

04 December 2014

**Attention:** Andrea Morgan, P. Eng.  
Senior Project Engineer  
Aboriginal Affairs and Northern Development Canada  
Nunavut Regional Office, Building 918  
Iqaluit, Nunavut X0A 0H0

**Subject:** **Licence No. 2AM-MRY1325, Mary River Project: Annual Security Review under Part C and Schedule C of the Type 'A' Water Licence**

---

Dear Andrea,

SNC-Lavalin appreciates the opportunity to participate in the Annual Security Review (ASR) required under Part C and Schedule C of Baffinland Iron Mines Corporation's (BIMC's) Type 'A' Water Licence No. 2AM-MRY1325 for the Mary River Project.

The following advice has been provided pursuant to AANDC's responsibilities under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Department of Indian Affairs and Northern Development Act*.

### **Background**

On November 1, BIMC filed information for the ASR with the Nunavut Water Board (NWB) in accordance with relevant sections of Schedule C, Item 2 of the Type A Licence and on November 6, the ASR was initiated by the NWB, providing guidance on the 2015 ASR Process and requesting parties to file written submissions by December 5, 2014.

In conducting this analysis, SNC-Lavalin has relied on the following documentation:

- NWB Guidance for the Annual Security Review Process (dated November 6, 2014);
- BIMC 2015 Work Plan and Attachments (dated October 31, 2014);
- BIMC 2015 Marginal Closure and Reclamation Financial Security Estimate (dated October 31, 2014);
- BIMC 2014 Complete Project Financial Security Assessment Report (dated October 31, 2014);
- NWB Water Licence No. 2AM-MRY1325 (July 15, 2013);
- NWB Water Licence No. 2BB-MRY1114, Amendment #1 (December 4, 2013);
- NWB Water Licence No. 8BC-MRY1314 (May 24, 2013);
- Nunavut Impact Review Board (NIRB) Project Certificate No. 005 (amended May 28, 2014)
- BIMC Mine Closure and Reclamation Plan (BAF-PH1-830-P16-0012, dated June 27, 2014); and
- BIMC-provided Technical Support materials associated with their Water Licence amendment package (dated July 16, 2014).

The ASR for the Baffinland project is occurring concurrently as Baffinland's amendment to their Type A Water Licence No. 2AM-MRY1325. The licence amendment and ASR generally address the changes at Milne Port, the Tote Road and the Mine Site to account for the Early Revenue Phase (ERP), i.e., road haul of ore prior to the development of the rail haul option. These include the following changes:

#### **Milne Port**

- Increase water demand (proposed under amendment to Type B Licence No. 8BE-MRY1314) during construction and operation;
- Increased size of the sewage treatment plant (proposed under amendment to Type B Licence No. 8BE-MRY1314);
- Construction and operation of additional off-spec capacity in the form of a Polishing Waste Stabilization Pond (PWSP), similar in design to the existing PWSP constructed in 2013;
- Relocation of the treated sewage effluent discharge location (NEW);
- Increased fuel storage to include marine diesel (NEW - addition of two 100,000 L tanks as authorized by the amended Project Certificate No. 005);
- Construction of the ore stockpile pad and associated drainage ponds (NEW - authorized by the amended Project Certificate No. 005); and,
- Construction and operation of an ore dock and ore loading system, additional ancillary buildings and maintenance facilities required for the shipment of ore which will result in changes in drainage patterns on the Milne Port site. Revisions to site drainage have been reflected in the approved Surface water and Aquatic Ecosystems Management Plan submitted to the NWB on March 31, 2014.

#### **Tote Road**

- The current Type 'A' Water Licence already authorizes Baffinland to proceed with the full development of the Tote Road. However, during the NIRB review process of Baffinland's application for an amendment to the Project Certificate No. 005, the Company committed to undertake best efforts to minimize dust generation from the road haulage and shipping operation of ore via Milne Port. This commitment necessitates an authorization from the Nunavut Water Board for additional withdrawal of water at several locations along the Tote Road for effective dust suppression associated with road haulage of ore from various sources along Tote Road (NEW).

#### **Mine Site**

- The current Type 'A' Water Licence already provides the authorization necessary for Baffinland to proceed with the full development of the Mine Site. However, by proceeding with a phased development approach for the Mary River Project, the life span of some of the temporary facilities (transitional construction camp, buildings, and fuel storage) will be longer than originally intended. Baffinland wishes to recognize the longer use of these facilities in the amended Type A Water Licence; and

- Land discharge of treated sewage effluent as was submitted to the NWB in the March 31, 2014, version of the approved “Fresh Water Supply, Sewage and Wastewater Management Plan”.

BIMC’s 2015 Work Plan specifically outlines the following activities to be carried out in 2015-16:

- The continued development and construction of infrastructure required at Milne Port and the Mary River Mine Site (Mine Site) for the Mary River Project;
- Development and operation of the mine, ore crushing and land transportation, stockpiling and marine shipment of ore;
- At Milne Port, vessels carrying fuel, equipment and supplies for both use at the Mine Site and Milne Port will arrive during open water (approximately between mid July and mid October 2015). Material, fuel and supplies required for construction and operational activities will be transported to the Mine Site year round via the Tote Road year round;
- Ongoing environmental baseline data collection and geotechnical drilling will continue to support the construction and operation of the Project. These activities will resume, as required, at the Milne Port site, along the Tote Road, at the Mine Site, at numerous quarry sites and at other Project development areas;
- Continued environmental monitoring in accordance with the approved Project Certificate, licences, authorizations, management plans and environmental effects monitoring plans;
- Continued archaeological surveys at project component areas as required;
- Operation of the aerodrome at the Mine Site, which will support year round passenger and freight service by aircraft. Adjustments to the existing aerodrome flight path to improve aviation safety at Mary River Mine Site. This will involve the minor leveling out of two knolls within the planned flight path;
- Continued fuel transfer from Milne tank farm to the Mine Site tank farm along the Tote Road to support ongoing construction and operations activities; and
- Continued progressive reclamation of areas of current and past use in association with exploration and construction phases of the Project.

### ***Security Estimate Development***

On October 31, 2013 BIMC submitted their 2014 Work Plan and the 2014 Marginal Reclamation and Closure Security Estimate (H349000-1000-07-126-0017) for the Project to the NWB, the QIA, and AANDC. The 2014 Marginal Reclamation and Closure Security Estimate represented Baffinland’s proposed annual adjustment to reclamation security for 2014. This documentation was reviewed by AANDC, QIA and other stakeholders to provide comments on the reclamation liability estimate based on the scope of Baffinland’s proposed work for the upcoming 2014-2015 season. After extensive discussions between relevant parties, an agreement (NWB letter dated January 23, 2014) was reached between NWB, QIA, AANDC and BIMC that for the 2014-2015 year that BIMC would post an additional amount of \$3,959,000 (\$3,793,000 plus \$166,000) to the global financial security amount. The agreement recognized that there were still discrepancies between the QIA estimated closure and reclamation costs and those costs proposed by BIMC but that this amount was agreed to be held for the current period pending further discussions and adjustments in subsequent years including during the ASR process for the 2015-16 season.

During 2014 to seek resolution for the discrepancies in the estimated closure and reclamation costs for the Project, the QIA and BIMC agreed to engage in a consultation process. This involved a “re-

baseline” of the Project’s closure and reclamation financial security estimate based on project-specific unit costs and assuming the completion of the 2014 Work Plan activities. The intent was to establish agreement on a closure and reclamation cost value for all components of the Project upon conclusion of the 2014 Work Plan and to establish a set of assumptions/unit rates that could be applied moving forward during future ASR processes. This “re-baseline” development process included monthly meetings, a site visit, and teleconferences to facilitate resolution of the cost estimation discrepancies. The results of the development process are documented in BIMC’s 2014 Complete Project Financial Security Assessment Report (H349000-1000-07-126-0018) dated October 31, 2014. This report outlines the agreed estimating guidelines, procedures and assumptions plus the basis for establishing site-specific unit costs, quantities, direct costs and indirect costs required to prepare the 2014 Complete Project Financial Security Assessment. As noted in the report, although some items are identified as requiring further discussion, the 2014 Complete Project Financial Security Assessment was identified as the proposed basis for future ASR processes including the 2015 Marginal Closure and Reclamation Financial Security Estimate.

It is BIMC’s position that the aggregate of the 2015 Marginal Closure and Reclamation Financial Security Estimate and the 2014 Complete Project Financial Security Assessment represent the total global closure and reclamation costs estimated to be required for a third-party contractor to perform the work in a ‘worst-case’ scenario for all disturbed areas, project components and project activities existing on the Mary River Project site upon conclusion of the 2015 Work Plan.

The evolution in the security cost estimates as a result of the “re-baseline” and aggregation with the marginal 2015 estimate is shown in Tables 7.1 and 7.2 which have been reproduced from the BIMC 2015 Marginal Closure and Reclamation Financial Security Estimate report.

**Table 7-1: Mary River Project Total Closure and Reclamation Security Summary<sup>1</sup>**

	A	B	C	D	E	F	G	H
	Authorization	Liability	Pre-baseline Liability (\$)	2014 Re-Baseline (\$)	Difference (\$)	Marginal 2015 (\$)	Total (\$)	Adjustment to be posted (\$)
					D-C		D+F	E+F-Type B construction
1	Type A 2AM-MRY1325	IOL	40,231,000	38,961,000	(1,270,000)	2,236,000	41,197,000	819,000
2		Crown	166,000	-	(166,000)	-	-	(166,000)
3		Water	2,172,000	2,193,000	21,000	-	2,193,000	21,000
4		Land	38,225,000	36,769,000	(1,456,000)	2,236,000	39,005,000	633,000
5	Subtotal Type A		40,397,000	38,961,000	(1,436,000)	2,236,000	41,197,000	653,000
6	Type B Construction 2BC-MRY1416	IOL	147,000	See note 3	-	-	-	-
7		Crown	-		-	-	-	-
8		Water	-		-	-	-	-
9		Land	147,000		-	-	-	-
10	Subtotal Type B Construction		147,000		-	-	-	-
11	Type B Exploration 2BE-MRY1421	IOL	165,000	165,000	-	-	165,000	-
12		Crown	1,082,000	1,082,000	-	-	1,082,000	-
13		Water	18,000	18,000	-	-	18,000	-
14		Land	1,229,000	1,229,000	-	-	1,229,000	-
15	Subtotal Type B Exploration		1,247,000	1,247,000	-	-	1,247,000	-
16	DFO	IOL	-	-	-	-	-	-
17		Crown	3,566,000	3,566,000	-	-	3,566,000	-
18		Water	3,566,000	3,566,000	-	-	3,566,000	-
19		Land	-	-	-	-	-	-
20	Subtotal DFO		3,566,000	3,566,000	-	-	3,566,000	-
21	AANDC Land Lease 47H/16-1-2	IOL	-	-	-	-	-	-
22		Crown	-	5,856,000	5,856,000	-	5,856,000	5,856,000
23		Water	-	-	-	-	-	-
24		Land	-	5,856,000	5,856,000	-	5,856,000	5,856,000
25	Subtotal AANDC Land Lease		-	5,856,000	5,856,000	-	5,856,000	5,856,000
27	GRAND TOTAL		45,357,000	49,630,000	4,420,000	2,236,000	51,866,000	6,509,000

<sup>1</sup> All totals rounded to nearest '000 in CAD

<sup>2</sup> 2014 Re-baseline refers to 2014 Complete Project Financial Security Assessment, H349000-1000-07-126-0018, Rev. 1

<sup>3</sup> The reclamation costs associated to the Type 'B' Water Licence 2BC-MRY1416 was captured under 2014 Complete Project Financial Security Assessment. The current sum of \$147,000 posted under this licence is proposed to be relocated under Type 'A' Water licence 2AM-MRY1325 upon amendment.

Table 7-2: 2015 Estimated Closure and Reclamation Security Detailed Summary<sup>1,2</sup>

Cost	2014 Re-Baseline (\$)	2015 Marginal Increase (\$)	Total for 2015 (\$)	IOL	Crown Land	Water Liability	Land Liability
<b>Direct Cost</b>							
Project Wide	873,000	54,000	927,000	927,000	-	-	927,000
Milne Port	9,931,000	-	9,931,000	6,101,000	3,830,000	227,000	9,704,000
Construction Facilities & Services	2,731,000	-	2,731,000	2,731,000	-	-	2,731,000
Mine Site	6,671,000	772,000	7,444,000	7,444,000	-	1,115,000	6,329,000
Tote Road	4,042,000	76,000	4,118,000	4,118,000	-	-	4,118,000
Mary River Exploration Activities	1,022,000	-	1,022,000	135,000	887,000	15,000	1,007,000
<b>Total Direct Costs (\$)</b>	<b>25,270,000</b>	<b>902,000</b>	<b>26,172,000</b>	<b>21,455,000</b>	<b>4,717,000</b>	<b>1,357,000</b>	<b>24,815,000</b>
<b>Indirect Cost</b>							
Off-Site Disposal of Waste & Material	1,969,000	-	1,969,000	1,658,000	311,000	-	1,969,000
Fuel	3,098,000	33,000	3,131,000	2,642,000	489,000	-	3,131,000
Ammonium Nitrate (explosive Material)	876,000	553,000	1,429,000	1,291,000	138,000	-	1,429,000
Contaminated Soil Treatment	234,000	-	234,000	197,000	37,000	-	234,000
Mobilization of Workers Required for Reclamation	996,000	54,000	1,050,000	893,000	157,000	-	1,050,000
Worker Accommodation & Camp Operation	2,630,000	148,000	2,778,000	2,363,000	415,000	-	2,778,000
Mobilization and Demobilization of Equipment and Materials by Sealift	2,425,000	90,000	2,515,000	2,132,000	383,000	-	2,515,000
Geotechnical Inspections	150,000	-	150,000	126,000	24,000	-	150,000
Project Environmental Site Assessment	90,000	-	90,000	76,000	14,000	-	90,000
Closure & Post Closure Monitoring	851,000	-	851,000	717,000	134,000	851,000	-
Engineering Fees	946,000	35,000	981,000	832,000	149,000	-	981,000
Supervision, Project Management & Contract Administration	2,381,000	165,000	2,546,000	2,170,000	376,000	-	2,546,000
Contingency	3,923,000	256,000	4,179,000	3,559,000	620,000	-	4,179,000
Mary River Exploration Activities	225,000	-	225,000	30,000	195,000	3,000	222,000
DFO Financial Security for Ore Dock (Construction and Monitoring)	3,566,000	-	3,566,000	-	3,566,000	3,566,000	-
<b>Total Indirect Costs (\$)</b>	<b>24,360,000</b>	<b>1,334,000</b>	<b>25,694,000</b>	<b>18,684,000</b>	<b>7,010,000</b>	<b>4,420,000</b>	<b>21,274,000</b>
<b>Total Cost (\$)</b>	<b>49,630,000</b>	<b>2,236,000</b>	<b>51,866,000</b>	<b>40,139,000</b>	<b>11,727,000</b>	<b>5,777,000</b>	<b>46,089,000</b>

<sup>1</sup>All totals rounded to nearest '000

<sup>2</sup>All totals in CAD

### Scope of the ASR Review

SNC-Lavalin's review builds on our previous reviews carried out for the Mary River Project and addresses whether the existing global security amount as set by the NWB during the 2014 ASR Process is adequate to account for the updated scope of activities and undertakings proposed by BIMC in the 2015 Work Plan.

Specifically, the review examines:

- Whether the 2015 cost estimate is sufficient to ensure appropriate closure of the undertaking, restoration of the sites and implementation of any required on-going measures after closure of the undertaking (cumulative and legacy liabilities) estimated in the 2015 Work Plan; and
- If the proportion of security applied to both Crown and Inuit Owned Land (IOL) is adequate to meet the highest reclamation liability proposed in 2015-16;
- Whether any issues have not been adequately addressed based on comparisons between the content of the updated work plan and security to Water Licences No. 2AM-MRY1325, No. 2BE-MRY1421, and No. 8BC-MRY1416 including relevant Management Plans as well as previous work plans and closure cost summaries (2013-2014) for the Mary River Project;
- How ERP-related costs are accounted for in the security estimate; and
- Whether the procedures used for security estimation are consistent with the fundamental assumptions employed in the AANDC-sponsored RECLAIM (ver. 7) closure cost estimation program.

### Findings of the ASR Review

#### 1. General Comments on New Security Estimation Approach

There is general agreement in the total security estimates when comparing the "Pre-baseline" versus the "2014 Re-baseline" liability columns in Table 7.1 (column C versus column D). Once the AANDC Land

Lease security (Row 25) is subtracted from column D, the summations are remarkably similar (<5% difference) indicating the Pre-baseline RECLAIM model and the site-specific Hatch Estimate Breakdown Structure (EBS) approach, on balance, yield similar estimates.

## 2. Proportion of Security Applied to Both Crown and Inuit Owned Land (IOL)

There seems to be a discrepancy in the value of Crown liability between Tables 7.1 and 7.2 and hence the allocation of total liability between Crown land and IOL. In Table 7.1 the Crown liability calculated by summing the appropriate rows in column G is \$10,504,000 (i.e., \$1,082K + \$3,566K + \$5,856K). In Table 7.2 the sum indicated under the column "Crown Land" is given as \$11,727,000 (or \$1,223,000 more than in Table 7.1). Based on values in Table 7.1, the percentage of Crown liability is 20.3% of the \$51,866K total. Based on Table 7.2 values, this percentage is increased to 22.6% of the \$51,866K total. This discrepancy needs to be reconciled by the Proponent.

Regarding the allocation of liability to Crown land, it is not apparent how this is calculated according to the EBS approach. In some instances it appears a percentage is applied to a calculated closure and restoration cost to yield that portion which is allocated to Crown land (presumably using a percentage based on the proportion of Crown versus IOL under current development). This appears to be used for indirect costs. It is not apparent in the documentation if this is in fact the case and what approach is applied to direct costs. It is recommended the Proponent indicate where in the documentation the method of allocation between Crown and Inuit Owned Land is addressed or otherwise provide additional clarification/transparency.

## 3. Addressing Closure and Reclamation of ERP and 2015 Work Plan Components

The EBS approach employs a detailed and extensive list of project components and inventory of buildings and mechanical and mobile equipment as the basis to account for all aspects of project closure and restoration. The major components of the ERP are addressed within the EBS cost estimation tables including ore stockpiles, ore handling facilities, runoff collection ponds, ore dock, etc. These ERP components have not been identified or sorted separately but could be if requested of the Proponent.

For the Milne Port site it appears that all of the ERP components have all been accounted for in the 2014 Complete Project Financial Security Assessment. No increase in 2015 marginal security requirements is identified in Table 7.2 for Milne Port direct costs. However, since the 2015 Work Plan indicates that there would be continued development and construction of infrastructure at Milne Port in 2015-16, the Proponent needs to confirm that the "2014 re-baseline" security estimate has accounted for the entire development of this infrastructure and that no additional security needs to be identified in the 2015 marginal security estimate. For example, the Proponent needs to confirm that the grading and re-contouring of the ore stockpile area in the "2014 re-baseline" addresses the entire design development footprint and not just the area disturbed during the 2014 construction season. If this is not the case additional security needs to be identified.

## 4. Milne Port Shiploaders

The Mechanical and Mobile Equipment List provided as Appendix C.1 to the 2014 Complete Project Financial Security Assessment report indicates that there are two (2) Shiploaders at Milne Port (pages 6 and 7 of 35; cross referenced as Tag No.'s 2351-SL-001 and -002). In the 2015 Work Plan reference is also made to Shiploader 1 and Shiploader 2 (page 5 of 17, 4<sup>th</sup> bullet). However in the detailed EBS costing tables (2014 Complete Project Financial Security Assessment, Appendix A, Estimate Breakdown Structure (EBS) Details, page 5) only one Shiploader is costed (specifically Tag No. 2351-SL-001). The Proponent needs to confirm what is the fate of the second Shiploader given that Shiploader 1 has an associated liability of \$3,827,469.

#### 5. Borrow P1

On page 4 of 17 of the 2015 Work Plan, Borrow P1, Tote Road km 63 is identified as being on Crown land and under AANDC land lease. However in the 2015 Marginal Closure and Reclamation Financial Security Estimate, Appendix A: Complete Project Financial Security Assessment Estimate Breakdown (page 14) the cost to grade and re-contour the P1 Borrow Source amounting to \$137,369 has been assigned to IOL costs. This needs to be transferred to Crown land costs.

#### 6. Addressing RECLAIM Program and AANDC Fundamental Assumptions

SNC-Lavalin was specifically requested to investigate whether the newly applied EBS cost estimation approach addressed the following:

- Interim Care and Maintenance;
- Post-Closure Monitoring;
- Accelerated Filling of Pit to reduce legacy liability issues;
- Mobilization/Demobilization by third-party contractors;
- Personnel and on-site accommodations; and
- Salvage Value of on-site equipment not to be considered as discounting the security cost.

Interim care and maintenance are not explicitly included in the EBS security estimate at this time although the EBS approach could address this in the future if required. At the 2015 stage of site development, legacy liability issues have not been identified which would require long term care or maintenance (e.g., perpetual treatment). The level of site development will not be that extensive and no potential pit lake would have been created. Once the mine is further developed and if future monitoring identifies ARD/ML issues will be greater than projected, then interim care and maintenance will need to be addressed.

The BIMC Mine Closure and Reclamation Plan assumes 5 years of post-closure monitoring with provisions to increase this should future site monitoring warrant it. This is less than the typical Departmental assumption of 25 years of monitoring for abandoned site projects. Given the level of site development reached with the completion of the 2015 Work Plan, the 5 year monitoring time frame is reasonable. The mining activity is not expected to create any long term legacy issues (e.g., no pit lake will have been created).

Accelerated filling (e.g., by assuming pumping costs over a multiple number of years) has not been considered in the security estimate to date. This is because the pit excavation will remain self-draining for several more years until the excavation extends below grade.

Mobilization/demobilization by third-party contractors has been assumed in the EBS approach and hence the security estimate reflects higher costs for staff and equipment.

Personnel and on-site accommodations are also clearly built into the EBS approach.

No salvage value has been assumed for on-site equipment or inventories of fuel or other materials in the calculation of the security estimate.

#### ***Summary of Review Findings***

In general, the RECLAIM model and the site-specific EBS approach prepared by BIMC provided similar results for the 2014 “re-baseline” security estimates.

Clarification is required on how the security estimates are allocated between the Crown and QIA in the site-specific EBS approach. Also, there appears to be discrepancies between BIMC Table 7.1 and 7.2 security estimates for allocation between Crown versus IOL.

Early Revenue Phase costs are currently not identified separately. A separate summary would be appropriate given these reclamation costs remain tied to the Water Licence No. 8BC-MRY1421, until the amendments to the Water Licence No. 2AM-MRY1325 have been approved by the NWB.

Milne Port Shiploaders do not appear to be fully accounted for in the BSE approach summary (i.e., only one of the two Shiploaders is costed in the detailed tables).

Borrow P1 is located on Crown land however the security cost estimate for this borrow area is allocated to IOL. This should be re-allocated to the Crown.

The AANDC RECLAIM Model ver 7 components for estimating security appear to be addressed in the BIMC EBS approach.

SNC-Lavalin appreciates the opportunity to participate in this study and trusts the provided review will be useful in the upcoming ASR process. Please do not hesitate to contact the under-signed if you require any clarification of the information contained within this submission.

Sincerely,

**SNC-Lavalin Inc.**



Mart Lupp, M. Eng., P. Eng.  
Senior Environmental Engineer