

Environmental Monitoring Advisory Board

Presentation to the Wek'eezhii Land & Water Board

Diavik Diamond Mines' Water Licence Amendment

Application: W2015L2-0001

Natural Drainages

June 1, 2023



Intervention Sections

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1. Overview Comments

Proposed application is not acceptable

- Basis for application is that discharge is not a waste
- Regulate by SWALF, not numerical criteria.
- Weakens Closure Criteria
- Doesn't identify mixing zone
- Uncontrolled discharge
- Insufficient monitoring
- SWALF responses inadequate

1. Overview: Diavik Approach - Moving Target

- **ICRP 4.0 - One kilometer mixing zone around East Island**
- **ICRP 4.1 - 15 mixing zones, from 100 to 1800 meters**
- **Mixing Zone Research Plan**
- **Amendment to breach collection ponds**
 - **Provide Decommissioning Plans for each pond**
- **Revised Amendment to breach collection ponds**
 - **Approved through FCRP**

1. Overview: Limit Number of Pond Breaches Approved

- **Value of discharging is collecting real data**
 - No data yet - only have modelled predictions
 - Need data to understand effects of discharge on water in Lac de Gras (LdG)
- **Diavik doesn't need approval to breach all ponds to collect data**
- **Water Licence Renewal due by 2025**
 - Use data to improve Decommissioning in closure licence.
- **Recommendation: Limit any approval for breaching to Ponds 2 & 7**

2. Regulating Discharge: Discharge is a waste

- **Diavik claims discharge from ponds is not a waste**
 - Discharge at breaches should not be consumed by humans or wildlife
 - Discharge exceeds AEMP Benchmarks for protection of aquatic life
 - No predictions for water quality where streams enter LdG
- **Recommendation: consider discharge from ponds a waste; sample where discharge enters LdG**

2. Regulating Discharge: Missing Information

- **Diavik has not provided important information required in Decommissioning plan description**
- **EMAB identified over 20 requirements in the Decommissioning Plans that Diavik did not provide, including:**
 - **Predictions don't define mixing zones**
 - **No predictions of water quality at catchment discharge or at 100 meters**
 - **Sampling plan for each catchment, including sediment, benthics and fish**

2. Regulating Discharge: Missing Information

Summary of Recommendations

- ▶ **Reject Diavik proposal to approve breaching all ponds through FCRP**
- ▶ **Diavik should provide all information required in Decommissioning Plan description for each pond before any approval**
- ▶ **Set and meet numerical thresholds for all Contaminants of Concern for each pond**

3. Use of Traditional Knowledge

- ▶ Diavik has not proposed TK Monitoring for collection pond breaches
- ▶ Diavik has not proposed monitoring of cultural water use criteria for collection pond breaches
- ▶ Recommendation Summary: Any approval to breach ponds should require Diavik to propose TK Monitoring.

If Diavik proposes that meeting AEMP Benchmarks also meets cultural criteria it needs to demonstrate this.

4. Water Quality Modelling - Arc 1

- ▶ Model predicts water quality will be diluted to safe levels in Lac de Gras
 - ▶ Predictions are at Arc 1, not edge of mixing zone



Pond 7

Discharge Point

100 meters

Diavik says mixing zone edge is somewhere inside Arc 1. Model can't predict exactly where.

Distance of Arc 1 from discharge point into Lac de Gras ranges from 200 to 500 meters.

4. Water Quality Modelling: Accuracy

- ▶ **EMAB has some questions and recommendations about modelling that could affect accuracy of predictions**
 - ▶ **Inputs**
 - ▶ **Mixing Zones**
 - ▶ **PKC Source Term**
 - ▶ **Climate Change Effect**
- ▶ **Need to verify model predictions with real world data**

5. Closure Criteria: Human Drinking Water

- ▶ **Diavik has revised proposed closure criteria for water quality for humans and wildlife**
 - ▶ **Removed human drinking water quality criteria from SW1**

- ▶ **Summary of Recommendations about Drinking Water Criteria:**
 - ▶ **Add Drinking Water Guidelines back into SW1**
 - ▶ **Add sediment quality monitoring in discharge areas**

5. Closure Criteria: Aquatic Health

- ▶ **Diavik has revised proposed closure criteria for water quality for fish and aquatic life**
 - ▶ **Removed requirement to meet AEMP Benchmarks from SW2**
- ▶ **Summary of Recommendations about Aquatic Health Criteria:**
 - ▶ **Add back meeting AEMP Benchmarks at the mixing zone edge to SW2**
 - ▶ **Do toxicity testing on more species - fish, benthics, algae/aquatic plants**

6. SNP Monitoring

- ▶ Discharge will mostly happen during freshet or after rain
- ▶ Diavik wants to monitor discharge :
 - ▶ At dam breach
 - ▶ At model prediction location: Arc 1
 - ▶ Likely unsafe to monitor at freshet time

6. SNP Monitoring

Summary of Recommendations about Monitoring:

- ▶ Plume survey to show mixing zone
- ▶ More sampling locations
 - ▶ where stream enters LdG (where humans and animals will drink)
 - ▶ 100 meters from discharge point (target for maximum size of mixing zone)
- ▶ Monitor sediment in mixing zone

6. SNP Monitoring

Summary of Recommendations about Monitoring (cont'd):

- ▶ Remove 5 meter sampling depth restriction
- ▶ Plan to monitor whenever there is discharge
- ▶ Alternate plan when monitoring is not safe
- ▶ Longer monitoring for catchments with possible acid rock drainage
- ▶ Any change to monitoring must be approved by WLWB

7. Surface Water Action Level Framework

- **EMAB view: SWALF is not adequate to protect water quality or health of humans, wildlife or aquatic life**
- **Proposed data collection doesn't provide enough data: not enough locations; not often enough**
- **SWALF triggers and responses may not be protective**

7. SWALF: Triggers

Summary of Recommendations

- ▶ Add triggers, and monitoring, where discharge enters LdG, and edge of mixing zone (not Arc 1)
- ▶ Add AEMP Benchmark triggers at edge of mixing zone (not Arc 1)
- ▶ Add Drinking Water Guidelines triggers where discharge enters LdG
- ▶ Integrate Cultural Use Criteria
- ▶ Add early warning triggers

7. SWALF: Triggers

Summary of Recommendations (cont'd)

- ▶ Better justification for 10 x AEMP Benchmark trigger
- ▶ Add early warning triggers for human, wildlife and aquatic health
- ▶ Toxicological trigger should be IC20, not IC50
- ▶ Add sediment trigger in mixing zones

7. SWALF: Responses

- **Some responses require lengthy actions:**
 - Risk assessment (could take a year)
 - Adjustments to parameters
- **Recommendation: Add trigger/response to stop discharge to prevent adverse effects while other responses are carried out**
 - Chronic toxicity above IC20 at edge of mixing zone (not Arc 1)

7. SWALF: Environmental Trade-off Study

- Proposed by Diavik if water treatment is only solution
- As presented, could compromise closure goals and objectives.
- ▶ Recommendation: Diavik must define how the trade-off study would work
 - ▶ Factors to consider
 - ▶ Who will be involved
 - ▶ Timeframe
 - ▶ Decision process

8. Pond Decommissioning

Summary of Recommendations:

- ▶ EMAB has recommended any approval for decommissioning be limited to Ponds 2 & 7
- ▶ Any change to Decommissioning Schedule needs WLWB approval
- ▶ No pond can be breached until Diavik shows water quality is suitable throughout the year

8. Pond Decommissioning

Summary of Recommendations:

- ▶ **Treat pond sediment as contaminated soil**
 - ▶ Analyze for any potential contaminants of concern
- ▶ **No approval to breach until closure earthworks in catchment are completed**
- ▶ **Assess possible erosion during high rainfall**

9. Closure AEMP

▶ Closure AEMP

- ▶ Focuses on discharge areas around East Island
 - ▶ Scheduled to start in 2025, after some ponds will have been breached
- ▶ Recommendation: Collect monitoring data before any discharges, to compare with results after discharge starts.

9. Closure AEMP

- ▶ **Modelling predicts greatest discharge effect where PKC discharge flows - C3 bay**

- ▶ No AEMP site in C3 bay

Recommendation: Sample all components in C3 bay and collect a minimum of one year of data before any discharge.

- ▶ **Closure AEMP to Start in 2025**

Recommendation: Implement Closure AEMP before 2025 for any ponds scheduled to breach before then.

10. Human Health and Ecological Risk Assessment (HHERA)

- ▶ **HHERA assesses risks 10 years after Diavik closes**
 - ▶ Based on predicted concentrations of contaminants
 - ▶ Predictions based on reference data - may be some issues
 - ▶ Requires more robust risk management
 - ▶ Potentially underestimates some risks

10. HHERA

Summary of Recommendations

- ▶ Compare current water quality from reference areas to pre-development
- ▶ Mixing Zones need to be reduced
 - ▶ No chronic effects at end of mixing zone
- ▶ Identify all risks above background
- ▶ More discussion on parameters with potential unacceptable risks
- ▶ Verify modelling results with monitoring
 - ▶ Toxicity testing



11. Specific Comments on Licence Wording

- ▶ **Revise Part G(33)**
 - ▶ Authorization to discharge from collection ponds is subject to other licence conditions eg. G(36) & G(37)
- ▶ **Revise Part J(10)**
 - ▶ Authorization to discharge from collection ponds is subject to other licence conditions eg. G(36) & G(37), Schedule 8(3)(e)(x)
- ▶ **Modify Part G(27)(e), G(28)(h), G(33), J(9) and J(10)**
 - ▶ remove references to approval of pond decommissioning through the Closure and Reclamation Plan

Thank you
Masi

Questions?

