

# DDMI Traditional Knowledge Panel Session #11

## OPTIONS FOR PROCESSED KIMBERLITE

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Diavik Diamond Mine, NT  
May 10–14, 2018



# Table of Contents

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Background.....	2
Session Purpose and Overview.....	2
Session Goals and Activities.....	5
Report Outline.....	6
Proceedings: Key Questions and Themes.....	6
1. Closure Planning.....	8
2. Fish and Water.....	10
3. Watching PK.....	11
4. Wind.....	12
5. Tours of the Underground, Pits and Processing Plant.....	12
TK Panel Next Steps.....	13

# List of Figures

---

Figure 1: Diavik Mine Site Layout.....	4
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# List of Appendices

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Appendix A..... TK Panel Session #11 Photos  
Appendix B..... TK Panel Session #11 Agenda  
Appendix C..... TK Panel Session #11 Informed Consent Form  
Appendix D..... TK Panel Session #11 Daily Notes  
Appendix E.....Presentation on PK - Backgrounder and Previous TK Panel  
Recommendations on PK and PKC  
Appendix F..... DDMI Presentations on Closure and Reclamation Plan Overview,  
Water License Amendment and Underground Dewatering  
Appendix G..... TK Panel Session #11 Recommendations Presented to DDMI  
Appendix H..... Presentation of DDMI Responses to TK Panel Session #10 Recommendations  
Appendix I ..... Next Steps  
Appendix J ..... TK Panel Session #11 Evaluation Summary

**Diavik Diamond Mines (2012) Inc.  
Traditional Knowledge Panel Report**

## Session #11: *Options for Processed Kimberlite*

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Diavik Diamond Mine, NT  
May 10–14, 2018

### Facilitation

Joanne Barnaby, Joanne Barnaby Consulting  
Natasha Thorpe, Thorpe Consulting Services

### Participants

Kitikmeot Inuit Association	Bobby Algona, Nancy Kadlun, Regan Adjun (youth)
Łutsel K'e Dene First Nation	Doris (Terri) Enzoe, Cecelia Sarazine (Sara) Boucher, Kohlman Enzoe (youth)
North Slave Métis Alliance	Kathy Arden, Wayne Langenhan
Tłı̨chǫ Government	Dora Migwi, Louis Zoe, Mason Beaverho (youth), Peter Huskey (interpreter), James Rabesca (interpreter)
Yellowknives Dene First Nation	Rose McKenzie, Angus Martin

### Observers/Presenters/Visitors

Environmental Monitoring Advisory Board	John McCullum, Allison Rodvang (observers on May14)
Tłı̨chǫ Government Lands Department	Joline Huskey (observer)
Diavik Diamond Mines Inc.	Peter Gillies, Steve Rowles, Shelby Skinner, James Sovka, Nathan Wolfenden
C&E Consulting	Colleen English
Thorpe Consulting Services	Kaylee McKinney (transcriber)

*Interpreting equipment provided by Pido Productions.*

## Background

Since 2011, the Traditional Knowledge (TK) Panel has guided Diavik Diamond Mines (2012) Inc. (Diavik) to appropriately and meaningfully consider of Traditional Knowledge (TK) in operations, environmental management and monitoring as well as closure planning at the Diavik Diamond Mine. The TK Panel has been meeting since 2012 and continues to gather at least once a year to discuss select issues and concerns related to the Diavik Diamond Mine (Figure 1). The most recent gathering was held at the Diavik Diamond Mine from May 10–14, 2018 to consider various options for handling processed kimberlite on-site through operations and closure.

## Session Purpose and Overview

The purpose of TK Panel Session #11 was for participants to explore options for processed kimberlite (PK) for operations and closure/post-closure, “see with their own eyes” the open pit and underground mining areas (A154 and A418) and processing plant, and respond to Session #10 recommendations around the South Country Rock Pile and watching/monitoring made by TK Panel members.

The possibility and technicalities of placing PK into the A418 mine workings—possibly moving much of the PK from the current containment facility (i.e., the processed kimberlite containment, or PKC) as well as the option to put PK from the process plant in the mine areas without emptying the PKC—were discussed. Finally, the TK Panel considered the implications of continuing PK disposal within the current containment. Panelists were asked about their comfort around each option.

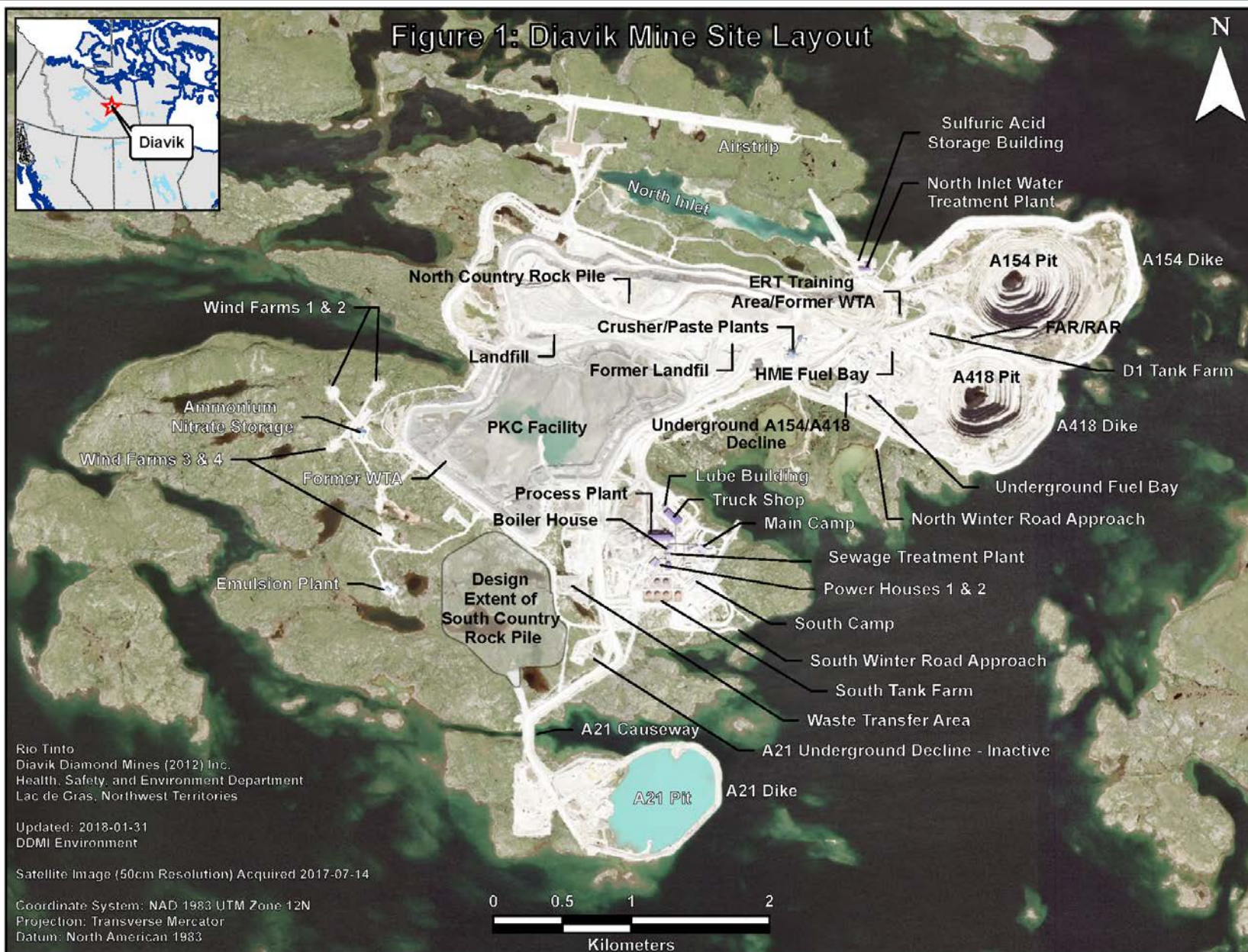
During previous sessions, TK Panelists suggested that an underground and open pit tour would help them to understand the nature of mining kimberlite for diamonds to better provide guidance on closure options for PK. During this session, DDMI accommodated this request. These learnings built upon previous session discussions around PK, PKC and closure and enabled people to provide informed guidance and recommendations. In particular, the TK Panel revisited findings from Session #6 which focused on the PKC.

A short presentation highlighted PK disposal at other mines (e.g., Ekati) and spoke of diamond mines facing similar challenges around waste rock throughout the world. The Diavik mine is unique given that the kimberlite pipes are located under a lake. This background information provided additional context for the Panel members when evaluating PK disposal options on-site.

Diavik also presented revisions to the site-wide Closure and Reclamation Plan (CRP V4) which informed the subsequent discussions around the proposed flooding/filling of the open pits, inert waste disposal in pits and PK to underground/pit options, focusing on A418.

In addition, details on underground dewatering were highlighted in a presentation that also touched on fault systems, the water table and drill holes to manage water in the underground. These explanations provided context for individuals and aided in the discussions around potential impacts from filling pits with water, PK, waste, etc. at closure.

Finally, the TK Panel reviewed responses from Diavik to recommendations from the TK Panel Session #10 Focus on 'Watching' and the South Country Rock Pile. In addition, they developed new recommendations for review and consideration by Diavik, including suggestions for future TK Panel sessions. This format is the same as that of previous sessions and provides strong consistency, feedback, and communications between the TK Panel members and Diavik staff.



## Session Goals and Activities

The TK Panel reviews closure plans for various areas of the mine, shares their knowledge in relation to each topic, and presents recommendations to Diavik. In this way, they are continually building their understanding of the mine site and its closure challenges, while also directly influencing Diavik's closure plans.

The goals for Session #11 were to:

- Review input incorporated to date and provide an opportunity for input on progressive reclamation opportunities (i.e., North Inlet, WRSA-NCRP, PKC, infrastructure, pits and underground);
- Review options for PK disposal and provide input to the proposed plans for disposal of PK in the pits and underground;
- Visit the pit/underground at A154/A418; and
- Review and suggest future session topics for the TK Panel.

The session format followed an established routine, modified according to participant feedback and learnings over the previous ten sessions. At the outset of each session, the group reviews and approves the proposed format and agenda. An evaluation process held at the end of the session then helps to inform and improve future sessions.

As with previous sessions, participants took a brief surface tour of the mine upon arrival to re-familiarize with the site and to have recent changes to the site highlighted by Diavik. On the third day of the session, participants visited the A154 open pit and then selected to go underground or visit the process plant.

The tour of the process plant included an explanation of how the kimberlite moves through the plant, diamonds are extracted, technology automates both recovery of the diamonds and the entire process throughout the plant and safety precautions to keep workers safe. TK Panel members climbed seven stories high into the plant in order to look down at the impressive labyrinth of conveyor belts, crushers, screens, video cameras and platforms.

The tour underground began with a thorough safety briefing and gearing up for going underground. Participants tagged in with their host and learned about the tracking, communication and retrieval systems in place for workers underground. Diavik's hosts took participants to the area where the A418 underground mine connects to the open pit and they were able to see across the space where the kimberlite used to be present. They also visited an area deep in the A418 mine where backfill was being placed into a drift that had been mined out, in addition to visiting two different sump stations to see how water is managed underground. They were able to meet some of the underground employees and see firsthand the type and size of vehicles that operate underground. They travelled across one of the connecting drifts over to the



A154 mine and ultimately exited the underground into the A154 open pit before returning to the mine dry.

As in previous sessions, staff from the Environmental Monitoring Agency Board (EMAB) attended the last day in order to hear the TK Panel present their recommendations to Diavik. EMAB distributed a one-pager, inquired about how EMAB could best support the TK Panel, and asked whether it would be appropriate for EMAB staff to attend future sessions in their entirety rather than just on the final day.

## Report Outline

This report outlines key themes related to PK disposal options considered by the TK Panel and presents their subsequent recommendations.

Appendix A includes photos from the session and field trip. Appendix B contains the session agenda while Appendix C provides a blank copy of the informed consent form that was signed by participants or observers new to the TK Panel. Session notes were reviewed and verified by the speakers and included in Appendix D. Appendix E contains a background presentation on PK and highlights previous recommendations related to PK and the PKC made by the TK Panel. Appendix F contains presentations given to the TK Panel by Diavik related to the CRP V4, underground dewatering, and the proposed PK to A418 water licence amendment.

The TK Panel gave their guidance and recommendations on options for PK disposal as shown in Appendix G. Diavik presents their response to TK Panel Session #10 recommendations on watching/monitoring and the South Country Rock Pile in Appendix H. A short presentation used for discussion on the next steps and session topics is included in Appendix I, followed by participant evaluations summarized in Appendix J.

## Proceedings: Key Questions and Themes

The TK Panel was tasked with exploring guiding questions during this session. The original questions proposed by the facilitators as well as the general direction of the session were modified with input from the TK Panel over the course of the session. Key guiding questions included:

- What other information do you need to feel comfortable with PK material being placed in mine areas? What questions do you have that you want answered?
- Can you share your knowledge of how fish use deeper waters to help predict fish behavior in the pits once they are filled with water?
- If Diavik goes ahead with putting the PK in the pits and the mineshafts, what would you want to watch at closure to know that it is good? For example, once the pits are filled with water and before connecting back to Lac de Gras as well as once reconnected.

Throughout discussions to consider these questions, the following key observations emerged:

- Seeing A154 was important in helping the TK Panel to think about and consider the option to put PK in the mine area;
- Results presented from the PK toxicology study previously recommended by the Panel helped people feel more comfortable about various disposal options for PK in mine areas;
- Stability of the pits (cracks, fissures) and underground areas are a significant concern, particularly around the potential for water leakage;
- Contamination in the mine areas remains one of the biggest concerns, particularly around water; and
- When considering options for PK, the significance of climate change impacts must be acknowledged and part of any plan.

This session slightly differed from previous sessions in that time for plenary discussion was reduced in order to facilitate the process plant and underground tours and the technical discussions and presentations that were invaluable in providing a strong understanding for members considering underground disposal of PK.

The TK Panel made a total of 16 recommendations, as outlined above and presented in Appendix G.

The resulting recommendations centred on the following themes as detailed above and summarized below:

- Closure Planning (PKC versus Pits)—Three recommendations pertained to moving the PK and PKC slimes from the PKC into the pits.
- Fish—Three recommendations spoke directly to fish, fish habitat, and movement particularly if the pits and underground were to be filled with PK.
- Water—The quality of water in the North Inlet and the pits were highlighted in two recommendations. However, water quality was at the core of almost all of the recommendations made during this session.
- Watching (Monitoring)—With caring for and protecting the land for future generations at the forefront of people’s minds, the TK Panel put forth six recommendations specific to monitoring PK.
- Wind—Two recommendations related to how wind behavior could affect water quality and overall mixing of lake waters both inside and outside the dikes.

Recommendations are numbered to reflect the TK Panel session identification (i.e., Session 11) and to subsequently identify each specific recommendation (i.e., 11.1–11.16). Diavik will consider these and add them to their Recommendations Tracking Table. Diavik’s response will be presented back to the TK Panel at the next session.

## 1. Closure Planning

Diavik gave an overview of the updated site-wide Closure and Reclamation Plan (V4) after which Panel members spoke about their observations of change and concerns about planning for climate change during reclamation. There was also discussion about how scrap metals and materials should be sorted. Diavik responded that a demolition inventory will be created. Community members continue to want to know what materials will be left behind upon closure and what might be donated or taken off site. It was suggested that this could be the topic of a future session.

Comments around onsite monitoring were made, in particular with respect to the importance of watching wildlife and reporting types observed and their behavior. The Environment Department explained that there is ongoing monitoring of wildlife, as well as water quality as part of the AEMP and SNP programs. The TK Panel had questions around caribou safety near the pits and on roads, contaminants and nutrient loading in water, dust and mercury levels in both fish and water. The TK Panel was pleased to learn that Diavik has adopted the TK Panel recommendation to leave the wall between the North Country Rock Pile (WRSA-NCRP) and the PKC steep as a barrier to prevent wildlife from moving from the top of the pile down into the PKC area at closure.

Questions were asked around whether there were other examples of diamond mine closure in Canada, but there isn't yet and there are no other examples in the world where closure of pits in a lake has taken place. A backgrounder on diamond mine closure was presented the next day and discussions followed noting that mining practices in Canada have changed over the years such that companies can no longer simply walk away. Diavik is required to carry out closure and reclamation. As a safeguard, Diavik was required to post a multi-million dollar security deposit with the government.

In the words of one TK Panel member, specific ideas around closure were offered since “we need to help the company make the right decisions and do the best clean up and reclamation so we aren't leaving the problem for future generations.”

### Processed Kimberlite and Pits/Underground

Another Diavik presentation followed, detailing the possibility and logistics of putting PK into the underground and pit mine areas, starting with A418, and then possibly A154 and A21. It was acknowledged that timing is an issue in terms of filling pits given that A418 will be ready to be filled while A154 and A21 will still be in operation. Follow-up discussion provided clarification on groundwater, connectivity between underground chambers, monitoring, PK properties and more. The TK Panel weighed the options of placing PK in the PKC versus A418. Much of the session was spent exploring details around this concept which required considerations such as the size of the pit and underground voids, stability, groundwater, physical and chemical properties of PK. Specifically, the TK Panel explored the question: *What other information do*

*you need to feel comfortable with PK material being placed in mine areas? What questions do you have that you want answered?*

The TK Panel was interested in learning about the dimensions and volume of A418 compared to the volume of PK generated for operations and closure. For A418, there is approximately 7.5 million cubic metres in the underground and when combined with the pit volume, the total is approximately 25 million cubic metres. The volume of materials presently in the PKC has not yet been calculated. The operational slurry is expected to be approximately 5 million cubic metres.

Other participants questioned whether the PK might generate heat or at least conduct heat thereby not freezing when placed in the underground/pits. Diavik confirmed that the PK does not generate heat, and that they don't expect it to freeze in the mine working areas.

The TK Panel discussed whether there was anything different that should be planned or monitored around the pit given the new proposal to put PK in the mine areas and cover it with water. The group was reminded of their recommendations to convert the road going into the pits into wildlife ramps in particular places (see Session # 6). One member suggested that there should be gentle slopes of the pits while another recounted previous discussions of the PKC where large boulders would be placed at the edge of the pond to prevent wildlife from falling or jumping in and not being able to get out and wondered if the same should be applied at the dike. The TK Panel generally agreed that the wildlife ramps would remain and that the break in the 1 km cliff on A418 was still important. Further discussion may be required to provide additional clarification or direction.

Panel members weighed the options of disposing PK into the PKC versus the pits/underground, considering the potential effects on wildlife, fish and the environment. As discussed during previous sessions, Diavik reminded the Panelists that a concern about the PKC are the slimes that form a consistency like toothpaste and can be harmful to wildlife or people that may get stuck in it owing to its physical properties. After much consideration, the TK Panel put forth the following recommendations:

- 11.1 If the PK goes to the mine area, the TK Panel recommends that all of the PKC slimes also be put into the pits. There is interest in moving as much of the slimes as possible from the PKC into the mine area and away from the surface where wildlife might gain access.
- 11.2 If Diavik moves ahead with putting PKC slimes into the mine areas, the Panel requests to review any changes to the PKC closure plan. For example, if it is not possible to move all of the slimes in the PKC to the mine area and some of the slimes remain in the PKC, the TK Panel may recommend that the PKC is topped with large boulders to discourage wildlife and people from entering.
- 11.3 The beach materials and rough kimberlite should stay in the PKC area (i.e., anything that can support a rock cover).

## 2. Fish and Water

Discussions around fish were guided by the question: *Can you share your knowledge of how fish use deeper waters to help predict fish behavior in the pits once they are filled with water?*

Panelists were particularly interested in knowing whether PK would affect fish and water, and expressed significant concern that fish might ingest PK or that PK may affect fish gills. The differences between the types of PK were reviewed (e.g., slimes, fines, coarse), and Diavik presented results from the PK toxicology study that found that PK does not contaminate water or chemically harm fish.

Panel members advised Diavik that sunlight doesn't penetrate to deep water so that fish generally remain in water where nutrients can grow, where the pressure is not too great and where oxygen is plentiful. Panelists expressed concern that the PK could create a "dead" lake given that PK does not support much growth.

When considering filling the underground and pit with PK, Diavik is interesting in learning from the Panel how far from the surface of the water the PK should be filled, if that option is preferred and approved. The Panel discussed at length what this level might be and did not come to a consensus. However, they talked about setting nets 6–7 metres deep since that is where fish can be found. One panel member said that they have set nets 12–14 metres deep on an extremely hot day. One suggestion was to make sure PK was at least 30 metres below the surface of the water, as this is deep enough and fish will not go that deep without a food source to attract them. However, the Inuit contingent suggested that fish can go much deeper, up to roughly 100 metres, which may be a regional difference.

Another suggestion was to spread the PK into each of the three pits rather than filling only one pit, or one pit followed by another. This approach would mean that the PK would not be as deep in each pit in case fish wanted to go into extremely deep water. One suggestion from the women's breakout group was to put PK from operations into the mine areas first and then PK from the PKC afterwards into another pit. Most TK Panel members expressed concern about PK coming in contact with aquatic life. However, if it is decided that PK will be put in the underground/pits, then it was recommended that the PK from the PKC also go underground. In general, the idea that all PK slimes should be removed from the PKC was supported if it is decided that PK will go into the underground/pit.

The TK Panel discussed ways to make the lake bottom more hospitable to fish if the pits were filled with PK. The suggestions to add sediment, sand or rocks/pebbles were made but it was explained that these would just sink into the PK slimes.

The TK Panel recognizes the importance of water to life. The TK Panel questioned whether PK might affect water quality. Discussions centred around how PK may affect fish and how PK in the pits might create a dead lake given that PK does not support much growth. These same

concerns have been expressed in previous sessions and prompted Diavik to fund a toxicological study. Once new participants at the session were informed of the results of these studies, the issue was less of a concern.

Questions around fish (e.g. minnows) returning to the pits once the dikes are breached were also asked. The closure plan is for water to flow freely back and forth from inside the dike areas and within Lac de Gras.

Following much discussion and weighing options with fish in mind, the TK Panel put forth the following:

- 11.4 TK holders know that fish generally go where there is food (nutrients) and oxygen so they are unlikely to go to the depth where PK would be.
- 11.5 The Panel would like additional scientific research to see what the effects of PK (ingestion) might be on fish specific to Lac de Gras.
- 11.6 If PK were to go in any mine area, the Panel requests an opportunity to learn more about the depth of water for fish habitat to cover PK (TK and western science).

### 3. Watching PK

Building on recommendations expressed at TK Panel Session #10, the TK Panel discussed watching (monitoring) requirements for PK whether in the PKC or pits/underground guided by the following question: *If Diavik goes ahead with putting the PK in the pits and the mineshafts, what would you want to watch at closure to know that it is good? For example, once the pits are filled with water and before connecting back to Lac de Gras as well as once reconnected.*

The TK Panel discussed ways of minimizing the suspension of PK once it is put in the underground/pit ranging from installing screens to covering pit walls to adding soil, sediment or aquatic vegetation to try to stabilize the lake bottom. The TK Panel suggested that the PK should be monitored for a time before the dikes are breached to ensure the PK is as expected.

The TK Panel put forth the following recommendations related to watching / monitoring:

- 11.9 The TK Panel recommends that their members are present for at least some of the time when the slimes are moved from the PKC into the A418.
- 11.10 The TK Panel wants to monitor how water behaves when placed on PK. They would like to see the PK and water in the A418 as soon as it is safe to do so and when there is a good visual of the material, as well as at regular intervals afterwards.
- 11.11 The TK Panel recommends that they monitor the fish habitat within the pits, shoreline modifications (e.g., ramps) for wildlife as well as the stability of the dikes on a regular and ongoing basis.

- 11.12 The TK Panel recommends that they monitor freeze-up and break-up within the contained areas (i.e., within the dikes) to see if the formation and melting is any different—with a view towards safety for people and wildlife.
- 11.13 The TK Panel would like to see the PK vegetation plots again.
- 11.14 The TK Panel recommends that we test slimes/PK in a fish tank to see if any water plants would grow on the PK.

#### 4. Wind

Concerns were expressed about the effects of wind on the pit areas at closure, particularly nowadays with climate change and winds becoming stronger. If PK were stored below the water and the pit areas were connected back to Lac de Gras, they want to be sure that the PK would not be stirred up by the movement of the water on windy days. People expressed interest in better understanding wind patterns in and around the contained pits/dikes both now and when they are filled with water as well as in Lac de Gras over a period of time (e.g., throughout all seasons). There were discussions around how wind could affect water movement and mixing, for example, after the pits were closed. Some participants expressed concern that churning waters might mix the slimes. It was discussed that wind can travel across a big lake but some people thought that the dike would protect the filled pits from these big winds. Some participants thought that wind might pose a problem whereas other members expected that the wind wouldn't be much of a problem given the height of the dike walls. The TK Panel decided that they needed to have a clearer understanding of the prevailing winds to understand the potential impact of wind on the pits at closure. One member commented on how the weight of the water above the lake bottom of the pit once it is refilled would be so heavy that there would not be much sediment mixing regardless of the wind.

- 11.15 The TK Panel would like to see wind behaviour on water within the contained pits/dikes over a period of time (i.e. throughout all seasons).
- 11.16 The TK Panel would like to see wind behaviour on Lac de Gras in and around the dikes. [How is the water on the outside of the dikes and breach areas affected by wind?]

#### 5. Tours of the Underground, Pits and Processing Plant

On the third day of the session, TK Panel members first went on a tour to the A154 pit together and then people divided and went either on a tour of the underground or the process plant. The group pit tour included a drive along the dikes of A418 and A154 with an extended stop at the viewing trailer in the pit of A154. From this station, people could visualize the “ice cream cone/carrot” and “ice cream” analogy they had been discussing when considering the PK to pit/underground options (i.e., the cone/carrot is the underground and the ice cream is the open pit). People observed the rock faces and got a sense of the scale of the operations. While driving along the dikes, TK Panel members were able to revisit the areas slated for special fish habitat

construction (e.g., shoals and reefs discussed in Session 8) as well as viewing the areas where the dike will be breached upon closure.

There were five Panel members plus two facilitators that took a tour of the underground mining areas at A418 and A154 led by Peter Gillies and Steve Rowles from Diavik. People commented on water seepage, water in the underground, the grouting process that Diavik uses to mitigate water flowing and the extensive network of sumps, pumps and piping systems to move water to the surface (i.e., North Inlet) from the underground. Some people talked about the feeling that it was a wet environment deep in the underground while others talked of it being cold and dry higher up in the pit. People were happy to see some kimberlite as well as garnets and to learn more about the dust suppression (water sprayed in dry areas) so that silica is not inhaled. Everybody who went on the tour commented on how it helped them better understand or visualize what filling up the underground and pit might look like upon closure. Some members talked about the sensors underground that monitor any movement. One member commented on how it seemed to dispel a lot of fears on what could happen underground and that containment of the PK underground would be the best approach. There was also recognition of the strong safety protocols in place.

The group that viewed the process plant commented on the complex conveyor belts and multiple sorting screens. One participant was concerned about the dust within the plant, particularly for employees breathing in fine material, while another suggested that it was less dusty than any other mines he had visited. People spoke of the various screens filtering different sizes of kimberlite and holding PK in their hands to feel the consistency.

## **TK Panel Next Steps**

During each TK Panel session, participants typically re-visit the list of session topics carried out to date and those suggested for the future (Appendix I). During this session, the TK Panel reviewed the list of potential future TK Panel topics:

- Watching / monitoring at Closure
- Updates on PKC closure options
- North Inlet – fish and water health
- Closure Details: building demolition, metal disposal, waste disposal, contaminants, laydown areas, airports, roads, etc.
- Closure Inspection Criteria
- 2018 Aquatic Effects Monitoring Program (AEMP) TK Camp



Further to the EMAB presentation, another topic was to look at how the TK Panel functions and possibly conducting a more thorough review of the recommendations to date. EMAB's presentation also revisited the idea of hosting a women's panel on vegetation. In reviewing the possible future topics list, the following questions were asked: *Are there any questions on these topics? Did we miss anything? Are any not important? Do any of them stand out as a priority?* The TK Panel members reviewed each possible topic and raised their hands in support of all of them.

Other general discussions included the suggestion that both a male and female youth from each group could attend future sessions and to hold the TK Panel meetings during times when the youth are off school. One participant suggested that the next Aquatic Effects Monitoring Program (AEMP) contain a focus on rivers so that people can look at the rivers draining into Lac de Gras. During the session, it was suggested there be a colour code applied to the Recommendations Tracking Table to show which ones have been accepted, in-progress or rejected.

In conclusion, the following recommendations were put forth:

- 11.7 The TK Panel recommends a future TK Panel session dedicated to the health of the North Inlet upon closure and to decide if there is anything to address with the sediments.
- 11.8 The Panel requests that Diavik provide a list of items/equipment that will remain and be removed from underground before flooding or filling the mine with PK/water.

## **Appendix A**

### **TK Panel Session #11 Photos**



Throughout the sessions, caribou gathered outside the sleeping quarters.



Front: Peter Huskey

Middle (L to R): Colleen English, Terri Enzoe, Kathy Arden, Nancy Kadlun, Dora Migwi, Joline Huskey, Bobby Algona, Natasha Thorpe, Angus Martin

Rear (L to R): Rose McKenzie, Joanne Barnaby, Louis Zoe, Regan Adjun, James Rabesca, Mason Beaverho, Wayne Langenhan

## Processing Plant Tour



Conveyor belts move crushed rock.



Inside the plant. Note the large covered square pipe on the right where mined rock enters the plant.



Cameras and sensors make for an efficient, automated and safe process.



Mason inspects a piece of kimberlite.



Processed kimberlite ready to go to the processed kimberlite containment.



Multiple screens separate out crushed rock.

## Underground Tour



Photo by Regan Adjun  
Preparing to enter the underground.



Photo by Colleen English  
The group learns about diamond mining underground.



Photo by Colleen English  
The group views kimberlite.



Photo by Colleen English  
TK Panel members underground.



Photo by Regan Adjun  
Managing water in the underground.



Photo by Regan Adjun  
Driving underground. Note the green lights indicate where the location on the winding road underground.



Photo by Regan Adjun  
Looking out of the underground and into the pit.



Photo by Regan Adjun  
Common sightings underground.



## Viewing A154



Peter Huskey walks with Dora Migwi.



Dora Migwi and Regan Adjun.



View into A154. Note road into pit.



Colleen English points out key features.



Kathy Arden and Rose McKenzie.



Angus Martin And Wayne Langenhan.

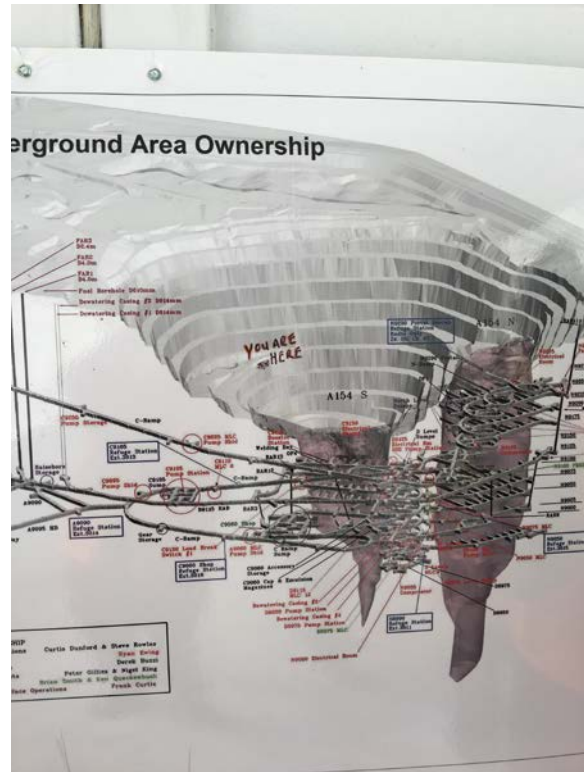


TK Panel in the viewing container.





Natasha Thorpe and Nancy Kadlun.



"You are Here" located the viewing container.

Note:  
All photos Natasha Thorpe unless otherwise indicated

## **Appendix B**

### **TK Panel Session #11 Agenda**



## Final Agenda

**Diavik Diamond Mines Inc.  
Traditional Knowledge Panel  
Session #11: Options for Processed Kimberlite (PK)  
May 10–14, 2018**

### **Thursday, May 10**

3:00 pm Arrive onsite - quick surface tour en route to camp (~1.5 hr)  
Security, Orientation & camp tour (~1 hr)  
Saturday Tour Preference Discussion  
Rooms & Luggage assistance

### **Friday, May 11**

8:30 am Opening Prayer, Welcome, Round Table Introductions, Review Draft Agenda, Workshop Purpose Overview

9:00 am Presentation: Site overview, Closure and Reclamation Plan, community engagement, Responses to previous session recommendations

Group Discussion

10:40 am Presentation: Processed Kimberlite to A418

Question 1: What other information do you need to feel comfortable with PK material being placed in mine areas?

11:30 am Lunch

12:30 pm Group Discussion

Presentation: Review of TK Panel Discussions of Processed Kimberlite

Question 2: Can you share your knowledge of how fish use deeper waters to help predict fish behaviour in the pits once they are filled with water?

Break-Out Discussion

Report to Plenary

4:30 pm Close

### **Saturday, May 12**

8:30 am Presentation: Summary of TK Panel Recommendations Related to PK

10:30 am Surface Tour (A154) and Underground or Process Plant Tours

4:30 pm Close



### **Sunday, May 13**

- 9:30 am      Opening
- 9:45 am      Debrief from Site Tour
- Plenary or Break Out Group Discussion
- Question 3: If Diavik goes ahead with putting the PK in the pits and mine shafts, what would you want to watch at closure to know that it is good?
- 11:30 am     Lunch
- 12:30 pm     Plenary or Break-Out Group Discussion
- 3:30 pm      Next Steps / Next Sessions, AEMP Camp, EMAB request
- 4:30 pm      Close

### **Monday, May 14**

- 7:30 am      Bags & belongings out of rooms, store under stairs in lobby
- 8:30 am      Opening
- 8:35 am      Facilitators present draft of TK Panel recommendations for discussion
- Group Discussion: Finalize recommendations
- 11:20 am     Next Steps/Next Session Group Discussion
- 11:40 pm     TK Panel Presentation to Diavik: TK Panel recommendations,  
                 Diavik Response and Group Discussion
- 12:40 pm     Closing Circle and Prayer
- 1:00 pm      Lunch
- 3:00 pm      Check out for return flight

*Note: Frequent breaks will be scheduled throughout the day, as needed. Each day will close at 4:30 pm.*

## **Appendix C**

### **TK Panel Session #11 Informed Consent Form**

## Diavik Diamond Mines Inc. Traditional Knowledge Panel

### ***Informed Consent Form***

I, \_\_\_\_\_ on May 11, 2018 give permission for Diavik Diamond Mines (2012) Inc. and its Contractors (i.e., Thorpe Consulting Services, Joanne Barnaby Consulting, PIDO Productions) to take notes, photographs and / or audio and video recordings related to my participation in meetings, workshops and events related to the Traditional Knowledge Panel established for the Diavik Diamond Mine. I understand that my participation includes meetings and workshops held throughout each year either in communities in the NWT or NU or at the Diavik Diamond Mine.

Through my signature below, I understand that:

1. I consent to have my words, activities and responses regarding and related to my knowledge recorded on maps, in notes and photographs, and using audio- and video-recording equipment (collectively referred to as Traditional Knowledge Data);
2. I am free to choose not to respond to any questions asked or participate in any discussions without prejudice or penalty;
3. I can choose to be anonymous in my participation without penalty;
4. My representative Aboriginal Organization, DDMI and / or its contractors may use the information collected to contribute to operations and closure planning at the Diavik Diamond Mine;
5. DDMI and its contractors may share my information which I have verified and given permission to share in either reports and/or photographs and provide such information to my Aboriginal organization and other regulators;
6. I agree that my contributions may also be used for future educational, cultural, heritage, and environmental purposes that are outside the scope of the TK Panel and that my representative Aboriginal organization, DDMI and/or its contractors will make all reasonable efforts to consult me, or my descendants, before using my information for purposes not indicated above;



7. I will receive financial compensation for my participation in accordance with DDMI policy;
8. I am free to request that any information I share is removed, erased or deleted and that I will have the opportunity to verify draft video-documentaries, reports and maps to make edits before I sign them off and that final copies will be provided to me;
9. I also understand that DDMI cannot ensure the protection of the Traditional Knowledge from public release once the reports are released (e.g., via youtube.com, Facebook, other social media, or Aboriginal group websites);
10. The Traditional Knowledge Data will be summarized and included in a report which will be publicly available.

Signed on May 11, 2018 in Diavik, Northwest Territories.

Signatures:

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Participant

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Aboriginal Organization

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Diavik Diamond Mines Inc.

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Witness / Contractor

## **Appendix D**

### **TK Panel Session #11 Daily Notes**

## **TKP Diavik Friday, May 11<sup>th</sup> 2018**

### **KEY:**

Kitikmeot Inuit Association;

**BA-** Bobby Algona

**NK-** Nancy Kadlun

**RA-** Regan Adjun

Łutselk'e Dene First Nation;

**CSB-** (Sara) Cecilia Sarazine Boucher

**DTE-** (Terri) Doris Therese Enzoe

**KE-** Kohlman Enzoe

North Slave Métis Association;

**WL-** Wayne Langenhan

**KA-** Kathy Arden

Tłıchǫ Government;

**LZ-** Louis Zoe

**DM-** Doris Migwi

**MB-** Mason Beaverho

**PH-** Peter Huskey

**JH-** Joline Huskey

**JR-** James Rabesca

Yellowknives Dene First Nation;

**AM-** Angus Martin

**RM-** Rose Mackenzie

THORPE;

**JB-** Joanne Barnaby

**NT-** Natasha Thorpe

DIAVIK;

**CE-** Colleen English

**SS-** Shelby Skinner

Elder Opening statement prayer

**DM:** Thank you for giving me the opportunity to say the opening prayer this morning, due to the fact that we are becoming elders have made us hard of hearing but prayer is still important. Since we met last year and it has been good to see all the changes taking place the only thing we see kind of different is that some people that used to participate aren't here with us today and it's important to remember them in our prayers. It has been nice to see the new faces participating here in their place especially the youth. The momentum is always with us and growing, the main importance is the future and the future generations and it is great to see the youth and the elders working together we know the history of the land and it's important to be participating with the industry and that the government supports us to advise them in this capacity. We bring our history to the industry and to our youth and hope that our experiences can teach them and help guide them to their destiny. These are important experiences. On Monday we have the elders gathering with our youth in Behchoko to discuss what the future looks like for us all, elders, youth, and our relationships with the government and industry. We are working hard at getting language workshops to make sure we help our youth keep their language, they aren't keeping it as much as they should so elders are training more with them to understand their language and keep the language strong. We came a long way from the Tł̨ch̨q̨ region, we see representation from all over the north, we are all one nation, it is good to see we all share the revenue coming off the land, we all live off of and how we share the animals and resources the land provides us so it is important we thank the creator and ask him to give us a future and good relationships. As I age I have difficulty walking but at least I made it this far and I am so grateful to be here. \*Prayer\*

**PRESENTATION:** Site overview, Closure and Reclamation Plan, community engagement, response to previous session recommendations **ONLY QUESTIONS TRANSCRIBED, SEE ATTACHED MATERIALS**

**CSB:** Where did they drain the water from A21?

**CE:** A good part of it goes back into LDG, so they set up a pumping system that runs from the pond over the dyke and back into the lake. That whole area is fished out before they start doing any of that so they take the fish and put them back into LDG as well, then they pump that water directly over. They have numbers they have to meet from the water license and the inspector is up here all the time to make sure they keep the water quality within that range so they are testing it all the time. At some point, the water quality starts to go down because the pumps are low and you get that turbulent water and a bit of sediments in it. When that starts happening, when they start approaching those numbers, they turn off those pumps to the lake and then all of that water gets pumped to the North Inlet. It goes into the North Inlet, settles out, goes through the treatment plant and then gets put back to LDG so they split how they pump the water out of there. And then there is still water in the open pits and in the underground when they are mining and so they have little pools at the bottom or in certain areas and pumps and piping systems that also keep putting that water into the North Inlet so that it settles and gets treated to go back to LDG.

**CSB:** Do they have pipes from that pond to the inlet where they are going to bring that water to?

**CE:** Yes, they have a whole pumping system, a big pipeline system that runs from underground and the open pits. \*continued with slide\*. So, at closure in these areas the plan is to go in reverse direction and take the water from LDG while those dykes are still fully intact, pump it back into the open pits before that there would be some of the fish habitat that we talked about, reefs established at the edges of these pits, the water would be pumped back in and then it would sit so we have the opportunity to test it while it is still separated from LDG and make sure that everything is okay. And then there would be cuts/breaches made at certain points in the dyke to reconnect it back to LDG. A lot of this dyke system that you see would still stay at closure but there would be some passageways for boats and water to be able to flow back and forth between LDG and that area and for people to be able to move back and forth as well.

**CSB:** So what you are saying is that the dyke is going to be there and there are also going to be cuts in the dykes where things can pass, but they are not dismantling the whole thing?

**CE:** Yes that's correct. They are not dismantling the whole thing.

**DTE:** That's underground right? But when it is closure time you are going to fill it up with water, the mine (Diavik) is I mean, I'm not talking for today but talking for the future, we have an underground mine on those two (pits) and we know we have climate change, do they think it is going to stay like that? Because I watch things and I go out on the land all the time and I have seen lots of changes since I was young. I may look young but I am 60 years old and I have seen lots of changes so for me the way I think and the way the mine thinks are not the same, one day that thing is going to fall right down on the tunnels right where they go underground. I am only speaking for the future of my grandchildren and my community because we live close to here. As soon as I see this picture- it is on my mind, I don't know how the other groups feel, but this is only for me, the way I see it, but we go hunting on this side of the land and how about the fish? We live off the fish and the caribou so it's kind of like something is not right for me. Just to let you know.

**CE:** It's good to be thinking of those things and it's good to have those concerns and I don't think you are alone in those concerns by any stretch of the imagination, So all of the kind of closure planning and I know Bobby and a few other people here have spoken about the concerns around the climate changing and things changing and whether this is enough whether it's good enough to last that long when you are talking about the mine company no longer being here and this just being on the land and people using the land after they are gone. This is coming at it in a totally scientific approach but they do a lot of work to predict into the future and there are scientists looking into climate change and they are looking at what the expected differences are between now and a couple hundred years into the future and they use that information when they are designing the closure plans for these structures. So when we speak about the rock pile, getting a cover on it and trying to keep a frozen layer when we talk about things warming up, that has a bunch of extra kind of material built into it in order to account for those changes that may be coming in terms of warming and that type of thing. Structurally they do the same thing between engineering designs when you are talking about dykes, dams and filling these with water, I think you would get, just from your experience, I think in terms of pressure and the incredible pressure that water has and the ability to hold, so when all of those voids are filled with water, and possibly other material which we will talk about, it creates an enormous support structure basically for those back filled areas; voids underground. Plus, there is some backfilling we were talking about where at the backfill plant when they will fill some of those holes, so it is designed to be stable and secure over the long term. I get that you are still concerned and that is a fair statement, but they are working towards the assumption of climate change when they are making all of these plans.

**DTE:** When I was young my grandfather told me “way down the road things will change” and he is no longer with me, he has been gone for a long time (1973) he said “things are not going to be the same” and he pointed on this side of the land and said there is a lot of money and now I understand, for me it seems like I have a hard time dealing with this, you know when you open old stuff (the mine) –it is not healthy anymore (the land). And they keep telling me that things will be back to the same way- and it is not going to. It’s hard for me to believe it and when they come to my community I make sure I sit and speak for my community. I have a hard time with this, I’ve been going to all these mines and workshops this is not my first time, I’ve been here more than 500 times and I keep seeing the same things. Maybe it goes into one ear and pops out the other one I don’t know. Whatever I feel, I am going to say because I am only here as an alternate for Celine Marlowe, maybe this is the only time I might be here, but I am speaking for the young people and the future of the young people. We see lots of elders in our community that talk about things like that, they are no longer here for the next generation and then after that there is another one so we have to speak for them and I think that is one reason I was selected to be here; to sit in your workshop, but still I disagree with things, I guess it is not only me.

**CE:** Thank you for your comments, they are not falling on deaf ears, I think there are a lot of people who share the same opinions, and development is harder for some people than it is for others, some people don’t like development at all and other people are ok with it. If you have development in your backyard, in my personal opinion no company should be telling you that it will be going back to what it was before, because it’s not, so when you say yes to mining there is going to be a change in that area, what you want to do is control that change and be comfortable with that change you cannot magically take this land and turn it back to what it was before. \*return to presentation\*.

**BA:** With all the loose gravel here on the slopes, would it be possible to pack that down as you put more gravel into it, use a packing machine or something like that because in the future, you know, that is loose soil, the caribou are going to wear it down and water and rain will wear it away, and wash away that loose gravel that you guys have just pushed in. Can they pack it down hard so it won’t wash away? So as they put gravel on it they keep packing and packing so that as hard as possible so the water and caribou don’t wash away the gravel and expose the rock that is covered?

**CE:** We have to remember there is still more work to be done here, so this is just the re-sloping and the “cover” is going on top of this. So you will have the till materials, like the lake bottom material, that will be on top of this and then rock. So the final rock will look like the test pile you guys were on, it is broken up but it is smoother and not as fine of a material as this is so it will happen it is just going to be a bit of time before we get there. They are moving over it with the dozers and everything that compacts it down as we move the material over this re slope area. So, patience. \*return to presentation\*

**DTE:** Where is your landfill?

**CE:** It is in the North Country Rock Pile.

**DTE:** I know that they are not going to take everything out the way they brought it in.

**CE:** No, that’s right.

**DTE:** They are going to bury it.

**CE:** Yes.

**DTE:** I ask so many questions about stuff like that, even metals and whatever they don’t need they are going to bury it, now its climate change again, and it is going to leak out somewhere down the road and down the future. And after the mine closes how long will they be there to go and watch anything that has changed? Fish are important, and the water is important, you know, if they destroy our water, we live off water and water is important to our people and people all over the world and even fish. I keep asking the same questions, but I never get an answer. You know the Elders at home, they are like professors, they have the knowledge and some of them see in the future of the things that are changing today and they tell us. And we are going to see changes for the young people that are growing and we speak for them but even though they hear our voice and our concern, it feels like we are hitting a brick wall and we are not going anywhere, speaking things over and over again, that even bothers me. Masi Cho

**CE:** So, the land fill is in the rock pile, it is approved for “inert material” meaning it has to be clean and neutral but it does include metal, so the metal can be buried in the landfill. Then there is a cover system, but it is very similar to a community landfill or a city landfill where you kind of stack your materials and push them in and then you have to build in cover layers every so often. And in the end, that rock pile will have a cover system that will go on top of it. So, it has a big layer of till, and a bunch more rock that goes on top to encapsulate that whole area. There are 4 meters of cover going on top of everything else. And then there is a whole system of collection ponds that are around the whole north country rock pile, Bobby calls it ‘the moat around the castle’ that collect any of that seepage or the water that comes out of the pile or off of the pile. So, water that



comes off of it like rain water or melting runs off the surface it is captured in those ponds. During operations, all of that is pumped to the treatment plant. When we talk closure, those ponds will still exist, they will be reconnected back to the tundra and a lot of people have talked about the tundra's ability to filter and clean the water as it finds its way back to LDG.

**DTE:** So everything around that area is all captured?

**CE:** Yes.

**DTE:** For some reason, I don't believe it.

**CE:** That is your call.

**WL:** I am not really satisfied with the definitions they come up with, I think it is too broad of a definition to say there is going to be metal piled in there on a scrap heap and whatever because you've got stainless steel, you've got aluminum which lasts thousands of years. I think a lot of this stuff should just be freighted out unless its regular old cold roll steel, it will rust away with time but even in this country it will last hundreds of years because of the water, we are not really a wet land we are very dry. I think it should be broken down exactly which metals are going into the scrap heap out of all these buildings, like what about the insulation with the glass and everything in it. Everything is just too broad of a definition here and what we need from the mine is it has got to be broken down into certain sections and those sections again have to broke down a bit.

**CE:** Thanks for that, part of that is probably me, so I am speaking pretty generally, I am not an expert on this by any stretch of the imagination they have worked on an updated building inventory that breaks down some of that information that you are interested in, I know the panel has requested a session on this to dive into a bit more detail around you know what are the plans for the buildings and what the metals look like so I think I this is one to park because in no way can I really speak to that. It is a good one to work towards and identify, they have pushed off (demolition) and originally, they kind of wanted to demolish everything pretty quick and just have some core buildings but they have since decided that probably not smart because they might miss something so they have pushed off demolition until later in the closure cycle so there is still quite a bit of time to work through some of those concerns or questions around what materials go where and how to salvage. I would suggest parking that one for a future discussion, but good point. \*return to presentation\*

**CSB:** There's no fish in the inlet right?

**CE:** No, so that was fished out as well after they cut it out from LDG.

**DTE:** After it was closed, most of the water that is drained off ground and underground goes into that, right? So are they going to clean that water and put it back (into the inlet) first?

**CE:** Yes, so everything would be drained, that whole pond would be drained and cleaned. The treatment plant would not be going anywhere for a while so they would still be using that treatment plant to clean and make sure that the water is as clean as possible at closure. It would all be cycled out of there but the sediments would remain.

**DTE:** But maybe it is not healthy or anything? For me they should just leave it like that. Because if you open it up, the water is going to move around and the fish are still going to go there even though we say the fish are not.

**CE:** Well it would still have the dyke that would block fish from going in there so they could not get through the rock wall that is there, water could still get through, but the fish could not. That wall would stay but it would only be able to let water trickle back and forth between. Right now, it is cut off with those thermo-syphons that we saw yesterday, but they would remove those so water flows but fish still can't get through. In terms of the North Inlet recommendations, people wanted more time to consider whether or not that would be a 'no go' zone for wildlife or if wildlife would be encouraged to use that area. The land around the North Inlet is where we get tons of grizzly bears, ground squirrels, caribou, it is a pretty nice little lush area so the land around the North Inlet gets used a lot. This Panel has so far suggested not reconnecting the Northern Inlet to LDG, unless the sediments and water quality were the same as the lake. They have followed this advice in the latest version of the reclamation plan that was submitted where water can flow back and forth and not the sediments or the fish.

**BA:** The dyke, it is narrow and it is not really hundreds of feet wide and it has freezers in there, and once you take those freezers out, it is going to start melting again and when you say fish cannot get in there- we have fish that are microbes right to the largest fish, and fish start as microbes, they will go from the tiny to the big. They start small and will get through with the swells. They will be pushing in and out all the time, big fish might not but there are ones that will get through. Every single one of them depend on each other for food and once you breach that it will seep out too anyways and the contaminants will get into LDG. That is what I see anyway.

**CE:** There are the tiny little organisms that float around in the water column. Algae and little zooplankton and little bugs that live in that water column. Those types of things can absolutely move between the partial dyke if you will, limited breach, those types of things can move and can also help water quality, it would be the big fish that feed on the bottom that we would want to keep out and prevent from coming into the area. So not the little microbes, those types of things would be able to connect back and forth. \*return to presentation\*

**CSB:** Is the kimberlite you just showed us, is that crushed or is that natural?

**CE:** It is a natural rock, but it is crushed it comes out of the process plant; it is a really soft rock though so it crushes quite easily.

**CSB:** I want to ask a question about that lake you showed us here previously. There are a lot of animals such as birds and squirrels around that lake, what I'm thinking is that if that lake is contaminated now- animals go to the lake to drink water, is there any monitoring to see if the animals are drinking the water and how healthy are they at this point? Because it has been there for quite a while. Because there are some people that have found dead animals on the tundra it could be unnatural but could it be from the water here? The caribou are back hanging around this area, as people we aren't even allowed to walk around the ground here- what about the animals? When they get too close to the mine, there should be a way- If it is not safe for humans, it is not safe for animals either. And we live off the animals, especially the caribou. Is this healthy for them? Are they going to be as healthy as when the mine started? These are the things we come to see and as an elder with TK, I have to say something about it, it is for the safety of our people that live off the caribou and bears and we use bears for our medicine too so this is a concern to me.

**CE:** So when animals are on the site there are a few different things that are done. If the animals are in a place that could cause danger; so if there is an incoming flight or in the north inlet area or on the landing strip, or if they are on heading up the road towards the PKC, then the environment staff do herding events to move the animals away from those areas to make sure they are not at risk. This whole area too as you can see there is a lot of access to LDG water as well. In my years here I sat and watched a lot of grizzly bears in that area and they weren't ever using the pond, some of them would swim across the pond but that is really all we have seen for animals using the water in that area.

**CSB:** Well no one would know they are not monitoring it.

**CE:** They do monitor for wildlife on site and that is why people are sitting there watching for them.

**CSB:** You have to know the behaviour of the animals, and I know most of the animals go out at night and rarely in daytime, that is when they are hunting.

**CE:** They do behavioural observations of caribou groups as well that are in or around the areas of the mine. Staff here does not do anything with the dead animals that are found on the mine site but the GNWT (Government of the Northwest Territory) are responsible for that. So, if there is ever an animal that is found dead on the mine site then the GNWT is notified and they will either take the carcass or give direction on what to do with that animal.

- CSB:** I have seen them taken by the GNWT, I don't know which one it was, but we still have not heard anything from them yet. I had a question for them on that too and nobody seemed to know what happened to them.
- CE:** I am not sure.
- KA:** I believe at one of our sessions, maybe 2 sessions ago when we were talking about the North Inlet and contamination, I had asked the question if the water was contaminated. The answer that came back was saying that it was not so much the water being contaminated because it settles, that it is the sediments at the bottom that contain the hydrocarbons and the contaminants. So to drink the water, the question was asked if they would drink the water from that? Would you be willing to give it a try? And they said they would because it is not the water that is contaminated it is just the sediments. Going to the breaching, and Bobby's question about the microorganisms and what not, I was thinking about minnows, a lot of time they swim on the surface because it is nice and warm, and the possibility of them coming through because the water will be going in and out from the lake so if we get some minnows growing they will be feeding from the bottom if there is good growth there. What would happen if that happens? Would they test the fish that end up going and living in there?
- CE:** Slimy sculpins are little fish, about minnow size, and they are the fish that is studied a lot here because they are localized - they spend their time in one area so those would probably be the species used to test the North Inlet area if they did see small fish moving into that area. And you can do metal analysis on their bodies and all of that stuff. Currently they take sculpin from this area \*slide\* where the water is discharged back into LDG- they take them from a lot of other areas as well, but this one goes directly to LDG and is a major focus area and those same fish are what we would see because it is a zone small enough for them to use.
- JH:** When you are talking about reclamation of the site, do you have any samples where mining has been done and reclaimed so we can just see if it is working, maybe in a climate similar to this or another diamond mine, or is this the first of its kind here in the world?
- CE:** I would have to look around a little bit more and as all of you know, there is a horrible history associated with mining, and it is that they do not close- they walk away and they have not done the right work. Especially up here it would be challenging to find an example, let me think on that one a bit more and maybe even the later years of Con may be a good one to pull out some information from. So let me think on that one.

**CSB:** So as far as you know this is the first time they are reclaiming the land? Has it been done in the south where all the mining industry, especially for diamonds where they never reclaim the land? Do they just leave a lot of chaos?

**CE:** These are the first diamond mines in Canada. Diamond mines are a good mine relatively speaking, when you talk about metal mining or anything like that you get way worse water quality issues, way worse acid rock drainage off of waste rock and that type of thing, so we are pretty fortunate in the type of mine that we have and the type of effects that we see. But there are mines that have closed and have done it properly and sometimes it is much later and it becomes a government site like we see at giant or other areas, and sometimes it is the company doing progressive reclamation. I do know one mine in the Yukon that is in temporary shutdown right now but they were doing a lot of progressive reclamation so doing the reclamation as they went, covering old rock piles and they were seeding and putting vegetation in certain areas and some of that depends on how the mines life progresses and how it is staged, if they know they are done with one area then you can close it while you are still working in other areas. And that is exactly what is happening with the NCRP right now so that is an opportunity to start closing an area of the mine that is no longer needed while operations are still going on to ensure that that work is done before it closes. There are examples, it is getting better. Certainly, back in the day when there was very little environmental regulation and companies didn't really have to put security deposits down, that type of thing was more common, where companies just folded, left and left everything in their wake. Even if Diavik went bankrupt and had to leave this site tomorrow they have a 1.2 billion dollar security deposit that is sitting there for the government to use to close the mine, so there is comfort in that as well.

**LZ:** Reclamation is a very good question for us because we had a bad experience with Colomac Mines and Ray Rock Mines. There is some reclamation that has been done and it is not 100% clear in our minds. The mine that was in operation in our area did not run for as long as this one did and the area of concern was not as big as this one either- none the less the damage was huge in the area around the uranium mine. Although they did a really good reclamation of the Colomac mine site, we still are not 100% sure about the seepage to the underground water. Some mines that operate use chemicals in their process and I'm not sure if this diamond mine uses chemical to get the ore into production. What we see today at LDG is the caribou hanging around the buildings and they say the processed kimberlite is not good for the animals so what are they going to do about it. Maybe the berm around it is not good enough, I would think that an elder would like to say there should be a fence to keep the animals away from the kimberlite that would be left behind, this would be satisfactory. We need to help the company make the right decisions and do the best clean up and reclamation so we aren't leaving the problem for future generations.

**CE:** Just trying to wrap up so everybody can get a break here. So I explained what the PKC looks like now. When we are talking about closure those dams would still be there, they would be cut to allow access in certain areas as well. On top of those area's (refers to slide) there would be rock placed on top of that material to prevent the wildlife from accessing the processed kimberlite. Those areas, so this would be covered with rock- that's the gray layer on top- so that would be the kind of clean rock that's coming out of A21 that would be used to cover that area. Right now the plan is to have a pond that would remain in the middle. I talked yesterday that there is only so far that you can push that rock before it hits the material, as you can see it is not super stable so there would be problems keeping the rock on the surface. The idea is to put water on top of that material and prevent access that way. That is the current closure plan. There is an option to start taking some of this fine processed kimberlite, this slurry material and move that underground into the 418 pit and then covering that with water at closure. That could change this plan, so it would remove the need for a pond in the Processed Kimberlite containment area and it would be covered with rock and become just a dry area at closure instead of having that pond and some of that challenging material to deal with on the surface. Some of the recommendations from the PKC would cover it with sand and soil to promote revegetation and eskers and wildlife habitat and willows and that type of thing. Returning the lake and the shoreline to the natural condition and lining it with rock, water plants, bugs etc. Providing safe access for wildlife over the dam by re sloping some of those dams and reopening some of those sections of the dam to create water flow back to LDG. Leaving some areas steep for animals such as wolverines, bears and foxes. Removing the slimes from the mine site at closure. Doing some toxicological testing on the PK slimes to see if it is harmful to wildlife or humans.

\*returns to slide\*

**KA:** Just going back to the slimes, a couple sessions back the question (has always) come up about the PKC slimes being toxic. Did we not run tests? We sent them out and they put fish in that water and there was nothing wrong with the fish, the only thing is they starved because there is no food in that water but as far as it being toxic it was not, and fish were able to live in it so if that is the case then why do we keep having the worry that is toxic?

**CE:** So these were old recommendations.

**KA:** This is the old recommendation? Oh I see. So for the new people that are here.

**CE:** I'm going to be updating you on that in a bit.

**KA:** Ok good.

**CE:** There was a recommendation to create a barrier to prevent wildlife from moving from the top of the north country rock pile down into the PKC. Part of that was the steep slope and keeping those rough boulders along that edge. And that has been incorporated into the north country rock pile closure design as well. Having streams that would filter the water flowing from the PKC using mosses and natural vegetation to monitor that water. And then kind of Loui's point, talking about a fence but there was some conversation about how fences can be complicated when looking at a closure scenario where there is not a lot of people around because they can fall down, animals can get caught in them. So, the end recommendation was circled boulders around the area where the rock was stable to try and prevent access into that pond area to deter wildlife from being around there.

BREAK

**\*\*Shelby Skinner conversation. File 2 5:00\*\***

**KA:** Maybe what you can do is give us an overview about the kind of environmental work you are doing and then we can ask questions.

**SS:** Here at Diavik we have a water quality monitoring program. Every 6 days we go to test the water so we collect samples that go the lab in Edmonton and we have labs here where we test for sediment and PH. Those are the in-house analyses we do. We get several test bottles that we get analyzed for mercury, metals, nutrients and other general chemistry like pH conductivity and stuff like that. We also look after the wildlife on site, right now we have one grizzly bear awake and caribou on site. We get calls during the day and night so if there is a bear onsite we go and monitor and make sure that they are keeping clear. We do caribou scans monitor their behaviour. This year we have had a lot that hang around mining activity. We watch how they react when the haul trucks, we monitor what they do during blasts. We have wolves and wolverines, we do not monitor those too much we just make sure they are not getting in the way in work sites. We also have two air monitoring stations on site they collect particulates in the air and then on a weekly basis we download that data and send it to a contractor that reports for us. We just finished a big AEMP testing program all over site. We go to LDG and take water samples at sites that are close to site. We call them mid field because they are in between 10 km and then we have far field sites as well. We just finished that program. We do wolverine track surveys and we count the prints and we see if they like hanging around on site. They are about 16 km long. Last year we had a grizzly bear DNA program so we had posts out all over the tundra and we bate them with different things that attract bears. The posts have barb wire on them so the bears will rub up against the post and then we go and

collect the hair to be sent out to be analyzed. We got preliminary results back and there are 136 different bears that they found based on the hair samples we collected. We also respond to any spills on site. We report large spills to the government and follow up with that. We also have desk stations around sites. We can compare the samples we get close to site to the ones we get far away. That is it in a nutshell.

**RM:** Where do they use the water to drink?

**CE:** It comes in from the water intake shack by where we saw the caribou, it comes up and goes into the treatment plant and gets piped to the camps and all around

**KA:** This is the 2<sup>nd</sup> year that the caribou have showed up here at the mine site in a number of years. In the beginning when the mines were here there was concerns that they would fall in the pit because at that time this was their migration route. Have you been observing if they are coming near the old pits? They used to fence it with that orange fencing to deter them from falling in. It is a small herd that is out there right now but have you noticed if they have been going near those pits?

**SS:** There have been a couple small herds called in around the ice around pits but none in the pits. They go in the tundra but I have not seen them in the pits.

**NK:** I am concerned about the water; the only water we get to Kugluktuk is from LDG are there any changes (in the water) from when the mine was built to today? Are there any contaminants that are showing from before there were mines?

**SS:** I think it is mostly a nutrient change so just in the different processes we have and water treatment will add to that LDG is a nutrient. Nothing toxic. Anything you add to LDG will have an effect.

**DTE:** I heard you say you collect water and send it to Edmonton, how long do results take to come back to the mines?

**SS:** About 2 weeks, some samples have quicker return times. We run for turbidity and PH so we cannot put out water that has high turbidity, PH, and TSS so we check that and we monitor some on site. We check that within an hour of coming back from taking samples, the bottles we send to the labs are for nutrients.

**DTE:** Is there lots of mercury in water?

**SS:** I do not look at the samples all that closely.



**CE:** A couple years ago, I think it was 2010, there was some slimy sculpins that had elevated levels of mercury. That was curious when that result came back because there is no mercury in Diaviks processing systems. Chemicals are not used on site so it was an odd finding so that was the year the fish tasting stopped and that triggered a huge lake wide study on ultra-low mercury detection. We had to go to a specific lab that does really low level mercury testing and we did samples on the mercury levels of fish. All the water in LDG came back with no levels of detection, and the fish were well in the safe level. I might have a graph about the white fish and trout and the next test came back. There seemed to be that samples can get contaminated easily. There was a very rigorous testing program done of mercury, that has not been the case here, the water has been really good quality in terms of mercury up to date.

**CSB:** So you said that nothing changed with the water except the nutrients. When you have a high level of nutrients in the water, what does it do to the water? Was it normal before and now it is high? Is it at a level where it is dangerous in the water causing other chemicals to show?

**SS:** What the nutrients do, is they actually help organisms grow in the water. Nutrients are the small tiny bugs that will do better which means that the fish and vegetation will do better.

**CSB:** Does it take the oxygen away?

**CE:** What you have seen is if there are very high nutrients, you get something called eutrophication which means a ton of algae grows into the pond or lake. Small lakes that have a rich bottom with a lot of nutrients, you can see that. There are lakes that have been closed down because of eutrophication it can kill animals and that type of thing if they get into it. It is very visible; the lake turns green. It can be a risk to animals and probably to humans if the levels were really high We have seen increase in nutrients in LDG but we are in no way at that threshold of a risk of eutrophication starting to happen. Too many nutrients can become toxic but we nowhere near that yet.

**CSB:** Would it be because of climate change or what the mining is doing, or are you like me and not scientific in that way?

**SS:** No I am not an expert on that for sure.

**CSB:** But everything is combined, one thing affects the other.

**NT:** I'm sure everyone has seen eutrophication around a honey bucket. That is the same process, the loading of nutrients. Around spring time it would be so green where the honey buckets were.

**DTE:** It is good to talk about water, water is really important to us. Ever since the mine opened, I worked for Water and Lands (for LKDFN) for 9 years to see if there were any changes in the animals, fish, water. We put this big buoy in the water and we put 6 tubes inside it and we put in the water where the river comes down and we left it there in the first week of July and left it until September. We sent our water out and wherever they get tested it comes back to our First Nations office. Now we are teaching the youth that travel with us in the boat and we show them these little bugs that we pick out of the lake and we tell them if it is healthy or not and that we will get the results back at the end of the summer. Even if we see any changes in the water they will tell us. But there is mercury in our water. They tell us not to eat the big fish because they are not healthy enough for us to eat. We do see changes and when you start seeing mercury it hits me right there (heart), you know there is something wrong and maybe it was just that one year, it was too hot. With climate change, you just do not know. But the snow used to be hard and now it is just powder. I went for a skidoo ride with my son close to the tundra and I walked off the road and I fell in the snow, before that I used to stand on it. Everything I do is all written down and anything that is not the same as when I was young right up to today I write it all down. That is why I am asking so many questions. Masi cho.

**BA:** When we are talking about living things, sometimes we do not ask ourselves what we are made of. The chemicals in our body, like the fish and all the animals are made. I always wondered what fish, one type of fish how many ingredients or nutrients or chemicals do you need to make a fish? How many nutrients do you need in your body to keep yourself healthy? We have a lot of salt in our bodies, once one starts to take too much it makes us sick when we get too many chemicals we get sick. It is all living things on the land they are all chemically made from the very rock we are made from. How many chemicals does it take to make the living things? When we start talking about chemicals and fish we have too much salt overtaking another part of our body we become sick and I always have a hard time taking medication for myself because of the later effects of chemicals in your body. That is what medicine tries to do. That is one of my biggest concerns, we as an industry give a lot of chemicals in the air and we are changing all aspects of animals on the land. Thank you.

**DM:** Me as an elder we came here as advisers to the people we are representing. This is a learning process to a lot of us because of the chemistry and all that. I for one my dad and others that have travelled and trapped for white fox, around here in the past they had a good relationship with the Inuit. The land was really good back then, it was natural. Now everything has changed and the minerals are changing and the waste rock pile that was not here our ancestors were out on the land and it wasn't easy and if you get sick out on the land you have to learn from one another. To see what medication would be good for our people, some of us got sick out on the land so when I saw the caribou today cornered by the big waste rock pile I see them making it around the waste rock pile. It is confusing

for us to see what the landscape looked like and so does the animal so we have to learn how to adjust to the changes that come to us. In a short period of time I will be 81 so it is so good to see the youth coming with us and the youth need to be involved to learn from us and learn from various nations and companies as well. With the surrounding landscapes, the land will remain once we are gone, I think we enjoyed the land and now we see lots of changes, like I said the waste rock pile was not her and now it is. The most important subject I see today is the water. Because without water we cannot survive, neither will animals. I understand the diamond operation is not using chemicals but the concern I have is the dust coming off from the blasting of the rock and the dust. The dust flies out causing contamination down the road. I know one of my uncles travelling around that they were hunting with skidoo and he saw blowing dust so I just wanted to share this point with you. Thank you.

**JB:** I think the interest is in explaining to the panel what they do and how it is different and similar to what we do as far as out advice to Diavik.

**WL:** There is another little lake you were talking about filling in. Are you are using A21 material to fill?

**CE:** Louis had recommended draining it to maximize the area available and minimize the water that would come out from the rock pile.

**WL:** Is that little lake going to be enough to contain materials coming out of A21?

**CS:** No, it would be a part of the pile but it gave it more space.

**WL:** That north arm lake there could that not take the excess from A21, could they fill it right in, is that possible?

**CS:** I don't know if the time will work out, A21 is done in 2021 and we need the North Inlet until the end of the mine and beyond to hold all that water going into the water treatment plant so you could not back fill it with rock until you are done using it.

**WL:** You could not do it partially and work as you advance it couldn't get smaller and smaller to the end.

**CS:** The underground water is a huge source of water and they need the space they would not want to lose the security to have a place to store water.

**WL:** So that is a rotten idea then?

**CS:** Don't know if I would go that far.

**NT:** How does everyone feel about Diaviks responses to our recommendations? I see a few nods and yawns.

**DTE:** Can we get a bigger font it is really hard to read your letters are so small maybe not only for me. But when the diavik responds it should be in color so we know they got back to us. Sometimes they do not respond so we should see it sometimes we talk and talk and no response, so we want to make sure we can connect with each other. I bring everything home to her and talk about all the things I have said at this meeting.

**NT:** I like that idea, if we could color code the ones they are accepting, the ones they are still working on and the ones they have modified.

**CS:** Yes like a check or dash to make it obvious.

## LUNCH BREAK

### Presentation 3: Review of TKP discussions of processed kimberlite

**KA:** All of those little swirly things, that's how you get done into the kimberlite carat, I remember the last time we were here they said if you go worn there you can look up and see the sky, will we see that on our tour.

**CS:** You will be able to see down from the pit for use

**KA:** I'm just wondering how they mine that out with all those roads

**CS:** it's blocked by a block and not by the layers, they use lots of different rock to make it a paste so they can put it back and fill the voids

**KA:** Connected to 514?

**CE:** Yes

**KA:** So, if they put the pk slurry in, will they be putting it at the bottom?

**CE:** They are connected as you can see, it's the same access and then they split. The pipes are not connected but there are 2 tunnels that connects them so once. You can drive across to the 154. Once mining is done here, there are cement concrete barriers stopping the things from crossing.

**LZ:** Once the PK product and the water is being mixed in the underground chambers, I wonder what the water quality would be like. I just want to question that.

**CS:** I think that is one of the most important questions for everybody, including Diavik. There are two pieces to that; the PK material itself and what its properties and chemicals are and then there is the water. There is groundwater that comes into underground and then there is water on top of the PK material that will come in as well. Those all kind of interact together. It is an important question to understand what that looks like and what the result of those are. That is one of the biggest questions, for the work on defining what that water quality looks like and what that means for the lake. There would be a pipeline to move the PK into the underground. Similarly, that return water pipeline would bring back that processed recycled water. The AEMP, that is the whole lake monitoring that gets done. That will continue throughout operations and into closure. That is looking at the lake water quality, sediment water quality, the fish and the bugs in the water and they're health. There may be changes. The SMP monitors everything on site; samples PKC, north inlet water etc. We expect there would be additional stations added in the 418. One of the things that becomes an option if Diavik is allowed to put PK in the 418, is that the closure options for the PKC can change. We talked about that pond with the covered rock. The closure plan for the pit itself would remain the same. There would still be plans to cover that material with lake water. So we would pump lake water back into the open pit, leave it for a number of years to make sure everything is okay and then reconnect it back to LDG. This panel discussed doing a toxicological study to test the PK to see if it is toxic to organisms.

**BA:** My question is about the fish going deeper. There is a lot of time especially July during hot weather when the fish go deeper and I was wondering they also like to stay close to streams, which can be cold too but not in them because it's too cold, the light is constantly going down they can still be cold, eskers have a lot of cold water going into streams as well because of the permafrost nearby, it needs lots of time to settle the sediment before the fish can go down there, we need to keep a close eye on it.

**NT:** We have the rest of today and tomorrow. I am hearing you talk a lot about the fish, do we want to tackle this first? You asked for the toxicology study to make sure you feel comfortable with the Processed Kimberlite. I am glad that Diavik responded and carried out that study. We have some time here to talk about anything else you can think of, any information you need to make an informed decision before they move forward. Do you have any questions you would like answered?

**JH:** You were talking about the PK slime that will go in the mines underneath 418 and I remember at the last meeting we also talked about if it was a good idea to put it there and then later on fill it with water. And right now, Diavik has responded into doing more studies to see if that was safe? The other question we have is with that water, because water is weight, it will keep it down below, and now we got a little bit of information

back saying that the slimy little bugs like snails are 100% not going to survive because there are no nutrients in that. They will not survive, right?

**CE:** Sorry, I may have phrased that wrong. It is reduced survival but not 100% dead. It is just they had a small amount of mortality, so there were a couple of individuals that died in full concentration of the PK material.

**JH:** Because the mine is like a cone and it is going deep, deep, deep we do not have a lot of survival down there but around the edge of the mine site where there are some nutrients and it is shallow for other vegetation to grow and other species of fish need if the pressure of the water is heavy it will keep it down below. Louis was asking a question about the movement of the water would be turbulent, and for any growth to happen they need sunlight, but it will be too dark for anything. I guess we will have a better view when we go out there and look. Because we did go out there when there was no snow and stuff and it is pretty deep. Just to have the idea and thinking about it because on the survival in deep water and what fish we have in north and if the water depth will affect. We need to give the visual especially to the elders who are more visual people to get them to take a look at that to give them a better idea.

**NT:** Thanks Jolene. I think that is a very strong example of two-eyed seeing where you are bringing your scientific and traditional knowledge together. I am hearing a lot of curiosity about fish and maybe we should move directly to speaking about them now. I know there are a lot of fishers in this group. And maybe we can look at that question on how fish use deeper water? How deep do fish go? How deep do we have to worry about fish going? So, the pit is drawn there. Where do you think fish will live if we were to fill that back with water when fish start moving freely?

**WL:** Can you mark it off at 100ft intervals?

**CS:** Each of these is 200ft tall.

**WL:** So where would the PK come up from the bottom?

**CS:** It would depend if you are talking operations or closure. If you are just talking operational PK deposition, it comes up to the top of the underground.

**WL:** At the very end of the line how much water will be from the surface to the top of the PK on the ground?

**CE:** I would turn that question around and say what do you think it should be? Because there is no answer right now. Diavik would be looking at a range between 15 ft until 50ft but they do not know what that number is yet. So I think that is a question more for you guys in terms of what comfort you would have above that water level. There is no defined water level. It depends, if I look at this picture, this is 30 metres of water sitting on top of everything underground.

**WL:** How deep do you set nets?

**BA:** Depends. 20-25 feet depending on where the fish might be. We check by sending a hook to feel where the fish are mingling. Some days the fish are on top when it is colder and on warmer days you want to set your nets a little bit deeper to get the level of where the fish are at that time or month or season of the year. Anywhere from the surface level to 25ft.

**WL:** That is 25ft to the top of your net or the bottom of your net?

**WL:** so you have about 30 feet?

**BA:** On a cold day you do not set your net very deep so pretty close to ice level. Anywhere from 1 foot to how fast ice is forming at the bottom. Fish will be just below that ice level.

**WL:** Okay. Are you talking about the lake or the sea?

**BA:** Both.

**WL:** Because salt water acts different than fresh water, inland.

**BA:** All fish react to cold water. It has something to do with the pressure in the air.

**WL:** The deepest I have ever set my nets is 50-60 feet down on a very hot day, that is the deepest I've gone. The hotter it is, the deeper you have to go.

**BA:** I have not set nets in about twenty years not but it has gotten a lot warmer so we set it much deeper, the temperature in the water has risen and it makes a big difference.

**WL:** My opinion is if you leave at least 100 feet for water on top of it that would be plenty for fish.

**DTE:** So, when they fill up the pit- In one of my meetings at home, they said they will fix the cut areas along the pit, they said they were going to fill it all the way up with water then they are going to open it up so it can be connected to the LDG, that's what I heard. But I do not know if anything is ever going to live here. I do not think any type of fish will live that far because there is nothing there for them to eat. They are going to fill it up, that is what I heard. I have never missed a meeting. On a hot day in my community, you have to go to deeper water to get fish and in the fall and when it is cool the fish move up, and

your nets do not have to be far I go with my brother, right now under the ice it is only like one foot, it was very shallow and lots of fish and trout but very shallow, but here I do not think they will go there.

**WL:** I am talking about 100ft from the top, I don't think they will go any deeper so that stuff can go in and I don't think it will hurt anything.

**DTE:** I know there is no food there for them. Unless we go 20-30 years from now, just like caribou; where is all their food? They are gone for a while but then they are going to come back. Maybe this would happen because when they move this pit up, water is going to move around and the food will move because everything moves in the lake nothing stays in one place. But I do not think anything will grow, that is what I am trying to say.

**NT:** What you heard was right, when Diavik came into your communities and said they are going to fill this up with water, you were right, that is what the plan was and still is, they are coming to ask for your advice, expertise and guidance on adding this slime and PK. One way we can deal with it is potentially putting the PK into the pits. Right now it's just a discussion, Diavik coming to these experts early to ask for guidance and input. You heard right, they want to brainstorm this with you. The second thing that I'm hearing is that fish do not go more than 100ft and that things will not grow 400ft down.

**BA:** We are trying to feed the fish around that pit, we are creating shallow spots around that pit. When we think about not having any nutrients and no fish habitat down there right now it might be short term. Once the winds bring the plants back to the area the fish will eventually be able to come back as long as the plants can grow for them to eat, the water movement will fill it up with sediment in the bottom and if we did out PKC in the bottom, maybe in the future, the wind and nature will bring nutrients to the lake, if we are going to fill it up it will end up like a river bottom all of it from the lands, streams and lakes will bring nutrients.

**NH:** Those pits are so huge and man-made when you fill them up with the water again do you know if it will settle or would it constantly move from the roads constantly moving like a water pool?

**CS:** The way that the dyke will remain it is expected that the water will be quite still in this area because of a big portion of the dyke will remain. In LDG there is a lot of water movement because there are big winds that move the water so there will be a lot of surface water waves, this area is quite sheltered and protected because these are essentially breaks to stop that momentum of the water moving in. That was one of the reasons of what would be the purpose of one of those shallow areas will be good for resting and feeding in that area because that is quite protected, once it is full and once everything is even with the lake it will stay at that settled water.



- KA:** Does Diavik know how many cubic meters is that carrot, to the top where the PKC would end? Do they know how many metres of PKC can fit into that carrot and where it would end? Because only need 100 feet through all the tunneling that it's that area how much will fit? I think any fish in their right mind, if they went any further would say wait a minute I cannot breathe, get me out of here. It would be too dark, the light source would maybe go down 100 metres before it gets really dark into that carrot. So maybe just to give us a vision of how much PKC is out there that can fit into that ad what is going to be left over and where it is going to go?
- CE:** The space of the void- how much can be filled and an estimate of what will fit, the operational PK material would be going in first and then anything that is in the PKC. I could get you the void, the operational number but I do not yet have the closure number.
- KA:** The operational number is coming out of A21.
- CE:** And A514
- KA:** So those two are going to start filling 418, so how much in the operational? What is left for cubic metres? And what is left in the PKC pond? If this carrot gets filled to the top and they leave 100 metres for fish to swim in and there is still PKC left, would they put it into 154?
- CS:** That could happen if it was going well and if there was more material. Primarily, they are trying for 418 and they think everything will be able to fit in 418 but the option to go into 154 or even A21 which does not have the underground but it has pit, would be something DDMI would consider.
- WL:** There is an easy way to find the depth of that water. And that is to get a depth finder, get one of those college kids to go out with boats and find out exactly what the depth is around this whole lake, even do half of it.
- NT:** Or for how deep the fish go, my guess is that there have been a lot of scientific studies so Diavik has a pretty good idea, assuming how deep fish go in LDG.
- WL:** If you take the deepest point and maybe chop a bit off and compare it to the depth of the hole, send some kids out there jigging trying to get some fish.
- LZ:** Once the water goes into the open pit, half of the water will not be able to move, the small bugs in the water and if there is no fish food down there, how will it feed itself? If there is wind, the water would move on top of the open pit and then if there is no fish food in the water then the fish won't go deep in the water even if there is fish half way down into the pit the water won't move. In the past when we set nets on the shore we would sit in the shallow water and catch. Then when it gets warm we have to set our nets

deeper, after august the fish come back into shallower areas. I just want to share that with you. Thank you.

**BREAK OUT GROUP MENS:**

**NT:** Before we took a break, Wayne had said he didn't think the fish would be going deeper than 100 feet. I do not know if that changes the way you feel about processed kimberlite being in the pit or not in the pit.

**WL:** I still think that before this thing is complete, the height that they are going to in that column there, they should grid the lake and use a depth finder to map the lake and get a lot more information on it.

**NT:** Map where the fish go in the lake you mean?

**WL:** The thing is the lake should be graded out and some young people should get out there with a fish finder and go back and forth on a boat every day monitoring the depth of the lake. They will find the fish if the fish are there and then we would know how deep the fish are going down and being found. Grid the lake.

**NT:** Do you mean LDG?

**WL:** No. The lake, the areas closest to where the mine is the most important. You do not have to do the whole lake. Just a section here and there.

**NT:** If that became a recommendation and Diavik said the deepest was 100 feet. How would you use that information?

**WL:** If they know the depth of the lake, then why not just put the pit water at that depth and then there will not be any argument about whether it is too shallow or not.

**NT:** Are you wanting to know the depth or just the depth of where fish go to?

**WL:** It does not really matter where fish go because they are moving all the time. You just need to know how deep they are in this are so you know how deep to fill your carrot.

**NT:** If that is a recommendation and the results come back and they say fish do not go any deeper than 100ft, then would you be ok with filling the pit to 100 ft. below the surface?

**WL:** I do not see why not.

**NT:** Would you feel comfortable filling this 318 meters in with processed kimberlite up to the point where fish do not go any deeper?

**WL:** I'm okay with it, how do you feel?

**LZ:** I am not too familiar with processed kimberlite. I prefer to see some sand because maybe sand is better ingredients for the fish to feed on. Even some pebbles. Fish would even eat them sometimes. Talking about the depth of the water, it is not the current, there is no river going through it. So how will water circulate underneath? Maybe the water would not be able to move, it will just stay there. That is the only concern I have.

**BA:** PKC, if we could somehow spread a little to each pit, maybe the ones that are underground could receive a little more and add sediment just above PKC somehow, will it hold sediment on top? Can you mix it? When I think of all the nutrients on the bottom of the lake, that we want the light stuff and light vegetation it would maybe stay on top. And if we use something like a screen on top of the PCK it would maybe harden up a little bit to help keep the sediments from sinking below the PKC. Maybe the screen would keep the sediments on top of the PKC. I don't know what kind of material you would use to put there, maybe that could be an option, it is going to be really quiet and there is no movement. We might end up with fissures from the pressure because the water is not moving, it would be good to keep the sediments down there somehow. Nancy was hinting that if you breach it a little deeper maybe it would keep the water from circulating. Depends on the wind. If the wind comes from the one side, that water will circulate around the outside of that pit and maybe it would go all the way down like a sink. Depending on which side of the pit maybe that would help bring a little more movement.

**WL:** Which one are we talking about?

**NT:** 418. The real question becomes when they are mining from A21, it has to go somewhere. They said no to trucking off site and now they are thinking about putting the sediment on the land, the processed kimberlite going into the pit. So at the end of the day, are you comfortable putting it into the pit depending on how it might affect fish?

**WL:** There was a mention earlier that they stock piled the bottom of the lake, why can't the material be returned to the pit after the PK is put on?

**NT:** This is really challenging stuff, no matter what you put on top, it sinks to the bottom. It is like toothpaste, so slowly the things sink in. And Bobby's suggestion to net is great but it would just sink down as well into the PK. Whatever they put on top of this is just going to filter down. Unless they discover an engineering plan this is what would happen.

**WL:** Will anything grow on that? It might just end up being a dead lake and just fill it up with water and slope it so the caribou can cross safely and make it safe.

**LZ:** Yes. I would think that maybe what I want to do is try to collect some pebbles along the shore and some sands from the lake bottom and put them along the bottom of the lake. I understand that they still have the lake bottoms preserved. I noticed that the lake bottom has things that I'm concerned about, how the fish are going to survive without a proper food source. It is hard when it is something we have not done before we do not know if it is going to work.

**NT:** When we think about the different kinds of fish that live in LDG, are there some that go deeper than others? You guys are the fish experts, not me.

**BA:** Most fish go really deep even lake trout can go very deep, sometimes 100's of feet deep. I have caught them along the shore. I use a little motor so my line will not break and 20lb test so I follow the fish and it took my line straight down and it took almost all my line straight down. My fishing line was more than 300 yards and It went straight down. The line went four circles around until it stopped. I use a big reel it stayed there for maybe 15 or 20 minutes without moving and when I tugged on it a little it started coming up slowly and back up to the surface slowly and then took out back to the shore. I couldn't get him, it took over an hour. When I did get him close I grabbed him, he was so big my whole family had to come help. This was lake trout. It was an enormous 59 inches wide / 37 inches long my daughters fish. Ling cod go very deep as well, right near the bottom. I am not sure if they are here in LGD, they are cousins with ocean fish and ocean fish like it very deep.

**NT:** What do you young guys think?

**WL:** A trout a Great Bear Lake was a trophy, this is a little lake, it is not Great Slave or Great Bear: we are looking at a puddle here. It is very small, I do not know if fish would be down at 900ft. I feel that 100ft is plenty for the fish that live here, what do you say Louis?

**LZ:** Yes. there are so many great stories about fishing, the main concern is how deep they are in an inland lake. The fish in the summer time, when there is no ice, they hang around the shallow parts until the ice is gone. If it is too deep, they can't swim deep they get crushed by the water. They need oxygen and there is the weight of the water. I think the fish get nutrients from the inland lake with the wind and debris. The rivers bring things and feed into the lake so I guess that contribution can go a long way.

**WL:** We come up with some pretty good stuff here but what we really have to know is what weight will it hold? Can it sustain life or would it sink out of site like a rock? I think more testing should be done on this PK before we can come to any final decision, what do you think?

- BA:** When we think about fish, we talk a lot about fish up north or where we are from. You find some small lakes where you catch fish. How do they get in there? Because of streams, the springs and snow accumulation. I have caught big fish in small lakes. Everywhere I go I dig a fish hole, and I camp overnight. I dig a hole and always find fish and even in our small lakes, I always find fish you dig a hole that is part of our culture, all people come to do this as well, every Native will dig a hole to look for fish. In the fall, we walk a lot and hunt alone. Finding places to fish and when we do find fish we use inukshuks. We use boulders just like gun sites but we pile them on a hill and line it up and there are always fish. Inukshuks are used in many different ways up north, might even be a site where a person was buried in the past, bigger ones are welcoming, to mark great hunting grounds. You can use this to find fish. You can find a camp, you can find burial places, and they point us in the right direction. When we bury caribou underground, we immediately put inukshuks beside it.
- NT:** One of the questions diavik is interested in getting your opinion on is if the pit is filled back with processed kimberlite, do you still want to see those reefs coming back. A couple sessions ago, our topic was to look at fish habitat and we looked at a couple places we could use for spawning, rearing and nursing would look like.
- WL:** This stuff is not poison and if it turns out it can sustain life I do not see why it a couple little holes make a difference. They have the whole lake who will care about a couple little holes? I would like to see them focused on filled these holes up to make it safe for the animals. I do not think we should be overly concerned with these holes in the ground. I could be wrong.
- LZ:** Last time we visited, we did check on the place where the saved the lake sediment and soil were left for replantation. I think they store it somewhere over here, they stock pile it. They told us this is where they took lake bottom. True reclamation means we use it to replant the lake bottom, but I do not know if the movement on the landscape is going to work for replantation. We saw one area where the lake has a hill, they have a mountain shaped like a ladder; it is a natural formation. My father told me the beaver made the ladder out of the lake so this is where you go to the opiunt lake area, there are a lot of areas are traditional ways to mark how you would survive while you were out there, we went to the lake by canvas canoe. And the only way we got there was lake and we didn't have any caribou so it was just by fishing and sometimes we came across birds, a little history of the land scape. Thank you.
- WL:** These holes that are going to be filled if this is not going to be used for spawning they spawn in shallow water, they do not go to 100 ft of water.
- NT:** If you put the processed kimberlite back into the pit, do you want to encourage the fish habitat here or not?

- WL:** Was there spawning before these holes came?
- NT:** I know that studies were done and the law is that if you take one away you have to put it back so you have to make sure you create habitat if you take away habitat.
- WL:** The outside portion could be fish habitat and these could be dead. As long as the caribou can get in and out, we don't have enough information on that PK. Because what happens if we cannot grow anything there, it is going to be dead water. Drill some holes here and there just to stay within the law.
- NT:** So what I'm hearing is it does not matter, you can keep doing this fish habitat and not worry about the PK and the fish.
- BA:** I like that, just keep the habitat and not worry about the pits, maybe it will have fish and grow from there if you clean it until the depth of 100ft, maybe you can keep all that heavy metal; keep it clean the fish might want to use it so I'm not sure. If you take out that slurry and PKC it might work. Keep all that habitat going. Even with the PKC you can keep that habitat in there.
- NT:** Wayne's point is that it has to be tested before we can come to any solid decisions. Just to be clear what has to be tested? We want to know what will grow in it?
- WL:** I'd like to see it tested to see if it could be mixed with something to help it bear weight. If it won't and there won't be any growth then just breach the dyke, fill it up with water and call it a day, go home I guess. There has to be more testing done on that PK I don't feel like I can make a proper decision here.
- NT:** This is always the challenge when we are making decisions about the land. We do not always have the perfect information. We make the best decisions we can with the information we have. I know we have the time tomorrow to really dive into this deeper. And honestly sometimes we have to choose a or b, here's this Processed kimberlite, is it better to put it in the holes, or leave it on the land? I do not know.
- LZ:** Filling it back up it is not only here that it has to be done, but even other mines might use these ideas so they might have an idea on how they are filling up the pits. Maybe we can ask them as well, we can learn from them. We need to learn from one another.
- NT:** Diavik will not invest anymore money before your panel makes some decisions; they want to know what you want to see. If it is a hard no then they have to go look for other solutions. We are here today to see how people feel about this idea.
- WL:** What is the time frame on this?
- NT:** Over the break you can think about how you might want to present the points.

## BREAK

**NT:** Do you want to share what we talked about with everybody?

**KA:** We do not know a lot about this PK yet. We would need a lot more testing before we can make a valid decision on whether it be inside the pit or leave it on the ground. We also talked about some fish would go below 100 ft deep below the water so we did not know how much PK to put inside the pits. We also talked about how we need to research if anything can grow in the PK or under water, and stay above the PK or if it would sink.

**NT:** There was one question about how the water stay healthy if it is not moving? Putting PK in would fill in the deep pit, would the water might otherwise stay stagnant.

**KA:** There was a suggestion that we put a barrier or a screen to help things grow on top rather than sink. We could pack the PK with something else so we could increase the weight.

**NT:** Maybe just the weight of the water would keep the PK from mixing too much. In the tk panel 8, we talked about building special habitats for fish to spawn and rest. If we put the PK back in the pits would we want those reefs in that area? The final answer was yes. We want to stick with those recommendations around fish habitat. "Why not?" was one of the comments.

## Women's

We did not take notes or anything we just chatted, figuring out what was best for us. We just wrote it down on a napkin. In the pit we should put the PK in and then the PKC after. Then there were thoughts about how deep things were and nothing grows. We thought about the tailing ponds and the caribou try to eat the minerals. We should remove it and then just fill it up. In the spring or the fall, the plants would grow. We can open it up for the water to come in. If it is windy the dust will move around in the lake. We need to test for the bugs that appear on top. We cannot say it is calm or shallow and with climate change we see wind getting trapped sometimes this might happen. Sometimes we get wind bound for days out in the lake. When I went hunting we had to stay on land for 3 days before we went back to our camp. And how wide would we have to open the dyke to get water moving. How long is the life of the mine, I asked and they said 2024-2025. I asked, when they will do their fish tasting and they said 2018 in august. Madeline Drybones will go and we will ask her and she will judge the fish, the color and the taste. It is good for the community too. Younger members should take back the knowledge to

the community, we have mercury in our water so we cannot eat the big fish anymore we can only eat the small ones. So we need to keep track of what is happening. We learn from each other. That is how our community works. If we do not say anything and just sit back we will never know how you feel. That is why I do not stop talking, even at home.

**JB:** So we had quite a few concerns expressed mainly by people who had not attended sessions in the past and it took awhile to hear about the concerns and the frustrations. What happened in previous sessions, like burying materials and equipment in the NCRP and we discussed the uncertainty around whether there was an actual proposal to put the pkc in the pits. It took us awhile but people started to feel more comfortable with the idea and to explain that there is limited options. The slimes and the PKC cannot be moved off site and KA was very good at explaining the history of the discussion to date. JH was good at explaining the relation between science and traditional knowledge and elders sharing their own knowledge to help the future process.

**NT:** Great work today, it is a lot information on the first day and coming up with some great thoughts and being curious about moving forward and in a creative way. We will wrap up here at 4:30.

END



## **Traditional Knowledge Panel Session #11: Saturday, May 12<sup>th</sup> 2018**

### Opening Remarks

- CE:** We still do not have the PKC slime number. If they were to pull the PKC slime out, they don't have that number yet and they need to figure out how much they will get out. Because they do not know what that would look like yet. I have the volumes for the operational PK. So, what they would do from 2022 until the end of the mine life as well as the void. This is the underground piece, the bottom of the carrot and that is 7.5 million cubic meters of space. There is that much space to fill in the underground. The operational amount of PK is 5.2 million cubic meters. So, this almost fills the underground completely. Then, if you take from the top of the underground or bottom of the pit up to the level of the water, that whole volume is 25 million cubic meters.
- KA:** We have got a total of 7.5 million cubic meters in the carrot that it can hold? And coming out the operational slurry is going to fill it to 5 million cubic meters so 2.5 million cubic meters left. If operational slurry is going to fill that up, what is in the pit has got to be more than 7.5 million cubic meters. Would they then keep the slurry and put it in 154 at closure? Because obviously operational slurry is going to fill that carrot. It is also going down into the tunnels.
- CE:** It fills the carrot but it will not fill the pit. So you would almost fill that with the operations and then you would go into the pit. The question about that water cap and how much you want to have on top of it, is the key question. We did speak of Ekati and they currently allow a 30 metre water cap on that but they did that math back in 1996, and when they recently went over the water survey they are thinking of making it so they can add more slurry and lessen the water.
- KA:** Well, being inland they do not have to worry about the fish being in it. I'm thinking that with the 5 million cubic meters of operational slurry going in and then just filling to the base and topping with water because it would be enough then if there was any water movement, that slurry is going to stay where it is. Look at the jar, see how it settles and sits, so now it is a question of where we put the remaining operational slurry sitting in the PKC and operational is 154 and A21?
- CE:** Yes. And the challenge is that 154 is the only one that will take it to the end of the mine life. It will be the last thing that will be mined so you cannot fill it while they are still mining.
- KA:** Can they adjust their plan to have that in the closure to have that as the last step to get the PK into a place where it is not staying on the land and making it detrimental to animals?

**CE:** I guess the question on that is timing and if we need to get all of that PK out of the PKC and when to start that? That is the bigger question.

**KA:** Well perhaps they can start thinking about that because we always said if you came here and brought it then do something with it before you leave.

**CE:** Peter is waving at us to slow down.

**KA:** Because there is going to be some left at the end and we are trying to stay away from filling that pit with rocks but we may have to depending on what is remaining. It might be something that can be left and maybe to keep the animals away from it. Maybe we could get that slurry out of there totally, from the South Country Rock Pile over the PK and over to the north country we would leave a really nice path for the caribou, so we could probably still do it if we had to leave it there with big boulders around it because some people I don't think got to see that tour where we went from one side to the other. We saw that nice slope they put in so maybe on another tour we could see it again, that was one of those plans we thought would be best for the caribou.

**NT:** *Presentation: Processed Kimberlite Backgrounder (Appendix E)*

**NT:** How are people feeling about our option?

**NA:** It might be easier for this PK to be put in the carrot, try to get as much as possible so it could be less harmful on the land.

**KA:** When we were talking yesterday, were we talking about a 100 ft or 100 m?

**NT:** The idea was not that fish do not go deeper than 100 feet so that would be a safe level. In other words, to leave this top part 100 feet (30 m) of water.

**KA:** Okay, I think that is a good idea not to bring that slurry above the floor of the pit. So that we keep the water on the top of the ice cream cone and the slurry in the "carrot" so that there is no water disturbance. I do not think that it will ever mix, but just in case.

**NT:** I think if Diavik were to take the PK that is in the PKC and try to move that into the pit, it would bring it up above the ice cream cone.

**KA:** Because we do not have numbers, we do not know how far up the ice cream cone it is going to go. Would it still leave approximately a 100 feet gap for water?

**NT:** If we are looking at this diagram, this looks like the ice cream (underground) is at about 300 maybe 200 something, so if this is 418 half way would be where?

You see what I am saying, the way we have it looks like the cone is 300 and the ice cream is 100. But if I look here, it looks half and half. 200, 200.

**KA:** We might not want to go too far beyond the ice-cream cone part. As long we still have that 100 feet, say we had 100 feet right to here as long as we can take all the slurry from operation and the PKC pit, then it is looking good. With a 100 feet cap then we are looking good. Look at the jar look how much it settled because it has weight to it there is some kind of weight to it so the water pressure there I cannot see it moving. It would have to be a tornado not a big wind.

**NT:** It really comes down to feeling comfortable with the cone up until you have at least 100feet. How does everyone else feel if we were to put this forward as a recommendation?

**DTE:** Is it only us that are planning on this or do we take this home to our community to get advice from our community members? For me the PK and the PKC is like a tailings pond and I see caribou going near the base and lick the ground for salt and maybe it is not healthy for the caribou. My other thought is: are we going to fill the cone and then what is going to happen next? Is it going to go where they are doing the underground mining too because of climate change? I have to take this home to my community members before I say anything. I have to think about the water. My brother works underground and I ask a lot of questions when he comes home. I cannot make a decision right now. Anything in the water in my community when it is windy, moves around, in the spring everything moves around. We see it. There are a lot of creeks and rivers that come into LDG. My head is spinning to see what the better way of doing things is but I have to bring it home first before I move forward. It is only for the health of the animals, fish, plants, people. It is hard for me to say I can agree because I cannot. I only have one voice here and I have a lot of voices of elders and young people and I have to ask what they think before I say anything. Masi cho for listening to me.

**NT:** Thank you for sharing those points. I think the TK panel is one of several community engagement pieces so this is not the only place for consultation. Diavik is required to visit all the communities, meet with chiefs and it is very formalized. The TK panel has always operated as a group of elders and youth providing their expertise. Not necessarily them representing their community. It is not a political place. A place of knowledge and wisdom that comes forward. In the same way that Diavik pays to have all of these engineering reports, there is support for the TK Panel.

**DTE:** We have TK knowledge and people who come here from my community. When they go home, they never tell us what they talked about. It is not my fault and that is the reason I am asking questions. When I go home, my community will know what I came here for. You have to update them. That is one reason I am asking questions. I have been to so many mine meeting and I can ask the same questions over and over again which is good for us and good for whatever we will be doing.

- BA:** In our group yesterday, we were talking about pulling the plug in a sink. If the decision ever got to the point where the PKC ever went into the carrot, the sand would be way below the pit because once you breach the water winds are coming from all directions and once that breach is coming from one direction and when they breach that wind it is going to make the slimes move as well. That is what I am thinking. I am having a hard time with that, the wind is going to cause the pit to swirl around. If you breach the walls, it is the wind will swirl around. Maybe with how many breaches will start breaching the walls. I think yeah, it is going to cause the wind and the water to swirl, I am concerned about the slimes being moved around from the bottom. The winds are so strong nowadays.
- JB:** If there is a concern about where the winds are coming from is there any opportunity for the Panel to recommend where the breaches should be placed? What drives that now?
- CE:** Unfortunately, there are navigation permits so the NWT has requirements around lines of site and those are set from a permit back in 1999. There is not an opportunity to change those. In the 418, there are 4 cuts in the dyke.
- KA:** Is there anyone that could speak to us about how water would react to wind in a contained area? We have those walls all the way around both of those, so the water levels are going to be up near the top, I know in big lakes there is a lot of surface area but in this contained area it is really small when you think of it but it is big for us so wind is going to hit the walls and try to squeeze into that small breach. I don't think it will churn 20 feet down I just don't think it will swirl, if you look where the breaches are there are two on the north side and two on the south side. Then one on the north side and then west is all rock so I just cannot see it swirling there is no force on the bottom making it swirl. If someone can speak to us about wind and how it affects water movement, maybe that could help.
- NT:** Science calls that fetch. The fetch is the freedom of the wind being blown across the water, but the fetch within this area would be very small because these are break waters. For example, where I live we have the ferries, there is a massive break water wall built straight out into the ocean so that it is safe for the ferries to dock as this is an unpredictable weather environment. All around the world people build break waters so boats can come in and out safely.
- DTE:** I know we have the deepest water on Great Slave. I lost an uncle on the lake and when it is windy and you have to travel and you don't speak because it is a spiritual place. When the wind picks up on the side it is like a fork where the water just moves roughly. It has bigger waves. You do have the break water so when it is windy in Great Slave Lake the wind just goes over it over it on both side. You have to remember climate change is different. Snow used to be hard, it is powder now. Wind is different on the lake. I can

stay on the lake longer. We can be wind bound for weeks. Not only in my community, there are floods, everything has changed. Even though we try to protect the PK, it is still going to move unless we put it down and watch it for a few years to see what happens. Do not rush into it. Masi cho.

**NT:** Colleen said the dykes here are 18 feet above the top of the lake.

**JB:** I am thinking that we may want to have a clearer understanding of the prevailing winds to understand what the impact of wind might be and if that is something the Panel would want to know more so we might be able to predict the water disturbance within those pit areas.

**BA:** Think about if you remove the freezers on the dyke, it will get soft again and melt again. The freezers are right around. Once you move everything, they are not going to be around anymore.

**CE:** We did not point them out that, obviously, there are only 5 freezers on the dyke and only when they come in contact with the island. Outside of that, the dyke has a solid concrete wall down the middle of it so it has rock on the outside. So, you have regular seismic activity inside this dyke, the design of the dykes had to be very solid so the outside of the dyke has the larger boulder material then it goes into a finer grade, so say 10 cm or 8 inches and then it goes down to a really fine crush and goes in this area. Then they remove that crush and they back fill it so there is a meter wide that where it meets bedrock because they have moved onto the bedrock, where there are cracks and fissures on the bedrock so there is a seal and grout throughout those cracks. It is a very solid, stable structure and wall. The thermosiphons are only used from an operational perspective to maintain safety and make sure that the ground where there is an island would have more variability in the temperature of the ground. When they are working behind that, they want to make sure that just maintains a frozen core so there is no seepage going into the dyke. That is the reason for the thermosiphon. The distance from the top of the lake to the top of the dyke is 18 feet.

**DW:** While we are here our elders and forefathers talk about these things and they used to come visit the meetings here. We have four chiefs within our region and all our documents go to our leaders. Are they having a meeting according to the agenda? They are our leaders and all these recommendations we put forth we see these things and we do not make decisions at this point in time because the size of the LDG. I think about how the wind moves all over the place and all and how we discuss it and it will be circulated to our leaders because it is on our land.

**NT:** We are naturally coming to a place where you need some answers to make better informed decisions and one of the questions that we wanted to explore while we are here is what are the sorts of things you need answered that will make you more comfortable

about putting the PKC in the pit? How will the wind react within a contained area? What are the prevailing winds in the pits of LDG? Ones that came up yesterday were mainly about fish and how deep the fish would go, are there any other questions you need answered to make you feel more comfortable?

**WL:** I have flown around the Northwest Territories and Nunavut on staking jobs and sometimes in the chopper it is very windy so you look down into ponds of water and you cannot really tell exactly where the wind is coming from but if you look down into the water in a round pond and you will see that the water closest to the edge is clear as glass. But after you get so far from the shore, the wind ripples the water. This is very windy times and I always watch the water to see where the calm place is and you can see how hard and which direction the wind goes. This is on flat land I am talking about. Here we are in hillier country. You have an 18 feet high wall there, the dyke goes around these pits. If you get wind coming in, it might not hit the water inside the pit, it might just go on top of it. But with a dyke like that, it is so high I doubt there would be water disturbance. The higher the hill or slope, the wind will follow it and go up and over. I cannot see that there would be a lot of surface movements. Even though there are notches, they are very small. There is not a great concern about wind because of the height of the walls.

**JB:** Any other questions or comments? Any other questions we want answered before we make recommendations?

**LZ:** My friend Wayne is talking about the dyke, by the open pit, if you have a little opening the water will circulate through the openings, plus the dam is not going to move so as the wind picks up, the water would flow back and forth through the opening. I believe he is correct in what he is saying and the PKC being put back in the underground the cone section, it would be good if we do not use the slurry right now, maybe they are using chemical, in the past. When Pierre was meeting with us he was talking about testing of the slurry and he was correct in saying that so I just remembered and wanted to share.

**JB:** His recommendation about the slime being tested was followed, it was a good recommendation, and we know have the answers to his questions.

**CSB:** If were to fill it with the slurry and water, if there is water disturbance and the water is always moving, would it mix with LDG water moving back and forth will it affect it in the long run? What then will happen? Because water is not still it is always moving and that is my question. Will it affect all LDG, there might be 100 meters on top but still it will find its way out somehow, it always does.

**JB:** I want to check with the young people too if you have any questions you need answered before we make recommendations. Feel free anytime you have questions or comments,

sometimes young people come up with the best questions. Any further discussion at this point?

**JH:** You are saying that once the carrot and the mine of the pit being filled with PKC and the slurry part and then being filled with water. And then we are suggesting that there will be some monitoring happening to see how it settles. And then we were talking about volumes of water earlier, it is like 7.5 million cubic meters just for the carrot and then the top part was 25 million cubic meters. By picturing that, if we take the weight of the water it would put pressure on the PKC on the bottom. So, we know from the science part, anything in water can also put pressure and fossilize other stuff. I was wondering if you come back with an answer to see the weight of the water, the 30 meters to find out the weight of it and how it would compact the pressure of the PKC into the carrot. Because water is heavy, when you go down to a depth of water, there is only so far we could go and then we could not handle the pressure because of our lungs. When you look at fish that swim in deep water it is because their lungs can handle so much. I remember when we were doing fish camps back in lake area, the elders knew where fish go because of where the water goes. I was thinking of getting a visual idea to understand the weight. The movement of water down below could be different from the surface. It gets darker down below and there is not enough sunlight so it will reduce growth as well. Just want to find out some numbers.

**NT:** It is exciting to see these two ways of knowing, coming together, I think we are getting a good list here. So far, we have: What are the prevailing winds in the pit areas and LDG? How will wind react within a contained area? Do research to see if anything grows under water with the PK. How will water stay healthy if it does not move at the depth?

We do not know how it would react with water and fish, better to have sand or gravel at the bottom of the pit. We know that on land we cannot put anything on the PK without it sinking but is it the same case underwater? How deep does light go? How deep will things go? Could we pack the PK to increase the weight? Would suspended PK eventually mix with water in LDG? How will climate change affect PK in the pits? We have some time to look into monitoring and watching to see what you guys want to see before PK goes into the pit. One suggestion so far is to monitor how the PK will settle. One that came up yesterday was what about PK in 154 instead of 418? Rather than putting all the PK in just one pit, spread it out between pits. Is that right?

**KA:** It was to take the PK slurry to the top of 418 and then the remainder can go into 154. But there is a timing problem, because 154 is still in operation, the closing of the mine, so those are clashing. My question is can they make extra time at closing to put the remainder of the slurry into 154 at the end?

- WL:** Maybe we could find out exactly what kind of fish inhabit this lake. Exactly what are we dealing with?
- NT:** That question and the question about wind, we can break out into a couple groups with some maps to see if there is something, in terms of prevailing winds and the kinds of fish that are in LDG and how they behave. Do we feel like we have a good feel on what makes us feel comfortable for more information needed?
- RM:** If this thing happened elsewhere in the world, is it healthy for the people, plants, animals and the lake?
- NT:** I think that is exactly the question everyone is wondering. It has happened elsewhere in the world where they have put the processed kimberlite back in the ground. But it has not happened like at Diavik in the situation where it is in the lake.
- JB:** There is no other mine that has been constructed on an island like we have over here. That makes it harder to compare other experiences, even Ekati is not on a lake it is on the mainland so it is not going to be the same.
- NT:** In that case, it just becomes an inland lake surrounded by land. Whereas here, it is a lake surrounded by a lake; a lake within a lake.

**END**



## Traditional Knowledge Panel Session #11, Sunday, May 13<sup>th</sup> 2018

### Opening Remarks

**JB:** One thing some communities do on Mother's Day they really treat the women good, and they serve them, they bring them food, water, coffee, tea, it is in recognition of how much we appreciate our mothers. So, if we could just remember how important our mothers are to all of us so we could take the time to honour these women. Today we thought we would start with a sharing circle, go around the room and share what they have been thinking about and feeling the last couple days, if you want to talk about the tours that is fine and if you want to talk about whether or not things have changed in your mind with the discussions we have been having about the PK, if there are things as you saw during tours that make you go either way in your thinking, that is okay.

**NK:** When we went underground yesterday I saw a really big hole, and then we only went to a couple of them and there are so many in those two pits and they are really huge, we saw so much water pumping out every day and it made me think again if they put the slime in the underground mines, there is so much water being taken out every day from the tunnels, and we are thinking about putting slime into there and if they quit pumping water out I feel like slime is going up and in the pits. Maybe if they put the slime up where there are no tunnels that might be better.

**BA:** When we went to the process plant, I saw a lot of conveyor belts being used for how they split it into fine material and how they take the diamonds out, I do not have a lot to say about that. What I saw is it is really dusty, all the time I have been coming up here I never woke up with a plugged nose and now I have the sniffles from the air on the process plant. It got me thinking that the people in there should be wearing masks because they are breathing all that dust in there. If I was in there working, I would be wearing a mask because you have no idea what kind of metals and soot are in there from the process. With all the PKC that I saw being processed, there were big plates in there and we got to feel the PK. When you ground the PK it is soft for a few seconds and as you move it around in your hands it breaks down further, I do not know about putting it into the pits- maybe somehow from being warm here black stone makes heat and keeps the heat and in the pit it is cold but I don't think it will solidify again and when you put the water there will be so much pressure and when they put the water see they are putting out in the future, there is always seismic activity, maybe the grout will become loose again with the water I see it reaching out into the fissures, maybe they will not see this and some of them might not be grouted well and the pressure might cause leaking and depending on which fissures are open like the ones you find going to the ocean, once you take out all the freezers in there it is going to soften up the bottom- what is that content on? Is it loose? Is it soft? Once you take those freezers out and it warms up again, the bottom of the cement wall will be really solid and last for a long time but because of that seismic

activity we feel up here if those walls cut loose against the walls will come open and even though the water on top will be clean and the material on the bottom will not be.

- WL:** I was going to talk about the process plant but BA covered it. The couple things he did not mention that really did surprise me, it was not as dusty as I expected and compared to the other mines I have visited, we didn't get masks, but after we were walking around we did not really need them all of the air coming through the crush rock was wet and we didn't need a dust mask or anything. Metal mines are very different than diamond mines, I really appreciated the tour, it was interesting to see.
- KA:** I had the opportunity to go underground yesterday and I was very impressed, I was terrified in the beginning but gathered up my courage and went and I am glad I did. We learned a lot when we went down there and the one thing I noticed was those tunnels are wide enough to get a truck through and wide enough for two of those little vehicles that transport people to pass but those walls are solid there is no crumbling involved in there except for the few areas where there is some water seepage. When they come to an area that has the water seepage they have a grouting machine and they force grout through those holes that goes into the hole that sets and structures the hole, they are sealing a hole. So that crack that Colleen is drawing, there is no water that come through. The operation down there you will not see many people. We went down and we came to this and there is a little portal and he took us from the bottom of 418 where there is this arched opening where you can see to the bottom of the ice cream cone. It was a little chilly but very dry. We got to look at kimberlite and garnets so we continued along and we ended up at a water collection pond, the water was crystal clear and no weird smell at all. They explained to us that all of the water seepage is pumped up and goes out to the north spout for about 60 meters and it goes to the north inlet treatment plant and they do a lot of testing. It was a nice eye opener because we often wondered about the water in the mine. The next thing we knew we came out at the middle of 514 it was a really good tour and I don't think we fear anything seeping because those rocks are so solid.
- KE:** Sorry I was sick, what I am hearing is very interesting. I am not sure what to say, I didn't see anything out of the ordinary. I was here before and nothing has really changes that much as I see. I do not have much to say about that, I will keep listening here.
- RA:** This is my first time coming to a meeting like this. I haven't said much because I didn't know what was going on. But to go to the process plant, the guy gave us a lot of information, a lot of walking and stairs; that I did not like, good for young people but not for older people. I feel they are doing a really good job, they complain about it but I will tell them back home. They say that they are going to so that if it is safe for the other pits and if it is good for the animals it is good for the people. I agree.

**MB:** At first I wanted to check out the underground then I changed my mind, because I got an email to do training for process plants so I went to check it out to get information on what they were doing. It was nice to see the machinery just seeing that the diamonds are in there just moving up the ramp. This is my first time here, and I have not said much I was trying to wrap my head around the PK and the PKC. Before I left Whati, I was not sleeping well, but now I feel good. At first, I was shy and did not want to make fun of myself, but I understand now, I really feel you guys are doing a good job with everything and I do not know. I am thankful for being here and I am sorry I do not have a lot to say, it was a short tour and it was great. Thank you.

**LZ:** We went underground. At times when we come to these meetings we did not know about the underground or how it operated. We were given the opportunity once we went underground we did not know where we were going they are doing a lot of work, they are working with water, a lot of machinery and equipment, there is so much work in the underground. We have seen the drips of water and we saw the haul trucks underground and they would pass us by and we would go into the little turn offs, once the clean-up happens without all the infrastructure underground, what is going to happen with the infrastructure? But it was a good awesome tour and on our way out they took us out on the side of the A154. We exited the other side of the pit, when we talk about reclamation and the PKC and the size of the underground, it would be good to block all the cracks before they put into the PKC, block all the openings where you can see to the outside. Thank you.

**JB:** You can talk about what you are feeling about being here and what has changed.

**CSB:** Happy Mother's Day. I was called to this meeting by my wildlife workers. I have been to other mines but not here. I have a pretty good idea about what is going on, how we are putting the closure of the mine, it would be much safer underground instead of on top where animals can get at it. Mother nature usually looks after itself and our elders tell us that the earth heals itself, it came from the earth so if we put it back in the earth, it belongs there. PK it is heavier than water, I think they have a pretty good idea of what they are talking about. Before coming here I was pretty reluctant about if they respected us. But this one here is the goodness of the land and the people matter to them. To my understanding, it will not rise to the surface, if it is put in the shaft and kept in the cone, we can depend on mother nature to heal itself.

**DTE:** It is not my first time being in the mine, it is not my first time being in a reclamation meeting, but yesterday when we went to the pit and looked down to see the open areas, I was thinking about what PKC and PK do once you put in there. I am not just thinking for me or down the road in the future. Anytime I go to a meeting like this I worry about water; if something happens to the water it will be the end. Even after the mine closes, people that live close to this area are going to be coming to hunt. What is going to happen

to the animals? If you go out into the tundra you can see a strange person walking around with their canoes and they do not know about the area, what is going to happen? The good thing about the PK and PKC is that it is not like a giant and that is very good. I also have been thinking about a guy was talking to us about ice ridges, if we put PKC and PK in there the PKC would stay warm and the ice ridges would move because it is hot and the ice goes up. Which is the best way to put this PKC and PK in there? And thinking about Elders that went to a meeting, I am only the alternate and I am speaking for them while I am here. I have to think which is the best way things will work for the future. Sitting here and listening to all of you and putting our heads together and we work hard, things will work for us, but if we do not work together, nothing ever works out. People that go out hunting on the land, that is important to them. People who live in their community and do not travel have a hard time. That is what the elders talk about at home. I do not stay home, I travel with my son and I watch anything that changes and I write it down. I watch those things. Even the ice ridges that come close to our community, I write it down. Those are the things we have to watch down the road. Even the caribous that have come back. Last year I went to Ekati, they just came back there too. It takes them time to deal with the noise. And the fish, well we cannot see them because they are under the water. I am glad to be here, to get involved in the closure of the mine. Thank you to everybody who put their voice out and it is good to listen and learn from each other.

**JR:** I am happy to be here, I like participating with the mining company. I have done a lot of tours with the elders, they give us good direction, **knowing the land is important, it was rich for white fox, we did not know it was rich under the ground**, the elders give us a lot of good approaches, they have not seen a lot of changes, but remembering that the land is very important to them, things that are coming are new. I have been a middle man, I am not siding either way but I try to support and cannot really add anything more. We are here as communicators to give advice to the company leaders and the grand chiefs. I agree with my chief and I am below them. The work I do as a communicator thinking that I agree with my leaders and I respect them and I agree with the government and industry and I do as I have been told. I am not a leader I do not make changes but I like coming here with the elders. We did a lot of research with the elders in the past and the geologists and a lot of I will go home and share what we have learned. I know how the governments and territory industry. I cannot speak for them, but I am here to make communication happen, I ask a lot of questions and will report back what I have learned. One thing the elders thought for this morning was that we should have had a church service. Thank you.

**PH:** I am one of the communicators for the Tlicho Nation. I am trying to assist the elders as much as possible to communicate and direct them on what to do. While we were underground on the different levels, one thing I learned about the underground is it was a safe environment. There was a controlled spray so it would prevent the silica from being breathed in by the underground people. The way they pump the water at different levels

was all explained to us and some of the questions the elders asked and the guy, Peter Gillis answered any questions the elders had, it was almost like jet lag when we came out of the underground, it was a really good trip, we enjoyed it. Thank you.

**JB:** Regan was very talkative one on one and with our guide and it seemed to me that he was very open to learning and very curious. Some of my own observations and some of what I learned, I was really impressed with the safety measures and there was lots of backup plans. It was very clear to me that the safety was important and the safety of the environment and the water was a major priority. It is not only the systems that are in place but the attitude as well. It helped build my confidence and my trust, I feel very good about that. There are a lot of technical things that I do not really understand but understanding the basics and the commitment to human values that show up are the two things that make me feel good overall.

**NT:** I was lucky to go to the process plant with the smaller group and Joanne and I had a laugh because we tossed a coin for who would go underground and I lost the coin toss. I was disappointed at first but I was really pleasantly surprised, I was very interested to see how the diamonds were processed and retrieved from the kimberlite. Our group was very curious and I was impressed. We thought we had gone as far as we can go once we got to the top of the plant but Wayne pushed us one higher level. It gave us a really good view of how the plant is a well-greased machine. Lots of safety in that place.

I want to say happy Mother's Day to everyone. Thanks for sharing your thoughts. That is a very good way to start the day. Thinking about if the processed kimberlite goes underground, what would you like to watch and monitor? We also talked about the fact that we might need a little more time to think about that basic choice: at the end of the day we have this processed kimberlite, so what is the best way to deal with it? Is it to keep some on land, put it underground? What I am hearing is that there is less concern on putting the PK back in the pit. But perhaps we should discuss that more if we want to come up with more recommendations. There are two ways we can give advice to Diavik in the past. First, the recommendations are very clear and straight forward about something that they would want or like to see happen at closure. The second is to provide some strong advice in guiding principles. For example, last session, one of the pieces of guidance you gave Diavik was that we would like to talk about putting the PK underground. You said you were not ready to make decisions, but were ready to give some guidance and some issues that can be resolved. Are there more questions now that we have gone underground?

**WL:** I think after this tour, there is more reassurance that this containment would be the best way. I think it dispelled a lot of fears about what could happen underground. I wish BA would have come down with us on the tour. Maybe we can send him down tomorrow. I think the whole group feels that taking it off the surface where it could be dangerous for

animals and putting it down below. Because if there are major cracks that they can fill with cement, might be a good option for keeping the mess contained. I think the water will be okay for the fish to pass through the pits. They breached the dyke and gave it water flow. It would be good to find out how long it would take for things to grow, the underground tour might have changed people's minds.

## BREAK

**JB:** There is an offer from the underground supervisor, James Sovka, to come after noon to answer any questions you may have. BA can ask his questions then. Afternoon sounds good. It is a good chance to ask about anything technical, and what we can expect with the PK being put in there and how they would deal with that.

Natasha mentioned that we could get our heads around what we want to do with PK and monitor it after closure. Are there things we should be watching for? Not in terms of the challenges in managing the PK, but is there any testing we would like to try out? As we move along and learn from that, is there any ongoing monitoring we can establish and how that might be done? Do people want to continue with sharing your basic feeling about things at this stage, is there anything you want to ask for now or any other questions you have related to wind perhaps and how it might impact how the dykes and the water contained within those dykes? Is there anything we want to know regarding how deep fish might be going? Where it is that we want to avoid placing things that might harm fish?

**BA:** With that screen maybe helping PK, keeping it on top of the PK to collect its own sediment and organic material, nutrients from the land and the wind going into the pit maybe that could be done. You see all the screens holding the walls together, you see a lot of screens maybe if we could maybe have screen in the bottom that could hold the nutrients to help things grow on top of the PK, in my mind I see it only becoming helpful, nothing I will be sitting on top of it so maybe a screen would help. I can see it can be done along the walls it can be done in the pit. You do not want the walls falling on trucks and on miners. That is one of my ways of collecting sediments in the bottom.

**JB:** We could ask if perhaps some tests would be done to see if there is a size of screen that might be effective in some limited containment, recognizing that it is going to fall to the bottom. Whether that system might support growth of vegetation.

**NT:** I was thinking about what you said yesterday about the screen and the liner under the PKC. Have we thought about the pit and the PK coming up to here, could they bolt a

thick fabric to keep the fine materials on top? And keep only the water from going back and forth. Is that sort of what you are thinking?

**BA:** It does not have to be bolted down. The liner could be on top of the road and be held down by rock. It does not have to be bolted down onto rock itself. If we could put liner on top of those roads and then cover it just to keep it held down just so we do not have to worry about the bolts coming apart.

**JB:** Any other thoughts?

**DTE:** In the pit, are we putting PK or PKC first?

**NT:** Just PK. PKC just refers to processed kimberlite containment. PK is just the actual stuff in the jar.

**DTE:** So, if we fill it up here we should be monitoring it, if we put a rock in there it is going to sink. A few years down the road, we try another one and see how far it goes. If it goes down quickly, that means it is not going to stay on top. So that is how you monitor it unless it hits surface. The worker said it does not get cold enough to freeze, so we have to monitor it for a while and later down the road things will grow and we see grass and willow and fire weed. In winter, we have ice pressure so if the ice pressure comes up this way and it moves it will ridge, so we need to monitor it. Masi cho.

**JB:** So are you suggesting that after the PK is placed in the pit underground, that it be left open for a period of time to monitor it before it gets covered with water?

**DTE:** Yes.

**KA:** PK right now, we always refer to it as a slurry or toothpaste consistency. With that said I am thinking its consistency will never change. It does not freeze or thicken it just has weight so the water in the slurry comes to sit at the top. Once it is in the pit it will still have the consistency no matter how far down the mine. Throwing a rock on top would be like throwing a rock into toothpaste; it would push the slurry up the wall. So maybe when Steve comes we can ask about the freezing and the tunnels and what will happen with this stuff when we put it in there. Some of the walls will close some of them will be open so that the air can come out, so the slurry can sit inside the tunnels they have made.

**ML:** Excellent suggestions.

**WL:** I was thinking about what Terri was saying about the testing of the PK. Maybe the time to test would be after the water is in there and maybe after the millions of pounds of pressure, the consistency would change. The pressure alone could change the properties of that.

- JB:** So perhaps the period of time we monitor before water is placed on and then a period of time where we test and see what is happening after water is placed. I wanted to check with Dora to see if you wanted to share anything you saw at the pit and earlier we shared what we experienced if you want to share anything about that you are welcome to.
- DW:** The open pit mine that we went and toured it was spectacular to see, we only hear about it. Now we are speculating what is happening in the future, I think if the PK goes into the mine shaft I am thinking that maybe we should mix it with some natural materials as well.
- JB:** We should ask the underground supervisor whether it is any soils that are mixed in with the PK and what that might do to the PK.
- KA:** I was wondering will they be back filling the tunnels before they flood it?
- NT:** One of the options being considered is placing the PK around the tunnels and all the way down the carrot. The option is to put the PK down there and to put water on top as a way to keep the material down there because of the weight, that is the belief.
- BA:** With that screen, you do not have to fill the whole pit with water, maybe what I am thinking now just fill it with water up to the screen. Maybe have it just watch and monitor it that way and see the reaction is after the screen. Maybe it will start collecting seeds, but then again, all that pressure on the screen it might break. If everything goes well and we see growth on the screen they could add more water to see the changes before you fill it up completely. You will not be taking all the water out so go slow and then you can start collecting the sediments, maybe that could be a suggestion.
- KA:** One of our greatest concerns with working here trying to find ways for this mine to be reclaimed back to nature is contamination. I like the idea of the screen being used to help regrowth at the bottom. However, what would it be made of, will it float to the top, will it rust, will it hurt the fish will it hurt our water? Our concern is always contaminants. We will ask our questions to the superintendent. We must think again about the factor of contamination.
- NT:** That is a very good point. Most people are aware of what happened with the flocculants at Ekati to help it bind together so it would not be so fine. Now they have a different problem because they realized the flocculants were not good for the environment.
- LZ:** The processed kimberlite, how are you going to deal with it, how are you going to put it under the open pits? What are you putting back first? The water or the PK? Knowing what might happen down the road how the dyke has been operated to now and after closure, how it will work?



- JB:** The option that Diavik is putting forward now, is moving PK into the mine shafts underground and we can make recommendations about what happens after they do that, about how long they should wait before putting the water on top of that but the PK would definitely go before the water.
- NA:** I was just thinking the slime is so clean, each time you fill up the pit with it why don't you put plants and willows between and will help to grow plants and willows.
- JB:** Actually put some seeds in the PK?
- NA:** Even half way, and even at the top too, if you put plants in anything wet they will grow.
- KA:** Only if there are nutrients.
- NA:** If they put all that slime in there and then they fill it up some more or anything that way that will help it grow.
- KA:** If those plants do grow, then they are still going to fill it up with water and there is no use in those plants growing anymore. Because they are not underwater plants, they are land plants so are you just trying to find out if the slurry will grow something and then other plants will grow?
- NA:** Yes.
- KA:** Okay. Thank you.
- CSB:** I just want to know what volume of PK it will take to fill up. Obviously, the mine shafts are wide, the cone is deep, how much PK will go underground and how much volume of water it will take to fill it up. Since the mining here started are they looking at options for that fine stuff to be mixed with something to make it be more solid. If we put it by its self it will stay hot, but If they send it out to the lab to see what kind of chemical would make it solid even natural because if you have even willows, it will dissolve in there because it is natural. Something will probably happen which will make the liquidly stuff more solid but in the long run, if the fish go back there and nothing is growing it is a sign of contaminants so maybe they need to contain it somehow so no animals can get in there.
- NT:** I think you are asking the questions they have been asking and trying to solve since they started diamond mining and the scientists and research they have learned so far is that when you add some chemical property to try to make it bind together you are actually do more damage because you are adding a chemical; something unnatural to that environment which can be harmful to fish and other things. This is why it is such a dilemma, scientists have been trying to figure it out for over decades. At the end of the day we have this processed kimberlite that is like toothpaste. What can we do with that

PK? We have to do something, do we leave it on the land, underground in PKC? It is hard to know.

**JB:** The other question you raised about the space that is needed, is there going to be enough space in those tunnels for the PK that we are both producing and have to move from the PKC. Is there going to be enough room to put that underground so that it is not left on the surface? My question is if there is enough space and how much space is really needed for that?

**CSB:** If there are other mines that are here, and other pipes being worked on there is going to be more so instead of adding chemical to another chemical, there are natural sources like willows or trees it will eventually dissolve and that is not going to add anything dangerous, we use those trees for wood and we use the willows to make stuff. We are adding something natural onto something dangerous and the combination of clean and something that is contaminated will be less contaminated after that.

**JB:** We could consider asking for ongoing tests. Continue to see if there is some way to create stability with the PK while making sure it is not toxic.

**KA:** We keep coming back to the toxicity of this material. It has been tested and said that this material is inert, it has no chemicals, no nutrition and not toxic. The danger of the material on land is it like quicksand, so the reason we are trying to find a way to take the danger away is to move it somewhere where it will not be a danger for the people and the animals. I know we are talking about throwing seeds or willows on top of it but there are no nutrients on top of it. This material was created when the earth evolved, and now it is an alien material; it has been crushed, the diamonds have been taken out the material is pasty but we have to do something with it to keep people and animals safe. At the moment we do not know, we can ask to grow something into it. We can try to pull as much of the moisture out of it so it becomes something but when we try that it is still like toothpaste. So that is the material we are trying to deal with to keep everything safe. Our greatest idea right now is to put it in the mine to keep it away from people and animals.

**NT:** It sounds to me that maybe there is more information needed to encourage growth, something that can be naturally added to answer those questions. I am hearing that people seem more comfortable with the idea of the PK going underground rather than going on top of the land. I am also hearing that people still need more information. How comfortable are people to give a recommendation or guidance to Diavik that ties this idea together?

**JB:** What we can do is check out the general direction we want to go, these are the questions we need answered and build up to a final recommendation. We will have some questions answered this afternoon by him, and some might not, we do not have to solve this problem today, we could take some more time to do that.

**NK:** If all this land could fit in the pit and clean as much as possible on the land until we can walk on it again, that might be the best idea, seeing the caribou around here all this week, it makes me think that the caribou do not know it is there and that is best to clean as much as possible so it can fit in the pits it will be alright.

**WL:** I was thinking that if there is not enough volume to fit all the PK, that still means the surface amount will still be getting a lot smaller. Why couldn't there be bigger boulders dropped in? Eventually if the hole is deep enough you can fill it with rocks and heavy material and then top it off with something else even if you have to make a hill on top but then at least you have a foundation.

## LUNCH

**JB:** Alright so we are still missing a couple of people, Terri will be back she is just going to check on her nephew and it does not sound like Jolene is coming this afternoon. We were mistaken about who will be coming at 2:00pm. The hydro-geologist (James Sovka) will be coming, so a lot of the questions and concerns about the water in the mine shaft will come up. There are some other general questions that Colleen said there are some answers to. Then there will be more questions that we want to ask and have Diavik address with testing or in the labs and some of those questions might take a little longer as well. Some questions will relate to fish and fish impact, some questions will relate to what can we expect from PK and what will happen to it in the long term whether there is any expectation around the change of its. its make-up and whether there is any way to know that? And what kind of monitoring we can do? Are there any particular points we want to speak about? Monitoring or watching we want to see? How it goes before water is placed on top, and what we should be looking for and how long we should be watching it? If Diavik does go ahead with putting the PK in the pits and mine shafts, what would you want to see at closure to know that it is good?

**WL:** When you put the PK on top of the pits and it is pumped into those shafts, there are going to be places where there are air pockets. There will be cavities and places for the air to be trapped below the surface, does this PK generate its own heat so it stays a paste? Does it have some property to keep it that way, in that state?

**JB:** That is a good question. Any other questions for the hydrologists?

**NT:** Do you mean does it generate heat or does it conduct heat?

**WL:** Does it generate heat within its own body? Not about transporting just within.

- NT:** I would say no but we will have it double checked.
- KA:** What is our timeline for watching? If we have the PK in the pit can we wait a while before adding the water? I think there is a timeline for this closure process, it will take one season to fill it up and I am unsure if it was one season for the entire thing or is it just one season with the water? We have to take into mind what the timeline is from that point to closure and what we are actually watching for.
- WL:** I would like to know what the depth and volume is of the pond that is sitting right now.
- NT:** They do not know.
- JB:** So we should ask when we can expect to know that number.
- NT:** It is to find out if we are open to this.
- CE:** Gord answered this question. There are two parts to the question. How much material of that slime and fine PK is in the PKC right now? The bigger part of the question is how much can you get at, how can you move it and how much of it can move? We have an estimate. If you are looking down at the PKC, his estimates were 300 feet wide by 600 feet long. And then deep was 50-70 meters deep. That is a rough estimate. That is just the slimy bit so you would have some of that slurry water on top that settles out as well and some of that would be consolidated, so when you move it you would get space and volume and all those kinds of things being added again because you are disturbing it. That is part of the unknown of moving it to another location. This number would grow but by how much?
- JB:** Would there be an effort to syphon off the water that has been settled out where the PK is settled and you see that clearer water on top of it, would there be an effort to syphon that off the top before it is moved and transferred?
- CE:** It would depend on how moveable the slimes are. If they need that water in order to get it moving, they might need to use some of that water in the process. Which means it goes through 418 and then through that settling process and pumping off that water later.
- JB:** Has there been any experience with moving PK to other mine sites here in the North?
- CE:** What I know of, it is only PK that is being generated so Diavik moves PK from the process plant to the PKC from the pipeline with pumps. Some for Ekati when they are putting it into the pits. That is the only one I can think of.
- KA:** It is already sounding like there is some kind of settlement going on in the middle with that PK. As you said, they need that water to move the PK, so that sounds like there is some kind of solidity with all that water is gathering so there is maybe a possibility that

there is some settling going on if we will have to keep some water to move it then let it settle and then syphon it off.

**CE:** As you see here, this is settled, not compact but still settled. It is sitting under that pond and the anything with solids the issue is moving it. They have a pump coming in to agitate the water essentially to get it moving, to keep it moving maybe they need to add more water, who knows. Because it would be in a higher concentration there than when they are sending it to the process plant. I do not know if it would be any more consolidated than this. It is still a question of what it looks like down there.

**KA:** That might be something we can ask them if they know what the settlement is.

**CE:** Yes. Does PK generate heat? Not that I know of. We keep the water that is on top of the slimes at a temperature that keep the slimes warmer. If those slimes were at surface and did not have a water cap on top, they would freeze a little. Because we have the water, they have never frozen.

**DTE:** Since the mine opened they have been putting the PKC in the tailings pond, right? Do they go and check to see if the PKC hardens during the fall time?

**CE:** The PKC areas that are checked regularly are the dams, next in from that is the course materials that will freeze and consolidate at a surface level and the water that is in it. The next that goes out are those beaches and I remember when I first started working here, they went out to get a PKC sample to sample the water and I sunk but now you can walk on it so the outer edges of that beach have dried. And they are testing it all the time because they want to see if further down if there is ice and the consistency of it. They are sampling all the different variables with the materials with dryness the challenging part is the part that becomes the soupy slimes but they sample those regularly and the slimes underneath are it being studied. They have tested adding material to that to consolidate it. They have done a bunch of tests on it but it is not easy to get to. They mostly try to do it from boats. They have looked at the chemical makeup to see if it has toxic properties. They have dried some of it out to try to grow plants on it as a possible reclamation material but there are no nutrients in it. That are most of the tests that have been done so far.

**DTE:** In Ekati, they do the same thing, they put plants and rocks on the tailings ponds where it is dry. When you first walk on it you do fall in it. Then it gets harder now, they are planting into it and there are grasses growing but they are all brown. We asked why they are putting the big rocks down on top of it and they said it is only to prevent the caribou from going on it and sinking. So how come we are not working with our neighbours, so when it is dry you can walk on it but it is not good for caribou so they are trying to grow some grasses. I do not know I have not been there since but it is nice to see what kind of

changes are here. It is hard for another new person to just come in and get up to speed and understand where you are coming from.

**CE:** Those are all good points and it is a funny statement of who is doing best. The sites are different, there are similarities but there are differences. The biggest differences, I would say Ekati is blessed is space. Diavik is a very small site and we are on an island and do not have a lot of room for some of the infrastructures. This PKC has gone up and up and Ekati goes out and out. It is called their long lake treatment facility. They have cells that are treated differently and they place different materials in those cells. They have a much different way of managing than Diavik. Because of that, they can close areas differently as well. They have done some revegetation studies in the cells but Diavik took it out of there to put it elsewhere to see if it would help vegetation. Because Diavik has gone up and up, it would be very difficult for plants to hold in this material because you would only get a thin amount of soil over this whole area. There is not one right answer. It is just dealing with the mess in the middle and trying to figure out the best plan for that.

**KA:** The outside of the slurry pit, if you would flood that area with water, would the whole thing become a big slurry pit?

**CE:** You would try to get your level up above it but because it is sinking, you would always have that shoreline, like a beach where right before the water, you have that mucky edge on the side. The tricky thing about figuring out the boulders, was how far back to put them since you cannot put them right at the edge.

**KA:** What I was thinking is say there was a huge rainfall and it started filling it up and all the sand goes out to the edge where the dam is, would all that material become a slurry? Because if it all became wet would it continue to hold rock or is it going to sink?

**CE:** In every operation, you have a spillway, you have to plan for a huge storm event. Diavik has pond 3 so the PKC, if it flooded would go to pond 3 and be contained because it has so much space. In a closure scenario, anything that has water would have to have a spillway. You do not want to destroy whatever it is you have built up to be your containment facility. What it would mean is that water flows out of that pond and would exit the facility and go into the tundra, onto the east island and trickle its way to LDG.

**BA:** That one in a million rainfall has already fallen about 15-20 years ago and we almost got washed away. When I was still living in Pellet Lake, I had a brand-new shore line by more than two extra feet. When that big rainfall happened it rained for almost a month but steady, steady rainfall, the whole shoreline started giving off new vegetation, moving around. I am curious to see what happened to it now. Maybe the shorelines are a little bit different now. It is a bowl, anything you put in it, it is going to come up, any rainfall or snowfall will rise in that pond. Last year in BC we saw that big pond and steady, steady rainfall and that whole tailing pond breached and it headed to the ocean. If anything

happened again like that, with all of this snow we are having and later the accumulation of snow, this is the longest the snow has lasted in May. Snow used to melt in the middle of April when we were collecting hair samples from wolverines. The winds were so intense. There were big cement bags across the lakes and I have seen plastic bags blown away. I have seen wolverine scat with plastic bags in that scat which says to me that they got it nearby so I felt it came from the mines, this was before the big incinerators came in, that is where I saw all the garbage. Wolverines and foxes getting in there all the time. I can see something like that happening again maybe in the summer. We have had this steady snowfall and maybe we will have floods appear again. I wanted to mention how it could happen again and being almost half way into May, this is the longest time we have had this much snow in May. Thank you.

**JB:** Are there other questions we want to put out there for this person that is going to join us?

**DTE:** In 100 years or so, doesn't the water just run into places? There are places that the water fills the land, like big floods, can that happen too?

**Unknown:** I think she is talking about how, with climate change and global warming, she expects water levels to be coming up overall.

**CE:** That is generally the prediction, I thought I read somewhere about it being opposite in parts of the north where they expect less. One of the technical challenges with the current PKC closure, it has that pond in the middle and it is actually having enough water to keep that pond a pond. That is one of the things for the current closure plan that Diavik is working on is how to keep that water in the pond.

**JB:** When we are down in the mine shafts there was a particular area where there was a very powdery material on the ground, do we know what that is? Is that a dried out slime?

**CE:** There are no slimes underground, right now. We use something called shotcrete on some of the walls down underground to add additional strength and that is a powdery material so it could have just been residual shotcrete that could be still on the ground. It could also be just rock that has been moved by machinery, so fines and crushed.

**KA:** At the bottom of 418 where the little stalactites where it probably is shotcrete because if you looked up there were all the bolts and the screens on the ceiling. When I asked Steve what they used for the road gravel and he said regular crushed rock. I thought maybe they would use PK but maybe that is too soft. They do not want that slurry, slippery mess on the roads down there.

**CE:** He said that was a geo technical active area so I am sure they take triple protection steps to make it is as safe as possible.

- JB:** There are sensors in place to monitor any movement and I was interested in knowing how long those sensors are going to be watched. What they have noticed with that movement and if they will monitor it after the closure?
- WL:** The reason why I am wondering what is happening with that PKC going into that pit is because maybe we can just add water to it afterwards and slope the edges and then the water can just cross so there would be water just like in that pit. Instead of trying to fill with rock we can make it into a dead lake. Make it as high as we can get it so there would be no remaining stuff.
- CE:** If the concept of putting PK in the pit and/or the underground is supported, then that is when they start to look at closure options for the PK in the PKC.
- WL:** There is no guarantee that there will be enough room for that PKC to go into the pit.
- CE:** Depends on how much you are willing to put into the pit. If you are talking about the top of the underground, there is not a lot of room but if you are talking about the pit, there is so much space. It is about how high the PK comes up.
- WL:** If there is no food there the fish are not going to come around there.
- JB:** We would like some guidance about the inside of the dyke. We have talked in the past about what we want to do to recreate fish habitat, resting areas, feeding areas and we have talked about what that would look like. We have not talked about other habitat. Whether there is anything remaining around the remaining dyke that will stay there that we should think about in terms of other wildlife. Wolverines, fox, caribou, is there anything that would help them to either stay away, or to return to that area?
- NT:** We were thinking that if we assumed the PK went underground and if there is that 100 feet of water if there is anything you would recommend be monitored or put in place around the pit?
- JB:** We have that dyke there and so what do we want to do, if anything, around that?
- WL:** No sharp slopes, easy access and that is really all you can do. It is a small lake.
- JB:** You don't see a need to try to keep them away from that area? If the PK is placed in there.
- WL:** I do not see how it will be a problem. The PK will be covered by water, and caribous don't swim underneath they do not like fish. They do not dive down like a seal, they'll figure it out.
- JB:** So, if the side is not a total drop off, they will be okay?



**KA:** I think we had discussed this before where we had a pit that had a high side that does create a pit after flooding. So, on that side we wanted to ensure that there were large enough boulders to prevent them from falling off the edge. We wanted to leave the 514 ramp so if they got into that pit and there was water, they would be able to come in off that ramp. We went off that ramp with the bus. We do not want them to destroy it. The caribou can use it to come out after swimming. On 418 we were okay with it because the water levels are coming up to the dam and you have the shallow side for the fish. Coming up on the other side was natural shore line so I think we were okay with it because the caribou can swim across. But we should try to clarify that again to see what those shorelines look like.

**NT:** I think the main question here is would any of those change if we put PK underground.

**JB:** When we talked about those dykes the last time, it was before we looked at what it is and what it would do to include the PK at the bottom of the pits so we are just checking back to see whether that changes anything for us now.

#### **JAMES SOVKA PRESENTATION:**

My name is James and I am the hydrogeologist here at Diavik. I take care of the underground dewatering. I was asked to do a presentation for you guys. At any point please ask questions I am very happy to answer them for you. Let's get started. One of the questions is why dewater? Does anyone know? We need to be able to mine safely. One of the ways we do that is by limiting the risk of inflow. So you get all the water that comes rushing into your mine it is going to be a huge problem for the workers. We also need to maintain the stability of the pit walls so you have the open pit and the granite. If you have too much water, it will create high pressure and they will collapse. Another reason is to efficiently handle the dirty and clean water. The floor is dirty and wet, if you were to treat all the water in the same way, the dirty way would be very expensive. One of the things that makes us different at Diavik is that we have two systems. And that is the pump station and a smaller system where we handle the dirty water. The water that goes through the fault from the lake is clean, it is just running through the cracks. What we want to do is intercept that water before it gets into the mine and dirty. To intercept the clean water we drill a hole and hit the faults to make water. We see it underground as well. One of the sub vertical faults has intact rock and then there is highly fractured rock. They can be wide and flat as well.

**WL:** How do you get these names for these faults? Were they there before you guys came in or did you put them there afterwards?

**JS:** They are named as we go, there is always a story. So, this person was very involved in the discovery of the faults. We drilled a hole down, not expecting any water, and then all of a sudden you have 100 gallons coming out of it. We named it after him, in his honour.

You are right in some sense because this Mckenzie system, those are all over North America. Some of these features are very old and very well-known but others are local. There is the south and north body of the mine and we have these drill holes and sometimes we hit the water right away and other times we hit it further out. We do not always know and that is part of the process to find the faults because they can really be anywhere. We have drilled thousands of km. Some of them will hit over 500 gallons per minute and others will be dry so it is all about understanding the geology and the faults and trying to be as efficient as possible. There are heavy duty bolts because sometimes you get high pressure water so it is important to control it and capture it safely.

**CSB:** Is all that water being captured?

**JS:** Each one of these drill holes that gets connected into the yellow holes and then these go along the line in a system and they get connected to the other pipes that get collected and sent to the treatment station.

**CSB:** That's clean water?

**JS:** Yes that is clean and it is all going to those pump stations.

**NK:** If the mine finishes and you take those pumps off, will it all fill with water?

**JV:** Yeah, the water is moved so the water table drops, these holes will be providing the way to fill the hole. When you go lower and drill more holes you dry the holes that were higher up. When the mine is done and we allow it to flood, these holes will be providing the water to allow it to flood.

**BA:** Why is that water being so clear is it because it is at the bottom of the lake? The bottom of the lake has a lot of sediments and this water is coming from the top. Is that why it is so clean? I was kind of thinking if that were to happen, is there some way to find out if it is melted permafrost?

**JS:** The water is clean because, you have to remember that these faults are quite tight as this is 400 meters deep. So, if you take that 400 meters there is a lot of weight of water so if you take this water and you will find chemical indicators that tell you it is from the lake. When you first drill the hole, you are not hitting lake water, you are hitting water that has been there for who knows how long. So, this is quite deep, we call it dinosaur water. It is much below the permafrost and the lake acts as a mitigating factor the permafrost is mostly confines to the upper regions most of what we. The permafrost is only present when there is land mass.

**KA:** How deep are those drill holes going?

- JS:** They are 150 meters and the deepest we have drained is about 300 meters down and they are mostly in the horizontal ranges it depends what you are trying to hit. If your fault is horizontal it is best to hit it with a vertical hole, and vice versa.
- RM:** If you take all the pumps out of there, wouldn't that water come up?
- JS:** Exactly. That is a great transition into the next slide. This is the water table. We have the ore bodies, a bath tub where on the edges is basically the lake.
- CSB:** If you take all the pumps and everything out of the hole and they put the PK in there, so the ground water would mix with the PK? What is your prediction if we had to fill it up, how much water would it take to fill it up?
- JS:** The plan is once we have extracted everything from the 418 we will then start depositing PK into the pit and your water level will rise too. What we would do is we will allow the water to come back and have a barge on the top of the little pond to maintain water level. Because you are right, if you just turn off everything, it is going to go all the way to the top.
- CS:** They said they will open the dykes and let the water in and now it will have more water coming back. What will happen in the future?
- JV:** In closure when the dykes gets breached and allow it to go back to mixing that water, will instead of going through the fractures and then up, it will just go across. It is the same water. My understanding is that before they breached the dykes, they are going to do monitoring in the water to make sure it is clean.
- KA:** When we were down underground, Steve was explaining yesterday that they would put grout in through high pressure to fill in those cracks so they could continue drilling through that. So, you do not do that with all of these?
- JS:** When we were developing the mine, it is much deeper than what we have the water table to. When we cross the faults, if you do not grout it, there will be water everywhere. And that is your lowest point and then all the water is going to want to go everywhere. And now you have water that goes all over your road and is now dirty. The drain holes capture that clean water before it gets mixed into the road. The influence on the grout is actually really small and can only really push the holes so far. So, you will have a dry area in your tunnels. But it does not seal the fissure, it is a cocoon around your development to protect you from the water.
- KA:** He said they are 5 to 8 feet deep and then they work once it solidifies they continue mining through.

- BA:** What about winter time? When you fill it up from the water itself then come winter the ice is going to push down again. What happens with that pressure, what happens if they crack again? Maybe what I am worried about is that PK moving through those crack holes and into the lake itself.
- JS:** Whenever you are thinking about water, you have to remember the highest pressure is going to be the lake. There is so much of that water compared to what we have here. It will always win the pushing contest. That is why we need the barge. There is also so much rock pushing down. So, the PK and the water will not be able to pass through the faults. Maybe a little but never cross all the faults because it is so tight.
- BA:** When you see the pressure ridges and fault lines coming up from that carrot it is going to have a lot of pressure needing to push up too. In the pit and in the carrot hole, are the fault lines at risk because of the pressure?
- JS:** You have confining pressure from all the water around it so that will help maintain the integrity of the structure, it is even and surrounding areas, it is an even pressure on all sides. This is called isostatic pressure.
- DTE:** I want your help understanding the PK, so when you put it in the cone does it stay warm or does it freeze?
- JS:** It would not freeze, it is too deep down.
- DTE:** I only went in the pits I only went halfway I saw frozen ice dripping out, so when its finished and the PK goes in there what happens to those cracks, what happens to it?
- JS:** The water will become clean over time as long as you let it sit there and it will not be moving because you have all the isostatic from the lake. It will slowly settle. The only reason its ice right now because it is exposed to -20 air. The PK would probably reach that 2-4 degrees.
- DTE:** So after it is filled up with PK and water and open the dyke will it be moving around in the pit?
- JS:** Right now, there is water that we are moving but we are draining. Because the lake is much higher than where we are in the ground. I believe they have a proper plan for sediment reduction once they open the dyke.
- WL:** If there is a big storm how far down does the water move?
- JS:** Nothing moves below the surface, maybe a couple meters would move.

- WL:** The PK has to be moved so if you filled the pit to 100 feet from the surface there would be no way to move that PK. What is the maximum depth from the surface that can we safely put this PK before it might mix and get into the water table (30 meters)?
- JS:** Because we are not actively dewatering, the water would always want to be at lake level. You could pump it down but, why would you?
- LZ:** We are talking about the processed kimberlite putting it back to the underground. It will not go as high as the cone but when we cap it off with water, because of the steepness of dyke is too much the animals would not be able to climb up. The water that seeps underground and they take out all the pumps from the underground what would take place?
- JS:** When we take out all the pumps and the infrastructure that is pumping the water it will naturally fill up because it wants to be the same level as the lake. Right now, we are creating the artificial draw down. But once we stop doing that it will be the lake and it will naturally fill back in. We will be re sloping all the above water.
- CE:** There are some areas in the pit that come to natural ground. There is on in particular I think he is thinking of on 418, about 1km long very steep drop. We have talked about cutting that edge to re slope it and allow some access in that area.
- LZ:** As a person of this land and the amount of development taking place our future generations will be working and living on this land so we need to make sure we keep it safe. That is the reason we come to this traditional panel each year. Thank you for sharing your knowledge.
- JS:** I agree whole heartedly with that. Thank you.
- KA:** How is that going to mix with our plan of trying to get the PK in there if it is filling up with water?
- JS:** That is something we will have to coordinate. Things will need to be removed systematically. You only take out one pump system at a time so the water will rise gradually. They will do it piece by piece. With the deposition of the PK in here, you will want to keep the water level above the PK, it will be a coordinated effort in tandem so they do not get ahead of each other.
- KA:** I had envisioned a dry carrot and that they would be pumping in PK naturally and add water on top. Now that we have water seepage, would they add PK, let the PK settle then take the water table.
- JS:** It would be very similar to this jar. Add your PK, at the same time allow the water table to naturally rise. You want to build the PK up so it is nice and stable. You would not be

actively de watering because that would cause too much water. You want it to rise at the same time.

**KA:** We are worried about the air pockets while it is being filled with PK, would you leave it there or try to pull the air out of the air pockets?

**JS:** You would never have an air pocket if you have the water above the PK. If you did have a pocket, it would be filled with water.

**KA:** Would the air pocket seep through the fault line?

**JS:** Because of the water? No, because these faults are currently open to the air. It has more than enough time to move its way out. The faults are pretty tight so not sure how much air you would see.

**KA:** And of course, with water being thinner than PK, it would not be a problem.

**NT:** One question was around climate change impacts. Can you talk about how climate change would impact that PK scenario?

**JS:** The North has seen increase in temperature. It will still freeze in winter. Like we said earlier, it will not affect the PK because it is too low underwater. If it is frozen or not, should not affect the PK. So, I don't think there would be any changes due to climate change.

**NT:** How will water stay healthy if it is not moving in the deepest parts of the pit? There is the idea that stagnant water is not healthy.

**JS:** If you did not have any PK and it was just water, you would have to ask the biologist about it. My gut feeling is that the fish would not want to go that deep. Usually the fish want to stay closer to food, sunlight etc. You do not have anything in the lake that is that deep. It is a really good thing to re fill with PK because then you do not have any issue with new species going down. This would be a change from the typical lake bed and I think it is a good idea. You will not get that temperature blocking column.

**BA:** I have been fishing these lakes my entire life, the deepest part of the lake is the best part, the biggest fish. Because of these deep holes we put some inukshuk there to point at the hole. You would be surprised how deep they go and how deep we catch the fish. The need for inukshuk is great, we need them to point us to the best fishing and we want to find them and mark them again. I just wanted to give you an insight on how deep we have fished in the past.

**DM:** I understand, but my hearing is very bad, if you do the reclamation work in the underground it is good to hear from all of the representations. If they do the 3:1 slopes and take care of the island to make sure the wildlife are well taken care of into the future.

There are less elders but there are young people that are coming and the future generations and it would be good to have a good reclamation plan to protect the future. Water is life, we love our land, we like to see the beauty on the land. Thank you for working with us to keep our land beautiful.

**JS:** Absolutely, our plan is to make a good place for the animals and wildlife to be, protect the water and ensure water quality, that is all very important and I agree. Thank you for having me.

**WL:** Has this portion of the lake around the island, has it ever been mapped out for the depth? Can you remember what deepest hole is?

**JS:** The deepest part I know of was called “deep blue” and that was close to A21. Actually, within the A21 dyke. You have the A21 and then just below it you have deep blue which I believe was 40 metres below surface.

**WL:** If these holes were completely filled to 135 feet deep that would be sufficient, right?

**JS:** They are doing some environmental research right now with mixes. A PhD student was taking different mixes of her homegrown soil and she had just rock from the north country rock pile and then she had one that was half rock, half PK. So, she had all these different examples to see what is the best way to get the plants to grow, using local plants as the test.

**WL:** So dirt or rocks will not be necessary?

**JS:** That looks like lake bed sediment to me so it would mimic the lake bottom pretty well.

**WL:** So, there is no use breaking our heads over what we are going to plant in there. Thank you for your help.

**NT:** Anything else?

**WL:** I was thinking if we could get an estimate on how much more PK will be made from now to the end of the life of the mine.

**NT:** We can present that tomorrow morning. I will pull up pictures too.

END

## Traditional Knowledge Panel Session #11: Monday, May 14<sup>th</sup> 2018

- JB:** Good morning everyone. I hope everyone had some rest. Just a note that Colleen has posted some information up here that gives an estimate of the PK (processed kimberlite) fines that will be produced to the end of the mine. Some details up there. Colleen did you want to walk through those?
- CE:** Sure. A couple of things I guess. On the PK fines, that was in response to your question yesterday.
- LZ:** It would be nice if we converted all this stuff from the new system. ..yards, for the older crowd, that metric system is good for the younger people who grew up in school.
- CE:** I don't even know my height in centimetres! Thanks. Sorry about that. So for the PK fines that are up there. This was in response to Wayne's question yesterday over how much more will be produced over the next number of years of mine life. I just want to be clear. That is the total PK fines. It is also an estimate. So, those who went in the process plant the other day see that the ratio changes depending on the material they get. How much coarse, the rocky material, they can make vs that fine liquid material that they can make. So some material shifts. Also not all of that fine becomes slimes. So some of that settles out on the beaches and some of that is like a watery slurry substance as well. So I just want you to understand 100% what's behind that number. The next section on the board I thought might be helpful when you guys are talking about your ideas and recommendations about the questions that you want answered for this project of moving PK to the 418. I wanted to share with you some of the studies that Diavik is starting and is already doing as well. They are going to be looking – remember when James presented yesterday with the bathtub that surrounded those shafts? - So they're going to be looking at how the water table moves when they start filling 418 with PK and water; what the effect would be on 154 as it comes up. So how that will change that water flow into the other pipe that they are still mining out. So they need to understand that balance between the two areas and the dynamic. The other thing that is really important is making sure the stability, the geotechnical stability of 154 is able to be maintained while they are putting that material in and filling 418. So when you are talking about those pressures, like James was talking about yesterday, you want to make sure that pressure isn't going to cause any issues with stability of the underground or the pit. For those who went underground, you saw a very small bulk head – that door you walked through, and you felt that crazy wind when you opened it up for the ventilation system. They'll be looking to design much bigger bulk heads that would go in those areas between the two pipes, like where we cut over to go from 418 to 154. So, they would block that connection so that the PK material didn't flow into 154 when people were still working in there. They're also looking at the



pipeline design. So, what the pipeline needs to look like and what the pump system needs to look like to move PK from the process plant into the void of 418. And the last one aligns very closely with your recommendations and concerns. They do what's called modelling in science, so they basically take a whole lot of information and plug it into a machine or a computer. Like a program that gives you predictions about water quality based on all of those inputs, like what's the quality of the PK? How much water is coming into the mine? What's that quality? And they put all that information together and the model spits out what you can expect from the water quality of Lac de Gras. So they're doing that as well, trying to get those answers. And that's it.

**WL:** If you were to take, but you don't really know on a PKC (processed kimberlite containment area) how much of that sludge that you can retrieve, right?

**CE:** Right

**WL:** But say you were to take an estimate, do you think that what you can get out of that PKC plus the other stuff here that's going to be produced, the PK that's going to be produced, could you fit it all into that one pipe? And approximately where would that line be from the surface of the water?

**CE:** Right, so, all I can say for sure is that so far, from the estimates, they expect to be able to put all of it into the 418. So that's the expectation right now. But still uncertain exactly where that level would be just because of not having confirmed numbers around how much from the PKC they would be able to add into here. So, I can't 100% say what that level would be or how deep it would be from the water down to the PK if they put everything into the one pit.

**WL:** But if you were to load it into there. I realise you don't have any numbers on the recovery from the PKC, but you could still, if you were to take 100% recovery, the volume of PKC and the PK that's going to be produced, now, it could all fit in one pipe and according to the numbers that you got here and the other one, if you were to take it all 100%, which you aren't going to get.

**CE:** It would all fit; the water, slimes and some of the fines.

**WL:** It would all fit into one pipe and you'd probably still have 100 feet of water on top.

**CE:** I just don't know about the water piece. But yes, everything would fit. That's what they're working towards. So far Diavik is working towards 100% of the slimes going into the one pipe. And then there would be a cover of water on top, whatever that number is.

**??:** ...laughter. ...He's assuming

**??:** OK, then I'll say something. What he said. We're looking for 100 foot cap on top of that. Ekati has a 30 metre? – they're about the same.

**CE:** It's about 90 metres.

**KA:** So we still have a lot of footage to play with if everything went in there. Because as James said yesterday, if the water is rough and you dunk under the water, it's still, so nothing is moving. The difference being between Ekati and our pit, is that theirs is inland, no fish, and ours is going to become part of the lake with fish.

**CE:** Correct. I scuba dive and I can confirm James' statement. You can have people seasick on the surface and as soon as they get down, it's like dead flat calm.

**JB:** Are there any other questions before we move on?

**KA:** There's two there and they're going to do the same of one another?

**CE:** In both pits? So right now, as I was saying to Wayne, they're working off the model of putting it all in one as opposed to having to do it in others as well. I think most of that, I think, this is me guessing, is in relation to the timing of mining. So, they're mining 154 right until the end of the mine. So, to go and try to move PK into there, they can't do that while they're mining. So, they can do it in 418 because it is going to finish first, they can move it all into 418. And once your pipe systems and all that are all set for one, it's easier to keep going with the same one. I think that's the reason why. There might also be some technical thing I don't know about. Sorry, I should say one more thing. In the amendment application that Diavik will be making, or that Diavik is making, I think that they're allowing, or requesting that they be permitted for it to go to other pits if needed. So if they found that something went wrong with 418, then they would like that flexibility to be able to use other spaces, but with the main plan being to 418. So I just want to be clear on that.

**BA:** The last couple of days we've been hearing that 154 is more stable than the other pits. For some reason I heard that maybe 154 was more stable than the other pits or is there a difference between the two, or? Or, 154 can take most of the slimes and PK itself. For the slimes I prefer it to go somewhere else where it's more stable because PK is itself is, once you take most of the slimes out of it, it's going to become just sand. Is that what I heard last couple days or so?

**CE:** So, I don't think there is a difference on 154 and 418 in terms of stability. I can definitely double-check on that, but I don't think there's a stability difference between the two. The work they are doing there is to make sure that when they are filling one, that the other one stays as stable as it is in terms of the safety for the mine and the people and that sort

of thing. But in terms of the overall stability of both of those, they are both, I mean they build them to be stable. Both of them.

**BA:** I had for some reason in my head that 154 is more stable or something. That stuck in my head for some reason.

**CE:** Right, OK

**JB:** Any other questions?

**??:** Once a mine is done, they have to flood the two pits, 154 and 418 at the same time. Because there's a whole coming up on the other side.

**CE:** Yeah, so that's part of what they'd be planning. I don't have the electronic image anywhere, but when I was talking about the bulkheads to block the flow, they would be filling one before the other. Like this one where's there's tunnels underneath here that keep going and connect the two, they'd block that. And there's only a couple tunnels that connect. And so they'd block each of those tunnels so that that PK didn't move across. If they didn't fill this with PK, and they were just flooding, they would do it at the same time. So if they were just filling the pits with water, they would do all of this at the same time, and that makes things easier in terms of stability and that sort of thing.

**??:** So, in that cone they're going to put PK in there, right? That's what we're talking about for the past few days. They're going to put PK in the cone in there.

**CE:** Yes, or cone + ice cream. If you're talking operations, you get a level here (cone), if you're talking plus PKC, you get a level somewhere up in here (cone + ice cream). Where depends on how much and which sources.

**DTE:** OK. You know having that meeting here since Monday and talking about PKC, well, when you talk about things over and over, you dream about it. When I went back to my room, thinking about if it's going to be good or not, I went to bed, said a little prayer, now we put in my dream, we had this PK in the cone, and all of a sudden I start seeing all these ugly fish swimming around. Like in my dream. It's like did you guys make a mistake? I was talking and I woke up like that. So, I know that PK is not harmful, but the dream about the fish makes me think now. You know, it's like, it was a horrible dream. When you win, you talk about water and animals, we want them to be healthy and fresh water is important. Thinking about all these things for the past few days and then I end up dreaming, a bad nightmare. So, I hope down the road, not just for me, but for my kids, my grandchildren, my people in my community, when they come around and they go hunting, I hope they see healthy things. That's all I have to say. But worrying about my dreams sitting back here thinking about it, I have to say how I feel, and let it out, because if I keep things in and bring it home, then I would have said 'oh, I should have said that.

So, I try not to hide anything or if I said it wrong, that's ok, just let it out. So, thank you for listening to me.

**CE:** No, I think that's good. I think it's important to a) think about those types of things and b) to realise that everything you're thinking of today isn't the final answer. There's still a lot of work to be done before anything goes in there - water or PK. There's still work that needs to be done. So, I hope you can rest assured today that you are going to help inform those decisions and that there's going to be next steps. It's not just, you're deciding this today and it happens tomorrow. There's none of that. So, I hope that brings a level of comfort as well. And just knowing it's about the questions. What do we want answered before we would ever think about moving ahead with something like this?

**JB:** So we have our guests are here getting some chairs I see, which is great. There are some chairs here, I don't know how many more we need. So, I'll just let you introduce yourselves and at this point, we are just beginning to present the draft recommendations. You can sit in and listen in on that discussion. Then we will ask you to present to us what you would like to discuss with the panel.

**JM:** Thanks Joanne. My Name is John McCullum. I am the Executive Director of the Environmental Monitoring Advisory Board. That's a watch dog on the Diavik Mine. It's an independent watch dog so there's a board that has members from each of the various parties to what's called the Environmental Agreement. I won't get, maybe I'll talk a bit more about that later, but our job is to make sure that Diavik meets its commitments in relation to the environment and one of those commitments is to use traditional knowledge in making their decisions. And so, we are very interested in what this panel does and really interested in what you guys have to say about what you think is going on at Diavik because our job is to observe from the outside, be independent, and make recommendations to Diavik about what they can do better and what they are doing well now. So, I guess I'll leave it at that. Allison, do you want to just say hi?

**AR:** And my name is Allison Rodvang. I am the environmental specialist at the same place that John works, EMAB. And this is the third TK panel session that I've come to observe the last day when you present the recommendations. So I just want to thank you for having us back.

**JB:** Thank you very much. So, we'll begin the process of walking through the draft recommendations.

**NT:** I wanted to say that this process of pulling these recommendations together felt quite different for both Joanne and I. I think this was a very different session in the sense that it's something quite foreign, quite different from what people are used to thinking about, talking about at our traditional knowledge panel sessions. I think people are a lot

more comfortable talking about things like caribou movement and fish and and it's tough for all of us to wrap our head around this processed kimberlite idea. And on top of that, knowing that it's hard for the scientists as well. Because this situation of considering process kimberlite underground within a lake is different. So we did our best, but we're really open to suggestions here. So, we just had a few general comments. We tried to pull out the main themes of our discussion. So, we'll present those first and then move into some of the recommendations.

PRESENTATION: NT PRESENTS RECOMMENDATIONS: GENERAL COMMENTS: PK AND A148; A148 AND WATER, PKC VERSUS PITS; AND RECOMMENDATIONS: FISH WATER, MONITORING PK, WIND. ONLY QUESTIONS AND COMMENTS TRANSCRIBED, SEE ATTACHED MATERIALS

SLIDE -GENERAL COMMENTS

**NT:** Are there any changes that we should make to these general comments? Did we capture everything? There's still more but are we comfortable with those. Wayne is doing one of these.

**WL:** Lots of changes in ice.

**NT:** Changes in ice, too? Can you add that Colleen? Snow, ice, winds. Thank you. Louis?

**LZ:** Just that, PKC or whatever and the processed kimberlite that has to go back first into the open pit and then eventually how and when they're going to start flooding the area. My main concern is that it's always good to fill the open pit. And it's just like putting water inside a cup and then if there's a crack in a cup the water will seep out. I hope the kimberlite pipe isn't broken or water will be seeping away. Thank you.

**NT:** Mahsi Cho. Thank you. I think our next slide talks about that concern. Scientists would call it seismicity. Earthquakes or cracks in the earth. Fissures that might affect the stability of those pits. So, I think it's on. No. I know it's in one of them. Maybe. Should we add that Louis? Just make sure that that's strong at the beginning? So, concern, how should we phrase it? There is concern about stability of the pits, cracks or fissures underground and any leakage of water. Would that capture it? How's everybody feeling about that? Can you read that one aloud for Louis again just to make sure he's comfortable?

**NOTE: TAPE STOPPED SO THE REPEAT OF THE COMMENT WAS NOT CAPTURED**

**SLIDE - PK AND A418 – GENERAL**

**NT:** OK? So, let's move on. So, we spent a lot of time talking about the pit and the cone and how much PK there is and what would fit where. So, we tried to capture that here. So, we're just commenting here that it was a major part of our discussions. We aren't making any recommendations, we aren't making any guidance. We're just pointing out that this was a significant part of our discussion. How's everybody feeling about that as a general comment? Bobby?

**BA:** Instead of putting all the slimes and PK in one pit, can the slimes be taken out of the PKC and moved somewhere else? And then the black kimberlite itself be put in a different pit or something. Maybe in the future, something with the slimes, keeping the black kimberlite, the sand anyway, from remixing somehow, if it was it was kept a little bit longer. I don't know. I wonder if you can take the slimes from the PKC itself and moving it somewhere else so that the whole pit doesn't have the two parts to the PKC, I mean PK. The slimes and the PK itself. Can that be done?

**NT:** Did you want to answer? Just let Colleen comment on that one maybe.

**CE:** So, do you mean taking the slimes out of the PKC that are in there right now, and finding a different place for them. So not in the pits.

**BA:** Maybe put it in a different pit maybe. The slimes itself and the PK itself in another pit. Can those be separated?

**CE:** Gotcha. OK. Just trying to think. So, timing wise, moving them to different pits, may be a bit tricky. Only because they are still mining A154 until the end of the mine life. But if it was after the mine closed, and they were still moving PK out of the PKC, then it could be a possibility. But I'm not 100% sure.

**BA:** Just last night I was thinking about putting PK and slimes together in one pit in my mind last night in the evening, I was thinking about it again. Maybe if we could somehow separate those two ingredients.

**CE:** And what's the thinking behind it? Like what would be the reason for doing it?

**BA:** Being slimes maybe the chemical contents are a little bit different from the rock itself, from the sand itself.

**CE:** Ok.

**NT:** You can't separate the slimes from the PK. Aren't they one and the same?

**CE:** In the operational material, yes. So, I think what you're getting at is that in the PKC, some of that fine processed kimberlite has settled out in the beaches, and that's the sand. And then you've got the true slimes that are in the centre. Then the operational fine processed kimberlite that would go straight to the 418, wouldn't have that chance to have fines that would otherwise settle into the beaches separate out; it would just all go straight into the pit. Right? OK. You're seeing a difference between those two.

**BA:** Two different...

**CE:** Materials.

**BA:** Materials. Yeah.

**CE:** Yes. OK.

**NT:** What exactly are slimes? It's still PK. It's just the properties in the environment.

**CE:** It's the finer fine bits. So, Natasha was asking what exactly are the slimes. And so, when we say 'fine', that's what I was saying with that number. When we say "fine PK", it all goes out in a pipeline together, and then when it gets deposited on the PKC, remember that circle diagram? When it gets deposited on the PKC, the bigger fines, the slightly bigger particles, they settle out first, and form the beaches. And then the super fine almost powdery material, that becomes the slimes and sinks down below that and stays in the centre. So, when it goes to the 418 straight from the process plant, you would have the 'bigger' fines still within the mix.

**NT:** It doesn't separate out.

**CE:** Right. Dora?

**DM:** Last few days now that we've been talking about the open pit. I think we went on a tour out there. It's not, very often that we're coming to the to check out the open pit mine. I'm an elder, I'm not an expert in the area. I don't have experience work in a mine, nowhere near to it. But nonetheless I'm concerned because is there any water that is left underneath, under the pit. That will drain out. Is it toxic? Any elder would say that because one of the elders' concern about the water. And the putting the PK putting back into the pit. To me I think it's a good idea, but probably maybe wouldn't be a bad idea to cover it up with boulders to keep it stabilized under the bottom of the pit. Thank you.

**NT:** Mahsi Cho. Thank you, Dora. So, at the very beginning of our presentation to Diavik, we're saying we are always thinking about water. That's come up several times over the couple days and we want to make sure that's a really strong sentiment that's shared. I'm

wondering if we can go through some of these recommendations because I think some of these ideas are going to come up. Then maybe we can talk about if there's things that are missing. Let's go to the next one. So not only is it on the first slide, but we have a whole section here on water.

## **SLIDE – A418 AND WATER**

**NT:** How do people feel about that first point? Does that capture our ideas? Louis?

**LZ:** Yes. We talk about the open pit and we want to fill it up with water and we've been talking about it for the last few days, while we're here. I was concerned about are they trying to fill the two pits at the same time? I guess they're half connecting underground by tunnels connecting to both pits. I thought, maybe if they fill up with water, they might have water connecting to both pits, they might fill up at the same time. Is that what might happen? That is one of my only concerns I have since last night. Thank you.

**NT:** Maybe Colleen can draw it here to make it clearer.

## **TAPE STOPPED WHILE COLLEEN WAS DRAWING**

**CE:** OK. Back to my awesome drawings. So, this is the 418 pit, and this is the 154 pit. They're connected near the top. So remember Louis, when we were underground on Saturday, we went down then we came back up 418, and we went across and then we came out of the 154 pit. But there's only two or three of these connecting tunnels that run underground. When we went through that door underground and it was a big blast of air? That's called a bulk head, and it's basically a block that they can put in, they can put that on any shaft. So if they want to close a shaft, they use wood, concrete, and shotcrete and they can make a plug basically and stop access or stop water. So, if they were going to fill 418 with PK, they would plug each of these access tunnels that connects it with 154. So that as it was filling, once it hits that level, it can't go any further and it can't go into 154. Because they'll still be mining over here when they start to fill 418 with PK. If they don't fill this with PK, and they just fill the pits with water right at the end of the mine, they wouldn't stop the connection, they wouldn't block the connection and they would fill it all at once, is the plan right now. Does that make sense?

**LZ:** Yes, it's always good to especially the elders you know it's hard to apprehend what might happen and what's to take place. I guess you pretty well have to repeat in order to better understand that this is what I'm going through. This is one of my great concerns because



there'll be a large volume of water be taken to fill in all both pits. So, if they're going to block off the connecting to another pipe I guess, that'll be great, because they'll do it one at a time which is good. Even the old history tells the same thing too, but they blocked one of the roads just so that the seepage wouldn't get anywhere than it already did. Thank you.

**CE:** Thanks for that, Louis.

**NT:** Thanks for your patience Louis and others. As I say, this session has been very complex and difficult for all of us, Joanne and myself included, to try to wrap our heads around. It's been a very technical session. It's exciting to see people thinking in so many directions using two ways of knowing. At least two. So speaking of technical, we had that presentation at the beginning. You had asked for a toxicology study of the processed kimberlite so that you could have some comfort as to whether it would be toxic to fish and aquatic wildlife. Colleen presented the results of that study that was done in 2015 – 2016. And Joanne and I got the sense that you were comfortable or satisfied with that study. It's just an observation here, a place holder to recognize that we talked about it and reviewed the results. Is everybody fair with that? Yeah? Ok. Moving on.

## **RECOMMENDATIONS SLIDES**

**NT:** So here's where we start to get into the recommendations. This was the sense that Joanne and I got based on the notes and the discussions. But I'm hearing Bobby say something a little bit different this morning, so I'd like to check in. My understanding was that people seem to prefer that, if it's safe and if Diavik goes ahead with putting PK in the mine area, that it's better to have the PK underground than to pile it up on top of the land, in the PKC and other areas. So, if they're going to do it with operations, then put as much as they can in there. Of course, as much as they can up until the 30 m. line. But I heard Bobby say something a little bit different today, and I want to check in with the rest of the group this morning as to your comfort level around making this recommendation. Right now, the recommendation reads that there's interest in moving as much as possible off the land from the PKC into the underground and pit area. The cone and the ice cream. Kathy?

**KA:** Just to clarify. We're talking just the slimes and not the fine sand, right? If the PK goes into the mine area, that PK we're just referring to the slimes. We hadn't discussed moving any of the larger fines into the pits. Because it's the slimes we're concerned about.

**NT:** So what would still remain in the PKC?

**KA:** The rougher fines. Because they're more stable, they're like a beach. And then the rough stuff, yeah. And that's where we had talked about putting the larger, coarser boulders on top of the larger fines and the rough kimberlite.

**NT:** So, these, what's in this jar, which would end up being the slimes, would go into the pit, but this coarser material would remain on land? Could remain.

**KA:** Probably. It could remain because it's solid enough to hold boulders, which we had spoken of two or three sessions ago. To put larger boulders on and then a finer cap and a finer cap.

**NT:** So, I just want to check in on the thinking behind covering this. If we know that it's not toxic, is it that the actual material you don't want animals walking on?

**KA:** No, because the way the PKC goes, you got slime, coarser, fine, and then the kimberlite on the outside. Right?

**CE:** Yes.

**KA:** Yes. So, the kimberlite on the outside is fine. I'm just saying in the centre where we have the finer, like from the slime out where the red is, that's where we had discussed putting larger boulders to just make a walkway for caribou. Did we not?

**CE:** I think that part of that was dust, that you'd mentioned. So that that fine beachy material could be moved by wind if you didn't cover it. And I think that's where you had said, Bobby, that you'd prefer to have it covered a bit, that beachy stuff, because it prevents the wind from moving it. I think that's where it came from. So, I kind of tried to capture that here, so make sure that we're good with this. So, if the PK goes to the mine area, the TK Panel recommends that all of the PK slimes also be put into the pits. There's interest in moving as much of the slimes as possible from the PKC into the mine area. And then a second bullet saying the beach materials and the rough kimberlite, which is that coarse kimberlite, should stay in the PKC area, i.e. anything that can support a rock cover.

**KA:** Correct.

**CE:** OK. Do you want to make it? I'm trying to remember. I think we've had it in the past that there should be a rock cover. Do you want that or do you want to just say that "could".

**KA:** I think we discussed that at one session and I don't think we really resolved it. We were going to do it at a different session as we got closer.

**NT:** I think, I was just looking at this the other night. I think there was general interest in putting boulders on, but because there were the slimes, we thought the boulders would just sink, so we abandoned that idea.

**KA:** And went to the pit.

**NT:** Yeah.

**KA:** Thank you.

**NT:** Okay. Wayne?

**WL:** There's not going to be a 100% recovery of the slimes from the PKC, so, putting the boulders in is just going to go down until they can't go down further, and it'll just push the slimes closer to the surface. So, I can't see how that's going to solve too much. I think once they get the slimes down to a certain level, that it should be filled just like pits with the water so that the caribou go there, they can swim across that pond, or whatever. Or if it freezes in winter, they can cross it. So the slime will still be down as far as, just like in the pit. And then there'd be water on top of that also.

**JB:** Yeah. I'm not sure at this stage we can predict how much of the slime can be removed. So we may have to tweak those recommendations at a future point. So, we can see how successful they are at removing the slime and decide from there if there's anything left, what the challenges are and what our recommendations are.

**WL:** Well that's the reason I say about the water. Like you might get 70% out, but maybe there's still 30% down there. And if you fill it with rocks, the slime is just going to come to the top. So that won't solve anything.

**CE:** And I think, you raise a good point Wayne. If Diavik did go ahead with this as the primary closure option, they would have to change their plans in terms of how they're closing the PKC and then we'd be revisiting all of that. All of that, or the design would totally change, or could totally change. So that would be discussed here, it would have to be brought back to the panel again to discuss further. Does that make sense that it would follow from this?

**WL:** Yeah, I'm good with that.

**NT:** So, Wayne, could we add a last sentence maybe here saying exactly what you just said. Saying that the closure for the PKC would have to be revisited by the TK Panel and recommendations made around closure and monitoring because of changes in the mine plan, or something like that. Yeah? Ok. Colleen's suggesting that we combine these two bullets (11.2 / 11.3). I think that works. How about "for example, if it's not possible". Ok, just as she's making that edit, we generally got it with these three bullets? How are

people feeling? *NT rereads new combined recommendation.* You want to think about it for a while? OK why don't we move to the next one and then we can come back. Oh, Sara did you want to say something?

**CSB:** We have to cover that PKC the leftover from covered just around the pond or cover the whole area with boulders and make it look like an esker or something to be. You have to put a lot of boulders around it and make sure it's covered real good so that humans or animals won't get to it. But I don't know about the small mammals like squirrels and that, they make holes under the ground and have dens, so. Is there something like an esker that tends to the foxes and other small animals that would make their den in there? This is another thing that we need to think about.

**NT:** Thank you Sara. I think as we're talking this through, it becomes more obvious to me that again, if there is a change in the closure plan, that we really have to revisit the whole PKC closure and I'll make a note here. It's a good point. We often think about the caribou and the people and maybe we forget sometimes about those smaller mammals. So, I will add that to the report. Thank you. OK. Moving onto fish.

#### **SLIDE: FISH – RECOMMENDATION**

**BA:** I was mentioning different kinds of fish that we get in these lakes up here. We're dealing with fish that live above the bottom. We've got to remember that these lakes have ling cod. Ling cod in the ocean, they're bottom feeders, they mostly feed in the bottom of the ocean. Ling cod do the same thing on these lakes. I've come to know that because sometimes I tend to get on my line and find my depth on the lake. And sometimes I get right into the bottom of the lake and sometimes I happen to find ling cod right close to the bottom, at the bottom of the lake. So those are some of things that I come to find when I fish these lakes, is ling cod and maybe that other one, sculpin. That those are some of the main fish that live at the bottom. The bottom feeders. We've got to remember that there's bottom feeders in these lakes such as ling cod and sculpin and I'm not sure, maybe there's another one. But just as a reference, ling cod and sculpin would go down into the bottom of the lake as well. You've got to remember that too.

**KA:** Bobby, is the chance that they will not go down that deep based on whether there's food down there. So, if there's no food down there, would they go down anyway?

**BA:** Well, they would if they wanted to move around. When they move around doesn't mean there's no food there. They're going to move over or close to the bottom of the lake and find, look for food in there. It's just the same thing with us. We're land people. We do the

same thing on top. We look for food on top of the land over there. It's the same thing with ling cod and sculpin. They'll definitely go down to those levels as well even though it doesn't hold any nutrients in there. They tend to look for those nutrients anywhere in the lake.

**JB:** So, yeah that first point suggests that they'll only go where there's food. So, is that wrong then?

**BA:** Well in my opinion, when they're looking for food, they'll go over where there is no food to find and then go over to the other side to find their food, their vegetation. Some of these lakes have no vegetation, sometimes just sand alone, just sand alone and they will feed on that too. Sand and mud at the bottom of the lakes. Trout will do that. Any of the fish will do that too. They'll eat the bottom of the lake to get the bugs within that sand and what's in the bottom in the same as well. And I know for sure even our dogs do that same thing too. When they get sick, when they get tape worms in their stomachs, dogs will eat the mire, the mud. And fish will do the same thing for their stomach. When you see fish that are so thin. I've seen fish that are so thin and feeding on the mire at the bottom of the lake as well. I've seen that happen in shallow places where very thin and sick fish in my opinion, they eat the bottom of the lake as well. And having half wolf and half husky, we've raised half huskies and half wolves all our lives, my dad's been doing that because it's a wolf, it knows the nutrients in the mud. It'll eat mud to get rid of the bugs in their stomach. The fish will actually do that too.

**NT:** OK, so I wonder, I know that, we've heard different things through the last couple days. What if we added the word "generally". Fish "generally" go where they know there is food." Would you be more comfortable with that?

OK, so the other thing that I want to check in with the panel about, I'm not sure we got clear direction from everyone on this. I hope everyone can see this. So, at one point we talked about filling the PK just in that pit, just in the cone, sorry, just in the cone. We also talked about filling it in the cone and the pit. The ice cream here. So, from the bottom all the way up until 30 m. At one point I heard people just wanted it in the cone, they didn't want it in the ice cream. But as I reviewed the notes, we moved from there and talked about, well maybe it's ok to keep the PK up in this pit. Because after we heard what James had to say, we learned a lot more about the properties of processed kimberlite. But I think we need your direction on your comfort level about whether the PK can only go in the cone 7.5 million cubic metres, or whether it could continue up into the ice cream part, into the pit, as long as it didn't get any higher than that fish habitat 100 m point, like Bobby was saying. And one thought I have, Bobby is if, you're saying that the fish sometimes go that deep and need that substrate, or need that lake bottom, you know if the lake bottom is down here, it's very unlikely for a fish to go more than 345 m or 1000 ft. So, filling the PK up to this level would help with that.

**BA:** Just yesterday again, I commented on how deep fish can go, where we can find fish. Like I said, sometimes my line on my jigger, how much line I put on it, I usually put at least more than 250 yards or so, really, really long. Really long. And sometimes when we want to find depth of lake where we're fishing, we put out all the lines and the bait to go right to the bottom. We know how deep it is, and slowly we pull it back up to the level, and sometimes because the pressure in the air and the pressure in the water, the levels will be different. Sometimes the fish will be right in the bottom because the pressure in the air is going to keep the fish at the bottom. They don't actually live or congregate in that area, sometimes they could be half way down the lake and stay in that lake depending pressure in the environment, on the lake pressure itself. I've come to know that because when we want to find the depth of the lake and we work our way, we keep pulling it up, we keep pulling it up until we find that depth where the fish are congregating and then fish, and then stay there. You go any higher, nothing. You go any lower, nothing. So, you find that depth.

**NT:** I wonder, this seems like something that maybe needs more discussion, because I've heard different ideas around the panel. Could anybody else comment on comfort level? What I'm hearing from Bobby is that it needs to be more than 100 ft, but traditional knowledge holders, others in the room, might have some idea about what their comfort level is, how deep the fish go.

**DTE:** I know that I'm not a professor, I don't live under the water, we don't really know how deep the fish go. But I know they go deep. And they go just about to the surface. So, it's hard to say. But if they want to feed, I know the fish swim in different areas because the lake is never the same. Sometimes it'll be really deep and then it'll go shallow and then it'll go deep again and then it goes up again. Just like the hills we see in our home town. You know, because of the volcano a long time ago, that's how the land is built. A few years ago, we had this one guy come into our area to check to see where we have the deepest part of Great Slave Lake, and we've seen it. And it moves up and down. And that's how we know. That sometimes the fish live deep, some fish live up. In the big ?, they have seen a big fish that live way down there, but the divers couldn't go down because of the pressure, that's what Bobby said. That's how it is. We don't breathe the same thing as the fish, so we don't really know. I think we need more, to talk about it more. And I'm just an alternate for Celine, so I'll just say what I think. And if Celine wants me to come back, then I can sit in and say more. But when I go home, I'll ask questions, and I'll ask the elders to see if I can get more information. Because they go out. Even from our ancestors. People who live out in the bush and how they go fish and feed their dogs, long time ago. Today it's not like that. Everybody uses snowmobiles. In Stark Lake in my home town, they used to use the lake to feed their dogs. Now it's overpopulated, and there's something in the water like mercury. The fish is deformed. So here you know, last night I told you I dreamed about the fish that come towards me, that

look so ugly, I was just wondering what that means to me down the road. For me when we talk about this cone with the slime, because the slime is like quicksand, I want it to be removed from the ground because there are animals that'll go in there and they'll never come back out and they'll sink. We do live off caribou, but there's ground squirrels, there's birds, there's geese, there's ducks, there's wolves, there's grizzly bears, they have their cubs. You never know if they go to the slime area and if they get stuck they're not going to come back out. Their mother's going to try, but it might not help. So we have to protect those things. And I'm not sure about the fish if they go down fast and they go into the slime are they going to come back out? I don't know because I don't live under the water. So, I think we need to talk about it more. That's what I think. Mahsi Cho.

**LZ:** When James was speaking to us yesterday, yesterday he mentioned that the water wouldn't go into the deep waters because the pressure of the water. And if we're going to put water back into the open pit, fish probably won't go that deep. He's probably right. That's what I'm thinking. Back home we have large lakes, but I don't think there's any 100 ft deep, if we're going to sit and net, then we have to put poles in the water. So, in our area, there's no 100 ft deep water in our area, and what James had mentioned yesterday, I just wanted to relay that message again.

**NT:** So it sounds to me that like Terry is saying and we're hearing from Louis and Bobby that maybe we're not comfortable putting a specific number – this 30 m., 100 ft magic number. What I'm hearing is that folks need to go back to their communities and learn more about or ask more questions about how deep fish go and maybe we can rewrite this a little bit so that the recommendation is that we need to draw from the TK around fish behaviour, how deep fish go as well. So that we can give some recommendations about that fish habitat area.

**WL:** Yeah, there's a lot of controversy about how deep this thing should be. Like how far from the surface of the water, but people live in different places like Contwoyto Lake and Great Bear Lake, and this little lake is just like a little puddle compared with those lakes and those bigger lakes, they do go deep, and there are big fish up there. But here, the fish like right around this area here, the fellow that was here yesterday, James, he told us that the deepest hole around this area was only 125 ft deep or 135 ft deep, so 100 ft deep is very close in the ballpark. But perhaps to settle everyone's mind is to get a marine biologist in here you know for a little session here.

**NT:** We have a recommendation that the TK panel would like to see more scientific research to see what the effects of PK might be on fish specific to Lac de Gras and maybe we can add something on fish behaviour. But, if we're going to be practicing two-eyed seeing, we have the science, but we also have the TK. I'm hearing different things in the panel and seeing some nods when your saying it's probably unlikely that the fish are going to go lower than 100, and I'm seeing others around the room nodding, but I'm also wanting

to honour Bobby's idea that maybe they do go deeper than 100. So I'm wondering whether we should not attach this magic number and revisit this once you have time to talk to TK holders in your communities.

**CE:** Sorry this is may be me thinking more science-y, less TK-y, but is there a way to make it relevant to the overall depth of Lac de Gras? Does that make sense to people? Instead of trying to find a number. So the maximum depth in Lac de Gras, James was talking yesterday about deep blue, which is 40 m. / 135 ft. that's the deepest point as he was putting it that he knew of. I do believe that in the middle of the lake, from the old bathymetry, the old depth work that they did, I think there's one that's about 50m as the deepest point in the lake. So I don't know if it makes sense to think about the overall depth in Lac de Gras when we're thinking about how deep do we want this area to be?

**NT:** That's about it. That would be Lac de Gras.

**CE:** The deepest point of Lac de Gras. The average is 20 – 25 m.

**NT:** Does that piece of information change the way people are thinking? Because this is, if we think about the whole cone and the ice cream, this would be how deep Lac de Gras is at its deepest point. So, do we think that fish might go deeper than that if they could? I'm seeing a lot of no's. Kathy? Oh.

**??:** If you got it on 30 m, it can't go any further, so it's got to, they got to live there. That's the way I see it. But it all depends how deep you make it and you could make it as deep as Lac de Gras and it would be just as good I think. Or, yeah, because that looks good to me there, the way it looks.

**NT:** Thank you for that. Kathy?

**KA:** Just to add that if we go to this TSS, the total suspended sediment, how cloudy or clear is the sediment? How much sediment is in the water? And then it says sediment in the water can affect fish gills. So, if a fish goes down into the PK beyond the 30 m level or whatever line that is, I think once he gets down into the PK and realises it's affecting his gills, he's not going to hang out down there. He's probably going to come back up. So, they're going to figure out, I think, on their own like how far down they can go before they're having trouble to breathe. Because TSS in water affects their gills. So, I don't think it's going to continue all the way down if it can't breathe. You know?

**NT:** Joanne and I were just talking and want to put forward maybe a compromise which is what if we change the wording so that, if the PK were to go into the mine, the cone and the pit, that it could not go any higher than the deepest point in Lac de Gras. Nancy is saying that sounds good. How do people feel about that? I'm seeing lots of nods. Yeah? Bobby's still not convinced. OK, I guess we have to park it then.



**JB:** So, if we approach this as a guiding principle, we're trying to come up with a starting point of in terms of what would be safe for fish, that we're confident in, on the one hand, and on the other hand what is needed in terms of space for the PK. So, it doesn't mean that these numbers can't be adjusted. Maybe we find that we don't need that much space and we don't need to fill as high as what we're discussing here, or it could be that more space is needed and that we need to find alternatives. So, are people comfortable with providing that kind of guiding principal and revisiting any concrete recommendations in terms of numbers? You're good? OK? OK.

## **SLIDE – WATER - RECOMMENDATION**

## **SLIDE - MONITORING PK – RECOMMENDATIONS**

**CE:** So, I just had a question about this one in terms of logistics and ability. When I read this one I wasn't sure if it meant when the PK first starts getting placed underground, like so the first instance of placing PK underground, so when you're taking that operational processed kimberlite and you're putting it way down deep into the underground. Because that would be very challenging in that it's going deep down into flooded mine areas where people wouldn't be allowed to go for safety reasons, obviously. Or if this was referring to when they are putting the water cap on top of the PK in the 418. So, I wasn't sure how that was meant to be interpreted and what people are meaning to see and understand at first. So I was just wondering if you guys could provide some clarity on that one.

**KA:** I'm not going to speak to clarifying that, but maybe we can clarify from the first bullet, when the slimes are moved from the PKC into 418, not the mine area. Just to clarify that one. Into 418. A418.

**CE:** OK.

**KA:** I know in the beginning we won't be able to see how the slimes are being pumped into the mine pit, because that is way, way, way down there. So, you won't see that at all. Perhaps maybe by the time it gets  $\frac{3}{4}$  way up, the carrot portion and because James was saying what they would do is they would let it settle then add more water, then add more PK, let it settle like in the jar, pump off that water, so they would keep doing this. So perhaps maybe at a  $\frac{3}{4}$  level or when it gets to the base, that might be a time for us to go and look down there and say, "OK, that looks good, keep going". And by that time, we'd know how much they'd put in there.

**CE:** Right, OK.

**KA:** And what line level is left. What's left in the pit, what's left in operational and how much more is that going to fill the pit, the pit part.

**CE:** I'm wondering if we could use words like, it's using a bit of Diavik language, but "as soon as it's safe to do so", or something like that. So that gives you the first opportunity to see it as soon as its in a place that's safe to do so.

**KA:** And we have a good visual to do so.

**CE:** Yeah, so is that OK to use that kind of language? I don't know.

**KA:** Probably both you know 'until it's safe to do so' and 'we have a good visual of the level'

**CE:** OK. Let's try.

**NT:** **Recommendation 11.11** – Bobby's nodding his head. Terri what do you think? Yeah? **Recommendation 11.12** Is this one we'd like to put forward as a recommendation? Kathy's nodding. Dora? Yeah? **Recommendation 11.13** This is one we were challenged with. Because we talked a lot about does anything grow on PK? If it's in the pit underwater, is anything going to grow on it? Should we try to put seeds in it to try to get something to grown on it? Should we try to encourage fish habitat in that way? And the thinking was that going to see those vegetation plots and monitoring might give people more insight into how PK behaves when it comes to whether plants can grow on it. Wayne?

**WL:** Myself, I don't see any point in going to see those vegetation plots because we're talking about two things. We're talking about surface and then we're talking about low water level. So, its two different scenarios. If there was somebody to maybe take care and put the PK or slime or whatever and put it into a container like a fish tank, and then try and grow seeds or something like that, it would be much better than going to see something that doesn't pertain to the situation that we're going to be in with the slime under water.

**JB:** So, Wayne, we're still talking about the possibility of having some PK on the surface, so not just underwater, and I think we're anxious to see what to expect in those coarser areas where we still will find some level of PK.

**WL:** I wasn't aware of this. Before when we were talking about growing plants, to me it was aquatic plants. Something below the water surface. On the slime at the bottom from the surface down.

**JB:** Except those mats are on the surface now so we have the opportunity to see what's happening out there now. There not underground or underwater, they're on the surface and so I'm sure people would be curious to see if there's anything happening out there.

It's been a few years since we've been out to see them. To see what's going on, if anything there. It's simply an opportunity to learn. You don't have to go Wayne.

**NT:** I think you've been uninvited. (laughter) I want to check in with everybody. Because there was quite a bit of discussion around underwater plants growing on PK and there were some folks saying that nothing will ever grow there. We talked about screens and seeds and whether those would work. Is there anything more that we want to say around aquatic plants and PK or PK underwater? Or should we just leave that? Certainly in the report Joanne and I will have a paragraph that summarises all the discussion. It was a rich discussion. But is there anything you feel strongly about or that you feel should be here? Wayne?

**WL:** I recommend that we do a test plot like in a fish tank or something like that to see if there would be any chance of aquatic plants growing on that PK. Over and out.

**NT:** Does the TK panel agree with Wayne's suggestion to make that a recommendation? I see one nod. I see two nods. That's not enough to make it a recommendation. Yes? OK Kohlman, good stuff. So, the TK panel recommends that. Reworded 11.14. OK. Last slide.

#### **SLIDE: WIND – GENERAL**

**BA:** Especially for the dykes, maybe monitor after freezers are taken out of the dyke. I'd really like to have that looked at too. The freezers. I'm still worried about those cement or the wall coming lose after they thaw. That's what I wanted to look at too. At least monitor before putting the slimes in the pits, see if its stable enough without the freezer.

**NT:** I knew that was important to you, Bobby and that was one that we tried to include. It's in 2 here (recommendations 11.11 and 11.12). That idea about the stability of the dyke is meant to include the concerns that you and Louis were talking about, the construction of the dykes as well as the concern that people had about seismic activity, earthquakes, tremors, how all of those things will affect the safety and the stability of the dykes. Yeah? OK. That's the end of what we pulled together. Is there anything that we haven't pulled into this presentation that stands out as really important form our last couple of days. OK. I think people are not saying anything because they want a break. I get that. So, let me just remind the panel what we have on the agenda for the rest of the day. *Went over agenda.*

## 15 MINUTE BREAK

### PRESENTATION – EMAB, John McCullum

**JM:** EMAB is a board that was formed when Diavik was going through an environmental assessment. The Minister of Indian Affairs at the time said that in order for the project to proceed, one of the things they needed was for an independent watchdog to be set up and the members of that board are 5 Aboriginal parties, all of which are represented here today, the GNWT, and Canada and Diavik. There's 8 members on that board. And our job is to oversee what happens at Diavik, and one of the things we're supposed to do is to look at the scientific knowledge that they produce and also the traditional knowledge. And so, actually when this panel was originally formed, it was formed by EMAB and then after a couple of years it moved over to be run by Diavik to give it more connection between the panel and Diavik. That left EMAB to wonder how are we going to assess what's happening with traditional knowledge when we're outside the panel and are outside Diavik too. And because we don't really feel we're qualified to assess what traditional knowledge is given. But what we do feel we can assess is how Diavik is dealing with the traditional knowledge. The board met with one panel member and one person who has been involved with some of the panel activities before. So last May, almost a year ago, Bobby was at our meeting and Madeleine Drybones from Lutsel K'e. And after that we talked quite a bit about what EMAB does. We talked quite a bit about what the panel does. The kinds of things that the panel. Oh and Joanne was there and Natasha was on the phone. So, we sort of learned about what happens and hopefully Bobby learned what EMAB does. And then after that our board got together and came up with some traditional knowledge recommendations for Diavik and some of them are related to this panel and some are more general.

Short summary of EMAB's recommendations to Diavik about the panel and what Diavik responded:

EMAB talked about this and the board struggles with how EMAB and the panel should work together. What the best way that we speak to each other is. And anything you guys have to suggest about that would be helpful.

Following the meeting with Bobby and Madeleine and your facilitators, the board talked about what we saw for a while and made a number of recommendations.

1. How often the TK panel meets. The message we got is that it's important for the panel to meet at least a couple of times per year just for to maintain continuity. People forget about what's going on and it helps to keep the relationship solid and gives the panel the feeling that it has a strong direction. And so, we did make that

- recommendation after talking to the panel members. Diavik said they couldn't guarantee that. We made the recommendation and they responded.
2. The second recommendation is one I would really like you to think about today. It's hard for us to know exactly how to work with the panel and to know what the panel is thinking about what's happening with their recommendations they made to Diavik. That's what we're really looking to you to tell us. And our recommendation was that the panel meet where there's one session where you go through all the recommendations that you made over the last five years, pretty ambitious, maybe crazy. And maybe that's more than one session, I don't know what the best approach would be. And then to give us your assessment of how Diavik responded to those recommendations. Were you happy that they took them all really seriously? Were there some they said they couldn't do that you thought were important? Just any kind of an assessment of the recommendations that you made and how Diavik responded. And the second part is what have they actually done with the recommendations? So are you happy with the way they're starting to build the waste rockpile for example, or the way they're proposing to do reclamation. So that might be a longer-term thing because some of those recommendations are not in place yet, they won't happen until later on. So that was our main thing. If EMAB can't assess the traditional knowledge. What we can do is assess what Diavik is treating the traditional knowledge and the recommendations you are giving. And that's what we'd really like you to think about. For EMAB we think it would be helpful if the panel had a session focused entirely on that.
  3. Other topics for panel meetings that came up with Bobby and Madeleine and your facilitators. 1) Women's pane to talk about vegetation and berries and medicine and gathering and those kinds of things; 2) post-closure monitoring – since we made this recommendation, you've actually had a session on post-closure monitoring. I think that's been done, but we'd love to hear what you think about how Diavik is responding to those. 3) To look at all the recommendations as things have changed over time. To make sure they're still relevant or maybe they need to be changed a little bit. I know for us, Diavik's closure plans have been a moving target over the last few years, and particularly over the last year or so. So, some of the recommendations that we made still make sense and some of them don't. So, for both of those two recommendations, Diavik told us the panel chooses what it wants to talk about, not us. So, ask the panel. So that's what we're doing.
  4. Youth – it's good to involve youth in the panel discussions and Diavik should continue to involve youth in all of those meetings. And they agreed.

Those are the recommendations we made to Diavik about the TK panel. We made a few other recommendations about the use of traditional knowledge in general. We review different reports that Diavik produces. Every year they produce a wildlife monitoring

report, they produce an aquatic effects monitoring report, closure plans from time to time and they produce an air quality monitoring report. And we want them to be clear on how they're using traditional knowledge in each of those reports because they're supposed to be about science and traditional knowledge. So EMAB asked them to report to EMAB once a year on what traditional knowledge they've used each year in each of those kinds of reports. And it's a hard question and it's not, sometimes it seems to be hard for companies and for EAMB as well to know how to use traditional knowledge in some kinds of environmental monitoring. It might be easier in wildlife monitoring and harder in air quality monitoring, but we think they could do a better job and a more thorough job in terms of incorporating traditional knowledge into their reporting and to talk to us about what they've done so that they're accountable. And that's something where this panel might have some input as well. What more traditional knowledge they could use in terms of aquatic reporting or air quality or closure or whatever. And that's really it. There weren't that many recommendations. The sheet I gave you is just the recommendations that EMAB made in terms of the panel. I didn't include the other recommendations on that table. The take home message is that if you think there's a way the panel can help EMAB assess what Diavik is doing with your recommendations either through a panel meeting or through other ways, that would be really helpful for us.

**KA:** Does EMAB not get our reports and recommendations that come out of this panel? We get 11.5 x 14 sheets with questions, recommendations, Diavik's response, etc. Do you get to see those at the end of a TK workshop?

**JM:** Yes, we get those. We post them on our website, so the public has access to it.

**KA:** Where is it that you're having a problem with what comes out of the TK panel, what EMAB sees, what Diavik does with that? Are you not seeing something? On how Diavik is taking our recommendations and they're not doing it. I know you get other reports from Diavik. And you said you're not really seeing our recommendations in their day to day or monthly activities here. Was that what I understood?

**JM:** What I was trying to say was that we would like to hear directly from the panel about what they think about Diavik's responses. We do see the chart and we do see the reports. But we don't see a long-term view from the panel about what you think is being done and not being done. What recommendations Diavik is accepting or what they're saying needs to be changed. It's like seeing things with your own eyes. We'd like to hear directly from the panel.

**KA:** My experience with all the recommendations that we bring to Diavik has been positive. They've always listened to us with an open ear. There's some recommendations that we've put forward that have been a definite no. There's been some maybes and there's been yes. And that's been very helpful to us. My feeling personally, is that they've

always been very open to what all of us have to say, right from the animals to putting the slimes in the pit. We're going to present that today. This is our first time discussing putting the PK slime into A418. I've been on the panel 3 years now, they've had a good open ear. I'll pass the mic on.

**NT:** It would be helpful to hear quick impressions from anyone else who's had that long-term experience. Anyone else? Bobby? Nancy? No?

**??:** One of the things that has come up several times and we've been flexible, is to have that women's session on vegetation. Just because it's our women who know our medicines. It's our women who pick the berries for the most part. And they know what's out here, what to look for, where to look and how to tell if its healthy. All of those issues. And that's been a source of frustration, one source of frustration in not having that recommendation supported. So that's one observation I have. On the other hand, one of the changes that I saw when we moved away from working under EMAB to working directly with Diavik, is that we had access to a lot more answers to our questions and immediate answers, and so that was extremely helpful. And it made it, we were dealing with things in real time and that was quite satisfying.

**JM:** Just wanted to follow up on the comment from Kathy, you were saying sometimes they reject recommendations or they give you a maybe. I'm wondering how you respond to that. Are you happy with that? Are you satisfied with the reasons that they give?

**KA:** Some of them we probably weren't happy but a lot of times it was due to technical things. It could be say we wanted to move a rock pile or something like that, but they say no because the middle is frozen and maybe there's something you can think of. One of them was we wanted to move the rock into the pits, but because rock is numbered 3, 2 and 1. 3 being the acidic rock, 2 being the medium rock, and 1 being the good rock. And putting it into the pit would cause acid in the water which would kill the fish, any fish that would go there. So that was a no. But once we understood why it was a no, we said, OK, wonderful. We didn't know. We thought rock was rock was rock. But there's different kinds of rock. So once we knew that, then we say ok don't do that then. We take your no. And there's other things. Say maybe we can do that. For example, putting PK into the bottom of 418 to get it off the land where it's a danger to people and animals, people and wildlife. So that's a maybe. Could be treating the water before it goes into the lake. Yes, we can do that. So those are examples. And they do, they listen to us with an open ear. I've seen that. They've never once looked at us and said, 'oh that's a crazy question'. They go 'wow, we never thought of that'. Because of traditional knowledge from our elders, and things like that. Just little things like that. Does that help?

**JM:** Yes, thank you.

**JH:** From the TK perspective for our elders and our youth that participate from Tlichio government, we found that DDMI responded well to what we asked them. When they were talking about the PK contaminated area site, they seen you know like how elders are more visual because they don't really understand how to read and write. And look at plants, I don't mean plants, but plan of the site, mining site area and the numbers, the slope 3 to 1, 1 to 3 and stuff like that was all on maps. Because they're all visual, and when we had Janelle here with us, because she was a youth, and I've got her to ask questions like, "in your eyes, what would you see?" and "if you're an elder, what would they see and hear?" They wouldn't really understand the technical, the science part of it, but they would know a lot of TK part of it. So, what I got Janelle to ask is if we could go to an area where they could understand what is the PK contaminated area, and what it's mixed with and the slime they're talking about in the sandy area, and where does it come from, from the start. So, think about it I told her. And she said OK.

And when Gord was here, we got an opportunity to go to where they crush the diamonds, where they sort them. The process plant. We went to a process plant. And they got to see. When we took Louis there, he was pretty amazed at how they got little pieces of diamonds out and the process of it coming out. And then looking at the machinery, the slurry and the water that they use all the way. And then being disposed at the PKC contaminated site. He got to understand where it came from and then now we knew that we're going to talk about how we're going to contain the PK site. We talked about boulders, covers, and then they were really worried about drainage going into the big lake, and they talked about the contaminates. So when we came back. I think this is my third session in a row, to come back with the elders and the youth. I saw that they're really well, it's like they take our concerns seriously. Especially when the youth presented when we asked the youth to ask all these questions. And even the elders asked the youth to ask questions because they feel that their voice is stronger and they're the next generation. And we got an opportunity to go underground and when we talked about the PKC the slimy part, to go underground, and we took Louis to go underground, on this trip, it was a good opportunity to see. And when we talked to a guy called Peter that was taking us on a tour, he said that they taught him where you see it at the edge of pit 514, that's the actual lake bottom. And then we go down and go deeper and deeper and deeper. And then when we took our elder Dora to one of the sites where you're halfway down the pit and then you're at the look-out. She got to see the depth and then I asked her a question "do you think fish would swim this deep?" and she said no because she got to see how far down she was, like half-way through. I told her that 'ok if fish doesn't go this deep, if they fill it with the slime, the PKC, would you feel comfortable if it was put down the tunnels, the pit, and then filling it up with water.' And then she started to get the picture because we went to different sites. So that's good that DDMI has taken us out and they responded to the questions, and we got opportunities to go places, like where we went underground, 99% of employees that work here don't go there. It was a first



opportunity to go down as panel members, it was good. I feel pretty comfortable that they listen to our questions and give answers. If they don't have the answers right there for us, they'll go back and then come back and give them to us and I feel comfortable with the elders that Tlicho government has sent because we're really well informed of how we present when we speak to the panel.

The way it works for TG (Tlicho government), is that they select the elders that have a lot of knowledge. We also select a youth to come see the changes and how it impacts and how we can also help fix. It comes back to TG. Me as a TG employee, I would report everything to my manager and then it goes from the manager directly to the Chief Executive Council. And then we also have a member that sits on EMAB. So, we're all connected that way. I don't know how other boards or other Aboriginal members here do it, but I feel comfortable to say that TG is well informed. And we do see the reports, like Natasha when they're done the reports, it goes to DDMI and then to us, so we do see it.

I just trying to figure out the connection between, it was all under EMAB, then it became a TK panel, I don't know if EMAB is getting the right information.

- NT:** That's a question for John to answer, but how many TK panel members were there when the panel was under EMAB? How many do we have? Louis, Bobby. So, it was 4 sessions. The first 4 sessions of the TK panel were held under EMAB and then the panel members requested that it come directly under Diavik and that's what we've been doing since. Does anybody else want to comment?
- NK:** Coming to these meetings a few times and really lean lots. Especially when its' coming to a closure. The more we go the stronger we get as it's getting closer to the closure. So, I'm so happy I came to learn from the elders and everybody here. I'm so thankful to EMAB that's watching out for what's going to happen. We wouldn't always be there. Sometimes we might not know what happened when we're at home. But EMAB would know what happened, while we're not here. Diavik's been listening to our elders and our panel. Each time I come here, OK this is happening, you wanted this to happen, how it's happening. And it makes us stronger. So I'm really thankful for EMAB wanting to hear from the panel.
- BA:** Coming to these EMAB meetings in the beginning and staying here this long has given me a lot of perspective on how these mines appear on the headwaters of Kugluktuk. And it gives me a great pleasure to come to these meetings. In the first place, a province to province thing always comes to my mind. Which is kind of conflicting in my mind when I come to these meetings. Because another province really can't tell another province do what another province should be doing. Which in my mind, Nunavut is a brand new province, and NWT is another province.

It's really a pleasure to be here and to be accepted in this way. Because we live so close to the mining area. I'm just 60 miles north of here. And Nancy was born we're still up there. And to my experiences, where we are born and raised all along. And to give our perspective and our traditional knowledges, all the same thing, no matter if I was Inuk or Indian from this part of the world. We all do the same things out on the land, and use the same things on the land, how we do things on the land. It's really wonderful that we can work this way and give our perspectives to the mining companies, how traditional knowledge has really come to help give the mining companies more of what they need to know about the land, and to our, to all peoples that use this part of the world, they don't know what to expect, or what's coming or what's been done out on the land or how our fish and animals use this land a lot. Because in my part, in my mind, these mining companies and these personnel who come to this part of the world, they don't really know what to expect when they see animals, fish and the air, and the land itself, and how we use it, we're doing a wonderful a job of giving the mining companies in this way. It's wonderful that we're giving them, without our traditional knowledge, they would be doing anything like in the past. They didn't know in the past, what was being thrown out on the eland and what it reacts to the lands. That s all I see coming from the mining companies. And just knowing that these mining companies are saying 'ok, that's what it was about with traditional knowledge, he knows about that thing'. That really makes my mind and my body feel easier. And to work with the mining companies because they're southern people and there totally from a different part of the world. And that's really wonderful to me. What do people think of another province or traditional knowledge, or anybody coming to your province and giving my traditional knowledge? I don't know, maybe sometimes you get different opinions. Thank you.

**NT:** You said before the other day, even though we have this territory between Nunavut and the NWT, the caribou don't pay attention, the headwaters, it doesn't matter to water. That's why we're all here together.

**JB:** Though all our sessions over time, there's been interest in what happens after the mines are gone. And as people from the land, what can we do to keep watching the land, to keep monitoring the land. We've started that discussion. There was a session last year around that and we need to continue that discussion. We need to start planning for that. Where we don't have the mine to continue to pay for us to come here. How are we going to do that? How can we organize around doing that? That's certainly a discussion of keen interest to anyone who's from here. So, there's a lot that we have to figure out and how do we carry on that responsibility beyond the life of this mine or the other mines in the area?

**BA:** I've been coming to your meetings and sessions for as long as we've built EMAB. And it's wonderful to see other traditional knowledge holders of other territories to come to

our territory and giving them, giving us a bit about what they think too. We all use the same land and waters and everything. And I've never had a problem with other people coming to our province too. Little sessions here and there. I like that. Whereas, maybe law makers might not agree in the government or high parts of industry to be conflicting. Whereas traditional knowledge, we all use the same water and lands and everything. And it's wonderful to see other people from, well our neighbours from this part of the world coming to our part of the world and giving a session too.

**JM:** This has been really helpful. I was at one panel session in December 2015, but I was just there at the end to hear your recommendations to Gord. But just hearing you talk this morning and the depth of your discussion, it's really helpful to me and it's helpful to get feedback from Kathy and others on what Diavik does with your recommendations. I would be interested in hearing more about the recommendations that aren't accepted and how you're feeling about that. And what you think about what's going on further into the future. But that's a discussion for another time. Thank you very much.

**NT:** We need to give direction to Diavik as to what sessions you would like to see next and put them forward to Diavik so they can put some thought into it in terms of timing. We're always concerned about timing. That's why we did this one on processed kimberlite now, so that your input is meaningful and timely, it's not coming after all the plans and decisions have already been made. What we've heard for future sessions would be:

1. Post-closure monitoring, watching
2. Fish and water health in the north inlet and if its connected with Lac de Gras
3. Protecting the land – nitty gritty around demolishing the buildings, waste, metals, airports, roads what's going to be left underground
4. What to check for at closure
5. Wildlife movement and health for PKC closure options. And I think that needs to happen once Diavik is clearer on what direction they will take for dealing with the PK.
6. Women's panel on vegetation
7. I'm hearing from John that there would be an evaluation session, this was an EMAB suggestion to look at how the TK panel functions, reviewing the recommendations

Any questions on these topics? Did we miss anything? Are any not important? Do any of them stand out as a priority? I'm going to go through them one by one. Give me a hand up that we want to do this in the future, a TK panel session.

1. Post-closure monitoring, watching - YES
2. Fish and water health in the north inlet – OK
3. Protecting the land – nitty gritty of what gets left behind, demolishing the buildings, etc. Yes? OK.

4. What to check for at closure

**CE:** How does this differ this? The 4<sup>th</sup> one people talk about inspections, almost like a standard? What do we need to say yes, we've done that. We said do this, you've done this, as opposed to watching. So checking that Diavik did what they said they'd do.

**NT:** It's like holding Diavik accountable, making sure they do what they say. Do we like that idea? Yes? OK.

1. Wildlife movement and health for PKC closure options. - Yes? OK.
2. Women's panel on vegetation – Yes.
3. Evaluation session. Yellowknives taught me years ago that their lands department has this weekly meeting that they call their checking nets session. How are we doing? What are we doing this week? Who's doing what? And that's what I'm hearing John propose. A checking nets session for the TK panel. Is there interest in that? Seems to be. Ok.

Is there anything missing?

**DTE:** Evaluation should be all the EMAB, the TK and the Diavik should be all together and work together, we should be working together, be a team builder. If we don't work together, nothing works. I think Diavik and the TK panel should be involved. That we're all working together. That's what I see. If there's only one that makes it hard. So, evaluation should be all. With the EMAB, TK and Diavik. That's how I see it. Mahsi Cho.

**JM:** Just to add to what Terri was saying. One of the things that EMAB wanted to request was that we be invited to come to an entire panel session. So if you meet for 4 days, we would be here for the 4 days. Of course, there might be times where you want to be on your own. If you want to be on your own, then you kick us out. But we would be here the whole time, so we can see the whole panel process as you work your way through the information to make your recommendations. That's something we thought would be very useful as well.

**JB:** John can you clarify if that is something you would like to try just once? Or something on a regular basis.

**JM:** We were proposing it once and we could all see if it worked well we could decide together. I just like Terri's idea of working together. If it doesn't work, it doesn't. But I don't see why it wouldn't. EMAB is trying to get a handle on what the panel does now that we're not directly involved. So that would be useful.

**JB:** Nothing missing off this list? OK we're good for now? Ok.

**SeS:** Introduced himself. New environment superintendent.

**KA: Presentation of Recommendations to Diavik (Gord)**

**GM: Responses to panel recommendations (by phone).** I just have a couple of questions or comments. Most of it was quite clear. First, is the concern to you of contamination. That is our concern as well, and that's something that we'll be putting a lot of effort into. We'll be happy to share those results and work with you on that. A couple of questions:

1. Climate change is a big part of what we look at with, like with the waste rock piles, for example, where we looked at climate change from an increasing temperature perspective. So that was pretty clear on how we would evaluate a climate change scenario there. I presume when you're talking about it in the context of closing the pit and flooding it, that the climate change scenarios would be more related to wind and lake levels, flood, that kind of thing. Maybe if you could comment on that.
2. You wanted to know which equipment we were going to remove from the underground. I presume what you really want to know is what will be left behind, vs being interested in actually doing something with the materials we're removing. Just to be clear there. Your concern is what we are intending to leave behind.
3. Interesting observations on plants and growth with PK as a growth medium, where we've identified that it isn't a great growth medium for plants on the surface. And you're translating that also into 'would it be a good growth medium for aquatic plants, such as rooted plants that might be under the water. I hadn't thought about that aspect of it specifically, because I was never envisioning that the water depth over the PK would ever be shallow enough that we'd have rooted plants exposed. My understanding is that those plants wouldn't grow in water that was greater than 10 m of depth. My question is, is the interest actually wanting to grow aquatic plants or was the testing of the aquatic plants more a way of understanding the properties of the PK in an aquatic environment.
4. The last one is on wind effects. Again, very well aligned with where we're doing as well. The wind behaviour, particularly on the outside of the dykes, is definitely going to be the driver that sets up the circulation pattern behind the dykes. So, the stronger the wind and the bigger the waves, the more that water is going to circulate in that area behind the dyke. So, that's one of the drivers. We can help or hinder that based on how big we make those breaches in the dyke. If we want more circulation of the water, and the wind is strong, one way is to look at what the future winds might be like, but the other is to make the dyke breaches larger to increase circulation. Or if we want it to be less circulation, we make those breaches smaller. You're absolutely right about the need to understand both how the wind and circulation work inside the dyke and how it works outside the dyke.

Those are my main questions and comments out of the presentation.

- NT:** I'm not sure there was a specific question around contamination, Gord, other than your asserting that it is a concern of Diavik's as well. So, I'm going to assume that, but we can circle back if I'm wrong. But I heard an interest in wanting to know more about what the panel meant by climate change impacts and detail. The gist of that conversation was around concerns about PK in the actual pit and whether climate change impacts, temperature, floods, rare extreme events would somehow compromise the stability or the integrity of the way that the PK was put and kept safe in the pit. Louis, for example, had concerns about how seismic activity might affect some of the fissures, and how that would ultimately affect the containment of the PK. James gave an excellent detailed presentation yesterday that included where the fault lines were.
- G:** I wasn't expecting a comment back on the contamination. And thanks for the clarification on the climate change. It's really just looking at extreme, but unlikely events, but what might be more likely in the future with climate change in that context of safe storage of the material as they put it into the mine.
- NT:** The next question from Gord was regarding buildings and infrastructure. What will be left behind vs what will be gifted or given away. I think, please correct me if I'm wrong. If the interest was wanting a checklist of what will be left behind. What will remain underground? What's going to be taken off site? I think that was mainly the interest, keeping in mind that the TK panel has always expressed they would like to be gifted anything that's still useful and that, for example, having some sort of facility to support ongoing watching programs is a strong recommendation that came out of TK Panel 10. Does anybody else in the panel want to add to that?
- JB:** I just add that Wayne in particular was looking for a very detailed breakdown of materials, particularly metals that he was concerned might create chemical reactions if left in water or open air. So, he just wanted to make sure that not all metals were assumed to be the same and that we might want to pay attention to a lot more detail.
- GM:** I hear on that bullet on slide 7 on water recommendations that it's mostly about what we'll leave underground. I expect there wasn't much interest in the actual materials/equipment that we'd be bringing out of the underground that would be of value to anyone. It's mostly what we're leaving in, or what we're proposing to leave in. And making sure that it doesn't become a contamination concern.
- WL:** If you're going to leave any machinery underground, then all the fluids will need to be taken out. The antifreeze, transmission fluids, all oils, from the differential, grease off the machine, otherwise that could get into the water.

**NT:** I'm thinking we should make a change to the wording of the recommendations. Maybe we should add "equipment to be removed and what will remain". Are we in agreement with adding that phrase? Yes? OK. Gord's next question of clarification was around does the panel want to explore growing plants on PK with a view to encouraging aquatic life and fish habitat? Or is it more a curiosity around understanding whether PK would support any growth. I'm actually not sure we have clarity on that as a panel. Does anybody want to contribute some ideas on that? It's similar to that question we keep going back to around wildlife and caribou. Do we want to make it attractive to caribou to come back or do we want to deflect them away from site? If PK goes in the pit and water is on top, do we want to try to encourage aquatic plant growth on the PK to attract fish, or just do nothing and let nature run its course? Wayne?

**WL:** I think just the slopes so the Caribou if they go down in the water, in the pit there, that they can swim to the other shore and won't have trouble getting out. They won't drown in the pit.

**NT:** We have that recommendation about monitoring those ramps. But Gord's question is specific to that question around plant growth on the PK under water. We made a recommendation, you made a recommendation around growing plants in a tank. Is it because you want to see, encourage growth, or is it because of curiosity, you want an answer.

**WL:** Depends on the shallowness of the water for the fish. If they came in and something can grow for them, why not grow it. But if the PK is really deep and there's a lot of water on top of it, they probably won't go that deep so there's no point in growing anything. Does that answer your question?

**JB:** So, there is no concern about toxic substance in the PK? Ok. So that was one of the issues that some people spoke about. But you're not concerned that that would be a source of contaminated fish food in the future?

**WL:** Well, we're already told that PK is non-toxic so that should be good enough.

**KA:** I was just commenting on the tail end of Wayne's comment about PK not being toxic. And as well it has no nutrients. So, he still would like to have tests to see if they can sustain water plants. I believe that came from our discussion on will there be growth on top of the PK when it's in the pit. We had spoken about putting a screen or some kind of material to support growth on top. I believe that's where that conversation came from, but then we talked about this screen or material being a contaminant to water in time, either rust or material coming apart and causing contaminants in the water. I think that's where that fish tank testing came from. But the vegetation part for the plots is just to see if we

can have growth on the slopes or the sandy areas in the PKC. Does grass grow in there? Is it edible later? I think that's where that comes from.

**NT:** OK. I'm glad Gord asked the question. It sounds like there is a curiosity to know whether PK would support aquatic life at a depth where light penetrates, but not a commitment to try to facilitate or encourage that growth at this point. Yes? I'm getting a thumbs up from Wayne. OK. Gord's last comment was affirming that Diavik also has a strong interest in understanding winds outside the dykes, realizing that it can be the driver that can influence circulation within the contained area as a function or depending on the size of the breaches. I'm not sure I heard a question. It was mainly a comment.

**GM:** Going back to the vegetation, thanks Wayne and Kathy for the clarification. I think I do understand where you're headed there. We'll probably come back to you and say that if we are considering PK material in shallow water inside the dyke, that we would then do this kind of study. If we're talking about very deep water, I don't think there's much value other than perhaps curiosity to go and answer that question. And no, there was no question about wind, it was just a comment that we are aligned. Thanks very much for the dialogue.

**NT:** Is there anything anyone would like to say directly to Gord?

**KA:** Thank you on behalf of everybody.

## **SHARING CIRCLE**

**WL:** Seeing as we're breaking up here now. I know everybody is going back to their respective communities. I wish them all a safe trip. I want to thank the facilitators for their input and help, as well as the interpreters for their great work and everyone that attended here. I think it was a pretty progressive type session here. We got a little bit going, but maybe we have quite a bit left to go. I'd like to thank Colleen for coming all the way from Texas to see us. And the youth that showed up. It was really nice. We should have more youth attending. I'd like to thank EMAB for attending and giving some accounting. And my old boss there, standing in the corner, Sean. I tried his desk on for size, his old one. It's too big, it didn't fit me. To everybody here, I wish a good journey home.

**KA:** Whenever we come here to gather for our next TK session, it's always a question in my mind how we're going to discuss and what we're going to discuss. This one's been particularly interesting, dealing with the PK and everyone's comments and concerns. It's been really eye opening. And I like that we have some new faces. And it's really nice to



see you. Thank you for your participation. Our elders were always giving us your wise thoughts and comments. That helps us see things differently and how you've seen them on the land. To our facilitators, thank you so much. You always do such a wonderful job in keeping us going right on track and getting us answers that we need when we have questions. Colleen's always on the ball getting us those numbers that she has such a difficult time understanding them too. Thank you so much. I wish you all a good journey home. Thank you to all the technical people who come and explain things to us. Take care and have a great journey home.

**??:** Thank you. This is my third year in a row participating. And I feel I've gained a lot of information and knowledge from our elders and from the whole group from all over. It's good we're working together. Sharing information among each other. I've learned a lot coming here not only from our elders back home, but coming here from others, how they do their TK studies, and how they work with their people back home. That's really eye opening for me. All the information we request, we get it and then the information that we want to see especially the elders, because their more visual. And, I'd like to thank Gord for giving us an opportunity to go underground and to the process plant. And it would be good to have extra youth involved, a male and female, like we have elders-male and female. That's only one suggestion that I have. Even bringing Mason here. He took a walk in the process plant and was pretty amazed. He was quiet but I'm sure he has a lot of questions flowing in his head. It's good to get youth and elders together like that. I'd also like to thank Colleen and the facilitators for taking care of us. Also being away from home and sacrificing our weekends and being away from family, especially on mother's day weekend. But you guys still treated us very well. And it's always good food and stuff like that here. I just want to wish everybody a safe trip home. Some of you come from very far north, and it's good to see your faces again. Good to see that EMAB's here. It'll be good to work together so we have a better understanding of one another. I know we've been involved with EMAB too, just don't have really clear mind about it, yet. That's all I want to say. Mahsi. And thank you also to the interpreters for doing hard work. Mahsi.

**??:** Even though this is my first time and I got to meet everybody, got to know everybody. I love your hospitality. And including all the elders, the interpreters, they do a lot of work. And thank you for everybody. Thank you.

**MB:** Hello. I'd just like to thank everyone for having me here for the past weekend. It's my first time here. I know I haven't been saying much. Mainly because I wasn't feeling myself later. I did have a couple of ideas but I'm kind of shy and not really good at public speaking. I'd like to say thank you for having me here. And hopefully I'll see you guys sooner in the future. That's pretty much it.

- BA:** Thank you for putting up with me. I had a good time here. I liked what went on here. And what we talked about. It was really informative. We'll take it back to the community and see what they have to say about this. But I had a good time. Thank you.
- ?? :** Mahsi. This is my third year in the meetings. Thank you. I'd like to thank the facilitators for doing wonderful work. And when they do the presentations, we've learned lots this week. Since we got here, we travel with airplanes, but I hope everyone has a safe trip home. I'd like to thank the interpreters, because it's difficult work. It seems like when we go astray we help each other go on a straight path again. What can we do for one another? The only things we can do is pray for one another and hope that we arrive home. We have lots of children and grandchildren at home. Thank you very much.
- RM:** Mahsi. I know nobody understands me, but I had to say it in my own language, the first words. I'd like to thank everybody for the information. We all learned from one another and this I think is from the real good people who are sitting on this panel. And especially the facilitators. They had a lot of patience with us explaining everything to us. And the elders too. They give us a lot of information about the land. To me the elders are just like scientists, because they visually see everything, and they live all their life of what they are talking about. And they know. It's been a pleasure here, but I want to go home. Tomorrow there will be a meeting, but I'll be there only for half a day because I was committed to escorting a patient to Edmonton in the evening on the 15<sup>th</sup>. So, I'll be there with you and even if I'm not there, I'd like to pray for you, and wish everything, the decisions that you make will be good for all the people. Mahsi Cho.
- KE:** I kind of wrote all this down in fear of messing this up. Last time I publicly spoke, I messed things up pretty bad. Hi. This is my first time to one of these TK panels. I found the experience quite enjoyable. Unfortunately, I was kind of sick a couple of days, so I didn't get the full experience. All I'd like to say is thank you to everyone who's involved in this panel. Mahsi.
- LZ:** Mahsi. Thank you, everyone's thankful. I'm thankful for the facilitators and the interpreters, they're doing a lot of work. We may not understand one another but through the interpreters, we understand one another, we sleep well, we have good meals, we hear lots of wonderful stories and we exchange a lot of experience and there's people that experience the tour underground and into the process plant. And we want our future generations to live well beyond when the mine site is gone. So, all the people that work here, we're thankful that. I've been involved with this TK panel since its inception and this one elder from Whatì he was here with us. As for now, through the interpreters, even though we may not communicate one to one, but through the interpreters we understand one another. So in the future, all of us we may not be here, but sometimes, so hopefully in the future we'll meet one day at this TK panel. Have a safe trip home. Thank you. That's all I have to say.

**DTE:** I've been busy on my phone trying to text or email somebody back home because I was only supposed. Well, first of all, never mind. I'll just say something else. It's nice to come here to this meeting. It was a last minute for me to come to be an alternate for Celine Marlowe that sits on this board and whenever she doesn't come, I'll be the alternate. I think I'm going to be wearing so many hats. I'm an alternate for Charlie who sits on EMAB. So, I'll be sitting on that board. So I'll be coming back again to Diavik. It's really nice to be here, to see friends again, and to see new friends. And working together. I always ask myself when I go to a meeting, if we all work together, things will be better and move ahead. Sometimes we disagree, but things will work out at the end of the day. That's what my mother always says. I listen to her on the phone all the time when I'm travelling to a meeting. Which will be a best way for my community? The next generation? I also have the next generation with me. It's my nephew. I was hoping he would come hear us. Because next time, when I don't come to a meeting, it will be him coming to the meeting. It's nice to have young people sitting on this board. And we should have more young people, so we can teach them. Because we're not going to be here forever. Life is a cycle and it changes. We see the next generation moving and sitting on this kind of board or any kind of board. I'd also like to thank the translators. I know they work really hard, since some of us speak different languages. I'd also like to thank the people from Nunavut that are here. It's nice to see you again. Bob. I don't know when was the last time I saw you, it was a few years ago. But when I walked through the door at G&G, I was happy to see you. Seeing new friends again. I know when I go to a meeting, I don't close my mouth. I speak whatever I have to say. I'm really happy to be here. I know I'm going to be in your meetings tomorrow, the 15 and 16 and that's what I was trying to do, somebody is just trying to Facebook me, because he can't text me. I'm trying to arrange something. I'm glad that I'm going to be there with the youth. Helping out the youth. I feel so happy just to give them my knowledge, my wisdoms to them. Whatever I learned from my ancestors that's been passed on. I carry it with me. And sometimes it's really hard when I speak to my nephew and he doesn't understand what I say in my language. It's ok. They're going to learn one day anyways. Mahsi Cho. Safe travels home. You know when your meeting is over. It's good to be with families. I miss home. And I miss my sisters. Since I don't have a mom or dad, at Mother's Day, it was one of the hardest days for me, but I hold it back. Because I just lost a niece too, but I have to move on to help the young people, and be strong, and move forward. So, I'm really happy. And it's true what my auntie Sara said. Wants to go home. I don't mind being close to home, it's Yellowknife, but I still can't go home for another few days. Mahsi Cho and safe travels. God bless you all.

**RA:** I'm here to represent the youth from Kugluktuk. I'm happy to be here. This past week I gained knowledge from the elders and youth. That I'm happy about. I don't have much to say. Mahsi, quana.

**NK:** I was thankful for coming back. Whatever your trying to fix, it makes life and the job easier to go. And I'm so thankful for the youth to come again. I wish we could have more youth. When I was a young child, when I was nine, my mom used to always tell me how life's going to be in the future. And then I seemed to ignore it all, but hearing it when I was young, when I had kids, it all started coming back to me which made me strong. The words. These young people are here, hearing what elders have to say. They won't forget it. They'll be our leaders next. How to be a leader, you young people, you really have to take care of yourselves. Listen to elders, keep yourself healthy because you have to look after yourself to look after other people. Your job. To keep strong, you have to look after yourself. I'm always happy there's youth coming. Even if they never come back, they still won't ever forget what they hear from these meetings. Even though only one time you hear somebody, maybe when you get older, you'll pick it up again, and get stronger from it. So, I'm always happy to see youth coming. And I'm so thankful for Diavik to keep us in a comfortable house, all the cooks because you can't do anything without eating. I'm so happy for the facilitators. Have a safe trip. Only if I could speak my Inuinnaqtun language, I would really like to speak lots, but only Bobby and Natasha would understand what I'm saying if I'm speaking Inuktitut. Good to see you all again and have a safe trip.

**??:** Kohlman, you didn't mess up really badly. Mason, it's good to hear your voice. Regan, you too. It's always good to have you. You never mess up. We were all young people too. At your age, we all messed up too. That's how life goes. Youth when we go home, we tend to mess up when we were growing up in our days. It's always nice to have young people. We don't really expect you to say a lot, just opening up your mind and helping you along the way. You don't have to be shy about anything. And another one I've been concerned about the last few years up to now, my mind and my body has been really giving me conflicting, what to say, especially with this global warming. And I see the countries in the world in bad shape right now. All the floods, all the hurricanes, all the winds being strong and more intense now, and I see whole countries being plummeted right to the ground, such as Puerto Rico. And seeing other parts of the world where I see in the news great big tailings ponds, waste management places, being really ??? and in my mind that's what's causing our oceans to be sick. I'm really depressed now because I see what our future looks like through all these hurricanes and massive floods we're seeing now, which is what is giving our oceans bad chemicals. That he animals have to cope with. I'm in a bad state now when I think about it. That maybe in the future we might be losing some of our species in the oceans. It's really sad to me. I see this right now too. We need to do our thing, as traditional knowledge holders. Try to speak to other parts of the world as well. Even though we are many thousands of miles or millions of miles away or whatever. And our traditional knowledge holders in other parts of the world that's what I see. Traditional knowledge holders all over the world. I don't know if they're going through the same thing. I don't know if they're going through what hew

have here. We could have great discussions. What I see in other parts of the world, the traditional knowledge holders are not getting the answers and their ancestors are not really being taken care of. That's really sad to me right now. And I'm really praying every day for those people, all traditional knowledge holders and people who want to keep the lands clean for us too. We need to keep a closer eye on our planet more now because the weathers are more intense now and we really have no control over it. Weather being weather, it's working itself. It's giving us our destiny. Weather. All weather that we have is giving us our destiny. It's really how for many millions of years, you saw dinosaurs die off and we're in the same boat too. We're all on the same planet and sometimes when I step on a floor like this, I'm really stepping on the floor with the person on the other side of the world just sitting beside me. I can see that too. And I feel for him a lot as a traditional knowledge holder. And I hope that his future or her future will be resolved in the future. And I thank everybody here again for giving us the chance again to go over things we need to look at a little more closely. And I thank everybody who's done a great job again. And keep up the good work again. Who knows, anything could happen to us in the future. Maybe tomorrow or whatever. We need to watch out for each other a little bit more. And I think everybody for giving me a chance to say a few words and listening to me as well. I thank everybody for that. Have a safe trip home and be with your family again. Bye.

**PH:** Thank you. My name is Peter Huskey. I'm from Behchoko I used to work here from 2002 – 2005 and since 2005 I started interpreting. And I'm thankful that the traditional knowledge panel keeps bringing me back here to do some interpreting. All the things you talk about has been a good experience for me. And throughout the sessions I write down some words that I don't know so I build on these meetings. Every time there's a different meeting, they describe different things in different words. In that way, I'm thankful. And with the trips to the underground, it gives me better understanding of this operation. And also, from the visits from Diavik, from James, the guy who did the water, hydrology presentation. And I believe it's John, from EMAB, and the staff, and the facilitators for doing a good job. Mahsi Cho. And even though Gord's not here, we communicate with one another. I hope everyone has a safe trip home, even if they're living along the highway. Mahsi Cho.

**JR:** Well my name's James Rabesca. I'm happy to be here again like I said the other day. We learn as we go. And I think I'm happy that we had all the communications, and then the bloody well politics, but however, I'm glad that I have a good colleague like Peter. He learns a lot from me. Because we learn a lot from the elders. And I learn from the elders. I picked up a lot of examples from the elders. And now we have to pass our knowledge to the future generations. Thank you. Mahsi.

- AR:** Even just being here for the one day, I find these sessions really valuable. And I learned things I didn't know. And also, I thought of things in a way that I hadn't before. Thanks again for organising these TK panel sessions.
- SeS:** Thanks from me as well. And thanks from Diavik. Sorry I couldn't be here over the weekend. Some very interesting and helpful recommendations from you guys. Really appreciate it. And I look forward to continuing this work.
- JM:** Thanks again for inviting us. Really grateful we could be here and listen to you guys think about new things and make recommendations and also just sharing with each other. It's been a really great experience for me, and I really appreciate that a lot. And thanks for not voting us off the island.
- ??:** I want to thank everybody here for being so fantastic and making my job so easy. Especially the interpreters and Kaylee and the facilitators, you guys are amazing. And thank you for inviting me again.
- KM:** It has been amazing to know and meet with every one of you and get to hear all of your words and put it on paper, horrifically spelled, but I did it. Thank you guys very much for having me.
- JB:** Thank you everyone. Kaylee has had an especially difficult job and it's her first effort at taking on a challenge like this, so I really appreciate the patience that you've had. And I also would really like to express how I feel about working with you again. There's a few elders that are still here that I've so grown to love. And it's hard not to, when you're with such good people. I really appreciate Natasha and working with her. She makes it look easy. And Colleen makes us feel like we can actually make a difference here. And I really appreciate that, Colleen, and your contributions. Thanks for the interpreters, thanks to the cooks, many cooks, and thank you to the young people that have come out. I know that for most of you it's a little intimidating and I know your scared. And when you do step out and take a risk, we're all behind you. We're really 100% behind you and really appreciate the courage that it takes. So Mahsi. Mahsi Cho to all of you.
- NT:** I wanted to acknowledge that it was my screw up that we're here over Mother's Day weekend. So, I'm really sorry, because I think it was extra hard for us to be away on Mother's Day. Thank you for that. I wanted to say also that it was a real gift for the caribou to be here when we first arrived. I feel like we somehow had those guardians with us, I want to say witnesses. We had more energy with us than we normally do. I'm really grateful for that. Also wanted to acknowledge the patience that everybody has shown, both the new members who got thrown into the deep end, parachuted into this process that's so strong, so successful, and the patience of those who have been here because it's hard sometimes to pull people along. But I was really grateful that everyone

took the time to show the patience and that caring, not only with the elders but also with the youth. It's amazing how supportive you are with the youth. And I'm really struck, I think of Pierre, your grandpa who was here. We've been doing this long enough and building on his and others' really good work, it's like this echo that's coming back. It's really beautiful to see. Thanks everybody for your patience and having the faith for Joanne and I and Colleen to facilitate. We try our best and it's always bonkers behind the scene. But I'm so grateful to work with such strong and amazing women who teach me so much. Both during the sessions and outside. I also want to say thanks to Gord and Sean and James and Nathan at the process plant and Steve, Peter, and all the folks and the cooks who made our stay so wonderful. I'm sure I forgot people, but I won't go on.

**CE:** I want to thank you. We consistently ask you to give up weekends to come and do this, and especially on the Mother's Day weekend. And we appreciate it. It's kind of one of the only ways we can make it work, to come up to site and do this where it's more relevant and you get to see everything. And there's a lot of good work that goes on with a lot of Diavik staff, not just the obvious ones that you guys interacted with that help out behind the scenes. And they try to pull out all the stops for you guys when you come. And I think they've done that again. So thank you all for giving up your weekend and thanks to all those Diavik people as well.

**CLOSING PRAYER**

**END**

## **Appendix E**

### **Presentation on PK—Backgrounder and Previous TK Panel Recommendations on PK and PKC**



Presented to the TK Panel  
TK Panel Session #11  
May 11, 2018



# Processed Kimberlite Backgrounder



# Why are we talking about Processed Kimberlite now?

- Diavik needs input from the TK Panel regarding options for dealing with processed kimberlite on-site
- Timing is good in terms of planning for closure at DDMI (early and meaningful input)



# Haven't we talked about Processed Kimberlite before?

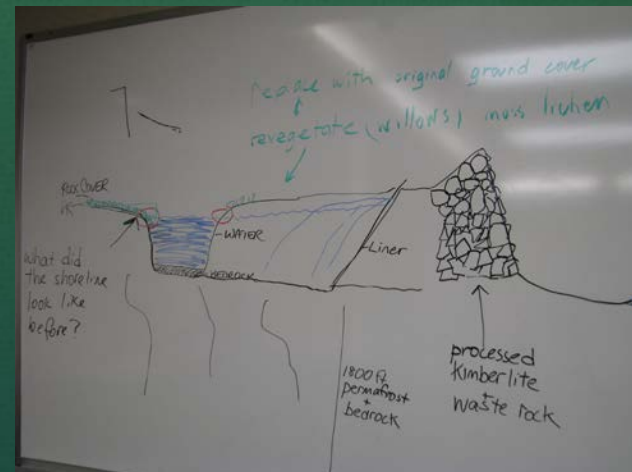
- The focus of TK Panel Session #6 in October 2013
- Idea of putting processed kimberlite underground introduced at TK Panel Session #10 in September 2017



# Examples of Concerns about PK On-the-Land

- Is there something else that can be done like put in a rock or something so that the rock can settle down into the bottom of that PKC area? . . . if [caribou] tend to jump in, maybe because of that slurry . . . they're going to have a hard time getting out or maybe sinking in the pond. - Bobby Algona (2013)

I prefer that no aquatic things be put back in the PKC pond. I don't think any human being will eat that fish. - Alfred Baillargeon (2013)



# TK Panel

## Recommendations to Date

6.7 Removing the slime offsite remains the preferred option until Diavik can demonstrate through chemical and toxicological analysis that the slime is not harmful to the environment (i.e. plants, wildlife, fish, and humans).

- ✓ Toxicological analysis done (2015-2016)

6.10 Once the slime is removed, line the lake bottom with granite / gravel and rocks and other natural materials that were there before.

# TK Panel

## Recommendations to Date

9.25 Given that the pits are going to be refilled with water, that Diavik is considering putting processed kimberlite and 'slimes' into the pits and underground shafts and concerns about tremors and seismic activity, the TK Panel requests a tour of the pits and underground shafts to see the 'receiving environment' with their own eyes.



# TK Panel Guidance (TK Panel #10)

- There is a concern if slimes were to be put into a pit that they may be released into the environment.
- As long as there are no chemical contamination or physical suspension issues (i.e. the slimes don't mix with the lake water), the TK Panel generally supports Diavik researching this alternative for disposal of the PK into the pits. The rationale for this guidance is that the TK Panel wants the WRSA-SCRP and disturbance footprint on the tundra to be as small as possible – move slimes out of the PKC and use WRSA-SCRP rock to cover the PKC area. It was hoped that this might help prevent wildlife access.

# Example: PK in Underground

## Ekati

- Currently putting PK into Beartooth
- Plans to put PK into Panda/Koala
- 30 m freshwater cap on top of processed kimberlite (considered conservative and thus under review)





## **Appendix F**

### **DDMI Presentations on Closure and Reclamation Plan Overview, Water License Amendment and Underground Dewatering**

RioTinto

# Closure and Reclamation Plan (CRP Version 4) Overview

TK Panel

11 May 2018



## Status of Diavik's Closure Plans



- The NCRP Final Closure Plan was submitted to the WLWB for review; it has been approved!
- The site-wide Closure and Reclamation Plan (Version 4) was also submitted to the WLWB and is under review
- A workshop was held by the WLWB during fall 2017
- Likely update to CRP V4.1 based on comments

# Review of the NCRP Final Closure Plan

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- Your hard work paid off!
- Community organizations that reviewed the Plan felt the Panel's recommendations and DDMI's responses were valuable and meaningful
- DDMI met with leadership from each of your organizations to review the Plan and your contributions; your recommendations were echoed and supported by leadership
- Regulatory and DDMI financial approvals were received and progressive reclamation has begun.

## Closure Plan by Area – CRP V4

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1. Open Pits & Underground
2. North Country Rock Pile
3. Infrastructure
4. North Inlet
5. Processed Kimberlite Containment

# 1. Open Pits & Underground



## CRP V4

- Flood piping/fill options
- Inert waste to pit option
- PK to underground/pit option

## TK Panel Recommendations on Open Pits & Underground

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- Do not breach the dikes until communities are satisfied that the water quality is okay
- Leave the lake bottom between the dikes and open pit as-is; plants that have grown will help re-growth after flooding; do not build reefs in these areas
- Leave the dikes as they are; do not modify the slope
- Vary the depths of reefs built within the dike areas
- Ensure good habitat for rearing, feeding and resting inside dikes
- Stock water with bugs to improve quality
- Break up 1 km cliff on A418 pit wall
- Leave current road into pits

## 2. North Country Rock Pile



### CRP V4

- NCRP cover construction
- SCRPs not yet included
- Re-sloping work has started; cover placement will begin soon



## TK Panel NCRP Recommendations

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- Do not allow water to pool on top of the pile; include a domed top to promote water drainage
- Have a 'moat' around the pile to collect and monitor water coming off/out of the pile
- Focus re-vegetation on the base of the pile, around the ponds; allow the rest to naturally re-vegetate
- Simulate an esker for the final shape of the pile
- Ensure safe wildlife access for all seasons and soft material for caribou feet
- Keep the height as low as possible while ensuring contaminants are contained
- Cap materials with the best material for biodiversity

## TK Panel NCRP Recommendations Cont'd

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- Consider using wetlands for filtering runoff/seepage water around the base of the pile
- Slopes similar to that of the test pile so it is safe for wildlife
- Long-term scientific monitoring to ensure the core remains frozen
- Place a limited number of large boulders on top of the pile for wildlife shelter, and place boulders along the edge between the PKC and NCRP to deter wildlife
- Study wind and snow accumulation on wildlife pathways prior to finalizing slopes and cover

# NCRP Re-sloping Underway



### 3. Infrastructure



#### CRP V4

- Updated building inventory
- Updated re-vegetation information
- Updated timing for building demolition

# TK Panel Infrastructure Recommendations

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- Ensure meaningful employment for communities to be involved with closure work
- Create safe passage for wildlife at the site after closure; evaluate ways to keep animals away from certain areas
- Add rock cover and do not re-vegetate areas that were used for waste or hazardous materials storage (e.g. fuel bays, waste transfer areas, etc.)
- The TK Camp and airstrip should remain after closure
- Create safe slopes on the sides of roads and the airstrip, similar to test pile surface
- Do not disturb new areas, except where re-sloping would assist with safe wildlife movement
- Remove equipment, unused buildings, pipes, toxic materials and non-biodegradable items from site
- Scarify (roughen) the surface of old plant sites to support re-vegetation
- Re-vegetate certain areas of the site

## 4. North Inlet



### CRP V4

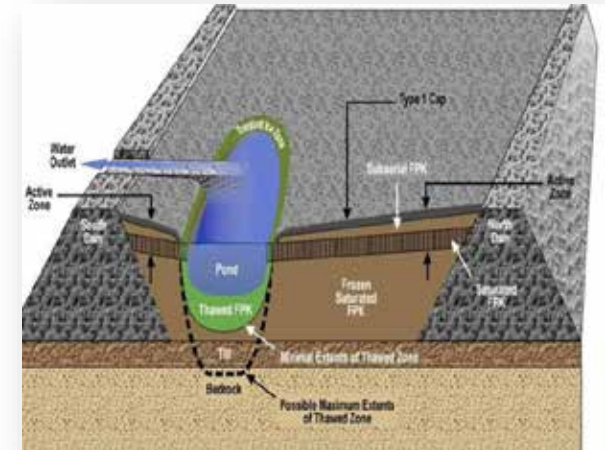
- Evaluated hydrocarbon option
- Change default plan to limited breach

## TK Panel North Inlet Recommendations

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- Further consideration is required to determine if this area would be a no-go zone for wildlife, or if wildlife use would be encouraged in this zone
- Do not reconnect the North Inlet to Lac de Gras unless the sediments and water are of the same quality as the lake

## 5. Processed Kimberlite Containment



### CRP V4

- Updated to approved closure concept
- Option to go to underground



## TK Panel PKC Recommendations

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- Cover the area with sand and soil and promote re-vegetation, restore eskers, create wildlife habitat and marshy areas and plant willows
- Return the PKC lake and shoreline to their natural condition, line the lake with rock, re-vegetate with water plants and re-stock with bugs and fish
- Provide safe access for wildlife over the dam by re-sloping and open some sections of the dam to re-create water flow to Lac de Gras
- Leave some areas steep to encourage denning for wolverine, bear, foxes, etc.
- Remove the PK slimes from the mine site at closure
- Conduct toxicological testing on the PK slimes to determine if it is harmful

## TK Panel PKC Recommendations Cont'd

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- Create barriers to prevent wildlife from moving between the NCRP and the PKC, e.g. steep slopes, boulders
- Filter streams flowing from the PKC by using mosses; monitor this water
- Place a circle of boulders around the PKC pond to deter wildlife from accessing the pond and unstable shore

# Additional Questions?



The background of the slide is a photograph of several industrial pipes. Three pipes are visible, each with a stream of water flowing out from its bottom. The pipes are dark and appear to be made of metal. The water is white and turbulent as it falls. The overall scene is dimly lit, with the water providing a bright contrast.

**RioTinto**

# Diavik Dewatering May 11, 2018

Community Presentation

James Sovka

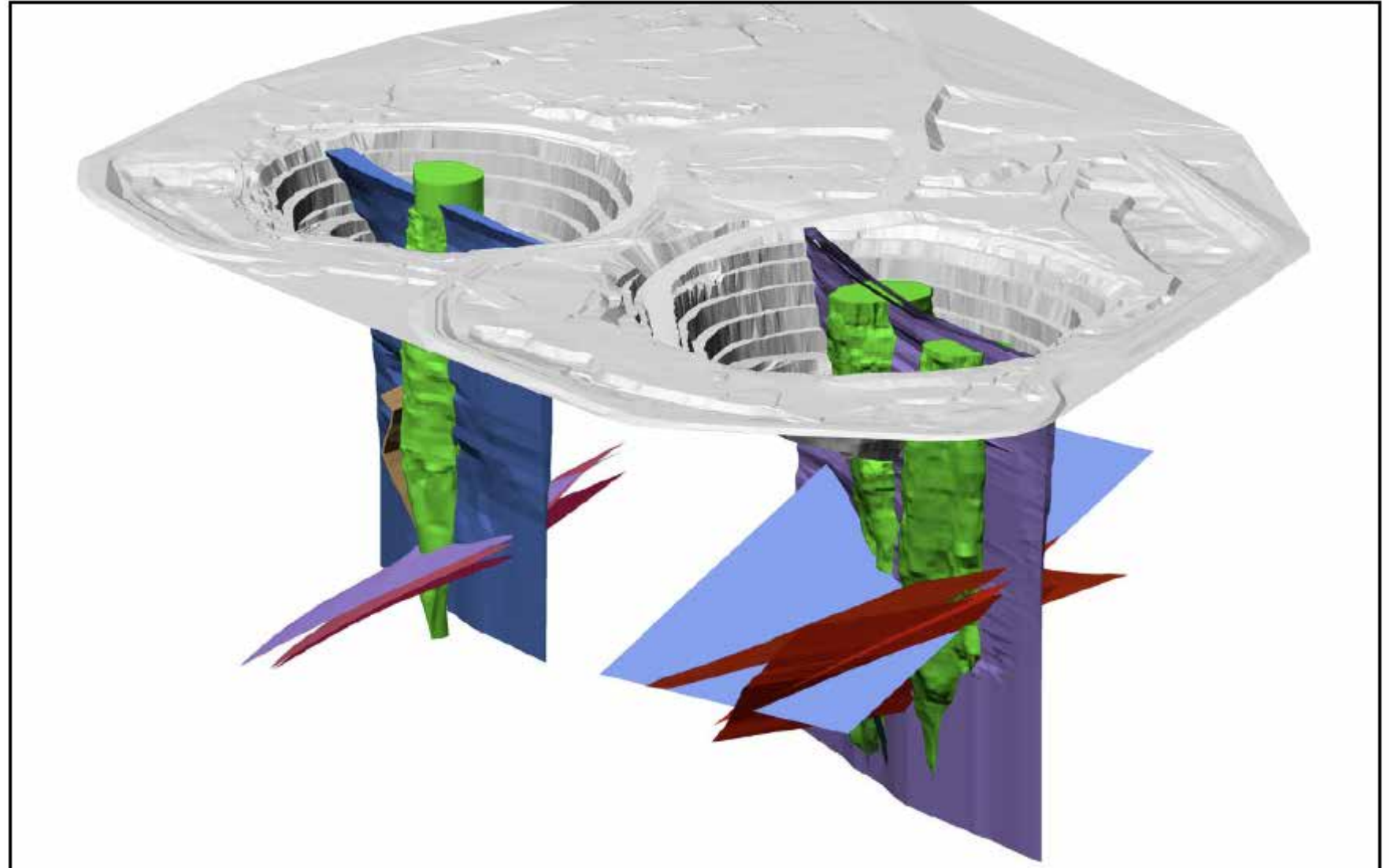
# Why Dewater?

- To mine safely.
- Minimize risk of inflows into the workings.
- Maintain stability of the pit walls.
- To efficiently separate clean and dirty water.
- Two systems to handle clean or dirty water.



# Fault Systems – Primary Conduits

- Faults and cracks in the ground carry water from the lake.
- This water is clean!
- Goal: intercept this clean water before it reaches the mine workings.
- Method: drill holes to capture water.
- The faults are the primary target.









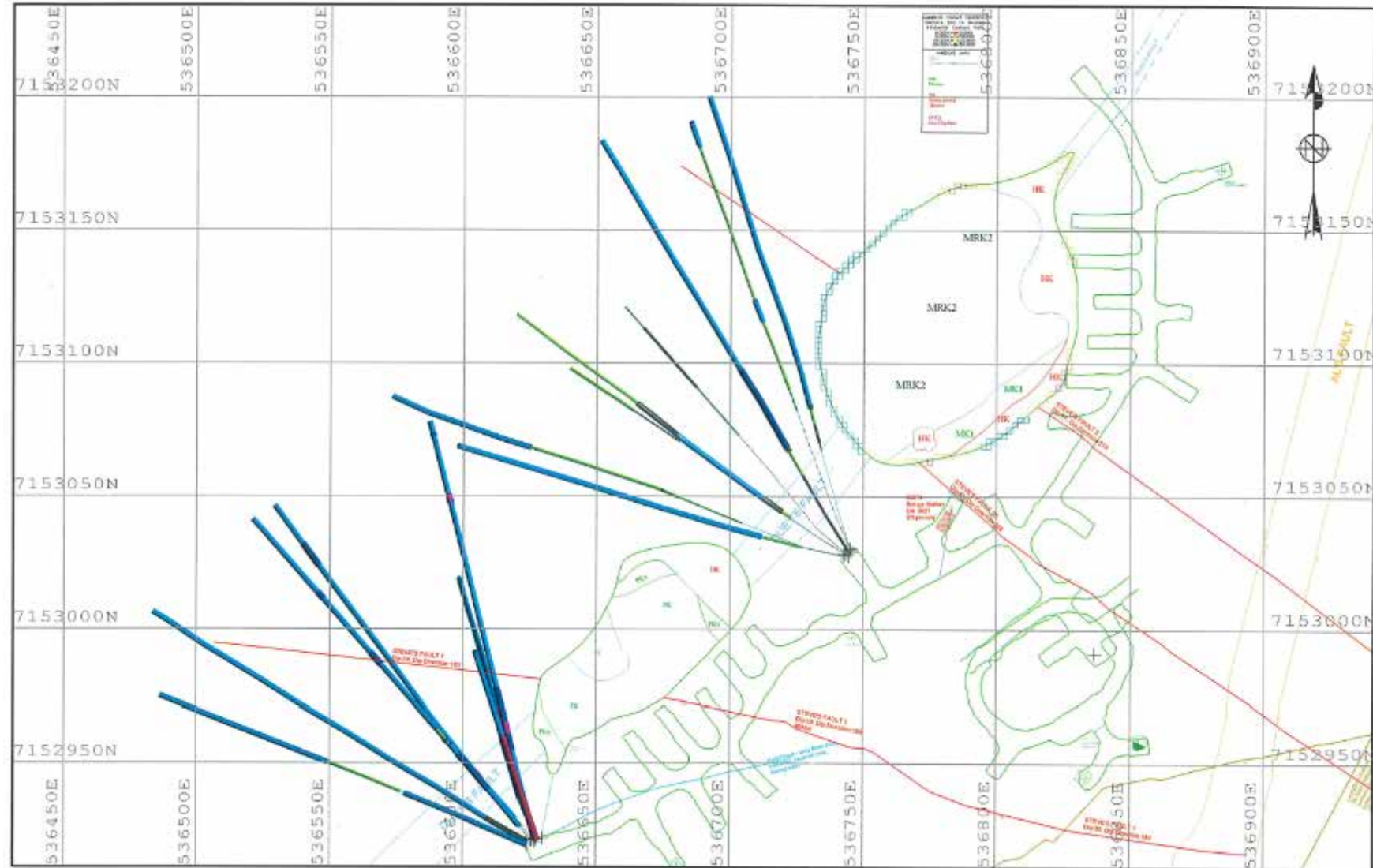






# Drill Holes

- We've drilled several thousand kilometers of drill holes!
- Some holes hit over 500gpm of water!
- But other holes are dry...
- Understanding the geology is critical.





# Drain Holes

- Drain holes contain clean water, from the faults, which is drawn from the lake.
- Need pipe to connect.
- This water is flown into the pump stations.
- Very good “security” in the case of high inflow or high pressure.





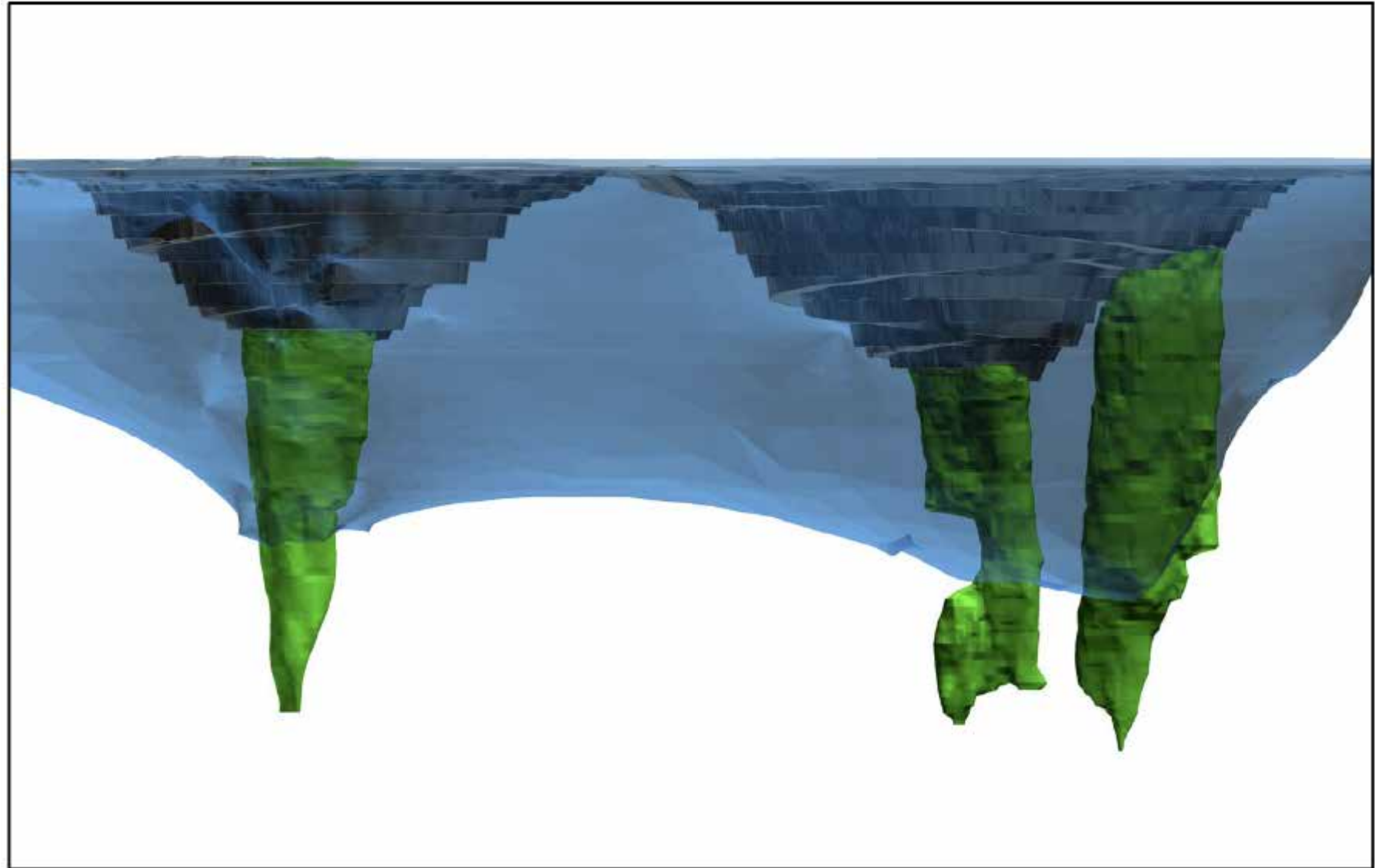






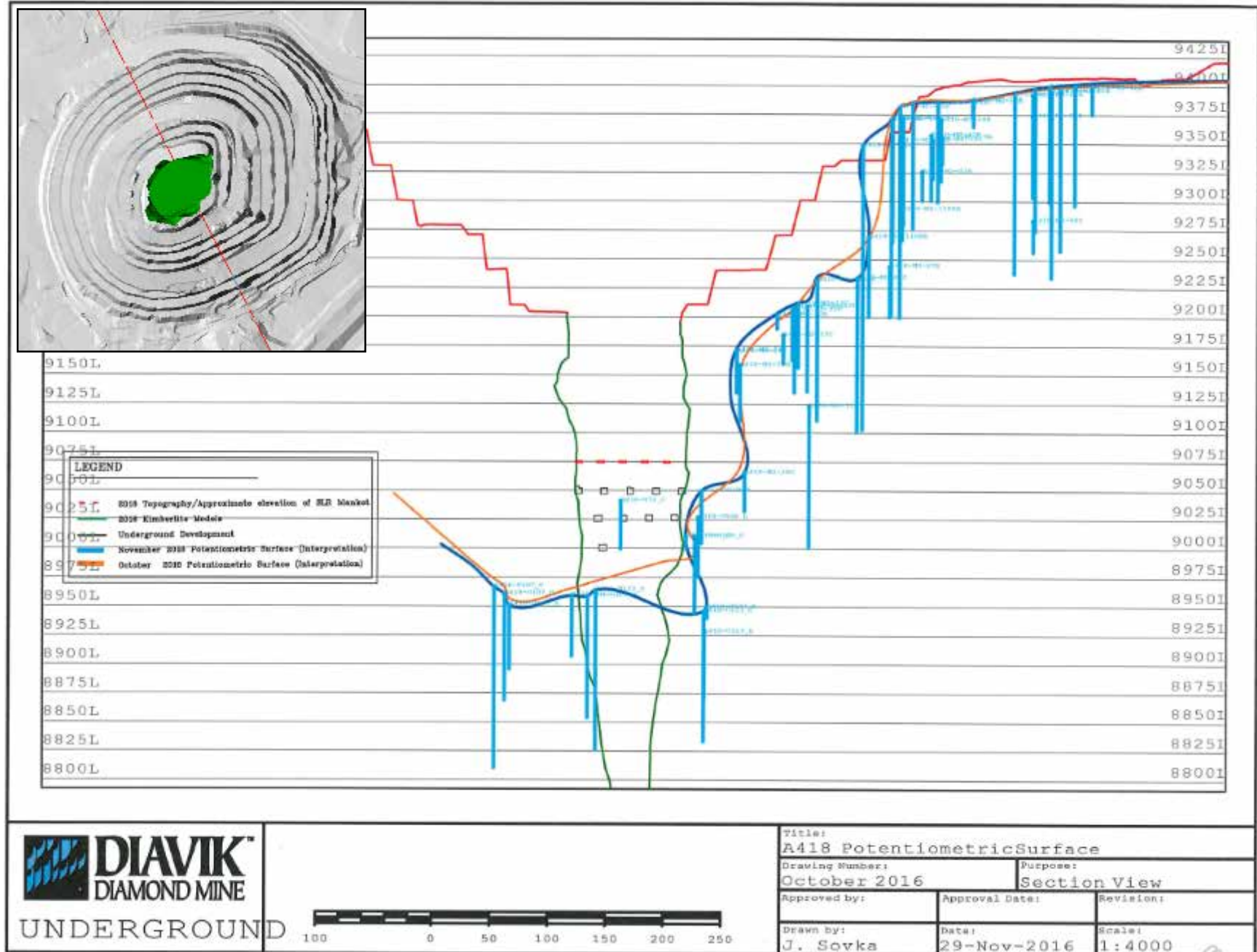
# The Water Table

- We've drawn down the water table.
- This is a model of the current water table.
- It can still be wet above, but there will be no pressure.
- The drawdown affects the pressure, which affects the safety of the mine workings.



# The Water Table

- Section View.
- Each instrument reads a certain level of water above it.
- From many instruments, we can compose a contour.
- This allows for detailed control of when it is safe to release levels for mining.



Questions?



**RioTinto**

# PK to A418

Water License Amendment



1. Overview
2. Processed Kimberlite Production and Storage Options
3. A418 Pit and Underground, Concept Drawings
4. Environment – Monitoring and Closure
5. Next steps and how you can help



# Overview

- Kimberlite is the rock that contains diamonds.
- It is processed on site and any remaining material is deposited on site.
- The remaining material is referred to as 'processed kimberlite' (PK).



# Overview

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

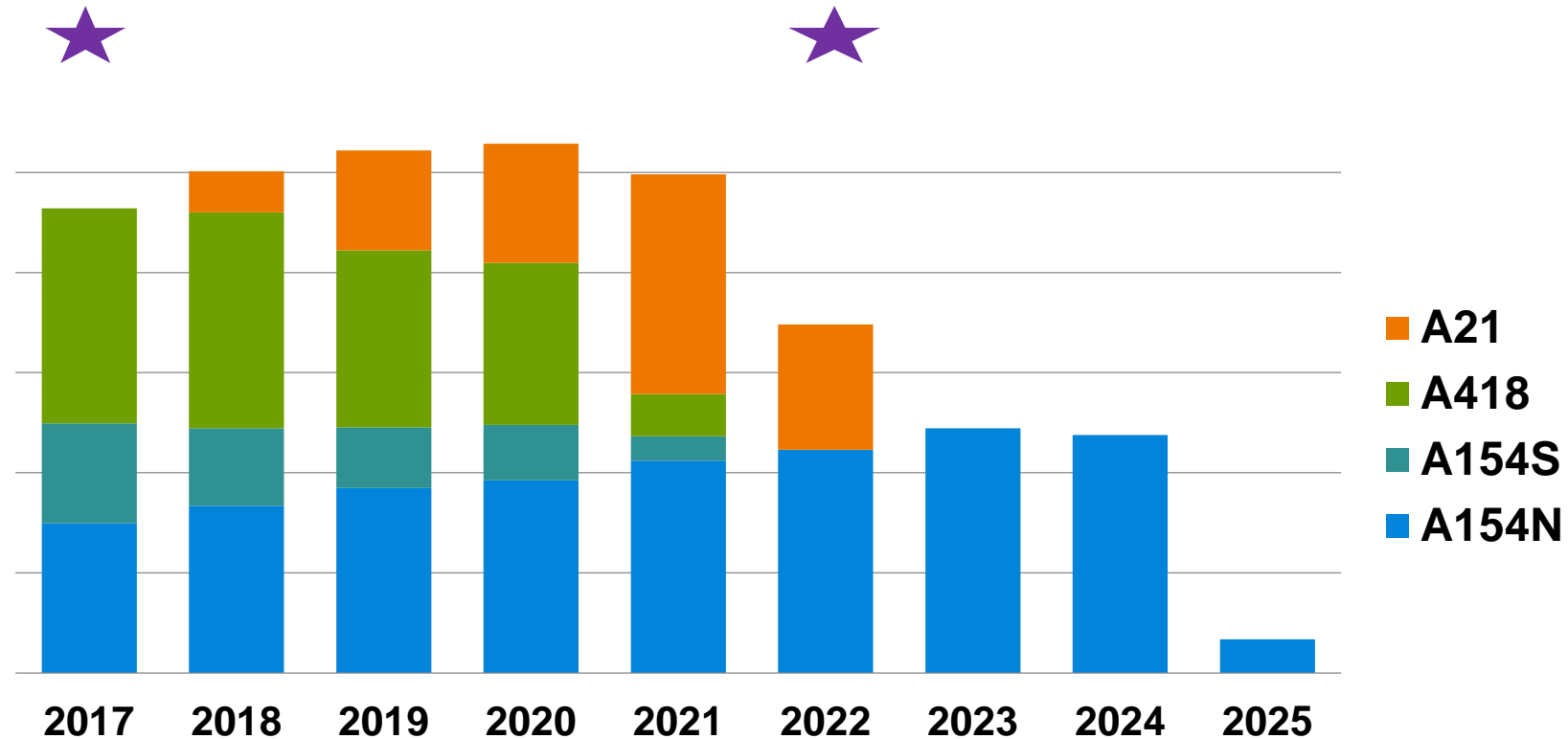




# PK Production and Storage

- Based on the current mine plan, the PKC will be full in 2021.

- ★ DDMI requires a short-term option for PK deposition (2017-2022), and a long-term option (2022-closure)

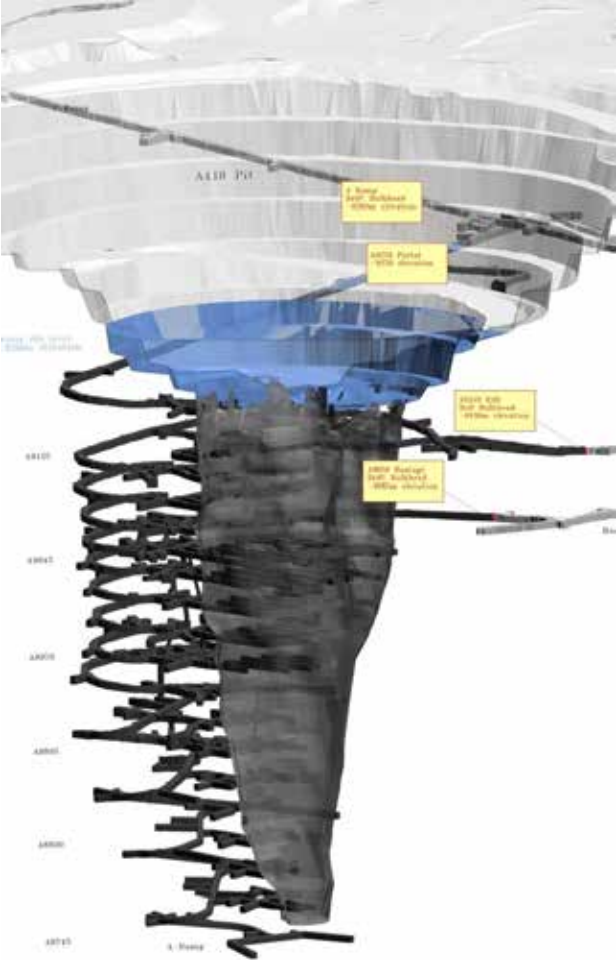


# PK Storage Options Analysis

- Multiple options were explored for PK storage:
  1. Traditional PKC Dam raise to hold full PK volume
  2. Remaining PK stored in A418 once mining is complete
  3. Alternative storage locations (North Inlet, collection ponds, etc.)
  4. Combination PKC Dam Raise and A418 storage
- Option 4 was the preferred option based on technical, engineering, closure and cost factors.

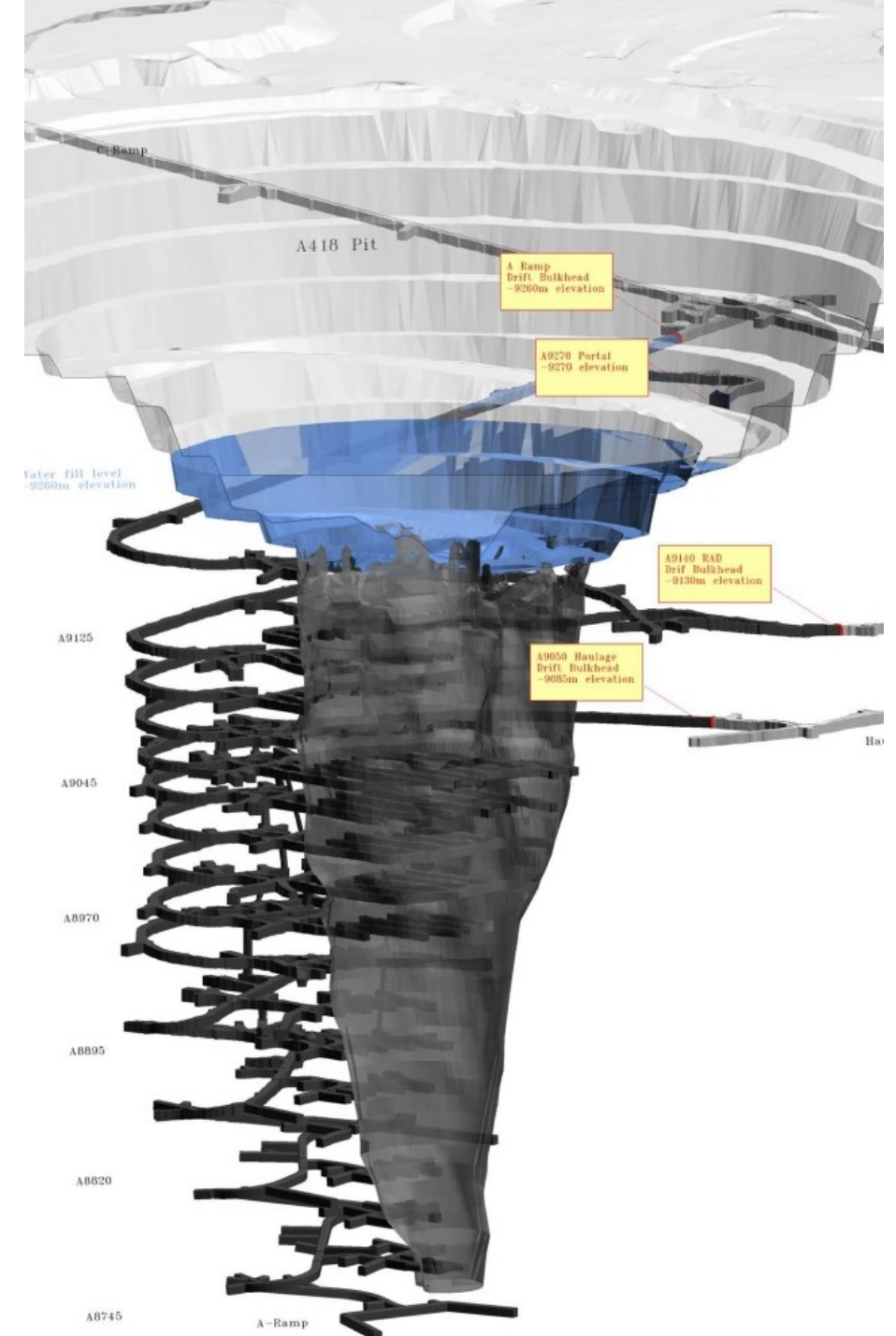
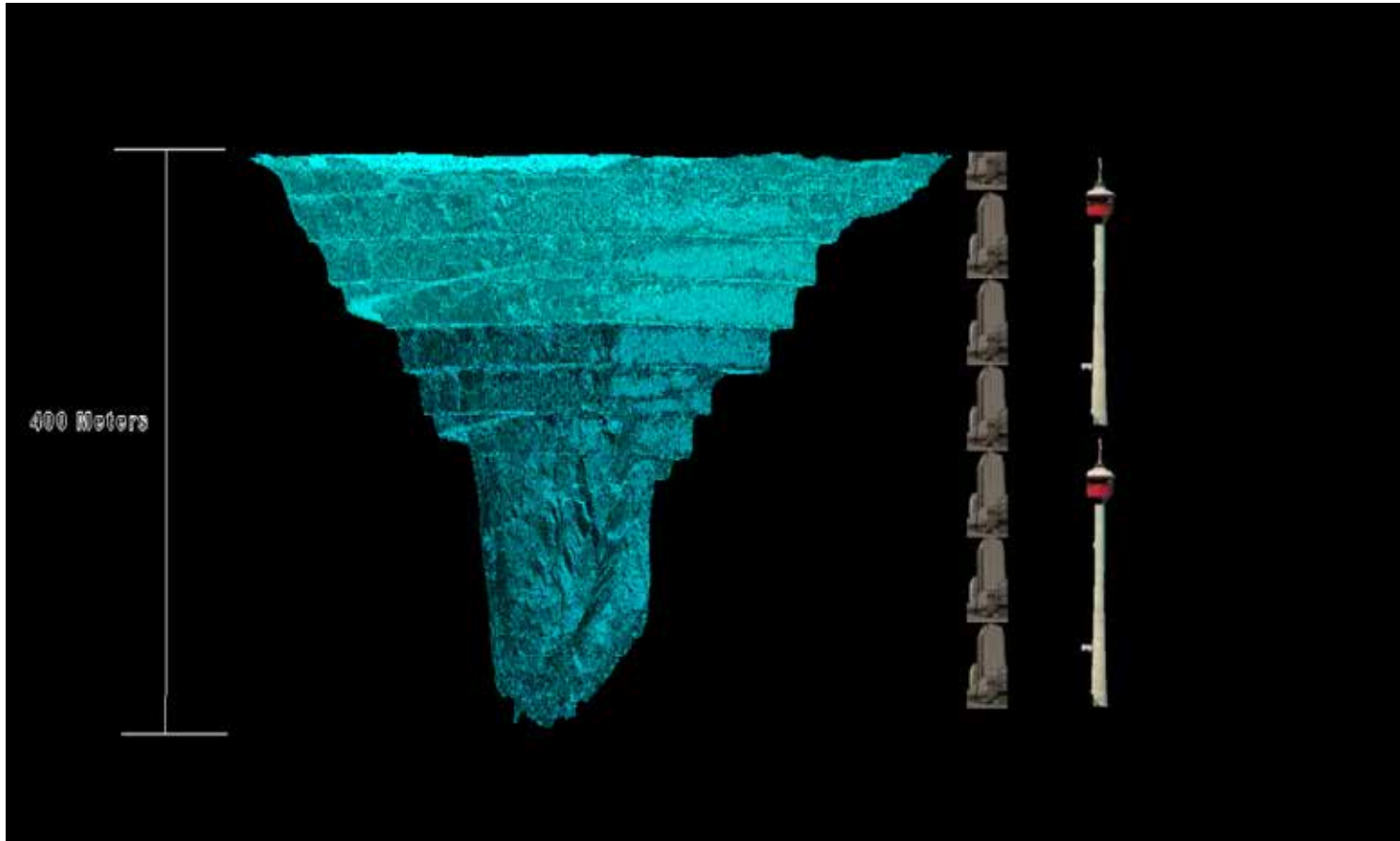


# PK Storage – Current and Future Operations



# A418 Pit and Underground

- We have explored options for what we can do with PK, using existing facilities within the mine footprint.

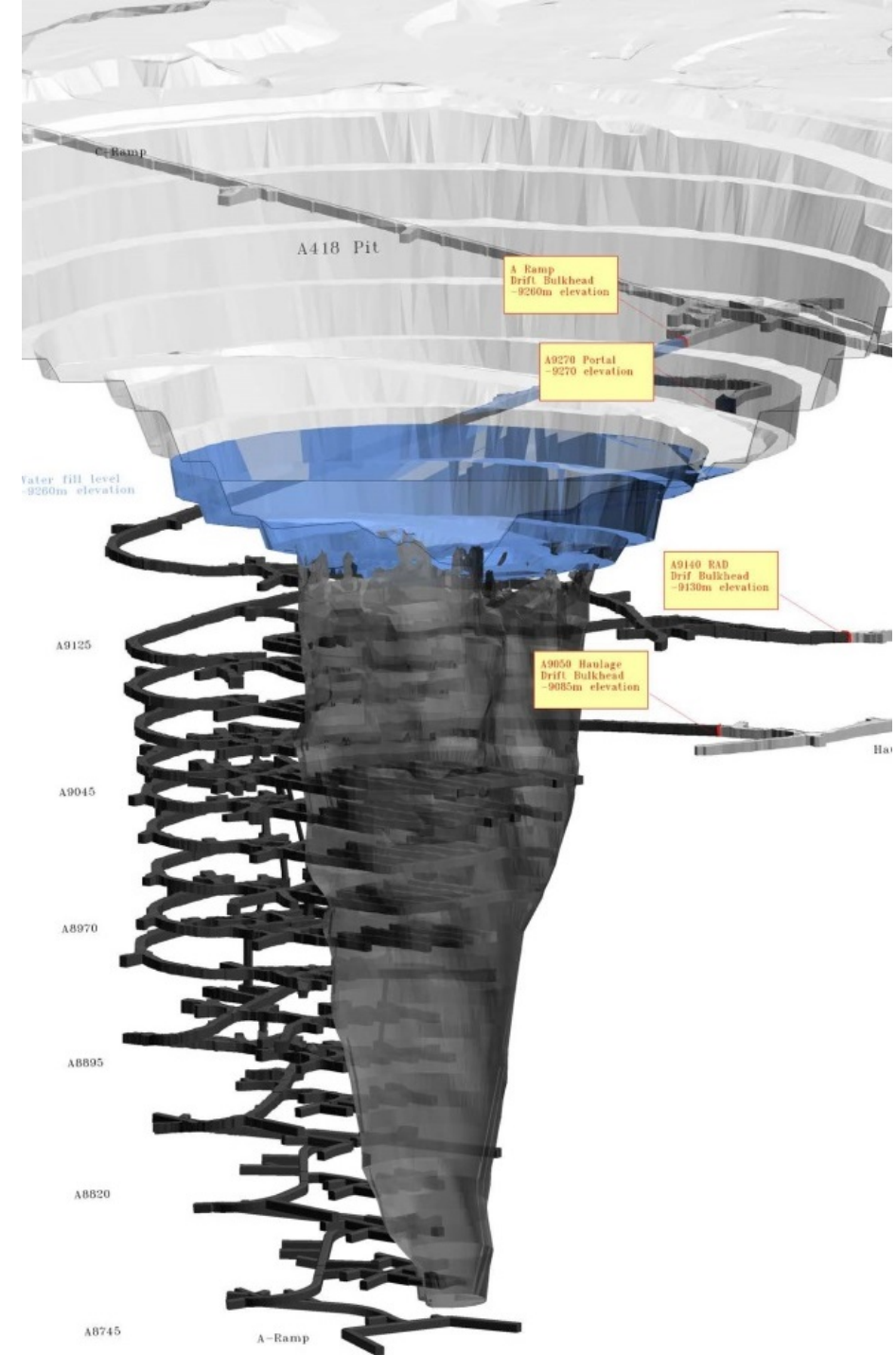


# A418 Pit and Underground

- A Water Licence Amendment is required to place and store PK in A418



# Conceptual Drawing



# Environmental Considerations – Monitoring & Closure

- **Monitoring:**

- Aquatic Effects Monitoring Program (AEMP) in Lac de Gras will continue (lake water quality, sediment, fish and bugs within the water and sediment), including the AEMP TK Study; and
- More Surveillance Network Program (SNP) stations (site water quality) for A418 PK deposition.



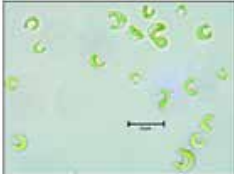


- **Closure Plans:**

- Likely a positive change to the PKC Facility closure concept; and
- Closure concept for A418 remains the same with plans to reconnect the area to LDG

- **Toxicological Studies:**

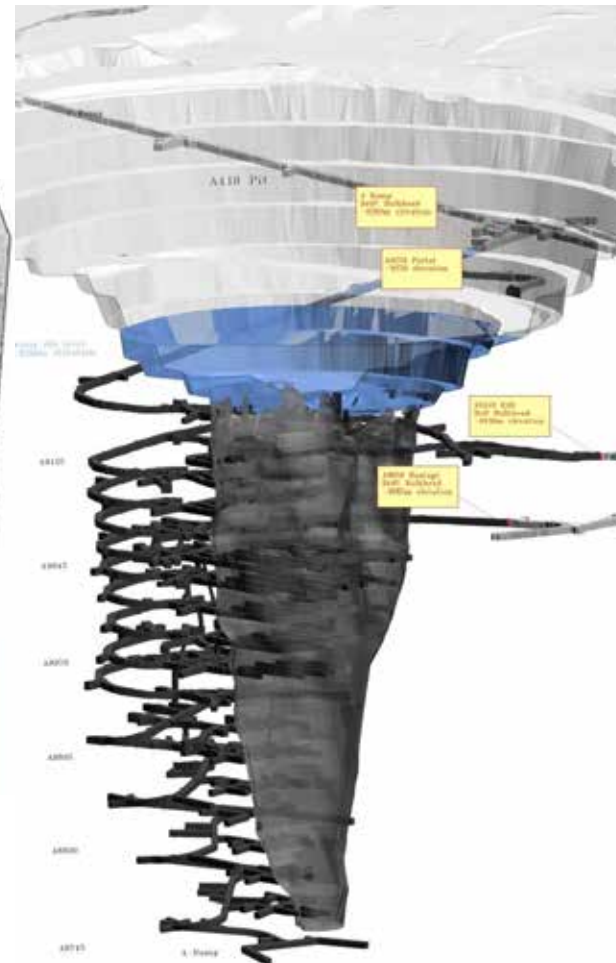
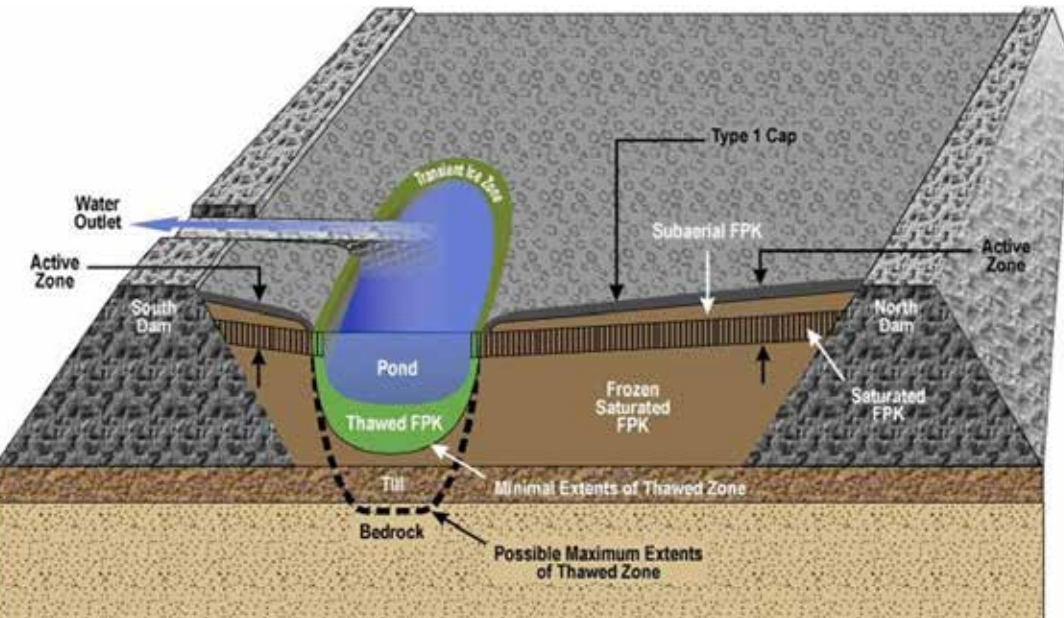
- Study of PK has been done by the University of Saskatchewan at the TK Panel's request.

# Summary of Toxicology Test Results

Toxicity Test		PK Slimes	Pore Water	Leachate
Fish				OK
Water Flea			OK OK	OK
Algae			OK	OK
Benthic (1)		Reduced survival in [100%]		
Benthic (2)		Reduced growth in 100%	Reduced growth in 100% and 50%	Reduced growth in 100%



# Closure Options for PK



# Timelines and Schedule – PK Management

	Spring 2018	June 2018	Summer 2018	Feb 2019	Summer 2019	Summer 2020	2022	2023-2025
PK Management/Operations	Submit updated PKC Facility Plan to WLWB (March)							Commence progressive closure of PKC
		Submit phase 7 dam design	Commence dam raise		Continue dam raise	Complete dam raise	Placement of PK in A418	Placement of PK in A418
Amendment	Amendment Submission (May)				Revised Water Licence – proceed with additional studies & approvals			
A418							A418 UG Completed	

# Next Steps - Regulatory

- We have engaged with communities and regulators about the Amendment
- We will submit a Water License Amendment application to the WLWB in May 2018
- The amendment process will follow the WLWB process which includes additional engagement (i.e. initial comments, technical hearing, public hearing, etc.)
- The amendment process is anticipated to take approximately 12 months
- If approved, the amendment will likely allow for deposition of PK in A418, provided Diavik meets certain conditions and additional approvals

# Diavik needs your help!

- What other information do you need to feel comfortable with PK material being placed in mine areas?
  - What questions do you have that you want answered?
- Can you share your knowledge of how fish use deeper waters to help predict fish behaviour in the pits once they are filled with water?
- If Diavik goes ahead with putting the PK in the pits and the mine shafts, what would you want to watch at closure to know that it is good?
  - For example, once the pits are filled with water and before connecting back to Lac de Gras, as well as once re-connected.

## **Appendix G**

### **TK Panel Session #11 Recommendations Presented to DDMI**

# Traditional Knowledge Panel Guidance and Recommendations

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Session #11: Options for Processed  
Kimberlite  
May 10-14, 2018

# General Comments

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- Seeing A154 “with our own eyes” was really important in helping us to think about and consider the option to put PK in the mine area.
- Results from the PK toxicology study helped us feel more comfortable about various options for PK on-site.
- One of our biggest concerns is contamination
- We are always thinking about water
- Climate change impacts are significant and need to be part of any plan: people are noticing increased snow, ice, winds, floods and changing temperatures
- There is concern about stability of the pits (cracks/fissures) and underground and leakage of water

# PK and A418 - General

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- The TK Panel was interested in learning about the dimensions and volume of A418 compared to the volume of PK generated for operations and closure. Detailed discussions followed and the TK Panel weighed the options of PK in the PKC versus A418.



## A418 and Water - General

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- The TK Panel recognizes the importance of water to life. The TK Panel questioned whether water quality in the pit might be affected by PK. Discussions centred around how PK may affect fish and how PK in the pits might create a dead lake given that PK does not support much growth.
- The TK Panel is satisfied by the results of the toxicological study of PK and discussions and presentations by Diavik staff.

# PKC versus Pits - Recommendations

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- 11.1 If the PK goes to the mine area, the TK Panel recommends that all of the PKC slimes also be put into the pits. There is interest in moving as much of the slimes as possible from the PKC into the mine area.
- 11.2 If Diavik moves ahead with putting PKC slimes into the mine areas, the Panel requests to review any changes to the PKC closure plan. For example, if it is not possible to move all of the slimes in the PKC to the mine area and some of the slimes remain in the PKC, the TK Panel may recommend that the PKC is topped with large boulders to discourage wildlife and people from entering.
- 11.3 The beach materials and rough kimberlite should stay in the PKC area (i.e. anything that can support a rock cover).

# Fish - Recommendation

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- 11.4 TK holders know that fish generally go where there is food (nutrients) and oxygen so they are unlikely to go to the depth where PK would be.
- 11.5 The Panel would like additional scientific research to see what the effects of PK (ingestion) might be on fish specific to Lac de Gras.
- 11.6 If PK were to go in any mine area, the Panel requests an opportunity to learn more about the depth of water for fish habitat to cover PK (TK and western science).

# Water - Recommendation

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- 11.7 The TK Panel recommends a future TK Panel session dedicated to the health of the North Inlet upon closure and to decide if there is anything to address with the sediments.
- 11.8 The Panel requests that Diavik provide a list of items/equipment that will remain and be removed from underground before flooding or filling the mine with PK/water.

# Monitoring PK - Recommendations

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- 11.9 The TK Panel recommends that their members are present for at least some of the time when the slimes are moved from the PKC into the A418.
- 11.10 The TK Panel wants to monitor how water behaves when placed on PK. They would like to see the PK and water in the A418 as soon as it is safe to do so and when there is a good visual of the material, as well as at regular intervals afterwards.
- 11.11 The TK Panel recommends that they monitor the fish habitat within the pits, shoreline modifications (e.g. ramps) for wildlife as well as the stability of the dikes on a regular and ongoing basis.
- 11.12 The TK Panel recommends that they monitor freeze-up and break-up within the contained areas (i.e. within the dikes) to see if the formation and melting is any different - with a view towards safety for people and wildlife.
- 11.13 The TK Panel would like to see the PK vegetation plots again.
- 11.14 The TK Panel recommends that we test slimes/PK in a fish tank to see if any water plants would grow on the PK

# Wind - General

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- 11.15 The TK Panel would like to see wind behaviour on water within the contained pits/dikes over a period of time (i.e. throughout all seasons).
- 11.16 The TK Panel would like to see wind behaviour on Lac de Gras in and around the dikes. [How is the water on the outside of the dikes and breach areas affected by wind?]

# Questions

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## **Appendix H**

### **Presentation of DDMI Responses to TK Panel Session #10 Recommendations**



RioTinto

# Diavik Response to TK Panel Session 10 Recommendations

TK Panel

10-14 May 2018



# Response to Session 10 – SCRP & Monitoring

## Supported

- Diavik must return East Island to a caribou-friendly state (as defined by the TK Panel and Elders), other than those areas identified as ‘no-go’ zones. Caribou pathways should follow caribou corridors identified through traditional knowledge. (10.9) – *to be developed for SCRP*
- Consider alternative uses for A21 material: Cover the Processed Kimberlite Containment (PKC) area after removing slimes; Assuming the slimes are gone, slope the south face/wall between the NCRP and the north end of the PKC to allow for caribou movement; Extend the west end of the NCRP and slope it for caribou; Cover areas that may have been contaminated after clean-up like the hydro-carbon containment area. (10.10) – *most of these uses are being evaluated*
- Avoid disturbing new areas (e.g. tundra) with A21 material at the SCRP as much as possible. The proposed SCRP area is part of a major caribou migration and feeding corridor and should not be disturbed.(10.1) – *trying to use A21 rock/till for other purposes, e.g. NCRP cover, to reduce size*
- We recommend that rock from A21 that could go to SCRP be used to cover the NCRP. (10.4) – *approvals are complete and this work has begun*

# Response to Session 10 – SCRP & Monitoring

## Supported Cont'd

- Drain the pond that would be covered by the SCRP before using the proposed area. (10.5) – *completed, fall 2017*
- Have all SCRP water tested (both science and TK) before releasing into Lac De Gras. (10.6) - *DDMI plans to establish a monitoring station in this location*
- Use natural filtration methods in areas where water will run off the SCRP on site. (10.7) – *this will occur in the area downstream of the SCRP*
- Research or monitoring methods that are offensive to elders (e.g. caribou collars) should lead to getting alternative method advice from elders. (10.24) Also want to learn more about operational monitoring programs, methods and results in order to determine if they are suitable for closure monitoring(10.20) - *provide presentation on Diavik's operational monitoring programs to the Panel at future session*

# Response to Session 10 – SCRP & Monitoring

## Modify

- Encouraging communities working together and supporting each other long into the future will give us strength. Diavik has helped us do this and we must continue into the future. (10.21)
  - Diavik sees this as a recommendation to the TK Panel members and community organizations; we are pleased that the Panel recognizes the efforts Diavik has undertaken to encourage collaborative work

# Response to Session 10 – SCRP & Monitoring

## Pending

- If this area (SCRP) must to be used, minimize the size (i.e. volume/amount) and height of the SCRP and slope all sides like an esker so that animals can easily walk over it. We recommend the slope should be at 3:1. (10.2, 10.8)
  - SCRP closure plan has yet to be developed; currently not planned to re-slope the entire pile, as no closure cover is necessary for the SCRP.
- If the SCRP is large, designated pathways become more important and must follow caribou routes known through TK. (10.3)
  - SCRP Design included all A21 materials, as approval of NCRP cover was pending. Will need to re-evaluate final size and work with Panel/communities to determine preferred route for caribou.
- Many recommendations related to monitoring that would require another TK Panel session to discuss further. Includes:
  - 10.11, 10.12, 10.13, 10.14, 10.15, 10.16, 10.17 and 10.18
- Plan to leave some buildings (and possibly the airstrip) to support Watching Programs for this and other mines in the surrounding area. (10.22)

# Response to Session 10 – SCRP & Monitoring

## Pending Cont'd

- Start training for watching programs during mine operations by inviting community members to site, i.e. train-the-trainer program. For example, bring up people to work with Environment dept, starting with one weekend a month and scaling up over time (10.19)
  - Diavik currently invites and involves community members in some of their on-site monitoring, largely program-specific. Evaluate options for some weekend community assistants.
- Diavik should support the development of a 'best practices' document that explains the Panel's approach to integrating TK into mine closure planning. (10.23)
  - The Panel's presentations and reports do a good job of summarizing the process and principles that underly the Panel's recommendations and guidance. Something like this may be more valuable further in the future, once closure plans advance and more is learned about how to practically apply these recommendations and guidance.

## **Appendix I**

### **Next Steps**

# Next Steps

Session	Original Plan (2013)	Completed & Revised Plan
6	PKC	PKC
7	Re-vegetation	Re-vegetation
8	Review of Closure Landscape	Fish Habitat Design & Water Quality
9	Post-closure monitoring: Wildlife & Water	Post-closure Wildlife Monitoring
10	Fish Habitat Design Reviews	SCRP & TK Monitoring Plan
11	PK Management (A418)	<b>PK Management (A418)</b>

Reached the end of the topics you'd originally suggested

Need to plan for future sessions – 1/year is realistic



# Future Topics/Sessions

Monitoring at Closure

Updates on PKC closure options

North Inlet

Closure Details: building demolition, metal disposal, waste disposal, contaminants, laydown areas, airports, roads, etc.

Closure Inspection Criteria

2018 Aquatic Effects Monitoring Program (AEMP) TK Camp

## **Appendix J**

### **TK Panel Session #11 Evaluation Summary**

2018 Diavik TK Panel, Session 11: Evaluation Form Summary

Question	Very Good	Good	Neither Good nor Poor	Poor	Very Poor	Total Responses	Comments
How would you rate the session for working and communicating together?	11	3		0	0	14	
How would you rate the session for mutual respect among participants?	10	4		0	0	14	
How would you rate the recording and documenting of TK during the session?	8	5		1	0	14	Lots of good info to bring back
How would you rate the facilitation of the session?	9	5		0	0	14	Keeping all/everyone on track
How would you rate the outcomes and findings of the session?	7	7		0	0	14	Good info. Lots of sharing. For the elders, should be closer to the kitchen from their rooms.
How would you rate the venue and food for the session?	8	4	2	1	0	15	Always good. Too much!
How would you rate the logistics for the session (e.g. hotel, travel, honoraria)	7	5	1	1	0	14	Very well done. This may be better if done through EMAB due to the processing of cheques.
Overall, how would you rate the session?	8	5		0	0	13	1 blank response.

Question	Too long/ many	Enough	Too short/few	Total Responses	Comments
How would you rate the opportunities for you to share your knowledge and experiences?	2	11		13	
How would you rate the amount of time to discuss the topics during the session?	3	7	3	13	ed to do break exercises. 1 blank response.

**What were the strengths of the session? What did you enjoy most about the session?**

*Everybody coming together and expressing their concerns. I enjoyed being here and hopefully I come back in the next session. It is very important that we continue to share our knowledge with the youth. There was a lot of information on the cone (pit) and fish and caribous and water. Presentation to DDML. Always double checking that we are happy with our comments and recommendations. Reviewing and clarifying that each statement is what we mean. You always do a good job! Communication and understanding. Given knowledge from different cultures. Listening to Elders about the animals and especially the land given to us. Given information about Diavik closure and how they want us to nurture. Understand gave more so I can understand in good way. I felt the session had a very friendly atmosphere and was pleased with the ideas and findings from the group. The respect of the panel. Working together giving advice while learning from one another. Change in venue. Different subject entirely.*

**How could the session be improved?**

*Future improvements to closure plan be implemented as the mine is coming into closure. More youth. More youth from the region, one female and one male. This is my first time here and I couldn't say much except for the hospitality. Would be good to have more visuals for the Elders. That is the only one and to have the elders stay closer to the kitchen area so it is not too far to walk for them. Would be good to have a table out for those who would like to take notes. Information from the previous sessions to the newcomers and follow-up slideshow for topics and ideas given. For next time if you have a meeting at Diavik Mine make elders stay closer. Also people who have problems with knees. This will be good. Thank you for your understanding. Can't think of anything.*