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**Sent by e-mail to:** Info@nirb.ca

Subject: Health Canada's comments on the *Draft* Environmental Impact Statement for the Baffinland Iron Mines Corp.'s (Baffinland) Mary River Project, dated December 2010, for NIRB's 30 day review period (NIRB File No. 08MN053)

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Dear Nunavut Impact Review Board,

Health Canada (HC) has completed a preliminary review of the *Draft* Environmental Impact Statement (*Draft* EIS) for the Baffinland Mary River Project proposal (the Project) that is undergoing a Review under Part 5, Article 12 of the Nunavut Land Claims Agreement, as requested. HC notes that the *Draft* EIS is a lengthy document with information that is potentially related to human health presented in multiple volumes and appendices, which made it challenging to review in the time period allotted. HC would like to indicate that due to the time constraints these comments are based on a preliminary review, and they may be further developed during NIRB's 60-day technical review period, based upon the proponent's responses to the supplemental information requests.

HC notes that the *Draft* EIS makes few or limited linkages of the effects of project activities to human health in the areas of air quality, water quality and contamination of country foods. A human health risk assessment (HHRA) is a useful tool to quantify and discuss the risks to human health as a result of contaminant release or mobilization. HC suggests considering using a HHRA to examine these risks.

To enable HC's review of potential human health effects of the Project, HC generally advises the inclusion of the information listed in relevant sections of the recent publication entitled "Useful Information for Environmental Assessments[1]". This guidance document describes in greater detail HC's areas of expertise and guidance with respect to human health information to be included in environmental assessments (EAs), as applicable.

As per HC's expertise in Air Quality, Noise Effects, Contamination of Country Foods, and Drinking and Recreational Water Quality, HC provides the following human health-related comments specific to the *Draft* EIS, for your consideration during this information

[1] http://www.hc-sc.gc.ca/ewh-semt/pubs/eval/environ_assess-eval/index-eng.php

request phase of the NIRB review. If the HC comments below are related to information that is already provided in the *Draft* EIS, please identify it by volume, section and page number.

**Location and Characterization of Receptors**
A discussion identifying human receptors is necessary for an assessment of potential human health effects due to impacts of the Project, and HC advises including the following in the EIS:

- Describe and characterize all potential human receptors, using maps to delineate their locations and the distances of communities, residences, temporary/seasonal residences, etc., to project sites and related infrastructure. If any potential receptors are excluded from the assessment, provide a rationale.

- If applicable, discuss the number of workers expected to be residing onsite or in workers' camp(s), and identify the distance between the camp(s) and the worksites. HC advises that an assessment of potential effects on human health to off-duty workers residing onsite or nearby be considered.

**Air Quality**
It appears that human receptors are not identified in the Air Quality Assessment. HC suggests the receptors are located and characterized as discussed in the section above. This information is important in describing risk to human health.

The *Draft* EIS does not appear to contain a rationale for excluding possible air quality contaminants that were not considered in this assessment. For example, Petroleum Hydrocarbons (PHCs) and diesel particulate matter (PM) were not included in this assessment, however project activities such as the use of diesel burning vehicles are associated with emissions of PHCs and diesel PM.

Values for "Federal Air Quality Objectives" and National Ambient Air Quality Objectives (NAAQOs) are presented in multiple locations throughout the *Draft* EIS (e.g. Vol. 5, Table 5-2.5 "Ambient Air Quality Criteria, Standards and Objectives" p.33; p117; Appendix D-1 p.2, etc), and appear to list outdated categories and associated values for Air Quality parameters. The current interim NAAQOs are available on EC's website[2]. HC advises the use of the most current objectives and standards as applicable. Please clarify the reference on page 117, Vol. 5 (and elsewhere) cited as "Environment Canada. 2010b. *National Ambient Air Quality Objectives*".

Particulate matter (PM) varies in size. Particles of size 10 micrometers (µm) or less in diameter, called $PM_{10}$, and particles less than 2.5 µm ($PM_{2.5}$) are considered to be non-threshold substances, meaning that health effects may occur at any level of exposure. Canada Wide Standards (CWS) for PM recognize that any increase in exposure will result in an incremental population risk. HC advises this fact be considered in a comparison of predicted project related changes in ambient air quality to applicable air quality benchmarks relevant to human health (Canada-wide Standards, National

[2] http://www.ec.gc.ca/rnspa-naps/default.asp?lang=En&n=24441DC4-1

Ambient Air Quality Objectives, territorial regulations, etc.), and a discussion of the potential effects on human health. HC notes the principles of "Keeping Clean Areas Clean" and "Continuous Improvement" are an important part of the CWS. In addition, HC notes that air quality criteria and standards should not be considered as thresholds below which health effects do not occur.

Please note that HC does not verify air quality modelling results and assumes that correct and accepted and/or validated methods were used. HC relies on the expertise of Environment Canada for the review of air quality modelling results and the provision of related advice. If errors and/or gaps in the modelling are noted by Environment Canada, it is suggested that revisions be made to address them as indicated by Environment Canada. If the revised results differ from the originally submitted results, it is advised that the report be resubmitted to HC for review.

**Noise Impacts**

HC suggests that potential human receptors are identified and characterized as discussed in the section above on Location and Characterization of Receptors.

HC notes that there is an inconsistency in the text between statement in the second-to-last bullet on page 100 under "Construction" heading, Section 3.3.3.2 Milne Port, Volume 5; and Table 5-3.8 (same page), regarding the value of "45 dBA", i.e. clarify the text "*above less than 45 dBA"* from the bullet, to the information provided in Table 5-3.8.

**Contamination of Country Foods**

The assessment of risk to human health due to the possible contamination of country foods appears to be limited in the *Draft* EIS and appendices. The discussion of possible contamination of country foods appears limited to the deposition of iron ore dust as a source of metals and only include a preliminary assessment of blueberries and caribou as country foods consumed that may be contaminated (Appendix 6G of the *Draft* EIS). However, the EIS identifies several other possible sources of contaminants (marine spills of fuel and other substances, transportation emissions i.e. trucks and trains, and waste rock handling) that are advisable to include in assessment of country food contamination as they may be operable pathways for contamination of country foods. Also these activities may be sources of contaminant types not discussed in Appendix 6G. The *Draft* EIS also states that "other berries (i.e. crowberries) and a number of marine mammals (i.e. ringed-seal, walrus, beluga whale, narwhal, polar bears) are also consumed"; but these country foods were not included in the discussion of contamination of country foods and risks to human health. It is also likely that fish from Mary River and surrounding lakes are consumed by populations in the area, and Volume 7 of the *Draft* EIS, p. 233 identifies that there are some exceedances of mercury values for Arctic char. Please note that the 2010 Government of Canada document "*Risk Management Strategy for Mercury"*[3] provides up-to-date information and discussion on mercury, including values, recommendations and guidelines.

[3] http://www.ec.gc.ca/Publications/9B24BD24-7D0B-4A1E-BFE0-53DC4137ED90%5CRisk_Management_Strategy_for_Mercury_e.COM1241.pdf

Also, Appendix 6G does not provide an quantitative assessment of the risks to human health, nor does it seem to be included elsewhere in the *Draft* EIS. In order for HC to provide advice about the human health risks associated with contamination of country foods, HC suggests adding a section in the EIS that includes:

- A discussion of whether country foods are consumed, or are expected to be consumed, in the potentially affected area (considering First Nations and Inuit people, local residents, hunters, fishers and trappers). Whenever possible, identify what country foods are consumed, which parts of the country foods are consumed if applicable (e.g. whether organs are consumed as well as the meat), and their consumption frequency using surveys of potentially affected people.

- An inventory of all potential contaminants (including naturally-occurring contaminants such as methylmercury) and a determination of whether possible transport pathways of these contaminants into country foods will result from project activities. A contaminant with a pathway relevant to food sources is considered a contaminant of potential concern (COPC).

- A further level of assessment (e.g. HHRA) if there is potential for contamination of country foods as a result of the project activities. An HHRA would consider adequate baseline data and/or modelling of COPCs in country foods prior to any project activities, a predicted impact of project activities on the concentration of contaminants in country foods, a risk characterization of the possible impacts from project activities, and possible risk management strategies, if appropriate.

- A detailed justification, if it is decided that an assessment of the potential for contamination of country foods is not needed, or if certain COPCs are being excluded.

- Information on the mitigation measures that will be taken to minimize any negative impacts on country food quality during all phases of the project. These measures may include the reduction of emissions (e.g. dust suppression, tarps on trucks), the use of consumption advisories when increases of contaminant levels are unavoidable, and educational programs to reduce the affected population's intake of contaminated country foods.

- A description of monitoring plans and/or follow-up programs, if applicable.

**Drinking and Recreational Water Quality**

HC has developed a detailed guidance document containing advice for drinking and recreational water quality related to human health and environmental assessments (enclosed for your convenience). The checklist (refer to Appendix A), may be useful to verify that the main components of a water quality assessment are completed.

HC advises the following be considered in an assessment of water quality:

- identifying all sources of drinking water (surface and groundwater), as well as water used for recreational purposes, within the area of influence of the project.

- an indication of baseline levels of naturally-occurring contaminants (e.g. arsenic, metals) in order to assess impacts on drinking water. The level of naturally-occurring contaminants may already be elevated, and may be further influenced by project activities.

- HC advises an examination of the potential impacts on the quality of drinking water sources (physical and chemical parameters) during all phases of the project, as well as the potential for cumulative effects on the quality of these water sources. If any changes to water quality are predicted, HC suggests that the potential effects on drinking water quality and human health be discussed.

The *Draft* EIS references "Health Canada. 2004. Drinking Water Quality Guidelines" (Volume 7, p. 301). It is unclear exactly what document the *Draft* EIS is citing, however HC advises consulting the current *Guidelines for Canadian Drinking Water Quality - Summary Table*[4] that were most recently updated in December 2010.

Should you have any questions regarding Health Canada's response, please feel free to contact the undersigned.

Sincerely,

- original signed by -

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Encl. *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Drinking and Recreational Water Quality*. Draft January 2011.

[4] http://www.hc-sc.gc.ca/ewh-semt/pubs/water-eau/2010-sum_guide-res_recom/index-eng.php