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Environmental Protection Operations Directorate (EPOD)
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February 26, 2014

EC file: 6100 000 135
NWB file: 2BE-MOU0914

Robin Ikkutisluk, Licence Administrator Assistant
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Via e-mail: robin.ikkutisluk@nwb-oen.ca

Attention: Robin Ikkutisluk

RE: Hornby Bay Mineral Exploration – Mouse Lake Project–Renewal– Type "B".

Please find attached Environment Canada's (EC) submission to the Nunavut Water Board (NWB) containing comments on the renewal of the Type B Water Licence No. 2BE-MOU0914 for Hornby Bay Mineral Exploration Ltd.'s (the Proponent) Mouse Lake Project, in response to the NWB's correspondence dated February 18, 2014. EC's specialist advice is provided pursuant to the *Canadian Environmental Protection Act 1999*, the pollution prevention provisions of the *Fisheries Act*, the *Migratory Birds Convention Act*, and the *Species at Risk Act*.

For further clarification on any aspect of this submission, please contact Michael Mohammed at (867)-975-4637 or michael.mohammed@ec.gc.ca.

Sincerely,

Michael Mohammed
Senior Environmental Assessment Coordinator

Attachment – "Environment Canada's Comments on Hornby Bay Mineral Exploration Ltd.'s Mouse Lake Project"

cc: Carey Ogilvie, Head Environmental Assessment North (NT & NU), PNR-EPOD
EC Internal Distribution

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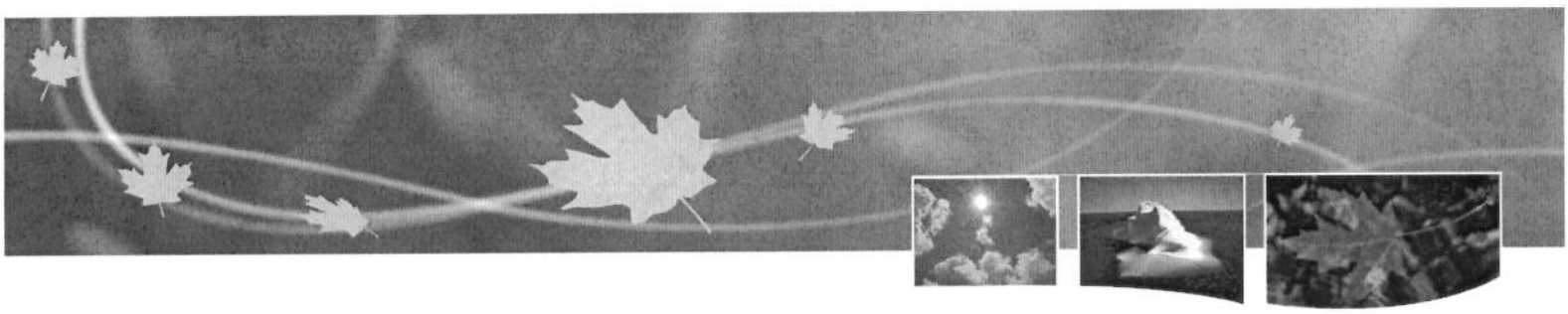

Environment Canada's Comments on Hornby Bay Mineral Exploration Ltd.'s Mouse Lake Project

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General

All mitigation measures identified by the Proponent, and the additional measures suggested herein, should be strictly adhered to. This will require awareness on the part of the Proponents' representatives (including contractors) conducting operations in the field. EC recommends that all field operations staff be made aware of the Proponents' commitments to these mitigation measures and provided with appropriate advice / training on how to implement these measures.

If there are any changes in the project proposal or more information becomes available, EC should be notified, as further review may be necessary. Please do not hesitate to contact Michael Mohammed at (867) 975-4637 or michael.mohammed@ec.gc.ca with any questions concerning the points contained in this advice document.

Water Quality

Subsection 36(3) of the *Fisheries Act* specifies that, unless authorized by federal regulation, no person shall deposit or permit the deposit of deleterious substances of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter any such water. In the definition of deleterious substance (subsection 34(1)) the *Fisheries Act* includes "any water that contains a substance in such quantity or concentration, or that has been so treated, processed or changed, by heat or other means, from a natural state that it would, if added to any other water, degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water." Subsection 36(3) makes no allowance for a mixing or dilution zone at the point of deposit.

Drilling

To ensure that Project activities do not impact water quality of surface waters the following should be adhered to:

- The Proponent should ensure the use of appropriate sediment / erosion control measures. Control measures should be monitored as necessary to ensure water quality is protected. Drilling from land adjacent to the lake shore should be conducted in such a manner that no materials enter the water and surface erosion will not occur;
- Land-based drilling should not occur within 30 m of the high water mark of any water body;
- The Proponent should not erect camps or store materials other than for immediate use on the surface ice of any water body;

- Chemical additives or drilling muds used in connection with this drilling program shall be disposed of such that they do not enter any water body either by surface or ground water flows; and
- Drilling of near-shore targets in any water body during the open water season should be avoided. Drilling from shorelines has significant potential to disturb / destroy shoreline vegetation and the physical integrity of the bank, resulting in erosion of the shoreline. All near-shore targets should be drilled from ice during the winter.

Regardless of the type of drilling conducted, EC recommends the following:

- Drilling wastes from land-based drilling should be disposed of in a sump such that they do not enter any body of water;
- Drilling additives or mud shall not be used in connection with holes drilled through lake ice unless they are re-circulated, contained such that they do not enter the water, or are demonstrated to be non-toxic; and
- If artesian flow is encountered, core-drill holes shall be plugged and permanently sealed immediately. EC requests that, if encountered, coordinates and depth of artesian flows be provided to the NWB.

EC assessed inorganic chloride salts and concluded that these salts in high concentrations are harmful to the environment. As a result, the Proponent should ensure that when using calcium chloride (CaCl2) for drilling purposes that return water is contained in a properly constructed sump and located in such a manner as to ensure that the contents do not migrate out from the sump. Please note that the Proponent should not rely on permafrost integrity to contain and isolate drilling wastes.

A list of drilling fluid products to be used in the drilling program should be submitted to and approved by the NWB. The list should include the intended use of the product, the approximate concentration to be formulated in the mud system, and expected concentrations to be found in the sump supernatant. The use of non-toxic mud additives does not guarantee the final drilling effluent will be non-toxic (cumulative toxic effects). Therefore, it is the Proponent's responsibility to demonstrate that the drilling waste is non-deleterious and in compliance with the pollution provisions of the Fisheries Act.

Sumps

All drilling effluent should be directed to a sump that is properly constructed and adequately sized to ensure there is no runoff and that water bodies downstream of drilling activities are not affected. All efforts shall be made to prevent drill mud, drill additives, return water and cuttings from migrating from the drill site.

Drilling wastes from land-based drilling should be disposed of in a sump such that they do not enter any body of water.

EC recommends the following measures be implemented with the use of sumps:

- The addition of lime to the sumps or the use of other suitable treatment measures to neutralize acids and precipitate metals should be considered where appropriate;
- All sumps should be located at least 100 metres from any water body;
- To minimize surface disturbance within continuous/discontinuous permafrost zones the sump should be excavated deeper rather than wider with an adequate freeboard; and
- All sumps, spill basins, and fuel caches should be located in such a manner as to ensure that their contents do not enter any water body, are to be backfilled, and re-contoured to match the surrounding landscape when they are no longer required.

Environmental Studies Research Funds (ESRF) (2004) has produced the guide "Drilling Waste Management – Recommended Best Practices" identifying best management practices for sump planning, design, operation and monitoring. EC recommends the use of these guidelines where appropriate.

A properly engineered sump, constructed in a suitable location should provide effective containment. However, there are a number of factors that can lead to potential instability and sump failure. These should be considered in the sump design, site selection, construction and closure methods. To mitigate potential impacts the following recommendations should be implemented to identify an appropriate sump site:

- The sump should be located away from surface waterbodies and drainage channels;
- Sump site selection criteria, design, construction, and final closure procedures; sump construction should be on flat terrain, avoiding the toe or bottom of a slope to reduce the potential for runoff water and pooling of water above the sump. Establish the high water mark and site the sump away from this mark to prevent the sump from being flooded;
- Perform a soil characterization to determine soil suitability and establish the local thermal regime to determine the range and extremes of the ground temperature and active layer for the drilling waste site. Construct the sump away from any gravel deposits or large ice lenses and in a location adequate to maintain the long-term frozen state of the waste;
- Consider developing a monitoring and management plan.

Spill Containment Plan

A Spill Containment Plan should include a set of procedures to ensure a prompt response, notification, and cleanup in the event of a hazardous substance spill or threat of release. Identification of any reasonable environmental emergencies expected to occur should also be outlined in the Plan.

The spill plan should identify what specific and potential risks are involved in the different stages of clean-up and provide specific guidance for response.

Waste Disposal (General)

If solid waste is to be shipped off site for disposal, EC suggests that confirmation and authorization be obtained from the owner/operator of the landfill prior to shipment.

Disposal of Hazardous Substances

Waste tracking or "manifesting" should be implemented to ensure proper use, storage, and management of hazardous materials. Manifests provide detailed information to first responders in the event of an accident and serve as a tool for confirming that shipments of dangerous or hazardous materials or waste are properly handled, transported, and disposed.

EC recommends that all hazardous wastes, including waste oil, receive proper treatment and disposal at an approved facility.

Sewage

Discharge of untreated sewage sludge to the environment is not an acceptable practice, and treated sludge should not be discharged into receiving waters. EC recommends that sludge be characterized prior to disposal to ensure disposal options are appropriate. The method of disposal of treated sewage sludge should comply with the requirements of municipal and territorial/provincial authorities.

EC recommends the disposal of treated camp effluent that meets discharge criteria via discharge to the land in a distributed surface application.

Migratory Birds and Species at Risk

EC recommends that food, domestic wastes, and petroleum-based chemicals (e.g., greases, gasoline, glycol-based antifreeze) be made inaccessible to wildlife at all times. Such items can attract predators of migratory birds such as foxes, ravens, gulls, and bears. Although these animals may initially be attracted to the novel food sources, they often will also eat eggs and young birds in the area. These predators can have significant negative effects on the local bird populations.

Subsection 5.1 of the *Migratory Birds Convention Act* prohibits persons from depositing substances harmful to migratory birds in waters or areas frequented by migratory birds or in a place from which the substance may enter such waters or such an area.

Eskimo Curlew is designated as Endangered and listed on Schedule 1 of the *Species at Risk Act*. However, there have been no reliable sightings of Eskimo Curlew since 1998 and the National Recovery Team for this species has determined that recovery is not feasible at this time. It is EC's view that, in light of its current status, there is no need for further action with respect to Eskimo Curlew. An appropriate mitigation and monitoring plan will be developed with the Proponent if it is established that this species does occur in the area.

Implementation of these measures may help to reduce or eliminate some effects of the project on migratory birds and Species at Risk, but will not necessarily ensure that the proponent remains in compliance with the *Migratory Birds Convention Act*, Migratory Birds Regulations, and the SARA. The proponent must ensure they remain in compliance during all phases and in all undertakings related to the project.