



RioTinto

DEPOSITING PROCESSED KIMBERLITE IN PITS AND UNDERGROUND

MVEIRB Environmental Assessment 1819-01

Public Hearing Community Sessions September 3-4, 2019

Public Hearing Project Team

Rio Tinto Diavik Team Panel

Sean Sinclair – Superintendent, Environment

Gord Macdonald – Manager, Closure

Kofi Boa-Antwi – Regulatory Advisor, Environment

Louis Beland – Rio Tinto Legal Counsel

Technical Experts Panel

Shadi Dayyani – Golder, Modelling

Jerry Vandenberg – Golder, Modelling

Rainie Sharpe – Golder, Aquatics

Erica Bonhomme – Stantec, Environmental Assessment

Colin Buchanan – Stantec, Environmental Assessment

• Additional Rio Tinto Diavik Team

- **Dave Patterson** – Business Partner, Health Safety Environment
- **Steve Bourn** – Closure Study Lead
- **Winter Bailey** – Manager, Communities and External Relations
- **Myra Berrub** – Principal Advisor, Communities and Social Performance, Closure
- **Kyle Bennett** – Principal Advisor, Media Relations

Public Hearing Technical Session Outline

1. Purpose of Processed Kimberlite to Mine Workings (PKMW) Project and Feedback from Engagement
2. PKMW Project Description
3. Summary of Effects to Valued Components
4. Summary of Responses to Interventions

Part 1: Purpose of Processed Kimberlite to Mine Workings (PKMW) Project and Feedback from Engagement

Purpose of the Project

- DDMI is requesting for Approval of the Proposal to deposit PK into one or more of underground and/or open mine workings
- **“Mine Workings”** means the underground and/or open pit area resulting from the development of an ore body
- Mackenzie Valley Environmental Impact Review Board is conducting an environmental assessment (EA) or Review of the Proposal

Engagement and Other Operations

- DDMI did not receive opposition from communities or regulators during the initial engagement phase on the project concept
- What we heard was support to **“put it back where it came from”** as long as it could be done in an environmentally safe manner
- DDMI is the only Operating Diamond Mine in the NWT that does not have approval to deposit processed kimberlite (PK) in Mine Workings

Processed Kimberlite Mine Workings Project

Advantages

- Eliminates the need to construct another on-land PKC dam raise
- Smaller on-land PKC Facility
- Best option for Lac de Gras water quality
- Less chance of caribou directly contacting PK material
- On-land PKC Facility closure can start 3 years earlier
- Enables additional PKC Facility closure options
- Uses less water from Lac de Gras to fill pit lakes

Disadvantages

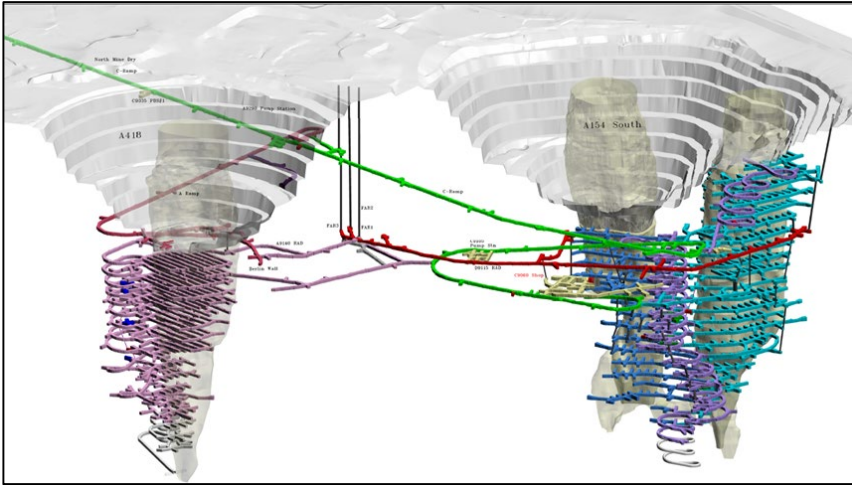
- Requires construction of a new pipeline
- More operating experience with deposition in PKC Facility
- Requires an Environmental Assessment and Water Licence Amendment
- Change from what was originally proposed in 1999

Part 2: PKMW Project Description

Lac de Gras and Diavik Mine Site



Mine Workings at Diavik Include Open Pits and Underground



What is Processed Kimberlite?

- Kimberlite is the rock that contains diamonds
- The diamonds are removed by crushing and washing the rocks in water
- The remaining material is referred to as 'processed kimberlite' (PK) and is a mixture of rock and water

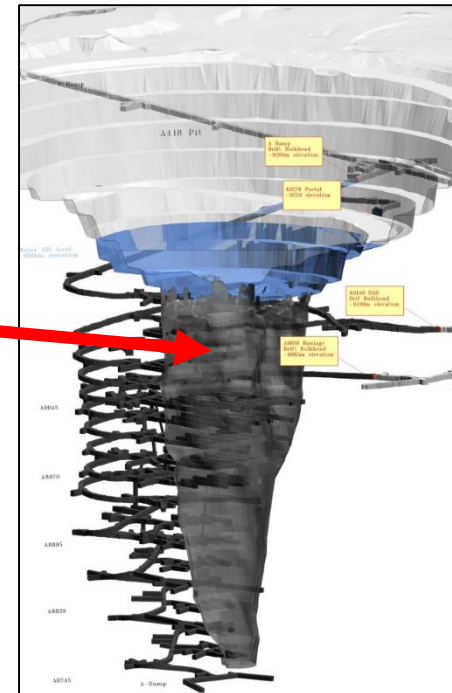
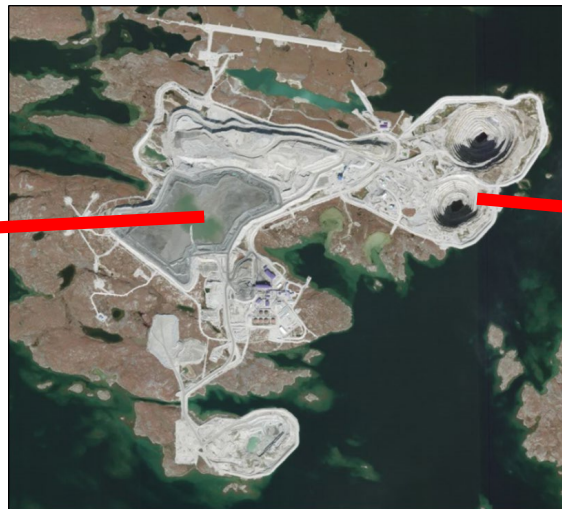


Lac de Gras East Island PK Storage Options

1. Processed kimberlite is currently stored within the Processed Kimberlite Containment (PKC) Facility



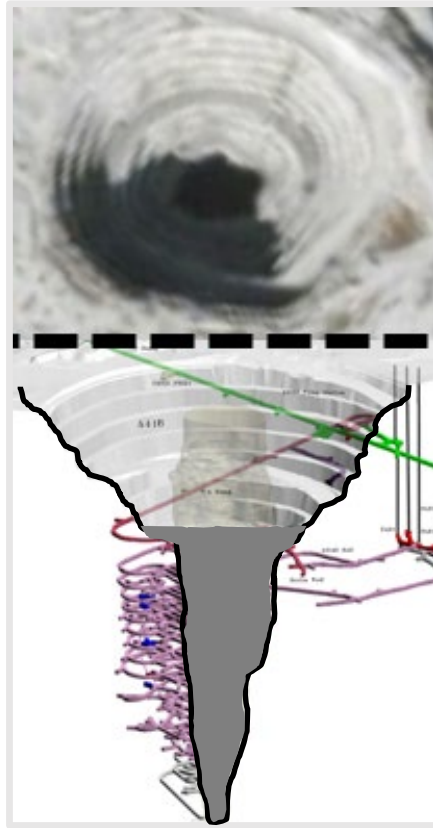
2. Processed kimberlite could be stored within the Mine Workings



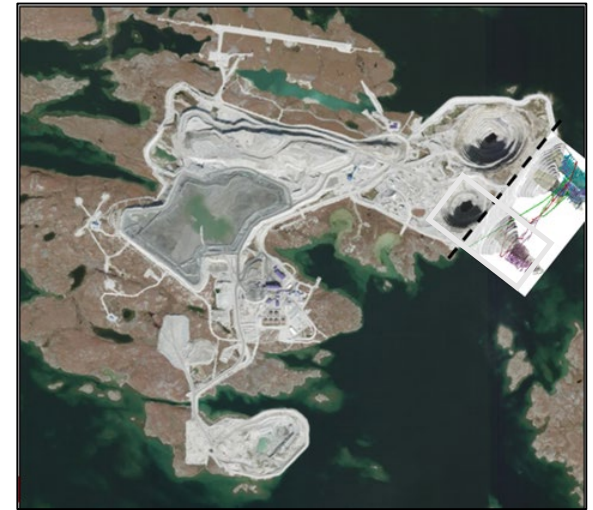
The A418 Mine Working is the Preferred Option for PK Storage



Robertson Head Frame is 76m tall

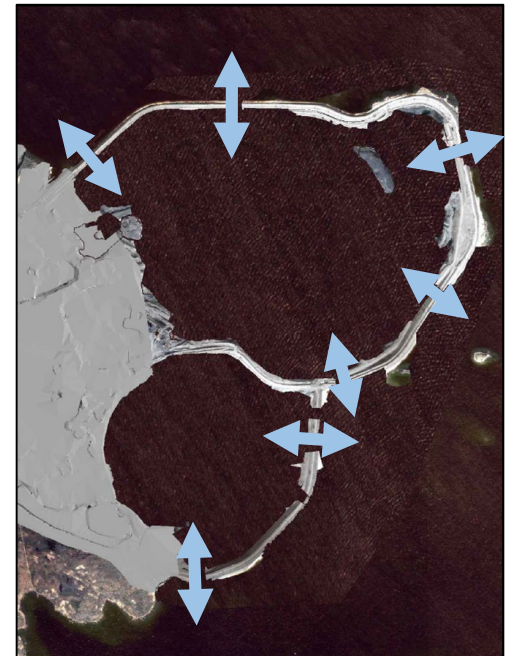
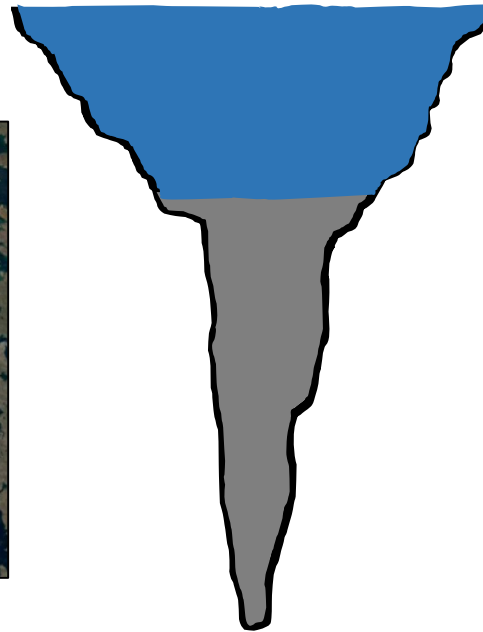


A418 Mine Working is 630m deep



You could stack **8 Robertson Head Frames** on top of each other in the mine

Closure Plan is to fill mine area with water to create pit lakes and open passages to connect the pit lakes with Lac de Gras

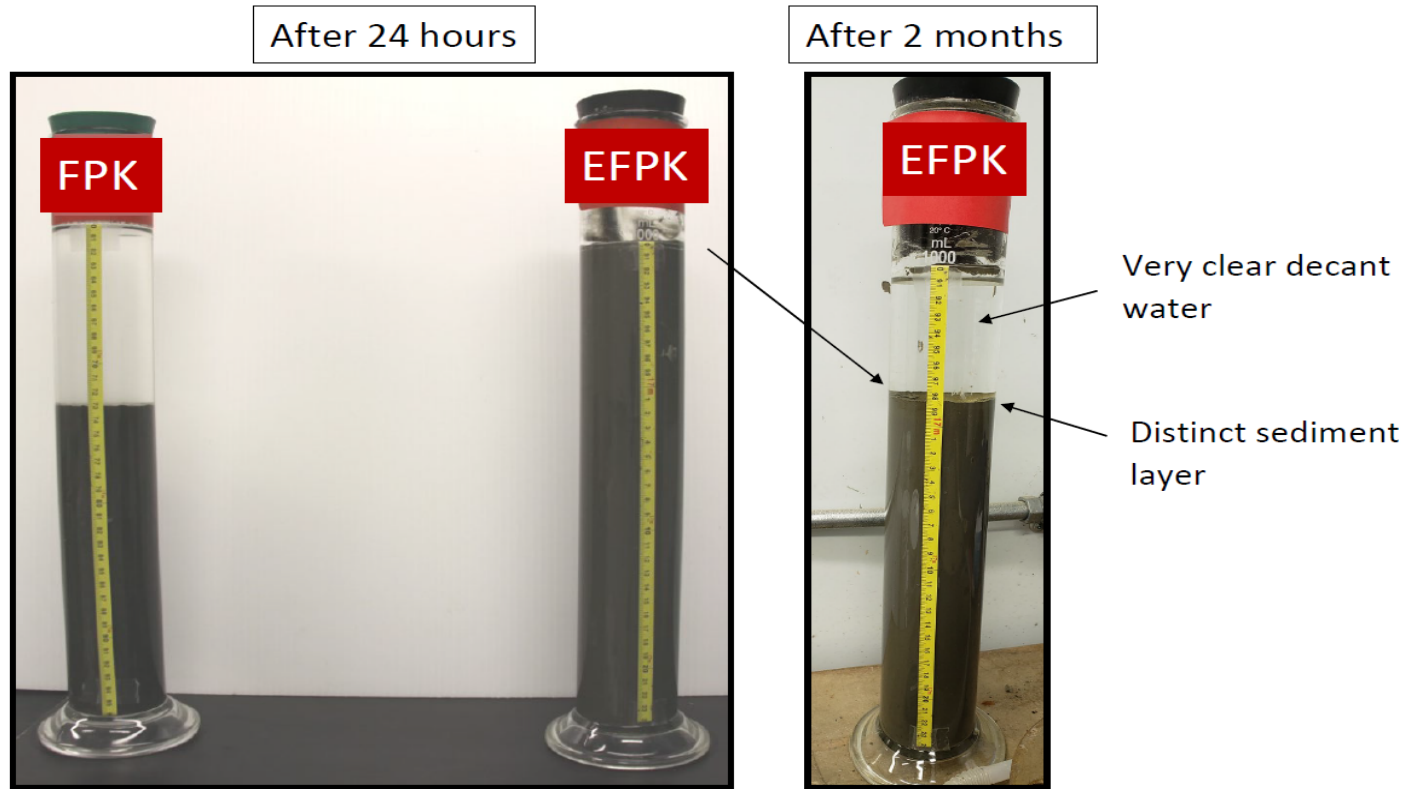


Use of Traditional Knowledge in Project Design

2018 TK Panel Focused on Processed Kimberlite in Mine Workings

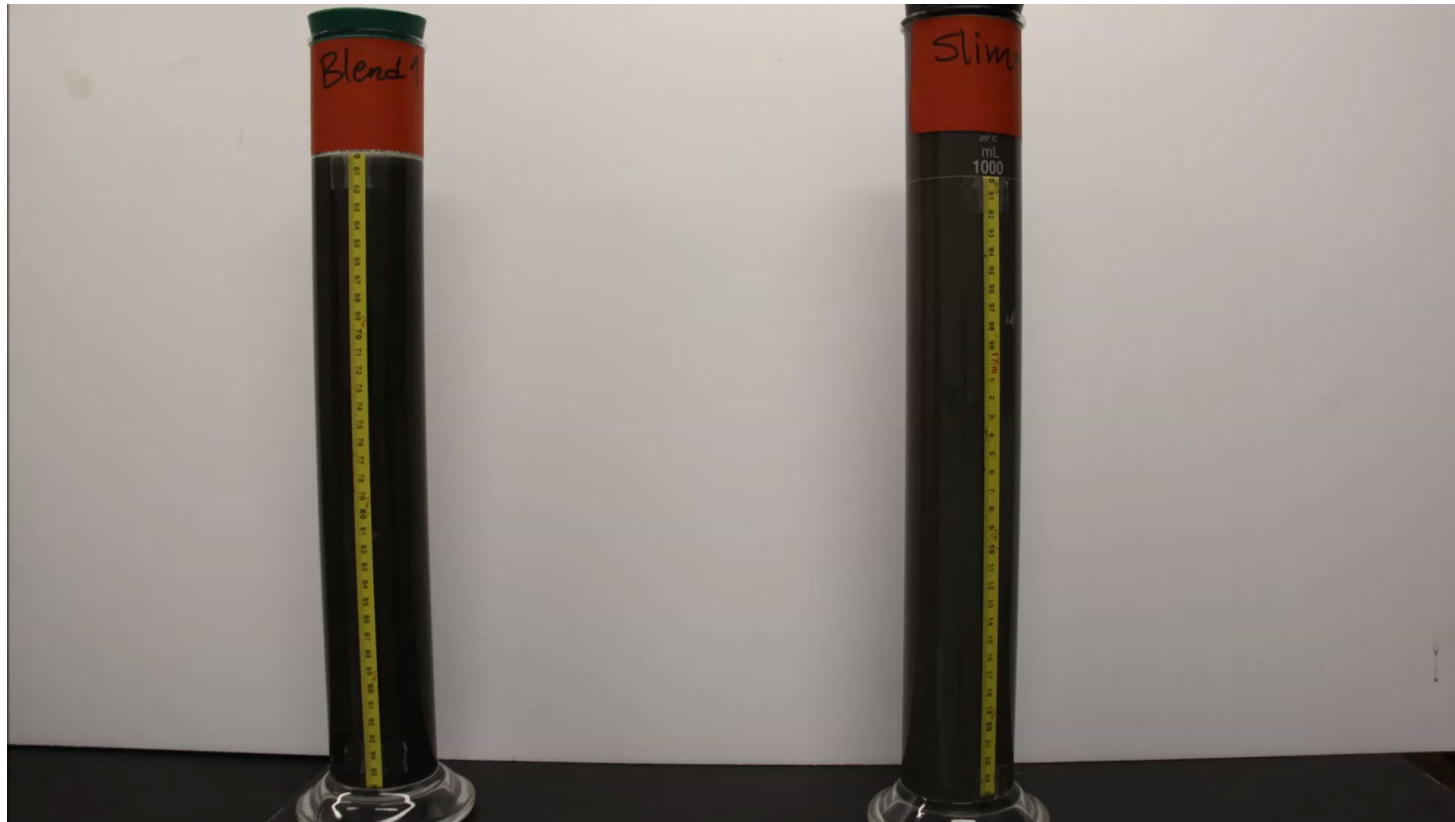


Fine Processed Kimberlite Rapidly Settles Out of Water within 24 Hours

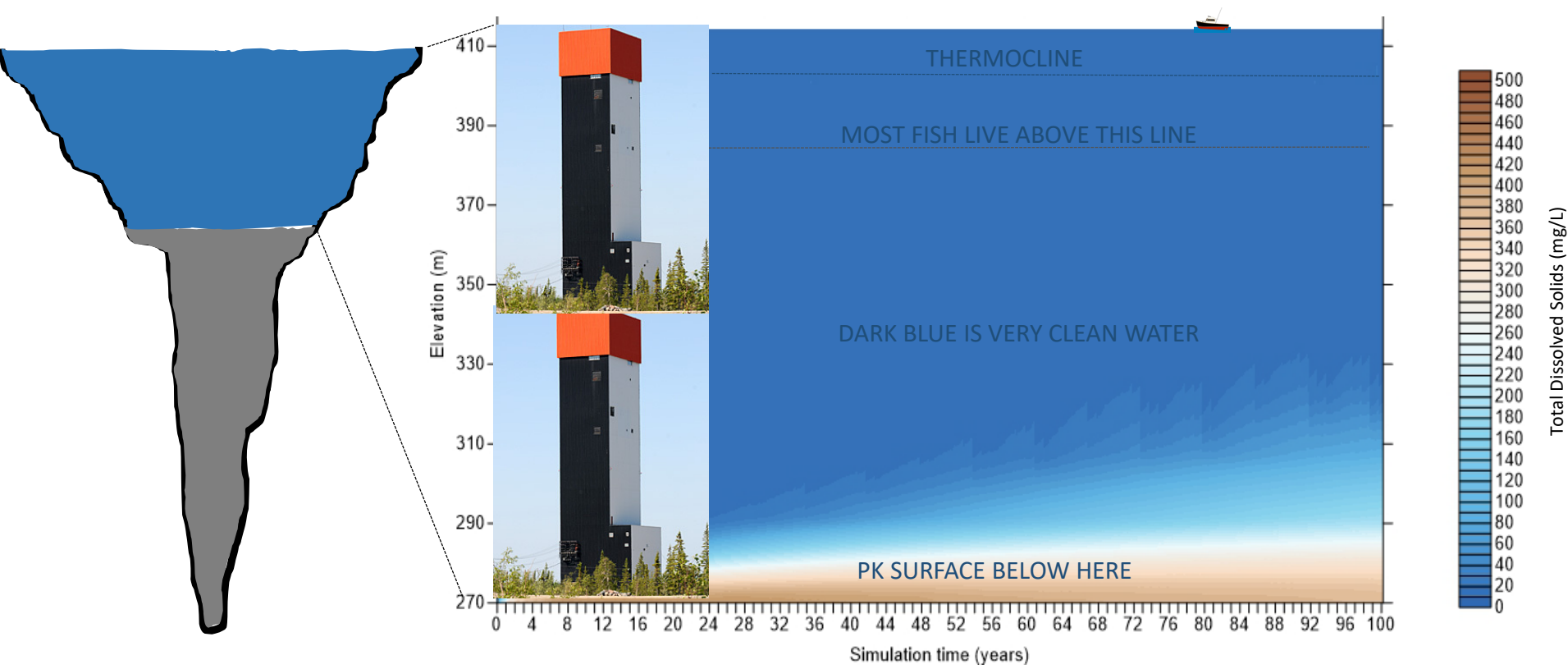


Sample	Initial Height (cm)	24 hr Height Change (cm)	2 month Height Change (cm)
FPK (Fine Processed Kimberlite)	36	13	15
EFPK (Extra Fine Processed Kimberlite)	36	0.2	8.3

Video of FPK and EFPK Settling Over 24 Hours



Modelled Water Quality In The Pit Lake



Water Quality Modelling Results

Pit Lake Water Quality Parameter	AEMP Benchmark	A418-2a Max*	A418-3a Max*	A418-4a Max*
Sulfate (mg/L)	100	6.5	9.1	12.0
Nitrate-N (mg/L)	3	0.26	0.50	0.72
Ammonia-N (mg/L)	4.7	0.064	0.094	0.12
Nickel (ug/L)	25	0.79	0.91	0.84
Iron (ug/L)	300	4.1	4.9	4.1

* Maximum concentration in the top 40m of pit lake water column over 100-year period after closure

Part 3: Assessment of Effects to Valued Components

DDMI's Conclusions on Project-Specific and Cumulative Impacts and other Environmental Risks

- Water quality is the primary effects pathway to all valued components.
- Modelling of water quality in the top 40 meters of the pit lakes predicts concentrations will remain below AEMP Benchmarks.
- AEMP Benchmarks are protective of aquatic and terrestrial life.
- The only effects pathway to wildlife is through water quality and modelling shows that concentrations will remain below any level of effect.
- No significant negative effects as a result of the construction, operation and closure of the Processed Kimberlite to Mine Workings Project.
- Residual project-specific and cumulative impacts, after mitigation, would be reversible at closure and/or are limited to the Project footprint.
- Environmental risks from accidents and malfunctions are considered remote and resulting effects are considered not significant.

Part 4: Summary of DDMI's Commitments in Response to Interventions

Summary of DDMI's Responses to Interventions

1. Expanded engagement with non-signatory Indigenous Groups.
2. Reconnection criteria to define culturally acceptable pit-lake conditions
3. Fish habitat off-setting plan
4. Removal of A21 Open-Pit from Review
5. Conditions to be included in an Amended Water License or as Follow-Up Measures

Questions?