Rio Tinto Diavik Team

Rio Tinto Diavik Team Panel

**Sean Sinclair** – Principal Advisor, Environment and Closure Readiness

**Kofi Boa-Antwi** – Regulatory Advisor, Environment

**Nicole Goodman** – Supervisor, Environment

**James Sovka** – Hydrogeologist, Diavik Technical

**Gord Stephenson** – Manager, Projects

**Gord Macdonald** – Manager, Closure

**Technical Expert**

**Zsolt Kovats** – Golder, Aquatics and Environmental Assessment
Agenda

Part 1: Project Description and Assessment Summary
Part 2: Waste Rock
Part 3: Water Quality Predictions
Part 4: Water Management and Monitoring
Part 5: Other Topics
Part 1: Project Description and Assessment Summary
Diavik Diamond Mine: 1998 Concept and A21 Below Pit
DDMI’s Rationale for and Approach to the A21 Below Pit Project

RATIONALE

• To recover additional ore/resources within the A21 Kimberlite Pipe
• To allow for a more robust operations in the latter years of the Diavik Mine Operations (2023-2025)

APPROACH OPTIONS

• Sub-level retreat (SLR) mining and/or vertical cutter mining, large diameter drilling, and continuous flight auger mining
• Project will mostly involve use of existing permitted infrastructure at the Diavik Mine
• Use of existing Diavik Mine human resources, including contractors to support Project execution
• Reclamation of the constructed facilities/structures to align with existing Diavik Mine Closure Plan

A21 Below Pit would not extend Diavik mine life
DDMI conducted pre-submission Engagement with Stakeholders from February to September 2019

DDMI submitted the Water Licence Amendment Application to WLWB in November 2019

DDMI’s main intent of this Water Licence Application is for an administrative change to the definition of “A21 Pit” in the Diavik Water Licence to reflect proposed additional mining activities:

"A21 Pit" means the developed open pit and underground mine workings for the mining of the A21 Kimberlite Pipe.

All other project elements will be incorporated as minor updates to Environmental Management Plans. No significant change to the current Environmental Management Approach or Practices on site have been identified to manage additional mining of the A21 ore body.
Mining Methods

Current A21 Open Pit Ore: ~3.6 Mt
Potential A21 Below Pit Ore: ~1.1 Mt
# A21 Below Pit Project Schedule

<table>
<thead>
<tr>
<th>Kimberlite Pipe</th>
<th>Access</th>
<th>Mine Status</th>
</tr>
</thead>
</table>
| A154 North      | A154 open pit (approved)  
                 | A154 underground (approved) | - Open pit mining completed Q3 2008  
                                |                                   | - Underground mining active  
                                |                                   | **Expected completion 2025** |
| A154 South      | A154 open pit (approved)  
                 | A154 underground (approved) | - Open pit mining completed Q3 2010  
                                |                                   | - Underground mining active  
                                |                                   | **Expected completion 2022** |
| A418            | A418 open pit (approved)  
                 | A418 underground (approved) | - Open pit mining completed Q3 2012  
                                |                                   | - Underground mining active  
                                |                                   | **Expected completion mid-2021** |
| A21             | A21 open pit (approved) | - Open pit mining started in 2018  
                                |                                   | **Expected completion mid-2023** |
| A21             | A21 below pit (proposed) | - Deeper or Underground mining to start in 2023  
                                |                                   | - Deeper or Underground mining to be completed in 2025 |

<table>
<thead>
<tr>
<th>Calendar year</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
<th>2025</th>
<th>Beyond 2025</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Study</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-construction/Construction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Below Pit Ore Production</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Green</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-Closure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Existing Diavik Mine Approvals versus A21 Below Pit Project

<table>
<thead>
<tr>
<th>Component</th>
<th>Diavik Diamond Mine Project, Currently Approved</th>
<th>A21 Below Pit Mining Project</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Footprint</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diavik Diamond Mine</td>
<td>12.67 km²</td>
<td>No Change</td>
</tr>
<tr>
<td><strong>Process Plant</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design Capacity</td>
<td>2 to 2.5 Mt per year</td>
<td>No Change</td>
</tr>
<tr>
<td><strong>Waste Rock Storage Areas</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South Country Rock Pile Design Capacity</td>
<td>25 Mt</td>
<td>13 Mt forecast; 0.3 Mt increase; within design capacity.</td>
</tr>
<tr>
<td><strong>Processed Kimberlite Storage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design Capacity</td>
<td>50.4 Mt in PKC with full Phase 7 Dam Raise, with additional storage in Mine Workings (if approved)</td>
<td>1.1 Mt increase in PK stored in PKC, already factored into PKC Phase 7 Dam Raise Design capacity and PK to Mine Workings Proposal capacity</td>
</tr>
<tr>
<td><strong>Water Use / Water Withdrawal / Wastewater Discharge</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Design Capacity</td>
<td>90,000 m³/day (32,850,000 m³/year)</td>
<td>3,271 to 10,225 m³/day (1,193,915 to 3,732,125 m³/year) increase due to A21 Below Pit Mining Project; within water management system capacity</td>
</tr>
<tr>
<td>Freshwater Use</td>
<td>1,280,000 m³/year</td>
<td>No Change</td>
</tr>
</tbody>
</table>
Summary Environmental Assessment for the A21 Below Pit Project

DDMI’s environmental assessment approach:

- Determine the scope of the Project i.e. construction, operation and closure of the A21 Below Pit Project
- Identify the Project phases that are relevant to the assessment
- Select valued components to be considered in the assessment
- Identify existing programs and plans at the Diavik Mine that are relevant to the Project
- Describe and assess the likely effects of the Project on valued components, including mitigation measures to be incorporated into the Project
- Identify residual effects (effects after mitigation) of the Project

Conservative assumptions:

- Impacts from A418 and A154 continue at maximum levels for duration of project
- Maximum impact from A21 Below Pit occurs for full duration of project
Summary Environmental Assessment for the A21 Below Pit Project… cont’d

**Biophysical Environment**
- Climate
- Air Quality
- Groundwater
- Surface Water Quantity
- **Surface Water Quality**
- Fish and Fish Habitat
- Permafrost
- Terrain, Soils and Vegetation
- Caribou
- Carnivores
- Raptors, Aquatic and Migratory Birds

**Socio-economic Environment**
- Heritage Resources
- Land Use and Traditional Land Use
- Employment and Economy
- Community Health, Well-being, and Infrastructure

**Project Interactions with Valued Components:**
- No linkage or Secondary
- Primary
Effects of the A21 Below Pit Project on Water Quality and Aquatic Life in Lac de Gras

- APPROACH:
  - Qualitative evaluation, considering compliance with EQC, AEMP benchmarks, and changes in water quality in relation to currently observed effects in Lac de Gras by the AEMP
  - Considered TDS and TN loading, but focused on TP loading, because AEMP results indicate that existing biological effects in Lac de Gras are primarily related to nutrient enrichment, as a result of phosphorus inputs
  - TDS is an indicator variable, with proportional changes expected in concentrations of its constituent ions
  - Considered the potential for nutrient enrichment or toxicological impairment
  - Determine residual effects and significance determination
Effects of the A21 Below Pit Project on Water Quality and Aquatic Life in Lac de Gras

- **EFFECTS ON WATER QUALITY:**
  - Potential effects in water quality are related to predicted increases in effluent flow rates (6% to 22% relative to the fully developed A21 open pit).
  - All constituents with currently applicable EQC in the Water Licence are predicted to remain below EQC, consistent with effluent monitoring results since the Mine began operations.
  - Loads were estimated for TDS, TN and TP:
    - TDS (and its constituents) load to Lac de Gras is predicted to increase by 2% to 8% relative to currently approved operations; slight increases in concentrations are predicted in Lac de Gras.
    - TN load to Lac de Gras is predicted to remain similar to the TN load under the currently approved operations; concentration increases are not expected in Lac de Gras.
    - TP load to Lac de Gras is predicted to increase by 3% to 9% relative to currently approved operations; both the lower and upper bound loads remain below the EQC; slight increases in concentrations are predicted in part of Lac de Gras.
EFFECTS ON WATER QUALITY (Continued):

- Increased concentrations of ions and metals due to increased effluent flow rate are not predicted to result in toxicological effects:
  - Doubling concentrations measured at the mixing zone boundary results in concentrations remaining 2 to 400 times below AEMP benchmarks

- The predicted TP load (461 to 487 kg/year) remains within the range of TP loads reported between 2007 and 2018 (256 to 742 kg/year)
  - Based on AEMP monitoring data, TP affected area is qualitatively predicted to be up to 10% of Lac de Gras, localized in the area near the diffuser, which is within the observed range of variation since 2007 (0.5% to 19.6%)
  - Lac de Gras is predicted to remain oligotrophic
EFFECTS ON AQUATIC LIFE:

- The Project is not predicted to result in toxicological impairment of aquatic life in Lac de Gras.
- Change in productivity that may result from the increased nutrient loads is expected to remain within the previously observed range documented by the AEMP.
- Changes to biological components of fish habitat are not expected to be of concern regarding aquatic ecosystem health.
- Slight increases in primary and secondary productivity may result in increased abundance and biomass of organisms used as food by fish.
- An effect on fish distribution or community composition is not expected.
Effects of the A21 Below Pit Project on Water Quality and Aquatic Life in Lac de Gras

- **EFFECTS MONITORING:**

- Effects of DDMI on Lac de Gras are currently monitored by the AEMP (components: dust deposition, effluent and water quality, sediment quality, plankton, benthic invertebrates, fish health and tissues)

- The AEMP incorporates a Response Framework and Action Levels to manage effects on water quality and aquatic life in Lac de Gras

- The changes due to the Project are either negligible or within the range of previously observed effects during the AEMP

- Additional Action Level triggers beyond those observed currently (Action Levels 1 & 2 out of 9) are not expected

- The AEMP currently in place is appropriate without modifications, and will identify future changes in Lac de Gras and trigger Response Plans as necessary
Overall Conclusions from the Environmental Assessment of the A21 Below Pit Project

- DDMI believes that the Project can be operated in a manner that, taking into account proven environmental design features, mitigation and administrative controls, is not likely to cause significant adverse effects to the biophysical or human environments.
- New infrastructure that will be required for the Project is minimal and will be placed within the existing Mine footprint (i.e., already disturbed areas).
- There are no environmental effects that cannot be mitigated or regulated through a Water Licence amendment. Authorizations from agencies such as DFO and Transport Canada are not required.
- The Project will have a positive effect in terms of resource royalties paid on the value of production.
Questions?
Part 2: Waste Rock
Volumes of Waste Rock

- **WLWB-1:** Confirm the amounts of Waste Rock that would be generated from each of the proposed mining methods

- The sub-level retreat (SLR) option for the A21 Below Pit Project will generate a total of 290,000 tonnes of Type I waste rock

- The other mining methods proposed for A21 Below Pit, i.e. vertical cutter mining, large diameter drilling, and continuous auger mining, will not generate waste rock

- Design capacity of the South Country Rock Pile (SCRP) is 25,000,000 tonnes and, based on the current mine plan, only 13,000,000 tonnes of waste rock is planned for storage at the SCRP

- Diavik life of mine (LOM) waste rock production is approximately 217,000,000 tonnes

- A21 Below Pit Project is considered minimal i.e. 0.13% of the total LOM waste rock production for the Diavik Mine
A21 SLR Waste Rock
Volumes of Waste Rock

- WLWB-8: If pit wall ore was blasted, how much additional Waste Rock would need to be managed and would this Waste Rock still fit in the South Waste Rock Storage Area

- Currently A21 ore does not need to be blasted, it is free dug using heavy mine equipment

- Recovery of ore from pit walls above the 9,200 bench would not produce significant additional waste rock (maximum up to 10% of the amount of wall ore to be mined, or 0.1 Mt)

- There is approximately 12Mt of additional space in the SCRP
Characterization of the Waste Rock

- EMAB-3 & WLWB-3: Has open pit mining at A21 provided any additional information on the potential for encountering increased metasediment xenoliths in the underground

- Haulage records until the end of 2019 for the A21 Pit, DDMI classified 12.75 Mt of rock as Type I and 0.06 Mt of rock as potentially Type III

- Pre-mining geochemical characterization samples were collected from within the A21 Open Pit zone and current verification samples are from within the A21 Open Pit

- Limited distribution of metasediments (<0.5%) within the A21 Pit does not indicate that frequency may increase below the Pit

- Waste Rock Mass Below Pit without current samples is 290,000 tonnes (0.13% of all waste rock); this material will be classified during mining
Waste Rock Storage

- WLWB-7: Explain proposed pad for temporary storage of ore and Waste Rock

- Stockpiling of material within this storage pad is planned until the end of the operations phase of mining at the Diavik Mine.

- The proposed temporary storage pad will be equivalent to existing temporary storage pads associated with underground operations at A154/A418

- Information on the proposed temporary ore and water rock storage pad in the A21 mining area will be included in an updated WRMP
Geochemical verification and monitoring

- EMAB-3 & WLWB-4: An updated WRMP should describe the monitoring plan for verification of geochemical characteristics of the mined material, the specific findings that would signify a concern, and the steps that would be taken if these findings arise.

- Drill core data and geological interpretations do not indicate that waste rock below the current A21 Open Pit will be different than rock within the Open Pit.

- Verification methodology for UG development waste rock would be approved through an updated Waste Rock Management Plan.

- The verification process would be comparable to the previously approved visual classification process used in the A418 and A154 Underground Workings:
  - Visually inspect the development face and record the percentage of biotite schist and diabase; Identify the waste rock type as Type III if the biotite schist and/or diabase proportion is >10% (combined amount).

- DDMI will provide an updated WRMP if A21 mining is to proceed using the SLR method.
Questions?
Part 3: Water Quality Predictions
Raw Data Requests

- All data* from A21 Well 19 (Attachment #1) collected in 2019
- All A21 underground water from bulk sample decline sampling (Attachment #2) collected in 2007
- 10 years of data from SNP station 1645-13, aka the North Inlet (Attachment #3)
- 10 years of data from SNP station 1645-75B, aka A154/A418 UG water (Attachment #4)
- A summary table containing 25th and 75th percentile data for A21 well 19, A21 underground water from 2007, and SNP stations 1645-13 and 1645-75B

*data gap identified by Bill Slater and available for redistribution
Finding Data on the WLWB ORS

Listing of all attachments converted by the ORS to be PDF documents

Original attachments provided by Diavik (PDF, word, excel, jpeg, etc.)

Note: if you ever have questions or concerns about responses or data provided by Diavik, do not hesitate to contact us directly.
Groundwater flow rates

- WLWB-2: It is not clear how the groundwater inflow estimates were derived.

- A154 UG Mine Discharge Method (lower and more accurate estimate) = 3,271 m$^3$/day
  - Observed rates of groundwater flow into the A154 mine (as the Underground mining progressed) and scales them to the A21 Below Pit Mine
    - total mine inflows that do not increase linearly with depth because once the groundwater potentiometric surface gradient is near vertical flow increase drops drastically with depth
    - decreasing hydraulic conductivities with depth

- A21 Specific Capacity Method (upper estimate) = 10,225 m$^3$/day
  - Predicted groundwater inflow for the A21 Open Pit and scales it linearly with depth
    - Does not incorporate the potentiometric surface gradient or decreasing hydraulic conductivity with depth
  - Flow rate in addition to final A21 Open Pit predicted groundwater inflow of 12,200 m$^3$/day
Groundwater Inflow Comparison

A21 Pit Inflow

A154/A418 Underground m³

A154/A418 Pit Inflow m³
Current Conservative Water Balance Model

![Graph showing predicted and actual water balance over time with estimated range and A21 model details.]

- Actual vs Predicted
- A21 In Model
- A21 with Below Pit Estimated Range

Time: 2003 to 2025
Predicted Annual Effluent with A21 Below Pit Operations

- Measured Effluent Volume
- Lower Bound Estimate of Effluent with A21
- Upper Bound Estimate of Effluent with A21
- A21 Open Pit Fully Developed

**Annual Volume (m³)**


0 5,000,000 10,000,000 15,000,000 20,000,000 25,000,000
Changes in mine effluent water quality

- ECCC-1&2&3 and GNWT-1: Provide a quantitative analysis that compares and contrasts existing data collected for the A21 groundwater, to current water quality in the North Inlet, in order to support the statement that there is no expected change to overall mine effluent quality.

- Raw datasets provided for 1) A21 UG water; 2) North Inlet water; 3) A418&A154 UG water.

- Statistical summary table containing 25th and 75th percentile data.

- Three Well 19 parameters are more than an order of magnitude greater than 75th percentile NI pond water (1645-13): total zinc, dissolved iron, and dissolved zinc; all other parameters are within an order of magnitude of current NI pond values and many are below NI pond values.

- Elevated zinc values can be attributed to the fact that the well was recently constructed with galvanized steel risers which commonly has an elevated zinc flush when first used; supported by 2007 A21 data having low zinc levels.

- TDS in A21 UG water is lower than TDS in the North Inlet.
Changes in mine effluent water quality

- **WLWB-23**: Can the DDMI explain why TP loads have varied over time, and particularly why the TP load in 2013 was higher than other years

- The operation continuously improves treatment efficiency by adaptively managing the North Inlet Water Treatment Plant (NIWTP) to produce the best quality effluent regardless of EQC

- Up to 2011, NIWTP process operations employed the enhanced coagulation procedure whereas excess alum dosages are applied to achieve a process pH target of 7.0

- In 2011 continuous improvement of operations resulted in a lowering of alum dosage, which resulted in a higher pH and decreased turbidity

- In 2013 a systematic review of each process variable’s effect on P removal was conducted to identify the maximum P removal configuration

- Since 2014, NIWTP process operations have been conducted in a manner to balance lower alum dosages and sludge production while maximizing nutrient and turbidity/TSS removal efficiency

- Continuous improvement events combined with increasing flow and loading to the NI has resulted in variable loads year over year. DDMI considers this continuous improvement process a success, which is demonstrated by stable to decreasing P loads to Lac de Gras over the last six years despite expanding operations.
Changes in mine effluent water quality

- **WLWB-25**: Explain if the 10% of the area affected by TP is conservative given the variability of the TP loads and lake areas affected over time?

- The upper estimate of TP load to Lac de Gras from the existing Diavik Mine operations plus the A21 Below Pit Operations is 487 kg/yr.

- With the exception of 2008, which appears to be an anomaly, the area of LDG with TP concentrations above the Normal Range has been substantially less than 10% during each year when effluent TP load was below 500 kg.

- Therefore, the 10% estimate is reasonably conservative.

### Table 6.5-4: Annual Loading Rates of Total Phosphorus to Lac de Gras and Spatial Extent of Effect on Total Phosphorus Concentration, 2007 to 2018

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual Total Phosphorus Load (kg/yr)</th>
<th>Area of Lac de Gras with Total Phosphorus Concentration above Normal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lake Area (km²)(d)</td>
</tr>
<tr>
<td>2007</td>
<td>302</td>
<td>25.4</td>
</tr>
<tr>
<td>2008</td>
<td>256</td>
<td>11.6</td>
</tr>
<tr>
<td>2009</td>
<td>552</td>
<td>23.5(^{(d)})</td>
</tr>
<tr>
<td>2010</td>
<td>501</td>
<td>23.8(^{(d)})</td>
</tr>
<tr>
<td>2011</td>
<td>429</td>
<td>9.2(^{(d)})</td>
</tr>
<tr>
<td>2012</td>
<td>611</td>
<td>3.6(^{(d)})</td>
</tr>
<tr>
<td>2013</td>
<td>742</td>
<td>80.6(^{(d)})</td>
</tr>
<tr>
<td>2014</td>
<td>494</td>
<td>3.6(^{(d)})</td>
</tr>
<tr>
<td>2015</td>
<td>453</td>
<td>&lt;3.6(^{(d)})</td>
</tr>
<tr>
<td>2016</td>
<td>438</td>
<td>37.1(^{(d)})</td>
</tr>
<tr>
<td>2017</td>
<td>422(^{(d)})</td>
<td>6.2</td>
</tr>
<tr>
<td>2018</td>
<td>375(^{(d)})</td>
<td>2.6</td>
</tr>
</tbody>
</table>
Groundwater quality predictions

- **EMAB-5&6**: Provide details about the Well 19 location, as well as summaries and copies of the data used to support the water quality predictions and conclusions.

- Well 19 is the deepest A21 depressurization (dewatering) well and is therefore considered most representative of the current deep groundwater near the A21 ore body (50m below Pit Bottom).

- Observations of groundwater quality versus depth during the mining of the A154 and A418 Ore bodies suggest regional groundwater is relatively homogenous (e.g. no significant increase in TDS as mining deepened).

- Well 19 compared to 2007 A21 UG concentrations demonstrates they are similar except zinc.
Well 19 Location at A21
**Groundwater quality predictions**

- **WLWB-19&20:** Explain the monthly estimates of groundwater TDS, TP and TN and will this change as a result of oxygen exposure over the course of the mining operation?

<table>
<thead>
<tr>
<th>Month</th>
<th>Current Configuration (NIWTP Influent)</th>
<th>Current plus Open Pit A21 over Life of Mine</th>
<th>Including Lower Bound A21 Below Pit</th>
<th>Including Upper Bound A21 Below Pit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Flow (m³/mo)</td>
<td>Load (kg/mo)</td>
<td>Flow (m³/mo)</td>
<td>Load (kg/mo)</td>
</tr>
<tr>
<td>Jan</td>
<td>1,373,679.0</td>
<td>339,298.7</td>
<td>52,704.5</td>
<td>16,383.3</td>
</tr>
<tr>
<td>Feb</td>
<td>1,197,001.5</td>
<td>294,646.5</td>
<td>51,165.2</td>
<td>17,591.8</td>
</tr>
<tr>
<td>Mar</td>
<td>1,185,444.0</td>
<td>306,149.0</td>
<td>46,637.3</td>
<td>16,551.3</td>
</tr>
<tr>
<td>Apr</td>
<td>1,043,577.0</td>
<td>270,808.2</td>
<td>42,513.5</td>
<td>13,833.5</td>
</tr>
<tr>
<td>May</td>
<td>1,039,753.0</td>
<td>267,447.6</td>
<td>40,870.2</td>
<td>12,343.6</td>
</tr>
<tr>
<td>Jun</td>
<td>1,324,019.0</td>
<td>351,278.8</td>
<td>51,908.1</td>
<td>18,519.4</td>
</tr>
<tr>
<td>Jul</td>
<td>1,351,147.0</td>
<td>418,696.6</td>
<td>50,912.1</td>
<td>23,800.4</td>
</tr>
<tr>
<td>Aug</td>
<td>1,314,282.0</td>
<td>418,750.5</td>
<td>50,950.0</td>
<td>23,558.8</td>
</tr>
<tr>
<td>Sep</td>
<td>955,471.0</td>
<td>297,078.0</td>
<td>39,484.7</td>
<td>17,675.7</td>
</tr>
<tr>
<td>Oct</td>
<td>1,034,474.0</td>
<td>294,773.4</td>
<td>41,719.7</td>
<td>14,501.9</td>
</tr>
<tr>
<td>Nov</td>
<td>748,055.0</td>
<td>203,520.8</td>
<td>33,916.8</td>
<td>12,262.8</td>
</tr>
<tr>
<td>Dec</td>
<td>932,883.0</td>
<td>224,389.5</td>
<td>37,861.5</td>
<td>11,650.9</td>
</tr>
<tr>
<td>Total Annual Load (kg/yr)</td>
<td>-</td>
<td>3,686,829</td>
<td>-</td>
<td>198,673</td>
</tr>
</tbody>
</table>

(b) Percentages in parenthesis are average percent difference in load compared to Current plus Open Pit A21 over Life of Mine.

(1) Not applicable
Consideration of other parameters

- WLWB-6: DDMI comment on whether a potential increase in ammonia concentrations from blasting was assessed and will Ammonia Management Plan updates be required

- DDMI would continue the use of current blasting agents (which include ammonium nitrate) for the sub-level retreat (SLR) mining option

- The increase in residual ammonium nitrate from blasting / waste rock production for the SLR mining method for the A21 Below Pit Project would be proportional to the increase from waste rock generation associated with Below Pit mining at A21 (0.13%)

- DDMI will continue to follow the current Ammonia Management Plan for the Diavik Mine, which adequately manages ammonia associated with SLR mining
Consideration of other parameters

- **WLWB-17:** Consideration of individual ions that make up TDS (potential effects of ions; consider benchmarks or EQC; rationale for exclusion; data to support lack of effects)

- Change in TDS loading was considered an indicator of changes in its constituent ions’ loading rates

- Predicted changes in TDS in the receiving environment were assumed to be proportional to the expected changes in dissolved ion concentrations

- A small (2% to 8%) increase in TDS loading is expected relative to the currently approved Mine configuration, which translates to proportionally small changes in concentrations of ions in the receiving environment

- In areas of Lac de Gras subject to the greatest effluent exposure, measured concentrations are 3 to 40 times lower than the lower Effects Benchmark for each variable. Therefore, additional benchmark exceedances are not expected from the Project

- All constituents with currently applicable EQC in the Water Licence are predicted to remain below EQC

- No additional mitigation is anticipated to manage aquatic effects of the Project
Consideration of other parameters

- **WLWB-18**: Were all parameters that have reached Action Level 2 considered? What are the potential impacts? Are they mitigable? Did DDMI consider the benchmarks or EQCs? If no, what is the rationale? Data to support lack of impact?

- All parameters with Action Level 2 exceedances were not considered. The assessment focused on indicator parameters (i.e., TDS, TN, TP).

- Action Level 2 trigger does not equate to existing risk to the aquatic environment (there are 9 Action Levels).

- Changes in effluent volume and resulting TDS, TN, and TP loading rates were estimated to allow comparisons to the applicable EQC and previous years’ loading rates.

- Effects were evaluated qualitatively based on changes in loads of TDS, TN and TP, and observed treatment efficiency for TSS, and were predicted to be negligible in magnitude.

- No additional mitigation is anticipated to manage aquatic effects of the Project.
Questions?
Part 4:
Water Management and Monitoring
Water Balance

- **WLWB-9**: Can DDMI explain how it determined that a net zero balance will be achieved for this proposed Project?

- A21 water sourced from groundwater as part of the A21 Below Pit Project will be captured in the existing water management system, and treated and released back into Lac de Gras (LDG). The 'net zero balance' refers to no change in the water level in LDG or in the discharge of the Coppermine River.
Water Management Strategies

- EMAB-4: Approval of mining activities carried out in a flooded pit should be based on submission and review of additional detailed information including relevant management plans (e.g., water management) and evaluation of potential environmental effects.

- DDMI has experience in successfully managing 6,000 Mm³ of high TSS waters (turbidity up to 2235 NTU) during the construction and dewatering of A21

- The A21 Dike would constrain any potential impact within the current DDMI Water and Waste Management systems

- Mining from a flooded pit bottom would result in no significant increase to groundwater inflow/management since the water table would remain above the current A21 Open Pit floor

- Water would likely be maintained at a depth of about 5m and maintained by removing additional water from groundwater inflow using the current water management system

- A21 water is discharged at the West end of the North Inlet which is roughly 1.6 km from the NIWTP intake which allows sufficient time for the removal (settlement) of most TSS prior to final treatment within the facility

- Treatment Plant is specifically designed to remove TSS from water and this would not change that function or effectiveness of the system

- DDMI could use Pond 3 as an additional intermediate settling pond. This approach was outlined in the A21 Construction Environmental Management Plan and is still a viable contingency option for site water management.
Water Management Strategies

- WLWB-14&16: Will there be any changes to the Drainage Control and Collection System or Water Management due to the Project

- New water management strategies would only be required for a flooded pit bottom mining approach as discussed above and dry pit bottom or SLR methods would follow current water management strategies

- The Project will rely on existing water management infrastructure associated with the DCC System to mitigate the potential for changes to local hydrology (surface water flows and drainage patterns)
Fresh Water Use

- WLWB-15: Will freshwater usage will remain within the current Water Licence limits
- The main freshwater use at the Diavik Mine is for ore processing
- A21 Below Pit Mining Project will not increase ore processing rates beyond the currently approved plant capacity, therefore water use limits in the existing Water Licence for the Diavik Mine will not need to be amended in support of the A21 Below Pit Mining Project
- Demands on freshwater sources for domestic use/camp facility operations at the Diavik Mine are not expected to increase above current requirements
SNP Stations

- WLWB-5: Will SNP stations be needed to monitor underground water from the proposed pump stations at A21 Underground
- A21 SNP station (1645-51) would continue to be used to monitor amalgamated A21 dewatering, including from groundwater sources associated with the A21 Below Pit Project
Questions?
Part 5:
Other Topics
Updates to Management Plans

- **GNWT-3 and WLWB-11&12: What WLWB-approved updates will be implemented**

- Key environmental aspects associated with the A21 Below Pit Mining Project are already addressed in Management Plans (similar mining, processing and waste)

- Water Management Plan and Water Balance (increase in A21 dewatering; additional water management for the flooded pit-bottom option; all proposed changes are within the design capacity of existing pumping and wastewater treatment system)

- Waste Rock Management Plan (negligible increase in waste rock generation for the Sub-Level Retreat mining option; no increase for alternate mining methods)

- Processed Kimberlite Containment Plan (PKC) and Design (additional processed kimberlite volume already factored into containment designs at PKC and in Mine Workings, if approved)

- Revisions to the Closure and Reclamation Plan for the Diavik Mine to reflect the A21 Below Pit Mining Project through periodic iterations of the Diavik Interim Closure and Reclamation Plan

- The Final Closure and Reclamation Plan for the Diavik Mine will encompass the A21 Below Pit Mining Project where A21 closure will be comparable to A418 and A154

- Administrative updates to applicable plans would include updates to maps and text identifying the A21 Below Pit Mining operation and address minor incremental water and waste production associated with the Project

- GNWT supports approach of submitting Plan updates after Amendment and 90 days before any proposed changes
Closure Planning

- EMAB-1: Establish a clear requirement for reclamation and closure plans, cost estimates and security bonding for the A21 Below Pit Mining activities to be in place prior to the beginning of the Project

- Requirement for a closure and reclamation plan that reflects the Diavik Project and any associated modifications, such as the A21 Below Pit Project, already exists in the Water Licence for the Diavik Mine

- (ICRP) Version 4.1 includes proposed closure and reclamation activities and cost estimates for key infrastructure associated with the A21 Below Pit Project including the A21 dike, the A21 mine workings, the South Country Rock Pile, and other surface infrastructure associated with A21 Below Pit Project and anything not captured will be added to the next iteration

- Appendix VII (Diavik Diamond Mine RECLAIM Cost Estimate, December 2019) in ICRP Version 4.1 includes the costs associated with the A21 Below Pit Project
Closure Pit Lake Modelling

- EMAB-2: Requirements for reclamation and closure planning to include more detailed, site-specific modelling to refine predictions of hydrodynamic and water quality performance of the A21 pit during closure and post-closure phases

- Recent modelling with PK in A21 Pit showed meromixis is not likely to be stable in the long-term

- DDMI removed A21 from consideration for PK deposition as communicated to MVEIRB so this scenario of unstable meromixis is no longer relevant

- The proposed A21 Below Pit Project would result in a deeper pit with an open sub-level retreat (SLR) which will improve the stability of meromixis at closure
Additional Infrastructure for the Project

- **WLWB-10: Provide a more complete list of new infrastructure**

- The Project will mostly rely on existing Diavik Mine surface infrastructure (camp, kitchen, process plant, backfill plant, batch plant, water treatment plants, power houses, wind towers, boiler house,

- Moving rock to create vehicle segregation and a pad

- Pipeline extensions deeper into A21 kimberlite pipe for Mine water handling

- Fresh air raise for ventilation

- Refueling area

- Ancillary/supporting infrastructure (e.g. tag board, break room, bathroom, maintenance bay at portal entrance)
Questions?