



Operations Directorate
Nunavut Regional Office
Iqaluit, Nunavut, X0A 0H0

Our reference
File #9545-2-1.2BB.BOSA
CIDM #420708

August 5, 2010

Your reference
2BB-BOS0712/TR/G1

Phyllis Beaulieu
Manager of Licensing
Nunavut Water Board
Gjoa Haven, Nunavut X0E 1J0

Sent Via Email

Dear Phyllis,

Subject **Water License #2BB-BOS0712/TR/G1, Hope Bay Mining Ltd.,
Boston Advanced Exploration Project, Kitikmeot Region,
Submission of Sewage Treatment Plant Operation and
Maintenance Plan, Sewage Sludge Management Alternatives
Document, and Final Design Drawings**

Please be advised that on behalf of Indian and Northern Affairs Canada, I have completed a review of the above referenced Hope Bay Mining Ltd. documentation that was submitted to the Nunavut Water Board.

A Technical Review Memorandum (attached) is provided for the Board's consideration.

Should you have any questions regarding this submission, feel free to contact me at 867 975-4555 or david.abernethy@inac-ainc.gc.ca.

Regards,

David W. Abernethy
Water Resources Regional Coordinator

Attached.

Cc: Lou-Ann Cornacchio, INAC Water Resources Manager
Peter Kusugak, INAC Field Operations Manager
Melissa Joy, INAC Water Resource Officer
Bryan Rayner, INAC Water Resource Officer

TECHNICAL REVIEW MEMORANDUM

Date: Aug. 5/10

To: Phyllis Beaulieu, Nunavut Water Board

From: David Abernethy, Indian and Northern Affairs Canada

Re: **Water License #2BB-BOS0712/TR/G1, Hope Bay Mining Ltd., Boston Advanced Exploration Project, Kitikmeot Region, Submission of Sewage Treatment Plant Operation and Maintenance Plan, Sewage Sludge Management Alternatives Document, and Final Design Drawings**

A. PROJECT DESCRIPTION

On July 8/10 the Nunavut Water Board (NWB or Board) distributed the following documentation that was submitted by Hope Bay Mining Ltd. (HBML) pursuant to Part G: Conditions Applying to Modifications, Item #1 of their Type B license, #2BB-BOS0712. Interested parties were invited to provide representations by Aug. 5/10.

FSC Architects and Engineers. *Sewage Treatment Plant Operation and Maintenance Plan for the Boston Camp*. Prepared for Hope Bay Mining Ltd. June 2010;

FSC Architects and Engineers. *Sewage Sludge Management Alternatives for the Hope Bay Project*. Prepared for Hope Bay Mining Ltd. June 2010; and,

FSC Architects and Engineers. *Boston Camp STP Design Drawings SK1-SK4*. Prepared for Hope Bay Mining Ltd. 2010.

Hope Bay Mining Ltd.'s notice of modification to replace their existing rotating biological contactor (RBC) sewage disposal facility with a new RBC facility was distributed for review on July 8/10. In their July 16/10 letter to HBML, the NWB stated that they considered the proposed modification to be consistent with the terms of the license and as a result accepted the modification. The NWB informed HBML that no further information was required prior to carrying out the modification. They also reminded HBML that in accordance with Part G, Item #3 of the license, as-built drawings must be submitted within ninety (90) days of the modification's completion.

B. RESULTS OF REVIEW

On behalf of Indian and Northern Affairs Canada (INAC), I am providing the following comments / recommendations for the Board's consideration,

1. Information Requirements Specified by the Board

The issues section of the project's license states that the sewage treatment operations and maintenance plan must address discharge procedures, wetland / land application, erosion control procedures, and spill contingency procedures. Having reviewed the submitted operations and maintenance plan the following observations are noted,

- **Discharge Procedures**

The submitted plan provides a general overview of treated sewage effluent discharge procedures. This effluent will continue to be discharged onto the tundra at the same location with the new RBC facility as was practiced with the former facility and the effluent quality requirements specified in Part D: Conditions Applying to Waste Disposal, Item #'s 17 and 18 will remain in effect. This plan also discusses tundra treatment and erosion control measures. It is recommended that HBML revised their plan to describe the anticipated effluent flow rates, potential impacts to the receiving environment that may result from this activity, and how discharge procedures and treatment will be affected by seasonal variations (i.e., during ice-cover when the tundra treatment process is ineffective).
- **Description of Wetland / Land Application**

The submitted plan provides a general overview of the tundra treatment process that effluent discharged from the RBC facility will undergo before entering Aimaoktatuk (Spyder) Lake. The physical and biological processes that occur in overland flow are briefly discussed. This plan should be revised to include as a minimum, a detailed description of how treated sewage effluent is discharged onto the tundra, its subsequent flow path (including distance and slope), the frequency of monitoring this flow path, a topographic map that references the flow path and applicable monitoring program stations, and photos of the tundra treatment process.
- **Erosion Control Procedures; and,**

The submitted plan identifies erosion control procedures that will be applied to effluent discharged from the RBC facility. They are the use of a surge control box filled with crushed rock, coco-straw mats for surge box overflow, and an inspection program to determine whether additional mitigation measures are necessary. It is recommended that this plan include a description of the surge control box (e.g., dimensions), a topographic map that reference's where it and the matting will be

positioned, photos of these erosion control measures, and an inspection program schedule.

- Spill Contingency Procedures
The spill contingency procedures identified in the submitted plan appear reasonable.

2. CCME Compost Guidelines

The submitted operations and maintenance plan and sewage sludge management alternatives document reference the application of Canadian Council of Ministers of the Environment (CCME) guidelines to determine whether treated sewage sludge is acceptable for use in reclamation activities as a compost material. These plans should be revised to properly reference these guidelines, discuss their applicability to the project area, and include the criteria that will be used to determine whether treated sewage sludge can be disposed on the land (i.e., specify parameters and limits).

3. Disposal and Treatment of Sludge on Land

Part D: Conditions Applying to Waste Disposal, Item #13 of the license outlines conditions that must be addressed in a proposal to the Board before any disposal or treatment of sludge on land. HBML should revise their operations and maintenance plan to include these information requirements as they pertain to their sludge pit and submit proposals to the Board for approval prior to any disposal of sludge on land.

4. Discharge Procedures for Sludge Pit Effluent

Section 3.7.3: Sludge Pit Management of the Operations and Maintenance Plan states that “effluent should be removed from the sludge pit if the water level approaches the 0.5 m freeboard. The water should be first sampled to determine if it can be discharged to tundra treatment or should be introduced to the flow equalization tank.” INAC recommends that any effluent from the sludge pit be directed to the RBC facility. Any discharge of effluent at a different location should require Board approval.

5. Basic Revisions to Submitted Operations and Maintenance Plan

- Introduction Section
As recommended in the Government of the Northwest Territories 1996 *Guidelines for the Preparation of an Operation and Maintenance*

Manual for Sewage and Solid Waste Disposal Facilities in the Northwest Territories, the plan's introduction should be revised to include (1) basic geophysical information, such as general geological information, mean precipitation data, extent of permafrost, and general hydrological information; and (2) a topographic map that references the camp, RBC facility, sludge pit, tundra treatment area, and receiving water body, Aimaoktatuk (Spyder) Lake.

- Background Section

As recommended in the Government of the Northwest Territories 1996 *Guidelines for the Preparation of an Operation and Maintenance Manual for Sewage and Solid Waste Disposal Facilities in the Northwest Territories*, the plan should be revised to include a background section that provides as a minimum, the following information,

- where domestic water is obtained;
- how drinking water is distributed;
- how sewage is collected;
- sewage generation, composition projections, and related tables and charts;
- an overview of the previous RBC facility including its specifications, date of installation, and performance history; and,
- a discussion of how the new RBC facility will address the performance issues encountered with the existing (non-operational) RBC facility.

Prepared by David Abernethy