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*Your file Votre référence*  
EA0809-004  
*Our file Notre référence*  
4709 012 001 090

April 20, 2012

Chuck Hubert  
Environmental Assessment Officer  
Mackenzie Valley Environmental Impact Review Board  
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*Via email*

**RE: EA0809-004 Information Requests on the Fortune Minerals Ltd. NICO Project  
Environmental Assessment – Round 2**

Environment Canada (EC) has identified a further number of questions in connection with the Developer's Assessment Report (DAR) and supplemental information submitted by Fortune Minerals Ltd. Should you have any questions please do not hesitate to contact Sarah-Lacey McMillan at (867) 669-4724 or by e-mail at [sarah-lacey.mcmillan@ec.gc.ca](mailto:sarah-lacey.mcmillan@ec.gc.ca).

Yours truly,

Carey Ogilvie  
Head, EA-North  
Environmental Protection Operations  
Prairie and Northern Region

cc: Sarah-Lacey McMillan - Environmental Assessment Coordinator, EPO  
EC Review Team

**IR Number:** EC-2-1  
**Source:** Environment Canada  
**To:** Fortune Minerals  
**Subject:** Site Specific Water Quality Objectives (SSWQOs)  
**References:** Aquatic Risk Assessment - April 2012  
Undertaking #1 Effluent Treatment System Information  
IR-AANDC\_1 Response

**Preamble:**

Environment Canada (EC) notes that many of the proposed SSWQOs are significantly higher than CCME and other guidelines (e.g. aluminum, chloride, sulfate), Fortune has stated (AANDC IR\_1-2) that objectives are based on aquatic health benchmarks, i.e. were derived independently of the ability to discharge high-quality effluent. However, the Aquatic Risk Assessment states in Section 4.0 (page 11) that the SSWQOs were derived to guide the design of the water treatment system.

The description of the proposed water treatment system provides end-of-pipe concentrations for a range of parameters of concern. In comparing those to the proposed benchmarks, it is evident that the benchmarks are considerably higher than warranted by the predicted quality of effluent. This is expected to hold true for other contaminant sources, given the degree of conservatism that Fortune states is consistently used. For example, in the response to AANDC's IR\_1, Fortune states that the deposition of dust (as predicted by dispersion modeling) is sufficiently conservative as to render potential impacts to Nico Lake negligible, for the example of aluminum.

**Requests:**

EC requests that further work be done on identifying water quality objectives that are based on the lowest feasible concentrations in the receiving environment, taking into account ambient conditions (including sensitive local species) and reasonably achievable effluent quality and source predictions.

**IR Number:** EC-2-2  
**Source:** Environment Canada  
**To:** Fortune Minerals  
**Subject:** Site Specific Water Quality Objectives - aluminum  
**References:** Aquatic Risk Assessment - April 2012 Section 5.3.1.1

**Preamble:**

EC has not had sufficient time to review the derivation of the benchmarks (noting the report was posted less than a week before this round of IRs was due) but from an initial scan, finds the rationale for the higher numbers warrants further examination and discussion. Aluminum provides one example.

The calculation of the aluminum SSWQO is based on a formula for dissolved aluminum at pH levels below 6.5. Baseline pH levels in the project receiving environment are an order of magnitude higher, and a reference is provided that recommends a 30-day mean of 50 µg/L. Based on a review of the toxicity literature, it was concluded that 410 – 480 µg/L would be protective. EC notes that the literature cited included effects to early life stages of fishes, as well as deformities and behavioural effects, at levels at or below the

proposed SSWQOs. The Risk Assessment weighed the attenuating factors of DOC concentrations and form of aluminum in concluding the SSWQOs would none-the-less be protective. EC has concerns with this conclusion, and does not agree that this benchmark would be protective of all forms of aquatic life for indefinite exposure periods.

Another concern is with the reliance on NOECs and LOECs in determining effects concentrations.

**Requests:**

EC requests recalculation of the SSWQO for aluminum be done, with consideration of the 2007 CCME protocol. Further review of other parameters would also be appropriate.

**IR Number:** EC-2-3

**Source:** Environment Canada

**To:** Fortune Minerals

**Subject:** Effluent quality estimates

**References:** Undertaking #1 Effluent Treatment System Information: Table 1, Page 3  
EC\_12-3

**Preamble:**

The Memorandum dated Feb. 23, 2012 provides estimates of the end-of pipe treatment levels that are projected in the early years of the project, and for the worst case. Several of the parameters are higher than may be expected for that level of treatment, notably aluminum, nitrate, nitrite and sulfate. There is some uncertainty about elevated aluminum due to the conservatism associated with influent concentrations, and the expected flushing of the system. The predicted nitrite concentrations are of concern for toxicity.

**Requests:**

EC requests further explanation for the high concentrations predicted of nitrate, nitrite, and sulfate. Are there options for increased retention or aeration in the aerobic step of the active biological treatment system, in order to reduce nitrite concentrations?

**IR Number:** EC-2-4

**Source:** Environment Canada

**To:** Fortune Minerals

**Subject:** Mixing zone in Peanut Lake

**References:** Appendix 7.IV; Undertaking #1 Effluent Treatment System Information

**Preamble:**

The quality of effluent discharged will determine the extent of alteration in the receiving environment, in conjunction with mixing through the diffuser, and receiving lake conditions. Appendix 7.IV presents the size of the Near Field Region and dilution factors in Table 7.IV.3-5 and Table 7.IV.3-6, but it is not clear what would be considered the extent of the mixing zone, and where there would be no chronic toxicity given the updated effluent quality numbers.

**Request:**

What is the extent of the mixing zone in Peanut Lake, given the revised treatment system?

**IR Number:** EC-2-5

**Source:** Environment Canada

**To:** Fortune Minerals

**Subject:** Contaminants associated with dust deposition.

**References:** AANDC's IR\_1; Appendix 3.III Table 3.III.6-1

**Preamble:**

Predicted contaminant concentrations were based on contributions from dust plus expected quality of treated effluent. In the response to AANDC's IR\_1, Fortune states that the deposition of dust (as predicted by dispersion modeling) is sufficiently conservative, and effects would be negligible. The DAR water management plan includes provision for water for dust control, but this tends to be a short-lived remedy.

**Request:**

What mitigation measures can be implemented to reduce contaminant loadings associated with dust deposition?