



November 9, 2012

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Dear Mr. Hubert:

**Technical Report Responses – Aboriginal Affairs & Northern Development Canada**

De Beers is pleased to provide the Mackenzie Valley Environmental Review Board with Responses to the Technical Submission from Aboriginal Affairs & Northern Development Canada dated October 22, 2012.

Should you have any questions regarding this submission, please contact our office.

Regards,

Veronica Chisholm  
Permitting Manager

Attachment

c: Robert Jenkins, A/Director, Renewable Resources & Environment, AANDC





**D<sub>E</sub> B E E R S**

**CANADA**

**GAHCHO KUÉ PROJECT**

**Aboriginal Affairs & Northern  
Development Canada**

**Technical Report Responses**

**November**

**2012**

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# **1 INTRODUCTION**

On October 22, 2012 Aboriginal Affairs and Northern Development Canada (AANDC) submitted their technical report to the Mackenzie Valley Environmental Impact Review Board (MVEIRB) for the De Beers Canada Inc. (De Beers) proposed Gahcho Kué Project (Project). This report provides responses to those recommendations outlined in the AANDC technical report (AANDC 2012).

## **2 ABORIGINAL AFFAIRS AND NORTHERN DEVELOPMENT CANADA RECOMMENDATIONS AND RESPONSES**

### **2.1 SITE SPECIFIC WATER QUALITY OBJECTIVES**

#### **2.1.1 Recommendation 1**

AANDC recommends that the Report of EA should include narrative statements that describe the level of protection to be afforded the aquatic receiving environment. These statements could include:

- Water quality changes due to mining activities will not significantly affect benthic macro-invertebrate and plankton abundance, taxonomic richness or diversity.
- Water quality changes due to mining activities will not significantly alter fish abundance or diversity or fish consumption at current levels.
- Water quality changes due to mining activities will not negatively affect areas utilized as traditional drinking water sources.
- Water quality changes due to mining activities will not significantly affect mammals or wildfowl using the area as a drinking water, food source or habitat, or the current ability for people to harvest these animals.
- Prior to re-connection with the surrounding watershed, water and sediment quality in Kennady Lake will be adequate to support a viable and self sustaining ecosystem that is compatible with the regional watershed and maintains traditional use of the area.

#### **2.1.2 Response**

De Beers agrees with the intent of narrative statements to articulate the water management goals for the Project, and acknowledges the proposed statements provided by AANDC. De Beers believes, however, that the statements provided in *Water Quality Objectives (WQO) and Sediment Quality Objective (SQO) for the Proposed Gahcho Kue Project – Recommendations* (Golder 2012) provide a clear statement of goals for the Project, which align with the assessment endpoints that were used in the 2012 Environmental Impact Statement (EIS) Supplement (De Beers 2012):

- Kennady Lake

- 
- Water quality changes as a result of Project activities will not significantly affect the suitability of Kennady Lake in post-closure to support viable aquatic ecosystems
  - Water quality changes as a result of Project activities will not significantly affect the return of populations of lake trout, northern pike, and Arctic grayling in Kennady Lake in post-closure
  - Water quality changes as a result of Project activities will not negatively affect traditional and nontraditional uses of Kennady Lake in post-closure
- Lake N11 and Downstream Waters
    - Water quality changes as a result of Project activities will not significantly affect the suitability of Lake N11 and downstream waterbodies to support viable aquatic ecosystems
    - Water quality changes as a result of Project activities will not significantly affect populations of lake trout, northern pike, and Arctic grayling in Lake N11 and downstream waters
    - Water quality changes as a result of Project activities will not negatively affect traditional and nontraditional uses of Kennady Lake in post-closure

De Beers recognizes that as part of the process to develop the Aquatic Effects Monitoring Program (AEMP) for the permitting/regulatory phase of the Project, opportunities will be available to further refine these statements as a result of on-going engagement and feedback with regulatory agencies and Aboriginal communities. De Beers will focus any future refinements to the above statements on maintaining the future function and uses of the potentially affected waterbodies.

### **2.1.3 Recommendation 2**

AANDC recommends that specific baseline values, as opposed to regional baseline values, should be used when deriving SSWQOs for Kennady Lake and Lake N11.

### **2.1.4 Response**

The proposed benchmarks and WQOs presented in *Water Quality Objectives (WQO) and Sediment Quality Objective (SQO) for the Proposed Gahcho Kue Project – Recommendations* (Golder 2012) were developed using the EIS aquatics local study area (data from the Kirk Lake watershed) and not the

regional study area that extends through the Lockhart River watershed. De Beers will consider exposure and toxicity modifying factors (ETMFs) from specific water bodies (e.g., Kennady Lake and Lake N11) in the setting of site-specific benchmarks and WQOs as part of the on-going development of the AEMP design and Response Framework.

### **2.1.5 Recommendation 3**

AANDC recommends that the hardness concentration used for calculating hardness dependant SSWQOs should reflect the existing baseline hardness concentration and not the altered conditions predicted as a result of mining activities.

### **2.1.6 Response**

De Beers cannot support this recommendation because Canadian Council of Ministers of the Environment (CCME 2007) states that the derivation of WQOs needs to account for key ETMFs, such as hardness, which may influence the bioavailability, and thus the toxicity, of substances of potential concern to aquatic receptors. Hardness, organic carbon and pH are ETMF's that have been considered in the development of interim WQOs for Lake N11 and Kennady Lake. Increased water hardness will reduce the possibility of toxic effects from inorganic substances such as metals.

### **2.1.7 Recommendation 4**

AANDC recommends that, when deriving SSWQOs, the lowest level reasonably achievable (considering requirements for operational flexibility) should be selected instead of defaulting to existing generic guideline values.

### **2.1.8 Response**

De Beers does not support with this recommendation. Water Quality Guidelines (WQGs), such as those provided by CCME, are set to be protective of the aquatic environment, that is, protective of all forms of aquatic life over the long term. As a consequence they are deemed appropriate to consider as benchmarks or WQOs. While water chemistry changes due to Project activities are projected, increases in a parameter concentration above baseline, but below its guideline concentration, should result in negligible risk of adverse effects to aquatic biota. Accordingly, in De Beers' view, it is unnecessary to create conservative benchmarks that will offer no additional environmental benefits but rather favours reliance on accepted guideline values.

## **2.1.9 Recommendation 5**

AANDC recommends that the SSWQO for mercury should either align with the maximum predicted mercury concentrations as a result of the project and/or within the range of naturally occurring background concentrations in Kennady Lake and Lake N11.

### **2.1.10 Response**

De Beers will re-examine the benchmark for mercury through the development of the AEMP and Response Framework, which includes on-going engagement with regulatory agencies and Aboriginal communities through this process.

## **2.2 AQUATIC EFFECTS MONITORING PROGRAM (AEMP) AND ADAPTIVE MANAGEMENT**

### **2.2.1 Recommendation 6**

AANDC recommends that De Beers Canada be required to follow the “*Guidelines for Designing and Implementing Aquatic Effects Monitoring Programs for Development Projects in the Northwest Territories, June 2009*” in the development of its Aquatic Effects Monitoring Program, action levels, and related Management Response Framework for the Gahcho Kue Diamond Mine Project.

### **2.2.2 Response**

De Beers will consider the following documents in the development of an AEMP and related management response framework for the Project:

- Guidelines for Designing and Implementing Aquatic Effects Monitoring Programs for Development Projects in the Northwest Territories: Recommended Procedures for Developing Detailed Designs for Aquatic Effects Monitoring Programs (Zajdlik et al 2009);
- Draft *Guidelines for Adaptive Management – a Response Framework for Aquatics Effects Monitoring* (Wek’éezhii Land and Water Board 2011); and
- other related AEMP documentation publicly available from existing northern mines, as applicable.



## **2.3 CLOSURE AND RECLAMATION**

### **2.3.1 Recommendation 7**

AANDC recommends that water quality be closely monitored during the re-filling process, and adaptive management be implemented as required to ensure that the final water quality is sufficient to support a viable and self-sustaining ecosystem that is compatible with the regional watershed and maintains traditional use of the area prior to reconnecting the WMP to the downstream watersheds.

### **2.3.2 Response**

De Beers agrees with this recommendation.

### **2.3.3 Recommendation 8**

AANDC recommends that a key element of the closure planning process, during operations, should be to identify potential mechanisms through which full lake mixing could occur (e.g. weather, pit wall slumping, etc.) and use the results of ongoing investigations and study to implement measures such that chemocline stability will be enhanced.

### **2.3.4 Response**

De Beers agrees that a key element of the closure planning process will be to identify potential mechanisms through which full lake mixing could occur and to provide mitigations that enhance chemocline stability during the refilling process.

### **2.3.5 Recommendation 9**

AANDC recommends that a key element of the closure planning process, during operations, should be to identify and develop methods to reduce the period of time required for recovery of the WMP.

### **2.3.6 Response**

De Beers agrees with this recommendation.

### **2.3.7 Recommendation 10**

AANDC recommends that closure goals and objectives be developed for the WMP that must be met prior to and following reconnection with the downstream environment. These closure goals and objectives would be developed in consultation with Aboriginal groups, interested parties and regulators.

### **2.3.8 Response**

De Beers will develop closure and reclamation objectives for the Project that are consistent with the draft *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories* prepared by AANDC and the Mackenzie Valley Land and Water Boards (2011), which builds upon the *Mine Site Reclamation Guidelines for the Northwest Territories* (INAC 2007). Objectives for Areas 2 to 7, which include the Water Management Pond (WMP), will be developed as part of the Closure and Reclamation Plan process. De Beers understands that the development of a Closure and Reclamation Plan for the Project requires engagement with Aboriginal groups, interested parties and regulators.

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### 3 REFERENCES

- AANDC (Aboriginal Affairs and Northern Development Canada). 2012. Technical Report for De Beers Canada Proposed Gahcho Kue Diamond Mine Project. EIR0606-001. Submitted to Mackenzie Valley Environmental Impact Review Board. October 22, 2012. Available at:  
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- AANDC and MVLWB. 2011. Draft Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories. Available at <http://mvlwb.com/resources/policy-and-guidelines/>
- CCME (Canadian Council of Ministers of the Environment). 2007. A Protocol for the Derivation of Water Quality Guidelines for the Protection of Aquatic Life 2007. In: Canadian Environmental Quality Guidelines. Winnipeg, MB, Canada.
- De Beers (De Beers Canada Inc.). 2012. Environmental Impact Statement Supplemental Information Submission for the Gahcho Kué Project. Submitted to the Mackenzie Valley Environmental Impact Review Board, Yellowknife, NWT, Canada.
- Golder (Golder Associates Ltd.). 2012. Water Quality Objectives (WQO) and Sediment Quality Objectives (SQO) for the Proposed Gahcho Kue Project – Recommendations. Technical Memorandum. 11-1365-0012.3030.40/DCN-089. Submitted to De Beers Canada Inc. September 14, 2012. Available at:  
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- Wek'èezhii Land and Water Board (2010) Guidelines for Adaptive Management - a Response Framework for Aquatic Effects Monitoring - Draft . Wek'èezhii Land and Water Board, Yellowknife, Northwest Territories

Zajdlik, B., MacDonald, D.D. and INAC Water Resources (2009) Guidelines for Designing and Implementing Aquatic Effects Monitoring Programs for Development Projects in the Northwest Territories: Recommended Procedures for Developing Detailed Designs for Aquatic Effects Monitoring Programs. AEMP Technical Guidance Document - Volume 4. Indian and Northern Affairs Canada, Yellowknife, Northwest Territories

## **4 ACRONYMS AND ABBREVIATIONS**

AANDC	Aboriginal Affairs and Northern Development Canada
AEMP	Aquatic Effects Monitoring Program
CCME	Canadian Council of Ministers of the Environment
De Beers	De Beers Canada Inc.
EIS	environmental impact statement
ETMFs	exposure and toxicity modifying factors
MVEIRB	Mackenzie Valley Environmental Impact Review Board
Project	Gahcho Kué Project
SQO	<i>Sediment Quality Objective</i>
WMP	Water Management Pond
WQG	Water Quality Guidelines
WQO	<i>Water Quality Objectives</i>