

The Government of the Northwest Territories Environment and Natural Resources

Public Hearing Presentation – Water Resources
Dominion Diamond Ekati Corporation Jay Project
Environmental Assessment
EA1314-01

Yellowknife, NT
September 16th, 2015

Presentation Overview

- ▶ Water Quality – Impact Assessment and Assessment Boundaries
- ▶ Effects Assessment – Effluent Quality and Site Specific Water Quality Objectives
- ▶ Processed Kimberlite Management and Pit Lake Closure – Main Site

Water Quality – Impact Assessment and Assessment Boundaries

- Concerns with the Assessment Boundaries used for the Impact Assessment.
- For water quality and fish and fish habitat
 - DAR assessment relies upon a large regional boundary
- Use of large regional boundary may underestimate actual potential for impacts to Lac du Sauvage
 - May mask impacts at local level, i.e. in Lac du Sauvage.

Water Quality – Impact Assessment and Assessment Boundaries

Jay Project Site

- Fish Abundance:
 - Reliance in baseline study area for impact assessment.
 - 50% reduction in fish abundance in Lac du Sauvage corresponds to a 5% reduction in the baseline study area.
- Water Quality:
 - Effluent Discharge
 - end-of-pipe TDS concentrations could reach up to 2,925 mg/L.
 - High TDS and chloride may result in unacceptable impacts.
- Dyke Construction
 - localized impacts from increased turbidity during dyke construction.

Water Quality – Impact Assessment and Assessment Boundaries

Ekati Main Site

- Processed Kimberlite Storage:
 - Processed Kimberlite storage in open pits as slurry.
 - Impacts to water quality in LLCF and pit lake surface water at closure.
I.e. Leslie Lake
- Pit Lake Reconnection:
 - Reconnection of pit lake as part of approved Interim Closure and Reclamation Plan.
 - Impact of pit lakes water quality on receiving environment unknown, I.e. Kodiak Lake

Water Quality – Impact Assessment and Assessment Boundaries

Recommendation:

MVEIRB include a measure that minimizes impacts at localized scales from dike construction, dewatering, operation and closure of the Jay Project Site, and its associated project activities at the Ekati Mine Site, to the extent practical. These local boundaries should include the initial mixing zone, Lac du Sauvage, Leslie Lake and Kodiak Lake.

Effluent Quality and Site Specific Water Quality Objectives

- ▶ Concerned about the water quality in Misery Pit
 - As effluent during operations; and
 - Pit Lake water quality post closure.
- ▶ Water quality in Misery Pit will become worse with time.
 - Discharge currently not planned to occur until year 5 (2023).
 - Water quality decreases with time as depth of pit increases.
 - Finite pit volume limits ability to store water later in the mine life.
 - Not convinced a viable contingency has been provided if water quality is poorer causing toxicity later in mine life.

Effluent Quality and Site Specific Water Quality Objectives

- ▶ Misery Pit closure plan is to place a 60 m freshwater cap over poor quality mine water.
- ▶ The water quality in the cap will degrade with time and result in elevated TDS concentrations in Misery Pit.
I.e. modeled at ~748 mg/L TDS in yr 200
- ▶ GNWT suggested modifications to DDEC's proposed water management strategy to address the effluent quality and post-closure water quality concerns.

Effluent Quality and Site Specific Water Quality Objectives

- GNWT proposes initiating discharge from Misery Pit earlier than Year 5.
 - Water quality in Misery Pit is better during early years of operation.
 - Discharging earlier will increase storage volume available later in operating life –
 - Storing the poorest water quality in Misery Pit later in the mine life creates a larger density difference between minewater and freshwater cap in Misery Pit and Jay Pit.
 - Should result in more stable meromictic conditions.
- GNWT proposes increasing the depth of the freshwater cap in Misery Pit at closure.
 - Appears to be sufficient post-closure volume in Jay Pit to contain more Misery Pit water.
 - Should result in better post closure water quality.

Effluent Quality and Site Specific Water Quality Objectives

Recommendation:

To prevent the potential for significant environmental impact to VCs (i.e. water quality and fish and fish habitat) in Lac du Sauvage and Lac de Gras during operations and post closure:

- ▶ MVEIRB include a measure requiring effluent discharge from Misery Pit be managed such that sufficient storage volume is available in later years to curtail effluent discharge volumes in Years 9 and 10. This should include an evaluation of discharging effluent in Year 3, which should focus on accumulating the worst quality mine water within the Misery Pit to reduce toxicity concerns and impacts to Lac du Sauvage and promote more stable meromictic conditions post closure.

Effluent Quality and Site Specific Water Quality Objectives

- ▶ MVEIRB include a measure requiring additional volumes of Mine Water from Misery Pit be pumped to Jay Pit at closure and an increase to the proposed water cap over Misery Pit Lake to a depth greater than 60 m. This would result in better water quality in the near surface waters of the Misery Pit Lake than predicted in the environmental assessment and result in better water quality post closure (i.e. goal for long term Mixolimnion concentrations ≤ 500 mg/L TDS).

Processed Kimberlite Management and Pit Lake Closure – Main Site

- Concerned about post closure pit lake quality at the main site.
 - Processed kimberlite from the Jay will be deposited in the mined out Panda and Koala Pits.
 - Process water will accumulate and slurry water will freeze during winter disposal.
 - Proposed 30 m freshwater cap for closure.
- Uncertainty around interactions between freshwater cap and deposited processed kimberlite and process water.
 - Alternate options for PK and slurry water in the Panda and Koala Pits have not been described.

Processed Kimberlite Management and Pit Lake Closure – Main Site

- Panda and Koala Pits will be re-connected to Kodiak Lake post closure.
- Approved Interim Closure and Reclamation Plan includes closure objectives and criteria for all the Ekati Open Pit Lakes.
- Limited information has been provided regarding the potential impacts to post closure pit water quality due to deposition of PK.
 - Additional Reclamation Research is required.

Processed Kimberlite Management and Pit Lake Closure – Main Site

Recommendation:

To prevent water quality within the water cap in Panda and Koala Pits from degrading over time, and potentially affecting traditional use or Valued Components, MVEIRB should include a measure requiring DDEC to conduct an optimization study regarding the storage of PK and slurry water in Panda and Koala Pits, during the operational stage. The outcomes of this study should be implemented to enhance DDEC's ability to meet existing closure objectives for the Panda and Koala Pit Lakes.