other applicable activities associated with ERP facilities construction will operate in accordance with the terms and conditions of the Type A Water Licence.

Additional Off-Spec Sewage Effluent Storage Capacity

To ensure Baffinland's proactive approach to managing its impacts on the environment, additional off-spec sewage effluent storage capacity is requested to be developed at Milne Port under authorization provided by an amendment of the Type B Water Licence. Additional off-spec sewage effluent storage capacity will be provided in the form of a Polishing Waste Stabilization Pond (PWSP) identical in design to the existing PWSP approved and constructed in 2013 at Milne Port. This additional off-spec sewage effluent storage capacity has been included in this application as a contingency if the existing off-spec sewage effluent storage capacity is not deemed sufficient based on current operations. Off-spec sewage effluent storage capacity will be constructed to the same design requirements as the existing PSWP. Proposed off-spec sewage effluent storage capacity expansion drawings are presented in Appendix 5. In the event additional off-spec sewage effluent storage capacity is required at Milne Port, the effluent will be trucked to and from the facility.

Baffinland would like to note although it is applying for additional off-spec sewage effluent storage capacity by this amendment of the Type B Water Licence, this is only the administrative mechanism proposed to be used in order to increase efficiency and to ensure all related approvals are obtained in a timely way. While the addition of tent camps at Matrix will intensify demands on related systems, this activity is not directly required as a result of ERP development and is a function of ensuring ongoing contingency based on off-spec sewage effluent generation rates experienced in 2013, and would be a necessary contingency at the camp regardless of the changes to the project triggered by the ERP.

Spill Contingency Plan

Baffinland proposes the Spill Contingency Plan (BAF-PH1-830-P16-0036) submitted to the Board on March 31 2014 supporting the 2013 Annual Report should be used to govern approved construction activities detailed in this application and should be incorporated in the terms and conditions of the renewed Type B Water Licence. It is recommended that this Spill Contingency Plan be reviewed in conjunction with this application.

9.0 Closure

At final closure, all ERP facilities will be closed and reclaimed as per the Interim Abandonment and Reclamation Plan (BAF-PH1-830-P16-0012) and the approved Preliminary Mine Closure and Reclamation Plan (H337697-0000-07-126-0014) for the Mary River Project. For further information, an amended Type "B" Water Licence Abandonment and Reclamation (A&R) Strategy and Security Estimate are presented in Appendix 8 of this Application, although it should be noted this document was developed to only provide additional information.

Upon completion of the construction of the ERP facilities, the sewage treatment facility that is planned to be put back into commission for the summer season will either be maintained as a redundant system, or decommissioned as part of progressive reclamation initiatives. Similarly the additional off-spec sewage effluent storage capacity will either be maintained as a redundant system, or decommissioned as part of progressive reclamation initiatives, if constructed and deemed no longer necessary based on predicted off-spec sewage effluent generation rates.

Closure and reclamation activities required for the proposed amended Type B Water Licence have a estimated associated cost of \$146,826, which represents a \$24,807 marginal increase from previous security estimates for the Type B Water Licence (see table below). The closure and reclamation costs associated with the Matrix Camp and off-spec sewage effluent storage capacity increase requested in the renewed/amended Type B Water Licence are included in this amount. Baffinland would propose that the security agreed to would be held by the QIA as the activities considered would be on Inuit Owned Land. The aim will be to incorporate these new facilities into the next Annual Security Review process and amendment of the Type A Water Licence as Baffinland recognizes the intention will be for all closure and reclamation security associated with the Mary River Project to be solely held under the Type A Water Licence. Required security related to the other on-land scope of the renewal and amendment of the Type B Water Licence was considered in the 2014 Work Plan and associated 2014 Marginal Closure Cost Estimate (H349000-1000-07-126-0017).

A&R Financial Liability Estimate Breakdown for All Activities under Amended Type "B" Water Licence

Cost Type	Existing Type "B" Licence	Marginal Additional Security under Amended Licence	Total
Total	\$122,019.26	\$24,806.84	\$146,826.10
Direct Costs	\$103,846.18	\$21,112.20	\$124,958.38
Indirect Costs	\$18,173.08	\$3,694.64	\$21,867.72

NOTES:

All prices in Canadian Dollars.

Financial security that will be associated with the ore dock facility will be done as a separate process with the Department of Fisheries and Oceans (DFO) Canada. This process is ongoing and once details have been finalized, the NWB will be informed of the decisions. It is suggested that the amount required for security with the DFO be considered during the Annual Security Review required and outlined in the Type A Water Licence.