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Mason Mantla, Chair
Wek'èezhìi Land and Water Board
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Canada

8 July 2022

Dear Mr. Mantla:

**Subject: DDMI Submission – Processed Kimberlite Management Plan,
Version 7**

Diavik Diamond Mines (2012) Inc.'s (DDMI) is pleased to submit the Processed Kimberlite Management Plan Version 7 (PK Management Plan Version 7) to the Wek'èezhìi Land and Water Board (WLWB or the 'Board'). The PK Management Plan Version 7 is an update to the WLWB-approved [PK Management Plan Version 6.1](#) and meets requirements of Schedule 6, Condition 2(b) of the [Water Licence W2015L2-0001](#). The PK Management Plan V7 addresses processed kimberlite management with respect to the Processed Kimberlite to Mine Workings Project (PKMW), with a focus on the immediate deposition plan i.e., deposition of PK into the A418 pit and mine workings. This updated PK Management Plan also meets the requirements of Part G, Conditions 4 and 16 of the Water Licence W2015L2-0001 (see attached tables of conformity).

DDMI wishes to highlight the following points regarding PK Management Plan Version 7:

- The Processed Kimberlite Containment Facility (PKCF) sections of the updated Plan remain unchanged from the Board-approved PK Management Plan V6.1, except for administrative revisions such as highlighting that PKMW is now part PK management at Diavik and noting ongoing PKCF-related construction activities associated with the approved V6.1 of the PK Management Plan.
- A new section has been added to present PK management with respect to PKMW (Section 5).
- The current PKMW scope of activities as part of this version of the PK Management Plan is focused on PK management during the operations phase of the PKMW i.e., operational deposition of PK into the A418 mine workings and the associated water and waste management and monitoring.
- A WLWB-approved Closure and Reclamation Plan will be implemented once the operational aspects of PK deposition and storage are complete.

In addition, DDMI's submission includes a separate report on proposed criteria for determining if water in at least the top 40 m of any pit lakes containing processed kimberlite

is suitable for cultural use at closure as per Part G, Condition 16, of the Water Licence W2015L2-0001. Specifically, DDMI has completed workshops with the potentially impacted Indigenous Groups to the PKMW. Based on these engagements, DDMI has developed the following criteria for water quality that are culturally relevant:

- looks clear
- feels cool or cold
- smells clean and healthy
- tastes fresh
- sounds alive

The criteria will be monitored:

1. prior to flooding of the pit(s)
2. prior to breaching the dam and reconnection of the pit lake with Lac de Gras
3. after reconnection with Lac de Gras

These proposed criteria are summarized in the appended Summary Report: Diavik Diamond Mines (2012) Inc.: Water Quality Criteria for Cultural Use Workshops (September 2020-April 2022), which is informed by the final reports from each of the following workshops with the potentially impacted Indigenous Groups:

- Workshop Summary for Diavik Diamond Mines(2012) Inc.: Water Quality Criteria for Cultural Use Workshop, Deninu K'ue First Nation, Fort Resolution, NT, May 12 & 13, 2021 (verification session November 30, 2021);
- Workshop Summary for Diavik Diamond Mines (2012) Inc.: Water Quality Criteria for Cultural Use Workshop, Kitikmeot Inuit Association, Kugluktuk, NU, October 13 & 16, 2020 (verification session September 16, 2021);
- Workshop Summary for Diavik Diamond Mines(2012) Inc.: Water Quality Criteria for Cultural Use Workshop, Łutsel K'e Dene First Nation, Łutsel K'e, NT, September 24 & December 3, 2020 (verification session October 20, 2021);
- Workshop Summary for Diavik Diamond Mines (2012) Inc.: Water Quality Criteria for Cultural Use Workshop, North Slave Métis Alliance, Yellowknife, NT, September 22-23, 2020 (verification session September 27, 2021);
- Summary for Rio Tinto Diavik Diamond Mine: Water Quality Criteria for Cultural Use Workshops, Northwest Territory Métis Nation, Hay River and Fort Smith, NT, May 3-4, 2021 and April 27, 2022 (verified June 3, 2022);
- Tlicho Government Public Hearing Intervention: Diavik Water Licence Amendment – Processed Kimberlite to Mine Workings (Workshop November 4, 12 & 13) (verification session November 8, 2021); and
- Workshop Summary for Diavik Diamond Mines (2012) Inc.: Water Quality Criteria for Cultural Use Workshop, Yellowknives Dene First Nation, Yellowknife, NT, June 3-4, 2021 (verification session April 13, 2022; follow up notes received June 2, 2022).

DDMI also intends to submit the bulkheads design drawings and the bulkheads design and construction plan for the PKMW to the WLWB for review at least 90 days prior to start of construction of the bulkheads as per Part E, Conditions 6 and 7, of the Water Licence W2015L2-0001.

DDMI is requesting a joint review of these two submissions as the PK Management Plan Version 7 includes action levels and response actions related to the cultural water use criteria noted in this letter. We trust that the PK Management Plan Version 7 and the Cultural Use Criteria Summary Report included with this submission meet the WLWB's requirements. Please do not hesitate to contact the undersigned if you have any questions related to this submission.

Yours sincerely,



Kofi Boa-Antwi
Superintendent, Environment



Gord Stephenson
Manager, Infrastructure and Surface
Operations

cc: Marie-Eve Cyr, WLWB
Anneli Jokela, WLWB

Attachments:

- Table of Concordance to PK Management Plan Version 6.0 Reasons for Decision, September 30, 2021
- Tables of Conformity to PK Management requirements regarding PKMW (Schedule 6, Condition 2(b) and Condition 16 of the Diavik Water Licence)
- PK Management Plan Version 7
- Summary Report: Water Quality Criteria for Cultural use Workshops (September 2020-April 2022)

PK Management Plan V7 Concordance Table

PK Management Plan Version 6.0 Reasons for Decision, September 30, 2021		
Directive	DDMI Response	Location
Bullet 2 on page 9 references a photo, but the photo is not provided. Please edit accordingly.	DDMI removed the photo reference as it is no longer applicable.	Section 2.2.1
There are various locations in the document where the formatting appears to combine words incorrectly; edit accordingly.	DDMI corrected formatting errors.	Throughout
Section 3.5 references the management responses to the 2021 freshet. EMAB recommended that DDMI include a description of the results of the activities in response to freshet and any future plans related to freshet (EMAB comment 15). DDMI responded with a description of both the 2021 freshet response as well as future freshet management; DDMI's response should be included in this section of the PK Management Plan.	DDMI included response on future freshet responses.	Section 3.5
EMAB commented that statements in Section 3.2 related to the storage capacity of Pond 3 were inconsistent with other statements in the Plan; EMAB commented that Section 3.2 implied that water from an inflow design flood (IDF) may exceed the design capacity of the Pond, when in other sections DDMI states that Pond 3 maintains enough storage to hold an IDF. DDMI committed to revise Section 3.2 to state that "DDMI continues to maintain enough storage to hold an IDF for the PKCF and Pond 3 catchments without discharge to the environment."	DDMI revised text within report to clearly state that Pond 3 continues to maintain enough storage to hold an IDF for the PKCF and Pond 3 catchments without discharge to the environment.	Section 2.1 Section 3.2

Table of Conformity to PK Management requirements regarding PKMW (Schedule 6, Condition 2b of the Diavik Water Licence)		
Schedule 6 Condition 2		Location in PK Management Plan V7
b(i)	a comprehensive description of all sources and types of process Waste and wastewater which will be deposited in the Mine Workings;	Section 5.2 (Sources and Types of Process Waste and Wastewater)
b(ii)	a description of any proposed physical or chemical treatment of process Waste or wastewater prior to its Discharge to the Mine Workings;	Section 5.3 (PK Deposition Plan and Project Schedule)
b(iii)	a description, including maps to scale, of the locations of all monitoring stations within the Mine Workings, as well as Discharge locations to and from the Mine Workings. The description should include the sampling protocols for each station;	Section 5.3 (PK Deposition Plan and Project Schedule); 5.4 (Water and Waste Management); 5.6 (Monitoring); and Appendix B (Process Flow Diagram – Process Plant to A418 General Arrangement)
b(iv)	a description of the management and scheduling of all Processed Kimberlite deposition within the Mine Workings;	Section 5.3 (PK Deposition Plan and Project Schedule)
b(v)	any operational and/or structural Modifications which may be implemented that will affect the management of Processed Kimberlite deposited into Mine Workings and associated wastewater operations;	5.5 (Operational or Structural Modifications)
b(vi)	identification of the operational water elevation limit in the PKC Mine Workings, along with supporting rationale;	5.4 (Water and Waste Management)
b(vii)	A description of monitoring activities during deposition of Processed Kimberlite. Monitoring shall include, at a minimum:	N/A
b(vii)1	a determination of the volume in cubic metres of fine and coarse fractions, including total percent solids content, of Processed Kimberlite disposed of in the Mine Workings on an annual basis;	Section 5.3 (PK Deposition Plan and Project Schedule)
b(vii)2	a characterization of the consolidation properties and pore water quality of the Processed Kimberlite deposited in the Mine Workings; and,	5.6 (Monitoring)
b(vii)3	the sampling and analysis necessary to validate the assumptions and predictions of the approved PKMW Modelling Plan;	5.6 (Monitoring) and 5.7 (PKMW Modelling)
b(vii)4	the sampling and analysis necessary to improve the accuracy of predictions made in subsequent PKMW Modelling Plans, address IRP recommendations, and inform closure objectives and criteria, as applicable;	5.6 (Monitoring) and 5.7 (PKMW Modelling)

Table of Conformity to PK Management requirements regarding PKMW (Schedule 6, Condition 2b of the Diavik Water Licence)		
Schedule 6 Condition 2		Location in PK Management Plan V7
b(viii)	A description of how the Licensee will link the results of monitoring to those corrective actions necessary to ensure that the requirement in Part G, Condition 17 will be met. This description shall include:	N/A
b(viii)1	definitions, with rationale, of Action Levels applicable to the deposition of Processed Kimberlite into Mine Workings;	5.6 (Monitoring) and 5.8 (Contingencies and Adaptive Management)
b(viii)2	for each Action Level, a description of how exceedances of the Action Level will be assessed, and what contingency actions may be taken in response to that exceedance;	5.8 (Contingencies and Adaptive Management), which includes cultural water use criteria-related action levels and response actions.
b(ix)	A description of how recommendations of the PKMW Modelling Plan or the IRP relevant to the deposition of Processed Kimberlite into Mine Workings have been addressed.	5.6 (Monitoring); 5.7 (PKMW Modelling) and 5.8 (Contingencies and Adaptive Management)

Table of Conformity to Cultural Criteria-related requirements in Part G, Condition 16 of the Water Licence W2015L2-0001		
Condition		Location in PK Management Plan V7 and/or Water Quality Criteria for Cultural Use Summary Report
Part G, Condition 16	The Licensee shall submit the following with the proposed cultural use criteria:	N/A
(a)	an engagement record demonstrating that the development of the criteria was done in accordance with the approved Engagement Plan for the PKMW Project;	Appendix E of the Water Quality Criteria for Cultural Use Summary Report
(b)	evidence demonstrating that the proposed criteria will be met at closure.	5.8 (Contingencies and Adaptive Management)



Diavik Diamond Mines (2012) Inc.

Processed Kimberlite Management Plan

Version 7.0

Document #: OPCO-034-1210 R5

8 July 2022

Revision History

Version 1	July 2001
	Initial approved plan
Version 2	January 2011
	Updated to reflect 2010 operations
Version 2.1	October 2012
	Updated to reflect 2012 operations and WLWB Version 2 Reviewer Comments
Version 3.0	May 2016
	Addition of Section 3.1.1 - Trial Changes to the FPK:CPK Slit.
	Addition of Section 3.2.3 – Pond Location and Size.
Version 3.1	June 2016
	Information added to Section 3.1.1 from WLWB Directive June 9, 2016
Version 3.2	May 2017
	Updates to Section 3.1.1 to support an extension to the PK Trial
Version 4	Operational updates resulting from the PK Trial and use of the 'degrit' circuit in the Process Plant; freeboard modification updates & additional information to align with past Board directives

Version 4.1	Address WLWB Directives from Water Against the Dam RFD (15 May 2018) and PKC Facility Plan V4 RFD (28 May 2018).
Version 5	Update water management and PK deposition management strategy to align with the approved Phase 7 Dam Raise and optimize facility management to maximize PK storage and align with closure scenarios.
Version 5.1	Address WLWB Directives PKCF Plan Version 5.0 RFD (21 August 2020).
Version 6	Information added to reflect the updated Phase 7 final raise and Phase 7 spillway designs.
Version 6.1	Address WLWB Directives following its approval of PK Management Plan Version 6.0 RFD (30 September 2021).
Version 7	Updates to reflect the operations phase of PKMW and WLWB's June 8, 2021 issuance of an Amended Water Licence for PKMW.

Summary

The Processed Kimberlite (PK) Management Plan (Version 7) describes the management of the waste ore from the Process Plant. This waste stream is made up of water, which also has some fine material mixed in with it, and sand-like solids that are deposited into the Processed Kimberlite Containment Facility (PKCF) and the A418 pit and mine workings. This PK Management Plan provides information on PKCF and permanent storage of PK in the A418 pit and mine workings:

- Design and dam construction;
- Operations, including solids and water management;
- Monitoring programs; and
- Descriptions of the types of water, ice, and solids stored within the PKCF and A418 pit and mine workings.

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1. Introduction

1.1 Purpose and Scope

The purpose of the Diavik Diamond Mines (2012) Inc. (DDMI) Processed Kimberlite (PK) Management Plan (previously referred to as the Processed Kimberlite Containment Facility Plan or PKCF Plan) is to describe water and solids management within the Processed Kimberlite Containment Facility (PKCF) and the A418 pit and mine workings. This PK Management Plan (Version 7) fulfils the requirements of Part G, Conditions 3 and 4 of the Type A Water License W2015L2-0001 issued by the Wek'èezhii Land and Water Board (WLWB or 'the Board'). This PK Management Plan provides information on PKCF:

- Design and dam construction;
- Operations, including solids and water management;
- Monitoring programs; and
- Characterization programs for water, ice, and solids stored within the facility.

The PK Management Plan also provides information on the deposition and permanent storage of PK in the mined-out A418 pit and mine workings i.e., the PKMW Project (see Section 5).

1.2 Changes to the PKCF from Previously Approved versions of PK Management Plan (V5.1, 2020; V6.1, 2021)

It is the responsibility of the Process Operations, Mine Technical Services and Health, Safety and Environment departments to update and implement the content of this Plan, as required. Previous versions of the plan included the results of the Processed Kimberlite (PK) Trial and updates to ongoing operational methods for use of the 'degrit' screens in the Process Plant. These changes reversed the fine processed kimberlite to coarse processed kimberlite ratio (FPK:CPK ratio) beginning in June 2016 from 87:13 to 46:54, on average. Moving forward the exact target may vary depending on ore sources and deposition plans; however, DDMI notes a general annual target of 50:50 (+/- 5%) has been set. From 2020, FPK deposition and water management changed to align with eventual use of the approved Phase 7 dam raise and allow flexibility to consider all closure options. As per the PKCF Plan V5.1, FPK deposition above 465 m will develop around approximately three quarters of the facility perimeter (leaving the northwest corner of the PKCF, upstream of the spillway below 464.6 m) and the pond is expected to be managed toward the NW corner of the Facility where an additional water management structure (Northwest PKC Decant Sump) has been installed to replace the reclaim barge (see Figure 2). The overall pond size will also progressively reduce over time as deposition above 465 m advances. The purpose of this updated Plan (Version 6.1) is to address an update to the previous Phase 7 dam raise design (Golder 2018a; Reference 15) in the Updated PKCF Phase 7 final raise design (Golder 2021a; Reference 17) to reflect a modified approach for the final dam raise from elevation 469 m to elevation 473 m to accommodate FPK deposition above elevation 469 m to maximize PK storage capacity while keeping the pond level 0.4 m below the lined section of the Phase 7 dam crest at 469 m. This update (PKCF V6) also reflects an update to the original Phase 7 spillway design (Golder 2018b; Reference 16) in the Updated PKCF Phase 7 Spillway Design (Golder 2021b; Reference 18) for FPK deposition above elevation 469 m. The Phase 7 final dam raise to elevation 473 m is required to store FPK to October 31, 2022 and CPK material to the end of

2025.

Additionally, the following Engineering Standards required under Part G, Condition 27 of the Water License are addressed in the PK Management Plan as follows:

- a) a minimum Freeboard limit of 0.4 metres below the lowest surveyed point of the dam crest liner, shall be maintained at all times; or as recommended by a Geotechnical Engineer and as approved by the Board; (Sections 2.1, 3.4.1)
- b) Accumulation of ponded surface water against Phase 6 of the containment Dam structures of the Processed Kimberlite Containment Facility shall be limited to 14 days, unless otherwise approved by the Board. Occurrences of such accumulation are to be reported in accordance with Schedule 6, Condition 2.
- c) Accumulation of Processed Kimberlite Containment Facility pond water against Phase 6 of the containment Dam structures of the Processed Kimberlite Containment Facility shall be limited to 14 days and shall be approved by the Engineer of Record, unless otherwise approved by the Board. Occurrences of such accumulation are to be reported in accordance with Schedule 6 Condition, 2.
- d) There shall be no accumulation of water against any subsequent Dam raises of the containment Dam structures of the Processed Kimberlite Containment Facility, unless approved by the Board.
- e) if Seepage from the Processed Kimberlite Containment Facility occurs, the Licensee shall collect and return the Seepage to the Processed Kimberlite Containment Facility, the North Inlet or other on-site containment structures forming the Drainage Control and Collection System, and measures shall be undertaken to eliminate the Seepage (Section 3.2).
- f) any deterioration or erosion of any Engineered Structures associated with the Processed Kimberlite Containment Facility shall be reported to an Inspector and repaired immediately (Section 3.3.2).
- g) the solids fraction of Processed Kimberlite shall be deposited and permanently contained within the Processed Kimberlite Containment Facility or the Mine Workings (i.e., A418 and A154 Pits) (Section 2.1).
- h) weekly inspections of the Processed Kimberlite Containment Facility Dams, emergency Spillway(s), pipeline(s), and catchment basin(s) shall be conducted, and the records of these inspections shall be made available to the Board or an Inspector upon request (Sections 3.2.3, 3.3.2).
- i) an inspection of the Processed Kimberlite Containment Facility shall be conducted annually between June and September by a Geotechnical Engineer. The Engineer's Report shall be submitted to the Board within ninety (90) days of completing the on-site inspection, including a covering letter from the Licensee outlining an Implementation Plan for addressing each of the Engineer's recommendations (Section 3.3.2).

The current PK Management Plan (Version 7) also covers the PKMW Project with a focus on PK management during the operations phase of the PKMW i.e., operational deposition of PK into the A418 mine workings and the associated water and waste management and monitoring requirements.

1.3 Site Overview

The Diavik Diamond Mine is located in the Canadian Arctic, about 300 km northeast of Yellowknife, Northwest Territories Canada. The kimberlite pipes are located underwater, beneath the oligotrophic Arctic lake, Lac de Gras. A series of water-retaining dikes have been constructed to permit mining of the pipes. All mine infrastructure, including the PKCF, is located on the 20 km² East Island located within Lac de Gras (Figure 1).

Open pit (surface) and underground mining removes kimberlite ore from four kimberlite ore bodies. The Diavik ore bodies are referred to as A154 North (A154N), A154 South (A154S), A418 and A21 pipes. The upper reaches of A154N and A154S were mined from the A154 open pit, the upper reaches of the A418 pipe is mined from the A418 open pit and the A21 ore is being mined from the A21 open pit. Three of the four kimberlite pipes are also being mined from underground developments. Mining in both the A154 and A418 open pits is complete. Underground production in A418 and A154 started in 2010 and are expected to continue through 2022 and 2025, respectively (Table 1). Open pit mining at A21 commenced in 2018 and DDML received regulatory approval from the WLWB on October 15, 2020, through an Amended Water Licence (W2015L2-0001), to enable underground mining at A21.

Kimberlite ore is processed using physical processing methods. Fine processed kimberlite (FPK) is discharged as a slurry to the Processed Kimberlite Containment Facility (PKCF), and coarse processed kimberlite (CPK) is placed, or used as construction material, within the PKCF.

An overview of the PKMW and details on processed kimberlite management in the A418 pit and mine workings are presented in Section 5.

Table 1: Diavik diamond mine ore bodies, access and mine status

Kimberlite Pipe	Access	Mine Status
A154 North	<ul style="list-style-type: none"> • A154 open pit • A154 Underground (common decline with A418) 	<ul style="list-style-type: none"> • Open pit mining completed Q3 2008 • Underground mining active
A154 South	<ul style="list-style-type: none"> • A154 open pit • A154 Underground (common decline with A418) 	<ul style="list-style-type: none"> • Open pit mining completed Q3 2010 • Underground mining active
A418	<ul style="list-style-type: none"> • A418 open pit • A418 Underground (common decline with A154) 	<ul style="list-style-type: none"> • Open pit mining completed Q3 2012 • Underground mining active until Q4 2022 or Q1 2023
A21	<ul style="list-style-type: none"> • A21 open pit • A21 Underground 	<ul style="list-style-type: none"> • Open pit mining active • TBD

1.4 PKCF Overview

The PKCF is designed to permanently store processed kimberlite (PK) produced during ore processing; this includes CPK and FPK products. CPK and FPK consist of approximately 0.25 to 5.5 mm and -0.25 mm size fractions, respectively. CPK is placed in the PKCF for storage. FPK is deposited as a slurry in the PKCF. The PKCF Facility consists of FPK beaches surrounding a central pond, and designated CPK deposition areas located within the PKC dam.

Historically, FPK deposition was from the entire perimeter of the facility and a generally central PKC and was maintained. A reclaim barge was located centrally in the PKCF. In 2020, a decant sump (NW Decant Sump) was constructed in the northwest corner of the facility and the reclaim barge was decommissioned and removed. This modification to the water reclaim system was to support a change in the FPK deposition geometry to slope to the northwest corner of the facility, upstream of the spillway.

The updated Plan is to advance the PKCF based on a sloped spillway FPK deposition geometry, where FPK deposition surface slopes towards the decant sump and spillway in the northwest corner of the facility, and CPK continues to be placed between FPK deposition and the lined crest.

Key components of the PKCF are further explained in Section 2.0 and illustrated in Figure 2.

RioTinto

Diavik Mine Site Layout, 2021

N
W E S

Airport Runway

Pond 2

N17 Laydown

North Inlet Containment

Airport Road

North Country Rock Pile

PKC North Dam Road

Crusher Plant

Crusher ROM

Backfill Plant

Crusher Loadout Yard

Till Dump

ERT Training Grounds

N3 Laydown

D1 Laydown

Fresh Air Raise

A154 Pit

A154 Dike

Watering Tree

North Inlet Water Treatment Plant

N. Containment Dam

Pond 3

Pond 4

Wind Farm Tower 2

Wind Farm Tower 1

Ammonia Nitrate Storage

Wind Farm Tower 3

Wind Farm Tower 4

Magazine Storage

Emulsion Plant Road

Emulsion Plant

Processed Kimberlite Containment Facility

NW Decant Sump

PKC West Spill Road

PKC East Spill Road

800E Single Lane

South Haul Road

North Haul Road

Pond 1

Underground Portal

Pond 13

Vegetation Plots

UG Fuel Farm

Batch Plant

UG Mine Dry

A418 Pit

A418 Dike

Zone 1 SCAP Warehouse

SCAP Pub Shop

North Winter Road Approach

Lube Storage

Pond 5

Pond 10

Truck Shop

Process Plant

Boiler House

Main Camp

Sewage Treatment Plant

Powerhouse 1 and 2

ROM Pad

Metcon Laydown

Seacan Alley

Pond 11

South Camp

South Tank Farm

South Winter Road Approach

Ring Road

South Country Rock Pile

E21 Sump

A21 Portal

A21 Haul Road

Lakeshore Boulevard

A21 Muster Station

A21 North Ramp

A21 Pit

A21 South Ramp

Zone 2 HME Parking

Zone 3 Pit Maintenance

Waste Transfer Facility

Test Piles

PKC High Point Shovel

PKC Refueling Bay

PKC Muster Station

ROM Hill

AN Windfarm Road

PKC West Spill Road

PKC East Spill Road

0 0.5 1 2 Kilometers

Rio Tinto
Diavik Diamond Mines (2012) Inc.
Health, Safety and Environment Department
Lac de Gras, Northwest Territories

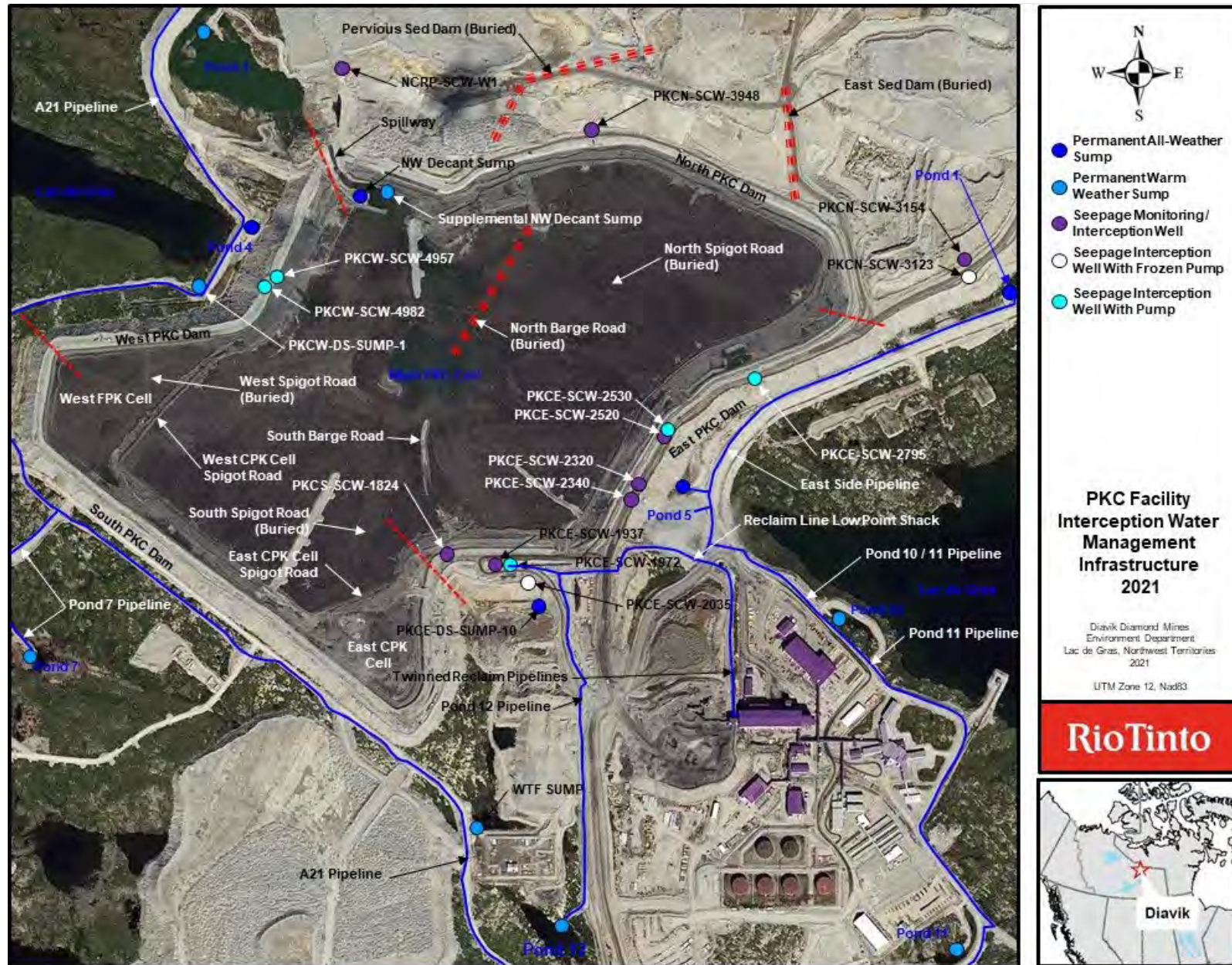
Created: 2/24/2021
DDMI Environment

Satellite Image: (150cm resolution) Acquired 25/07/2021

Coordinate System: NAD 1983 UTM Zone 12N
Projection: Transverse Mercator
Datum: North American 1983

Diavik Mine Site

Figure 2: Components of the PKCF



2.0 PKCF Design and Dam Construction

2.1 Design Basis

The PKCF was designed by the engineering consulting firm SNC Lavalin under the direction of a Professional Engineer (P.Eng.) registered in the Northwest Territories (Reference 1 and 2). The design was updated and revised in 2007 by the engineering consulting firm Golder Associates Ltd. under the direction of a P.Eng. registered in the Northwest Territories (Reference 3). Golder Associates Ltd. continues to perform the duties of the Engineer of Record for the PKCF, including engineering and design services.

Guidelines consulted for the PKCF design included:

- Guidelines for tailing impoundments in the Northwest Territories. Northwest Territories Water Board, February 1987.
- Guidelines for abandonment and restoration planning for mines in the Northwest Territories. Northwest Territories Water Board, September 1990.
- Dam safety guidelines. Canadian Dam Association, 1999, 2007, and 2013.
- Rio Tinto Internal Standard (D5 – Management of Tailings and Water Storage Facilities, 2021).
- Technical Bulletin: Applications of Dam Safety Guidelines to Mining Dams (Canadian Dam Association, 2019; Reference 19).
- Global Industry Standard on Tailings Management, GISTM, August 2020.

The PKCF was designed to permanently store FPK and CPK. Key design elements of the original and revised designs included:

- Enclose a natural topographic depression on East Island;
- Provide permanent storage for the process materials resulting from the mineable kimberlite reserve;
- Dams comprised of a rockfill shell and upstream liner system that extends into frozen cut-off trenches excavated in ice-poor till or bedrock;
- Perimeter collection ponds at key locations outside the facility dams to provide for secondary containment;
- Dams designed to permit phased dam raises that maximize direct-haul of waste rock for construction without increasing the facility footprint;
- Storage of FPK, CPK and water (including waste water, treated sewage and precipitation) within the PKC;
- A water management system capable of ensuring an adequate supply of process water and control over PKCF pond level and volume;
- Slurry discharge of FPK and dry disposal of CPK;
- Originally designed to store 87% FPK and 13% CPK. Following the addition of a

‘degrit’ circuit in the Process Plant in 2016, and the subsequent PK Trial (refer to Section 3.1.1), the ratios were adjusted to approximately 40% FPK and 60% CPK and eventually 50:50;

- Reclaim FPK slurry decant and other water inputs to the PKC for use in the Process Plant circuit, and maximize reclaim;
- The normal operating water volume of the pond ranged from 500,000 m³ to 1,200,000 m³ prior to 2016. The pond is now typically operated at volumes of approximately 2,000 m³ and increased to approximately 400,000 m³ following completion of the Phase 7 spillway. This pond volume will decrease with FPK deposition until commencement of the operations phase of the Processed Kimberlite to Mine Workings Project projected for 2023.
- Maintain sufficient freeboard in the PKCF to pass an inflow design flood (IDF) event through the PKCF spillway and maintain freeboard in Pond 3 to store an IDF event;
- Maintain sufficient freeboard to prevent wave-induced run-up from overtopping the dam during a climatic event;
- Provide an emergency operational spillway to route water out of the PKCF, if a climatic event occurs that exceeds the normal operating design freeboard. The minimum normal operating freeboard limit of 0.4 metres below the lowest surveyed point of the dam crest liner was approved by the WLWB in 2017 and shall be maintained at all times; or as recommended by a Geotechnical Engineer and as approved by the Board. The spillway is designed such that a freeboard of 0.2 meters is maintained if an IDF causes water to pass through the spillway;
- Manage Pond 3 to maintain sufficient freeboard to store an IDF for the combined PKCF and Pond 3 catchment without discharge to the environment: and
- Allowing the CPK and FPK to temporarily rise above the liner crest is acceptable if a rockfill shell is in place downstream of the deposition area prior to the FPK rising above the liner and as long as the pond is maintained 0.4 metres below the lowest surveyed point of the dam crest liner.

2.2 Changes from the Original Design

2.2.1 North and South CPK Cells

The original ratio of FPK to CPK was assumed to be 68.5:31.5. Based on this assumption CPK storage areas were designed to the north and south of the central FPK storage area in what at the time was referred to as the uplands. The original design of the North and South Perimeter Dams called for an 8 m thick upstream layer of till rather than liner.

The actual FPK to CPK ratio until 2016 was closer to 87:13. CPK proved to be a useful construction material for liner bedding and cover as well as for building pipe berms and benches within the PKCF where other construction materials would use up valuable storage volume. As a result, the amount of area required to store CPK was drastically reduced. By Phase 5 of construction, the North and South CPK Cells were reclassified as FPK storage and the North and South Perimeter Dams were redesigned with a liner keyed into a frozen key trench similar to the East and West PKCF Dams.

By the time that Phase 5 construction was complete and FPK deposition could begin in the North and South PKCF Cells, the level of the central Main PKCF Cell pool was higher than both the North and South Cell pools, which were kept low for construction. Decant sumps were installed in both the North and South PKCF Cells to control the settling pool levels during deposition to maintain adequate FPK beach lengths against the North and South PKCF Dams. Supernatant water was pumped into the Main PKCF Cell from both the North and South PKCF Cells where it was reclaimed for process operations. The FPK levels in both the South and North PKCF Cell have reached the point where the decant sumps are no longer required and supernatant water now flows naturally into the Main PKCF pond.

Prior to mid-2016, CPK was stored in the far west end of the PKCF, in an area known as the West CPK Cell as well as the southeast end of the PKCF in an area known as the Southeast CPK Cell (Figure 2).

In 2016 (following completion of Phase 6 dam construction) the Process Plant was modified to initiate a PK Trial. The purpose of the PK Trial was to change the FPK:CPK ratio through a 'degrit' process that would reduce the percentage of FPK (hydraulically deposited) and increase the percentage of CPK (manually placed/compacted). The benefit of manually placed CPK is that it can be strategically placed, dewatered and compacted, as compared to FPK which offers less control on placement, density and water/ice entrainment. The results of the PK Trial are documented in the quarterly updates provided to the WLWB in 2016 and 2017 and summarized in Section 3.1.1 of this plan. From an operational perspective, the PK Trial and ongoing experience with the 'degrit' process has resulted in the following changes:

- The FPK:CPK target ratio is now approximately 50:50, although the ratio can be as low as 40:60 or increase as high as 70:30, based on plant feed (ore types) and variation within each orebody itself.
- CPK is now placed in a series of cells delineated by a perimeter berm (road) constructed of CPK material inside of the PKCF and offset from the lined dams. FPK is deposited from spigots placed along the perimeter berm, creating beaches and a central pool as has always been the practice for FPK deposition.
- Depending on FPK:CPK ratios some outer cells delineated by CPK perimeter berms may be filled with FPK to maximize material storage.

2.2.2 Liner System Change

During Phase 4 construction planning, the PKCF Dam design was reassessed with the purpose of developing a design that better utilizes readily available local materials and allows for a longer construction season. Golder Associates developed a proposal to use bituminous liner rather than High Density Poly Ethylene (HDPE) liner as was used in Phases 1 to 3. The bituminous liner, which can be installed in cold weather thus lengthening the construction season, has similar performance characteristics as HDPE and can be installed with crushed granular bedding and cover material which can be produced in suitable quantities on site. The crushed granular material is also workable in cold weather which is not the case with the natural tills and sands used in Phases 1 to 3 which had to be selected from insitu or stockpile sources

and worked with heavy machinery to produce a suitable construction material.

The bituminous liner was bonded to the HDPE to provide a continuous impermeable surface. Before Phase 5 construction started, the bituminous liner design was reassessed and verified (Reference 3).

The use of bituminous liner continued in Phase 6.

The Phase 7 dam raise includes a bituminous geomembrane liner and commenced construction in the spring of 2018.

2.2.3 Liner Slopes

The liner slope on the West PKCF Dam was changed from 2.5:1 in Phase 3 to 3:1 in Phase 4. This allowed equipment to work on the slope more effectively and safely. It was then changed to 1.5:1 in Phase 5 to provide adequate surface width at the crest for the mine haulage fleet without having to widen the dam downstream into Collection Pond 4 and reducing its storage capacity.

The liner slope on the East PKCF Dam was changed from 2.5:1 in Phase 3 to 3:1 in Phase 4. This allowed equipment to work on the slope more effectively and safely. It was then changed to 1.5:1 in Phase 5 to provide adequate surface width at the crest for the mine haulage fleet without having to widen the dam downstream into Collection Pond 5 and reducing its storage capacity. All other sections of the East PKCF Dam not above Pond 5 retained the 3:1 liner slope for Phase 5.

The liner slopes for the North and South PKCF Dams were designed at 3:1 to allow equipment to work on the slope more effectively and safely. The original design for the North and South Perimeter Dams called for an 8 meter (m) thick upstream layer of till at a 1.5:1 slope.

Phase 6 of the PKCF dam construction was a continuation of the Phase 5 design concepts. The 3:1 (South, North and part of the East Dam) and 1.5:1 (West and a section of the East Dam) slopes were continued in Phase 6. Complete details are provided in the PKCF Phase 6 Dam Raise Construction Report. The Phase 7 raise construction sequence included placement of selected run-of-mine rockfill, followed by trimming of the upstream face of the rockfill to 1.5H:1V, placement of crushed transition and bedding materials and Coletanche bituminous geomembrane liner, followed by placement of a compacted coarse processed kimberlite berm upstream of the liner.

2.2.4 Downstream Rock Fill

Rock fill placement for Phases 4, 5 and 6 was optimized for use of the mine haulage fleet and was placed in 5 m lifts using the haulage truck traffic to achieve the desired compaction. The upstream face was then re-sloped and compacted to support the various transition and liner bedding layers. Rockfill placement for the Phase 7 dam design was generally aligned with previous raises.

2.2.5 Upstream Shoulder Berms

The windrows, or shoulder berms, that DDMI constructs along the upstream edge of the PKC

Facility perimeter dams shall be maintained with a crest elevation of not less than 469.0 m. DDMI will maintain the entire Phase 7 downstream rockfill elevation above 469.0 m.

2.2.6 East Side Pipeline (formerly referred to as the North Inlet to Process Plant Pipeline)

In 2010, a pipeline and pumping system was installed that allows water to be pumped from the North Inlet directly to the Process Plant to be used in the process stream. This system also allowed water to be pumped from the former Main PKCF Cell Reclaim Barge to the North Inlet. This allows for tighter control over the Main PKCF Cell Pool level as well as greatly reducing dependence on raw water use from Lac de Gras. The reclaim barge was decommissioned in 2020 and replaced with the Northwest (NW) Decant Sump that serves a similar function. The NW Decant sump and pad was raised in 2021, in line with the WLWB approved Phase 7 spillway design.

2.2.7 Interception Wells/ Upstream Depressurization Wells

Historically, there was a moderate amount of infiltration through the PKCF Dams that was initially captured/intercepted and collected in the downstream Seepage/Runoff Collection Ponds and pumped back to the PKCF or to the North Inlet for treatment. Over several winters, as the downstream face of the PKCF Dams began to freeze back to a depth where it doesn't thaw during the summer, water began to collect within the PKCF Dam embankments, impounded behind an ice dam forming within the frozen zone of the downstream dam face. This created the situation where water could accumulate within the dam embankments held back by an ice dam of unknown integrity.

Beginning in 2010, 6-inch diameter steel cased wells were installed in the East and West PKCF Dams where there was evidence of the accumulation of water within the dam embankment fill, as well as in 3 locations on the newly constructed South PKCF Dam where it was determined that water would accumulate, if it were present. The size of well casing, which in turn limits the size and capacity of pump that can be used, was limited by the size of drill available on site. Expected flow rates were in excess of the capacity of a single pump, therefore multiple PKCF interception wells were installed to collect water within the same aquifer.

The network of downstream Collection Pond infrastructure continues to be maintained, but the Interception Well system has proven to be a more effective means of intercepting and managing water, especially in the winter when the small amounts of water tend to freeze and accumulate in the Collection Ponds before it can be pumped, reducing the ponds available storage capacity for extreme freshet runoff events. The system continues development based on monitoring results and recharge rates measured by the Geotechnical team.

In 2013, the East PKCF Dam Interception and Upstream Depressurization Well pump discharges were tied into the East Side Pipeline. This allows the water to either be sent directly or indirectly to Collection Ponds, the North Inlet or to the Process Plant via the reclaim circuit (which is then returned to the PKCF as part of the FPK slurry). These water management options provide greater control over PKCF Pond level and volume.

In 2013 it was also identified that a network of rockfill structures within the PKCF, that were

initially used to support Reclaim and FPK pipelines and spigots, were acting as hydraulic conduits between the PKCF Pond and certain sections of the PKCF Dams with high seepage potentials. In early 2013, two 6-inch steel cased wells were installed in one of these rockfill structures upstream of the East PKCF Dam and equipped with pumps to reduce the hydraulic head acting on an area of high infiltration potential to ultimately intercept the water in that section of the East PKCF Dam cut-off. Four more 8-inch steel cased wells were installed upstream of the North, East, South and West PKCF Dams in late 2014 and early 2015 with only the North PKCF Dam well equipped with a pump in mid-2015.

These Upstream Depressurization Wells initially proved quite effective at intercepting water in the East and North PKCF Dams, but strategic FPK deposition has since reduced the recharge into the majority of the upstream rockfill structures to the point where continuous pumping is not required.

2.3 Dam Construction

The PKCF Dams are planned to be constructed in phases. Table 2 summarizes the completed and planned raises and the relevant as-built or design documents.

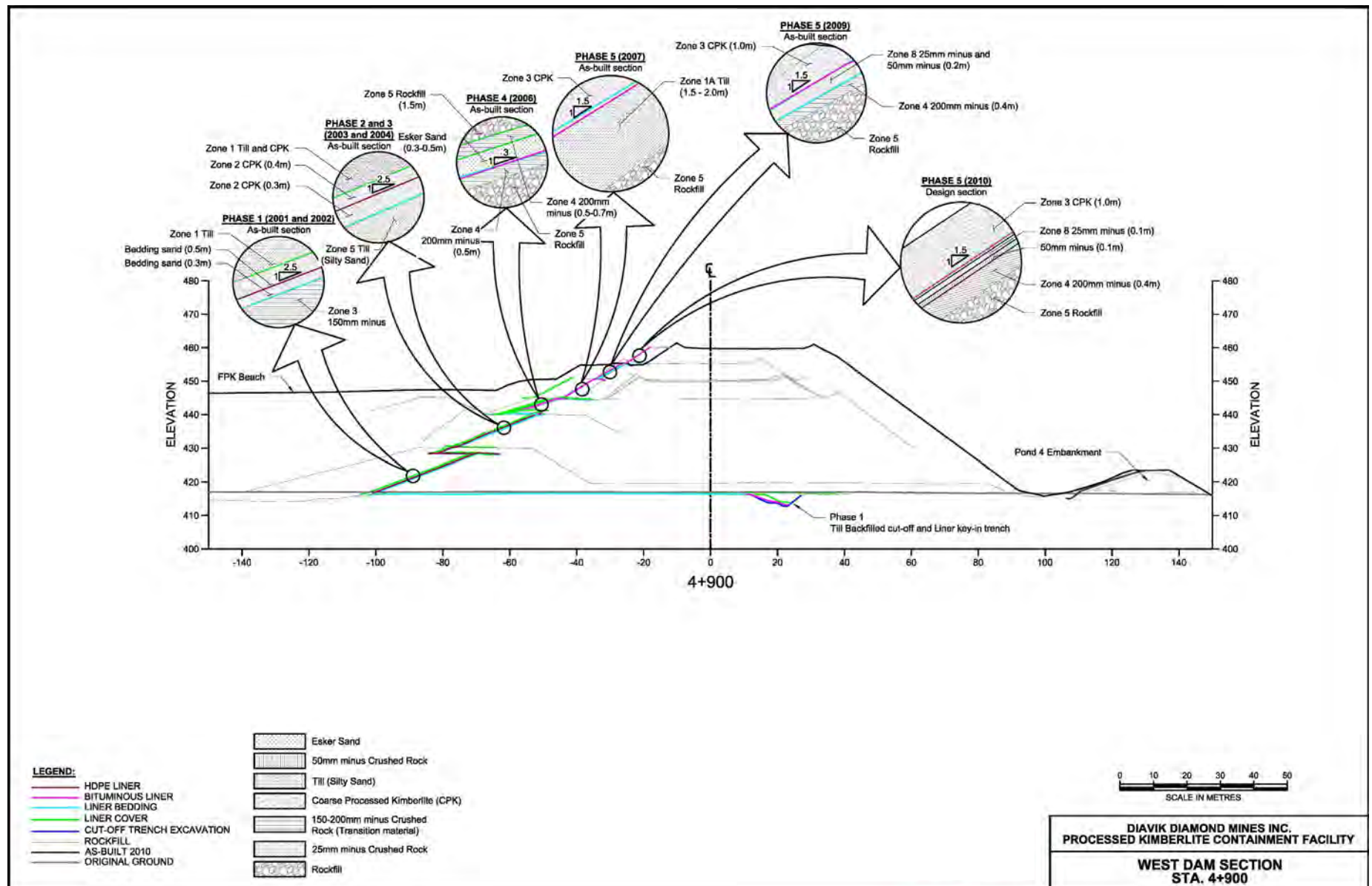
Table 2: PKCF dam construction activities

Construction	Crest Elevation	Construction dates	References
Phase 1 dam construction	430 m	Sep to Dec 2001 and Apr to Sep 2002	Reference 2 Reference 4
Phase 2 dam construction	435 m	2003	Reference 5
Phase 3 dam construction	440 m	Jun to Oct 2004	Reference 6
Phase 4 dam construction	445 m	Nov 2005 to Oct 2006	Reference 7
Phase 5 dam construction	460 m	2007 to Nov 2010	Reference 3
Phase 6 dam construction	465 m	2010 to Sept 2014	Reference 14
Phase 7a&b dam construction	469/473 m*	2018 to 2023	Reference 15
Phase 7 final dam raise construction (updated)	469/473 m	2021	Reference 18

2.4 Future Dam Construction

The Phase 6 dam raise to elevation 465 m was completed in 2015. The Phase 7 (Part a) dam raise to 469m began construction in the spring of 2018 and was completed in 2021. The approach to the Phase 7 final raise (Part b) to elevation 473 m has now been modified, as summarized in the PKCF Updated Phase 7 Final Raise Report (Golder 2021a; Reference 17). The dam raise to elevation 473 m is to be an unlined CPK berm to be constructed upstream of the elevation 469 m dam raise in 2021 and 2022.

Figure 3: Example of Dam Construction



3. PKCF Operations

3.1 Solids Management

FPK slurry is discharged from spigots. Short term deposition plans are developed for a period of two years. The operational philosophy for the FPK discharge plan is based on:

- Using two discharge points at any one time;
- Sequentially retreating from the most distant point on a pipeline back towards the Process Plant in the winter, and varying the discharge locations in summer, depending on the pond location;
- Maintaining long, even FPK beaches (including the upstream CPK Storage Cells);
- Flexible deposition locations updated based on modelling using industry standard modelling software to assist in facility planning to maximize PK storage capacity while keeping the pond level 0.4 m below the lined dam crest;
- Minimizing the FPK deposition thickness during the winter months to reduce the amount of permanently entrapped ice within the FPK beach; and
- Use of an inner perimeter CPK berm above PKCF dam liner crest to contain the FPK above elevation 469 m during operations (CPK berm at maximum elevation of 473 m).

The short-term deposition plan provides information about capacity within the PKCF and how long spigots can be maintained in current positions before spigots must be raised.

CPK moisture content is approximately 19% (including the 'degrit' circuit in the Process Plant) and is placed in designated storage areas generally around the perimeter upstream of the dams within the PKCF or used as construction material within the PKCF (i.e. dam raises, roads and pipe benches within the PKCF).

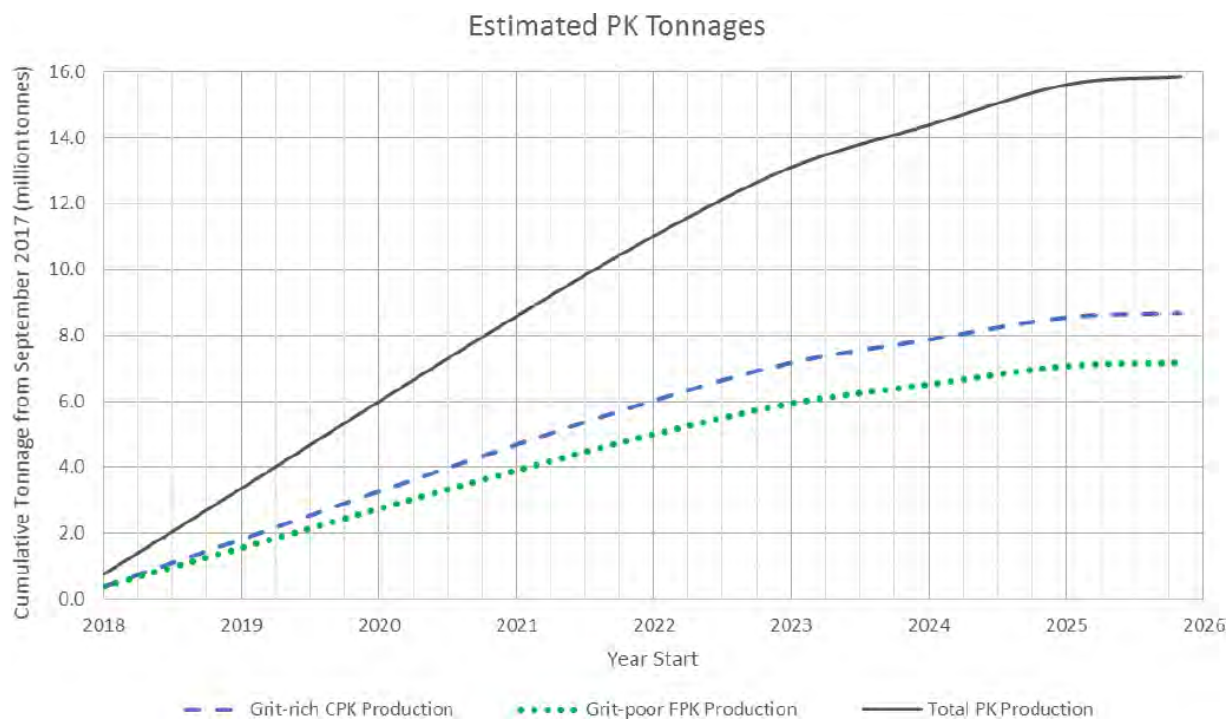
FPK produced during processing is measured in the Process Plant using an in-line meter. CPK produced is measured by scales in the Process Plant. Table 3 provides the annual kimberlite processing tonnages and Figure 4 illustrates the actual and projected annual PK production based on current life-of-mine plans. Note that changes to the mine plan can affect PKCF operations, including ore processing values.

Table 3: Annual kimberlite processing tonnages

Year	Annual PK (tonnes)	Cumulative PK (tonnes)	Cumulative FPK (tonnes)	Cumulative CPK (tonnes)
2002	56,338	56,338	54,411	1,927
2003	1,354,615	1,410,953	1,145,659	265,295
2004	1,977,902	3,388,855	2,741,692	647,164
2005	2,196,334	5,585,189	4,707,423	877,767
2006	2,407,924	7,993,113	6,599,824	1,393,290

Year	Annual PK (tonnes)	Cumulative PK (tonnes)	Cumulative FPK (tonnes)	Cumulative CPK (tonnes)
2007	2,549,168	10,542,282	8,472,208	2,070,073
2008	2,487,868	13,030,149	10,542,851	2,487,299
2009	1,592,209	14,622,358	11,915,908	2,706,450
2010	2,025,232	16,647,590	13,666,990	2,980,600
2011	2,138,108	18,785,698	15,495,375	3,290,329
2012	2,001,976	20,787,674	17,125,737	3,661,938
2013	2,014,010	22,801,684	18,657,321	4,144,364
2014	2,105,839	24,907,523	20,203,116	4,704,408
2015	1,760,333	26,667,856	21,513,435	5,154,422
2016	1,974,686	28,642,542	22,631,671	6,010,872
2017	2,217,051	30,859,593	23,742,518	7,117,076
2018	2,539,817	33,399,411	24,942,332	8,457,079
2019	2,511,338	35,910,749	26,275,962	9,634,787
2020	2,584,501	38,495,250	27,533,488	10,961,762
2021	2,549,470	41,044,720	28,800,383	12,264,337

Figure 4: Annual and Projected PK Production for the Life of Mine



3.1.1 Changes to the CPK:FPK Ratio Resulting from the PK Trial

In June 2016, DDMI completed modifications to the Process Plant that provide DDMI with enhanced operational flexibility regarding the proportion of FPK and CPK produced as mineral waste. A trial was completed to determine what FPK:CPK ratio would be operationally feasible considering various constraints and challenges such as: transport, moisture/dewatering and compaction of grit-rich CPK, as well as deposition characteristics of grit-poor FPK, and the seasonal impacts on each of these. CPK and FPK continue to be deposited in the PKCF; however there has been an increase in CPK and a reduced volume of FPK slurry.

The forecasted ratio during the PK Trial was between 40:60 and 30:70 FPK:CPK. Actual achieved ratios ranged between 50:50 and 30:70 FPK:CPK, averaging out at approximately 46:54 FPK: CPK over the duration of the Trial. This range of values is expected to continue during operations and depending on ore blend may be as high as 60:40.

During the trial, CPK was used to build a network of 3 m to 5 m high, by 40 m wide berms within and around the entire perimeter of the PKCF between 100 m and 150 m inside of the PKCF dams, as shown in the satellite image in Section 2.2.1. CPK was also placed between the perimeter berm and the dam, as was planned in the Trial and will continue as part of the operational plan going forward. During the Trial various CPK placement, compaction and dewatering arrangements were tested in above and below freezing temperature to determine optimal placement methods and to assess seasonal challenges.

FPK slurry will be deposited from spigots inside of the CPK perimeter berm, continuing to create beaches and a central reclaim pond within the PKCF. Overall water management during the Trial was not greatly affected. The reduced FPK production resulted in less reclaim water reporting to the central PKCF pond. Local dewatering efforts (shallow excavated sumps, ditching and pumps) were implemented in various locations of CPK placement within the PKCF. Similar practices are expected to continue, as required, with use of the 'degrit' circuit during operations. The 'degrit' circuit installation and the corresponding PK Trial that has been completed has resulted in enhanced operational flexibility and positive impacts relating to PKCF operations, site water management and closure planning, including:

- Less water being added to the PKCF pond (due to a reduction in FPK);
- More efficient use of the PKCF storage capacity, with the potential to reduce the extent of future dam raises; and
- Potential opportunity to influence the final landscape of the PKCF surface at closure.

The modifications made to the Process Plant allow operational flexibility. DDMI notes that this flexibility includes the ability to return to previous operational processes, should operational needs change. This translates to a target PK ratio of 40:60 (FPK:CPK), with possible variability that could range between approximately 40:60 to 70:30. Optimization of the process will be based on a number of variables that may include: deposition characteristics, ore source, operational efficiency, water management, CPK placement

logistics, PKCF closure plans, energy use and capital and operating costs. DDMI's internal and external assurance programs for the PKCF will continue to be coordinated in collaboration with the Engineer of Record.

3.2 Water Management

DDMI submits a Water Management Plan to the WLWB annually that describes in detail the PKCF water management and PKCF water balance (Reference 8). A summary of PKCF water management is provided here. For additional information, please refer to DDMI's most recently approved Water Management Plan on the WLWB Public Registry.

The operation of the PKCF includes seven pond water management objectives:

1. *Storage of supernatant, runoff and other waste water for reclaim to the Process Plant:* The PKCF pond stores the supernatant water from the FPK slurry discharge. The PKCF Pond also stores runoff from climatic events and other approved waste water sources on site (e.g. treated sewage effluent, collection pond water, cementitious waste from jet grout backflow).
2. *PKCF water recycling:* The water in the PKCF pond is one of two sources of reclaim water used by the Process Plant (the other being the North Inlet) and the pond is managed to maximize reclaim water use (from either the PKC or North Inlet).
3. *Maintain minimum operating pond volume:* The normal operating water volume of the pond ranged from 500,000 m³ to 1,200,000 m³ prior to 2016. The pond is now typically operated at volumes around 2,000 m³ and will increase to approximately 400,000 m³ following completion of the Phase 7 spillway. This pond volume will then decrease with FPK deposition until commencement of the operations phase of the Processed Kimberlite to Mine Workings Project. The primary benefits of the pond are:
 - Maximize reclaim from the Northwest (NW) Decant Sump (previously undertaken via the now decommissioned reclaim barge);
 - Facilitate development of the required PK beach configuration;
 - Allow for some variation in the position of the pond;
 - Accommodate temporary net decreases in pond volume in winter due to freezing.
4. *Promote freezing of FPK beaches:* Freezing the beaches against the dams below the CPK Storage Cells will be promoted by minimizing the CPK placement thickness (when possible) to maximize the depth of freeze each winter.
5. *Containment/discharge of extreme climatic events:* The PKCF storage capacity (including Pond 3) is maintained to ensure sufficient storage for a 1:500-year storm event (environmental design flood). In case of an extreme event, such as an Inflow Design Flood (greater than a 1:500-year storm event) the spillway permits excess water to discharge from the PKCF to Pond 3. Pond 3 will be managed to maintain sufficient freeboard to store

an IDF for the combined PKCF and Pond 3 catchment without discharge to the environment.

6. *Avoid PKC pond water from ponding against the dams:* PKCF pond water ponding against the dams for an extended period could enhance seepage potential through the dam and the foundations. Temporary storage of ponded surface water caused by snow melt, rainfall, or excess process water discharge is permitted against the dams for up to 14 days. Temporary storage of PKCF Pond water is permitted for the Phase 6 dam for up to 14 days, if approved by the Engineer of Record.
7. *Prepare for closure:* Flexible pond management strategies (e.g. progressively decreasing volume) that can influence the final landscape of the PKCF surface and prepare the facility for closure.

Temporary accumulation of ponded surface water against the PKCF Dams caused by snow melt, rainfall, or excess process water discharge (i.e. is not connected to the PKCF Pond) is permitted for the Phase 6 dam raise for up to 14 days. If ponded surface water accumulates against the PKCF Dams, DDMI will:

- a. Immediately notify the Inspector and the Board; and
- b. Report the following information in the Annual Dam Safety Inspection for the PKCF:
 - i. Date and locations of water ponding against the PKC Facility Dams
 - ii. Duration that water ponding against the PKC Facility Dams has occurred
 - iii. Depth and spatial extent of water ponding
 - iv. Likely source of water contributing to the water ponding, and
 - v. Any corrective actions and assessment.

Please refer to Section 3.5 for details on PKCF Pond water that may accumulate against the dam. Starting in 2020, water management strategies will evolve to align with the selected closure options. Specifically, the pond is expected to be managed toward the NW corner of the Facility where an additional water management structure (NW Decant Sump) has been installed. The purpose of this update is to maximize PK storage capacity while keeping the pond level 0.4 m below the lined dam crest. This option will also allow for flexibility in the deposition strategies that can influence the final landscape of the PKCF surface at closure.

3.2.1 Water Sources

The PKCF pond functions as an equalization reservoir for inflows from eight potential sources.

1. *FPK slurry supernatant water:* The principal water input to the PKCF is FPK slurry supernatant water. Water content of the FPK slurry is about 70%. CPK is also deposited in the PKCF, though it only contributes a small amount of input water to the PKCF.
2. *Surface runoff/waste water collected in site Collection Ponds:* Runoff from the mine site is directed to the Collection Pond system. Water from this system can be transferred to the PKCF, but it is generally transferred to the North Inlet via the East Side Pipeline.

3. *PKC interception well water and downstream dam runoff:* Collection Ponds were established in key areas as secondary containment to collect any PKCF dam seepage as well as runoff from the downstream portion of the PKCF dams. Interception Wells within the PKCF dams also prevent seepage from reaching the receiving environment. Water collected in the Collection Ponds and PKC interception wells can be transferred to the PKCF, but it is generally transferred, directly or indirectly, to the North Inlet via the East Side Pipeline.
4. *Runoff from PKCF:* Runoff within the PKCF footprint reports directly to the PKCF Pond. The area of the PKCF is currently 150 ha.
5. *Treated effluent from the Sewage Wastewater Treatment Plant (STP):* Effluent from the STP is pumped on a continuous basis during operation to the PKCF Pond with the slurry stream. Effluent is disinfected using chlorine prior to discharge (Reference 9).
6. *Snow collected from the mine site:* Some of the snow collected from the mine has historically been deposited in the PKCF; however, this practice has stopped to prevent unnecessary water addition to the facility. This practice may recommence if necessary.
7. *North Inlet:* Process water can be drawn from the North Inlet via the East Side Pipeline when the PKCF Pond reclaim water quality is poor. This generally occurs in the winter months when water has to be pumped through the pipeline to keep it from freezing and when much of the PKCF Pond water is frozen and the volume of available water becomes low.
8. *Jet grout backflow and/or cementitious material may be deposited in the facility.*

3.2.2 Outflows and Retention

There are six water outflow or loss mechanisms from the PKCF.

9. *Porewater storage in FPK and CPK:* FPK slurry supernatant water and meteoric water fills voids within the PKCF beaches. This pore water remains within the PKCF.
10. *Ice entrapment:* Water loss by ice entrapment occurs in the winter months. The site water balance estimates that 20% of the supernatant water from the FPK slurry will be entrapped.
11. *Reclaim water to the Process Plant:* Decant water from the NW Pond reports to the NW Decant Sump and is piped to North Inlet for use by the Process Plant. If additional water is required for process plant use, it is sourced from Lac de Gras. Water is returned to the PKCF as part of the FPK slurry.

12. *Evaporation and sublimation:* Evaporation occurs from open water sources, such as the pond and the slurry discharge, and sublimation occurs from accumulated ice and snow within the facility.
13. *East Side Pipeline:* Water is sent from the NW Pond in the PKCF via the NW Decant Sump to the North Inlet via the East Side Pipeline. This is done primarily in the summer to maintain a stable PKCF Pond water level following freshet as the winter-deposited ice-rich FPK beaches melt and drain. This can also be done in the winter to manage the PKCF Pond water level during cold weather when flow is required through the pipeline to keep it from freezing.
14. *PKC interception well water:* Water from the dam Interception and Upstream Depressurization Well system is normally pumped to the North Inlet, directly or indirectly, during the summer.

DDMI regularly moves water from the PKCF to Collection Ponds or the North Inlet during operations. Prior to sending water to the North Inlet the impact will be evaluated to ensure it will not compromise the capabilities of the North Inlet Water Treatment Plant to treat water to meet the effluent quality criteria.

3.2.3 Pond Location and Size

FPK slurry is piped from the Process Plant and is deposited into the PKCF from a series of spigots installed at regular intervals along the perimeter CPK berms. Supernatant water from the FPK slurry collects in a settling pond that is maintained in the centre of the PKCF. The volume of the settling pond is a function of the beach size and managed to allow adequate settling time to maintain the low turbidity requirements for reclaim ore processing water, while still maintaining adequate FPK beach lengths upstream of the PKCF perimeter dams. The PKCF pond water reports to the NW pond within the PKCF. Decant water from the NW Pond reports directly to the North Inlet via the East Side pipeline or indirectly via Pond 3.

Modelling indicates that FPK deposition to approximately elevation 473 m will provide the required FPK storage volume to Q1 2023. FPK deposition between elevation 469 m and 473 m will be limited to the Main Cell. The West Cell will be used for CPK storage above elevation 469 m and the Southeast Cell will continue to be used for CPK storage.

Deposition modelling of the FPK is conducted using industry standard modelling software to assist in facility planning. The pond level is surveyed daily and the entire PKCF, including the FPK beaches and pond bottom, is surveyed at least every summer. This yearly topographic survey data is used as a base for the subsequent years' FPK deposition modelling. Short and medium term FPK deposition planning and modelling is divided up into winter and summer deposition, as the FPK slurry behaves differently at low temperature conditions. These model results are used to schedule the FPK deposition sequence for individual spigots. Longer term FPK deposition modelling is used to plan and schedule infrastructure upgrades such as dam raises, and FPK pipeline moves. The constant in all stages of FPK deposition planning and

modelling is control of the pond location. A one-year plan will predict and control the location of the pond at the end of the yearly deposition cycle, but the short term FPK deposition planning and modelling will predict and control the location of the settling pond on a month to month basis throughout that yearly deposition cycle.

All deposition plans and deposition status updates are presented to and reviewed by the PKCF Management Committee which meets monthly and whose members include representatives from Processing, Diavik Technical, Infrastructure and Projects, Surface Mining, and Health, Safety and Environment Departments as well as Golder Associates in their capacity as the Engineer of Record for the PKCF.

Active FPK spigot locations and adjacent pipelines are inspected daily by Process Plant and/or Geotechnical personnel, and detailed weekly geotechnical inspection reports are recorded and filed.

In addition to managing the location of the pond, the volume and level of the pond can be controlled by adjusting the PKCF water inputs and outputs. The current PKCF water management system consists of the following components.

- The NW Decant Sump can be used to send decant water to the North Inlet via the East Side Pipeline.
- Water in the North Inlet can be pumped to the Process Plant via the East Side Pipeline.
- The Interception and Upstream Depressurization Well systems can be used to directly or indirectly send water to the Process Plant (via tie-ins with the reclaim lines), to Collection Ponds, back to the PKCF pool (direct discharge) or to the North Inlet.
- Water from the Collection Ponds can be pumped directly or indirectly to the PKCF Facility or the North Inlet. Water cannot be pumped from collection ponds to the PKCF pond when water levels in the PKCF are at or above the normal operating level of 0.4 m below the lowest point of the dam crest liner. This is currently 468.6 m with the completion of the Phase 7 final dam raise.
- Water sent to the Process Plant is then discharged to the PKCF with the FPK slurry.
- Assuming safe access, shallow surface water ponding (not connected to the PKCF Pond) can be pumped to the PKCF Pond with portable pumps after freshet or large precipitation events.
- Additional water management structures (e.g. floating pump skids) may be deployed to manage water in the PKCF.

The processes and physical systems that are currently in place allow for tight control over the pond location and level, as well as FPK beach lengths. Starting in 2020, water management strategies were evolved to align with the selected closure options. Specifically, the pond is now managed toward the NW corner of the Facility where an additional water management structure (NW Decant Sump) has been installed. The purpose of this update is to maximize PK storage capacity while keeping the pond level 0.4 m below the lined dam crest. This option will also allow for flexibility in the deposition strategies that can influence the final landscape of the PKCF surface at closure. The PK Management Plan Version 7.0 aligns with the current closure strategy for the Facility.

3.3 Monitoring

In 2017 DDMI prepared quantitative performance objectives (QPOs) for the PKC Facility. In collaboration with the Engineer of Record, DDMI updates the QPOs as needed. Significant issues related to the QPOs will be discussed in the Engineer's Report for the annual inspection of the PKC Facility.

3.3.1 PKCF Pond

Water chemistry of the PKCF pond in the northwest corner of the facility is monitored monthly (SNP station 1645-16) using the protocols outlined in the most recently approved version of the Surveillance Network Program (SNP, Annex A of the Water License). Results from sampling are provided in monthly SNP reports submitted to the WLWB as a requirement of the Type A Water License.

Pond water levels and depth are surveyed daily.

3.3.2 PKCF Dams

Weekly inspections of the PKCF dams may include:

- Length of beaches adjacent to the dams;
- Inspection of general condition of the PKCF dams and collection pond dams;
- Assessment of exposed beaches or areas lacking a beach;
- Condition of spillways (if applicable); and
- Observed seepage, cracking, settlements, flows or other abnormal conditions.

In addition to weekly inspections, annual inspections as required by the Water License are conducted by Golder Associates - the PKCF Engineer of Record (EOR). External, third-party reviews are performed every 2 years and every 5 to 7 years to satisfy the Rio Tinto Internal Standards, Water License requirements and the Canadian Dam Association Dam Safety Guidelines. The Annual EOR Inspection and the 5 to 7-year CDA Dam Safety Review Reports are submitted to the WLWB.

Thermistors, piezometers and PKC interception wells are installed within the dams and FPK beaches to monitor performance, including frozen foundation integrity, FPK beach freeze-back, and water accumulation rates within the dam embankment. Locations of the instruments are provided in Appendix A, which is not considered for approval. Instrumentation is typically read on the following schedule:

- Thermistors are read manually twice per month (at a minimum);
- Piezometers are read manually twice per month (at a minimum); and
- Interception and Upstream Depressurization Wells are read manually once per week, or once per day if actively pumping.

The produced data is reviewed and interpreted taking into account atmospheric conditions, the pond water level within the PKCF, FPK deposition activities, and observations taken from the regular geotechnical inspections. Unusual data trends are investigated, verified and responded to in accordance with the DDMI PKCF Operation, Maintenance, & Surveillance Manual & Emergency Response Plan (Reference 11). Any deterioration or erosion of the PKCF Dam would be reported to the Inspector and repaired immediately.

This data can be used to guide operations such as pool water and PKC interception well water management, as well as deposition and future dam design.

3.3.3 FPK Slurry System and Water Reclaim System

Daily and weekly inspections of the FPK slurry system and water reclaim system may include:

- General pipeline condition, presence of leaks or other abnormal conditions;
- Deposition location and beach elevation relative to spigot elevation;
- Length of beaches against dam shells
- Pipeline flow, slurry density, pipeline pressure; and
- Inspection of NW Decant Sump components; and
- Pipeline bedding for signs of instability.

3.3.4 Collection Ponds

Water chemistry of the collection ponds is monitored monthly when open water is present in the ponds, as per the protocols outlined in the most recently approved SNP and reported in the monthly SNP reports.

The volume of water pumped directly or indirectly from the Collection Ponds to the PKCF or North Inlet is measured and recorded and reported in the monthly SNP reports. Volumes are obtained by measuring pump flow rates and pump recorders or magnetic flow meters and data loggers.

Weekly pond inspections include inspections of exposed surfaces of dam slopes, spillways (if applicable), pumps, water intake and pipelines. Observations are recorded and any required remedial actions are identified. Detailed annual inspections by the Engineer of Record (EOR) occur after freshet. Additional inspections would be conducted following any unusual events (e.g. extreme spring runoff or rainfall, seismic activity or unusual performance). The annual EOR inspection reports are submitted to the WLWB within 90 days of the Inspection date.

3.3.5 PKC Interception Well Water Management

The PKCF is divided into 11 management zones (Figure 5) based primarily on the area where hydrologic flow paths would report.

- Zone 1 - West – North PKC Dam
- Zone 2 - West – North Spigot Road (Upstream)

- Zone 3 - East – North PKC Dam
- Zone 4 - East (North Cell) – East PKC Dam
- Zone 5 - East – North Spigot Road (Upstream)
- Zone 6 - Central (Main Cell) – East PKC Dam
- Zone 7 - East – South PKC Dam / West – East PKC Dam
- Zone 8 - Southeast – South PKC Dam
- Zone 9 - West – South PKC Dam
- Zone 10 - North – South PKC Dam / West – West PKC Dam
- Zone 11 - West PKC Dam

Water that is intercepted and collected from the PKCF is monitored/measured in three ways.

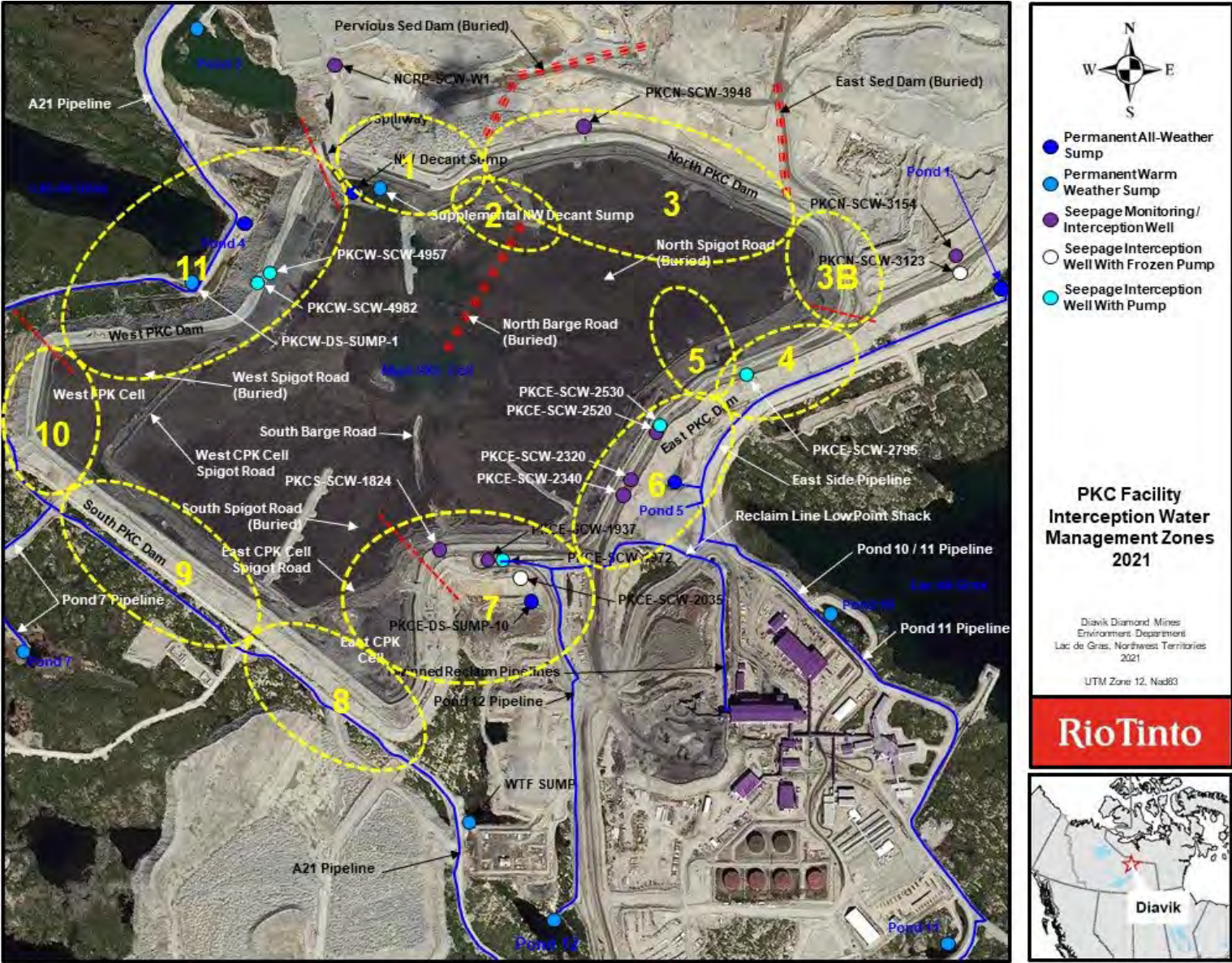
The presence of water within the dams can be determined by monitoring the level in the Interception and Upstream Depressurization Wells (Figure 2). If PKC interception well water is present, a pump is installed with flow meters and water level sensors that allow for accurate determination of recharge rates. Due to the limitations noted in Section 2.2.7 regarding the size of well casings and pump capacities resulting in multiple wells within the same aquifer, DDMI has established SNP monitoring stations that are representative of the water quality within an aquifer/PKC interception well zone (e.g. south, west and east dams of the PKCF), rather than being specific to individual wells. These stations were introduced with the intent of providing water quality data to inform management of PKC interception well water quality and as an early warning indicator of any potential water quality issues at closure. These are sampled in accordance with the protocols outlined in the most recently approved SNP and reported in the monthly SNP reports. The current recharge rate for the 6 currently installed well pumps (East and West PKCF Dams) is approximately 30-50 l/s.

Collection Ponds 1, 3, 4, 5, and 7 (Figure 2) were designed to capture potential PKC intercepted water and runoff before it enters the receiving environment and they are monitored regularly. Ponds 1, 4, and 5 have been equipped with permanent all-weather pumping systems and flow meters which are monitored daily. There is currently no intercepted water reporting to Collection Ponds 1, 4, 5, or 7. The North Inlet receives decant water from the PKCF via Pond 3. Runoff water collected in Collection Ponds 1, 4, 5, and 7 are pumped intermittently as required to the North Inlet.

PKC interception well water is being pumped from the West PKCF Dam Interception Well. Pond 3 is pumped to the North Inlet and kept low to accommodate pumping over the winter and during freshet.

Areas outside of the Collection Pond catchments as well as downstream of the Collection Ponds, are also monitored for seepage. Any flow that is identified outside of containment is sampled and reported to the Government of the Northwest Territories (GNWT) Inspector. If the seepage occurs outside of containment, management efforts are undertaken to stop, re-route or collect the flow of water.

Figure 5: PKCF Water Management Zones



3.4 Contingency and Mitigation Measures

3.4.1 Freeboard and Emergency Operational Spillway

The PKC Facility is operated and maintained to engineering standards such that a minimum normal operating freeboard limit of 0.4 m below the lowest surveyed point of the dam crest liner shall be maintained under normal operating conditions; or as recommended by a Geotechnical Engineer and as approved by the Board.

The freeboard for a water-containing structure can be defined as the minimum vertical distance between the still pool reservoir level and the crest of the containing structure (CDA 2007). This distance needs to be maintained at all times to prevent overtopping of the containing structure by large waves resulting from the sum of wind and wave set-up and wave run-up. The original freeboard requirements were based on the assumption that the PKC Pond might be in contact with the 1.5H:1V slope of the PKCF perimeter dam. The revised freeboard requirements were reassessed considering wave uprush on a continuous 3% slope FPK beach the full perimeter of the PKCF inside of a continuous perimeter upstream CPK storage area which varies in width between 50m and 100m from the PKCF perimeter dam.

The emergency operational spillway maintains PKCF dam integrity in the event of a severe climatic event equal to or greater than the IDF by allowing flood water to flow through the spillway (out of the PKCF) maintaining the PKCF design freeboard. The existing spillway is lined and armoured to protect against erosion with an invert 0.8 m below the dam crest and an elevation of 468.2 m. It is designed to allow peak flow to pass while maintaining a freeboard of 0.2 m to the lined dam crest (Reference 13) and a freeboard of 1 m to the perimeter upstream shoulder berms (Section 2.2.5). The 1 m of freeboard to the perimeter upstream shoulder berms is required to prevent overtopping of the PKCF dams by large waves resulting from the sum of wind and wave set-up and wave run-up. The emergency operational spillway is re-established during each dam raise.

A Phase 7 spillway, based on an updated Phase 7 spillway design (Golder 2021; Reference 18), replaced the existing Phase 6 spillway in 2021. The Phase 7 spillway is aligned with the Phase 7 final dam raise, which is a modified approach for the Phase 7 raise from elevation 469 m to elevation 473 m to accommodate FPK deposition above elevation 469 m to maximize PK storage capacity while keeping the pond level 0.4 m below the lined section of the Phase 7 dam crest until the Phase 7 liner raise to 469 m (which is now completed).

The modified Phase 7 spillway is cemented rockfill (CRF) lined trapezoidal spillway with a 32 m base width and 3:1 horizontal to vertical side slopes and a maximum invert elevation of 468.2 m. An upstream approach channel was constructed between the dam crest and the NW decant sump, which will be lined for erosion protection with select rockfill and jaw run.

The emergency operational spillway drains into Collection Pond 3 (Figure 2/ References 12 and 13), which has a verified maximum storage capacity of ~1.0 million cubic meters to the Pond 3 Dam emergency operational spillway invert; capacity was confirmed on 29 June 2021 and incorporates the Phase 7 spillway chute. DDML continues to maintain enough storage to hold an IDF for the PKCF and Pond 3 catchments without discharge to Lac de Gras.

This allows DDMI to manage the water to meet effluent quality criteria prior to discharge to the receiving environment.

3.4.2. Collection Pond Systems

Collection Ponds 1, 3, 4, 5 and 7 provide downstream secondary seepage containment for the PKCF. Runoff and periodical PKCF Seepage are intercepted by the Collection Pond system and pumped directly or indirectly back to the PKC Pond or to the North Inlet. Collection Ponds 1 and 5, as well as Collection Ponds 10, 11, 12, and 13 can be pumped directly or indirectly to the PKCF, however the standard procedure is to pump all Collection Ponds to the North Inlet, as provided for in DDMI's most recently approved Water Management Plan.

3.4.3. Collection Sump Systems

In 2008, seepage from the North Cell section of the PKCF East Dam was identified between Collection Ponds 1 and 5, outside of the containment area. Two sumps were excavated (EPKC-DS-SUMP-1 and EPKC-DS-SUMP-2; Figure 2) and permanent pumping systems similar to those in Ponds 4 and 5 were installed. For additional contingency, an access road was built downstream of this area from which additional pumps could be deployed if seepage was identified beyond the excavated sumps. No PKCF seepage has reported to this area since early 2013 when Interception Well PKCE-SCW-2795 was installed, and the ingress of permanently frozen ground conditions has reduced the effectiveness of EPKC-DS-SUMP-1 and EPKC-DS-SUMP-2 to the point where EPKC-DS-SUMP-2 has been decommissioned.

In late 2012, seepage from the southwest section of the PKCF East Dam was identified outside of the normal Pond 5 catchment. An Interception Well was planned for that section of the PKCF East Dam but would not be installed until early 2013 so a sump was installed and named EPKC-DS-SUMP-10. It is still in operation but is only used to pump local runoff as no PKCF seepage has reported to this area since early 2013 when Interception Well PKCE- SCW-2035 was installed. DDMI may decrease or expand the collection sump systems to prevent seepage from the facility to the environment.

3.4.4 Interception Wells

Cased holes were drilled into the rock fill shell on the East, West, North and South PKCF Dams as well as the Waste Rock Storage Area - North Country Rock Pile (WRSA-NCRP) to proactively intercept, monitor and manage water that collects in the PKC interception wells (Figure 2). The cased holes can act as interception and / or monitoring wells to collect and remove PKC interception well water before it is released to secondary containment ponds or sumps, or to the receiving environment. Wells are removed, additional wells are installed, and pumps are relocated between wells depending on water management priorities.

No seepage has exited the South or East PKCF Dams since early 2013. No seepage has exited the West PKCF Dam other than a single event in late 2021. Any water removed from the wells on the East PKCF Dam is either pumped directly or indirectly to the North Inlet or returned to the PKCF directly or via the Process Plant. Any water removed from the well on the West PKCF Dam is typically pumped to Collection Pond 3 and ultimately to the North Inlet.

3.5 PKCF Pond Management

The size and location of the PKCF Pond is managed to maintain long FPK beaches that promote freezing and provide long flow paths for pond water to reach the dams. This is accomplished by tailoring the deposition plan towards pond management as well as utilizing the East Side Pipeline to more effectively manage PKCF Pond water levels.

Starting in 2020, water management strategies were evolved to align with the selected closure options. Specifically, the pond is expected to be managed toward the NW corner of the Facility where an additional water management structure will be installed and progressively decrease the overall pond size. The purpose of this update is to maximize PK storage capacity while keeping the pond level 0.4 m below the lined dam crest. This option will also allow for flexibility in the deposition strategies that can influence the final landscape of the PKCF surface at closure.

The PKC pond water would not rise above the FPK beaches or the CPK perimeter berm, with the exception of the beach upstream of the spillway during a runoff event in excess of the design flood event. FPK is deposited upstream of the approximately 50-100 m wide CPK berms that line the perimeter of the PKC Facility, so the pond would not accumulate against the dams and would remain, on average, a minimum of approximately 50-100 m from the dam at the Normal Operating Water Level (NOWL) of 0.4 m below the dam crest liner.

Extended accumulation of the PKCF Pond against the PKCF Dams is not permitted, but temporary (up to 14 days) accumulation of the PKCF Pond against the dams is permitted for the Phase 6 dam raise, if approved by the Engineer of Record. Upon accumulation of the PKCF Pond against the dams, DDMI will:

- a. Immediately notify the Inspector and the Board;
- b. Report the following information as part of the Annual Dam Safety Inspection of the PKCF:
 - i. Date and locations of the PKC Facility Pond against the PKC Facility Dams;
 - ii. Duration that water ponding against the PKC Facility Dams has occurred;
 - iii. Depth and spatial extent of water ponding;
 - iv. Reason the PKC Facility Pond accumulated against the Dams; and,
 - v. Any corrective actions and assessment.
- c. Increase the frequency of key monitoring data, as identified by the Engineer of Record; and,
- d. Conduct a complete evaluation of the key monitoring data on an expedited basis while the PKCF Pond water is against (or near) the PKCF Dams.

The results of a Phase 6 PKCF Dam stability analyses show that the stability slip surface with the lowest factor of safety develops through the rockfill shell and foundation and does not extend to the upstream side of the rockfill shell. The Phase 6 models were completed for the maximum allowable elevation of the FPK with a 0 m FPK beach length upstream of the dams (i.e., pond against the dam but no water depth against the dam). The phreatic surface from the Phase 6 seepage analyses was determined to be maintained upstream of the liner and within

the dam foundation. As the downstream slope stability factor of safety meets the criteria, the Engineer of Record considers there will be an adequate factor of safety achieved under the loading generated by water ponding against the upstream face. The Phase 6 PKCF Dam stability analysis was submitted as Section 5.3 of the PKC Dam Raise Phase VI Design Report ([12 March 2013](#)) and provides more detail on this topic. The Phase 7 PKCF dam will have similar stability properties as the existing Phase 6 PKCF dam.

A test of the PKCF emergency response plan (ERP) would be conducted prior to the freshet of the first year that the water balance indicates PKCF Pond water is expected to pond against the Dam. In subsequent years, the Engineer of Record can determine a suitable frequency for ERP testing.

If PKCF Pond water was to pond against a PKCF dam, DDMI has two management controls. One is to strategically relocate an FPK spigot to direct deposition to the low area of FPK beach where the ponding is occurring. Second is to lower the PKCF Pond water elevation by pumping water from the NW Decant Sump directly to the North Inlet or indirectly to the North Inlet via Pond 3 or alternate water management structures. The current system allows for control over the PKCF pond level and volume under all but the most extreme runoff conditions. Overall, a scenario where the PKCF Pond water was to pond up against the dam is unlikely because there is a CPK berm upstream of the dam.

Following freshet in spring 2021, the water management of the facility was managed through a facility trigger action response plan (TARP), pumping, depositional strategy, and use of Pond 3 via the PKCF spillway. The reporting conducted during freshet included biweekly (every two weeks) reports to the WLWB. Additional decanting infrastructure was setup for Pond 3 and to ensure water level could be managed to maintain sufficient freeboard to store an IDF for the combined PKCF and Pond 3 catchments.

The following additional measures, which were executed prior to and during the 2021 freshet, will be implemented by DDMI as part of PKCF Pond Management for the duration of the operations phase:

- Beginning 45 days prior to freshet and biweekly thereafter until freshet has ended, DDMI will submit to the Board a description of the current status of the water balance, current PKCF and Pond 3 storage capacities in comparison to the storage capacity required to safely manage the EDF and IDF, a description of planned water management activities, and confirmation that DDMI expects to be able to meet all related Licence conditions and PK Management Plan requirements during freshet.
- DDMI will notify the Board and the Inspector as soon as possible if any of the triggers in its TARP for PKCF Pond water management are activated, describe the trigger, identify what actions will be taken and state when they will be implemented.
- DDMI will test the emergency response plan (ERP) prior to freshet.

In the case of temporary or early shutdown prior to or during freshet, DDMI will apply the same resources and diligence to monitor and maintain the PKCF and implement the TARP as it would during operations.

Future freshets will be managed with similar robust controls as during the 2021 freshet. Additional water storage in the PKCF is available for Spring 2022, as part of the completion of the Phase 7 spillway which raised the spillway invert to 468.2 m..

3.6 Stage-Volume Curve and Dam Raise Sequence

As with previous designs and in previous iterations of the PKCF Plan (e.g. PKCF Plan v4.1), the PKCF final dam raise sequence identifies PK levels that will end up higher than the PKCF lined perimeter dam level now that liner construction is complete to 469 m in 2021. Figure 6 is a schematic cross-section representation of a scenario where PK is above the Phase 7 liner. An inner perimeter CPK berm (or spigot berm) to elevation 473 m will be used to contain the FPK above elevation 469 m during operations. In order to prevent slurry from eroding the CPK embankment, the width of the CPK embankment was widened to approximately 20 m versus historical spigot berm widths of approximately 2 m. In the event that FPK slurry erodes through the CPK spigot berm, the wide downstream rockfill shell to elevation 469 m and rockfill berm to be constructed to elevation 471 m are considered able to provide containment such that it would be unlikely for any PK to be released beyond the rockfill shell.

DDMI also notes that as part of the CPK deposition strategy, there is additional capacity left between a portion of the CPK spigot berm and the rockfill shell/liner that would provide storage and allow time to respond and adjust the deposition strategy as required. To manage this process DDMI and Golder will have an operational plan and controls in the PKC Facility Operation Maintenance and Surveillance Manual, which include deposition modelling, monitoring and response actions. These actions are designed to prevent PK being released from the facility. Throughout this dam raise sequence the facility will maintain adequate freeboard to pass an IDF through the spillway to Pond 3 which will maintain sufficient freeboard to store an IDF for the combined PKCF and Pond 3 catchment without discharge to the environment. Figure 7 illustrates the total capacity of the PKC (storage-volume curve) as the Facility expands through sequential dam raises to a hypothetical final dam elevation of 469 m and an inner perimeter CPK berm to elevation 473 m.

As deposition of FPK nears completion in the PKCF, construction of a rock cover may be advanced over accessible final grade PK beach surface. Construction of the rock cover will be in accordance with the current Closure and Reclamation Plan and use rock approved for construction in accordance with the Waste Rock Management Plan. While the PKCF is still in operations, water and waste management aspects of the PKCF plan will not be changed by the construction of a rock cover over any available final PK beach surface.

Figure 6: Schematic Representation of FPK and CPK Raised Above the Elevation of the Existing Liner

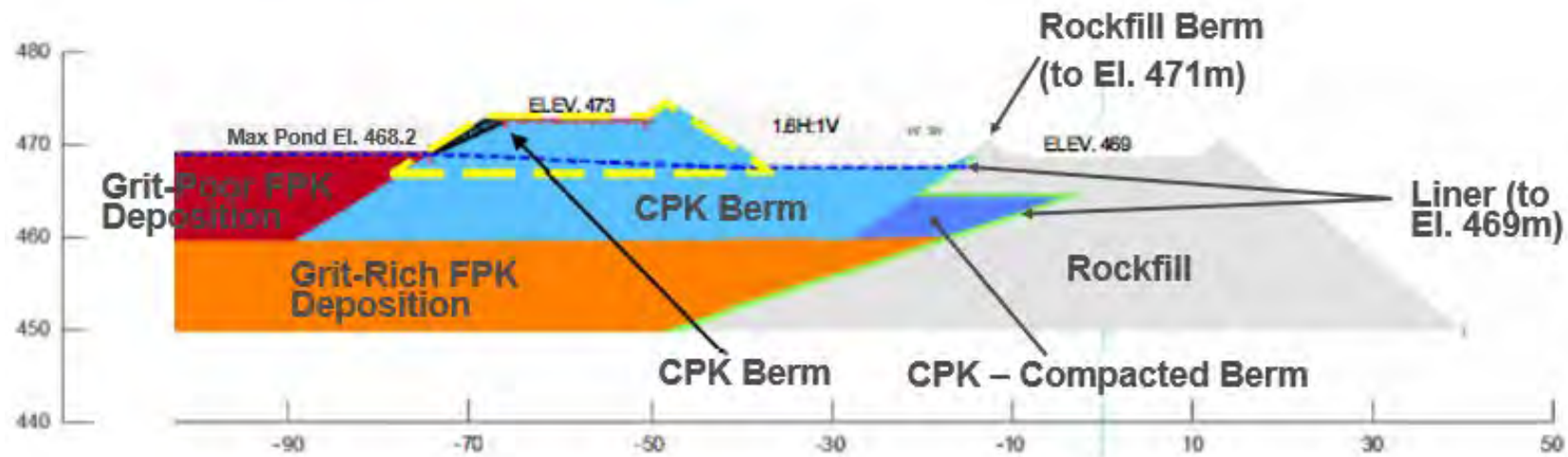
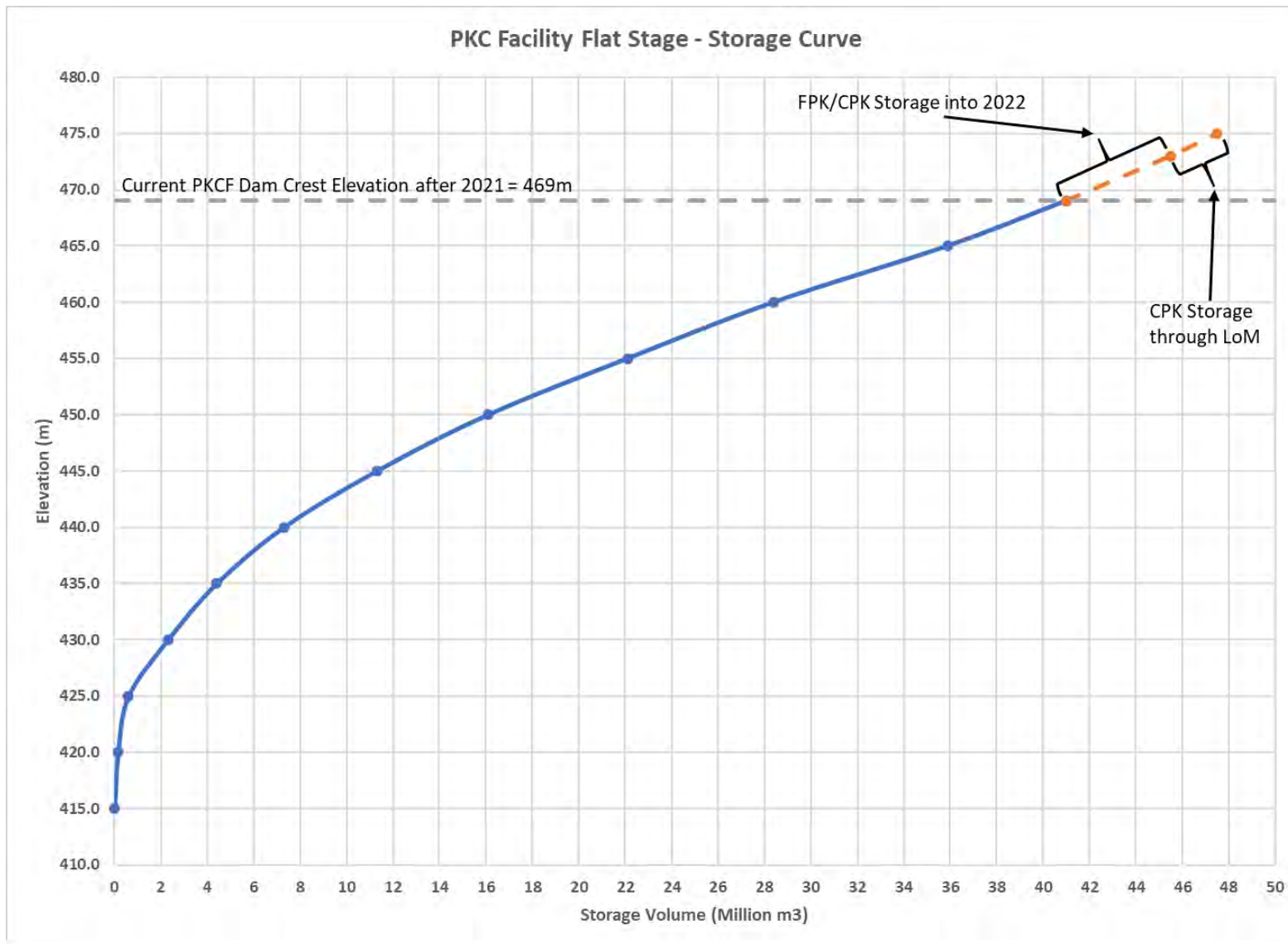


Figure 7 Stage volume curve of PKC facility projected up to hypothetical 475m elevation



4. PKCF Characterization

4.1 Bathymetry and Beach Surveys

Bathymetry and topography surveys are conducted annually to determine the solids and pond distribution within the PKCF. Bathymetric and topographic data are used as inputs for the model used in short-term deposition planning and to verify storage capacity within the PKCF.

4.2 Geotechnical Characterization

The geotechnical characteristics of PK have been characterized to provide a basis for deposition modelling and water balance modelling (Reference 8). Average geotechnical properties from laboratory testing for FPK and CPK are listed in Table 4 and Table 5, respectively.

However, characterizing the in-situ properties is required for closure planning. These field geotechnical characterization studies of in situ FPK include piezocone testing of the beach and slimes and installation of thermistors within the PKCF beaches. These tests are on-going and are described in more detail in Reference 10.

Table 4: Average FPK geotechnical properties

Property	Estimated Value
Specific Gravity	2.85
Dry Density	
Beach Fine PK	1.20 t/m ³
Slime Fine PK	
At surface of slimes	0.90 t/m ³
At bottom of slimes, about 32 m of slimes	1.30 t/m ³
Design mean	1.12 t/m ³
Consolidation Properties	
Void ratio @ 1 kPa	2.4
Compression Index	0.5
Coefficient of Consolidation	1 x 10 ⁻³ cm ² /s
Coefficient of Permeability	7 x 10 ⁻⁸ to 5 x 10 ⁻⁶ cm/s

Table 5: Average CPK geotechnical properties

Property	Estimated Value
Specific Gravity	2.76
Minimum Dry Density	
(i) Saturated and dumped on dry ground	1.04 t/m ³
Water Content at Saturation	60%
(ii) Loosely Settled in column	1.27 t/m ³
Water Content at Saturation	43%
Maximum Dry Density	
(i) Saturated and vibrated in column	1.40 t/m ³
Water Content at Saturation	35%
(ii) Standard Proctor Compaction	1.60 t/m ³
Optimum Water Content, (not saturated)	13.7%
Water Content at Standard Proctor maximum density and fully saturated	26%
Consolidation Properties	
Void ratio @ 1 kPa	1.16
Compression index	0.10
Coefficient of compressibility	0.002
Coefficient of volume change	9.0 x 10 ⁻⁴
Strength Parameters	
Cohesion	0
Friction angle (degrees)	32
Permeability Coefficient at Dry Density of 1.74 t/m ³ (cm/s)	5.5 x 10 ⁻²

4.3 Pore Water Chemistry Characterization

Studies to characterize the pore water chemistry in the PKCF are on-going and described in more detail in Reference 10. Tasks that have been initiated include:

- Geochemical and mineralogical characterization of kimberlites;
- Installation of standpipe piezometers for sampling FPK pore water from the beaches and slimes for geochemical analyses;
- Water sample collection from standpipe piezometers and geochemical analyses;

- Collection of shallow (< 3 m) cores for porewater extraction from thawed zones and ice lenses; and
- FPK sample collection and mineralogical analyses of in situ FPK beach sediments.

Pore water sampling and results interpretation will continue annually, as required, but to date have not influenced operations.

4.4 Ice Entrapment

Several attempts have been made to quantify ice entrapment within the PKCF, including ground penetrating radar investigations and piezocone testing. Results have been inconclusive and further attempts are not planned. Ice entrapment affects storage capacity, the changes to which are captured in annual bathymetry and topographic surveys. The actual in place densities, taking into account ice entrapment, are used in the deposition model and are factored in when planning dam raises.

5. PKMW

5.1 PKMW Overview

As part of the PKMW Project, the A418 pit and mine workings is to permanently store PK, in the form of a slurry (FPK), from the process plant once mining at the A418 ceases. DDML will deposit FPK production to the end of mine life (2025) into the mine workings because the Processed Kimberlite Containment Facility (PKCF) will eventually run out of storage capacity for PK. The PKMW Project includes new pipelines to transport PK slurry from the ore process plant to A418 pit (see Appendix B). After mining is complete, and no more FPK is deposited into the A418 pit and mine workings, freshwater from Lac de Gras would be added overtop the established decant or pore water layer overlying the FPK on the bottom of the A418 pit, isolating the stored FPK from the surface environment. Once this freshwater cap is established and tested to confirm that the top 40 m meets WLWB-approved Aquatic Effects Monitoring Program (AEMP) effects benchmarks and closure/cultural criteria, the A418 pit lake will be reconnected to Lac de Gras by breaching the A418 dikes. The current PKMW scope of activities as part of this version of the PK Management Plan is limited to PK management during the operations phase of the PKMW i.e., operational deposition of PK into the A418 mine workings and the associated water and waste management and monitoring.

In addition to the implementation of the PK Management Plan to manage the operational deposition and storage of PK in the A418 pit and mine workings, the following Plans will be updated and implemented to manage other operational aspects of the PKMW Project:

- Water Management Plan and Site Water Balance
- Contingency Plan
- Waste Management Plan
- Wildlife Management and Monitoring Plan

A WLWB-approved Closure and Reclamation Plan will be implemented once the operational aspects of PK deposition and storage are complete. The Closure and Reclamation Plan will inform the management of closure-related activities of the PKMW, including re-filling the A418 pit with water from Lac de Gras, reconnecting the A418 pit lake to Lac de Gras, and closure and post-

closure monitoring of the A418 pit lake and Lac de Gras.

5.2 Sources and Types of Process Waste and Wastewater

Processed kimberlite is generated at the process plant in two sizes: coarse PK (CPK) and fine PK (FPK). CPK and FPK consist of approximately 0.25 to 5.5 mm and -0.25 mm size fractions, respectively. The ore sources from which PK is generated remain the same i.e., A21, A418 (stockpiled ore), A154N and A154S kimberlites. Prior to commencement of the operations phase of the PKMW Project, FPK will continue to be discharged as a slurry to the PKCF. Once the PKMW Project is operational, all FPK from the process plant will be piped and deposited as a slurry in the A418 pit and mine workings. The PK slurry for FPK from the process plant will not undergo any additional physical or chemical treatment process prior to deposition in the A418 pit and mine workings. The PK slurry will be the primary waste source to the A418 pit and mine workings for the PKMW Project. For the remainder of the Diavik mine life, CPK will continue to be placed, or used as construction material, within the PKCF.

Water sources/inputs to A418 pit and mine workings as part of the PKMW Project will be the following:

- PK slurry supernatant water – The principal water input to the A418 pit and mine workings is PK slurry supernatant/pore water. Water content of the piped PK slurry is about 70%.
- Surface runoff – Surface natural drainage into the pit and mine workings from snow melt during freshet and rainwater during the wet season.
- Direct precipitation – snow and rain
- Dike seepage – dike seepage into the pit and mine from Lac de Gras.
- Groundwater – groundwater inflows to the pit and mine workings.

There will be no changes to the existing processes for treating waste or wastewater as a result of the PKMW Project.

5.3 PK Deposition Plan and Project Schedule

The Immediate Deposition Plan is focused on A418 mine workings with deposition of FPK to A418 scheduled to commence in Q1 2023. The FPK will be transported via PK slurry pipelines from the process plant to the A418 pit and mine workings aided by pumping infrastructure. The pipelines consist of high-density polyethylene (HDPE) pipes routed along the side of existing roads and safety berms and adjacent to existing dewatering pipelines to the mine workings. The pipelines will be aligned to allow drainage into the existing Drainage Control and Collection System in the event of a spill, where practical. At the A418, the pipelines follow the decline ramp into the A418 pit. The PK slurry pipeline from the Process Plant to A418 would extend 3.2 km to the edge of A418 and will extend a further approximately 1.4 km into the pit. The PK to A418 discharge location will be below elevation 337 m. As with the current deposition of PK to the PKCF, the PK slurry from the process plant will not undergo any physical or chemical treatment prior to deposition in the A418 pit and mine workings. A figure of the alignment and elevation of the PK slurry pipeline from the processing plant to the A418 pit and mine workings is presented in Appendix B.

A418 and A154 are connected by a common decline to access underground mine workings. To allow for the commencement of PK deposition into A418 while underground mining is ongoing in the adjacent A154, two (2) bulkheads will be constructed. Bulkheads will prevent PK deposited into A418 from flowing through the decline to the adjacent A154 mine workings. Prior to

commencement of construction of the bulkheads, Diavik will submit a Bulkheads Design and Construction Plan and associated Bulkheads Design Drawings to the WLWB as per the information requirements and timelines in Part E, Conditions 6 and 7 and Schedule 5, Condition 1 of the Amended Water Licence.

The deposition strategy is to deposit PK slurry directly into the open mine void at the center of the A418 pit allowing PK to fill from the bottom up and to flow into adjacent development tunnels as their elevation is reached. PK slurry will be discharged from spigots to the A418 mine workings and the deposition will be continuous/year-round. It is anticipated that up to 80% of the PK from the process plant will be directed to the A418 mine workings as PK slurry, with the balance trucked to the PKC Facility as coarse PK (CPK). FPK will be deposited in A418 to a total of approximately 3,300,000 tonnes over the three-year period from Q1 2023 to end of mine life in 2025. These FPK deposition quantity estimates are for dry material only. A stage-volume curve for FPK deposition in A418 is presented in Figure 8., where the y-axis shows the reference level elevation in the A418 pit, relative to sea-level at 9000. There are two scenarios informing the stage-volume curve for FPK deposition in A418: a 100% water drain scenario and a zero-drain water scenario. The actual stage-volume curve will be somewhere between the two scenarios. With that said, DDMI has planned for each extreme scenario and has systems designed to handle the water in a 100% drain scenario and a zero-drain scenario.

The geotechnical characteristics of PK have been determined to provide a basis for deposition modelling and water balance. Details on geotechnical characterization of PK are presented in Section 4.2. Active FPK spigot locations and adjacent pipelines will be inspected daily by Process Plant and/or Geotechnical personnel, and detailed weekly geotechnical inspection reports will be recorded and filed.

PK deposition strategy is to ensure that the deposited FPK can be overtopped with water from Lac de Gras at closure to ensure water quality in the pit lake meets AEMP benchmarks in the top 40 m prior to reconnecting the pit to Lac de Gras. All deposition plans and deposition status updates are presented to and reviewed by the Diavik PKMW Management Committee which meets monthly and whose members include representatives from Processing, Diavik Technical, Infrastructure and Projects, Surface Mining, Closure, and Health, Safety and Environment Departments. DDMI will prepare quantitative performance objectives (QPOs) prior to the deposition and storage of PK in the A418 mine workings. DDMI will update the QPOs as needed throughout the operation of the PKMW Project.

The anticipated project schedule for the operations phase is summarized below (Table 6) with a focus on activities leading up to and associated with the deposition of PK to A418 mine workings.

Table 6: Development Schedule for the Construction and Operations Phase of the PKMW Project

Development Phase	Activity	Start	End	Requirement to Proceed
Pipeline Construction	Construction of PK Slurry Pipeline	May 2021	November 2022	Pipe and appurtenances on site

Development Phase	Activity	Start	End	Requirement to Proceed
	Bulkheads	December 2022	June 2023	Submission of Bulkheads Design and Construction Plan and Bulkheads Design Drawings to the WLWB at least 90 days prior to commencement of construction
Operations	Deposition of PK slurry into A418 Mine Workings	Q1 2023	Q2 2025	Construction of pipeline, bulkheads, decant system, cessation of underground mining at A418
	Slurry water decanting (dewatering) and management	Once water levels reach pumping infrastructure at approx. elevation 257 m	Until flooding with Lac de Gras water	

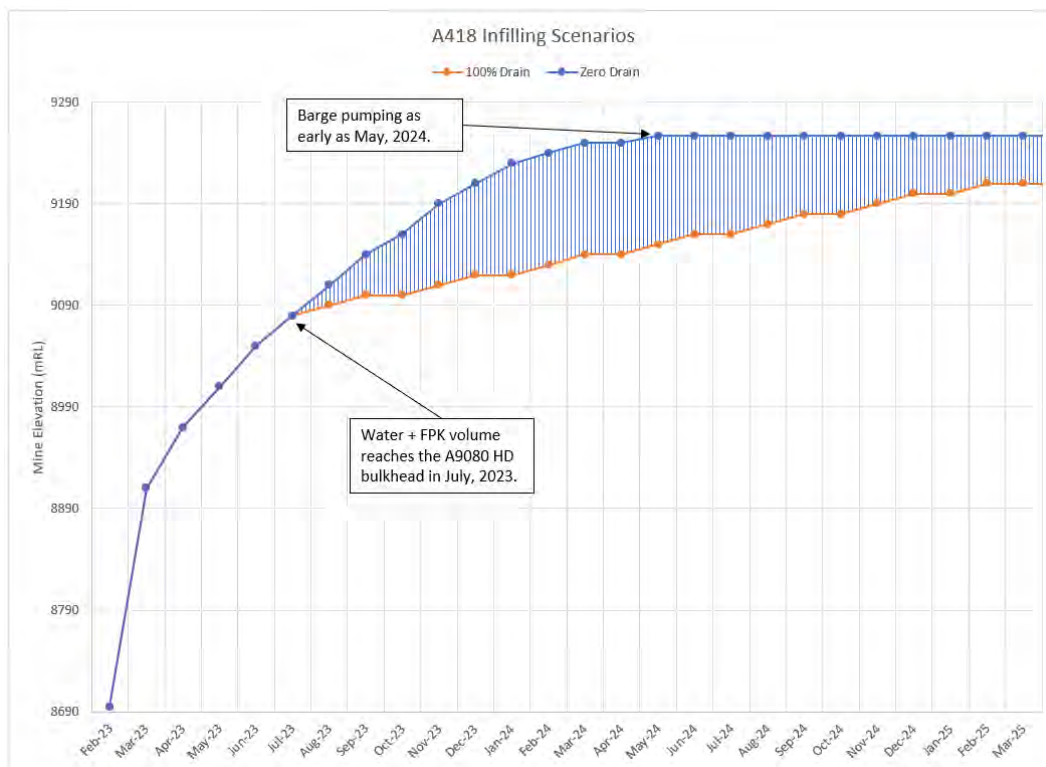


Figure 8: Stage-Volume Curve for PK to A418

Figure 8 (above) illustrates the predicted fill curve in A418 mine based on predictions of tailing volume and groundwater inflow. As the water and FPK reach A418 pit elevation 9080 haulage drift, there is the potential for water to naturally drain through a rock fault near the A418 mine orebody. In this case, drained water will be captured and managed by C9015 Pump Station and sent to surface to the North Inlet and either recycled in the process plant or treated in the NIWTP prior to discharge. In a zero-drain assumption, no water drains through the rock fault. In this case, the reclaim barge or pump and pipe system will manage all decant water to be maintained at Elevation ~257 m. It is expected that the actual stage-volume curve will be somewhere between the two extreme scenarios (100% drain and zero-drain), shown in the shaded area in Figure 8.

5.4 Water and Waste Management

As noted in Section 5.2, in addition to management of the deposition and permanent storage FPK in the A418 pit and mine workings, PK slurry supernatant or pore water, water inputs from runoff, direct precipitation, dike seepage from Lac de Gras, and groundwater inflows will be managed through a water management system to maximize storage capacity for FPK and to maintain a minimum depth and volume of supernatant water overlying the stored FPK for the duration of the operations phase.

Specifically, ponded water or supernatant that forms on top of the FPK as a result of release of pore water from the settlement, compaction/consolidation of the deposited FPK, together with contribution from the aforementioned natural sources of water, will be managed by continuously removing or decanting some of this water via a reclaim barge or pump and pipe system. The Reclaim barge or pump and pipe system would be at elevation ~257 m and will not be used until water reaches that level. The reclaim barge will be connected to a dewatering station at elevation 270 m and will maintain decanted water at the elevation ~257 m. As decanted water is pumped out, FPK will continue to fill this volume, i.e., volume remains the same and ratio of FPK to water increases over time. The decanted water will be sent to the North Inlet and either recycled in the process plant or treated in the NIWTP prior to discharge. As highlighted in the stage-volume curve (Figure 8), PK slurry is estimated to reach elevation ~257 m in the A418 pit and mine workings approximately 15 months under a zero-drain scenario after FPK into A418 deposition begins.

The operation of the PKMW includes the following pond/supernatant water management objectives:

1. Contain supernatant/decant/pore water, groundwater, runoff and other water inputs in the A418 pit and mine workings.
2. Ensure control over decant water level overlaying the deposited PK in the A418 mine workings by:
 - Maximizing use of water reclaimed from the A418 pond in the processing plant to reduce dependence of freshwater for diamond production.
 - Maintaining maximum normal operating pond at elevation ~257 m.
 - Accommodating temporary net decreases in pond volume in winter due to freezing.
3. Transport reclaim water from the supernatant/decant pond in A418 via pipeline and pumping system to the North Inlet to the NIWTP for treatment and discharge as effluent.
4. Maintain water levels and sufficient freeboard to accommodate filling of pit with Lac de Gras water to achieve closure target of the upper 40 m meeting AEMP benchmarks and WLWB-

approved cultural use criteria.

During the three (3) years (2023-2025) of processed kimberlite deposition in A418, the groundwater inputs would be expected to gradually reduce as the water level within the mine workings increases. Diavik has conservatively assumed groundwater inputs will remain constant over the three years of the PKMW operations phase. This conservative assumption presumes the maximum possible amount of decant water annually would need to be managed throughout the PKMW operations phase. The operational treatment capacity of the North Inlet Water Treatment Plant is 33 Mm³/year, or 131 Mm³ between 2022 and 2025 (period of PK filling). The expected reduction of groundwater inflow would have a negligible impact on the site water balance and would remain within the treatment capacity of the plant. The estimated total pore water release from consolidation of FPK is about 1.91 Mm³ for the 200-year period following the end of deposition.

The final level of porewater and FPK in the mine workings prior to infilling and the Pit Filling Design (i.e., filling of A418 pit and mine workings containing PK with water from Lac de Gras) will be determined as part of final closure design and will be specified in the final Closure Design Report for approval by the WLWB. The overlying decant water will be maintained at or below elevation ~257 m prior to infilling with water from Lac de Gras at closure. The bulkheads will be designed to allow for a hydrostatic pressure of PK slurry up to 295 m.

5.5 Operational or Structural Modifications

Operational or structural modifications to the PKMW Project may be necessary as the project advances. DDML expects that any significant changes to deposition plans, for instance, would require updates to the PK Management Plan. Diavik will engage the GNWT Lands Inspector and the WLWB regarding project modifications proposed for the execution of the PKMW Project as required.

5.6 Monitoring

Following commencement of deposition of FPK via the PK slurry pipeline from the processing plant to the A418 pit and mine workings, actual volume the decant pond water levels/volume and depth will be surveyed/measured daily. PK depth to be measured once decant water reaches elevation ~257 m via bathymetric assessment from a boat i.e., bathymetric assessment to be conducted annually during open water and pending safe access. A final PK level/bathymetric assessment will be completed at the end of PK deposition pending safe access. Weekly inspections of the PK slurry system and water reclaim system will include:

- General pipeline condition, presence of leaks or other abnormal conditions;
- Deposition location;
- Pipeline flow, slurry density, pipeline pressure;
- Inspection of Decant Sump/Reclaim barge components (after installation); and
- Pipeline bedding for signs of instability.

FPK consolidation properties are known from consolidation model analyses conducted to date for the FPK to be deposited in the A418 mine workings; hence, calibrations will be performed based

on this information. The planned monthly PK sampling/monitoring of water and solids and bi-weekly monitoring of water from the decant pipeline will enable characterization of the consolidation properties and pore water quality of the processed kimberlite within the A418 Mine Workings.

As part of the execution of PKMW, Diavik will establish a comprehensive SNP program (SNP Station 1645-88) in the A418 pit and mine workings for the operations and closure phases of the PKMW Project. As per the protocols (water quality parameters, sampling frequency etc.) outlined in the current version of the Surveillance Network Program (SNP, Annex A, Station Applying to Mine Workings Containing Processed Kimberlite of the Amended Diavik Water License), Diavik will conduct a monitoring program for water quality of the A418 mine working containing PK at the following frequencies during the operations phase i.e., PK slurry deposition. This sampling program is linked to validation of water quality and consolidation model assumptions that will inform stage 2 model update:

1. Quarterly PK slurry physical property sampling during active deposition of PK into A418 mine workings (grain size distribution and large-strain consolidation tests) to track against consolidation model assumptions
2. Bi-weekly decanted slurry water quality sampling as per SNP 1645-88 in Annex A of the Amended Diavik Water Licence. This monitoring program is to track against porewater water quality assumptions.

Water quality monitoring will be used to assess potential changes in water concentrations of chemical constituents in comparison with WLWB-approved water quality and other criteria. Results from sampling will be provided in monthly SNP reports submitted to the WLWB as a requirement of the Type A Water Licence.

Once FPK deposition is complete and the pit is filled with water from Lac de Gras as part of closure, DDML will implement follow-up measures to verify the environmental effects predictions and effectiveness of mitigations. These measures will be developed as part Final Closure and Reclamation Plan. Data collected from the monitoring/sampling noted above will inform updates to the consolidation model and Stage 2 (prior to pit filling with Lac de Gras water) and Stage 3 (after pit filling but before dike breaching) water quality modelling as part of closure design for the PKMW. A key purpose of the monitoring at 1645-88 is to provide real data from the pit lake to calibrate the initial conditions for the Stage 3 model which is used to demonstrate acceptability of reconnection of the A418 pit lake to Lac de Gras, including whether the top 40 m of the water column in the A418 pit lake meets AEMP benchmarks and cultural use criteria, once approved/established by WLWB. Decisions to require additional sample collection will be made based on the monitoring and results.

Monitoring requirements for closure and post-closure, including those related to SNP 1645-88, will be detailed as part of the Final Closure and Reclamation Plan and will meet regulatory requirements, including Annex A of the Diavik Water Licence. Closure and post-closure monitoring programs for PKMW will be advanced as part of Final Closure and Reclamation Plan development and will address the following:

- Monitoring water quality in the pit lakes after the mine workings are filled to determine when and if water quality parameters meet aquatic effects benchmarks.

- Monitoring water quality, particularly TSS and TDS, in Lac de Gras at near-field, mid-field, and far-field areas during the breaching of the mine workings dikes.
- Exclude fish from the pit lake(s) until the monitoring program shows that water quality in the top 40 m of the pit lake(s) meets AEMP benchmarks.

In addition to continuation of the existing Wildlife Monitoring Program at Diavik, DDMI will implement a wildlife management program for PKMW during the operations phase, including implementation of existing wildlife deterrent techniques, as required, to reduce wildlife interactions with the PKMW operations. Any wildlife observed in the mine workings will be removed prior to commencement of the closure phase, i.e., pit lake infilling, in accordance with applicable regulations. Details on wildlife monitoring for PKMW are provided in Diavik's Tier 3 Wildlife Management and Monitoring Plan.

5.7 PKMW Modelling

Diavik's 3-tiered approach to water quality modelling for PKMW Project is as follows:

- Stage 1 Modelling: prior to commencing deposition as part of the Processed Kimberlite Containment in Mine Working Design Report – Stage 1 Modelling was completed as part of the Water Licence Amendment Process for the Immediate Deposition Plan i.e., deposition of PK slurry in the A418 pit and mine workings;
- Stage 2 Modelling – prior to pit filling with Lac de Gras water (incorporating as-built conditions captured from monitoring during the operations phase); and
- Stage 3 Modelling – after pit filling but before dike breaching (to allow calibration of model inputs and assumptions from operations and closure phase monitoring).

DDMI notes that the water quality modelling is a planning and evaluation tool and as such it will evolve and improve over time supported by additional monitoring information collected as the PKMW project proceeds; hence, once PK deposition in A418 pit and mine workings commences, new information collected from the PKMW monitoring program detailed in Section 5.6, e.g., actual PK slurry quantities and chemistry, will inform updates to Stage 2 and Stage 3 water quality modelling associated with the aforementioned key project phases of project closure. Diavik will submit a PKMW Modelling Plan for A418 to the WLWB prior to filling the A418 pit with Lac de Gras water (incorporating as-built conditions) and after pit filling but before dike breaching (to allow calibration of model inputs and assumptions) as per Part G, Condition 21 of the Amended Water Licence.

If future modelling updates indicate that the final mixed water volume (after flooding with LDG water) will be above AEMP benchmarks, the following measures will be considered:

- Pump out pit water prior to flooding such that the final balance meets guidelines; or
- Provide an alternative approach to manage final water quality if pumping below elevation ~257 m is not possible.

The final modelling update “before reconnection” will be informed by the final pit lake water quality conditions based on monitoring results. Based on as-built and monitored conditions, the update will be used to evaluate pit lake water quality over the long term and, at a minimum, that surface water quality in the top 40 m will remain below AEMP benchmarks.

5.8 Contingencies and Adaptive Management

DDMI will monitor the following action levels and implement associated response actions to manage PK deposition during the Operations Phase:

- Maintain a minimum water content of between 70% and 80% in PK slurry to A418.
 - If monitored water content in the PK slurry pipeline to A418 falls outside the expected range, water inputs in the Processing Plant will be adjusted to address the deviation.
- Maintain decant water elevation of ~257 m, which is more than adequate for production up to end of mine life in 2025 and enables infilling with water from Lac de Gras water at closure to meet 40 m water quality benchmarks.
 - If decant water elevation is above the ~257 m threshold, Diavik will increase transport of reclaim water from the supernatant/decant pond in A418 via pipeline and pumping system to the North Inlet to maintain decant water at the ~257 m elevation.
- Undertake additional fill modelling if monitored water chemistry proves to be materially different than assumed for the Stage 1 Water Quality Model for PKMW (see Table 7).

In addition, DDMI will monitor the following action levels and implement the noted response actions as part of the Closure Phase of the PKMW Project:

- Based on Stage 1 Water Quality Model for PKMW, the A418 pit lake will meet AEMP benchmarks in the top 40 m following filling with water from LDG and prior to reconnecting the pit to LDG. If AEMP benchmarks in the top 40 m of the flooded A418 pit lake are met, DDMI has not identified any evidence that the identified cultural water use criteria will not also be met; hence, if future modelling updates indicate that the final mixed water volume (after flooding with LDG water) will be above AEMP benchmarks in the top 40 m of the A418 pit lake, one or more of the following response actions will be taken:
 - Lower decant water level prior to flooding such that the final balance meets guidelines.
 - Consider alternative mitigations.
- After the A418 pit has been filled with water from LDG the resulting water quality will be tested to confirm AEMP benchmarks are achieved in the top 40 m. If the water quality is greater than AEMP benchmarks, the following response actions will be taken:
 - Provide an alternative approach to manage final water quality, for example, in situ treatment of the A418 pit lake water to meet AEMP benchmarks in the top 40 m.
 - Do not reconnect the A418 pit lake to Lac de Gras until AEMP Benchmarks are met in the top 40 m of the pit lake.

Table 7: Stage 1 Model Input Chemistry (Average Concentrations)

Constituent	Unit	PK Porewater Release
Aluminum	mg/L	0.0047
Ammonia as nitrogen	mg/L	1.7
Antimony	mg/L	0.0043
Arsenic	mg/L	0.0044
Barium	mg/L	0.049
Boron	mg/L	0.063
Cadmium	mg/L	0.00042

Constituent	Unit	PK Porewater Release
Calcium	mg/L	0.63
Chloride	mg/L	101
Chromium	mg/L	0.000027
Copper	mg/L	0.0031
Fluoride	mg/L	0.075
Iron	mg/L	0.0018
Lead	mg/L	0.00036
Magnesium	mg/L	0.43
Manganese	mg/L	0.0027
Molybdenum	mg/L	0.19
Nickel	mg/L	0.0033
Nitrate as nitrogen	mg/L	12
Nitrite as nitrogen	mg/L	1.9
Phosphorus	mg/L	0.018
Selenium	mg/L	0.00041
Silicon	mg/L	0.78
Silver	mg/L	0.000018
Sodium	mg/L	95
Strontium	mg/L	0.53
Sulphate	mg/L	175
Thallium	mg/L	0.000036
Tin	mg/L	0.00013
Total dissolved solids	mg/L	534
Uranium	mg/L	0.000025
Zinc	mg/L	0.0041

DDMI is confident the current dataset and the proposed SNP station with additional PK deposition monitoring within the updated PK Management Plan will satisfy information requirements to properly inform adaptive management actions and subsequent model updates. DDMI does not foresee any situation where additional pre-deposition sampling would change the decision to commence PK deposition. For instance, any significant change to porewater conditions can be adaptively managed through the reduction of decant water volumes before flooding. Details on contingencies for PKMW, including to mitigate accidents and malfunctions, are provided in the Diavik Contingency Plan.

The next modelling update for PKMW i.e., “before filling the pit” will be informed by the monitoring during PK deposition and in particular the volume and quality of the decant water overlaying the consolidating PK solids. These results will be used to adaptively manage the volume of decant water prior to pit flooding to ensure initial water quality within the pit lake will be below AEMP benchmarks. Action levels will be informed by the AEMP Benchmarks and the WLWB-approved cultural use criteria, once confirmed or approved by the WLWB. As part of operational requirements for the deposition of PK into A418, a PKMW-specific Trigger Action Response Plan (TARP) will be developed prior to PK deposition, to, for instance, ensure that an appropriate system is in place to manage decant water volumes should chemistry data demonstrate additional volume mitigations are required.

DDMI will implement the following project execution options as contingencies based on the updated water quality modelling and monitoring results during project implementation:

- Do not reconnect PK filled pits to lake, treat in situ.
- Infill breach to prevent fish passage to PK filled pits but maintain hydraulics.
- Close the breaches or isolate the pit lake from Lac de Gras if water quality is later determined to pose a risk to water quality, fish and fish habitat, caribou, humans or cultural land uses.
- Consider alternative fish habitat off-setting plans should pit lake reconnection no longer be considered acceptable.

The following additional measures are planned as contingencies or to inform adaptive management:

- Ongoing engagement with stakeholders, including with the Participation Agreement groups and communities and other identified potentially affected Indigenous groups to inform project design and execution (refer to PKMW Engagement Plan).
- Use of information from PKMW monitoring programs conducted by DDMI and reviewed, updated and approved through the WLWB processes to inform adaptive management.
- Test of the PKMW emergency response plan (ERP) in the first year and establish ERP test frequency in subsequent years of operations.
- Work with DFO and Indigenous Groups to identify any follow-up monitoring that may be necessary to adaptively manage water levels in Lac de Gras and flows in the Coppermine River during the pit infilling periods i.e., as part of the closure phase.

References

1. Nishi-Khon/SNC Lavalin Processed Kimberlite Containment Facility Design Report, 4200-41EG-1003. August 1999.
2. Nishi-Khon/SNC Lavalin. Processed Kimberlite Containment Facility Updated Design Report. April 2001.
3. Golder Associates Ltd. Diavik Diamond Mines Inc. Process Kimberlite Containment Facility Phase 5 Design Report, DCN RPT 348. June 5, 2007.
4. Nishi-Khon/SNC Lavalin. Processed Kimberlite Containment Facility Phase 1 Construction As-built Report. 2002.
5. Nishi-Khon/SNC Lavalin. Processed Kimberlite Containment Facility Phase 2 Construction As-built Report. 2002.
6. Nishi-Khon/SNC Lavalin. Processed Kimberlite Containment Facility Phase 3 Construction As-built Report. 2005.
7. Golder Associates Ltd. Processed Kimberlite Containment Facility Phase 4 Raise Construction As-built Report, DCN RPT 300. March 8, 2007.
8. DDMI. Water Management Plan, Version 13. December 2014.
9. DDMI. Facilities Operation Plan – Sewage Treatment Plant. October 2010.
10. DDMI. Interim Closure and Reclamation Plan, Version 3.2. July 2011.
11. DDMI PKC Facility Operation, Maintenance, & Surveillance Manual & Emergency Response Plan.
12. Golder Associates Ltd. Technical Memorandum - Processed Kimberlite Containment Facility Operations Spillway Design – Support to DDMI on Resubmission of Proposed Modification. August 2016.
13. Golder Associates Ltd. Technical Memorandum - Processed Kimberlite Containment Facility Operations Spillway Description Review. July 2015.
14. Golder Associates Ltd. – Processed Kimberlite Containment Facility Phase 6 Dam Raise Construction Record Report, 1521339-1491-R-Rev 0-4000, February 2016.
15. Golder Associates Ltd. 2018a. Processed Kimberlite Containment Facility Phase 7 Dam Raise Design. 1771864-1671-R-Rev0-9000. 18 July 2018.

16. Golder 2018b: PKCF Phase 7 Operational Spillway Design submitted to DDMI on June 11, 2018.
17. Golder Associates Ltd. – PKC Facility Phase 7 Final Raise Design – Prepared for Diavik Diamond Mines (2012) Inc. Doc No. 20136439-2081-R-Rev0-8000. 13 July 2021.
18. Golder Associates Ltd. – Phase 7 Spillway Design Update Report – Prepared for Diavik Diamond Mines (2012) Inc. Doc No. 20136439-2092-R-Rev0-5000. 13 July 2021.
19. Technical Bulletin: Applications of Dam Safety Guidelines to Mining Dams (Canadian Dam Association, 2019)

Glossary of Terms

Coarse Processed Kimberlite (CPK): consists of approximately 0.25 to 5.5 mm size fractions of processed kimberlite.

Environmental Design Flood (EDF): is a 1:500-year return period 24-hour rain or snow event that is required to be managed at the PKC Facility without the release of water from the facility to the environment.

Inflow Design Flood (IDF): is a greater than 1:500-year return period rain or snow event and is the most severe inflow flood for which a dam spillway should be designed. The IDF is not required to be stored but must be conveyed through an emergency spillway without impacting the integrity of the facility.

Fine Processed Kimberlite (FPK): consists of the approximate -0.25 mm size fraction of processed kimberlite.

Kimberlite: Potassic volcanic rock which may contain diamonds.

Slimes: Generic mining term used to describe fine grained processed ore (i.e. tailings)

Slurry: Water and solids mixture that transports the Fine Processed Kimberlite.

Appendix A PKCF Instrumentation

Table A-1: Processed Kimberlite Containment Facility Instrumentation – Depressurization, Observation, and Interception Wells and Piezometers

Reference	Location		Installation Date	Comments
	Structure	Phase 6 Station		
PKCS-SCW-1040	South Dam	61+093	Jun 2010	152 mm observation well
PKCS-SCW-1567		61+577	Jun 2010	152 mm observation well, pump frozen in place
PKCS-C1760-US	South Spigot Road (east end)	61+854	Aug 2017	standpipe piezometer in South Spigot Road, upstream of East Dam
SSR-UDW-1758		61+852	2014/2015	203 mm observation well upstream of East Dam
PKCE-C1830-US	South Barge Road	61+916	Feb 2013	standpipe piezometer in South Barge Road, upstream of East Dam
PKCS-SCW-1824		61+905	Jun 2010	152 mm observation well downstream of the liner key trench
PKCE-C1823-US		61+908	Aug 2017	stand pipe piezometer
PKCE-C1921-US	East Dam	61+992	Aug 2017	stand pipe piezometer
PKCE-V1921-FPK		61+992	Aug 2017	vibrating wire piezometer
PKCE-SCW-1937		62+009	Aug 2016	406 mm interception well, operational
PKCE-SCW-1972		62+044	Aug 2016	406 mm interception well, operational
PKCE-V2023A-FPK		62+096	Aug 2017	vibrating wire piezometer
PKCE-V2023B-FPK		62+096	Aug 2017	vibrating wire piezometer
PKCE-C2023-US		62+096	Aug 2017	stand pipe piezometer
PKCE-SCW-2035		62+104	Feb 2013	152 mm observation well, pump frozen in place
PKCE-SCW-2320		62+407	Apr 2010	152 mm observation well
PKCE-SCW-2340		62+427	Apr 2010	152 mm observation well
PKCE-SCW-2480		62+567	Apr 2010	152 mm interception well, operational
PKCE-SCW-2520		62+607	Dec 2010	152 mm interception well, operational
PKCE-SCW-2530		62+617	Aug 2016	406 mm observation well
PKCE-V2547-US		62+633	Feb 2013	vibrating wire piezometer
PKCE-V2654-US		62+745	May 2013	vibrating wire piezometer in North Spigot Road, upstream of East Dam
PKCE-C2714-KT		62+787	May 2013	standpipe piezometer in North Spigot Road, upstream of East Dam
PKCE-V2779-US		62+861	Feb 2013	vibrating wire piezometer
PKCE-SCW-2795		62+873	May 2013	152 mm interception well, operational
PKCE-V2824-US		62+906	Feb 2013	vibrating wire piezometer

Reference	Location		Installation Date	Comments
	Structure	Phase 6 Station		
PKCE-UDW-2678	North Spigot Road (east end)	n/a	2014/2015	203 mm observation well upstream of East Dam
NSR-SCW-3454		62+786	Apr 2013	152 mm depressurization well, operational
NSR-SCW-3463		62+786	Apr 2013	152 mm depressurization well, operational
NSR-SCW-3491		62+783	Apr 2013	152 mm observation well
PKCN-SCW-3123	North Dam	63+227	Jun 2013	152 mm observation well, pump frozen in place
PKCN-SCW-3154		63+248	Mar 2013	152 mm observation well
PKCN-SCW-3948		64+105	Aug 2016	406 mm observation well
PKCN-SCW-3951		64+108	May 2013	152 mm observation well
PKCN-V4000		64+151	May 2008	vibrating wire piezometer
PKCN-V4089-US		64+239	Aug 2011	vibrating wire piezometer
NCRP-SCW-W1	North Country Rock Pile	n/a	2013	152 mm observation well in North Country Rock Pile east of Pond 3, frozen
NSR-UDW-4068	North Spigot Road (north end)	64+214	2014/2015	203 mm depressurization well, operational
NSR-SOW-4074		64+216	Dec 2012	standpipe piezometer
PKCW-SCW-4957	West Dam	65+109	May 2010	152 mm interception well, operational
PKCW-SCW-4982		65+134	Aug 2016	305 mm observation well
PKCW-V4992-US		65+123	Mar 2013	vibrating wire piezometer
PKCW-V5094-US		65+244	Mar 2013	vibrating wire piezometer
PKCW-V5200-US		65+341	Mar 2013	vibrating wire piezometer
PKCW-V5320-US	West Spigot Road (south end)	64+464	Mar 2013	vibrating wire piezometer
PKCW-C5340-US	West Spigot Road (north end)	65+482	Mar 2013	standpipe piezometer in West CPK Cell causeway, upstream of West Dam, not operational since October 2016
WSR-UDW-5343		65+485	2014/2015	203 mm observation well

Table A-2: Processed Kimberlite Containment Facility Instrumentation – Thermistors

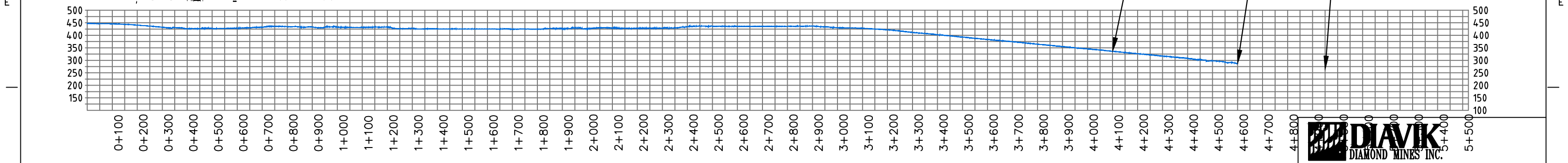
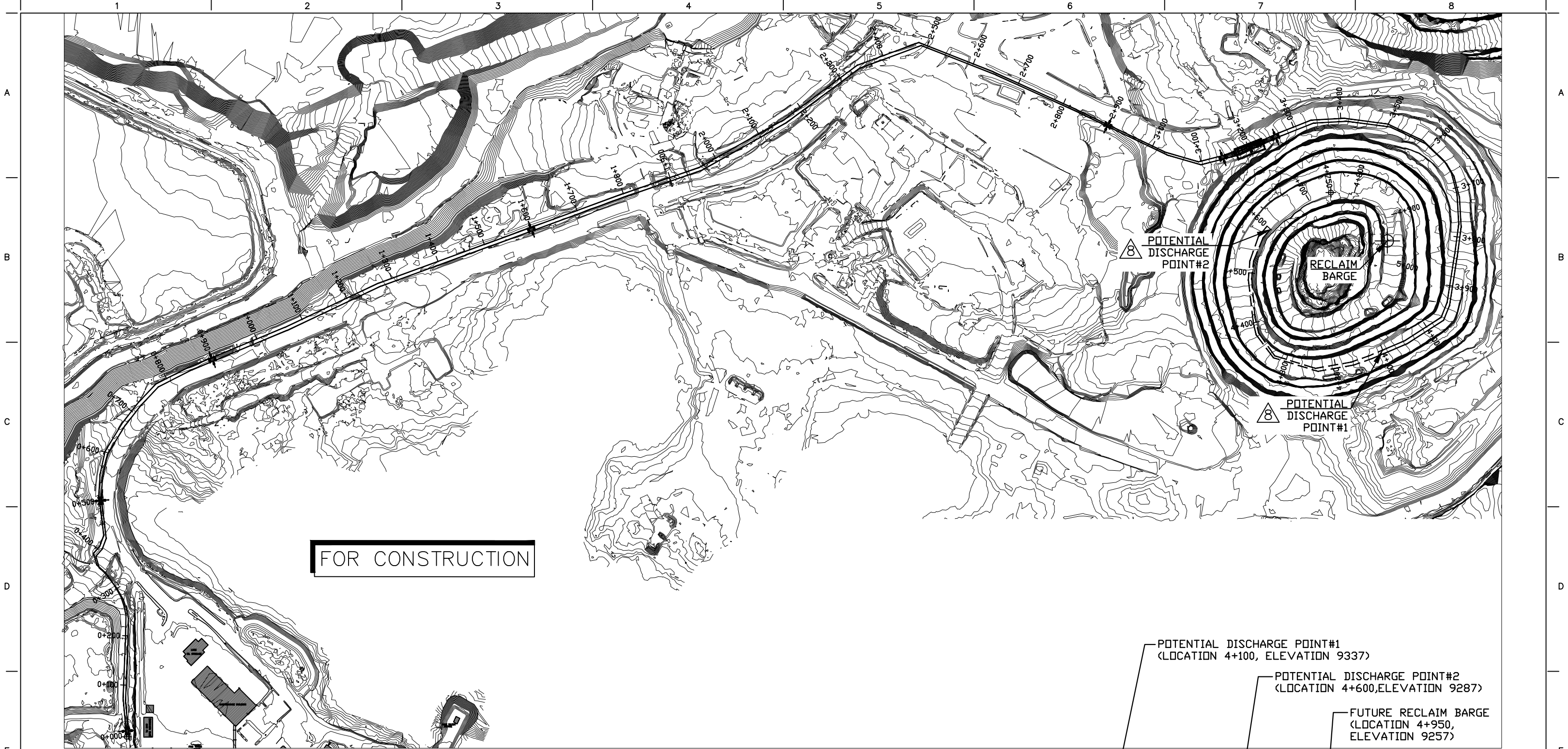
Reference	Location			Orientation	Installation Date	Comments
	Structure	Phase 6 Station	Location			
PKCS-T1040-DS	South Dam	61+093	in liner bedding	3H:1V	Jun 2008	operational
PKCS-T1049-DS		61+104	in liner bedding	3H:1V	Jun 2008	operational
PKCS-T1060-DS		61+116	in liner bedding	3H:1V	Jun 2008	operational
PKCS-T1540-DS		61+646	in liner bedding	3H:1V	Jun 2008	operational
PKCS-T1550-DS		61+655	in liner bedding	3H:1V	Jun 2008	operational
PKCS-T1560-DS		61+665	in liner bedding	3H:1V	Jun 2008	operational
PKCS-T1555-DS		61+669	downstream rockfill	vertical	2017	operational
PKCS-T1760-KT		61+854	upstream, South Spigot Road fill	vertical	2017	operational

Reference	Location			Orientation	Installation Date	Comments
	Structure	Phase 6 Station	Location			
PKCE-T1823-KT	East Dam	61+908	upstream, South Barge Road fill	vertical	2017	operational
PKCE-T1830-US		61+916	upstream, South Barge Road fill	vertical	Jun 2012	operational
PKCE-T1921-KT		61+992	key trench	vertical	2017	operational
PKCE-T2005-DS		62+075	downstream rockfill	vertical	2017	operational
PKCE-T2023-KT		62+096	key trench	vertical	2017	operational
PKCE-T2119-DS		62+197	downstream rockfill	vertical	2017	operational
PKCE-T2190-DS		62+262	downstream rockfill	vertical	2017	operational
PKCE-T2558-KT		62+400	key trench (foundation)	vertical	Jan 2002	operational
PKCE-T2558-CL		62+417	Phase 1 - CL (foundation)	vertical	Jan 2002	operational
PKCE-T2601-DS		62+444	downstream rockfill and dam foundation	vertical	Sep 2006	operational
PKCE-T2399A-CL PKCE-T2399B-CL		62+486	downstream rockfill and dam foundation	vertical	Jun 2012	operational
PKCE-T2725-DS		62+568	downstream dam foundation	vertical	Jan 2002	operational
PKCE-T2725-CL		62+568	Phase 1 - CL (foundation)	vertical	Jan 2002	operational
PKCE-T2725-KT		62+572	key trench	vertical	Jan 2002	operational
PKCE-T2734-DS		62+577	downstream rockfill and dam foundation	vertical	Oct 2006	operational
PKCE-T2765-KT		62+607	key trench (foundation)	vertical	Jan 2002	operational
PKCE-T2765-DS		62+608	Phase 1 - CL (foundation)	vertical	Jan 2002	operational
PKCE-T2765-CL		62+608	Phase 1 - CL (foundation)	vertical	Jan 2002	operational
PKCE-T2547-US		62+633	upstream, through FPK beach and upstream rockfill	vertical	Jun 2012	operational
PKCE-T2654-KT		62+745	key trench fill and into bedrock, upstream through FPK beach and rockfill	vertical	Jun 2012	operational
PKCE-T2700A-CL PKCE-T2700B-CL		62+782	downstream rockfill and dam foundation	vertical	Aug 2013	operational
PKCE-T2714-KT		62+787	key trench fill and into bedrock, upstream through North Spigot Road rockfill	vertical	Jun 2012	operational
PKCE-T2746-US		62+828	upstream CPK and FPK	vertical	Mar 2013	operational
PKCE-T3040B-KT		62+850	cut-off - (fill and foundation)	vertical	Jun 2006	operational
PKCE-T2780A-CL PKCE-T2780B-CL		62+860	downstream rockfill and dam foundation	vertical	Aug 2013	operational
PKCE-T2800A-DS PKCE-T2800B-DS		62+882	downstream rockfill and dam foundation	vertical	Sep 2013	operational
PKCE-T3080B-KT		62+900	cut-off - (fill and foundation)	vertical	Jun 2006	operational
PKCE-T2824A-US PKCE-T2824B-US		62+906	upstream CPK and FPK	vertical	Mar 2013	operational
PKCS-T1760-KT		61+854	upstream, South Spigot Road fill	vertical	2017	operational

Reference	Location			Orientation	Installation Date	Comments
	Structure	Phase 6 Station	Location			
PKCE-T2900A-DS PKCE-T2900B-DS		62+982	downstream rockfill and dam foundation	vertical	Sep 2013	operational
PKCN-T3126-DS	North Dam	63+239	under liner	3H:1V	Jun 2008	operational
PKCN-T3180-DS		63+293	under liner	3H:1V	Jun 2008	operational
PKCN-T3320A-KT PKCN-T3320B-KT PKCN-T3320C-KT PKCN-T3320D-KT		63+464	key trench (fill)	horizontal	Oct 2009	operational
PKCN-T3450-DS		63+588	under liner	3H:1V	Jun 2008	operational
PKCN-T3716-KT		63+842	under key liner	horizontal	Nov 2009	operational
PKCN-T4030-US		64+181	FPK beach	vertical	Sep 2011	operational
PCKN-T4038E-KT PCKN-T4038W-KT		64+186	over key liner	horizontal	Sep 2010	operational
PKCN-T4060-DS		64+211	under liner	3H:1V	Jun 2008	operational
PKCN-T4350-US		64+477	upstream through FPK beach, key trench fill and into bedrock	vertical	Sep 2013	operational
PKCN-T4589-DS		64+719	downstream of liner in till plug	vertical	Jun 2008	operational
PKCW-T4844-US	West Dam	64+994	upstream through FPK beach and upstream rockfill pipe berm	vertical	Ma 2013	operational
PKCW-T4855A-KT PKCW-T4855B-KT		65+006	downstream rockfill, key trench	vertical	2017	operational
PKCW-T5006A-KT PKCW-T5006B-KT		65+036	downstream rockfill, liner cut-off fill and foundation	vertical	Oct 2006	operational
PKCW-T5080-KT		65+109	downstream rockfill, liner cut-off fill and foundation	vertical	Oct 2006	operational
PKCW-T5140A-KT PKCW-T5140B-KT		65+171	downstream rockfill, liner cut-off fill and foundation	vertical	Oct 2006	operational
PKCW-T5041A-KT PKCW-T5041B-KT		65+194	downstream rockfill, key trench	vertical	2017	operational
PKCW-T5094-US		65+244	upstream through FPK beach and upstream rockfill pipe berm	vertical	Oct 2013	operational
PKCW-T5200-US		65+341	upstream through FPK beach and upstream rockfill	vertical	Mar 2013	operational
PKCW-T5375-DS		65+517	downstream in liner bedding	1.5H:1V	Dec 2007	operational
PKCW-T5385-DS		65+525	downstream in liner bedding	1.5H:1V	Dec 2007	operational
PKCW-T5395-DS		65+537	downstream in liner bedding	1.5H:1V	Dec 2007	operational
PKBSW-T1829	FPK beach	60+484	beach, West CPK Cell to Main Cell	horizontal	Jan 2007	operational
PKCN-T4288-US		62+415	North Barge Road	vertical	Mar 2013	operational
PKBNE-T1818		64+233	beach, northeast Main Cell	horizontal	Oct 2005	operational

* Not for approval

Appendix B Flow Drawing



11			FM	4	DISCHARGE POINT MODIFIED, NOTE ADDED	6/14/2021	FM																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							</
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Summary Report: Diavik Diamond Mines (2012) Inc. Water Quality Criteria for Cultural Use Workshops (September 2020-April 2022)



Joanne
Barnaby
Consulting

Prepared for Diavik Diamond Mines (2012) Inc.

Prepared by Natasha Thorpe, Joanne Barnaby and Sarah Ravensbergen

Submitted: May 2021 (V1.0)

Updated: May 2022 (V2.0)

Disclaimer

The document does not represent the results of community consultation. It is subject to the “No Prejudice” clauses of Article II, Section 2.1 of the Environmental Agreement for the Diavik Diamond Project. The document does not necessarily reflect the views of any Party to the Environmental Agreement. Any misinterpretation, error, or omission is that of the authors.

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Executive Summary

From September 2020 to April 2022, members of Deninu K'ue First Nation, Kitikmeot Inuit Association, Łutsel K'e Dene First Nation, North Slave Métis Alliance, Northwest Territories Métis Nation, Tłıchǫ Government, and Yellowknives Dene First Nation participated in virtual workshops with Diavik Diamond Mines Inc. (DDMI/Diavik) staff and external consultants to: (1) share recommendations from the ongoing Aquatic Effects Monitoring Program (AEMP) and the 2019 twelfth session of the Traditional Knowledge (TK) Panel, specifically related to water quality criteria that include cultural use, and (2) further discuss the concept of cultural criteria for water quality as a condition that must be met for Diavik to put Processed Kimberlite (PK) into the pits. The [*Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite \(PK\) to Mine Workings*](#) Measure 2 states that “water quality objectives need clear, measurable and culturally relevant criteria.” DDMI requested these workshops with intervenors to the Environmental Assessment and with both Participant Agreement (PA) and non-PA communities, to discuss these criteria in relation to closure planning.¹

Diavik expanded on what was shared during the TK Panel Session 12 and prepared proposed criteria for community review. The intent of these workshops was to provide an opportunity for feedback on the proposed criteria and further develop these criteria to include the recommendations of the broader potentially impacted Indigenous communities. DDMI then used the combined workshops' outcomes to develop draft cultural use water quality criteria to submit to regulators.

This report broadly summarizes results from this workshop series, focusing on the measures and properties of water for cultural uses shared by participants.² Many properties outlined in the workshops are consistent with previous input noted during the 2019 TK Panel 12 session (and previous TK Panel sessions from 2012 onwards) as well as AEMP activities (from 2002 onwards) (see list of references).

According to participants in the workshop series, healthy water has the following **qualities**:

1. looks clear;
2. feels cool or cold;
3. smells clean and healthy;
4. tastes fresh; and
5. sounds alive.

¹[*Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite \(PK\) to Mine Workings*](#)

² Summary reports from each workshop can be found in Appendix A.

Drawing from Indigenous Knowledge (IK), participants provided further detail on what makes water healthy and therefore suitable for cultural use. As shared by workshop participants, some **measures** of water that looks, feels, smells, tastes, and sounds healthy include the following:

1. Healthy, edible fish, healthy wildlife, animals using the water; edible fish;
2. Clean smell (can have a fishy smell) and taste (affected by fish, wildlife, plants, rocks, temperature, location, saltiness, sediments);
3. Clear colour (natural, not murky, no oil, film, scum, not too much algae); clear; (natural, no oil, foam, scum, not too much algae, nothing floating or disturbed in the water i.e., pollen, dust); healthy look and taste (especially for tea making), no smell
4. Free of contaminants/chemicals ((i.e. without deposits or by-products from industrial activities such as mining and farming such as crushed gravel, PK, mercury, sulphuric acid, ammonium nitrate);
5. moving / flowing (from wind or current, not stagnant; however, fast / irregular movement associated with extreme weather events such as flooding can severely decrease water quality);
6. Healthy flora and fauna in the water (to support healthy fish and water); Shoreline plants are healthy (e.g., willows, reeds, sedges);
7. Home to or used by healthy fish, birds and wildlife (especially fish and ducks; moose, caribou, bear, beavers, also important indicator species);
8. Quality of snow/ice;
9. Cold water high in oxygen;
10. Can drink unaltered; don't have to boil it; and
11. Free of deposits or by-products (e.g., crushed gravel, PK), and does not exceed the acceptable Canadian Water Quality Guideline levels; safe to drink unaltered (i.e. does not require boiling, filtering, or treating to be consumed and enjoyed; able to scoop water with a cup and drink it).

Knowledge holders highlighted two additional **properties** of healthy water that determine whether water is good from a cultural perspective and people feel secure in using it:

1. known as an area of cultural use (i.e., IK, place names and stories tell of good water; 'memory' of a place); and
2. considered alive with spirit (spirit returns to an area when wildlife, plants, birds, fish, etc. come back to the area and renew their relationship with the land as it was before).

While **cultural uses** of water discussed varied widely, most workshop participants spoke to the importance of water for:

1. consuming (drinking and cooking, e.g. tea or water while at home or out on the land);
2. fishing and supporting harvesting of bottom feeding fish, mariahs (i.e. burbot), birds and waterfowl, beaver, caribou, moose;
3. travelling (i.e. safe and reliable transportation by waterways and on ice, which is also important for sustaining other activities such as cabins, camping);
4. teaching cultural and traditional practices; (i.e. water provides a place for intergenerational knowledge transmission. Respectful practices such as thanking the water are important); and
5. practicing cultural (and spiritual) identity (i.e. water is life and water gives life - people are made-up of water).

While opinions varied, most workshop participants noted that they would not choose to drink the water in a pit lake or use it for cultural use after the mine closes. Some people noted that the abundance of alternate nearby water sources meant there was no reason to drink from the pit lake while others explained that they wouldn't choose to use the water for cultural practices given that they knew its history.

Principles considered vital to maintaining confidence in cultural use of water such as in Lac de Gras include, but are not limited to:

1. continuous and ongoing long-term monitoring according to both IK and scientific knowledge.³ Full consideration must be given to both ways of knowing;
2. Indigenous guardians must be involved in monitoring and review of documented monitoring information (data), including in many cases receiving the training necessary for such activities;⁴ and
3. monitoring standards and criteria as developed by the TK Panel, Canadian Water Quality Guidelines and regulatory requirements (e.g. WLWB) must be regularly measured, communicated and satisfied.

³ While suggestions for how long Diavik should monitor the site range from 20 to up to 50 years, most participants agreed it is important to Diavik to monitor "long into the future."

⁴ Where groups do not have a guardians program already in place, participants noted it is important to receive funding, support, and training to start a long-term established program.

Draft workshop notes and summary reports were returned to each participating community for review as part of the informed consent process. In general, the concept of “clear, measurable and culturally relevant” criteria grounded in IK was difficult for Indigenous and non-Indigenous workshop participants alike. In many cases, participants felt that reducing knowledge of water to a series of boxes to be checked or measured (e.g. properties or criteria) belies an Indigenous worldview. However, workshop participants persevered, motivated by their interest in getting things right and their roles and responsibilities as guardians within their territories. Through these workshops and often in other situations, people have started the important work of identifying culturally relevant criteria for water quality. However, this report should be considered the start of a much broader discussion beyond Diavik and across the North around how community members contribute to, and participate in, current and future guardianship and monitoring activities related to water quality in the context of mineral exploration and development.

Workshop/Meeting Dates

Workshops / meetings took place between September 2020 and April 2022 and were facilitated by Joanne Barnaby and Natasha Thorpe and supported by Sarah Ravensbergen for all groups except the Tłıchǫ Government.⁵

Deninu K'ų First Nation	May 12, 13, 2021
Kitikmeot Inuit Association	October 13, 16, 2020
Łutsel K'e Dene First Nation	September 24, December 3, 2020
North Slave Métis Alliance	September 22, 23, 2020
Northwest Territory Métis Nation	May 3, 4, 2021, April 27, 2022 ⁶
Tłıchǫ Government	November 5, 11, 20, 2020
Yellowknives Dene First Nation	June 3, 4, 2021

Abbreviations and Acronyms

AEMP	Aquatic Effects Monitoring Program
DDMI or Diavik	Diavik Diamond Mines (2012) Inc.
DKFN	Deninu K'ų First Nation
EMAB	Environmental Monitoring Advisory Board
IK	Indigenous Knowledge
KIA	Kitikmeot Inuit Association
LDG	Lac de Gras
LKDFN	Łutsel K'e Dene First Nation
NSMA	North Slave Métis Alliance
NWTMN	Northwest Territory Métis Nation
TG	Tłıchǫ Government
TK	Traditional Knowledge
YKDFN	Yellowknives Dene First Nation

⁵ Tłıchǫ Government (2020). Public Hearing Intervention: Diavik Water Licence Amendment – Processed Kimberlite to Mine Workings. Behchokǫ, NT.

⁶ The May 3, 4, 2021 workshop was held with NWTMN leadership; during this meeting, it was recommended that a second meeting to gather feedback from NWTMN Elders take place; the April 27, 2022 meeting was held in response to this feedback.

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1.0 Background

Diavik Diamond Mines (2012) Inc. (DDMI/Diavik) supported seven virtual and one in-person workshops (Water Quality Criteria Workshops) with both Participation Agreement (PA) and non-PA communities held between September 2020 and April 2022. The intent of this series of workshops was to: (1) share recommendations from the ongoing Aquatic Effects Monitoring Program (AEMP) and the 2019 twelfth session of the Traditional Knowledge (TK) Panel, specifically related to water quality criteria that include cultural use; and (2) further discuss the concept of cultural criteria for water quality as a condition that must be met for Diavik to put Processed Kimberlite (PK) into the pits. In June 2020, Diavik received approval through an environmental assessment process whereby the [Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite to Mine Workings](#) Measure 2 states that water quality objectives need “clear, measurable and culturally relevant criteria.”⁷

In response, Diavik expanded on what was shared during the TK Panel Session 12 and put forth proposed criteria for review based on what had already been voiced by community members. The workshops provided an opportunity to discuss and further develop the proposed criteria and to expand these criteria to include the specific insights around qualities and indicators of healthy water.

2.0 Approach

The same general methods were taken during each workshop.⁸ First, Diavik explained the purpose of the workshops, provided general closure updates and presented the proposed plans for storing processed kimberlite (PK) underground in pits, rather than in the current containment area (i.e., processed kimberlite containment, or PKC). Second, previously documented contributions from each Indigenous organization around these topics were shared by facilitators, drawing heavily upon IK documented during the TK Panel and AEMP programs. Lastly, examples from other Indigenous communities across Canada measuring water quality according to their ways of knowing were presented to stimulate discussion.⁹ In this way, background material customized for each group was presented to further contribute to the development of clear, measurable, and culturally relevant criteria.

⁷ MVRB 2020: 82

⁸ Specific details on the approach used by each Indigenous group are detailed in individual reports.

⁹ Including the Inuu-tuti: Baker Lake Aquatic Cumulative Effects Monitoring; Tr’ondëk Hwëch’in Water Quality Monitoring Program; Mikisew Cree First Nation Community Based Monitoring.

Workshop discussions were facilitated based on the following questions:

- What are the good properties you look for in other lakes you use?¹⁰
- What are the properties of water that make it suitable for cultural use?
- What needs to happen to see if the spirit returns to the pit lake?
- Do people expect to draw water from the pit lake for cultural use?
- What properties in the pit lake could change your use of the big lake (Lac de Gras)?

Summary reports for each of the workshops can be found in Appendix A. Sample informed consent forms and workshop agendas are in Appendix B. Workshop presentations are located in Appendix C. Appendix D contains a table summarizing the properties and indicators of water that make it suitable for cultural use based on workshop participant input throughout the workshop series.

3.0 Key Findings

Many properties and cultural uses of water raised in the workshops are consistent with previous input voiced during the TK Panel sessions and AEMP activities. These workshops focusing on water quality provided opportunity for these initial concepts to be further discussed and developed. There was both a diversity in perspectives presented as well as consistency and repetition around criteria shared both within and between Indigenous groups. Many participants emphasized that scientific and cultural water quality processes must work in tandem (e.g., participants fundamentally must understand that in addition to cultural criteria, water is clean to drink from a health and safety perspective provided by scientific and regulatory testing).

The following sections highlight key findings according to:

- Culturally relevant water quality criteria;
- Cultural uses of water and the importance of the Lac de Gras area; and
- Additional concerns.

¹⁰ Note that the word “properties” was changed to “things” during some workshops to use plain language. For the purposes of this report, “properties” generally refers to characteristics or qualities of water that participants feel make water healthy. “Indicators” or “measures” generally refers to ways in which participants might be able to tell if water is healthy. These definitions are somewhat fluid, and may change as this work continues.

3.1 Culturally Relevant Water Quality Criteria

According to workshop participants, healthy water has the following **qualities**:

1. looks clear;
2. feels cool or cold;
3. smells clean and healthy;
4. tastes fresh; and
5. sounds alive.

Drawing from Indigenous Knowledge (IK), participants provided further detail on what makes water healthy and therefore suitable for cultural use. Some **measures** of water that looks, feels, smells, tastes, and sounds healthy include the following:

1. Healthy, edible fish, healthy wildlife, animals using the water; edible fish;
2. Clean smell (can have a fishy smell) and taste (affected by fish, wildlife, plants, rocks, temperature, location, saltiness, sediments);
3. Clear colour (natural, not murky, no oil, film, scum, not too much algae); clear; (natural, no oil, foam, scum, not too much algae, nothing floating or disturbed in the water i.e., pollen, dust); healthy look and taste (especially for tea making), no smell
4. Free of contaminants/chemicals ((i.e. without deposits or by-products from industrial activities such as mining and farming such as crushed gravel, PK, mercury, sulphuric acid, ammonium nitrate);
5. moving / flowing (from wind or current, not stagnant; however, fast / irregular movement associated with extreme weather events such as flooding can severely decrease water quality);
6. Healthy flora and fauna in the water (to support healthy fish and water); Shoreline plants are healthy (e.g., willows, reeds, sedges);
7. Home to or used by healthy fish, birds and wildlife (especially fish and ducks; moose, caribou, bear, beavers, also important indicator species);
8. Quality of snow/ice;
9. Cold water high in oxygen;
10. Can drink unaltered; don't have to boil it; and
11. Free of deposits or by-products (e.g., crushed gravel, PK), and does not exceed the acceptable Canadian Water Quality Guideline levels; safe to drink unaltered (i.e. does not require boiling, filtering, or treating to be consumed and enjoyed; able to scoop water with a cup and drink it).

Knowledge holders highlighted two additional **properties** of healthy water that determine that water is good from a cultural perspective and people feel secure in using it:

1. known as an area of cultural use (i.e., IK, place names and stories tell of good water; ‘memory’ of a place); and
2. considered alive with spirit (spirit returns to an area when wildlife, plants, birds, fish, etc. come back to the area and renew their relationship with the land as it was before).

These qualities, measures and properties together form a possible holistic framework for monitoring: they reflect people’s lived experience, relationship with water, and roles and responsibilities as guardians on the Land.¹¹ Many workshop participants also emphasized that the health of water must be viewed within the larger context of a healthy ecosystem consistent with an Indigenous worldview.

Broader ecological processes also affect water. Participants noted that many water quality measures depend on broader systems, patterns, and cumulative effects such as seasonality, weather, climate, and extreme events. In other words, one criterion, principle, or indicator in isolation cannot be considered in isolation: the complex assemblages between water quality measures come together when a participant qualifies the current state of water. Further, people and their actions are a key part of this assemblage. It is important to document ways of knowing and honour knowledge from different perspectives (Elders, experience knowledge holders, etc.), both within and between Indigenous groups.

These qualities, measures and properties must provide the basis for monitoring:

1. prior to flooding of the pit(s)
2. prior to breaching the dam and reconnection of the pit lake with Lac de Gras
3. after reconnection with Lac de Gras.

3.2 Cultural Uses of Water and the Importance of the Lac de Gras Area

Workshop participants discussed the many ways that water in all forms is essential for supporting their activities, cultural identity and Indigenous way of life.

While **cultural uses** of water discussed varied widely (see individual summary reports, Appendix A), most workshop participants spoke to the importance of water for:

1. consuming (drinking and cooking, e.g. tea or water while at home or out on the land);

¹¹ The term “the Land” is understood to mean the spiritual, physical, social and cultural connections between land, water, air, and all living things -- typical of an Indigenous worldview.

2. fishing and supporting harvesting of bottom feeding fish, mariahs (i.e. burbot), birds and waterfowl, beaver, caribou, moose;
3. travelling (i.e. safe and reliable transportation by waterways and on ice, which is also important for sustaining other activities such as cabins, camping);
4. teaching cultural and traditional practices; (i.e. water provides a place for intergenerational knowledge transmission. Respectful practices such as thanking the water are important); and
5. practicing cultural (and spiritual) identity (i.e. water is life and water gives life - people are made-up of water).

While opinions varied, most workshop participants noted that they would not choose to drink the water in the pit lake or use it for cultural use after the mine closes. Some people noted that the abundance of alternate nearby water sources meant there was no reason to drink from the pit lake. Others elaborated that they wouldn't choose to use the water for cultural practices given that they knew it's history.

Workshop participants frequently discussed the importance of respectful practices toward water, especially when travelling. Knowledge holders frequently shared how their connection to water is unparalleled: cultural identity and security depends on healthy water. The tenets that "water is alive" and "water is life" is well understood and being able to depend on healthy water enables both personal and cultural security.¹²

Knowledge of the connections between water and life as well as water and people means that people feel safe and secure on the land when the water is healthy: this feeling then allows participants to practice cultural activities (e.g. fishing, harvesting, ceremonies, intergenerational knowledge transmission) without worry. Ideally, water should be good enough to drink from a cup that hangs off the side of a boat (i.e., enjoyed without, filtering, or treating).

While every person's relationship with water is personal, generally, Indigenous peoples have long recognized that there is spirit in water:

...it's important for us to always feel a certain way when we're within the environment and feelings often don't have to do what scientists would call "criteria" or different levels or bars associated with health and quality. As we kind of look at it in a way that's different. So it was important for us that not only do we have to know and understand the science of Diavik language, but

¹² Unlike scientific studies that commonly examine water through a series of components and separate indicators/thresholds, participants emphasized that they think about water as intrinsically linked to health of species and many components of the ecosystem: water is said to be alive and, in some cases, to have legal personhood (<https://ijc.org/en/i-am-river-river-me-legal-personhood-waters>).

equate it with the actual environment. That just speaks in some sense to how we navigate the environment and how we relate and how we find a certain comfort and a certain security and you continue to make judgments that would affect the practices. In our case, we'll call it our traditional cultural practices. Not only in the past but currently and in the future. [Patrick Simon, DFKN]

Workshop discussions around spirit and water varied greatly between workshops, but many participants expressed the desire for the water to return to as natural as state as possible following closure. Spirit returns to an area when wildlife, plants, birds, fish, etc. come back and renew their relationship with the land as it was before.

Finally, workshops participants frequently spoke to the importance of ongoing and long-term monitoring. When considering closure, participants highlighted that monitoring (or “watching” through ongoing guardianship programs) will partly define future cultural use.

Monitoring Principles considered vital to maintaining confidence in cultural use of water such as in Lac de Gras include, but are not limited to:

1. Continuous and ongoing long-term monitoring according to both IK and scientific knowledge. Full consideration must be given to both ways of knowing. Indigenous youth must be trained as guardians in both ways of knowing;
2. Indigenous guardians must be involved in monitoring and review of documented monitoring information (data); and
3. Monitoring standards and criteria as developed by the TK Panel, Canadian Water Quality Guidelines and regulatory requirements (e.g. WLWB) must be regularly measured, communicated and satisfied.

3.3 Additional Concerns

Knowledge holders across all workshops raised a number of concerns outside the scope of considering water quality criteria. These concerns, and specific suggestions for Diavik’s closure plans, are documented in individual summary reports. **Concerns** that were raised across all workshops include the need for:

- groups to conduct (and in many cases, receive support for conducting) their own long-term monitoring /guardianship activities of water and wildlife that include diverse community participation (e.g. youth and women) and are based in both IK and science across their traditional territories and through a co-ordinated and efficient approach (e.g. Caribou Guardians Coalition) recognizing cumulative activities. For example, suggestions for monitoring include, testing of a range of different fish and wildlife species in different areas/lakes to ensure that an accurate picture of the water and the broader ecological processes it supports are gathered;

- Diavik to continue to communicate their processes and plans with each group (especially plans related to the PKC and burying or leaving “garbage” behind), follow up on specific recommendations from groups (e.g. testing larger fish as well as slimy sculpin, testing fish by examining taste, spine, texture, look, liver, general health, internal organs both in the pit lakes and Lac de Gras), and respond to specific post-closure monitoring suggestions (e.g., monitoring the fish in the pits themselves) before the pit lake dam is breached and water is connected to Lac de Gras;
- Diavik not to assume that the dam be breached and to involve communities in this decision by actively involving them in monitoring and reviewing results first;
- Diavik to proceed step-by-step and with caution, particularly given the unique setting of the pits on an island; and
- Diavik and all industrial development companies to work together to minimize cumulative effects, legacy effects, effects on human health and safety, and climate change on the land, including on species that have experienced recent and severe impacts (e.g. caribou).

4.0 Closing

Diavik supported workshops with seven communities, with detailed draft notes and workshop summaries returned to each community for review and inclusion in this report. Knowledge holders spoke to qualities, measures, and properties of healthy water, drawing heavily on their sensory understandings. Cultural uses of water were elaborated, watching techniques suggested, and monitoring principles put forth.

In general, the concept of developing or identifying “clear, measurable and culturally relevant” criteria grounded in IK was difficult for Indigenous and non-Indigenous workshop participants alike. Reducing a complex understanding and relationship with water to a series of boxes to be checked or measured (i.e. properties, indicators, measures or criteria) belies an Indigenous world view. However, workshop participants persevered, motivated by their interest in getting things right and their roles and responsibilities as guardians within their territories.

Through this workshop series, participants commenced the important work of identifying culturally relevant criteria for water quality. However, this work and the accompanying report should be considered the start of a much broader discussion beyond Diavik and across the North around how community members contribute to, and participate in, current and future guardianship and monitoring activities related to water in the context of mineral exploration and development.

5.0 List of References

DDMI (Diavik Diamond Mines Inc.). 2003. Fish Palatability and Texture Study (2002 & 2003).

-----, 2006. Fish Palatability and Texture and Water Quality Study (2005).

-----, 2007. Fish Palatability and Texture and Water Quality Study (2006).

-----, 2009. Aquatic Effects Monitoring Program – 2008 Report.

-----, 2010. Diavik Diamond Mine Aquatic Effects Monitoring Program; 2009 Annual Report. 31 March 2010.

Environmental Monitoring Advisory Board (EMAB). 2005. Fish Palatability and Texture Study, August 24-26, 2004, Diavik Community-based Monitoring Camp, Final Report.

-----, 2006. Fish Palatability and Texture and Water Quality Study (2005).

-----, 2007. Fish Palatability and Texture and Water Quality Study (2006).

-----, 2011. Annual report 2010-2011. Yellowknife, NT. Canada.

Mackenzie Valley Review Board. 2020. EA1819-01. Diavik Diamond Mines Inc. Depositing processed kimberlite into pit(s) and underground. Reasons for Decision. January 2020. [Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite \(PK\) to Mine Workings](#)

Thorpe Consulting Services Ltd. and Joanne Barnaby Consulting. 2013a. At Night We Slept on Diamonds: Report of the Traditional Knowledge Camp for the Diavik Aquatic Effects Monitoring Program. North Vancouver, BC. March 2013.

-----, 2013b. Diavik Diamond Mines (2012) Inc. (DDMI) Traditional Knowledge Panel Session #6: Focus on Processed Kimberlite Containment: DDMI Traditional Knowledge Panel Interim Report. North Vancouver, BC. October 2013.

-----, 2014. DDMI Traditional Knowledge Panel Session #7: Focus on Re-Vegetation: DDMI Traditional Knowledge Panel Interim Report. North Vancouver, BC. August 2014.

-----, 2015a. Feeling the Spirit Together: Monitoring Our Land, Water, Fish and Air: Report of the Diavik Aquatic Effects Monitoring Traditional Knowledge Program. Vancouver, BC. December 2015.

- . 2015b. DDMI Traditional Knowledge Panel Session #8: Focus on Reefs and Monitoring Water: DDMI Traditional Knowledge Panel Report. North Vancouver, BC. December 2015.
- . 2016. DDMI Traditional Knowledge Panel Session #9: Focus on Caribou: DDMI Traditional Knowledge Panel Report. North Vancouver, BC. May 2016.
- . 2017. DDMI Traditional Knowledge Panel Session #10: Focus on Watching/Monitoring and the Waste Rock Storage Area - South Country Rock Pile: DDMI Traditional Knowledge Panel Report. North Vancouver, BC. September 2017.
- . 2018. DDMI Traditional Knowledge Panel Session #11: Options for Processed Kimberlite: DDMI Traditional Knowledge Panel Report. North Vancouver, BC. May 2018.
- . 2019a. Our Youth, Our Future: Monitoring Our Air, Water, Land and Fish: Report of the Diavik Diamond Mine Aquatic Effects Monitoring Traditional Knowledge Program. Prepared by Natasha Thorpe and Joanne Barnaby with support from Colleen English and Kathy Mai. Vancouver, BC.
- . 2019b. DDMI Traditional Knowledge Panel Session #12: Options for Pit Closure: DDMI Traditional Knowledge Panel Report. North Vancouver, BC. September 2019.
- . 2020a. Workshop Summary for Diavik Diamond Mines (2012) Inc. Water Quality Criteria for Cultural Use Workshop: Łutsel K'e Dene First Nation, Łutsel K'e, NT (Online Workshop). North Vancouver, BC. September/December 2020.
- . 2020b. Workshop Summary for Diavik Diamond Mines (2012) Inc. Water Quality Criteria for Cultural Use Workshop: North Slave Métis Alliance, Yellowknife, NT (Online Workshop). North Vancouver, BC. November 2020.
- . 2021a. DDMI Traditional Knowledge Panel Session #13: Vegetation Watching and Monitoring for Closure: DDMI Traditional Knowledge Panel Report. North Vancouver, BC. August 2021.
- . 2021b. Workshop Summary for Diavik Diamond Mines (2012) Inc. Water Quality Criteria for Cultural Use Workshop: Deninu Kųé First Nation, Fort Resolution, NT (Online Workshop). North Vancouver, BC. May 2021.
- . 2021c. Workshop Summary for Diavik Diamond Mines (2012) Inc. Water Quality Criteria for Cultural Use Workshop: Kitikmeot Inuit Association, Kugluktuk, NU (Online Workshop). North Vancouver, BC. October 2020.

- , 2021d. Workshop Summary for Diavik Diamond Mines (2012) Inc. Water Quality Criteria for Cultural Use Workshop: Northwest Territory Métis Nation, Hay River, NT. North Vancouver, BC. May 2021.
- , 2021e. Workshop Summary for Diavik Diamond Mines (2012) Inc. Water Quality Criteria for Cultural Use Workshop: Yellowknives Dene First Nation, Yellowknife, NT. North Vancouver, BC. June 2021.
- , 2022. Our Word as Truth: Report of the Diavik Diamond Mine Aquatic Effects Monitoring Traditional Knowledge Program. Prepared by Joanne Barnaby, Sarah Ravensbergen and Natasha Thorpe with support from Diavik Diamond Mines (2012) Inc. (DDMI). Vancouver, BC. V.4.0
- Tłıchǵ Government. 2020. Public Hearing Intervention: Diavik Water Licence Amendment – Processed Kimberlite to Mine Workings. Behchokǵ, NT. November 2020.

Appendix A – Workshop Summaries

Workshop Summary for Diavik Diamond Mines(2012) Inc. Water Quality Criteria for Cultural Use Workshop

Deninu Kų́ First Nation, Fort Resolution, NT
May 12 & 13, 2021

Natasha Thorpe, Joanne Barnaby,
Sarah Ravensbergen

For: Deninu Kų́ First Nation,
Fort Resolution, NT

May 31, 2021

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Executive Summary

On May 12 and 13, 2021, members of the Deninu Kų́ First Nation (DKFN) participated in a virtual workshop with Diavik Diamond Mines Inc. (DDMI/Diavik) staff and consultants to discuss recommendations from the 2019 twelfth session of the TK Panel, specifically those referring to water quality. The [*Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite \(PK\) to Mine Workings*](#)¹ Measure 2 states that water quality objectives need clear, measurable and culturally relevant criteria; DDMI is requesting these workshops with PA and non-PA communities to discuss these criteria in relation to closure planning.

Participants agreed that some properties of water that make it suitable for cultural use include clear, cold, and natural water that is not murky, and does not contain foam, scum, grease, soap, dust, sediment, or contaminants. DKFN members emphasized that everything centers around respect and care for water. The importance of their relationship to healthy water was highlighted; healthy water makes participants feel secure on the land and allows people to practice cultural activities.

Workshop participants discussed the importance of water for many different uses, including for travel routes (trails and water routes), drinking, swimming, fishing, supporting harvesting (hunting and trapping), making medicine, cooking, cabins and camping, teaching and intergenerational knowledge transmission. Several other topics or concerns were raised by DKFN participants during the workshop including: consistent and timely communication between DKFN and DDMI; continuing to conduct their own high quality monitoring activities; ensuring that women and youth are involved throughout the process; advocating for Diavik to conduct high quality monitoring of water in different states and seasons; highlighting the importance of TK monitoring conducted alongside scientific monitoring far into the future; having Dene language included in the monitoring process. The relationship between DKFN and water as well as the responsibility of DKFN as guardians of their territories continues to evolve within the broader framework of caribou loss and change in caribou behaviour related to mining activities (including illegal / disrespectful harvesting of caribou off of the winter road to the mine).

The information gathered in this workshop was shared for review with DKFN through meeting notes and this summary document. Their contributions will be combined with information gathered from workshops with other Participation Agreement (PA) and non-PA communities into a summary report for DDMI. Next, DDMI plans to use the combined workshops' outcomes to develop proposed cultural use water quality criteria to submit to regulators.

¹[*Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite \(PK\) to Mine Workings*](#)

List of Participants

Greg Balsillie, DKFN Land user/IMA Committee Member
Bradley King, DKFN Councillor
Eddy Lafferty, DKFN Land user/IMA Committee Member
Gabe Lafferty, DKFN Land user/IMA Committee Member
Dean McKay, DKFN Councillor /IMA Committee Member
Dave Pierrot, DKFN Sub-Chief
Patrick Simon, DKFN Councillor
Richard Simon, DKFN IMA Coordinator
Jerry Sanderson, DKFN Land user/IMA Committee Member
Minnie Whimp (DKFN Lands Coordinator)
Marc d'Entremont (Consultant, Observer)

Myra Berrub (DDMI)
Gord Macdonald (DDMI)
Tara Marchiori (DDMI)
Sean Sinclair (DDMI)

Joanne Barnaby (Consultant, Facilitator)
Natasha Thorpe (Consultant, Facilitator)

Background and Scope of Work

Diavik Diamond Mines (2012) Inc. (DDMI, or Diavik) supported virtual workshops (Water Quality Criteria Workshops) with both Participation Agreement (IBA) and non-PA communities. The intent of these workshops was to share recommendations from the 2019 twelfth session of the TK Panel, specifically those recommendations referring to water quality criteria that include cultural use. The [*Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite to Mine Workings*](#) Measure 2 states that water quality objectives need clear, measurable and culturally relevant criteria. Diavik has expanded on what was shared during the TK Panel Session 12 and prepared proposed criteria for community review. The intent of the workshops was to provide an opportunity for feedback on the proposed criteria and further develop these criteria to include the recommendations of the broader potentially impacted Indigenous communities. DDMI plans to use the combined workshops' outcomes to develop proposed cultural use water quality criteria to submit to regulators.

During the workshop, Diavik presented the proposed plans for storing processed kimberlite (PK) underground in pits rather than in the current containment area (i.e. processed kimberlite containment, or PKC). As noted in recommendation 12.8 put forth by the TK Panel during the twelfth session, TK Panel members advise that only when

scientists and the TK Panel agree that the pit water is safe (i.e., drinkable) and stable (i.e., consistent), can breaching of the dikes occur to allow water to flow back and forth but prevent fish from entering the pits, at least initially.

As well as providing DKFN participants the opportunity to give feedback on proposed closure details, the workshop focused on a discussion of healthy water according to Indigenous Knowledge (IK). Natasha Thorpe and Joanne Barnaby presented an overview of the many contributions from DKFN members in developing ways to measure healthy water (e.g. through the DDMI TK Panel and Aquatic Effects Monitoring Program), and shared examples from other Indigenous communities across Canada that are measuring water quality according to their ways of knowing.

A discussion was facilitated based on the following questions:

- What are the good properties you look for in other lakes you use?
- What are the properties of water that make it suitable for cultural use?
- What needs to happen to see if the spirit returns to the pit lake?
- Do people expect to draw water from the pit lake for cultural use?
- What properties in the pit lake could change your use of the big lake?

The workshop agenda and informed consent form are included (Appendix A). Copies of workshop presentations (Appendix B) and workshop evaluation summaries (Appendix C) are appended. Workshop notes have not been appended due to length concerns, but were provided directly to DKFN via email along with a draft version of this report for comment.

Summary of Key Findings

Properties of water that make it suitable for cultural use

Participants stated that water should be clear and natural, with no foam, scum, grease, soap, dust or sediment, and should not be murky; you should be able to see the bottom (Table 1). Water should be cold, should be consumed without having to be filtered, and should not have other contaminants like mercury or runoff from farms, mines, or other industrial operations.

Healthy water is water that makes participants feel secure on the land and allows people to practice cultural activities. Participants noted the importance of their relationship with water, not only in the liquid state, but also in all states, as highlighted in the following exchange:

Patrick: Yeah, I guess if we're on the land program and say, if we'll have kids and they're going out, even snow, when there's no water, we can't get to the water, we're going to melt snow. You'd want them to go to an area that has no tracks, no yellow in it, no branches and stuff. You want them to get to a good spot, you direct them to it. Same thing with ice, you direct them to where they should go and get the water and get the ice, or get the snow. And that comes from the direction from the Elders, kind of thing.

Dave: It's easier for good, clean water to freeze, than water that's full of chemicals and dirt. So that's what the Elders always take, the ice water, crystal water, to make their teas or stuff.

Richard: It freezes faster when it's like colder . . . or it freezes faster when it's clearer. More cleaner as opposed to if it's contaminated or has grease, it can take longer to freeze. That's one of the other things that we look at.

Participants spoke about the importance of watching the ecosystem as a whole when thinking about the health of water. An important sign of good water and a healthy ecosystem is healthy wildlife, especially fish and ducks. Healthy, green plants and vegetation are also important. Participants noted that they trust wildlife to know when water is good or not:

They [community members] may never even drink the water or eat energy from that area until they see a caribou actually get closer to us. That's just the way that we look at the health of the land. -Patrick

That's [the ecosystem and the animals] a really strong indicator of the healthy land for sure. -Bradley

If wildlife species are not healthy, participants tend to be wary of using water that the animals are using or that the fish are in. For example, finding worms in fish and ducks means some participants are wary of the fish and water:

Just like what Patty said there, if the caribou were to go back through the mine site, again it's like an island, the caribou used to go through there, so they wouldn't have to enter the water, go around the water shores. If the caribou start doing that again, maybe the water is good enough to drink or good enough to eat the fish if it's going to be like that again. Maybe then we'll have a chance to see caribou on this side [south side of Lac de Gras] again. If that's the case, the, maybe I would go fishing over there and eat the fish or drink the water. If it's good enough for them, then it should be good

for us. Because the caribou probably know better than I do in water and stuff like that.
-Bradley

Mariahs are bottom feeders. There were only two good ones out of 30. I work with lots of fish, so I know what's good and what's not good. I went to Gahcho Kué Mine to test, to eat fish. I wouldn't eat their fish, there were so many worms in there. -Gabe

One land user described watching the behaviour of beavers to draw conclusions about water quality:

On my trap line after the mines were there, I watched the beavers and I no longer eat the beaver because all those chemicals been through there, but I keep eye on the beavers and the movements they make. And they're redirecting the water that mines float ... They kind of cut it off here and there and they have their own little ways that have their little fast floods and get rid of the chemicals and stuff. -Edward

Participants noted other ways they use to know if water is good to use; for example, clean water boils faster and freezes best. Another way of knowing is the 'tea stain effect': the stain / residue left on tea pots, cups, taps, water treatment tanks:

Jerry: No, in Slave River in the last 15, 20 years. You see lots of that soap, just likes soap on top of the water, it's mixed with dirt and whatever, it seems like it's lots there. I don't think it was like 20 years ago. We never seen that. It just recently came in there last 15 years you get that soap all over the water, sometimes over years. ... It's like a foam, yellow foam, in places in the water, top of the water. ...

Richard: And you know there's something wrong when you make your pot of tea, and then when you're done with the tea, you could still see it in there, in the teapot. ...

Jerry: It's just like a white gas will look on top of the water, top of the water, turning bluish, green.

Richard: And there's a scum that sticks to the teapot, the cup, too. We've noticed that a lot.

Jerry: Yeah. Before you used to drink lots of tea and your cups will stay clean, and now, you have to clean it....

Eddy: You can see the water, you can tell by the colours you get on top of the water after the water has boiled too.

Participants noted that whether water is suitable for use can also depend on location, seasonality, weather conditions and extreme events such as flooding. For example, high winds can push water into certain areas, creating flooding and different localized effects, or flushing water from one area to another. High winds can cause water to rise on one side of lakes, like a tide. Flooding events can greatly affect water quality and its suitability for use:

Jerry: I think this year, the water quality will be a little bit . . .]. Yes because of all the flood water. Last year the water table, when it froze it was high, so it didn't need much to flood, from Slave River to here. So the water is flowing right onto the highway now into the lake. That's why I said if the water gets any higher could almost go over Slave and go east to us, here. Wouldn't even follow the river out in the boat, just flow right over the Slave. It seems like the water quality lowers a lot, last couple of years. Before that, for 20 years, it kept dropping, every year the water level. It seems like now that dams got so much water they got to let it out. Not only that, same time, they got to flush out the oil, sand, Tar Sands, those get flushed out and come down the river, streams, too.

Patrick: I think high water affects the quality.

Table 1. Properties of water that make it suitable for cultural use

Property	Supporting Quotes
Clear (no sediment, contaminants, not murky, no foam or scum; tea pot/cup stays clean, no residue or 'tea stain')	<p><i>The colour of your water, the clarity [is important]. Like Slave Lake, the east arm, you can tell the difference between the water when you get past certain places. Before, when you used to go towards the east arm, you used to be able to see the water clear by Stony Point. ... Now the last few years, when I went that way, you can't even see the bottom of the water and it doesn't even get clear ... the water is murky looking. -Gabe</i></p> <p><i>Like I said, when you leave from here, you used to be able to see the clear water and now you can't. There's a big difference. -Gabe</i></p> <p><i>Q: When you're talking about clear water, you said you used to be able to see the bottom and now it's murky. If you imagine that you were trying to teach one of your youth that wanted to go out, when you say it's murky is it brown? Is it green? Is it full of bugs? Is it dirt? What's making it murky?</i></p> <p><i>Bradley King: It'll be the sediment coming off the Slave River. All that muddy water that comes into the lake... Before, it never really was that bad before. I think it all has to do with the high water and everything in the water. It just floods over everything.</i></p> <p><i>The land users, it's like we're dealing with the flow of the water... It's muddier coming down the Slave River. Like before, in the past from our Elders, the north side of the lake and all those shallow water and gravel bottoms, that's where all of our clear, clear, clean water was coming from. Now the mines have replaced those clear water, shallow water and gravel parts that we used to get our clear water, that's fell through at home today. Great Slave Lake on the north side, now all that's changing because when we disturb the land, we are getting lots of mercury coming out of the land, too. When you crush up the gravel and you get natural mercury coming into the water. -Patrick</i></p>
Healthy ecosystem (healthy wildlife, vegetation)	<p><i>Q: How do you know water is healthy? ...</i></p> <p><i>Richard: -you get it from the animals, you get it from the fish, the birds...</i></p> <p><i>Bradley: Watching the environment, the ecosystem around us, the animals, the plants, the fish.</i></p>

Not greasy or slimy	<i>If it's greasy or slimy, everyone avoids that. We know that wouldn't be good. -Gabe</i>
Movement and temperature (healthier water seems to be clean or cleaner when water is cold)	<p><i>The temperature of the water. That let's fish know when it's time to breed and all that's changing over the years. The flushing from the Alberta side, maybe they're flushing so much stuff hitting the cold water and once the warm waters hit the cold waters in the winter, goes under the cold waters. -Richard</i></p> <p><i>The water seems to be warmer. It's a lot warmer, yes. When we go up in the spring, like July 1st, we will go out to the Simpson Islands where the water is nice and cold and the fish are high. The trout starts, it's easier to catch fish then than going out in the middle of the summer when it's warm and you have fish deeper and it's harder. -Bradley</i></p>
Location, weather, localized effects, extreme weather events	<p><i>Q: ...if you imagine taking out your grandkids or taking out the youth on the land, and making sure you taught them well, how should they know good water?</i></p> <p><i>Gabe: Locations and the lakes. The flow, where the flow is actually coming from, that's part of it. Like east, north, south. It depends on how cold the water is, how healthy the water is, not murky, not tampered with.</i></p>

Cultural uses of water

Participants discussed the importance of water for many different uses, including for travel routes (trails and water routes), drinking, swimming, fishing, supporting harvesting (hunting and trapping), making medicine, cooking, cabins and camping, teaching and sharing knowledge (i.e., intergenerational knowledge transmission). DKFN members emphasized that everything centers around respect and care for water. Respectful practices such as thanking the water, especially when travelling, are important:

...we don't store stuff around the water that we don't like, like gases and oils and stuff like that. So we're careful on where we put the outhouses thing. We don't put garbage near our water. We clean it up and move it away from it. And it's fine. And so that's one of the ways that we respect the water and look after it. Like Bradley mentioned traveling as a good one because we know all too well when you're not respectful of the water or when you're traveling that it's always fatal and that devastated a result. We're always mindful and respectful of that seems to have that if you're not careful, you're playing ... you will pay the price. -Patrick

...water is life. If we don't have water, we wouldn't be living here today. -Greg

Water and ice are essential for travel in all seasons:

Yesterday you said water is like a highway. In the winter it can be a travel route or in the summer, as well. -Jerry

Part of being secure with water, part of our cultural criteria with that, has to do with ice and transportation. -Patrick

Participants also explained how water is essential for harvesting practices:

If the caribou kept coming around like we would take that same route and keep it open all the time and hunt in that area. Now there's no caribou, so there's no use going around there. We stick around the rivers here and try to hunt moose and stuff we have. All we have now is moose and buffalo. -Jerry

The importance of harvesting fish from clean water was discussed at length in the workshop. Participants fish for many species in the lakes and rivers in the area, and fishing is a highly important practice for DKFN members:

Listening to my dad, he trapped in a lot of lakes. He used to commercial fish up in the East Arm [of Great Slave Lake], six miles. He used to trap these inland lakes. There used to be an old man that used to go set a net in one of the lakes. My dad would always wonder why, because he lived on the edge of Great Slave Lake. One day my dad was up there trapping and thought he would run his net to have some fish. My dad said it was the best tasting fish that he had ever had. Throughout his commercial fishing year, too. He never had fish that tasted that good. Undisturbed, these inland lakes where the fish are: good quality water. I wish I knew where this place was because he told me stories. I wouldn't mind going back over there and setting my net just to see what it looks like, tastes like. We call them 'smokers'. They're really good fish. -Bradley

As well as facilitating harvesting, lakes and rivers in the area are also important to participants for cabins and camping. The opportunity to spend time out on the land and on water can allow for knowledge to flow throughout families:

I got a cabin on the east arm of the Great Slave Lake. It takes me an hour and a half by boat to travel over there. ... We always give back to the water like we give with tobacco or something. Because you travel on the lake. Getting my cabin, kids go swimming in that water over there because they got a place there where there's a nice beach. -Bradley

I have a cabin up out in the east arm. I depend on feeding my family up there and, depending on the water, knowing that it's clean and I can take the fish out of there and feed myself, my family, take some home and give some to the people. -Bradley

All that has to be done for our future generation, children. The water was clean for us, we'd like to have it clean for them too. You can't replace the clean, cold, clear water with diamonds or whatever. You can never replace that lake if it's once gone. All life depends on that water. Even humans, 70% of your body is water. Water is important to all life. Like in the past, we knew all that was all clean, clear water. We don't have

that knowledge now because of all the changes from industrial development. [inaudible]. Like most of our Elders have passed too. That was the (source of our) knowledge of the land. -Patrick

Participants discussed how healthy water is essential to supporting DKFN ways of life, and how this has changed:

...somebody said they used to dip their cups in the water and drink it. Guaranteed, you won't do that now because you don't know what's in the water anymore. Like I said before, we used to travel in the east arm, you could see that water just clear. I don't know how many of you have been down from our side towards the east arm but you could see as you go, like a neck that goes across the lake, the colour from your water to that water. Now it gets further and further. I don't even know what it's going to look like this year because the water is so high. So now you have more contamination in the water like all these flooding that's happening. We're still waiting for Slave River to break, so imagine all that junk that's going to come down from Slave River and come into the lakes. There's still stuff that's not being recorded and I want to know if our water is being recorded down in this part. These are the things that we like to look after, is our water, right? The biggest thing is with our water, I don't know what it's like further east. -Gabe

Participants agreed that they would not be likely to use the water in the pit lakes for fishing, drinking, or ceremonial use after the mine has closed:

To be honest, after the [Pine Point] mine shut down and everything, and me being around that area, I don't think I'll drink the water or take the fish. Just my thought, because knowing that that area has been disturbed. -Bradley

Patrick: Would you use the pit lakes?

Gabe: I probably wouldn't eat the fish or drink the water from there.

Richard: Not for a long time? Jerry?

Jerry: Probably not. Unless I'm starving. Before the mine started in those areas there, we had shallow gravel bottom lakes that were just clear, clear water. And you look at the plants back there, the greens were just clear green, no dust, no nothing in that area. I'm sure it's not like that now. It's all changed.

Bradley: Just like I said-Bradley here, Councillor-it's like a different feeling for me. I guess they call it hard water. I wouldn't go fishing around over there, or eat the fish. I'll go fishing, but I won't eat the fish.

Patrick: And if they eat the fish, you eat the younger fish that doesn't have so many diseases, the young fish [around the mine].

By extension, some participants thought they would not use the water in Lac de Gras, at least initially:

Patrick: And I wanted to ask you guys, now that you know in the big pits they want to throw stuff in, they want to put a cap in water and they say it's going to be clean, and then put so high. Would you guys ever considered taking or using the pit water in terms of fishing and drinking water or even using-I know you use water for your ceremonies too right? Would you ever use that?

Greg: No, you can't. You wouldn't be able to use that water for a ceremony.

Patrick: You wouldn't want to?

Greg: You have to go farther back.

Patrick: Would you use the lake, Lac de Gras?

Greg: Nah.

Gabe: No.

Richard: Not for a while.

Gabe: Not for a while.

Returning the spirit to the pit lake

Participants spoke freely about the relationship they continue to hold with water, feeling blessed with clean water, and the importance of feeling the spirit in water:

Richard: You talked about the spirit, you can feel it when you're out on the land, when there's something good.

Patrick: Yeah. It's got really nice spirit. Water has good spirit.

Minnie: That's why you've got to pay and respect the land when you go out on the land...

*It's [teaching, passing on knowledge to his son] important for taking care of spirit.
Taking care of water. -Bradley*

Patrick: So you guys are saying that the history of the activity and the Diavik activity that's done with the water really tells you whether you feel the spirit of the water? Whether you're going to use it for ceremony or whether you're going to even trust if certain animals come back?

Gabe: Yes. It feels better when you know you're in a certain spot and you got clean water, clean birds, clean animals. You eat the blueberries. You feel good. You feel good for that too, the time you spent eating and drinking that clean and water. It's not like all over, just certain spots you can do that.

Participants discussed the impacts of mining operations in the area, and the desire for the water to return to as natural a state as possible:

Q: I really appreciate you sharing, you know that it's something that feels different. When you go out on the land you can't necessarily measure it. You can't explain it. Sometimes it's just a feeling in a place. I'm wondering is there anything that should be done or could be done to help heal the water and heal the fish so that the spirit might come back in the future so that you might have that feeling again?

Jerry: We'll have to close down the mines, all of the mines for a while. Maybe a good 25 years to give the land chance to breathe. But right now it's just like a shock to all this stuff that's going on. To me that Slave River, I mean the Great Slave Lake, it's like a heart. You start tapping with it, you get some heart attacks. Heart of the land. All these little streams, lakes, pumping into it, they were all clean at one time. Now it's all changed.

...it's important for us to always feel a certain way when we're within the environment and feelings often don't have to do what scientists would call criteria or different levels or bars associated with health and quality. As we kind of look at it in a way that's different. So it was important for us that not only do we have to know and understand the science of Diavik language, but equate it with the actual environment. That just speaks in some sense to how we navigate the environment and how we relate and how we find a certain comfort and a certain security and you continue to make judgments that would affect the practices. In our case, we'll call it our traditional cultural practices. Not only in the past but currently and in the future. -Patrick

Several participants expressed the desire for a ceremony or following closure, as an important part of helping the spirit returning to the pit lakes:

...we seem to have more bad stories about mining and mining industry than not. So some type of ceremony would have to take place from a reconciliatory thing, that might help. -Richard

Richard: Do you want to do a ceremony at the end? After the mine is closed?

Jerry: They all go through ceremonies, prayers, mostly the ceremonies is for the land, animals. Especially for the water now. There's so much going into the water, it's only going to take God's miracle to keep it safe.

Other

Other topics or concerns were raised by DKFN participants during the workshop including: consistent and timely communication between DKFN and DDMI; continuing to conduct their own high quality monitoring activities; ensuring that women and youth are involved throughout the process; advocating for Diavik to conduct high quality monitoring of water

in different states and seasons; highlighting the importance of TK monitoring conducted alongside scientific monitoring far into the future; having Dene language included in the monitoring process. The relationship between DKFN and water as well as the responsibility of DKFN as guardians of their territories continues to evolve within the broader framework of caribou loss and change in caribou behaviour related to mining activities (including illegal / disrespectful harvesting of caribou off of the winter road to the mine).

Workshop participants emphasized that clear communication is a high priority for DKFN members; when DKFN members suggest something or see something and share this with DDMI, they would like to hear a direct and timely response back:

I think the land users and the Elders, or anyone that's out there that identifies things to us, or brings us stuff that they figure is something of contaminants or something's wrong, they bring it to us with great concern. What they want is they want an answer back. Is not to just say, "Okay." They take the fish and never hear nothing about it. So that's something we're continuing to always work with the industry or government, even ourselves to ensure that the land users have some concern and brings you samples. Then we follow it through right back to them, and we actually tell them what we found out. That's still something that we're still working with science and government to make sure they honour that. -Patrick

High quality monitoring of water in different seasons and states, based in both TK and Dene language, and science, is very important to participants:

If you guys really want us to measure, you might have to prepare to try high bars. I know that all, science has bars too, but sometimes the land users and Elders, even myself we want higher. -Bradley

Nice to see monitoring then with the four seasons like the spring time, fall time, winter time or summer time. Not only during the summer, because there's stuff you see in the winter stuff you don't see in the summer. -Richard

Now you were mentioning the people out there were saying they would just dip their cups and dip it in the water and drink it. And you might be able to do that there even now. But in Deninu Kųé First Nation our confidence is not that high because of the diversity of science and industry that we have to dialogue with and we have to come to a common understanding, it's not quite so. Basically our river system is fading and a lot of our managers have started seriously having doubts and they're making choices that normally we didn't have to make. We do have relationships with industry that we

are continuing to develop and we do share our knowledge, we do share our experiences, in hopes that we could come to an understanding and that what they say and what we say and how we experience really is what it is out there on the land because ultimately that is why we are doing these things. -Patrick

We want to see you guys keep on monitoring, whatever you're doing out there ... get back to us every now and then let us know what's happening out there. That'll be great. Also, if the youth could be involved in all this. We should have had some youth here now at this meeting that's going on, so they know what's going on because the future is theirs, right? No, they'll be gone soon, no, getting into that age and all the young kids are going to be around and they're going to wonder what's happening with their lining. They're not going to know until they come to these kinds of meetings and see what it's all about. -Jerry

And I don't know where language fits in there. Because like, to speak it or say it or get it out of the harvesters, you might want to incorporate that for the next little exercise that we do. And then that we use the Elders in the community for that. I think it's important that that language will tie us to the history or past. So I think at some point in time, we're going to have to incorporate that. -Patrick

Participants expressed dismay at the changes in caribou and harvesting they have seen in recent years, including illegal / disrespectful harvesting of caribou off of the winter road to the mine:

It's all the blasting, the ground shaking under them [from mine operations]. They don't travel through here no more. And caribou have long memories. -Richard

And it's sad for us right now because the caribou aren't there anymore. There's no use for me to take my family over there to show them that, that part of the area where my dad grew up in and where my dad taught me, because there's nothing there anymore. -Jerry

...the winter road that you guys made, or the mines made they should put a stop to for hunting in stuff for these caribou places... it's supposed to be a private road, but it seems like it's a public road for everybody. And the mines pay for their own use for hauling all their materials and stuff. But then you got people out there I'm thinking like crazy making a mess up there. So something like that will be nice to see you guys could put a stop to that and talk to the right leaders and see. -Jerry

To say that. Like I said, when I first started there at the mines [Ekati] were thousands of caribou around that mine. Eight years later not one damn caribou went across

there, after three years of working at the mine, after five years I never seen a caribou around, maybe one. The animals know what is contaminated and what's not, that's why they're not coming back to that area. So you're saying to clean up this mess and now to bring it back to its original state, those caribou are not going to come back this way, no. They already migrated in a different way where the better food is. They're not going to come back to a contaminated site. -Greg

Participant Questions

The following is a list of questions asked of Diavik by workshop participants. Responses are further detailed in workshop notes.

1. Bradley: With the structures that are left, that isn't salvageable. You guys are just going to crush it, and bury it over there?
 - a. Gord: Yeah, so we do have a landfill currently that's part of that North Country Rock Pile. It's in the bottom section of there, and that's what we'll do with the buildings, is put them into the landfill there.
 - b. Bradley: Is that stick-built, or metals and stuff like that?
 - c. Gord: All of the above. None of it was actually stick-built, it was modular built, like the accommodation buildings were modular built off-site but would have wood in them. Most of the process plant is all steel.
2. Dean: How much of this mine is going to be sticking out of the water after you're done?
 - a. Gord: Yes, good question. On those blue areas, all you'll see at closure, it'll look like a road where the dyke was. It's probably 20 meters wide. It'll look like a road sticking out of the water. The rest of it will all be under water. I expect you'll probably be able to see the outline of the pits through the water, just because it'll be a darker color in the middle where it's deeper and the water is so clear, you might be able to see to that depth.
3. Richard: What goes into that PKC, besides rejects from the process plant and recovery plant? What else goes in that PKC?
 - a. Gord: The only other thing that goes in there, that's been going in there through operations, has been the treated sewage. That's it. So it's water plus that processed Kimberlite, and then the water is recovered, and it's been recovered as we go through and re-used? But the sewage actually from the operations has been going in there through that time as well. Treated sewage, sorry.

- b. Richard Simon: Also, the rejects. You're using hydrocarbons in your equipment to break the rock and crush it, separate it. But they have been soaked with hydrocarbons. Diesel and whatever you spilt on the ground in the pit. That's scooped up, that's thrown in the plant, run through the plant, run through the recovery, on to the PKC, truck to the PKC. And the minus six I think? Or minus three plus one. I think it's minus one, is flown through a pipe and the PKC.
 - c. Gord: That's right.
 - d. Richard: One minus six, is hauled by a truck to the PKC and dumped. Now, during this whole wily adventure of yours that lasted from 2000 to now, those pits have been soaked with hydrocarbons that you're using to dig the rock, put it in the truck and haul it up to the plant, send it through the plant and send it to the PKC. No hydrocarbons have been removed through that, when it goes to the PKC. That's a concern. If you're going to put that PKC into the water, with hydrocarbons, we know it's going to show [crosstalk 00:23:26] in the water.
 - e. Gord: You're right about the hydrocarbons from the mine operations. That's what I was mentioning. They tend to get into the water ... to the North Inlet. You'd have to have a direct spill on top of the processed Kimberlite ore body, which would be very unlikely but possible, for that hydrocarbon to end up in the PKC. So most of the hydrocarbons that we see were on the floor, like on the working faces of the open pit mine, the underground mine. They're cleaned up once they occur and the GNWT land inspector comes and inspects all those spills. We do have a separate stockpile of hydrocarbon-contaminated material that's outside of the processed Kimberlite containment, where any of that contaminated material's being stored. But you're right, there is a possibility of residual amounts of hydrocarbon in the processed Kimberlite.
4. Richard: Any kind of equipment failures or breakdowns within the process, where we're talking, go into the drain, i.e. glycol. Where would that go? If it went into the drain and it was sucked into a sump truck and taken to the PKC? How is that? How are those spills and stuff dealt with that go into a drain, shop close to the recovery plant, all the other plants there.
- a. Gord: That's a great question. I'll ask Sean, the environment manager at site, he might know exactly where that kind of-anything that went into a vac truck, where it would go.
 - b. Sean: Yeah, so any time we have a large spill, or a spill of glycol, or even if it's oil or diesel or something like that. As much as possible, we'll recover. So if it's just an actual pool, we'd recover it and we'd put it in drums or those large

used totes and we'd ship it off-site on the next winter road. But if it's not accessible, it's not something we can just pick up with a vac truck, then...if it's in the soil, we'll dig up the soil and that would go to that hazardous waste area, the land farm that we have that Gord mentioned. Or alternately, we have had two pretty large glycol spills over the past 10 years where it occurred under a building so we couldn't dig up the material, because it was under the accommodation. So that's an example of an area where, at closure we'll go, once the building's gone, once we've demolished the building and we can access the area, we'll sample the ground and if it's still there, we dig it up and dispose of it at the time.

5. Bradley: What is the water quality on top of the lake now?

- a. Sean: Good question. So right now, we have the pond in the PKC, and we sample that water every month. We also have collection wells that we sample every month that are around the PKC facility. The chemistry, it's not acidic, it's neutral. Around a PH of 7-8. There are higher concentrations of most chemicals, most metals and constituents, just because it's a muddier water. So it's not clean lake water, it does have higher concentrations of different metals, and chemical parameters. We monitor that. Currently it all gets sent to the North Inlet, and then sent through the water treatment plant and sent into the lake. I can't really say exact concentrations, but we do have that information available and I can pull it up if that would be helpful.
- b. Bradley: Because that stuff's still going to go into the pit lake?
- c. Sean: Yep. Yeah, so it will go into the pit. Basically, what you can see on this slide again, there's that PK water that's the dark blue, sort of in the middle of the pit. That's that higher concentration water that separates as the PK settles, and consolidates again. You end up with this water that sort of squishes up. What we've been doing for the last three years, a lot of the focus has been on the science. We've done a lot of modeling, so we've run a lot of computer models that have shown that that PK water with the higher concentrations will stay in that layer at the bottom of the pit, and it won't mix with the full water column. That's been the focus, getting a good, high-quality model that's been reviewed. We've gone through a whole independent review process with a panel of experts from the Wek'èezhìi Land and Water Board that they selected, to demonstrate that the model's as good as it can be, that it's predicting that the PK will stay at the bottom. That the PK water will stay at the bottom. That dark blue water will be different than the surface water, it will have higher concentrations. It will be like that into the future. But because it's so deep, 200 or more meters below the surface, that'll be safe.

6. Dave: I know there's cracks in the pit, where do those cracks lead to? Do they lead to the streams that are nearby? Would those contaminants go to the stream? You're saying it's safe, but yet there's cracks that could make its way to the stream.
 - a. Sean: That's a good question. While we're depositing the PK, when we're filling up the pit on the left with the PK, the brown color, the pit on the right will still be completely empty and we'll still be mining there. So we'll have people underground, we'll be de-watering everything. Most of those cracks that you see in the pit run between the two mines, so we're expecting a lot of the water to just flow from the pit on the left, through the ground, and then go into the pit on the right, where we'll be collecting the water and sending it to the North Inlet, to the treatment plant and then into Lac de Gras. That will continue throughout operations until we flood the pits. Once we flood the pits and they're just filled right up to the top with lake water again, then there's no reason for the water to go anywhere because it's just filled to the top. So we won't see that exchange or movement of water through the cracks anymore. That's sort of what the modeling's shown us, that once we fill the pits, there's basically not going to be any more movement of the water that's really deep. Especially that PK water.
7. Bradley: The remaining water that's around the pit and everything. All the studies are good? Like there's no contaminants in the water existing there?
 - a. Sean: Yeah, currently we have the aquatic effects monitoring program, where we monitor all the water in the lake. Everything's looking good there. We've seen some changes from the mine, but nothing bad. Nothing unexpected. The biggest change we've seen is extra nutrients from the groundwater. There's phosphorus naturally in the groundwater, so a lot of the water that we take out of the mine to keep it dry goes through the treatment plant and goes into Lac de Gras, and we've seen a bit of nutrient enrichment in the lake. That's the most notable change that we've seen. But nothing bad. Nothing bad for the aquatic life. We'll continue that program after closure, is the plan. Again, for that 20 years or so.
8. Bradley: Also, Sean, maybe give us a breakdown how the breakdown occurs through the ore to extract the concentrate? And if chemicals are used?
 - a. Sean: I'm not an expert on this. Generally what happens, so we blast the ore. Most of the ore gets blasted, some of it we don't even have to blast because it's already pretty soft. That processed Kimberlite gets sent to the processing plant, and then it goes through a series of crushing, like crushers. If anyone in the room's worked in the process plant and has better information, feel free to chime in. We're crushing those rocks, and they go across different shaker tables where they're washed and shook, it sort of naturally sorts them.

There's a flotation circuit, where there's a higher density water. The diamonds separate out, so some rocks sink, some rocks float, and then we end up with just diamonds and other minerals that are similar to diamonds. Then the last step is, you now just have a very small stream of rocks. They fall off a little waterfall, and there's x-rays that are looking at the rocks. Diamonds effervesce, they kind of shine under x-ray light. You can just picture a little waterfall of rocks, and there's an x-ray. Quite exciting, quite interesting stuff. So it'll see the diamond and then it shoots a blast of air, like a puff of air. So there's a waterfall of rocks, and you can see the diamonds get poof-ed out of the waterfall. They fall into a bucket, essentially. The other rocks carry on.

9. Bradley: So basically, you're not putting any chemicals in there to break it down? Like say in a goldmine, would have used other chemicals. No chemicals?
 - a. Sean: Nope. No chemicals. It's a pretty basic process, as far as mining goes. We're not having to add chemicals and change the rocks, like you would with different types of mining.
10. Bradley: With the material that's going to be left behind and buried. After the metal breaks down in the ground, wouldn't the groundwater carry that metals into the wake? ... You want to get everything back to the way it used to be years ago before the mining even started. And you're going to go bury some stuff that wasn't there before? ... You said that the structures that are there already, that are not salvageable, they're going to be buried in there, right?
 - a. Sean: Before we flood the mines, we'll remove all the mobile equipment, like all the trucks and whatnot. As you said, anything salvageable and anything that has value. The plan is to leave some metal, metal wiring, the metal ground support mesh that's everywhere underground. That will all be left behind. Then when we flood it, it will end up hundreds of meters under water and as long as it stays under water it won't react with the oxygen and release those metals that you're referring to. If it was just left on surface where you would normally see mine equipment, it's the act of rain and oxygen mixing and slowly rusting it out, and that's when you get the release of metals you would see with something on the surface but because this material will be hundreds of meters under water, you won't see that rusting or that degradation. That's all being considered in our modeling and our predictions.
11. Richard: What do you mean by good properties?
 - a. Joanne: Really it's what do you feel are good properties. Having your perspective on that, your insights on that is what we're looking for. Sometimes it's challenging when everybody thinks, "Oh the answer is really

obvious to that question". What might be obvious to you may not be obvious to somebody with a totally different background and a different perspective.

12. Dean: After you fill these pits and open up the dikes, are you guys still going to be testing the fish and for how many years after that are you going to be testing?
- a. Sean: Sean: Yeah, I can answer that. Fish testing is part of the Aquatic Effects Monitoring Program (AEMP) that we do out in the lake. That will continue and the plan for that is to go until about 2050. The fish testing we do every three years, so it's not every year. It depends, we mostly do the Slimy Sculpin, which are the little fish and then if we see changes to those, then we do the bigger fish. We don't want to or we don't go and catch a hundred trout to test them, just because we don't want to go out and kill a hundred trout unless there's a real good reason for it. We always focus on the little fish and then we'd only step it up if we see changes to those little fish first. They're more sensitive as well to chemicals and metals so you'll see a change there first, normally.
 - b. Dean: Wouldn't the big fish, though, have a larger concentration of chemicals over the years, at minimum, than the little small ones?
 - c. Sean: Yeah, that's a good point because they are the top of the food chain. We would see that but you'd see it in the small fish first because you can measure tiny changes, especially these days with all the lab equipment they have. If we did see those changes in the little fish, then we'd have to do the big trout program and then we'd see the changes there. We have done the large fish sampling throughout the years. We did it back in the 90's and we did it up until, I think the last time was probably around 2012, just because we weren't seeing any changes. Everything was just the same and stable, so we didn't want to just keep doing this program. Just doing the program itself is impacting the population. Yeah, we would have that option to continue it if we saw changes.
13. Patrick: ...the Board is leaving it to the Indigenous people to define culturally relevant criteria, or has there been a definition already developed and looking at other places that use it? Or in the past discussing it, ask the Indigenous people already and come up with a definition?
- a. Joanne: So there hasn't been a definition developed. And it's at the end of these workshops, these series of workshops, we'll be doing a report that will be descriptive of what it is that Indigenous people feel is good water and healthy water. So you'll be part of formulating that criteria and that definition. We probably won't use that terminology. But it will be as detailed as possible because that enables the regulatory boards to be really clear on

what we're communicating about what people have said from the communities.

- b. Patrick: So I guess Joanne, correct me if I'm wrong, but what we really want from the land users and Elders is to get their ideas and examples of when they're out on the land and on the water, what/how do they determine, or figure out if water is doing good or bad or something that they could have to be concerned with? What are the types of things that they do? I know they do it naturally. I know everyone of them here, and it's so natural for them that maybe it's hard to get it out of them because we're not asking the question in a way they can understand what we want. To them it's just so natural. It's like one of you guys said, how do I explain how breathe air?
 - c. Joanne: That's right. And everybody has the same reaction: we just know, naturally we just know. So it is a challenge to really break it down to get specific about what it is that you're looking for when you're looking for good water. What are the things that make you feel confident that it's good water?
14. Minnie: You said that there are going to be studies every two years, what if something happens in between those two years?
- a. No answer
15. Bradley: The lake, Lac de Gras what's the deepest part of the lake there? How many meters is it?
- a. Sean: I think I've seen almost 50 meters in one place. I can think of a few places that are 40, but most of it's pretty shallow, like 10 to 15 meters.
 - b. Bradley: Okay. The pit then, was it 40 meters of good water that's going to be down in the pit?
 - c. Sean: Yeah, that's the requirement. Is that at least the top 40 meters has to meet those benchmarks. Our modeling so far shows that the top 200 meters will meet those benchmarks. The requirement from the boards is the top 40 meters, but our modeling is showing could probably be more like 200 meters that will be okay.
 - d. Bradley: And then the dikes, you guys are going to be opening up these certain areas on the dike, after did your water testing and all that?
 - e. Sean: Yeah. Yeah. On all three dikes combined there'll be about 10 gaps, so the gaps will be about 30 meters wide. There'll be a little bit of a river, a 30 meter wide channel and only about three meters deep. So a pretty just like a small river type channel through the dikes. And there'll be about 10 of them spread around all the different dikes.
 - f. Bradley: Thank you. Is there any current in that river?
 - g. Sean: Not really. Not that you can see, because it's so big. Most of Lac de Gras is five, 10 kilometers wide, so you don't really notice much. It's more just

waves from the wind. There is current, it flows from the east end to the west to the Coppermine River. If you're at those points you can definitely see the flow, where it's really narrow, where it's going through those channels or rivers. But out in the big lake it's mostly just waves from wind and stuff like that.

- h. Bradley: Okay. So just putting up those 30 meter dikes would be enough for that area?
 - i. Sean: Yeah, that's what we expect. We can always change that plan a bit if we need to, but we think that'll be fine. We think that will be deep enough that even when the ice forms in the winter, there's still water below it. That's why we want to make it at least three meters deep. Even if we have like two meters of ice, there's still another meter of water below there.
16. Bradley: How long would you think the vegetation and that will grow back down in those pits? Did you guys figure something out for that?
- a. Sean: Outside, there's the original lakebed that's between the pit and the dike. In some areas, it's between 10 up to a couple of 100 meters, so there's these really big, shallow, original lakebed areas. We already actually have a lot of vegetation that's grown there naturally. It'll probably die when it gets flooded because it's not underwater vegetation, but I think there'll probably be some underwater vegetation there pretty quickly. In the pit we're not really expecting much to grow just because it's just rock, it's mostly just solid rock, it's not really a good surface for plants to grow. Long-term we'll probably see some growth in the shallower areas, but super deep down, a couple of 100 meters down, I don't think we'll really see much because it's going to be so dark and deep.
17. Bradley: For the blasting part of the mine, the powder they use I think it's called- what is it?
- a. Sean: Ammonium nitrate.
 - b. Bradley: How healthy is that stuff? ... is it all gone?
 - c. Sean: The main thing we see is, it's like an ammonium nitrate powder that's mixed with diesel and form an explosive, and there's something else a bit more to it. I don't totally understand it. But what we see is both ammonia and nitrate. At most ammonia just turns into nitrates, so most of what we see is nitrate, it's like a nutrient. If there's too much of it, it can be toxic to fish. It's something you need to be careful of. Back like 15, 20 years ago, we had some issues with rising nitrate levels, but we noticed it in our monitoring. Obviously everyone was concerned and we changed our blasting practices.

18. Greg: Do you guys got records of what kind of testing they did around the pit? They see how much stuff [ammonium nitrate, by-products of blasting] that is flying out of the pit?
- a. Sean: That's a good question. We have dust gauges that are near the mine, around the outside. And then we also have ones that are further away. Some of them are up to 8, 10 kilometers away. We also take snow core samples in the winter to collect samples of the dust. We've been tracking the amount of dust mostly from blasting, and then also just from trucks driving on the roads, especially the haul trucks. So we've been monitoring that for the last 18 years. It has gone down a lot. When we were open pit mining, 154, and 418, the two first mines, that's when we saw the most dust just because we were doing the most open pit mining. And then when we switched to underground mining, we saw quite a bit of a dip because there wasn't as much surface activity. Then we started 821 mining and a couple of years ago, and we've seen a bit of a blip again, like uptick but not as high as it used to be, just because it's not as much activity. We have been monitoring the amounts and we model how much dust total goes on the land, on the vegetation, and in the water and we sample both the vegetation and the water to see the chemistry changes. It's all being monitored. Probably when I said disappeared, it definitely wasn't the right word because it's obviously there. But most of it does land within about a kilometer of the mine. There's definitely more dust than you know naturally, but it hasn't been like toxic levels for the vegetation or anything like that.
19. Dave: When the mine finally shuts down, after you seal everything in place, are you going to have monitors monitoring the wildlife that's coming back into that area? Because once they start to come back into that area, you're starting to heal. Are you going to monitor the wildlife coming into that area? Are there going to be cameras, are there going to be people? How are you going to go and do that to see that a lot is healing when the animals start? That's one of the signs that the land is healing, so when the animal [inaudible 01:01:01] Are you going to monitor after the final closure and for how long?
- a. Sean: Wildlife-similar to water, we expect that to be one of the things that we'll be monitoring the longest. We haven't figured out all those monitoring plans in detail. That's something that we'd like to hear more about if you have input. But probably something like until 2050 is what we're expecting. Not necessarily every year, like every year to start and then maybe less frequent. Depends on if we start seeing changes.
- b. Dave Pierrot: I would add that the TK panel has been for a decade putting forward suggestions on what, where, when, how to monitor.

Conclusions and Next Steps

Diavik aims to complete workshops with Participation Agreement (PA) and non-PA communities, with the combined outcomes used to develop draft cultural use water quality criteria to submit to regulators.

Appendix A – Agenda and Informed Consent Form

Appendix B – Presentations

Appendix C – Workshop Evaluation Summary

Agenda
Diavik Diamond Mines Inc.
Water Quality Workshop

Deninu Kųę First Nation
Fort Resolution, NT
May 12-13, 2021

Day One: May 12, 2021	
4:45-5:00	Online Workshop Microphone Testing and Overall “How-To” (Myra) <i>Please log into the workshop at 4:45 pm so that we can make sure everybody is connected.</i>
5:00-5:20	Opening Prayer (DKFN) Opening Circle (Everybody) Workshop Welcome, Overview and (Facilitators)
5:20-6:00	Diavik Diamond Mines Inc. (Diavik) <ul style="list-style-type: none">• Overview of Diavik and the Processed Kimberlite to Mine Workings Project Why are we here? <ul style="list-style-type: none">• Background around the need to develop “clear, measurable, and culturally relevant” criteria for water quality at closure
6:00-7:30	What is Healthy Water According to Indigenous Knowledge? (Facilitators) <ul style="list-style-type: none">• Overview of how other Indigenous communities across Canada are measuring water quality according to their ways of knowing
<i>Break</i>	

7:40-9:00	Discussion Questions <ul style="list-style-type: none"> • What are the good properties you look for in other lakes you use? • What are the properties of water that make it suitable for cultural use? • What do you need to know (i.e. what are the properties) in order to drink water from the land? • What needs to happen to see if the spirit returns to the pit lake?
-----------	---

Day Two: May 13, 2021

4:45-5:00	Online Workshop Microphone Testing and Overall “How-To” (Myra) <i>Please log into the workshop at 4:45 pm so that we can make sure everybody is connected.</i> Welcome and Comment Circle
5:00-5:30	Refresher on Closure Plans for Pit Lake (Diavik)
5:30-7:30	Exploring Water Quality Criteria for the Pit Lakes <ul style="list-style-type: none"> • Do people expect to draw water from the pit lake for cultural use? • How will the properties of the pit lake with PK change your use of the big lake?
<i>Break</i>	
7:30-8:45	Exploring Water Quality Criteria for the Pit Lakes <ul style="list-style-type: none"> • Discussion continued
8:45-9:00	Closing Circle Closing Prayer

Deninu Kųę First Nation
Diavik Diamond Mines Inc.
Water Quality Workshop
May 5-6, 2021
Fort Resolution, NT

Informed Consent Form

I, _____ on May ____, 2021 give permission for Diavik Diamond Mines (2012) Inc. and its Contractors (i.e., Thorpe Consulting Services and Joanne Barnaby Consulting), to take notes, photographs and / or audio and video recordings related to my participation in meetings, workshops and events related to the Water Quality Workshop conducted on behalf of Diavik Diamond Mines Inc. (DDMI).

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;
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 Indigenous Organization, DDMI and / or its contractors may use the information collected to contribute to caring for water in the NWT and NU;
5. DDMI, Natasha Thorpe and Joanne Barnaby may share my information in either reports, presentations, and/or photographs provided it is within the context of this workshop scope and that they provide such information to my Indigenous organization;
6. I agree that my contributions may also be used for future educational, cultural, heritage, and environmental purposes that are outside the scope of this workshop and that my representative Indigenous organization, 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 my Indigenous organization policy and the DDML and DKFN Engagement Protocol for the Processed Kimberlite to Mine Workings Project;
8. I am free to request that any information I share is removed, erased or deleted from draft materials and that final copies will be provided to me;
9. My information will be summarized and included in a report which will be publicly available; and
10. I understand that DDML, Joanne Barnaby and Natasha Thorpe cannot ensure the protection of my information (e.g. Traditional Knowledge) from public release once the reports are released (e.g., via youtube.com, Facebook, other social media, or Indigenous group websites),

Signed on May ____, 2021 in _____, Northwest Territories.

Signatures:

Participant

Indigenous Organization

Contractor

Witness

Translated by: _____

Presented to Deninu Kue' First Nation
Diavik Diamond Mines (2012) Inc.
Water Quality Workshop
May 12-13, 2021

Facilitators and Support:
Joanne Barnaby, Natasha Thorpe,
Sarah Ravensbergen



Water Quality Criteria

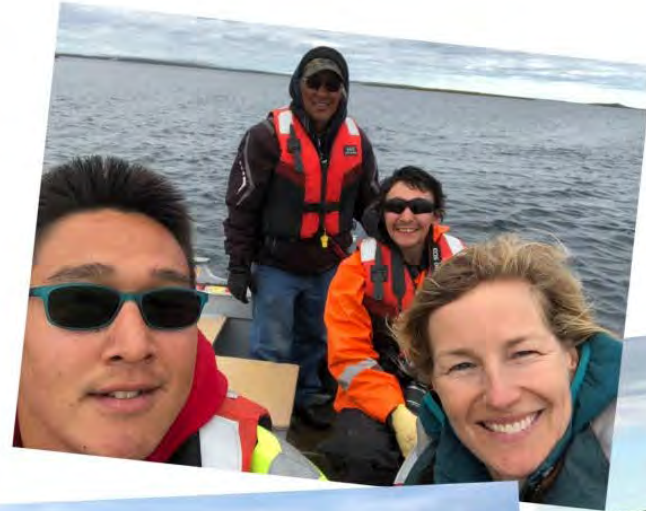
Culturally important indicators for water quality monitoring

What has been done so far?

- ▶ Community Aquatic Effects Monitoring Program (AEMP) overview (2003, 2007, 2009, 2012, 2015, 2018)
- ▶ TK Panel Sessions (e.g. TK Panel 12)

Regulators state that: “water quality objectives need clear, measurable and culturally relevant criteria.”¹

Water Quality Criteria Workshops



¹ Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite to Mine Workings

Aquatic Effects Monitoring Program (AEMP): Background

AEMP Development

- ▶ AEMP TK Study established by DDMI
- ▶ Two-way flow of information, resources, and knowledge between TK holders and scientists regarding the health of fish and water in Lac de Gras
- ▶ 2003, 2007, 2009, 2012, 2015, 2018



Traditional Knowledge Panel Summary

TK Panel #12 Purpose

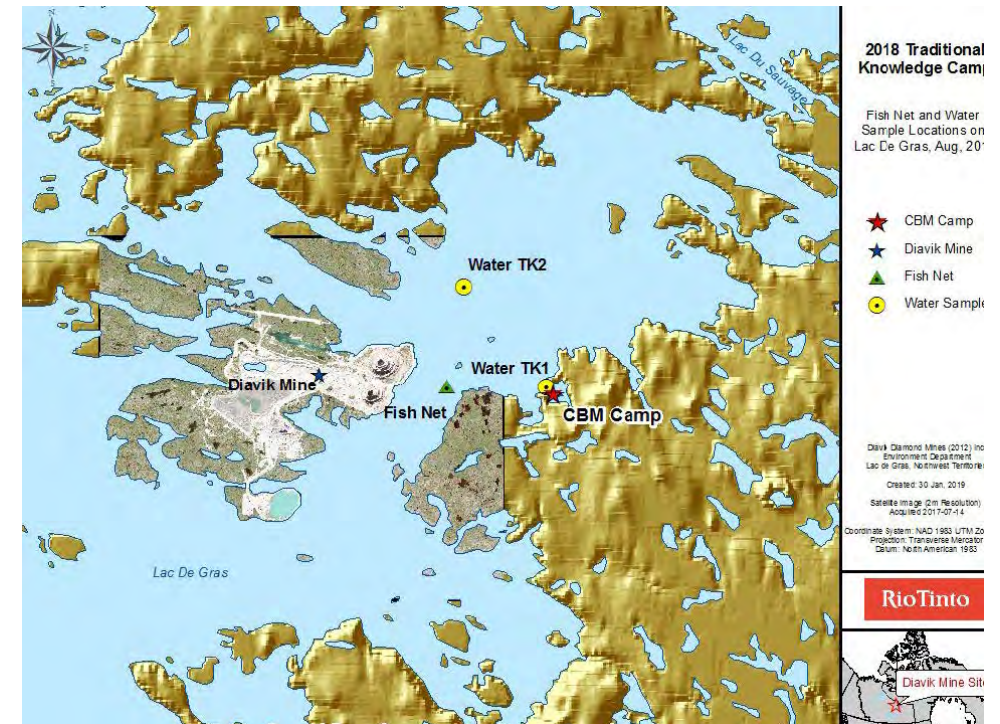


- ▶ Explore disposing of processed kimberlite (PK) in the open pits and underground mining areas (A418 and possibly A154 and A21)
- ▶ Consider water quality and fish habitat within the pits upon closure regardless of whether there is PK in the pits



TK Panel #12 Summary

- ▶ 12.7: The TK Panel would like Diavik to test water in the pits for at least two years (until the water is deemed good) and compare this to water in Lac de Gras. Water samples will be collected from multiple depths at various times throughout each year and tested according to the AEMP protocols. Taste tests will be done after scientific sampling tells us the water is drinkable, where they will watch for smell, clarity (turbidity), temperature, colouration, scum on the water or tea, and water and tea for taste.



TK Panel #12 Summary

- ▶ 12.8: When scientists and the TK Panel agree that the pit water is safe (i.e., drinkable) and stable (i.e., consistent), then breaching of the dikes can occur to allow water to flow back and forth but prevent fish from entering the pits, at least initially.



Indigenous Ways of Watching Water: Canadian Examples

Water Quality Monitoring in the Slave River Basin

- ▶ TK Knowledge Workshops in the Slave River Basin (Trans-boundary Water Management Agreement Negotiations, Alberta 2011): looking at water levels, colour, taste, smell, foam, ice conditions, spring break up
 - ▶ NWT Water Stewardship Strategy 2010 and Community-based Water Quality Monitoring Program (Mackenzie DataStream for information sharing)
- ▶ 2015, Jennifer Fresque-Baxter: **fresh smell, taste (tea), colour, texture, not too much sediment**, important for water quality
 - ▶ Changing water conditions can have impacts on culture and identity; mistrust of water from past developments is important to consider

Culturally relevant water quality criteria: Indigenous Guardians Toolkit¹

- ▶ Mikisew Cree First Nation Community Based Monitoring² and the Athabasca River Watershed (Fort McKay, Athabasca Chipewyan)
 - ▶ Indigenous indicators of water quality and climate change (weather conditions, flow, winter ice conditions, algae, foamy scum, dirty water, scum on tea pots and boats, smell, colour, proximity to development project/site, perceived contamination)³
 - ▶ Water quality index for each site (green, yellow, red)
 - ▶ Water quantity/level: Aboriginal Base Flow and Extreme Flow
 - ▶ Place names important

¹ <https://www.indigenousguardianstoolkit.ca/>

² <http://mikisewgir.com/cbm>

³ <https://www.ourcommons.ca/Content/Committee/421/ENVI/Brief/BR8622379/br-external/MikisewCreeFirstNation-e.pdf>

Why are we here today?

We need “clear, measurable and culturally relevant criteria” for measuring water quality

Summary Table: Results from previous WQ workshops

Table 1. Properties of water that make it suitable for cultural use.

Healthy, edible fish, healthy wildlife, animals using the water, edible fish
Clean smell (can have a fishy smell) and taste (affected by fish, wildlife, plants, rocks, temperature, location, saltiness, sediments); clean smell (can have a fishy smell)
Clear colour (natural, not murky, no oil, film, scum, not too much algae); Clear (natural, no oil, foam, scum, not too much algae, nothing floating or disturbed in the water i.e. pollen, dust); Healthy look and taste (especially for tea making), no smell
Free of contaminants/chemicals
Moving, flowing (from wind or current); not stagnant
Healthy flora and fauna in the water; Shoreline plants are healthy (e.g. willows, reeds, sedges)
History of the area (TK says it has been used); Shoreline rocks are worn from use
Quality of snow/ice
Cold water high in oxygen; temperature is important
Can drink unaltered; don't have to boil it
Free of deposits or by-products (e.g. crushed gravel, PK), and does not exceed the acceptable Canadian water quality guideline levels

Why are we here today?

We need “clear, measurable and culturally relevant criteria” for measuring water quality

► Consider:

- What are the good properties you look for in other lakes you use?
- What are the properties of water that make it suitable for cultural use?
- What do you need to know (i.e. what are the properties) in order to drink water from the land?
- What needs to happen to see if the spirit returns to the pit lake?
- Do people expect to draw water from the pit lake for cultural use?
- How will the properties of the pit lake with PK change your use of the big lake?



Next Steps

- ▶ Workshop summaries and transcription files returned to each community
- ▶ Summary report from all workshops



Thank you! Mahsi cho!

Presented to: DKFN

Diavik Diamond Mine Inc.
Water Quality Workshop
May 12-13, 2021

Facilitators: Joanne Barnaby
Natasha Thorpe



Summary: Water Quality Criteria

Culturally important indicators for water quality monitoring

Some properties of water important for cultural use

- ▶ Security on the land
- ▶ Ability to practice culture
- ▶ We relate to water (we have a relationship with water)
- ▶ Liquid state is important but we relate to water in all states
- ▶ Clear - see the bottom (not murky)
- ▶ Cold
- ▶ Clean water boils faster and freezes best
- ▶ Good to drink
- ▶ Healthy fish
- ▶ Ducks on water
- ▶ Take an ecosystem view, the water is healthy

What are some cultural uses of water?



AEMP Field Form

Date: Recorder:

Location/Depth: Sample ID: Group/Person:

Collection Features: (Circle what best describes the feature)

Temperature: Cold Average

Depth: Deep Average

Clarity: See bottom Murky

Movement: Still Some Running

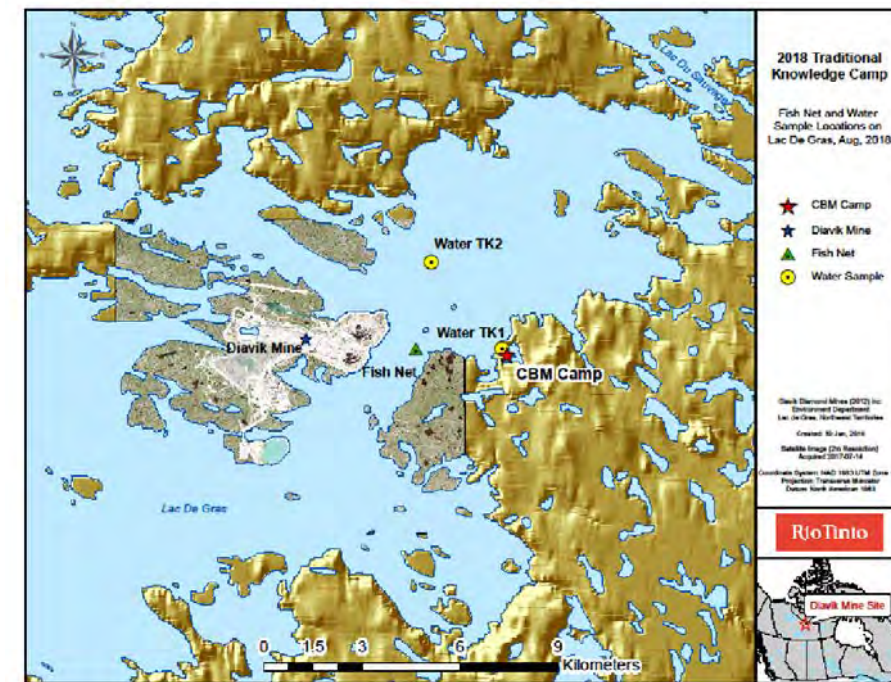
Colour: Blue Green Yellow

Other:

Taste Test:

Tea: Good Ave

Water: Good Average



Cannot see your hand in water

Overall Description:

*Why was this water testing location chosen?
How can you tell when water is healthy or unhealthy?*

*If water had words, what would it say about how it is doing? It is happy? Hurting? Why?
What can you teach us about water?*

DDMI Water Quality Workshop Evaluation Form

Thank you for participating in the online Water Quality Workshop held by Diavik Diamond Mines (2012) Inc. in May, 2021. We hope you enjoyed your time meeting with the group. We appreciate feedback on your experience. Your responses will help us maintain and improve future sessions.

1. How would you rate the session for working and communicating together?
 - ☐ Very good
 - ☐ Good
 - ☐ Neither good nor poor
 - ☐ Poor
 - ☐ Very Poor

2. How would you rate the session for mutual respect among participants?
 - ☐ Very good
 - ☐ Good
 - ☐ Neither good nor poor
 - ☐ Poor
 - ☐ Very Poor

3. How would you rate the opportunities for you to share your knowledge and experiences?
 - ☐ Too many opportunities
 - ☐ Enough opportunities
 - ☐ Too few opportunities

4. How would you rate the recording and documenting of TK during the session?
 - ☐ Very good
 - ☐ Good
 - ☐ Neither good nor poor
 - ☐ Poor
 - ☐ Very Poor

5. How would you rate the facilitation of the session?
 - ☐ Very good
 - ☐ Good
 - ☐ Neither good nor poor
 - ☐ Poor
 - ☐ Very Poor

6. How would you rate the **outcomes and findings of the session?**

- ☐ Very good
- ☐ Good
- ☐ Neither good nor poor
- ☐ Poor
- ☐ Very Poor

7. How would you rate the **amount of time** to discuss the topic(s) during the session?

- ☐ Too much time
- ☐ Enough time
- ☐ Too little time

8. How would you rate the **technical quality of** the session?

- ☐ Very good
- ☐ Good
- ☐ Neither good nor poor
- ☐ Poor
- ☐ Very Poor

9. How would you rate the **logistics** for the session?

- ☐ Very good
- ☐ Good
- ☐ Neither good nor poor
- ☐ Poor
- ☐ Very Poor

10. **Overall**, how would you rate the session?

- ☐ Very good
- ☐ Good
- ☐ Neither good nor poor
- ☐ Poor
- ☐ Very Poor

11. What were the strengths of the session? What did you enjoy about the session?

12. How could the session be improved?

Workshop Summary for Diavik Diamond Mines (2012) Inc. Water Quality Criteria for Cultural Use Workshop

Kitikmeot Inuit Association, Kugluktuk, NU
October 13 & 16, 2020



Natasha Thorpe, Joanne Barnaby,
Sarah Ravensbergen

For: Kitikmeot Inuit Association,
Kugluktuk, NU

November 20, 2020

Photos: Natasha Thorpe, Colleen English

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Appendix C – Workshop Evaluation Summary

Executive Summary

On October 13 and 16, 2020, members of the Kitikmeot Inuit Association (KIA) participated in a virtual workshop with Diavik Diamond (2012) Mines Inc. (DDMI/Diavik) staff and external consultants to (1) share recommendations from the ongoing Aquatic Effects Monitoring Program and the 2019 twelfth session of the TK Panel, specifically related to water quality criteria that include cultural use and (2) further discuss the concept of cultural criteria for water quality as a condition that must be met for Diavik to put processed kimberlite (PK) into the pits. The [*Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite \(PK\) to Mine Workings*](#)¹ Measure 2 states that water quality objectives need clear, measurable and culturally relevant criteria; DDMI is requesting these workshops with PA and non-PA communities to discuss these criteria in relation to closure planning.

Many of the properties and cultural uses of water raised by KIA participants in the workshop are consistent with previous KIA input noted during the TK Panel 12 session as well as Aquatic Effects Monitoring Program activities (starting in 2002). Participants agreed that some properties of water that make it suitable for cultural use include the presence of edible fish; healthy wildlife and animals using the water; a clean smell; clear, cold, flowing water; healthy shoreline plants nearby; and no contaminants or chemicals. Participants agreed that smell and taste can be affected by fish, wildlife, plants, rocks, temperature, location, saltiness (including proximity to ocean), and sediments, and that the history (i.e. Inuit Qaujimajatuqangit) of a water body is important in determining current use. Diavik's proposed three-part method to approaching cultural use closure criteria for the pit lakes was positively received by KIA members during the workshop, although participants felt that some amendments to current closure plans should be considered (i.e., either putting fish back in the pit before there is a complete breach, or increasing the breach of the dike so fish can swim in, and using a fishfinder to track fish below 40m in the pit lakes).

Workshop participants agreed that water is important for drinking, fishing, and other activities on the land, such as travel and camping on frozen lakes, that sustain harvesting and support Inuit ways of life. There was consensus that members would not be likely to

¹[*Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite \(PK\) to Mine Workings*](#)

draw water from the pit lake for cultural use regardless of whether or not the pit is filled with PK.

Several other topics or concerns were raised by KIA participants during the workshop, including:

- The desire for amendments to currently proposed monitoring processes and closure plans, specifically, an additional step of connecting water in the two pits together after closure.
- The need to ensure that Diavik follows up on previous recommendations from KIA.
- The need to ensure that Diavik follows up on previous recommendations from EMAB.
- The importance of continuous, long-term monitoring based on both science and Inuit Qauijimajatuqangit.
- The need for KIA to conduct their own monitoring (i.e. guardianship) activities and the importance of ensuring youth involvement throughout the process.
- The requirement to address all water quality concerns related to the flow of water between Lac de Gras and the pit lakes once they are reconnected.
- The importance of considering climate change impacts on monitoring activities and cultural uses of water.
- The need to ensure that Diavik proceeds with caution (especially given the Covid-19 context), and that fair and adequate consultation and continued access to project-related documents are considered.

The information gathered in this workshop will be shared with the KIA through meeting notes, and this summary document. The findings will also be combined with information gathered from workshops with other PA and non-PA communities into a summary report for DDMI. The outcomes of the summary report will be shared as part of a water license amendment renewal for the PK to Mine Workings Project, currently underway.

List of Participants

Bobby Algona (Elder)
Nancy Kadlun (Elder)
Jack Kaniak (EMAB Member)
Wynter Kuliktana (KIA Staff)

Myra Berrub (DDMI)
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Diavik Diamond Mines (2012) Inc. Water Quality Criteria for Cultural Use Workshop
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Background and Scope of Work

Diavik Diamond Mines (2012) Inc. (DDMI, or Diavik) supported virtual workshops (Water Quality Criteria Workshops) with both Participation Agreement (IBA) and non-PA communities. The intent of these workshops was to (1) share recommendations from the ongoing Aquatic Effects Monitoring Program and the 2019 twelfth session of the TK Panel, specifically related to water quality criteria that include cultural use and (2) further discuss the concept of cultural criteria for water quality as a condition that must be met for Diavik to put processed kimberlite (PK) into the pits. Diavik recently received approval through an environmental assessment process whereby the [*Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite to Mine Workings*](#) Measure 2 states that water quality objectives need clear, measurable and culturally relevant criteria.

Diavik has expanded on what was shared during the TK Panel Session 12 and prepared proposed criteria for community review. The intent of the workshops was to provide an opportunity for feedback on the proposed criteria and to further develop these criteria to include the recommendations of the broader potentially impacted Indigenous communities. These criteria and the feedback from workshops will be shared with the water board as part of the water license amendment during the regulatory process in Q4 2020.

During the workshop, Diavik presented the proposed plans for storing PK underground in pits, rather than in the current containment area (i.e. processed kimberlite containment, or PKC). As noted in section 12.8 of TK Panel 12, TK Panel members recommend that only when scientists and the TK Panel agree that the pit water is safe (i.e., drinkable) and stable (i.e., consistent), then breaching of the dikes can occur to allow water to flow back and forth but prevent fish from entering the pits, at least initially.

As well as providing KIA participants the opportunity to give feedback on proposed closure details, the workshop also focused on a discussion of healthy water according to Inuit Quajimajatuqangit. Natasha Thorpe and Joanne Barnaby presented an overview of the many ways KIA members have already contributed to developing ways to measure healthy water (e.g. through the DDMI TK Panel and Aquatic Effects Monitoring Program), and shared examples from other Indigenous communities across Canada that are measuring water quality according to their ways of knowing.

A discussion was facilitated based on the following questions:

- What are the good properties you look for in other lakes you use?
- What are the properties of water that make it suitable for cultural use?
- What needs to happen to see if the spirit returns to the pit lake?
- Do people expect to draw water from the pit lake for cultural use?
- What properties in the pit lake could change your use of the big lake?

Summary of Key Findings

Properties of Water that make it Suitable for Cultural Use

Many of the properties and cultural uses of water raised in the workshop are consistent with previous KIA input shared during the TK Panel 12 sessions and AEMP activities (Table 1). Participants stated that the taste, smell, clarity, turbidity, contaminants, temperature, movement, and history or Inuit Qaujimajatuqangit of the area are all important factors when deciding if water is good. Another important sign of healthy water to participants is that there are healthy fish and other living things in the water.

Participants agreed that the smell and taste of water can be affected by fish, wildlife, plants and algae, rocks, temperature, location, wind, currents, water level changes and flooding events, saltiness, and sediments; and that smells of the water can change throughout the seasons. For example, how close lakes are to the ocean and whether they are connected to the ocean can change the saltiness or the way the fish taste. Participants stated that every water body is different from another, and can even vary within the same water body.

Where one collects water from within the lake can also change the taste:

When we test the water last few times at Lac de Gras, we can taste the difference from the middle to the shore. [Nancy]

If it's still water which has no lakes or anything, it will actually smell different from the moving water, lake with moving water. Lake which is still with no rivers flowing out or anything, you'll have different smell and different taste as well. [Bobby]

...when I moved here, all the animals tasted different because of different environments, the water. [Nancy]

...Elders, we tell the children some lakes can be salty, and those are the ones that we know, some lakes for some reason they can be really salty as well, especially around closer to the ocean. Sometimes some lakes, some ponds, are really, really salty. So it's hard to tell sometimes. And sometimes if a lake has a river going down to the ocean, fish will taste different as well. [Bobby]

This year in our lakes we had more water than we've ever had in the last 10, 30 years, most water we've ever had. And the water can taste very different again because of the brand-new shoreline... The colour of the water will be changed again and the taste in the water will be changed again. And sometimes fish react to these types of brand-new feed in the water that's coming into the lake from a new shoreline. [Bobby]

Participants noted that a fishy smell in the water can be a sign that it's good fishing, and good water:

...when you go close to a river, a river is constantly emitting different types of smells all the time and there's one that always stays in that river, is that fishy smell in the river. A river which you could smell like fish, you're sure to catch 1 or 2 or 3 or 100 fish in that river, compared to a river which doesn't have as much fish in that lake for some reason. For some reason some rivers, small streams and that, they don't [have] that fishy smell. But some areas maybe in that spawning areas, spawning rivers, where the fish spawn, you can actually smell the fish, you can actually smell the fish even before you start fishing in that river. The river really emits a fishy smell. That's what we look for in the rivers. We want fish, we want fishing. [Bobby]

Participants cautioned that water can look clean but not be safe to drink, and that water can appear to be moving when it may not be. For this and other reasons, while taste can be a good indicator, it may not always be the best one:

Sometimes taste isn't always the indicator and smells, smells are good indicators in the lake too. You can smell different lakes, lakes have different types of rock and rock tends to make different smells, different taste in the water, and the colour can be changed very well too. Every pond that you might have on the land is a little different...what is already on the ground can already have a different taste and different smell in that water, because the rocks are all different in each, in every part, the land or anywhere. [Bobby]

Participants discussed the importance of the history of water; how the water has been used traditionally and how it continues to be used today affects participants' use:

Joanne: What would be good water from your perspective?

Wynter: Just the common site conditions, smell conditions, I guess fish conditions too, maybe the history of the area, and the conditions of the fish. I think what's important for me when I'm out on the land and I need to collect water is understanding the history of these lakes as well.

Diavik's proposed three-part method to approach cultural use closure criteria for the pit lakes (reviewing water quality; toxicity; and traditional water quality, see Appendix B) was, for the most part, positively received by KIA members during the workshop. However, participants expressed the desire for additional steps in the closure and monitoring process, especially before any breaching of the dikes occurs (see 'Other' section for more detail):

Natasha: Bobby, would you agree with what Diavik is proposing to do... ?

Bobby: Yes, I would really like to see that fish before they open the pits anyway. If the water and everything is drinkable and useable and free of any contaminants or anything, I don't see why the fish would be any different... the real fish indicator would be something I would really like to look at, before you breach the walls into Lac de Gras itself. If fish had at least the time to wander back and forth between the two pits, around the pits, and the varied habitat we've put together, that was being proposed, the fish habitat and if everything goes well, the fish would be using it as well, that's what I was getting at in the first place.

Table 1. Properties of water that make it suitable for cultural use.

Property	Quote (from workshop)	Sources (outside of workshop)
Healthy, edible fish, healthy wildlife, animals using the water	<p><i>But if we want to know if the water is healthy and if the fish are sick, that's when we know the water's not healthy or not. But most of the time, you don't have to love to see fish from the water that's always moving. [Nancy]</i></p> <p><i>Water would be clean, because fish go there. [Bobby]</i></p> <p><i>About fish, they react to good or no good water, so it's really good that we do fish sample as well. Because they're in the water and have to really look at those fish, whether they're healthy or not, so we could know more from the animals that are there. [Nancy]</i></p>	Raised in KIA AEMP Planning Meetings: January 21, 2012; Feb. 4, 2012; June, 2012
Clean smell (can have a fishy smell) and taste (affected by fish, wildlife, plants, rocks, temperature, location, saltiness, sediments)	<p><i>From a perspective, the water quality, good properties for KIA water, good water taste, no scum and smell, should be moving water, either river system or winds, moving water is the best out of it. For good water properties it should be clear, have a good water taste, and no scum and smell, and we see generally river system, moving water or current, river system or moving water. [Jack]</i></p> <p><i>Treated water in communities is really different from freshwater we get from the lake, from the water. Lot of us in wintertime, we prefer ice to treated water in the</i></p>	Raised in KIA AEMP Planning Meetings: January 21, 2012; Feb. 4, 2012; June, 2012

	<i>community. Community water sometimes really tastes bland, which has a lot of chemicals in it, be it whatever types of chemicals they are putting in the water in the communities. To make water drinkable in a community, these chemicals in the communities, that's what Elders don't really put up with is that community water. They prefer water that is from the river, or ice from the river, they prefer that. And every year when ice comes down, a lot of people come down, around the river, go collect ice for water. And they use mostly for tea and coffee and cooking, that's what we use from the ice, compared to tap water or community water. [Bobby]</i>	
Clear colour (natural, not murky, no oil, film, scum, not too much algae)	<i>Can't help it sometimes, sometimes we camp in a lake, sometimes we see the lake itself has a little bit different ice as well, might be a little murky... Sometimes that shoreline or that ice isn't what we need. We go a mile away from the camp and go and collect ice or snow from there, might use snow sometimes for making water. If it's too murky, we go to another lake, go get another ice, near a river, or another part of the lake, go get ice sometimes. [Bobby]</i>	Raised in KIA AEMP Planning Meetings: January 21, 2012; Feb. 4, 2012; June, 2012
Free of contaminants/ chemicals	<i>Even though snow is very good for drinking water but I always have this in my mind that there are chemicals in that snow, from fallout in the world. When you see fallout, especially around closer to the mine, it becomes more prominent, the taste in the water, the colour of the snow, the land itself will have dust. [Bobby]</i>	Raised in KIA AEMP Planning Meetings: January 21, 2012; Feb. 4, 2012; June, 2012
Moving, flowing (from wind or current)	<i>For me, water has to be moving all the time... [Bobby]</i> <i>Lakes have different types of current as well, some big lakes have really strong currents, especially around some islands or where it might be shallow between islands. You can see the currents... just like the ocean sometimes, the ocean currents, specially when it's windy, you can actually see the water flowing a different way, the wind is going one direction but sometimes you can actually see the current in the water flowing in a different way, it's like a river. Whereas still water, it's affected mostly by wind, it's all going one direction, sometimes there's taste from one area of the lake to the next area of the lake, that's why those fish sometimes go to different spots in the lake... Caribou migrate to go calve. It's just same with the fish, fish migrate to rivers, where the lake has current, it has to have movement. Fish don't necessarily ever spawn in still water, I've never seen beds in still water, especially on lakes, but fish need a lot of this current</i>	Raised in KIA AEMP Planning Meetings: January 21, 2012; Feb. 4, 2012; June, 2012

	<i>water, flowing water to have healthy spawning areas, that's what I see a lot in my years. [Bobby]</i>	
Healthy flora and fauna in the water	<i>We're looking at the water, whether it's healthy or not, but we got the living little things that live in the water. We have to really look at those because they're the ones that are there. [Nancy]</i>	Raised in KIA AEMP Planning Meetings: January 21, 2012; Feb. 4, 2012; June, 2012
History of the area (i.e. Inuit Qaujimajatuqangit)	<p><i>...anytime I've been out on the land and have had to collect water, I've got that family history and understanding, knowing where my parents or grandparents have always collected water in the area. So I think now I just know where to collect safe drinking water. Having that history passed down is very helpful as well. [Wynter]</i></p> <p><i>Natasha: Do you remember some of the teachings [your parents and grandparents] shared with you?</i> <i>Wynter: Not specifically, other than just a trust in where my family has always collected water. It's keeping-you know, having that freshwater accessibility. And there's just certain areas where you just know good tea locations, tea water locations.</i></p>	Raised in KIA AEMP Planning Meetings: January 21, 2012; Feb. 4, 2012; June, 2012
Quality of snow/ice	<i>We go down to the ocean, ice from down there, might taste in the water, or not taste any salt, it's just the same thing with the lake. Lake which has a lot of movement, sand, sediments are going into the lake. Sometimes if you go a little bit further from the shoreline, you'll taste the difference. You go close to the shoreline, the shoreline ice will be sometimes different colour too. Sometimes it can have a colour from the land and flowing from the land, especially tiny little streams going into the lake. In the fall time, the colour on the shoreline ice might be different because of the flow, water in the fall time, rain or whatnot might just before freeze up might be a little different sometimes. That's what I see a lot, different colourations in shoreline ice compared to the ones from the middle of the lake. It doesn't always, just because it might be a little murky doesn't always indicate that it's bad water, water near the shore as well, also little further from the shoreline. Sometimes when I make camp I want to have ice right from near my tent, most times, sometimes a little different, and most times nice and clean, and good clear ice, is more tastier than the ice that had little ground-can taste the ground ice, from more the ground ice. Or ground that's freezing near the shoreline, from the shore, and you</i>	Raised in KIA AEMP Planning Meetings: January 21, 2012; Feb. 4, 2012; June, 2012

	<i>can actually taste the difference when you go too close to the shoreline. Doesn't always indicate it's bad water so I still make ice, make tea with it. [Bobby]</i>	
Cold water high in oxygen	<i>I know that some lakes around Nunavut, they are landlocked, some of them have no rivers or streams going into them and the oxygen levels are really low in some places. When you open these places to fish, the fish are in need of a lot of oxygen, so they go to these holes that we make and gather around there. That's what makes us catch fish one after the other, when we find these lakes with no rivers or streams or anything else, if it's closed right around and has no oxygen coming in from other parts of the lake or other parts, streams or anything. Fish have a tendency to need a lot of oxygen, so when we make holes, we open up oxygen levels for the fish and the fish gather around these holes that we make, that's what makes us catch so many fish, one right after the other. That's what I was thinking about for this pit, maybe at least a year or so when the water is deemed clean and the fish will come out clean as well. [Bobby]</i>	Raised in KIA AEMP Planning Meetings: January 21, 2012; Feb. 4, 2012; June, 2012

Cultural Use of Water

KIA workshop participants discussed the importance of water for drinking and fishing. Water, ice and snow are also important for activities on the land, like travel and camping on frozen lakes, that sustain harvesting and support Inuit ways of life.

Participants discussed their desire to know that they can comfortably use the Lac de Gras area. One participant talked about going back to Umingmaktuuq and how important it is for people to have the security in knowing they can still travel safely and comfortably everywhere on their lands:

Like my son was born here, he's 20 years old, and he wants to go Umingmaktuuq. He wants to know the way, so my husband took him there this spring to show him the way. It's 200 miles away, and he wanted to go there so my husband brought him there. He came back one week later, he said 'Mum, I know the way to go back to Umingmaktuuq, I'm going to go.' So, I said yeah, right away. So, if in the future somebody's going to be using the whole place again, like reusing it again in the future, because they know lots of people who are from there. [Nancy]

In general, participants stated they would not be likely to draw water from the pit lake or use it for other cultural use (with or without PK), and would teach youth not to use water from there for cultural purposes in the future.

This question about do you expect to draw water from the lakes, I don't think so. Want to draw water from the pits, there's Lac de Gras in front of you there. That settles my question. ...Lac de Gras is right there, why would they want to go to the pits to get water? [Jack]

For me in the future, if I wanted to travel up to Lac de Gras again, which I have done with my father for many years in the past. Because it's a mine pit, I'm definitely not going to the mine pit to get my ice. I will go as far away from the pit if I wanted to get ice. I go far away from that pit in the future. But if the science and scientific way of knowing that it is clean and scientists are drinking it as well, then I would be willing to give it a try, do the same thing. Sometimes when there's water, and sometimes the flow, from the mine into the lake, which actually goes into the lake-I would never drink from there. The only way I would be, let's say I would really be willing to drink that water is if I see a scientist can drink it, then I will definitely go and have some tea and water from there. If I see that, I'll be more comfortable, really comfortable with collecting water from there again, or collecting fish from there again. I would like to see more scientists doing it first, because in his mind, I would like to see the scientist make tea, using that water, before I can myself go collect water from there. That's what I would do in the future. Because it is a mine lake and mine pits as well. That's what I would do in the future, and what I would tell my grandchildren and my children, to be leery about those mining areas, which they already are, because of the mining area as well. That's what I would teach my grandchildren and my children anyway. Thank you. [Bobby]

When asked if there were conditions under which they would use the water from the pit lake, participants stated that they would use it only if science first proved it was safe, if it was monitored long-term and met cultural standards laid out in TK Panel recommendations, and was the same colour as Lac de Gras (see 'Other section' for more detail on monitoring):

Natasha: ...We heard from you that it wouldn't be likely for you to take pit water for drinking. I am curious to know whether you might still fish in the pit water, or travel or use the water in any other way at closure.

Nancy: We wouldn't really use it unless we know it's healthy. We have to find out first whether that water is healthy or not.

Natasha: Nancy when you say "not unless we know the water is healthy", what would give you that comfort...?

Nancy: Well, they're going to monitor every time, every season.

Natasha: So you'd want it to be clear, you'd want the PK to settle?

Nancy: Yeah. You could test it even if it's clear, because it's not going to be clear when you put the water in there. Probably take at least few weeks, maybe longer-

Bobby: Years.

Nancy: Years, is it clear, keep testing it, by tasting it, or the environment.

Natasha: What about the colour? Is there a certain colour it should be?

Nancy: Well, the colour's going to be different if it's not settled, like murky.

Wynter: What colour do you think it should be?

Nancy: Same as the lake. Yeah.

Returning the Spirit to the Pit Lake

While every person's relationship with spirit is personal, generally, Indigenous peoples have long recognized that there is spirit in water. Previous engagement sessions have documented the importance of spirit in water and ice to Inuit participants², but this topic was not discussed in detail during this particular workshop.

Other

Several other topics or concerns were raised by KIA participants during the workshop. These include:

- The desire for amendments to currently proposed monitoring processes and closure plans.
- The need to ensure that Diavik follows up on previous recommendations from KIA.
- The importance for continuous, long-term monitoring of fish and water, based on both science and TK
- The need for KIA to conduct their own monitoring (i.e. guardianship) activities and the importance of ensuring youth involvement throughout the process.
- The requirement to address all water quality concerns related to the flow of water between Lac de Gras and the pit lakes once they are reconnected.
- The importance of considering climate change impacts on monitoring activities and cultural uses of water.
- The need to ensure that Diavik proceeds with caution (especially given the Covid-19 context), and that fair and adequate consultation and continued access to project-related documents are considered.

In addition, Jack Kaniak who is the EMAB representative for KIA, advised of the following:

- The need to ensure that Diavik follows up on previous recommendations from EMAB.

Participants discussed currently proposed monitoring processes and closure plans by connecting water in the two pits together after closure, allowing water and fish to travel around connected pits. During the twelfth TK Panel in November, 2019, the TK Panel stated

² AEMP Planning Meetings: January 2012; June 5-6, 2012 with Joseph Niptanatiak, Colin Niptanatiak, John and Martha Ivarluk, Mary Algona, Karen Ongahak and George Haniliak, Corbin Anablak, Mona Tiktalek, Luigi Torretti, Mark Taletok, Bobby and Mary Algona, Rosemary and Herbert (CLEY).

that the dikes should be breached but not enough to allow fish to allow travel into the pit. Participants in this workshop suggested an additional step of either putting fish back in the pit before there is a complete breach, or increasing the breach of the dike so fish can swim in. These fish should then be tested (and deemed healthy by scientific and TK standards, i.e., sampled and eaten by Elders) before the dike is breached:

...I would really like to see that fish before they open the pits anyway. If the water and everything is drinkable and useable and free of any contaminants or anything, I don't see why the fish would be any different, if that was the case. But I think fish indicator, the real fish indicator would be something I would really like to look at, before you breach the walls into Lac de Gras itself. If fish had at least the time to wander back and forth between the two pits, around the pits, and the varied habitat we've put together, that was being proposed, the fish habitat and if everything goes well, the fish would be using it as well, that's what I was getting at in the first place. How the fish would react to some of those habitats that were being put in the pit. How they would use this before we open the pits. That's what I was getting at. And I would really like to see the fish in really good condition. If they had stayed there six months to year, before we open the pits and see how the fish are, really are, especially their condition and everything about the fish. I would really like to see that happen to before we open it, before we open the walls into Lac de Gras. ...then we can monitor overall the pits and the whole mine itself along with the lake, with the complete Panel in there, a complete session, before we sign off anyway. ...for me, it would make me more comfortable if I can see fish and eat fish from the pit itself before we can breach the pits. [Bobby]

Participants felt that knowing and seeing that fish using the pit lake with PK were healthy would make them feel more comfortable about pit water quality:

...it would give me comfort if all this water and everything was tested and deemed very clean, that would always give us a clue that the water's clean, but the fish will definitely give us a clue how the water is going to be in the pit before we breach, that's what I was thinking. In addition to what we have agreed on, maybe it's to put the fish in as well, maybe after everything is deemed clean, I would like to see another one with a fish indicator itself. If the fish can be healthy, come out healthy over a year or so, then that would be a good indicator that it might be okay to breach the walls on the pit. [Bobby]

The need to ensure that Diavik follows up on previous recommendations from KIA and EMAB was also expressed; specifically, participants raised concerns previously documented by EMAB in the *Intervention to the Mackenzie Valley Environmental Impact*

*Review Board on DDMI Diamond Mines EA1819-01*³ related to monitoring and sampling. For example, participants reemphasized that fish will go below 40m in the pit lake and should be included in monitoring:

...any fish will go below 40m... Creatures have a tendency-they won't stay at 40m, I'm sure they will go down to the bottom, down 360m, maybe more. The fish will follow all that food that goes down. ... I think the fish should be monitored below 40m. If that's the case, if they're going below 40m, down there, they're disturbing the bottom of the-messing up all this crap in the water. [Jack]

You remember my fish story, can everybody remember my fish story, about how deep fish really go in times when they are in distress? That's my story about how deep the fish can go, with that fish story I gave the last Panel session, last or second last Panel. [Bobby]

Participants agreed that using a fishfinder to track fish and see how deep they are in the pits would be a good idea. In addition, participants expressed the desire to ensure that Diavik is taking into consideration input from previous engagement sessions, as well as EMAB recommendations.

The desire for continuous, long-term monitoring of fish and water in the pits and Lac de Gras was reemphasized during the workshop:

They should do that [monitoring] for a long time... it's maybe good to monitor for 100 years or something. Because there's always going to be people wanting to go there. There's lots of communities in Yellowknife that hunt and fish, live there so many years, hunt there, I'm pretty sure somebody's going to want to go back. ...Please don't give up right away because things will change, when it sits for a long time. Thank you. [Nancy]

Participants supported the idea of scientific testing first, followed by IQ testing, especially for taste tests, and the importance of a program similar to the AEMP but ongoing, even after closure. Participants expressed the desire for a program that allows monitoring to occur throughout the different seasons (where watching occurs all year round) and that brings Elders and youth and scientists together. Beyond water, wildlife, birds, bugs, small animals, plants, and weather should be checked, and for a long time, because it may take a long time before impacts to show up. These comments build on planning from previous engagement sessions (for example, the TK Panel recommendation⁴ from the women's

³ http://reviewboard.ca/upload/project_document/EMAB%20Intervention.pdf

⁴ Thorpe Consulting Services (2019). DDMI Traditional Knowledge Panel Session #12: Options for Pit Closure, September 12-16, 2019. Diavik Diamond Mine, NT.

planning group to start training for monitoring programs early, and to get people working with the environment department to learn from and build on what's going on at site).

Participants also expressed concerns about the flow of water between Lac de Gras and the pit lakes once they are reconnected; specifically, participants voiced the concern that temperature can influence the flow in the pit and between the pit and Lac de Gras, and cautioned Diavik to think about this when the dikes are being breached:

My concern is that those two holes are 30m wide, that's 100ft, then they're 10ft below. Wouldn't that create-those two, wouldn't that create current in the pit, that pit lake? ... That should be looked into. ... During the summertime, the temperature might have something to do with the flow too, because cold water from the bottom going right to the top, so there would be a flow and that could influence it too. [Jack]

Participants also noted the importance of considering climate change, and re-expressed the need for all testing to consider the effects of environmental change:

It's very, very hard to say that all the water is always the same, always tastes good, because of how clear and how it smells. That's not always the indicators that we rely on. We're really relying on scientists now to monitor the weather, atmospheric conditions, salt, or anything, any kind of chemical that might have fallen from around the world as well, because wind carries chemicals from many miles down, the wind. Not only a few miles but few hundred miles, goes all around the world, picks up from the ground, and goes many miles up into the atmosphere and just swirls around the world. When it falls out, it falls everywhere, not only in our part of the world, but all over the world. I see that also too. Sometimes you get that snow that is really different from other types of snow that we get from snowfall to snowfall, it could be different because of the atmospheric conditions and how that snowflake was made. [Bobby]

Sometimes we depend on scientists now, more than ever, because the water changes, can change very different, very quickly, because of the weather and because of the weather conditions that we might be getting from other parts of the world. [Bobby]

Finally, participants discussed the need to ensure that Diavik proceeds with caution (especially given the Covid-19 context), and that fair and adequate consultation and continued access to project-related documents are considered. Participants expressed the desire for workshop materials and important briefing documents to be provided further in advance of the workshop, and expressed frustration that they have had trouble accessing previous workshop output and reports. While participants expressed appreciation for the provision of TK Panel reports and AEMP reports distributed in both hard copy and electronic versions as well as the workshop going ahead in a virtual format given Covid

concerns, there was general frustration voiced at the difficulties around virtual engagement:

...the session was good, but I would like to have seen more input from the communities maybe. But that's more with the Covid stuff-I think this type of meeting is good but very important discussions, like with the water board, we need face to face meetings.
[Jack]

Participant Questions

The following is a list of questions asked of Diavik by workshop participants. Responses are further detailed in workshop notes.

1. This approval process for kimberlite, who's approval is that, is that Diavik's approval?
 - a. So far we got approval from the Mackenzie Valley Environmental Impact Review Board, we did the water license amendment and that triggered an EA. For the last year, we did the EA through 2019 and in January 2020, the EA review board recommended approval and in June of this year, the GNWT Minister signed off on that approval. That was the main approval, but it was contingent on us... fulfilling these measures. One of these measures is developing cultural criteria, criteria that demonstrate that water is suitable for cultural use... now we're going through water license amendment. ...we've been talking about that a lot with EMAB... that water license amendment is continuing, and later this year in November and December there will be some water license proceedings, where we'll be advancing some of this work. The idea is we've already met with you today so that what we propose to the water board a couple months from now, everybody agrees is a good path forward. We'd rather work it out with you now rather than through the water board process down the road.
2. ...I would like to ask Diavik, all the mining essentials, all the water license and everything that we have agreed on for you to work with, has all, has any of that been followed as well?
 - a. ...Natasha presented what we heard at the last TK panel session, it's still quite broad criteria, so we took that information and we tried to develop a bit further so it could be more tangible and testable from our perspective, something we could monitor year after year, we have put some thoughts down based on what we heard. We wanted to hear if you had thoughts ... we are still putting a proposal forward to the water board. They have approved

- the project, but we need to go forward with some more information and it will be up to them to decide whether or not that meets their requirements.
3. ...when I think about that, the last few years we've been working together, there's this one that really stood out for me, was that last pit that Diavik has made, the new one, that one we've been working on the last few years. All that mining activities that have been going on in there, is there anything new that might have come up in the last little while that might stand out, or that might have a question for you, for us about that new pit that you've been working on over the last couple of years or so.
 - a. It's been about two and a half years of mining there now. The open pit is quite large now, quite a bit larger then when you would have seen it about a year ago. Everything is going well though, we actually just got an amendment to our water license for the option to do underground mining now, so it would be similar to what we're doing at the other two mines where we're currently mining underground. So, we're looking at the option of doing underground mining there as well. It wouldn't change the mine life of Diavik, it's just that right now the open pit is going to be done at the end of 2022 so just another two years. If we do this underground mining, it will last until 2025, when all of Diavik is planning to be done. That's probably the biggest update, is that we just got approval for that yesterday ... but we haven't decided if we'll actually do it, it's a bit on the fence just because it's a lot of work to do underground mining, just for a few years . But that's probably the most important update about that mine.
 4. Another one is the dikes that are going to be open. The diagram shows there's two of them, they're 30m wide, and 3m deep. Those are the proposals to let the water in and out [see Diavik presentation]... I guess there's two of them they're proposing to open with that pit, right? ...My concern is that those two holes are 30m wide, that's 100ft, then they're 10ft below. Wouldn't that create-those two, wouldn't that create current in the pit, that pit lake?
 - a. We're not expecting any real current because the pit will be the same water level as the lake. Throughout the year the lake goes up and down about half a meter, depending on spring or fall, how much rain. So as the lake raises or lower, water will flow through those gaps so that the pit lake stays at the same level. It wouldn't be like a river, it would be pretty slow, I don't think you'd really notice it. If there's big waves on the lake, if it's really windy, you might get some good current through those gaps. But overall that pit lake will be pretty calm because it's quite protected, other than those gaps. But that's something we'll have to look at.
 5. Between the two pits, before opening Lac de Gras and the pits itself, can you open two pits itself together? Open the two pits, combine the two pits together, before we

open the main Lac de Gras-the pit walls on Lac de Gras, before we open those, that bit right in the centre, can we open before we open the walls to the lake itself?

- a. That's a good question. We haven't been planning to do that, but it would be an option. There's a similar little dike in between the two of them. We could always cut a hole there as well if we wanted to. ... We haven't thought much about it.
6. When can the whole panel get together again? I know this Covid thing, pandemic, virus, is giving us a hard time to get back together again. When can we be comfortable in putting a session together where we can all be together again in the future? Any predictions or what might happen in the next little while?
 - a. We were just talking about that before ... it's impossible to answer but I think as soon as government allows us to travel and once we have a vaccine for Covid, I don't know... The short answer is, as soon as possible, we recognize this is challenging and we honour your patience.
 - b. We're so grateful you're even willing to meet with us, to try this new platform, the only thing that's available is doing it right now is on phone and on video, so really thankful that you're even willing to try. We have no idea. When we cancelled this year's TK session, we made that decision in the summer, normally we would have met this September or August. At the time I really thought we would be able to get together in the spring or early summer but now this continues to go on and we just have no idea anymore. We have a TK camp that is supposed to happen next summer, fall, in August, and we're making the preparations, but we don't know if we'll be able to have visitors at site. We have not had visitors at site. We just have to wait and see if the vaccine does get developed and even once it is, how that gets implemented throughout the NWT and the north. So, I'm sorry I don't have any more news to share.

Conclusions and Next Steps

Diavik aims to complete workshops with eight Participation Agreement (PA) and non-PA communities, with the results being compiled into a report for submission as part of the water license amendment for the PK to Mine Workings Project. For each community workshop, Thorpe Consulting Services will provide copies of detailed workshop notes, and this workshop summary document to participating communities.

Appendix A – Agenda and Informed Consent Form



Agenda

Diavik Diamond Mines (2012) Inc. Water Quality Workshop

**Kitikmeot Inuit Association
Kugluktuk, NU
October 13, 16, 2020**

Participants

Bobby Algona (KIA Elder)
Nancy Kadlun (KIA Elder)
Jack Kaniak (EMAB Member)
Wynter Kuliktana (KIA Staff)

Myra Berrub (DDMI)
Sean Sinclair (DDMI)
Joanne Barnaby (Consultant, Facilitator)
Natasha Thorpe (Consultant, Facilitator)
Sarah Ravensbergen (Notetaker)

Day One: October 13, 2020

8:45-9:00	Online Workshop Microphone Testing and Overall “How-To” (Myra). <i>Please log into the workshop at 8:45 so that we can make sure everybody is connected and has reviewed the informed consent form.</i>
9:00-9:30	Opening Prayer (KIA) Opening Circle (Everybody) Workshop Welcome, Overview (Facilitators)
9:30-9:50	Why are we here? (Diavik) <ul style="list-style-type: none">• Background around the need to develop “clear, measurable, and culturally relevant” criteria for water quality at closure

9:50-12:00	<p>What is Healthy Water according to Indigenous Knowledge? (Facilitators)</p> <ul style="list-style-type: none"> • Overview of how the DDMI TK Panel and Aquatic Effects Monitoring Program have been developing ways to measure healthy water (i.e. water quality) • Overview of how other Indigenous communities across Canada are measuring water quality according to their ways of knowing <p>Discussion Questions</p> <ul style="list-style-type: none"> • What are the good properties you look for in other lakes you use? • What are the properties of water that make it suitable for cultural use? • What needs to happen to see if the spirit returns to the pit lake?
------------	--

Day Two: October 14, 2020

8:45-9:00	<p>Online Workshop Microphone Testing and Overall “How-To” (Myra). <i>Please log into the workshop at 8:45 so that we can make sure everybody is connected.</i></p> <p>Welcome and Comment Circle</p>
9:00-9:30	Refresher on Closure Plans for Pit Lake (Diavik)
9:30-11:30	<p>Exploring Water Quality Criteria for the Pit Lakes</p> <ul style="list-style-type: none"> • Do people expect to draw water from the pit lake for cultural use? • What properties in the pit lake could change your use of the big lake?
11:30-12:00	<p>Closing Circle</p> <p>Closing Prayer</p>

Kitikmeot Inuit Association

Diavik Diamond Mines (2012) Inc.

Water Quality Workshop

October 13, 16, 2020

Kugluktuk, NU

Informed Consent Form

I, _____ on October ____, 2020 give permission for Diavik Diamond Mines (2012) Inc. and its Contractors (i.e., Thorpe Consulting Services and Joanne Barnaby Consulting), to take notes, photographs and / or audio and video recordings related to my participation in meetings, workshops and events related to the Water Quality Workshop conducted on behalf of Diavik Diamond Mines (2012) Inc. (DDMI).

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;
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 Indigenous Organization, DDMI and / or its contractors may use the information collected to contribute to caring for water in the NWT and NU;
5. DDMI, Natasha Thorpe and Joanne Barnaby may share my information in either reports, presentations, and/or photographs provided it is within the context of this workshop scope and that they provide such information to my Indigenous organization;
6. I agree that my contributions may also be used for future educational, cultural, heritage, and environmental purposes that are outside the scope of this workshop and that my representative Indigenous organization, 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 my Indigenous organization policy and DDMI KIA engagement protocols for the Processed Kimberlite to Mine Workings Project;
8. I am free to request that any information I share is removed, erased or deleted from draft materials and that final copies will be provided to me;
9. My information will be summarized and included in a report which will be publicly available; and
10. I understand that DDMI, Joanne Barnaby and Natasha Thorpe cannot ensure the protection of my information (e.g. Traditional Knowledge) from public release once the reports are released (e.g., via youtube.com, Facebook, other social media, or Indigenous group websites),


Signed on October ____, 2020 in _____, Nunavut.

Signatures:

Participant

Kitikmeot Inuit Association

Indigenous Organization



Contractor

Joanne Barnaby

Witness

Translated by: _____

Appendix B – Presentations



A woman wearing a green hard hat and a high-visibility orange and yellow safety vest is looking out over a mining site. The background shows a large open-pit mine with heavy machinery and a cloudy sky.

RioTinto

Water Quality Criteria –

Culturally important indicators for water quality monitoring

Kitikmeot Inuit Association

October 13 - 14, 2020

Context: Why are we here?

Processed Kimberlite to Mine Workings Project

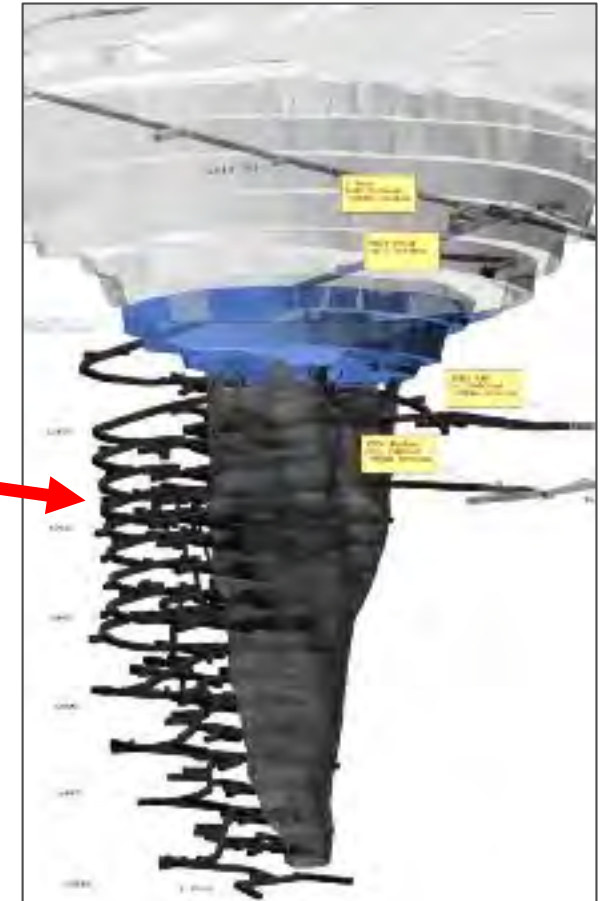
- ✓ to develop “clear, measurable, and culturally relevant” criteria for pit water quality at closure
 - January 2018 – Now: Water Licence Amendment and Environmental Assessment
 - Future – Measures to protect cultural use of the lake: TK, engagement, monitoring, reporting

Approved Processed Kimberlite Storage Options

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

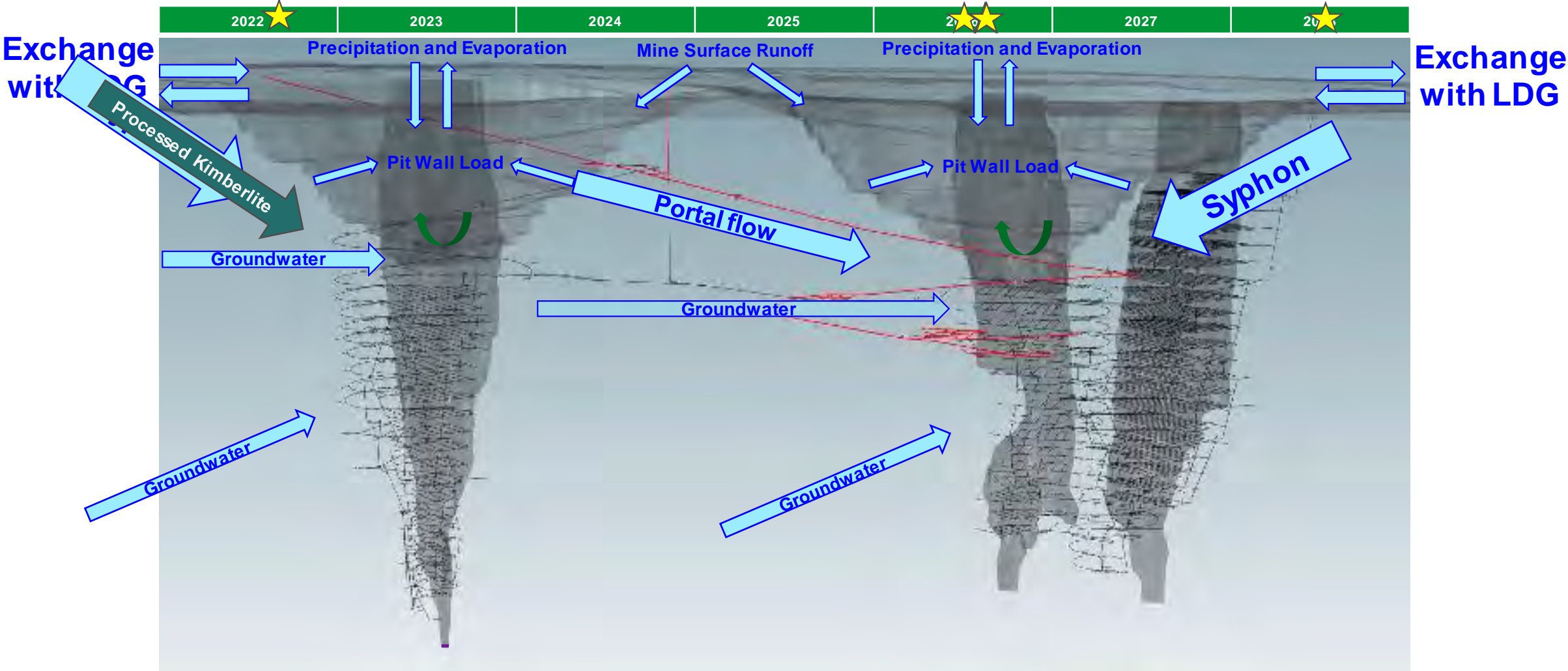


2. Processed kimberlite could be stored within the Mine Workings



PKMW PROJECT TIMELINE

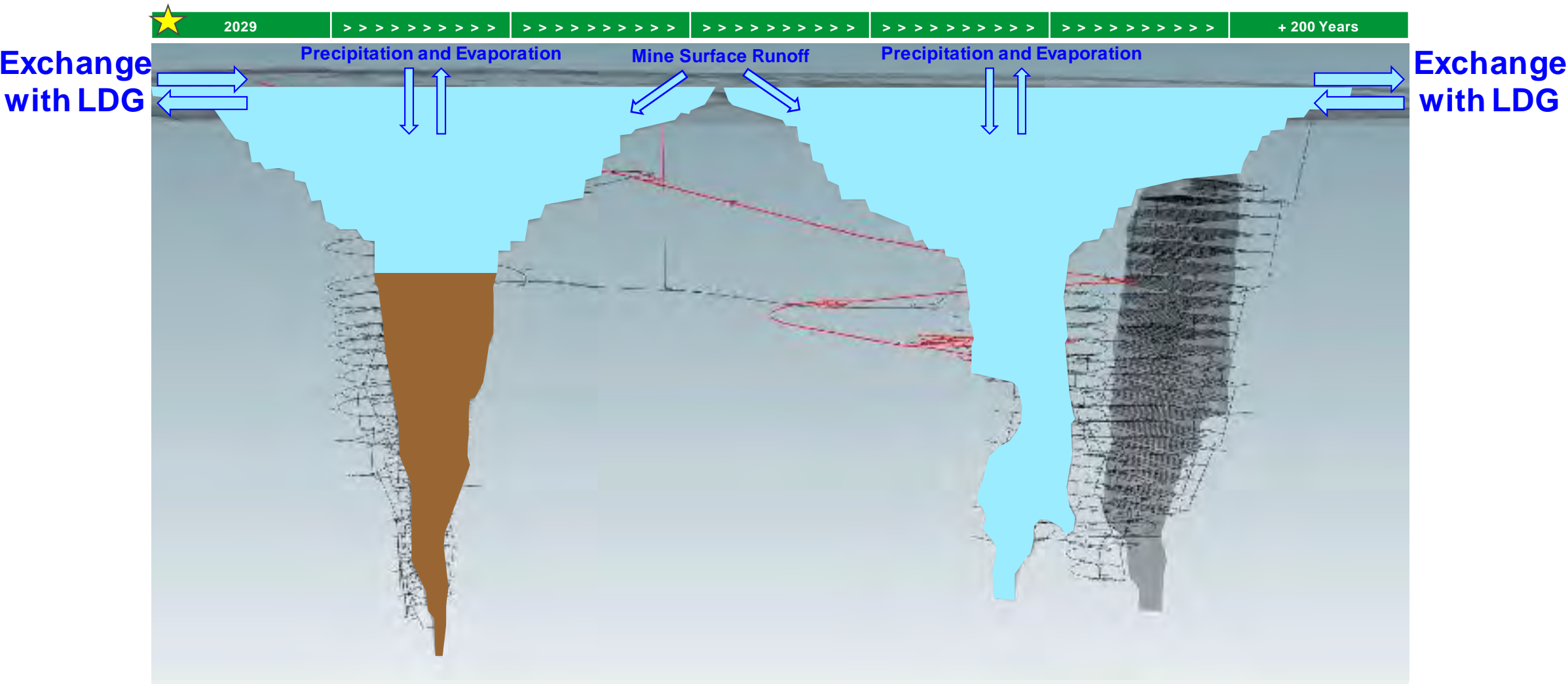
August 2022 to March 2023
Freshwater supply to the mine
Groundwater through the mine
A154 Undergoes with groundwater
Model Updates



PKMW PROJECT TIMELINE

Next 200 Years

PK consolidates
Releases PK porewater
Surface exchange with LDG



FLOODED MINE WORKINGS POST-CLOSURE



PKMW Measure 2:

Water quality objectives need clear, measurable and culturally relevant criteria

Diavik has met with all PA groups to share the water quality criteria recommendations from TK Panel session 12 and presented the same draft Cultural Criteria.

After positive initial feedback we have advanced the Criteria and would like to discuss these in more detail

- Does KIA have recommendations for different / modified criteria?

TK Panel #12 Summary Continued

- ▶ 12.7: The TK Panel would like Diavik to test water in the pits for at least two years (until the water is deemed good) and compare this to water in Lac de Gras. Water samples will be collected from multiple depths at various times throughout each year and tested according to the AEMP protocols. Taste tests will be done after scientific sampling tells us the water is drinkable, where they will watch for smell, clarity (turbidity), temperature, colouration, scum on the water or tea, and water and tea for taste.
- ▶ 12.8: When scientists and the TK Panel agree that the pit water is safe (i.e., drinkable) and stable (i.e., consistent), then breaching of the dikes can occur to allow water to flow back and forth but prevent fish from entering the pits, at least initially.



Water Quality Cultural Use Proposed Closure Criteria

Criteria: “Traditional Knowledge Panel verification that water is substantially unaltered and healthy for people, wildlife and aquatic life”

Measurement: Summer site inspection and signoff by TK Panel based on:

1. Review of scientific water quality
2. Review of acute and chronic toxicity testing
3. Traditional water quality sampling

Based on two stage review the Panel will confirm if pit water is safe to be reconnected with LDG



Water Quality Cultural Use Proposed Closure Criteria

2022	2023	2024	2025	2026	2027	2028	2029	2030
	Fill pits with PK				Fill pits with water from Lac de Gras			
					★ Session 1:			
			TKP#12 rec.12.7	TKP: Observe filling of pit and validate sampling locations for scientific and TK testing				
	Measurement criteria 1:				Scientific water quality analysis (chemical water analysis)			
							★ Session 2:	TKP#12 rec.12.8
	Measurement criteria 2:						Toxicity testing (lab fish test)	
	Measurement criteria 3:				TKP: TK observations: • clarity; temperature; colour; presence of scum or unnatural material around the pit lake area		TKP: TK observations: • ...+smell and taste	
							★ Breach dikes	

Criteria Measurement 1 & 2 – Water Quality and Toxicity

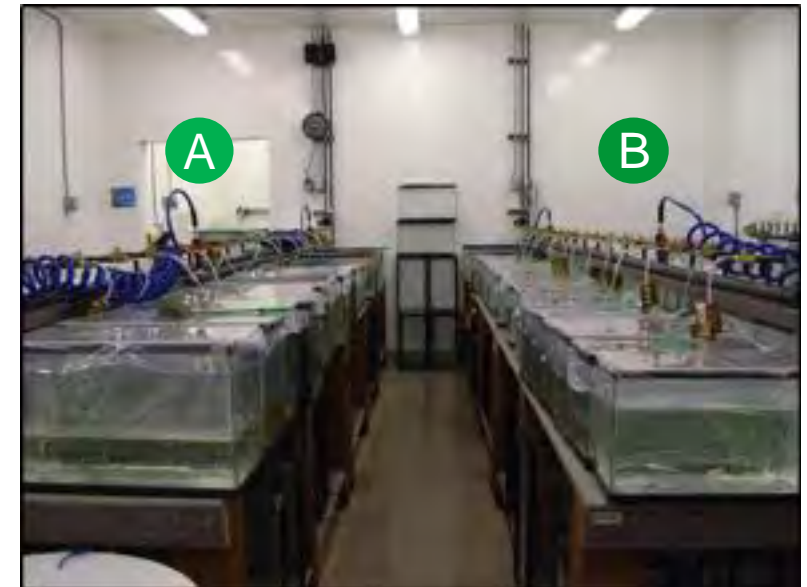
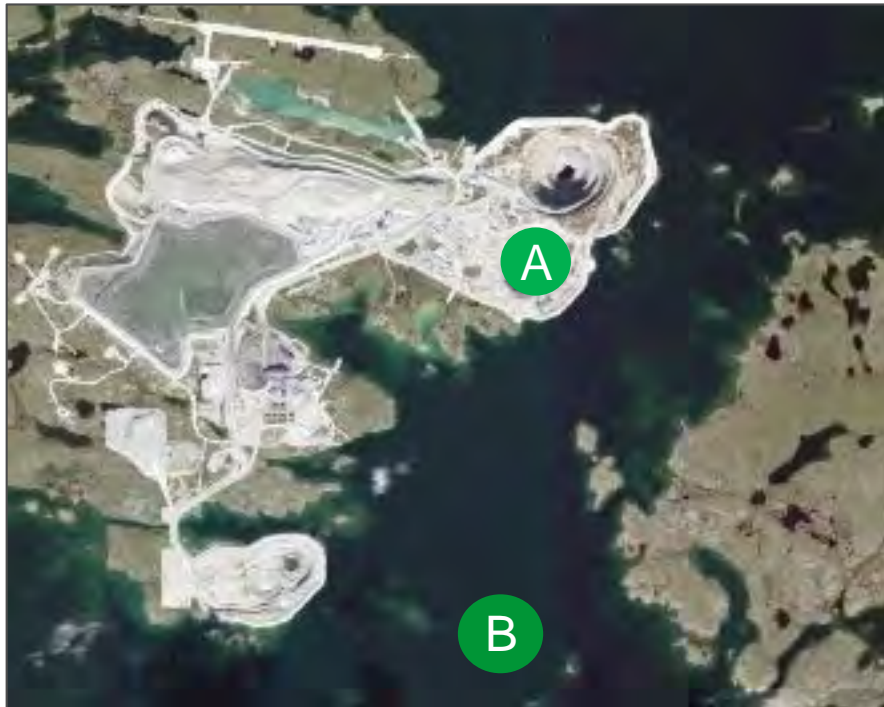
Session 1 (2026): Select sample locations in flooded pit with PK and in Lac de Gras.

--- Sampling (2026 – 2028) ----

Session 2 (2028): Review and compare the results of water quality and fish health before reconnecting to Lac De Gras

TKP#12
rec.12.7

TKP#12
rec.12.8



Criteria Measurement 3 – Traditional Water Quality

TKP#12 rec.12.7

Session 1 (2026): After pit is flooded with water

- Observe water in pit and Lac de Gras
- Select monitoring locations
- Inspect clarity, temperature, colour and presence of scum or unnatural material around the pit lake area compared to Lac de Gras



TKP#12 rec.12.8

Session 2 (2028): After water has settled

- Observe water in pit and Lac de Gras
- Inspect clarity, temperature, colour and presence of scum or unnatural material, smell and taste around the pit lake area compared to Lac de Gras
- Confirm if pit meets criteria to connect with Lac de Gras



Presented to the Kitikmeot Inuit Association

Diavik Diamond Mines (2012) Inc.

Water Quality Workshop

October 13 and 16, 2020

Facilitators: Joanne Barnaby, Natasha Thorpe



Water Quality Criteria

Culturally important indicators for water quality monitoring

What has been done so far?

- ▶ Community Aquatic Effects Monitoring Program (AEMP) overview (2003, 2007, 2009, 2012, 2015, 2018)
- ▶ TK Panel Sessions (e.g. TK Panel 12)

Regulators state that: “water quality objectives need clear, measurable and culturally relevant criteria.”¹

Water Quality Criteria Workshops



¹ Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite to Mine Workings

Aquatic Effects Monitoring Program (AEMP): Contributions from KIA

AEMP Summary: KIA Input

- ▶ AEMP Planning Meetings: January 2012; June 5-6, 2012 with Joseph Niptanatiak, Colin Niptanatiak, John and Martha Ivarluk, Mary Algona, Karen Ongahak and George Haniliak, Corbin Anablak, Mona Tiktalek, Luigi Torretti, Mark Taletok, Bobby and Mary Algona, Rosemary and Herbert (CLEY)
- ▶ Water is clear (not murky)
- ▶ Water quality depends on amount of snow and tastes different in different areas
- ▶ Taste of water; water can look clean but not be safe to drink
- ▶ Wildlife (e.g. caribou) affect water quality through migration, urination and defecation
- ▶ All testing needs to consider the effects of global warming/environmental change
- ▶ Cross-generational sharing valuable



AEMP Summary: Water Quality

- ▶ George indicated that he knows the water is good to drink when it is clear (not murky).
- ▶ Beatrice explained the traditional education system in which youth learned how to survive on the land, their history, their ancestry, and who they are (in order to know how to be a good Inuk). Youth should know where they come from in order to know where they are going. It is important that Inuit youth be curious (i.e., ask questions) and keep learning from Elders and community members. It is important to connect head and heart knowledge.
- ▶ Joseph, Mona, Beatrice, Bobby, and others, discussed the importance of going to the mine site to understand what is happening at the mine site with regard to the land and water, and to share this with fellow community members.

AEMP Summary: Water Quality

- ▶ Joseph noted that water quality declines with the decrease of inflows from snow, and stated that the river system by Kugluktuk goes to the ocean and the water there is too murky for use in tea. The water in the Yellowknife River looks good to him in comparison to the river systems near his home. Joseph grew up around Lac de Gras and says the lakes there are good for drinking. The water from rivers taste different between Bathurst Inlet and Lac de Gras. The former tastes saltier. So, water quality depends on your geographic area. At Lac de Gras, you can get good water to drink year round.
- ▶ John noted that thousands of caribou migrate through Lac de Gras each year, and urinate and leave excrement in the lake. He discussed wildlife- vs human-related effects on water quality in the lake, and that while caribou can affect the water quality, Inuit generally kept drinking the water from the lakes in which caribou migrated.

AEMP Field Form

Date: Recorder:

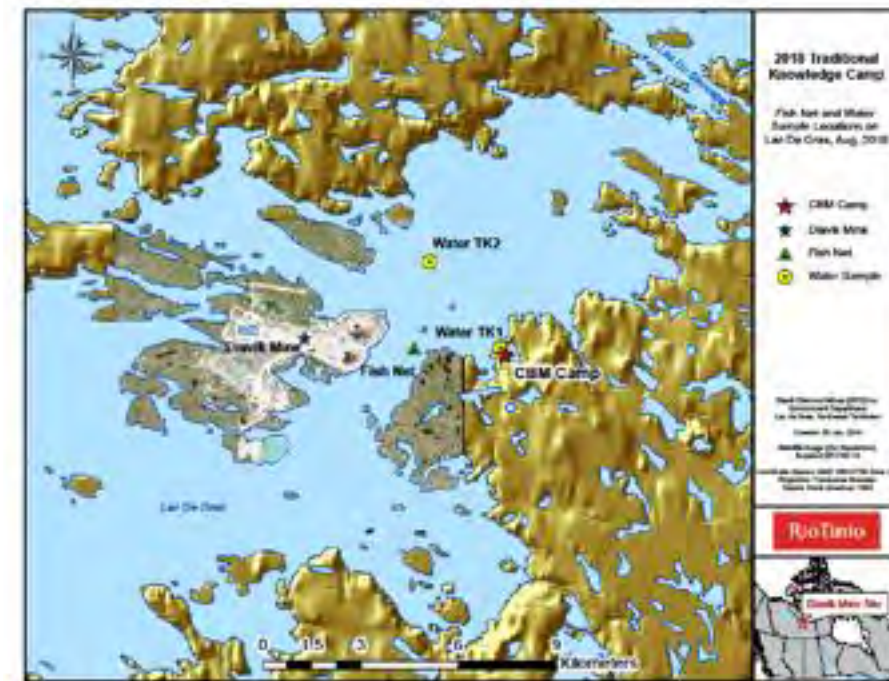
Location/Depth: Sample ID: Group/Person:

Collection Features: (Circle what best describes the feature)

Temperature:	Cold	Average	Warm
Depth:	Deep	Average	Shallow
Clarity:	See bottom	Murky	Cannot see your hand in water
Movement:	Still	Some	Running
Colour:	Blue	Green	Yellow
Other:			

Taste Test:

Tea:	Good	Average	Poor
Water:	Good	Average	Poor



Overall Description:

Why was this water testing location chosen?
How can you tell when water is healthy or unhealthy?

If water had words, what would it say about how it is doing? It is happy? Hurting? Why?
What can you teach us about water?

Traditional Knowledge Panel Summary

TK Panel #12 Summary

- ▶ The TK Panel put forth the following guidance points around monitoring:
 - ▶ We want to build on the existing AEMP and camp to expand TK testing and to build scientific testing methods and skills with young people.
 - ▶ Even after the TK Panel is satisfied that Diavik is released of responsibilities, the pits and mine site need to be monitored every year, indefinitely.

TK Panel #12 Summary Continued

- ▶ 12.7: The TK Panel would like Diavik to test water in the pits for at least two years (until the water is deemed good) and compare this to water in Lac de Gras. Water samples will be collected from multiple depths at various times throughout each year and tested according to the AEMP protocols. Taste tests will be done after scientific sampling tells us the water is drinkable, where they will watch for smell, clarity (turbidity), temperature, colouration, scum on the water or tea, and water and tea for taste.
- ▶ 12.8: When scientists and the TK Panel agree that the pit water is safe (i.e., drinkable) and stable (i.e., consistent), then breaching of the dikes can occur to allow water to flow back and forth but prevent fish from entering the pits, at least initially.



Indigenous Ways of Watching Water: Canadian Examples

Tr'ondëk Hwëch'in Water Quality Indicators¹

Table 1. Summary of indicators used by TH Elders to determine if traditional drinking water sources are safe for human consumption.

Indicator	Description
Sensorial Properties	
Color	Water should be clear with no color (e.g., tap water can be grayish or yellow).
Turbidity	The term "White Water" refers to clear water that you could see through. This means that water with limited turbidity is desirable.
Running Water	Water should be fast flowing and not stagnant.
Nothing Growing	No moss or plants should be growing on the rocks.
No animals in vicinity	There should be no animals around to contaminate the water. Ducks swimming in water can be a sign that it is not contaminated.
Makes Good Tea	Water should make red tea. Bad water makes black tea that leaves stains in your cup.
Odor	There should be no smell.
Taste	It should have a "fresh" taste.
	It should taste "good."
	It should not taste like chlorine.
Prior Knowledge and Use	
Prior Use	The water source has been used by many generations.
Knowledge of sources of contamination	There should be nothing above the water source in the watershed (e.g., no outhouses, septic fields, or resource extraction).
Water Quality Testing	Several Elders noted that they would like water quality sampling to be conducted at the water sources they use.

¹ <https://www.mdpi.com/2073-4441/11/3/624#:~:text=Water%20%7C%20Free%20Full%2DText%20%7C,Water%20Sources%20in%20Yukon%2C%20Canada>

Inuu'tuti: Baker Lake Aquatic Cumulative Effects Monitoring Program¹

Indicator Types	TK Measurement Indicators	Western Science Measurement Indicators	
Taste & smell (Organoleptics)	Taste of "land"	Organic carbon	Nutrient concentrations
		pH	Chlorophyll a
		Conductivity	
	Saltiness	Conductivity	Hardness
		Salinity	Alkalinity
		Chloride, sodium	
	Fishy smell	Specific algal community	Chlorophyll a
		Nutrient concentrations: nitrogen species, phosphorus	
		Salinity	Chloride, sodium
	Water is "refreshing"	pH	Temperature
		Copper, iron, manganese, sodium	Hardness
		Total suspended solids	Turbidity
		Total dissolved solids	Flow

¹ <https://www.afn.ca/wp-content/uploads/2019/03/10-Integrated-Water-Management-Hutchinson-Environmental-Sciences-Ltd.pdf>

Culturally relevant water quality criteria: Indigenous Guardians Toolkit¹

- ▶ Mikisew Cree First Nation Community Based Monitoring² and the Athabasca River Watershed (Fort McKay, Athabasca Chipewyan)
 - ▶ Indigenous indicators of water quality and climate change (weather conditions, flow, winter ice conditions, algae, foamy scum, dirty water, scum on tea pots and boats, smell, colour, proximity to development project/site, perceived contamination)³
 - ▶ Water quality index for each site (green, yellow, red)
 - ▶ Water quantity/level: Aboriginal Base Flow and Extreme Flow
 - ▶ Place names important

¹ <https://www.indigenousguardianstoolkit.ca/>

² <http://mikisewgir.com/cbm>

³ <https://www.ourcommons.ca/Content/Committee/421/ENVI/Brief/BR8622379/br-external/MikisewCreeFirstNation-e.pdf>

Why are we here today?

- ▶ We need “clear, measurable and culturally relevant criteria” for measuring water quality
- ▶ Consider:
 - ▶ What are the good properties you look for in other lakes you use?
 - ▶ What are the properties of water that make it suitable for cultural use?
 - ▶ What needs to happen to see if the spirit returns to the pit lake?
 - ▶ Do people expect to draw water from the pit lake for cultural use?
 - ▶ What properties in the pit lake could change your use of the big lake?



Next Steps

- ▶ Workshop summaries and notes returned to each community
- ▶ Summary report from all workshops ready for public water board hearing (November 2020)



Thank you!

Appendix C – Workshop Evaluation Summary

Workshop Evaluation 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?	0	0	2	1	0	3	
How would you rate the session for mutual respect among participants?	1	1	1	0	0	3	
How would you rate the recording and documenting of TK during the session?	0	0	2	1	0	3	
How would you rate the facilitation of the session?	0	1	0	2	0	3	
How would you rate the outcomes and findings of the session?	0	3	0	0	0	3	
How would you rate the technical quality of the session?	0	0	2	1	0	3	
How would you rate the logistics for the session?	1	0	1	1	0	3	
Overall, how would you rate the session?	0	0	2	1	0	3	

Question	Too long/much	Enough	Too few/little	Total Responses	Comments
How would you rate the opportunities for you to share your knowledge and experiences?	0	1	2	3	
How would you rate the amount of time to discuss the topic(s) during the session?	0	1	2	3	

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

Cheaper. Not much.

Keep in contact with Diavik.

How could the session be improved?

All meetings should be face to face for sessions like these, i.e. before water hearings.

Workshop Summary for Diavik Diamond Mines(2012) Inc. Water Quality Criteria for Cultural Use Workshop

Łutsel K'e Dene First Nation, Łutsel K'e, NT
September 24 & December 3, 2020



Natasha Thorpe, Joanne Barnaby,
Sarah Ravensbergen

For: Łutsel K'e Dene First Nation,
Łutsel K'e, NT

January 4, 2021

Photos: Natasha Thorpe, Colleen English

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Appendix A - Agenda and Informed Consent Form

Appendix B - Presentations

Executive Summary

On September 24 and December 3¹, 2020, members of the Łutsel K'e Dene First Nation (LKDFN) participated in a virtual workshop with Diavik Diamond Mines Inc. (DDMI/Diavik) staff and consultants to discuss recommendations from the 2019 twelfth session of the TK Panel, specifically those recommendations that refer to water quality. The [*Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite \(PK\) to Mine Workings*](#)² Measure 2 states that water quality objectives need clear, measurable and culturally relevant criteria; DDMI is requesting these workshops with PA and non-PA communities to discuss these criteria in relation to closure planning.

Many of the properties and cultural uses of water raised by LKDFN participants in the workshop are consistent with previous LKDFN input noted during previous TK Panel sessions as well as Aquatic Effects Monitoring Program activities (starting in 2002). Participants agreed that some properties of water that make it suitable for cultural use include a clear, natural, and healthy look, smell, and taste, with no oil, foam, scum, algae, or particles like pollen or dust. Participants noted that whether water is suitable for use also depends on seasonality and weather conditions (e.g. windy or warm weather conditions can blow dust into the water), and healthy fish are an important sign of healthy water.

Workshop participants discussed the importance of water for drinking, harvesting, travel and cabins, and spirituality, and expressed a desire for water to return to as natural a state as possible following mine closure. Several other topics or concerns were raised by LKDFN participants during the workshop. These include the need to ensure that Diavik proceeds with caution (especially given the Covid-19 context), the desire of LKDFN to conduct their own monitoring activities and ensure youth are involved throughout the process, the want to ensure that water is sampled from specific areas of concern, and the importance of considering climate change impacts on monitoring activities and cultural uses of water.

The information gathered in this workshop will be shared with LKDFN through meeting notes, and this summary document. The findings will also be combined with information

¹ The format of the workshop on December 3, 2020 ('Day 2') differed from that of September 24 ('Day 1') owing to challenges associated with COVID, limited bandwidth and internet speed, as well as the nature of remote engagement. After the first day of the workshop held by video conference, members of the LKDFN Wildlife Committee advised the LKDFN Lands and Resources Department that they preferred that the second day proceed with fewer LKDFN participants by phone conference and affirmed that the Wildlife Committee members speak with authority on behalf of the LKDFN.

²[*Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite \(PK\) to Mine Workings*](#)

gathered from workshops with other PA and non-PA communities into a summary report for DDMI. Next, DDMI plans to use the combined workshops' outcomes to develop draft cultural use water quality criteria to submit to regulators.

List of Participants

Ernest Boucher (Elder/Knowledge Holder) - Day 1 only
August Enzoe (Elder/Knowledge Holder)
Charlie Catholique (EMAB Member) - Day 1 only
Glen Guthrie (LKDFN Staff)
Beth Keats (LKDFN Consultant) - Day 1 only

Myra Berrub (DDMI Staff)
Sean Sinclair (DDMI Staff) - Day 1 only
Amanda Annand (DDMI Staff) - Day 1 only

Joanne Barnaby (Consultant) - Day 1 only
Natasha Thorpe (Consultant)
Sarah Ravensbergen (Consultant) - Day 1 only

Background and Scope of Work

Diavik Diamond Mines (2012) Inc. (DDMI, or Diavik) supported virtual workshops (Water Quality Criteria Workshops) with both Participation Agreement (IBA) and non-PA communities. The intent of these workshops was to share recommendations from the 2019 twelfth session of the TK Panel, specifically those recommendations referring to water quality criteria that include cultural use. The *[Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite to Mine Workings](#)* Measure 2 states that water quality objectives need clear, measurable and culturally relevant criteria. Diavik has expanded on what was shared during the TK Panel Session 12 and prepared proposed criteria for community review. The intent of the workshops was to provide an opportunity for feedback on the proposed criteria and further develop these criteria to include the recommendations of the broader potentially impacted Indigenous communities. DDMI plans to use the combined workshops' outcomes to develop draft cultural use water quality criteria to submit to regulators.

During the workshop, Diavik presented the proposed plans for storing processed kimberlite (PK) underground in pits rather than in the current containment area (i.e. processed kimberlite containment, or PKC). As noted in recommendation 12.8 put forth by the TK Panel during the twelfth session, TK Panel members recommend that only when scientists and the TK Panel agree that the pit water is safe (i.e., drinkable) and stable (i.e., consistent), then breaching of the dikes can occur to allow water to flow back and forth but prevent fish from entering the pits, at least initially.

As well as providing LKDFN participants the opportunity to give feedback on proposed closure details, the workshop focused on a discussion of healthy water according to Indigenous Knowledge. Natasha Thorpe and Joanne Barnaby presented an overview of the many contributions from LKDFN members in developing ways to measure healthy water (e.g. through the DDMI TK Panel and Aquatic Effects Monitoring Program), and shared examples from other Indigenous communities across Canada that are measuring water quality according to their ways of knowing.

A discussion was facilitated based on the following questions:

- What are the good properties you look for in other lakes you use?
- What are the properties of water that make it suitable for cultural use?
- What needs to happen to see if the spirit returns to the pit lake?
- Do people expect to draw water from the pit lake for cultural use?
- What properties in the pit lake could change your use of the big lake?

The workshop agenda and informed consent form are included (Appendix A). Copies of workshop presentations (Appendix B) and workshop evaluation summaries (Appendix C) are appended. Workshop notes have not been appended due to length concerns, but were provided directly to LKDFN via email along with a draft version of this report for comment.

Summary of Key Findings

Properties of water that make it suitable for cultural use

Many of the properties and cultural uses of water raised in the workshop are consistent with previous LKDFN input during the TK Panel sessions and AEMP activities over the last decade. Participants stated that water should be clear and natural, with no oil, foam, scum, algae, or particles like pollen or dust (Table 1). Water should have a healthy look, smell, and taste, and while boiling it and making tea (to see if there is anything floating in the water) is a good way to determine if it is suitable for drinking or other uses, it should not necessarily have to be boiled to be used. An important sign of healthy water to participants is healthy fish.

Participants noted that whether water is suitable for use also depends on seasonality and weather conditions, especially close to the mine site. For example, windy or warm weather conditions can blow particles into the water, stir up particles from the lake bottom, or create phytoplankton blooms that make the water unsuitable for use:

...the water is boiling around the mine there. The way I look at it, so high, windy, with the wash on the bottom, shallow water, it goes northwest wind, north wind, the wind changes so fast, I know I should go to-not with mines, you know. ...all this water tasting around the mine, some places are really deep, some from the bottom. ...because it's just like boiling water when it's blowing. What goes up and goes down again when it's calm. [Ernest]

...you ever thought about seasonal, spring, fall, winter, you know, summer. Change in weather. ... Yeah, plankton, lots, could be lots of things connected to the water. [Charlie]

Table 1. Properties of water that make it suitable for cultural use.

Property	Quote	Sources
Clear (natural, no oil, foam, scum, not too much algae, nothing floating or disturbed in the water i.e. pollen, dust)	<p><i>...if the water is no good, you can tell. It's kind of oily like. [Ernest]</i></p> <p><i>You ever passed a long, calm week, just calm, the water settles, not moving. You can see on top the difference from the clear, down the bottom. See everything. It comes up to the top, whatever, you can tell. Something that is floating around, you can tell the water, if something wrong with it, when you do that. Floating around, even the fish, if too calm, everything comes up to the surface. [Charlie]</i></p> <p><i>You can tell, like some tastes just like a foamy- ...And you can tell, in that area sometimes I won't drink it. [Charlie]</i></p> <p><i>[Interviewer: You look for a scum or a film on the top of the water, and you stir it before you would drink it?] Yes. That's the way we do it, yeah. But for now, Łutsel K'e is just different ... The colour of the water is really fresh, no dust, nothing in there. [August]</i></p>	Raised in LKDFN AEMP Planning Meetings: May 8 9, 2012; June 5 6, 2012
Healthy look and taste (especially for tea making), no smell	<p><i>...to have a healthy water, you want to have clean, healthy water [to] drink your tea. Elders always taking water from the river, because in the community, the water, they put something in there, chlorine. You make tea, it tastes a little bit different. Something like that, in Lac de Gras. You can tell if it's no good. [Charlie]</i></p> <p><i>Like when I go in the bush, anyplace I go, everything must look healthy for me. [August]</i></p>	Raised in LKDFN AEMP Planning Meetings: May 8 9, 2012; June 5 6, 2012
Healthy fish; ducks and fish using the water	<p><i>They [animals, fish] hang around there [Lac de Gras] too, around the lake, they depend on the water. ...everything has to be safe where they hang around. [Charlie]</i></p> <p><i>[Interviewer: ...what makes it a good lake?] Healthy water, healthy fish... [Glen]</i></p>	Raised in LKDFN AEMP Planning Meetings: May 8 9, 2012; June 5 6, 2012
Can drink unaltered; don't have to boil it	<i>With all the changes in the water, communities, you have to boil your water, that kind of things, we don't want to happen here. We don't want to have to boil the water here. We're living in a clean environment here, for many, many years. [Charlie]</i>	Raised in LKDFN AEMP Planning Meetings: May 8 9, 2012; June 5 6, 2012

Cultural uses of water

Participants discussed the importance of water for drinking, harvesting, travel and cabins, as well as spirituality. The importance of clean water for drinking, either for tea or other uses, was frequently talked about:

Like down here, we're drinking the water out off the shore. [August]

...what we usually do, we boil the water, something, you look at the water, before you put something in there. Let it settle for awhile, if the water is no good, you can tell. [Ernest]

...you want to have clean, healthy water drink your tea. Elders always taking water from the river, because in the community, the water, they put something in there, chlorine. [Charlie]

The importance of harvesting fish from clean water was considered:

The same thing at Stark Lake, we try the big fishes there and then the small ones... And some kind of fish are a little tough on the inside, and the meat, I don't bother to eat that kind, I just throw them away. [August]

It's a frozen-the river's frozen just around there, Łutsel K'e. And they were treating the water there. And I asked questions about that, I said should I worry about the water, just a little bit, not too much. But still they told me not to eat big fishes, small fishes still okay today 'til today, that's they told me last year. [August]

One participant talked about the importance of water for traveling, cabins and camping on the land, especially his cabin at Snowdrift River:

...I got a cabin up at about five kilometers from here, it's a river called Snowdrift River, that's flowing from the east... What I'm saying, the water is always good there... Snowdrift River. They used to call it... then they changed it to Łutsel K'e. [August]

Respecting and thanking the water, especially when traveling, was further highlighted:

[Interviewer: Are there other ways that you need healthy water to practice your culture?] Well, we do take tobacco to the water when we travel around. Just a little bit. ... Yeah, pay it, yeah. Give the water tobacco. [Interviewer: Is that more for safe travel, or just to respect the water, or thank the water?] To thank the water, when you travel down on the big one, you watch for that. So, we don't have that kind of wind around there, so that's why we still pay the water when we take off, ask for help, ask the Creator for help. [August]

While healthy water throughout the territory is essential to supporting the LKDFN way of life, one participant discussed how the use of the Lac de Gras area has changed:

It's a long way [to the Lac de Gras area], I know, a long way by skidoo. ... You got to know where to go, you got to watch where you're going. So we don't go that far. Far as we go is right around the east arm, McLeod Bay... we do a lot of travelling on the east arm of the big lake [Nonacho Lake]. [August]

While not discussed in detail, one participant felt that they would not be likely to drink or use the water from the pit lakes in great amounts. When asked about whether people would drink water from the pit lakes, participants laughed: although they would drink water if testing concluded the water was safe, why would people *choose* to drink water from the pit lakes given the abundance of surrounding lakes farther from the mine site?

*[Interviewer: So if they took samples and they tested them in the laboratories, and the Elders also tested it, say at the on the land camp, do you think people would want to drink water or take water from the pit lake, if the results were that the water was safe or healthy?] If I know it's really healthy... I could drink out of it there, if it's really clear, and as long as it's safe, then I would drink maybe one small amount sip. [laughter]
[August]*

Returning the spirit to the pit lake

Participants discussed the impacts of mining operations in the area, and the desire for the water to return to as natural a state as possible:

Everything you do affects the land and water... [August]

It was good before, before the mine. Before the mine, the land, the water, animals were all healthy. But now, how many years now, you been disturbing that area, many years now. [Charlie]

Not even the lake we're looking at, right inside that mine, springtime, dust, it all goes down into the lake. Streams we have, groundwater, everything. But once you disturb the area with the mine going on, it's not going to be the same again. Never. [Charlie]

One participant noted that respecting the water and traditional teachings is an important part of the spirit returning to the pit lakes:

[Interviewer: If you think about the pit lake, what would need to happen to make sure that the spirit remains or returns in the pit lake?] I do a lot of travelling around the

lake, somewhere in the middle, always respect, even in the wintertime this time of year, you go on the ice, you take a little branch and turn it in the water... Same thing in the water during summer. I [tell people?] way back. ...you need to tell them stories, watch your land if you [go] somewhere. Respect the land. That's what we need to tell them. Hopefully they remember this, those words... My mother-in-law taught us like that. ...That's how it is right now, so you got to teach them really good, for when they're lost in the bush. So now we're when we're learning, these young kids, you got to [help them?], any kids down there, and monitor [those kids, boys?] sitting in the bush, tell them a story, how we used to live way back, the old timers, we tell them all kinds of stories about that. [August]

Other

Several other topics or concerns were raised by LKDFN participants during the workshop. These include the need to ensure that Diavik proceeds with caution (especially given the Covid-19 context), the desire of LKDFN to conduct their own monitoring activities and ensure youth are involved throughout the process, the want to ensure that water is sampled from specific areas of concern, and the importance of considering climate change impacts on monitoring activities and cultural uses of water.

Participants discussed the need to ensure that Diavik proceeds with caution and 'does it right', especially in the context of Covid-19, which adds additional technical and logistical challenges. In particular, participants were concerned that the quality of virtual meetings and poor internet in the community compared to the benefits of in-person sessions may affect the closure process and/or workshop results:

It's quite different than face to face meetings. We're going to do our best I guess, I know Diavik is focusing on closure plans now, so make sure we do it right, you know. This is a bit difficult to have a workshop or meeting like that, technology, computers, stuff like that. It's not the same, so make sure you do it right. With the Elders, even right now there's Elders, technology is a bit difficult and we don't have a translator here for the Elders. Make sure we do it right because the closure plan is really important to the community... [Charlie]

We have to prepare for all the things after closure. ...even if the mine's closed, you still have to be involved, no matter what. Because whatever the community says to the company, the company has to do their homework. Be sure everybody's involved. [Charlie]

Participants expressed the desire to conduct their own monitoring activities and ensure youth are involved in monitoring and watching the water and the fish at every stage of the process:

[It's important to monitor] Not only for me, but for in the future, for young generations, we don't know what's going to happen. When you go out, you got to take the youth. [Ernest]

As for Roger [Łutsel K'e youth], you guys know I always take him along, I always take a youth when I go to a mine like Diavik. I take Roger with me, he's doing a lot before the mine closes, he's been doing that. [August]

The reason they are talking about youth is to help the youth, for the future. ...I go to meeting or workshop, I always take a kid with me, youth, for their future, I'm doing that for them. I hope that every sector should do that... Take the youth with an adult, adult goes with the youth. That would be good for the future. [August]

We need more money ...[to] train young people, young people can go out, do sampling, all that. [Charlie]

We need young people, we really have to work with them out on the land. We'd like to see more youth be involved, with the Elders. If there's any changes to the land, the water, around the mine. That's why they're saying it's very important to get young people involved. Because there's not too many Elders now. [Charlie]

Got to put everything a diary, you check all the [fish] stomachs, see if anything's different... [August]

For me the water, I look at the water all time. [August]

The desire to ensure that water is sampled from specific areas of concern was also raised. For example, participants were concerned about water quality (especially related to potential effects of dust) close to the mine and the islands around the mine, near the waste rock piles, and in the pit lakes. The need to include TK-based water sampling observations in these areas was discussed:

The mine site, I was there one summer with you guys, and we told those people we should take a sample around the mine. ...you could see something on top of the water. ...last time I was at the Diavik mine there, the fish camp, I know the dust blows on the lake, because I see it on the cup when I still taking water and drink it. That's reason we do it anyway there. And they were saying the dust doesn't go too far. And I told them, you guys are wrong. Even I go up the hill, over that fish camp, I could see ducks all over the land, I could touch it, just like a flour, sticky. And they were telling me it doesn't go that far... But down there is different. So far we drink water out of the cup yet, from the lake. [August]

...I mentioned about taking a sample around the island around the mine every year, so we know the water is the same or different. That's what I said last year. [August]

...I used to monitor those caribou in April, that dust blows up north when southwest wind, just brown. I would say, hard to where I could see. Hauling all that, blows 3-4 hours a day they're working. Really something to look into that too, not only around the mine. It goes quite a ways. [Ernest]

...three or four years ago I went to the fish camp. When the wind starts running from the north, you can't see the mine, the air, I was there that year it rained, lot of ducks around that cabin, next morning, full of ducks. Couldn't see nothing across that mine, solid, black, dark. [August]

Well, the last time we were out drinking at Diavik there, we did talk about that, the two pits. We said there was room for monitoring in there... after a year later, we could take samples out of it, testing how it is. [August]

[Interviewer: And once they breach those dikes, what about the big lake, Lac de Gras, once the water was flowing freely between the pit lake and Lac de Gras, would you still want to use the big lake?] The last meeting we had there, we mentioned that even if everything is closed, you guys, and the government should-we did say already to take samples out of the lake every-they told us about three years, I said, that's too long, they should do it every summer, that's what we said that time. And the mouth of the river, going down to the mine site, even from there, you could-I talk to people at Coppermine River, and they were saying so far the water's still good to drink out of the river, that's what I was told. [Interviewer: So there has to be regular testing of the water?] Yeah. That's what we want. [August]

Participants further raised concerns about runoff events and cumulative effects from mining impacting water quality and cultural uses of water in specific areas such as McLeod Bay, and the desire to conduct monitoring activities there:

In McLeod Bay, there's still good water but we don't know in the future. There are so many rivers that come in from the north shore to McLeod Bay and all these mines are north. ... Why don't they try to test the water in McLeod Bay? Every river runs into McLeod Bay, from north. ...in the future, I don't know about McLeod Bay, that's what I'm worried about. [Ernest]

...it's [Lac de Gras] a big lake. No islands, McLeod Bay. From Artillery Lake to Hope Bay Mine, towards the north shore, all the way to Hope Mine ...there's lots of rivers, over 10 or 15 I think, small rivers, some a bit bigger. They should sample every river, right now to McLeod Bay, even fish. ... The time of year when water starts flowing again, around

July. June, July. Been a long time. Same with the Diavik mine, with the river, Coppermine River, goes down to Kugluktuk there, the community there. They should get samples there every year, flowing down to the community. [August]

The need to consider the impacts of climate change on the cultural uses of water, and when developing monitoring planning and activities, was also raised. Participants were concerned about the effects of warmer weather patterns on water quality (e.g. more and larger phytoplankton blooms could decrease the quality of drinking water) as well as the uncertainty of climate change effects on LKDFN members, fish and wildlife (e.g. the possibility of increased rates of bioaccumulation in fish):

Not going to be the same like before. All the tailings ponds, what's going to happen to that too? We'll never know, climate change, the weather is changing, even the fish. They say they're going to monitor over the years, how long will you monitor after that, who knows what's going to happen? It's a big concern for the communities, not only here, but all over. When the first mine opened, all these people coming in to have meetings, they want to open up the mine. Now it's getting close to shut it down, and now we have to monitor, now we're tackling that issue now. To keep it still safe to drink, fish, not only us, animals too. They hang around there too, around the lake, they depend on the water. Tailings ponds, everything has to be safe where they hang around. [Charlie]

Participant Questions

The following is a list of questions asked of Diavik by workshop participants. Responses are further detailed in workshop notes.

1. ...right now you're talking about putting this all this down in the ground, and I assume that PK has some kind of chemical alteration to it, compared to being where it was in the '50's, so are we talking about that, the possibly of contaminating the water table or even Lac de Gras? I can see stuff here about monitoring down the road, but what about mitigations, are we talking about any of that?
 - a. Yes, we can, that's part of the requirements, the chemistry has to be safe and can't harm the lake. Part of the requirement is that it has to be safe from a scientific angle and then from a cultural use perspective as well. There are chemistry requirements and we have to do a bunch of modeling to predict that it will all be safe for chemistry and won't harm fish and lake overall.
2. The last meeting we had about the diamonds, around three years ago, you guys, you doing sampling around that big pile of boulders, we did ask you guys to sample every year? [referring to water sampling activities at the waste rock piles]
 - a. We've been re-sloping the waste rock piles for about two and a half years now. They were pretty boulder-y before when you saw them last, but we are

- pushing them into a gradual slope you can walk on so it's like a flat surface. And we're putting a cover on them made of till and rock.
- b. Yes, we also do water sampling around the waste rock piles, regularly, every week to every month. Not in the winter because it's frozen but throughout the summer we sample it. Things are stable, the same sort of chemistry we've been seeing for the last 15 years.
3. You said kimberlite will be put back in the pit, is that the first time they ever do that, in other places, like ever done before?
- a. Ekati, the mine just to the north of us, Ekati, they've already filled up one of their pits with PK, about 20m below the water at the top, and they're putting it in a second one, and Gahcho Kué is also doing the same, filling one of their pits with PK as well. It's not new, we're actually the only ones not doing it. But the reason it's different is because Lac de Gras is so close. At Ekati, they're surround by land and smaller lakes, same with Gahcho Kué, there's just smaller lakes... that's the only real main difference, we're very close to Lac de Gras, but everyone else is doing this. In the north. [So, you said, it's going to take about three years you think, three years time?] Yeah, right now the end of operations is the end of 2025, we're trying to figure out the closure plan, but it will probably take about four years to do most of the heavy lifting. We're doing a lot of the work now. The north country rock cover, we're doing that now, planning to do other work earlier rather than save it to the end. That will go to 2029, and we plan to monitor until 2050 depending on how the data looks, what the observations are, if things are getting better or not.
4. So, this your first workshop?
- a. Yeah, we're holding these workshops with all of our PA communities and also others that participated in the environmental assessment process.
- b. ...this is the second one we've done, earlier this week we did one with the Métis out of Yellowknife, so this is the second one.
5. ...we used to have a fish facility, fish tasting before. Is that still ongoing? Is that still going at the mine site?
- a. Yeah. The last time was 2018 and it's coming up in 2021, next summer.
6. Maybe some of the concern is the different chemistry of the PK processing, compared to the original rock, that it's more acidic, that it might be leaching into water and contaminate the lake, that's a concern?
- a. We've been trying to improve our understanding of that the last few years. We're going through a third round of modelling, we've done a lot of experiments, sampling the water in the PK when you squish it or let it settle, all of that is going into these models to predict the water chemistry in the lake. The PK is not acidic, you don't get that, but there are some metals

associated with it. One of the requirements of this is that the water in the pit lake and Lac de Gras needs to be below the aquatic effects benchmark in the top 40m where people and wildlife use the lake. That's a separate measure from this, that the water needs to be safe for fish and wildlife and water. Rest assured that that is also a requirement already, in addition to what we're working on here.

7. All that water [being sampled in Lac de Gras, it is], good to drink?
 - a. So far, it's all clean, all below those benchmarks that tell you its safe to drink from a scientific perspective, and for fish.
8. At the end of the workshop, where your information goes to?
 - a. ... We're talking an audio recording, video recording which we can provide back to you. Sarah is trying to get all these important words down, and then together with Joanne, myself and Sarah we will try to put together a summary. We'll share this with Diavik, and they will pull the summaries from all those communities we talk to and try to weave together a story about what they heard from all groups. A lot of the things we heard today are similar to what we heard earlier with NSMA. So, all those things come together and hopefully will be adopted, heard, by Diavik as they move forward with their sampling programs and all that. Before I hand over the mic, you will receive a copy, draft notes for you that Sarah's taking, so you can have copies of those, we'll also provide back the workshop summary. A bit different than the TK panel where we read aloud every word. We're not able to do that with this process, but you will have the draft notes and if there's anything we didn't get right, we want to know.

Conclusions and Next Steps

Diavik aims to complete workshops with eight Participation Agreement (IBA) and non-PA communities, with the combined outcomes used to develop draft cultural use water quality criteria to submit to regulators. Copies of detailed workshop notes, and this workshop summary document were provided to participating communities for each workshop.

Appendix A – Agenda and Informed Consent Form

Agenda

Diavik Diamond Mines Inc. Water Quality Workshop

Lutsel K'e Dene First Nation
Lutsel K'e, NT
September 24 & December 3,
2020

Participants

August Enzoe (Elder/Knowledge Holder)
Teri Enzoe (Elder/Knowledge Holder)
Albert Boucher (Elder/Knowledge Holder)
Charlie Catholique (EMAB Member)
Glen Guthrie (LKDFN Staff)
Beth Keats (LKDFN consultant)

Myra Berrub (DDMI)
Sean Sinclair (DDMI)
Joanne Barnaby (Consultant, Facilitator)
Natasha Thorpe (Consultant, Facilitator)
Sarah Ravensbergen (Notetaker)

Day One: September 24, 2020

1:30-1:45	Online Workshop Microphone Testing and Overall "How-To" (Myra) <i>Please log into the workshop at 12:45 so that we can make sure everybody is connected and has reviewed the informed consent form.</i>
1:45-2:30	Opening Prayer (LKDFN) Opening Circle (Everybody) Workshop Welcome, Overview and (Facilitators) Why are we here? (Diavik) <ul style="list-style-type: none">Background around the need to develop "clear, measurable, and culturally relevant" criteria for water quality at closure

- | | |
|-----------|---|
| 2:30-4:30 | <p>What is Healthy Water according to Indigenous Knowledge? (Facilitators)</p> <ul style="list-style-type: none"> • Overview of how the DDMI TK Panel and Aquatic Effects Monitoring Program have been developing ways to measure healthy water (i.e. water quality) • Overview of how other Indigenous communities across Canada are measuring water quality according to their ways of knowing |
|-----------|---|

Discussion Questions

- What are the good properties you look for in other lakes you use?
- What are the properties of water that make it suitable for cultural use?
- What needs to happen to see if the spirit returns to the pit lake?

Day Two: December 3, 2020

- | | |
|-----------|--|
| 1:30-1:45 | Online Workshop Microphone Testing and Overall “How-To” (Myra) <i>Please log into the workshop at 12:45 so that we can make sure everybody is connected.</i> |
| 1:45-2:15 | Welcome and Comment Circle |
| 2:15-4:15 | <p>Refresher on Closure Plans for Pit Lake (Diavik)</p> <p>Exploring Water Quality Criteria for the Pit Lakes</p> <ul style="list-style-type: none"> • Do people expect to draw water from the pit lake for cultural use? • What properties in the pit lake could change your use of the big lake? |
| 4:15-4:30 | <p>Closing Circle</p> <p>Closing Prayer</p> |

Łutsel K'e Dene First Nation

Diavik Diamond Mines Inc.

**Water Quality Workshop
September 24 & December 3, 2020
Łutsel K'e, NT**

Informed Consent Form

I, _____ on September ____, 2020 give permission for Diavik Diamond Mines (2012) Inc. and its Contractors (i.e., Thorpe Consulting Services and Joanne Barnaby Consulting), to take notes, photographs and / or audio and video recordings related to my participation in meetings, workshops and events related to the Water Quality Workshop conducted on behalf of Diavik Diamond Mines Inc. (DDMI).

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;
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 Indigenous Organization, DDMI and / or its contractors may use the information collected to contribute to caring for water in the NWT and NU;
5. DDMI, Natasha Thorpe and Joanne Barnaby may share my information in either reports, presentations, and/or photographs provided it is within the context of this workshop scope and that they provide such information to my Indigenous organization;
6. I agree that my contributions may also be used for future educational, cultural, heritage, and environmental purposes that are outside the scope of this workshop and that my representative Indigenous organization, 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 my Indigenous organization policy and the DDML and LKDFN Engagement Protocol for the Processed Kimberlite to Mine Workings Project;
8. I am free to request that any information I share is removed, erased or deleted from draft materials and that final copies will be provided to me;
9. My information will be summarized and included in a report which will be publicly available; and
10. I understand that DDML, Joanne Barnaby and Natasha Thorpe cannot ensure the protection of my information (e.g. Traditional Knowledge) from public release once the reports are released (e.g., via youtube.com, Facebook, other social media, or Indigenous group websites),

Signed on September ____, 2020 in _____, Northwest Territories.

Signatures:

Participant

Indigenous Organization

Contractor

Witness

Translated by: _____

Appendix B – Presentations



RioTinto

Water Quality Criteria –

Culturally important indicators for water quality monitoring

Łutsel K'e Dene First Nation

September 24 and December 3, 2020

Context: Why are we here?

Processed Kimberlite to Mine Workings Project

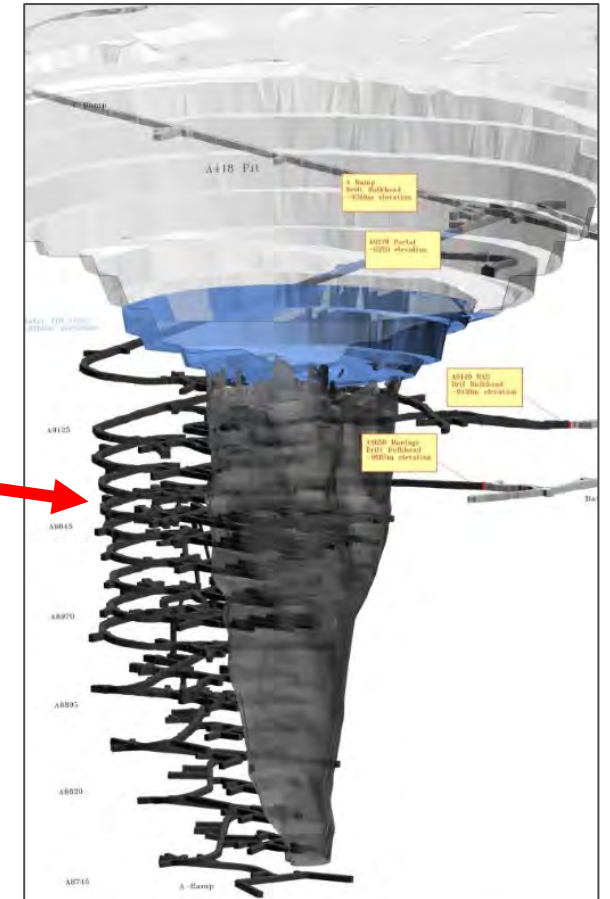
- ✓ to develop “clear, measurable, and culturally relevant” criteria for pit water quality at closure
 - January 2018 – Now: Water Licence Amendment and Environmental Assessment
 - Future – Measures to protect cultural use of the lake: TK, engagement, monitoring, reporting

Approved Processed Kimberlite Storage Options

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



- ## 2. Processed kimberlite could be stored within the Mine Workings

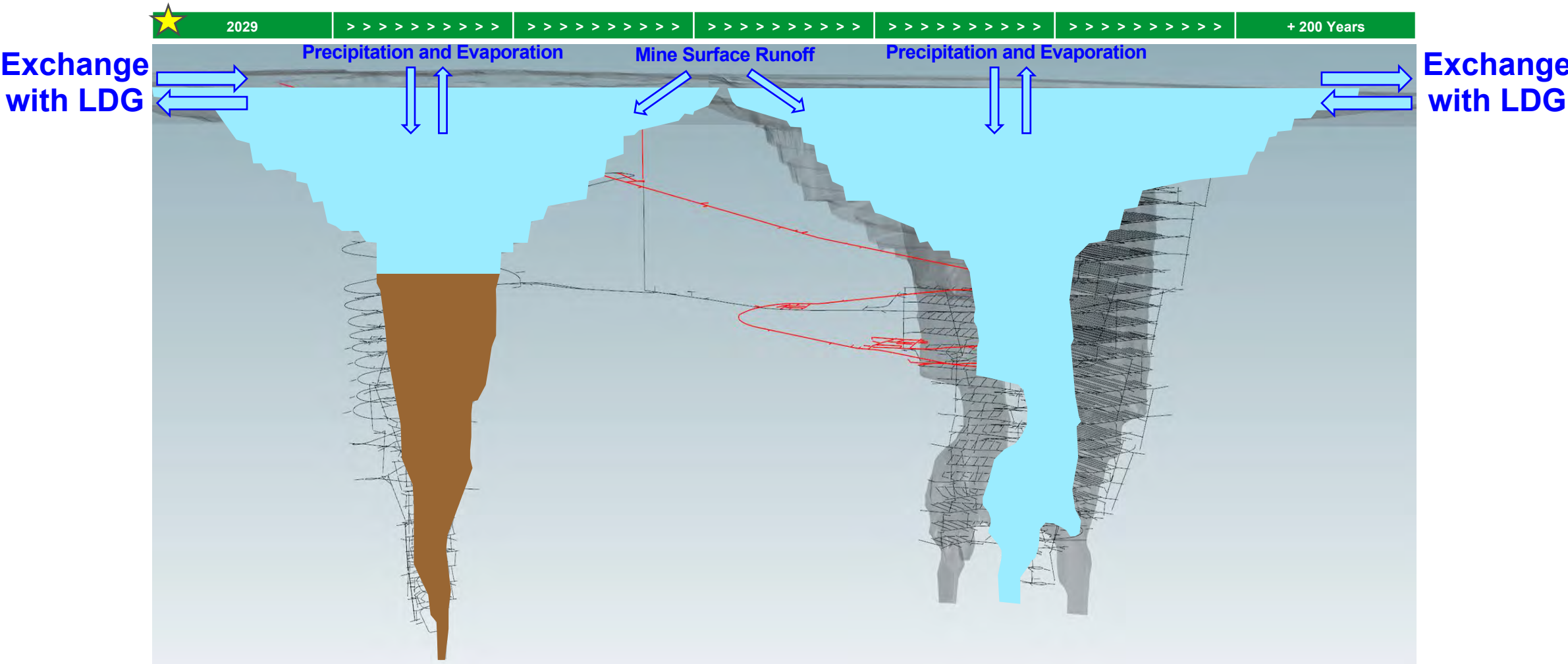


August 2022 to March 2023



PKMW PROJECT TIMELINE

Next 200 Years
PK consolidates
Releases PK porewater
Surface exchange with LDG



FLOODED MINE WORKINGS POST-CLOSURE



PKMW Measure 2:

Water quality objectives need clear, measurable and culturally relevant criteria

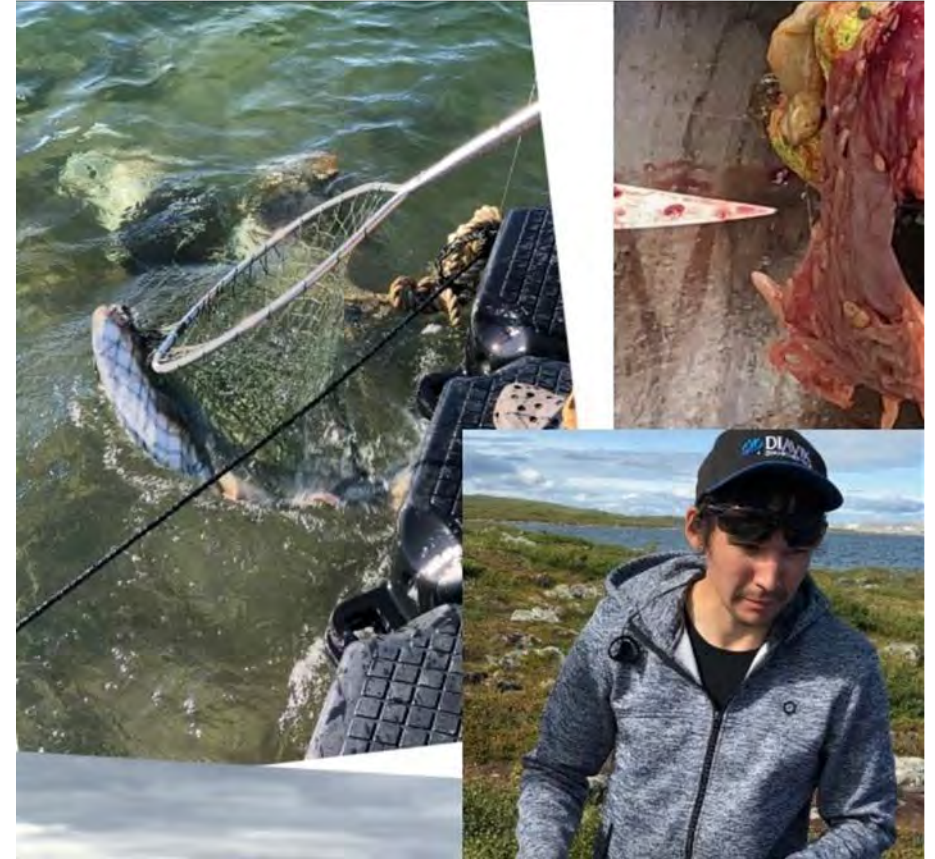
Diavik has met with all PA groups to share the water quality criteria recommendations from TK Panel session 12 and presented the same draft Cultural Criteria.

After positive initial feedback we have advanced the Criteria and would like to discuss these in more detail

- Does NSMA have recommendations for different / modified criteria?

TK Panel #12 Summary Continued

- ▶ 12.7: The TK Panel would like Diavik to test water in the pits for at least two years (until the water is deemed good) and compare this to water in Lac de Gras. Water samples will be collected from multiple depths at various times throughout each year and tested according to the AEMP protocols. Taste tests will be done after scientific sampling tells us the water is drinkable, where they will watch for smell, clarity (turbidity), temperature, colouration, scum on the water or tea, and water and tea for taste.
- ▶ 12.8: When scientists and the TK Panel agree that the pit water is safe (i.e., drinkable) and stable (i.e., consistent), then breaching of the dikes can occur to allow water to flow back and forth but prevent fish from entering the pits, at least initially.



Water Quality Cultural Use Proposed Closure Criteria

Criteria: “Traditional Knowledge Panel verification that water is substantially unaltered and healthy for people, wildlife and aquatic life”

Measurement: Summer site inspection and signoff by TK Panel based on:

1. Review of scientific water quality
2. Review of acute and chronic toxicity testing
3. Traditional water quality sampling

Based on two stage review the Panel will confirm if pit water is safe to be reconnected with LDG



Water Quality Cultural Use Proposed Closure Criteria

2022	2023	2024	2025	2026	2027	2028	2029	2030
	Fill pits with PK				Fill pits with water from Lac de Gras			
					★ Session 1:			
			TKP#12 rec.12.7	TKP: Observe filling of pit and validate sampling locations for scientific and TK testing				
	Measurement criteria 1:				Scientific water quality analysis (chemical water analysis)			
							★ Session 2:	TKP#12 rec.12.8
	Measurement criteria 2:						Toxicity testing (lab fish test)	
	Measurement criteria 3:				TKP: TK observations: • clarity; temperature; colour; presence of scum or unnatural material around the pit lake area		TKP: TK observations: • ...+smell and taste	
							★ Breach dikes	

Criteria Measurement 1 & 2 – Water Quality and Toxicity

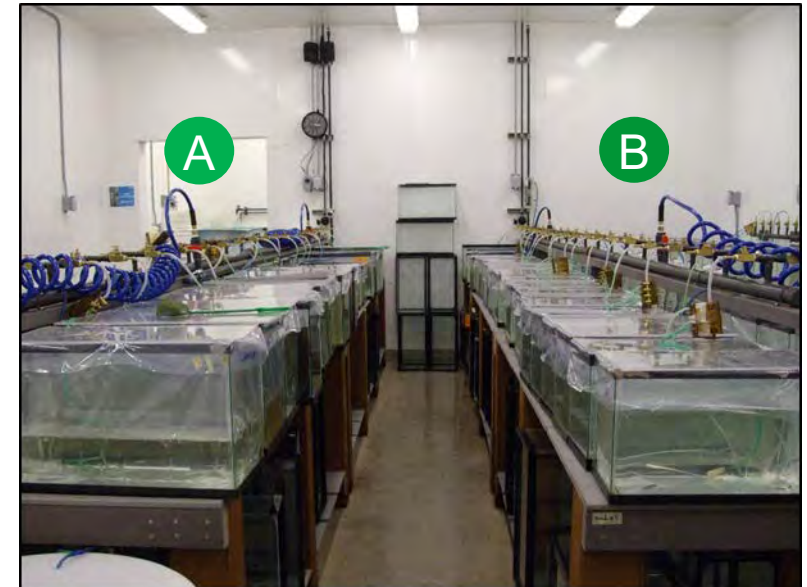
Session 1 (2026): Select sample locations in flooded pit with PK and in Lac de Gras.

--- Sampling (2026 – 2028) ----

Session 2 (2028): Review and compare the results of water quality and fish health before reconnecting to Lac De Gras

TKP#12
rec.12.7

TKP#12
rec.12.8



Criteria Measurement 3 – Traditional Water Quality

TKP#12 rec.12.7

Session 1 (2026): After pit is flooded with water

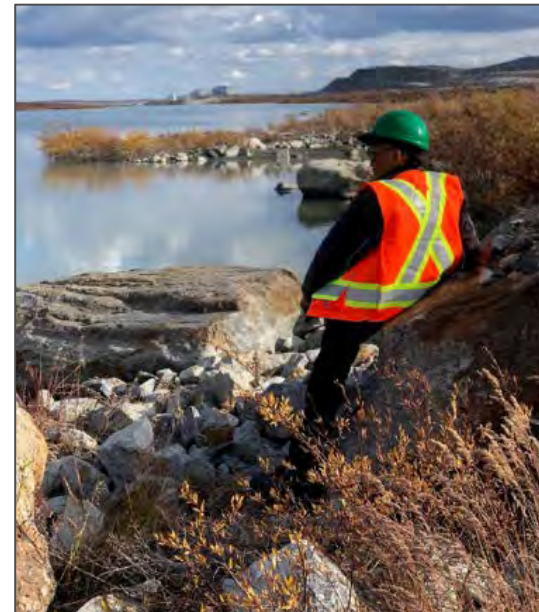
- Observe water in pit and Lac de Gras
- Select monitoring locations
- Inspect clarity, temperature, colour and presence of scum or unnatural material around the pit lake area compared to Lac de Gras



TKP#12 rec.12.8

Session 2 (2028): After water has settled

- Observe water in pit and Lac de Gras
- Inspect clarity, temperature, colour and presence of scum or unnatural material, smell and taste around the pit lake area compared to Lac de Gras
- Confirm if pit meets criteria to connect with Lac de Gras





Presented to Łutsel K'e Dene First Nation
Diavik Diamond Mines (2012) Inc.

Water Quality Workshop

September 24 & December 3, 2020

Facilitators: Joanne Barnaby, Natasha Thorpe

Water Quality Criteria

Culturally important indicators for water quality monitoring

What has been done so far?

- ▶ Community Aquatic Effects Monitoring Program (AEMP) overview (2003, 2007, 2009, 2012, 2015, 2018)
- ▶ TK Panel Sessions (e.g. TK Panel 12)

Regulators state that: “water quality objectives need clear, measurable and culturally relevant criteria.”¹

Water Quality Criteria Workshops



¹ Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite to Mine Workings

Aquatic Effects Monitoring Program (AEMP): Contributions from LKDFN

AEMP Development

- ▶ LKDFN AEMP Planning Meetings: May 8-9, 2012; June 5-6, 2012
- ▶ Madelaine Catholique, Madelaine Drybones, George Marlowe, Mary-Rose Enzoe, Angie Lantz, Alfred Lockhart, Ernest Enzoe, Mary Fatt, Sara Bushee, JC Catholique, Bertha Catholique
- ▶ Seeing, smelling, tasting the water is important
- ▶ Long term changes important; LKDFN knowledge and science
- ▶ Flow, movement, depth, colour of water
- ▶ Clean and clear water is best



AEMP: Water Quality

- ▶ “Water can be tested for anything out of the ordinary by what we can see, smell and taste.”
- ▶ “There is different water in rocky versus sandy areas. Tea making will indicate if the water is good or bad. Tea is red if the water is good, but tea is darker with black residue if the water is bad.”

AEMP: Water Quality

- ▶ George noted that water does not stay in the same place, it is always moving.
- ▶ Angie stated that foam on top of the water is natural and is nature's way of cleaning the water.
- ▶ George explained that for water treatment at the mines, dirty water goes in through a treatment plant and comes out clear and clean, but he would not drink that treated water right at the source. The water further down the lake can be drank, not that far and it is okay. He has caught fish right near the dike and mine and checked it himself and it was okay; he never found any problems. Water in the tailings pond is dirty looking but they say it is safe to drink. He would not trust to drink this water because of the look of it.

AEMP: Water Quality

- ▶ Angie noted that some areas are different - some lakes have algae while others don't and it may be natural.
- ▶ Sara wants to observe the movement and quality of water. If the water is unhealthy, so are the fish.
- ▶ Madeleine suggested adding the colour of the water as an indicator. The green colour of the water indicates that it is not too healthy. In terms of clarity, in some lakes you can see right to the bottom of the lake. Other lakes, you cannot see the bottom.
- ▶ Madeleine has observed that water cleans itself in the spring with “cotton” growing along the shore (white foam).

AEMP Field Form

Date: Recorder:

Location/Depth: Sample ID: Group/Person:

Collection Features: (Circle what best describes the feature)

Temperature: Cold Average Warm

Depth: Deep Average Shallow

Clarity: See bottom Murky Cannot see your hand in water

Movement: Still Some Running

Colour: Blue Green Yellow Other

Other:

Taste Test:

Tea: Good Average Poor

Water: Good Average Poor



Overall Description:

*Why was this water testing location chosen?
How can you tell when water is healthy or
unhealthy?*

*If water had words, what would it say about
how it is doing? It is happy? Hurting? Why?
What can you teach us about water?*

Traditional Knowledge Panel Summary

TK Panel #12 Purpose

- ▶ Explore disposing of processed kimberlite (PK) in the open pits and underground mining areas (A418 and possibly A154 and A21)
- ▶ Consider water quality and fish habitat within the pits upon closure regardless of whether there is PK in the pits

TK Panel #12 Summary

- ▶ The TK Panel put forth the following guidance points around monitoring:
 - ▶ Feeling comfortable and having confidence throughout closure is difficult given many complex and interconnected factors. Monitoring programs that we design and carry out will help us to feel more comfortable and less uncertain.
 - ▶ We want to build on the existing AEMP and camp to expand TK testing and to build scientific testing methods and skills with young people.
 - ▶ Over and above the fact that community members are the rightful guardians of their lands, these modern times mean that people now need the employment opportunities that formal monitoring programs provide.
 - ▶ Watching (monitoring) is just the beginning. Action plans need to be developed that identify responsibilities around addressing issues found through monitoring fish, water, wildlife, etc.
 - ▶ Non-invasive monitoring and testing are always preferred to methods that harass, prod or disrupt fish, wildlife, etc. (e.g., cameras versus tagging).
 - ▶ Even after the TK Panel is satisfied that Diavik is released of responsibilities, the pits and mine site need to be monitored every year, indefinitely.

TK Panel #12 Summary Continued

- ▶ Monitoring Water (TK) —The TK Panel drew upon the TK protocols and methods developed for the AEMP TK Program in making two recommendations related to monitoring water in the pits after closure.
- ▶ The TK Panel wants to compare water in the pits with water in Lac de Gras and only when they are comfortable with both the scientific findings and TK testing can the dikes be breached.
- ▶ These recommendations apply for both pits that may or may not have Processed Kimberlite (PK).



TK Panel #12 Summary Continued

- ▶ 12.7: The TK Panel would like Diavik to test water in the pits for at least two years (until the water is deemed good) and compare this to water in Lac de Gras. Water samples will be collected from multiple depths at various times throughout each year and tested according to the AEMP protocols. Taste tests will be done after scientific sampling tells us the water is drinkable, where they will watch for smell, clarity (turbidity), temperature, colouration, scum on the water or tea, and water and tea for taste.
- ▶ 12.8: When scientists and the TK Panel agree that the pit water is safe (i.e., drinkable) and stable (i.e., consistent), then breaching of the dikes can occur to allow water to flow back and forth but prevent fish from entering the pits, at least initially.



Indigenous Ways of Watching Water: Canadian Examples

Tr'ondëk Hwëch'in Water Quality Indicators¹

Table 1. Summary of indicators used by TH Elders to determine if traditional drinking water sources are safe for human consumption.

Indicator	Description
Sensorial Properties	
Color	Water should be clear with no color (e.g., tap water can be grayish or yellow).
Turbidity	The term "White Water" refers to clear water that you could see through. This means that water with limited turbidity is desirable.
Running Water	Water should be fast flowing and not stagnant.
Nothing Growing	No moss or plants should be growing on the rocks.
No animals in vicinity	There should be no animals around to contaminate the water. Ducks swimming in water can be a sign that it is not contaminated.
Makes Good Tea	Water should make red tea. Bad water makes black tea that leaves stains in your cup.
Odor	There should be no smell.
Taste	It should have a "fresh" taste. It should taste "good." It should not taste like chlorine.
Prior Knowledge and Use	
Prior Use	The water source has been used by many generations.
Knowledge of sources of contamination	There should be nothing above the water source in the watershed (e.g., no outhouses, septic fields, or resource extraction).
Water Quality Testing	Several Elders noted that they would like water quality sampling to be conducted at the water sources they use.

¹ <https://www.mdpi.com/2073-4441/11/3/624#:~:text=Water%20%7C%20Free%20Full%2DText%20%7C,Water%20Sources%20in%20Yukon%2C%20Canada>

Inuu'tuti: Baker Lake Aquatic Cumulative Effects Monitoring Program¹

Indicator Types	TK Measurement Indicators	Western Science Measurement Indicators	
Taste & smell (Organoleptics)	Taste of "land"	Organic carbon	Nutrient concentrations
		pH	Chlorophyll a
		Conductivity	
	Saltiness	Conductivity	Hardness
		Salinity	Alkalinity
		Chloride, sodium	
	Fishy smell	Specific algal community	Chlorophyll a
		Nutrient concentrations: nitrogen species, phosphorus	
		Salinity	Chloride, sodium
	Water is "refreshing"	pH	Temperature
		Copper, iron, manganese, sodium	Hardness
		Total suspended solids	Turbidity
		Total dissolved solids	Flow

¹ <https://www.afn.ca/wp-content/uploads/2019/03/10-Integrated-Water-Management-Hutchinson-Environmental-Sciences-Ltd.pdf>

Culturally relevant water quality criteria: Indigenous Guardians Toolkit¹

- ▶ Mikisew Cree First Nation Community Based Monitoring² and the Athabasca River Watershed (Fort McKay, Athabasca Chipewyan)
 - ▶ Indigenous indicators of water quality and climate change (weather conditions, flow, winter ice conditions, algae, foamy scum, dirty water, scum on tea pots and boats, smell, colour, proximity to development project/site, perceived contamination)³
 - ▶ Water quality index for each site (green, yellow, red)
 - ▶ Water quantity/level: Aboriginal Base Flow and Extreme Flow
 - ▶ Place names important

¹ <https://www.indigenousguardianstoolkit.ca/>

² <http://mikisewgir.com/cbm>

³ <https://www.ourcommons.ca/Content/Committee/421/ENVI/Brief/BR8622379/br-external/MikisewCreeFirstNation-e.pdf>

Why are we here today?

- ▶ We need “clear, measurable and culturally relevant criteria” for measuring water quality
- ▶ Consider:
 - ▶ What are the good properties you look for in other lakes you use?
 - ▶ What are the properties of water that make it suitable for cultural use?
 - ▶ What needs to happen to see if the spirit returns to the pit lake?
 - ▶ Do people expect to draw water from the pit lake for cultural use?
 - ▶ What properties in the pit lake could change your use of the big lake?

Next Steps

- ▶ Workshop summaries and transcription files returned to each community
- ▶ Summary report from all workshops ready for public water board hearing (November 2020)



Thank you!

2018 AEMP at Diavik/Lac de Gras**TK of Water**

Date: 2018 – August - ____

Recorder: _____

Location/Depth: _____

Sample ID: _____ Group/Person: _____

Collection Features:**(Circle what best describes the feature.)****Comments**

Temperature: Cold Average Warm _____

Depth: Deep Average Shallow _____

Clarity: See bottom Murky Cannot see your hand in water _____

Movement: Still Some Running _____

Colour: Blue Green Yellow Other _____

Other: _____

Taste Test:

Tea: Good Average Poor _____

Comments: _____

Water: Good Average Poor _____

Comments: _____

Overall Description:

Why was this water testing location chosen? _____

How can you tell when water is healthy or unhealthy? _____

If water had words, what would it say about how it is doing? It is happy? Hurting? Why?

What can you teach us about water? _____

Notes:

Guiding principle: Water is alive. It can hear what we are saying about it. We need to be respectful of the water. We should avoid talking too much about water.

Water Movement: Movement of the water may be related to the weather, so we need to check beneath the surface to determine if the water is really running.

Remember Camp Protocols:

When going out in the boat, did you give tobacco, pay the water, feed the land or say some words?

Are you taking care of the Elders?

Workshop Summary for Diavik Diamond Mines (2012) Inc. Water Quality Criteria for Cultural Use Workshop

North Slave Métis Alliance, Yellowknife, NT
September 22-23, 2020



Natasha Thorpe, Joanne Barnaby,
Sarah Ravensbergen

For: North Slave Métis Alliance,
Yellowknife, NT

November 1, 2020

Photos: Natasha Thorpe, Colleen English

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Executive Summary

On September 22 and 23, 2020, the North Slave Métis Alliance (NSMA) participated in a virtual workshop with Diavik Diamond Mines Inc. (DDMI/Diavik) to (1) share recommendations from the ongoing Aquatic Effects Monitoring Program (AEMP) and the 2019 twelfth session of the TK Panel, specifically related to water quality criteria that include cultural use and (2) further discuss the concept of cultural criteria for water quality as a condition that must be met for Diavik to put PK into the pits. The [*Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite \(PK\) to Mine Workings*](#)¹ Measure 2 states that water quality objectives need clear, measurable and culturally relevant criteria; DDMI requested these workshops with PA and non-PA communities to discuss these criteria in relation to closure planning.

Many of the properties and cultural uses of water raised by NSMA participants in the workshop are consistent with previous NSMA input noted during the TK Panel 12 session as well as AEMP activities (starting in 2002). Participants agreed that properties of water that make it suitable for cultural use include the presence of edible fish; healthy wildlife and animals using the water; a clean smell; clear, flowing water; healthy shoreline plants nearby; shoreline rocks worn from use; water that is free of deposits or by-products (e.g. crushed gravel, PK); and water that does not exceed acceptable Canadian water quality guideline levels.² Diavik's proposed three-part method to approaching cultural use closure criteria for the pit lakes was positively received by NSMA members during the workshop.

Workshop participants agreed that water is important for drinking, fishing, harvesting birds and waterfowl, subsistence transportation and sustaining other harvesting. While there was a diversity of perspectives, participants agreed that caring for the spirit of water through guardianship activities is important. There was consensus that members would prefer not to use water from the pit lake for cultural use with or without PK, and that remediation activities are important for helping the spirit of the water return. Several other topics or concerns were raised by NSMA participants during the workshop, including the desire of the NSMA to conduct their own monitoring activities, the importance of continued access and general aesthetic of the area for NSMA members, and the need to ensure that Diavik proceeds with caution as the closure process continues.

¹[*Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite \(PK\) to Mine Workings*](#)

² [*Canadian Water Quality Guidelines*](#)

The information gathered in this workshop will be shared with NSMA through meeting notes, and this summary document. The findings will also be combined with information gathered from workshops with other PA and non-PA communities into a summary report for DDMI. The outcomes of the summary report will be shared at a public water board hearing currently scheduled for December 2020.

List of Participants

Wayne Langenhan (NSMA Elder/Knowledge Holder)
Shirley Coumont (NSMA Elder/Knowledge Holder)
Marc Whitford (EMAB Member)
Melissa MacLellan (NSMA Youth)
Adelaide Mufandaedza (NSMA Staff)

Myra Berrub (DDMI Staff)
Sean Sinclair (DDMI Staff)
Amanda Annand (DDMI Staff)

Joanne Barnaby (Consultant)
Natasha Thorpe (Consultant)
Sarah Ravensbergen (Consultant)

Background and Scope of Work

Diavik Diamond Mines (2012) Inc. (DDMI, or Diavik) supported virtual workshops (Water Quality Criteria Workshops) with both Participation Agreement (IBA) and non-PA communities. The intent of these workshops was to (1) share recommendations from the ongoing Aquatic Effects Monitoring Program and the 2019 twelfth session of the TK Panel, specifically related to water quality criteria that include cultural use and (2) further discuss the concept of cultural criteria for water quality as a condition that must be met for Diavik to put PK into the pits. Diavik recently received approval through an environmental assessment process whereby the [*Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite to Mine Workings*](#) Measure 2 states that water quality objectives need clear, measurable and culturally relevant criteria.

Diavik has expanded on what was shared during the TK Panel Session 12 and prepared proposed criteria for community review. The intent of the workshops was to provide an opportunity for feedback on the proposed criteria and further develop these criteria to include the recommendations of the broader potentially impacted Indigenous communities. These criteria and the feedback from workshops will be shared with the water board as part of the water license amendment during the regulatory process in Q4 2020.

During the workshop, Diavik presented the proposed plans for storing processed kimberlite (PK) underground in pits, rather than in the current containment area (i.e. processed kimberlite containment, or PKC). As noted in section 12.8 of TK Panel 12, TK Panel members recommend that only when scientists and the TK Panel agree that the pit water is safe (i.e., drinkable) and stable (i.e., consistent), then breaching of the dikes can occur to allow water to flow back and forth but prevent fish from entering the pits, at least initially.

As well as providing NSMA participants the opportunity to give feedback on proposed closure details, the workshop also focused on a discussion of healthy water according to Indigenous Knowledge perspectives. Natasha Thorpe and Joanne Barnaby presented an overview of the many ways NSMA members have already contributed to developing ways to measure healthy water (e.g. through the DDMI TK Panel and Aquatic Effects Monitoring Program), and shared examples from other Indigenous communities across Canada that are measuring water quality according to their ways of knowing.

A discussion was facilitated based on the following questions:

- What are the good properties you look for in other lakes you use?

- What are the properties of water that make it suitable for cultural use?
- What needs to happen to see if the spirit returns to the pit lake?
- Do people expect to draw water from the pit lake for cultural use?
- What properties in the pit lake could change your use of the big lake?

Summary of Key Findings

Properties of water that make it suitable for cultural use

Many of the properties and cultural uses of water raised in the workshop are consistent with previous NSMA input during the TK Panel 12 sessions and AEMP activities (Table 1).

Diavik's proposed three-part method to approach cultural use closure criteria for the pit lakes (reviewing water quality; toxicity; and traditional water quality, see Appendix B) was positively received by NSMA members during the workshop.

Table 1. Properties of water that make it suitable for cultural use.

Property	Quote (from workshop)	Sources (outside of workshop)
Edible fish	<p><i>...the fish being edible would be a good sign of healthy water... [Melissa]</i></p> <p><i>...if that fish tastes good from directly from throwing it on the fire with no salt and pepper, that means that the lake itself is a good medium for the fish to swim around in. [Marc]</i></p>	
Healthy wildlife, animals using the water	<p><i>You've got to watch the growth, see if there's little bugs in there, usually if there's a little bit of light... even rats, or beaver or whatever, if they're in that water, you know it's good enough to drink... [Wayne]</i></p> <p><i>To the question, what are the good properties in other lakes, animals using it, being able to harvest those animals and stay healthy... seeing other caribou or a bear drinking from there too, them eating the fish in there too. [Melissa]</i></p>	
Clean smell (can have a fishy smell)	<p><i>Smell, I would say first, not just the look, but the smell. You know when you're around a swamp, I wouldn't drink that water because of the smell. So, if there's a nice clean smell or even the smell of fish, that shows me that that's healthy water. [Shirley]</i></p>	<p>Raised in NSMA AEMP Planning Meetings: January 21, 2012; Feb. 4, 2012; June, 2012</p>

Clear (natural, not murky, no oil, film, scum, not too much algae)	<p><i>...we all agree we like it clear, that it's not stagnant water, deeper water. [Shirley]</i></p> <p><i>...if there is a lot of microbes swimming around in it, I want to boil it first. Closer to shore you're going to have that, so I would go further out from the shore to get water for drinking. [Shirley]</i></p>	Raised in NSMA AEMP Planning Meetings: January 21, 2012; Feb. 4, 2012; June, 2012
Flowing, not stagnant	<p><i>...look for growth, if all algae, not so much drinkable, right. More algae, less drinkable. Got to have movement. [Shirley]</i></p> <p><i>...there's a little lake just down the highway 3, coming into Yellowknife, you look at that lake and you wouldn't think it had anything to feed it or whatever because there's a little ditch going out of it, not much water running in that ditch. But there's underground springs, that water when you taste it, it's just as fresh as can be, it's a small lake. [Wayne]</i></p>	Raised in NSMA AEMP Planning Meetings: January 21, 2012; Feb. 4, 2012; June, 2012
Shoreline plants are healthy (e.g. willows, reeds, sedges)	<i>I would say to look for plants in the area, healthy willow trees growing, healthy sedges, weeds growing by too that we could take sample of, look at and through TK grapple that it looks okay, then take a sample and it would be okay scientifically okay as well. When I go to a place for recreational fishing or something, I would look at healthy plants first. [Melissa]</i>	
Shoreline rocks are worn from use	<i>...I check the rocks too, to see how old they are, how big, how much water is being used, if the water rushed fast, see if they get moved a lot, do other people use it... But rocks are different in this area. But would be really hesitant because of that, if I saw the rocks and they didn't look like regular lake or didn't look how they should, that would make me really hesitant. [Melissa]</i>	
Free of deposits or by-products (e.g. crushed gravel, PK), and does not exceed the acceptable Canadian water quality guideline levels	<p><i>...I think it would be good to use Canada's criteria for clean water before we try to eat any of the stuff. Before we try to do any of the-watch animals eating the food or plants just for my own sake, I don't want anyone to get sick. [Melissa]</i></p> <p><i>It depends, some lakes have minerals in them that might change the taste of the water... But if you don't know what that mineral is, I wouldn't be drinking whole gallons of the water. [Wayne]</i></p> <p><i>...the water should be free of any deposits or by-products of the mining operation. ...We have to make sure that</i></p>	

	<i>what's in the water is basically okay at the time and there's nothing in there that you may miss like crushed gravel or debris or any PK that may have been dumped, stuff like that. Or your favourite dump truck or tractor, that's not going to be in the water... [Sean: Marc, you mean that's still floating around in the water, like if the gravel sinks to the bottom, is that okay?] Shirley: No. [Marc, Shirley]</i>	
Temperature	<i>The preference is to get cold water for most people, some of them like the water warm, myself my preference is cold. [Wayne]</i>	Raised in NSMA AEMP Planning Meetings: January 21, 2012; Feb. 4, 2012; June, 2012

Cultural use of water

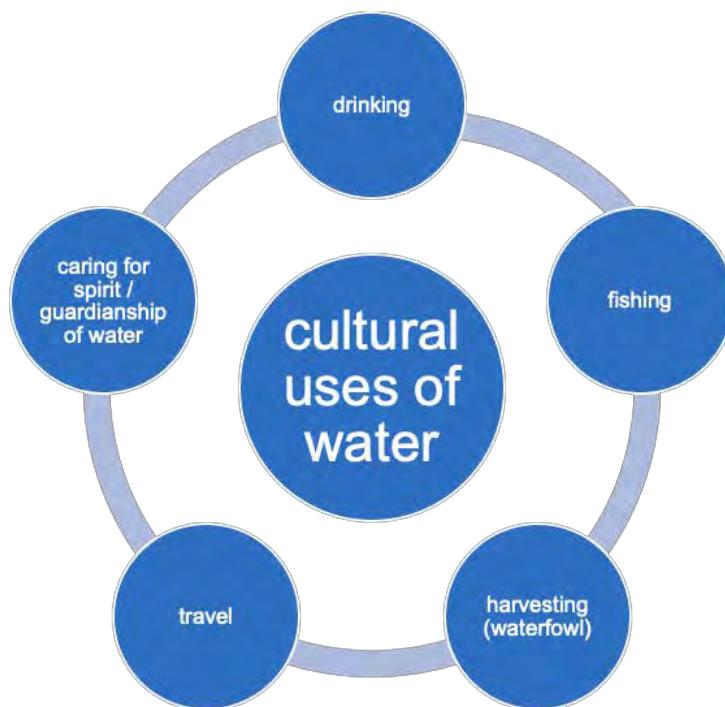
NSMA workshop participants worked on the graphic below together and agreed that water is important for drinking, fishing, harvesting birds and waterfowl, transportation and sustaining other harvesting (especially traveling on waterbodies throughout the area, especially for subsistence activities such as harvesting/hunting/trapping/fishing). While there was a diversity of perspectives, participants also agreed that caring for the spirit of water through guardianship is important:

All I know is that natural water, in a lake, in the outdoors, it's good water if it hasn't been touched by operations and all that. If you microwave a glass of water, I hear that the water is not good, it kills the water, the living organisms in it. So yeah, it makes sense to say living. [Shirley]

Participants were clear that that members would prefer not to use water from the pit lake for cultural use:

*Marc: You have to go for a pretty long sled ride to go draw that water from that pit. It's to the point that it would be ludicrous to think people will journey to the pit or even if the pit is there, to draw water from it, likely they know it's an old mining pit, and they're going to go take the water from Lac de Gras, or anywhere, not the pit.
Shirley: It's a hard no.
[Marc, Shirley]*

I also was thinking, looking at the next page, thinking about running water, any kind of standing water, I wouldn't even drink it. If these pits are going to be filled with water for two years before any other water goes into it, that doesn't sound like it will be drinkable for me. I wouldn't, if it wasn't flowing, right. [Shirley]



However, there were different opinions about whether having PK in the pit lake would change members' use of the water in Lac de Gras:

Personally, I would say I would have reservations about it ... More so with PK but I'm seeing this diagram with all of these tunnels and people have been using it and there's residual whatever left over from operations. It doesn't matter who it is, if have equipment, you're going to have oil spills, even if just a few drops, it adds up. Who knows what's going to be left down there? I would have reservations just with the fact that was open to operations underground. And now you flood it, now that's mixed in with the water and you don't know what's in it. Unless I have hard evidence scientifically that this water definitely safe and checking it for levels of whatever, chemicals, hydrocarbons, toxins, metals, to what is the safe drinking, and of course taste test, may not but until that was proven completely I would definitely have reservations about using the lake at all. [Shirley]

As long as before they blew those dikes, that water's to a safe scientific standard, I'd go for it. [Wayne]

These comments suggests that as long as scientific water quality criteria were met prior to reconnection, people would feel comfortable using Lac de Gras.

Returning the spirit to the pit lake

While every person's relationship with spirit is personal, generally, Indigenous peoples have long recognized that there is spirit in water. During the workshop, NSMA participants shared their thoughts regarding the spirit of water:

...there's a diversity of opinions within the NSMA, I'm going with the animals, I trust the animals to do what they need to do. You're going to get inconsistency, like dead animals around the waterhole, find one or two humans as well, driven mad by the thirst. But general indicator of health of water is the animals use of it, from my little experience. I'm not an outdoorsmen or avid hunter, I usually watch this on tv. We respectfully disagree ... you'll hear a lot of diverse opinions anyway. [Marc]

Marc: ...I'm not much on the spiritual side, I'm more of a western science kid, but you're right, and I think that the spirit of the water and the spirit of the land... if we can try to restore it, what would it take to restore that, what we feel has been displaced or lost, one of the two. Hopefully not lost. But rather, displaced somehow with the activity, as in any enterprise, whatever the case is, you're going to affect the area, and affect the pristine environment. ...does the spirit of the land and the spirit of the water return? It's like a game animal, moose, kaboom there's a moose... so what happens is when you go away again and you're no longer around that area, the moose comes back, birds come back. We can say, what invokes the spirit of the land? Spirit of the land is all the fishing and stuff like that... it's not something you can put your hands on, rather it's something that's there, you feel it in the heart, and to go on the land, if you're privileged enough to go on the land and water as it is today-god knows what it's going to be like 100 years from now, we are very privileged to go and use our land and share it with each other. To have a say and try and protect it. That brings back the spirit of that area.

Melissa: Well said.

Shirley: I totally agree with everything that he said. It is something that, whatever spirit of the land, nature, going back to its normal. I don't think it will ever go back to normal, I don't know, maybe in 100 years if man never went back again of course it will go back to baseline. ...We have to help it of course, do our remediation, bring the water to healthy enough to merge with the rest of lake, we do as much as we can and then nature does the rest after that. As long as untouched after many years. ...

Melissa: And the spirit is kind of returning when it can take over itself, when the flies and bugs can come back.

Despite the diversity of perspectives, NSMA participants agreed that there is a responsibility to care for the spirit of the water, and that water affected by industrial activities has had the spirit altered:

...there's two types of water, waters that are pristine and pure and have been there since time immemorial. And when mankind comes in anyway and disturbs the water and causes the water to change in some manner, that's an affront to nature. It takes time for that water to eventually heal itself and return to its natural state. The spirit of the water which once was and is temporarily taken away, sometimes for very long periods of time, the water eventually regains its spirit, it heals itself. I believe in that, whether it's said in a scientific or from a First Nations understanding of the universe level, it all amounts to the same thing. If you use the water and you use the lands, then you have to respect them, you have to allow them to return to a state. If not, you as a guardian of the land as a traditional people have failed. That's the hard truth. Does the water have spirit, yes. And people view the spirit differently. We view it different than First Nations do, but it all amounts to the same thing. [Marc]

NSMA participants also discussed that while the earth is naturally healing, remediation activities are also important to help the spirit of the water return:

[Joanne: So, it's through the remediation that will contribute to helping the spirit return?] Yes, to bring it back to baseline, where it was before, before they started exploration... The earth is also naturally healing if you give it time and leave it untouched. [Shirley]

It's a different kind of mine so we shouldn't really depend on something... it is good to also not just say the land will fix itself. ...we don't have a lot of baseline knowledge about what happens to diamond mines when you leave them for 100 years. [Melissa]

Other

Several other topics or concerns were raised by NSMA participants during the workshop. These include the desire of the NSMA to conduct their own monitoring activities:

...a property that is huge is doing our own scientific monitoring with our team here, and doing our own work to see if from our standards too, like our own water quality testing, on a smaller scale, doing our own kind of more scientific look behind seeing the properties ourselves, is the temperature okay to us, is there, the pH okay to us, the salinity, if that's okay to us, then we could come to our members saying that's okay, from doing the work ourselves, would be- to me, something that would make it okay. [Melissa]

One participant also raised the importance of continued access and general aesthetic of the area for NSMA members:

...we have to make sure we cover all these areas ...for instance you don't have a big dike blocking our way so we can no longer go down the river. And there's no inhibitions about using Lac de Gras due to some physical change that has occurred. [Marc]

I might add that there's nothing there as well so when you're paddling furiously along and you're starving for a drink and you suddenly see big sign on river bank with, radioactive, know what I mean, so that's a good sign, your water is clean and you can use it. [Marc]

Several participants also raised the need to consider high runoff events that might affect the water table:

One thing we'll have to watch for, I'm sure Diavik has considered, rain events, sometimes we get two inches of rain in 24 hours, which is a lot of rain, especially here in the territory. We have to make sure that whatever water is channeled appropriately. [Marc]

Finally, the need to ensure that Diavik proceeds with caution was raised:

I don't think this has ever been done any place else in the world, in quite this way, so I wouldn't like to see this overly rushed because we only got one shot at it, and that's it. If we don't do it right the first time, we're bugged. So I think things got to really test it out well, when those dikes are breached. [Wayne]

Participant Questions

The following is a list of questions asked of Diavik by workshop participants. Responses are further detailed in workshop notes.

1. ...that hole on the very right on the screen there, is that just going to be an empty hole or is it going to be like water put into also, like the one right next to it, to the left of it? [referring to slide 3 of the Diavik presentation]
 - a. Yeah, that's a good question... So that-the one on the right is actually-we're filling it with concrete as we go, so it'll just be fully filled with concrete, so there won't be any water or anything in it, it basically just becomes a rock again.

2. Who is going to determine when that water is going to be let into the main lake, like, if it's up to standards. Who is going to be out there to say, this water is up to standards, and to prove it I'm going to drink a big jug of it?
 - a. Well, we'll be drinking that jug together... That's really what we're here to talk about today, that process, figuring out those first steps, what you think, what everyone here thinks are the best criteria that we can measure. Again, we kind of have to decide today what we'll be measuring in 2026, 2028 to answer that question you just asked, when we know if it's okay.
3. Part of my concern is that the water that you fill up to, is it going to be back, not the dike part but the other part, how much of a drop is it going to be going down?
 - a. One area of the pit where it would be a pretty big drop, if an animal fell off, could get hurt. The TK panel identified that area, so we're going to break that area down, so instead of a cliff, it's a slope, animals or people won't be able to fall off of. When water filled to top, won't be anything people or animals can fall off of.
4. ...are you going to loop a fence for a couple years [around the PK pits] before you put in, or what, so we know that that animal cannot fall off a cliff, rather than slope, is that possible?
 - a. We'll be monitoring... the water in the pit lake won't be acutely toxic, and if it is, we will have to stop going animals in with a fence or something. But so far work shows it won't be poisonous and we'll be sampling it, monitoring it, so if it doesn't end up being what we think it is, we have to put up a fence. But right now, we don't think it would be acutely toxic water. But if it does, we'll have to stop animals from going in it.
5. Just wondering, the level of the water in that lake, when it is filled up, how far is the surface of that water to the top of the rock? How far is it going to be from surface of that water into the surface of land, what distance between the two? How many feet, whatever?
 - a. Just a few meters, so the pit-basically there's the pit, then there's that dike, bridge we made out of rock, currently Lac de Gras at 415 m elevation, the pit, once filled with water, will be at 415, will be exact same, and piece of land in between is 30 m wide, that small piece is 3m high, so small little stringy island, really small. That's what we'd be cutting holes through so that water can flow back and forth, and fish can go back and forth as they want.
6. We had quite a bit of work done since 2012, is Diavik looking for different answers, what are they exactly looking for? We don't want to miss anything.
 - a. We don't want to miss anything either. There's been a lot of work to get at the heart of this question, how do Indigenous communities understand healthy water. This process is a 'checking it out' opportunity. If at the end of

these two days, we just hear the same as we already heard, like water good water is odorless, then that's confirmation that we're on the right track of developing indicators.

- b. ...I find it encouraging that there is consistency between what the AEMP and the TK panel have told us. It's a good sign that the work is on the right track. It's becoming a bit of a verification activity.
7. I'd like to know if the company that took over Diavik, Rio Tinto, did they have anything different like on their plate than you have on yours? Do they have different ideas to put forward, or weren't satisfied with some of ours? Are there any discrepancies that we should know about?
- a. Rio Tinto is our parent company, and that has been since the beginning, that hasn't changed. Marc was referencing 2012 and the TK camp, when it was reinvigorated, 2012, 2015, 2018, Wayne you were at all of them, and the TK panel session in 2019. It's a significant body of work there, working towards a criteria, what do we need? What we actually need to do is submit a criteria to the water board fairly soon, that identifies water that is suitable for cultural use. We have an idea, and now we're talking with communities separately to check we didn't miss anything. At end of day, we have all this TK panel work for almost 10 years, and now we have to combine that with feedback from eight different communities. It's hard to find one perfect answer, but we have to provide something to the water board.
8. ...the fact is the pit itself with PK in it is still going to be a lot deeper than Lac de Gras would be. Lac de Gras is not a really deep lake but a reasonably shallow lake, would that be correct?
- a. Yes, correct. Lac de Gras is about 10-15 m deep. And the PK level that you're talking about would be between 200 and 300 m below the water.
9. You have an artificial containment for one part of the merged Lac de Gras pit, one is very much deeper than the other one. We don't know here we are 200 years later, what happens is, will there be, and we don't know, maybe fish that like deep water like in Great Slave Lake, you can have those fish there that maybe become resident, where they wouldn't be resident of Lac de Gras, but still. What say we?
- a. There's no indication that fish should be living there, so Lac de Gras is shallow so they're use to it and at these depths 200-300 m down, will be dark and no light, no food, bugs, plants. That's all in the top 40 m or top 10 m of water. Down that far, it will just dark and a small hole.
 - b. We talked about this once before, about fish habitat, down deep like that. There are no fish that go that deep, not even in Great Slave lake.
10. ...I thought we had discussions about the sludge [PK slime] up there, I'm not sure? ...What's happening with that?

- a. If we get final approval to do this, the idea is we would take some of the slime and extra fine PK, like a fine toothpaste material, take some of that out of the processed kimberlite containment and put it deep underwater in the pit, it would be a more stable place for it. That's something we're looking into. Before we figure that out, we need to know if we're allowed to do it at all. That's where we're at. If we get approval to put PK underground or in the mine, aside from being able to put that material to 2022 – 2025 underground, we could also take some out of the processed kimberlite containment and also put it underground... if we can start doing this in 2022, we'll not be putting anything else in the processed kimberlite containment. If we're not allowed to do this, until 2025, we'll still be putting things in the processed kimberlite containment. If mid 2022 we put this underground instead, we can focus on closing the processed kimberlite containment... if we put material underground than we can close the processed kimberlite containment much earlier.

Conclusions and Next Steps

Diavik aims to complete workshops with eight Participation Agreement (IBA) and non-PA communities, with the results being compiled into a report in time for a water board hearing in December 2020. For each community workshop, Thorpe Consulting Services will provide copies of detailed workshop notes, and this workshop summary document to participating communities.

Appendix A – Agenda and Informed Consent Form

Agenda

Diavik Diamond Mines Inc. Water Quality Workshop

North Slave Métis Alliance
Yellowknife, NT
September 22-23, 2020

Participants

Wayne Langenhan (Elder/Knowledge Holder)
Shirley Coumont (Elder/Knowledge Holder)
Melissa MacLellan (Elder/Knowledge Holder)
Marc Whitford (EMAB Member)
Adelaide Mufandaedza (NSMA Staff)

Myra Berrub (DDMI)
Sean Sinclair (DDMI)
Joanne Barnaby (Consultant, Facilitator)
Natasha Thorpe (Consultant, Facilitator)
Sarah Ravensbergen (Notetaker)

Day One: September 22, 2020

12:45-1:00	Online Workshop Microphone Testing and Overall “How-To” (Myra) <i>Please log into the workshop at 12:45 so that we can make sure everybody is connected and has reviewed the informed consent form.</i>
1:00-1:30	Opening Prayer (NSMA) Opening Circle (Everybody) Workshop Welcome, Overview and (Facilitators)
1:30-1:50	Why are we here? (Diavik) <ul style="list-style-type: none">• Background around the need to develop “clear, measurable, and culturally relevant” criteria for water quality at closure

- 1:50-3:00 **What is Healthy Water according to Indigenous Knowledge?** (Facilitators)
- Overview of how the DDMI TK Panel and Aquatic Effects Monitoring Program have been developing ways to measure healthy water (i.e. water quality)
 - Overview of how other Indigenous communities across Canada are measuring water quality according to their ways of knowing

Discussion Questions

- What are the good properties you look for in other lakes you use?
- What are the properties of water that make it suitable for cultural use?
- What needs to happen to see if the spirit returns to the pit lake?

Day Two: September 23, 2020

12:45-1:00 Online Workshop Microphone Testing and Overall “How-To” (Myra) *Please log into the workshop at 12:45 so that we can make sure everybody is connected.*

Welcome and Comment Circle

1:00-1:30 **Refresher on Closure Plans for Pit Lake (Diavik)**

1:30-2:45 **Exploring Water Quality Criteria for the Pit Lakes**

- Do people expect to draw water from the pit lake for cultural use?
- What properties in the pit lake could change your use of the big lake?

2:45-3:00 Closing Circle
Closing Prayer

North Slave Métis Alliance

Diavik Diamond Mines Inc.

Water Quality Workshop

September 22-23, 2020

Yellowknife, NT

Informed Consent Form

I, _____ on September ____, 2020 give permission for Diavik Diamond Mines (2012) Inc. and its Contractors (i.e., Thorpe Consulting Services and Joanne Barnaby Consulting), to take notes, photographs and / or audio and video recordings related to my participation in meetings, workshops and events related to the Water Quality Workshop conducted on behalf of Diavik Diamond Mines Inc. (DDMI).

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;
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 Indigenous Organization, DDMI and / or its contractors may use the information collected to contribute to caring for water in the NWT and NU;
5. DDMI, Natasha Thorpe and Joanne Barnaby may share my information in either reports, presentations, and/or photographs provided it is within the context of this workshop scope and that they provide such information to my Indigenous organization;
6. I agree that my contributions may also be used for future educational, cultural, heritage, and environmental purposes that are outside the scope of this workshop and that my representative Indigenous

organization, 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 my Indigenous organization policy and the DDMI and NSMA Engagement Protocol for the Processed Kimberlite to Mine Workings Project;
8. I am free to request that any information I share is removed, erased or deleted from draft materials and that final copies will be provided to me;
9. My information will be summarized and included in a report which will be publicly available; and
10. I understand that DDMI, Joanne Barnaby and Natasha Thorpe cannot ensure the protection of my information (e.g. Traditional Knowledge) from public release once the reports are released (e.g., via youtube.com, Facebook, other social media, or Indigenous group websites),

Signed on September ____, 2020 in _____, Northwest Territories.

Signatures:

_____ Participant Indigenous
Organization

_____ Contractor

Witness

Translated by: _____

Appendix B – Presentations

A group of 12 people, including men and women, are standing on a gravel-covered ground. They are all wearing high-visibility orange safety vests with reflective yellow and silver stripes. Most are wearing yellow hard hats, while one person in the center is wearing a dark blue hard hat. They are dressed in various work-appropriate clothing like jackets, scarves, and gloves. The background shows a cloudy sky and a body of water in the distance.

RioTinto

Water Quality Criteria –

Culturally important indicators for water quality monitoring

North Slave Métis Alliance

September 22 - 23, 2020

Context: Why are we here?

Processed Kimberlite to Mine Workings Project

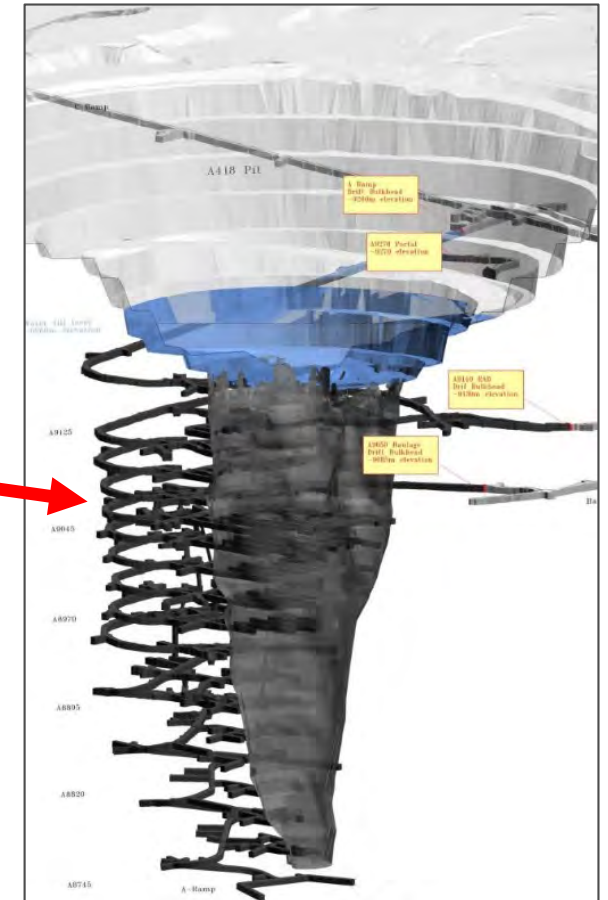
- ✓ to develop “clear, measurable, and culturally relevant” criteria for pit water quality at closure
 - January 2018 – Now: Water Licence Amendment and Environmental Assessment
 - Future – Measures to protect cultural use of the lake: TK, engagement, monitoring, reporting

Approved Processed Kimberlite Storage Options

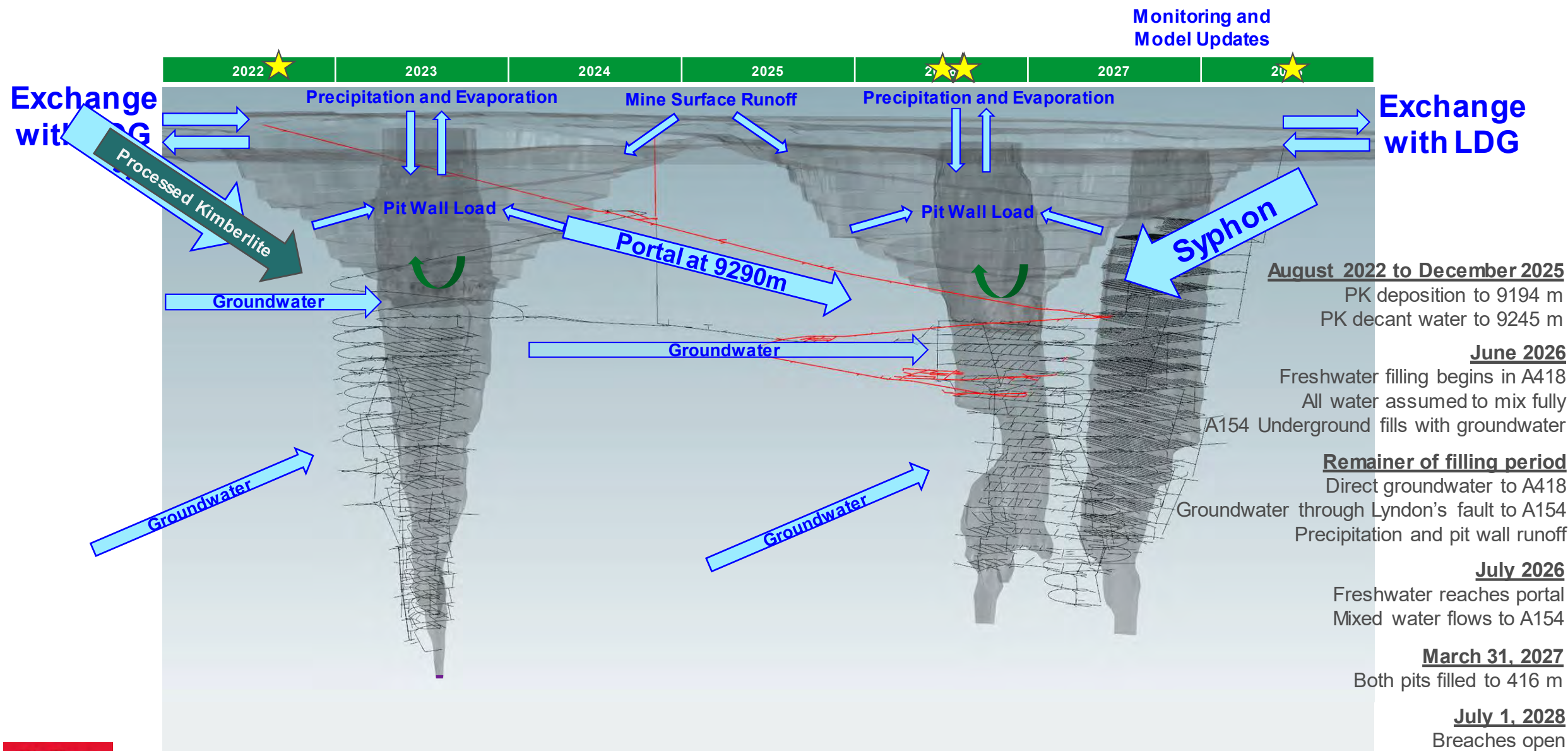
1. Processed kimberlite is currently stored within the Processed Kimberlite Containment (PKC) Facility



- ## 2. Processed kimberlite could be stored within the Mine Workings



PKMW PROJECT TIMELINE



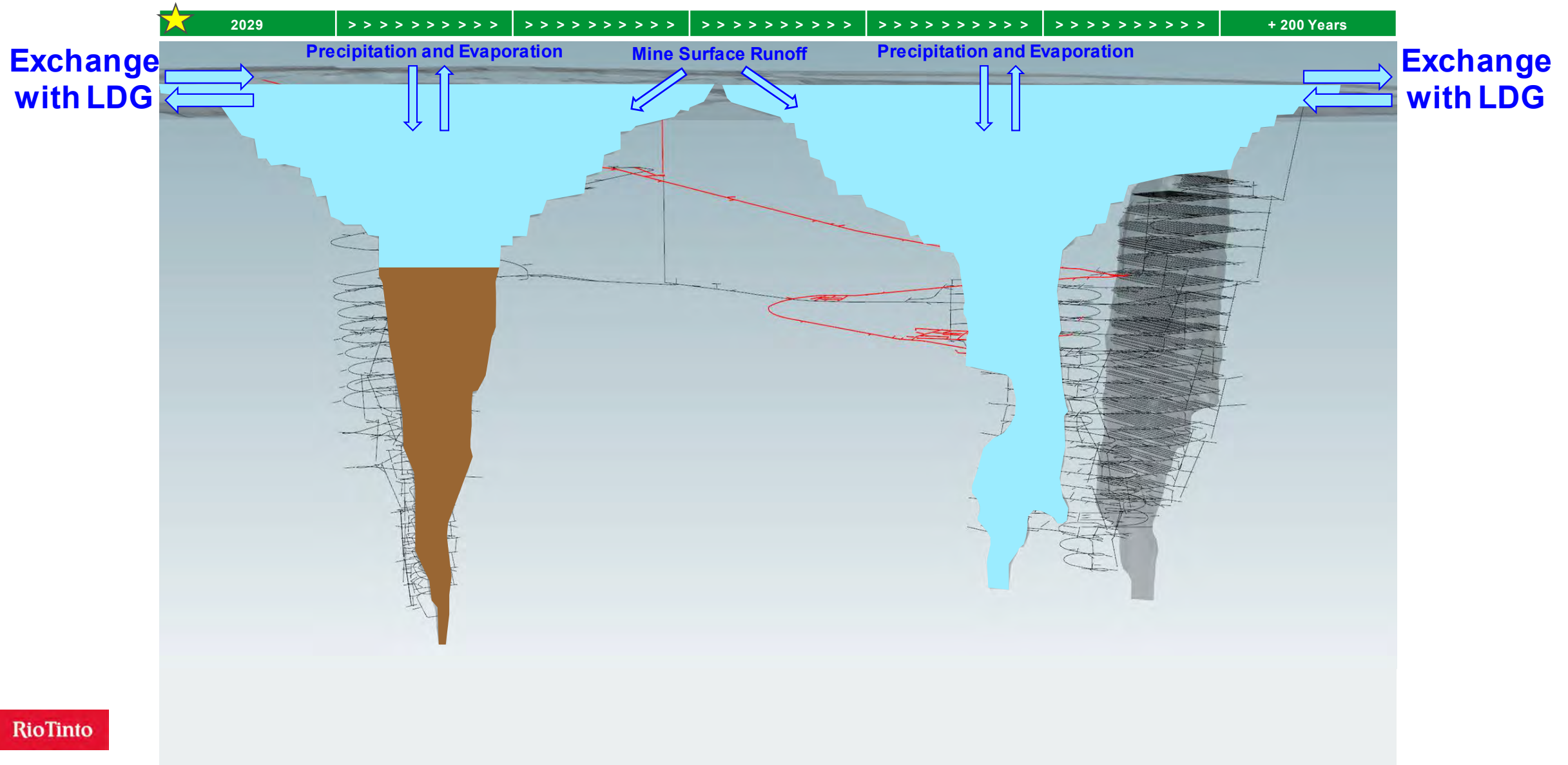
PKMW PROJECT TIMELINE

Next 200 Years

PK consolidates

Releases PK porewater

Surface exchange with LDG



PKMW Measure 2:

Water quality objectives need clear, measurable and culturally relevant criteria

Diavik has met with all PA groups to share the water quality criteria recommendations from TK Panel session 12 and presented the same draft Cultural Criteria.

After positive initial feedback we have advanced the Criteria and would like to discuss these in more detail

- Does NSMA have recommendations for different / modified criteria?

Water Quality Cultural Use Proposed Closure Criteria

Criteria: “Traditional Knowledge Panel verification that water is substantially unaltered and healthy for people, wildlife and aquatic life”

Measurement: Summer site inspection and signoff by TK Panel based on:

1. Review of scientific water quality
2. Review of acute and chronic toxicity testing
3. Traditional water quality sampling

Based on two stage review the Panel will confirm if pit water is safe to be reconnected with LDG

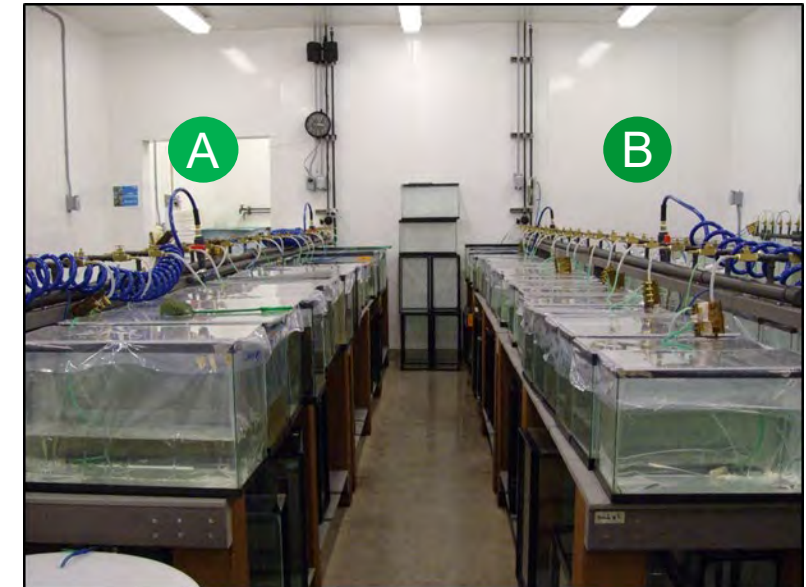


Criteria Measurement 1 & 2 – Water Quality and Toxicity

Session 1 (2026): Select sample locations in flooded pit with PK and in Lac de Gras.

--- Sampling (2026 – 2028) ----

Session 2 (2028): Review and compare the results of water quality and fish health before reconnecting to Lac De Gras



Criteria Measurement 3 – Traditional Water Quality

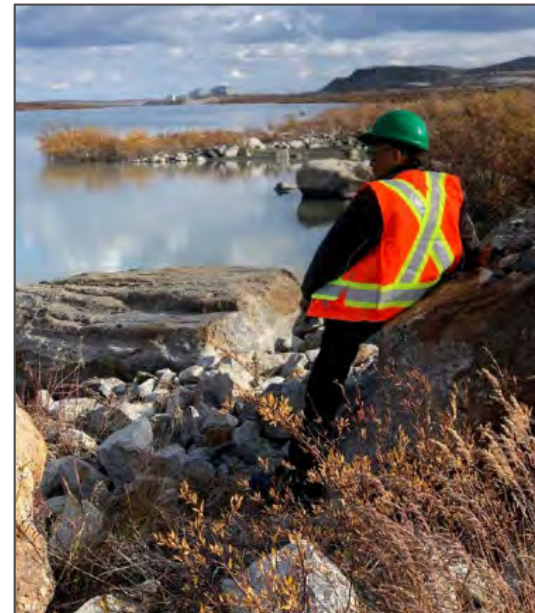
Session 1 (2026): After pit is flooded with water

- Observe water in pit and Lac de Gras
- Select monitoring locations
- Inspect clarity, temperature, colour and presence of scum or unnatural material around the pit lake area compared to Lac de Gras



Session 2 (2028): After water has settled

- Observe water in pit and Lac de Gras
- Inspect clarity, temperature, colour and presence of scum or unnatural material, smell and taste around the pit lake area compared to Lac de Gras
- Confirm if pit meets criteria to connect with Lac de Gras



Presented to the North Slave Métis Alliance

Diavik Diamond Mine Inc.
Water Quality Workshop
September 22-23, 2020

Facilitators: Joanne Barnaby, Natasha Thorpe



Water Quality Criteria

Culturally important indicators for water quality monitoring

What has been done so far?

- ▶ Community Aquatic Effects Monitoring Program (AEMP) overview (2003, 2007, 2009, 2012, 2015, 2018)
- ▶ TK Panel Sessions (e.g. TK Panel 12)
- ▶ Regulators state that: “water quality objectives need clear, measurable and culturally relevant criteria.”¹

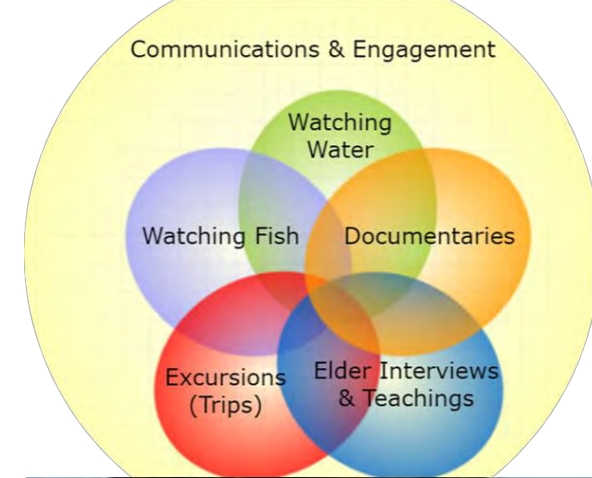


¹ Report of Environmental Assessment and Reasons for Decision,
Processed Kimberlite to Mine Workings

Aquatic Effects Monitoring Program (AEMP)

AEMP Summary: NSMA Input

- ▶ NSMA AEMP Planning Meetings: January 21, 2012; Feb. 4, 2012; June, 2012 with Wayne Langenhan, Ed Jones, Shirley Bohnet, Mary-Lynn Arychuk, Sue Enge, Derek Forsbloom, Sheryl Grieve
- ▶ Moving and clear water
- ▶ Take samples down-stream of mossy sections between water bodies (moss is a natural filter)
- ▶ Taste of water; water can look clean but not be safe to drink
- ▶ Clarity of water
- ▶ Temperature of water
- ▶ Cold, clear, pure water is best
- ▶ Odour of water
- ▶ Avoid stagnant water
- ▶ Water Quality Testing: Use of pictures, instead of a hand-written questionnaire, could be useful



AEMP Summary: Water Quality

- ▶ *Water quality:* One can tell if water is good or not when you make tea with it (e.g. Ceylon Tea). Suggest using the same type of tea and pot each year. Best water for drinking is from moving water or large lakes
- ▶ “It is hard to tell about water sometimes. Example provided from Barrens where an open river system went narrow and wide. The water looked and tasted okay, but people’s breath from drinking water was really bad and some got ringworm. Water had to be boiled South of Peterson’s Lake on the Yellowknife river system. This occurred ~18 years ago in 1990-91. How do we get this type of information? Combine science and TK to better answer question.”
- ▶ “We must look at environment at a broader scale and not focus on any one thing. Concerns are not just around fish. One can’t tell, for example, how a mine would impact fish, wildlife, how insects change, etc. Everything affects something else. Why isolate one thing?”

AEMP Summary: Water Quality

- ▶ Ed suggested that monitoring be carried out in a reference lake outside the mine's influence (i.e., control site) for comparability, not just at the mine site.
- ▶ The colder the better for water. Most people drink river water and not lake water when given a choice. When water is good for tea, it means the water is not changing the taste of the tea (i.e., there is no chemical interaction with the tea to change the taste).
- ▶ Wayne indicated that there is white foam along the shores of lakes. It drifts near swampy and reedy patches of the lake. He would not drink water from this kind of water.
- ▶ Wayne told a story of when he drank water and his breath became bad. Even though the water is cold, clear, moving, and has no odour, it is not a guarantee of water quality.
- ▶ Another test of healthy water is the taste of tea. Poor water quality adversely affects the taste of tea. There was discussion about whether tea magnifies the bad taste of poor water or does the tea interact chemically with the poor water.
- ▶ Wayne noted that poor water in warm lakes in the summer still taste bad in the winter if the water is boiled.

AEMP Field Form

Date: Recorder:

Location/Depth: Sample ID: Group/Person:

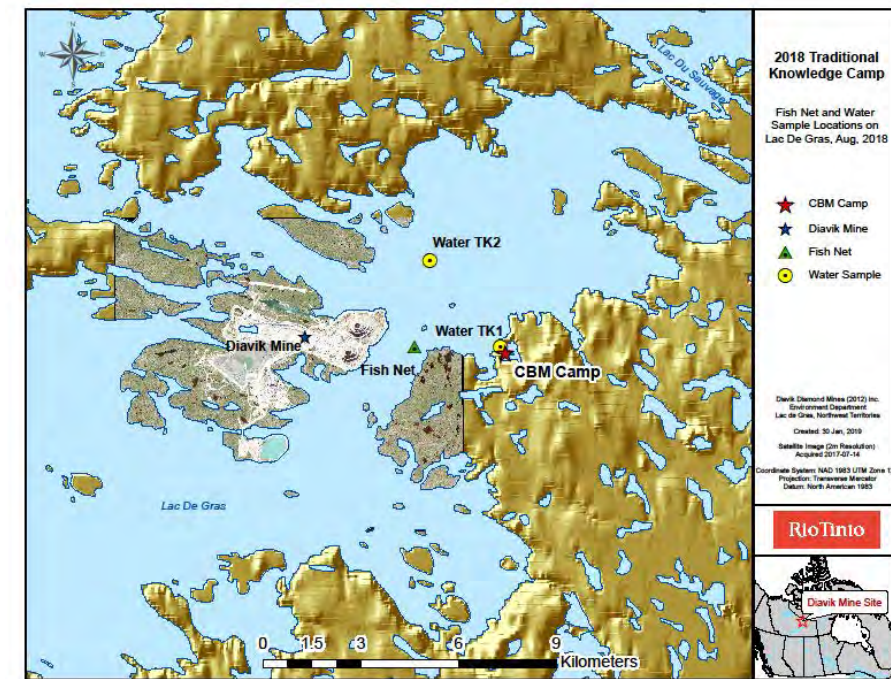
Collection Features: (Circle what best describes the feature)

Temperature:	Cold	Average	Warm
Depth:	Deep	Average	Shallow
Clarity:	See bottom	Murky	Cannot see your hand in water
Movement:	Still Some	Running	
Colour:	BlueGreen	Yellow	Other

Other:

Taste Test:

Tea:	Good	Average	Poor
Water:	Good	Average	Poor



Overall Description:

*Why was this water testing location chosen?
How can you tell when water is healthy or unhealthy?*

*If water had words, what would it say about how it is doing? It is happy? Hurting? Why?
What can you teach us about water?*

Traditional Knowledge Panel Summary

TK Panel #12 Summary

- ▶ The TK Panel put forth the following guidance points around monitoring:
 - ▶ Feeling comfortable and having confidence throughout closure is difficult given many complex and interconnected factors. Monitoring programs that we design and carry out will help us to feel more comfortable and less uncertain.
 - ▶ We want to build on the existing AEMP and camp to expand TK testing and to build scientific testing methods and skills with young people.
 - ▶ Over and above the fact that community members are the rightful guardians of their lands, these modern times mean that people now need the employment opportunities that formal monitoring programs provide.
 - ▶ Watching (monitoring) is just the beginning. Action plans need to be developed that identify responsibilities around addressing issues found through monitoring fish, water, wildlife, etc.
 - ▶ Non-invasive monitoring and testing are always preferred to methods that harass, prod or disrupt fish, wildlife, etc. (e.g., cameras versus tagging).
 - ▶ Even after the TK Panel is satisfied that Diavik is released of responsibilities, the pits and mine site need to be monitored every year, indefinitely.

TK Panel #12 Summary Continued

- ▶ Monitoring Water (TK) –The TK Panel drew upon the TK protocols and methods developed for the AEMP TK Program in making two recommendations related to monitoring water in the pits after closure.
- ▶ The TK Panel wants to compare water in the pits with water in Lac de Gras and only when they are comfortable with both the scientific findings and TK testing can the dikes be breached.
- ▶ These recommendations apply for both pits that may or may not have PK.



TK Panel #12 Summary Continued

- ▶ 12.7: The TK Panel would like Diavik to test water in the pits for at least two years (until the water is deemed good) and compare this to water in Lac de Gras. Water samples will be collected from multiple depths at various times throughout each year and tested according to the AEMP protocols. Taste tests will be done after scientific sampling tells us the water is drinkable, where they will watch for smell, clarity (turbidity), temperature, colouration, scum on the water or tea, and water and tea for taste.
- ▶ 12.8: When scientists and the TK Panel agree that the pit water is safe (i.e., drinkable) and stable (i.e., consistent), then breaching of the dikes can occur to allow water to flow back and forth but prevent fish from entering the pits, at least initially.



Indigenous Ways of Watching Water: Canadian Examples

Tr'ondëk Hwëch'in Water Quality Indicators¹

Table 1. Summary of indicators used by TH Elders to determine if traditional drinking water sources are safe for human consumption.

Indicator	Description
Sensorial Properties	
Color	Water should be clear with no color (e.g., tap water can be grayish or yellow).
Turbidity	The term "White Water" refers to clear water that you could see through. This means that water with limited turbidity is desirable.
Running Water	Water should be fast flowing and not stagnant.
Nothing Growing	No moss or plants should be growing on the rocks.
No animals in vicinity	There should be no animals around to contaminate the water. Ducks swimming in water can be a sign that it is not contaminated.
Makes Good Tea	Water should make red tea. Bad water makes black tea that leaves stains in your cup.
Odor	There should be no smell.
Taste	It should have a "fresh" taste. It should taste "good." It should not taste like chlorine.
Prior Knowledge and Use	
Prior Use	The water source has been used by many generations.
Knowledge of sources of contamination	There should be nothing above the water source in the watershed (e.g., no outhouses, septic fields, or resource extraction).
Water Quality Testing	Several Elders noted that they would like water quality sampling to be conducted at the water sources they use.

¹ <https://www.mdpi.com/2073-4441/11/3/624#:~:text=Water%20%7C%20Free%20Full%2DText%20%7C,Water%20Sources%20in%20Yukon%2C%20Canada>

Inuu'tuti: Baker Lake Aquatic Cumulative Effects Monitoring Program¹

Indicator Types	TK Measurement Indicators	Western Science Measurement Indicators	
Taste & smell (Organoleptics)	Taste of "land"	Organic carbon	Nutrient concentrations
		pH	Chlorophyll a
		Conductivity	
	Saltiness	Conductivity	Hardness
		Salinity	Alkalinity
		Chloride, sodium	
	Fishy smell	Specific algal community	Chlorophyll a
		Nutrient concentrations: nitrogen species, phosphorus	
		Salinity	Chloride, sodium
	Water is "refreshing"	pH	Temperature
		Copper, iron, manganese, sodium	Hardness
		Total suspended solids	Turbidity
		Total dissolved solids	Flow

¹ <https://www.afn.ca/wp-content/uploads/2019/03/10-Integrated-Water-Management-Hutchinson-Environmental-Sciences-Ltd.pdf>

Culturally relevant water quality criteria: Indigenous Guardians Toolkit¹

- ▶ Mikisew Cree First Nation Community Based Monitoring² and the Athabasca River Watershed (Fort McKay, Athabasca Chipewyan)
 - ▶ Indigenous indicators of water quality and climate change (weather conditions, flow, winter ice conditions, algae, foamy scum, dirty water, scum on tea pots and boats, smell, colour, proximity to development project/site, perceived contamination)³
 - ▶ Water quality index for each site (green, yellow, red)
 - ▶ Water quantity/level: Aboriginal Base Flow and Extreme Flow
 - ▶ Place names important

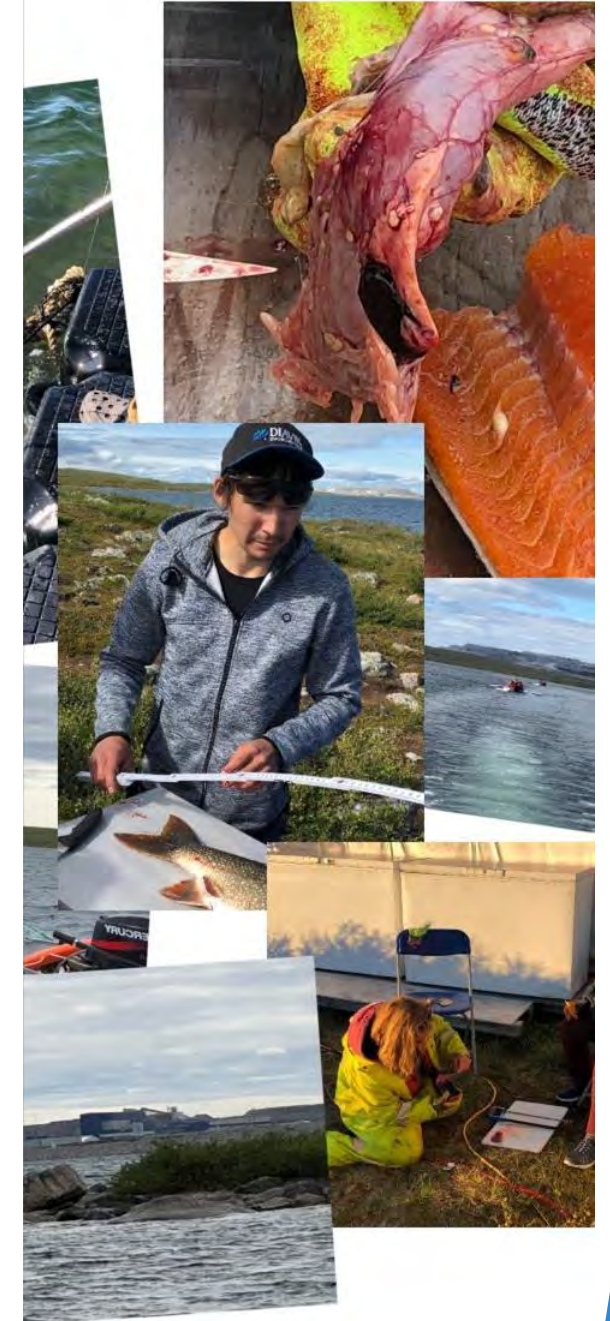
¹ <https://www.indigenousguardianstoolkit.ca/>

² <http://mikisewgir.com/cbm>

³ <https://www.ourcommons.ca/Content/Committee/421/ENVI/Brief/BR8622379/br-external/MikisewCreeFirstNation-e.pdf>

Why are we here today?

- ▶ We need “clear, measurable and culturally relevant criteria” for measuring water quality
- ▶ Consider:
 - ▶ What are the good properties you look for in other lakes you use?
 - ▶ What are the properties of water that make it suitable for cultural use?
 - ▶ What needs to happen to see if the spirit returns to the pit lake?
 - ▶ Do people expect to draw water from the pit lake for cultural use?
 - ▶ What properties in the pit lake could change your use of the big lake?



Next Steps

- ▶ Workshop summaries and transcription files returned to each community
- ▶ Summary report from all workshops ready for public water board hearing (November 2020)

Thank you!



2018 AEMP at Diavik/Lac de Gras**TK of Water**

Date: 2018 – August - ____

Recorder: _____

Location/Depth: _____

Sample ID: _____ Group/Person: _____

Collection Features:**(Circle what best describes the feature.)****Comments**

Temperature: Cold Average Warm _____

Depth: Deep Average Shallow _____

Clarity: See bottom Murky Cannot see your hand in water _____

Movement: Still Some Running _____

Colour: Blue Green Yellow Other _____

Other: _____

Taste Test:

Tea: Good Average Poor _____

Comments: _____

Water: Good Average Poor _____

Comments: _____

Overall Description:

Why was this water testing location chosen? _____

How can you tell when water is healthy or unhealthy? _____

If water had words, what would it say about how it is doing? It is happy? Hurting? Why?

What can you teach us about water? _____

Notes:

Guiding principle: Water is alive. It can hear what we are saying about it. We need to be respectful of the water. We should avoid talking too much about water.

Water Movement: Movement of the water may be related to the weather, so we need to check beneath the surface to determine if the water is really running.

Remember Camp Protocols:

When going out in the boat, did you give tobacco, pay the water, feed the land or say some words?

Are you taking care of the Elders?

Appendix C – Workshop Evaluation Summary

Workshop Evaluation 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?	1	2	0	0	0	3	
How would you rate the session for mutual respect among participants?	2	1	0	0	0	3	
How would you rate the recording and documenting of TK during the session?	1	0	2	0	0	3	
How would you rate the facilitation of the session?	2	1	0	0	0	3	
How would you rate the outcomes and findings of the session?	0	0	3	0	0	3	That's to come
How would you rate the technical quality of the session?	0	1	2	0	0	3	
How would you rate the logistics for the session?	1	2	0	0	0	3	
Overall, how would you rate the session?	0	3	0	0	0	3	

Question	Too long/much	Enough	Too few/little	Total Responses	Comments
How would you rate the opportunities for you to share your knowledge and experiences?	0	3	0	3	
How would you rate the amount of time to discuss the topic(s) during the session?	0	2	1	3	

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

Participants camaraderie and food

The ability to fully participate and draw out the information for input to DDMI

Good people

How could the session be improved?

Move it to Hay River and have everyone go there

Better sound quality

Have it live

Summary for Rio Tinto Diavik Diamond Mine Water Quality Criteria for Cultural Use Workshops

Northwest Territory Métis Nation
Hay River and Fort Smith, NT
May 3-4, 2021 and April 27, 2022



Prepared by: Natasha Thorpe, Joanne Barnaby, Sarah Ravensbergen

May 7, 2021, Updated May 18, 2022

V2.0

Disclaimer

The document does not represent the results of community consultation. It is subject to the “No Prejudice” clauses of Article II, Section 2.1 of the Environmental Agreement for the Diavik Diamond Project. The document does not necessarily reflect the views of any Party to the Environmental Agreement. Any misinterpretation, error, or omission is that of the authors.

Suggested Citation: Thorpe Consulting Services Ltd. and Barnaby Consulting. 2021. Summary for Rio Tinto Diavik Diamond Mine. Water Quality Criteria for Cultural Use Workshops. Northwest Territory Métis Nation. Hay River and Fort Smith, NT. May 3-4, 2021 and April 27, 2022. Prepared by Natasha Thorpe, Joanne Barnaby, Sarah Ravensbergen. May 7, 2021; Updated May 18, 2022. V 2.0.

Updated and verified June 3, 2022 by Myra Berrub with Lorne Napier.

Cover photo: Workshop #2 Participants gather. Front (L to R): Joanne Barnaby, Tara Marchiori, Jeanette Mandeville, Mary Helen Piche and Lorne Napier. Back (L to R): Natasha Thorpe, Dennis Hudson, Don Mabitt, Vita Morin-Beaulieu, Leonard Desjarlais, Archie Larocque, Calvin Lizotte, Earl Evans, and Sean Sinclair.



Photo: Elders Mary Helen Piche and Gordon Mecredi (foreground) watch a RioTinto presentation along with Tara Marchiori (background).

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Executive Summary

On May 3 and 4, 2021, leadership of the Northwest Territory Métis Nation (NWTMN) participated in a virtual workshop with Diavik Diamond Mines Inc. (DDMI) staff and consultants. On April 27, 2022, a second workshop was held in-person in Fort Smith, NT, with NWTMN Elders and other members. The purpose of these workshops was to discuss: (1) water quality recommendations from the 2019 twelfth session of the Traditional Knowledge (TK)¹ Panel; and (2) Measure 2 of the *Mackenzie Valley Review Board Reasons for Decision Report from the Processed Kimberlite to Mine Workings (PKMW) Project*.² Measure 2 is significant in that it states that “Diavik will work collaboratively with Indigenous groups to develop criteria for determining if water in the pit lake is acceptable for cultural use” and that “water quality objectives need clear, measurable and culturally relevant criteria,” (MVRB 2020: 82).

In the first workshop, NWTMN leadership considered a summary of properties that make water suitable for cultural use, based on input from, and documented during similar workshops with, northern Indigenous groups in 2020 and 2021. Participants generally agreed with what was proposed (Table 1). In addition, they made recommendations for follow-up around: the inclusion of healthy birds (as indicators of healthy water); the importance of examining cumulative effects (i.e., DDMI should look at total contaminants on properties, not just from one piece of operations/ company); water should be free of chemicals, dirt, dust; and Elders wanting healthy edible fish and wildlife (i.e., no mercury, oil, clean water with no sulfuric acids).

In the second workshop, Elders were invited to comment on five key criteria proposed by DDMI based on the input received from northern Indigenous groups, for submission to regulators (Figure 1). In accordance with feedback received during 2020 and 2021, Elders considered whether water acceptable for cultural use must have these properties:

1. looks clear;
2. feels cool or cold;
3. smells clean and healthy;
4. tastes fresh; and
5. sounds alive.

Participants in the second workshop generally agreed with these five criteria and voiced the importance of ongoing NWTMN engagement in monitoring (i.e., DDMI guardians programs) as well as concerns about overall water quality. Elders also repeated several key themes expressed in the first workshop.

¹ Note that Traditional Knowledge (TK) and Indigenous Knowledge (IK) are used interchangeably throughout this report. While IK is the more accepted term, TK is generally used more often in the North.

² [Mackenzie Valley Review Board. 2020. Diavik Diamond Mines Inc. Depositing Processed Kimberlite into Pit\(s\) and Underground. Reasons for Decision. EA 1819-01. January 2020.](#)

Key discussion points expressed at both workshops included:

- The Project area is important now and historically to NWTMN for harvesting and cultural, spiritual, and other uses.
- NWTMN have been impacted by mining processes. Membership is not likely to use the Lac de Gras water for cultural purposes given there are nearby alternatives.
- It is important to NWTMN to have funding to hire consultants to carry out independent reviews of Diavik's science / processes around fish and water. Fundamentally, the NWTMN needs to know first if the water is scientifically safe. Is it free of contaminants, chemicals and pollutants according to testing? That comes first. Indigenous Knowledge (IK) testing can be done at the same time, or when it is safe. Speaking to "old" and experienced people that fish and Elders is also a good way to document knowledge of fish (i.e., IK documented alongside western science).
- NWTMN reiterated that they want to be involved and trained in ongoing monitoring programs and to provide advice on what needs to be monitored; participants also inquired about training for Indigenous individuals on scientific approaches to monitoring going forward. The NWTMN also wants to be included in the TK Panel. Further discussions on how NWTMN can be included in monitoring are important to continue.
- NWTMN has concerns related to Diavik's operations, specifically, effects on water quality, including: cumulative effects; impacts of PK and contaminants on water; dust; human health; impacts to caribou; fish; birds; benthic and pelagic microorganisms including zooplankton, bugs; plans to reconnect the pits with Lac de Gras; health of people and the environment; Diavik's zone of influence; impacts of chemicals used in the blasting process.

Elders put forth the following recommendations during the second workshop, building upon leadership contributions in the first workshop:

- People want Lac de Gras water to be free of harmful benthic organisms as well as bacteria, biohazards, viruses, parasites, waste, organics and nutrients such as nitrogen and phosphorus. Testing and ongoing monitoring should address this. There must be ongoing independent monitoring of Diavik by Indigenous groups.
- Diavik must pay for training of Indigenous Guardians to continue monitoring the site long into the future (50 years?). This training will enable Guardians to use IK and western science when carrying out monitoring. A comprehensive guardianship/monitoring program (that focuses on cultural monitoring) for the impacted communities, including NWTMN, should be established– for water, fish, air, wildlife, flora and fauna. "We need to see animals and fish return to live there. We want to see the life return to the area – with plants and animals." It is very important to NWTMN members that cultural monitoring take place, and it should be done in collaboration with other Indigenous groups and with the NWT Métis Cultural Institute.
- Ongoing testing of fish should not be limited to slimy sculpin, but should also include:
 - a. Large fish testing (as appropriate);

- b. Testing on taste, texture, look, liver general health, insides, spine; and
- c. Testing of fish on lakes south and north of Lac De Gras.
- Fish and water testing should take place on a lake (outside of the impact zone, at least 60 kms away) to test and monitor to compare to Lac de Gras.
- Birds use of water can be an indicator of aquatic health and used in monitoring programs. People know that water quality is good for cultural use when it is being used by birds (for this reason, it should be part of a monitoring program).

Participants agreed that the following should be added to the proposed list of water quality criteria, or understood as a part of the existing “sounds alive” criterion: spirit returns to an area when wildlife, plants, birds, fish, people, etc. come back to the area and renew their relationship with the land as it was before.

NWTMN continues to express frustration that they are not involved in DDMI processes to the extent they would like to be, largely because the NWTMN was not a signatory to the Environmental Agreement. Their role as intervenors is frustrating.

Both workshops further advanced understandings of what makes water suitable for cultural use and how water quality objectives need clear, measurable, and culturally relevant criteria. Ongoing discussions will advance ways in which these criteria will be measured, with the understanding that common sense (as far as it applies to what is meant by water quality) means different things to different cultures. Participants reiterated that water is culturally and spiritually significant for a wide array of reasons, and this can be difficult to explain, especially in a workshop setting rather than being out on the land.

List of Participants (Workshop #1)

Garry Bailey, President, Northwest Territory Métis Nation (NWTMN) Executive
Trevor Beck, President, Hay River Métis Community Council
Lloyd Cardinal, President, Fort Resolution Métis Government (FRMG)
Paul Harrington, Secretary Treasurer, NWTMN
Allan Heron, President, Fort Smith Métis Council
Tim Heron, Lands and Resources Manager, NWTMN
Michael Holmberg, NWTMN Communications
Betty Villebrun, Vice President, NWTMN Executive

Myra Berrub (DDMI)
Tara Marchiori (DDMI)
Gord Macdonald (DDMI) – day 2 only
Sean Sinclair (DDMI)

Joanne Barnaby (Consultant, Joanne Barnaby Consulting)
Natasha Thorpe (Consultant, Thorpe Consulting Services Ltd.)
Sarah Ravensbergen (Consultant, Thorpe Consulting Services Ltd.)

List of Participants (Workshop #2)

Calvin Lizotte, Elder, Hay River Métis Government
Don Mabbitt, Elder, Hay River Métis Government
Jeanette Mandeville, Elder, Hay River Métis Government
Vitaline Morin-Beaulieu, Elder, Hay River Métis Government
Leonard Desjarlais, Elder, Fort Smith Métis Council
Earl Evans, Elder, Fort Smith Métis Council
Dennis Hudson, Elder, Fort Smith Métis Council
Archie Larocque, Elder, Fort Smith Métis Council
Gord Mercredi, Elder, Fort Smith Métis Council
Mary Helen Piche, Elder, Fort Smith Métis Council

Lorne Napier, Manager, Lands and Resources, NWTMN
Cynthia Cardinal, Lands Clerk, NWTMN

Tara Marchiori (DDMI)
Sean Sinclair (DDMI)

Joanne Barnaby (Consultant, Joanne Barnaby Consulting)
Natasha Thorpe (Consultant, Thorpe Consulting Services Ltd.)

Workshop notes transcribed and report preparation lead by: Sarah Ravensbergen
(Consultant, Thorpe Consulting Services Ltd.)



Participants from Workshop #2 gather in Fort Smith, NT on April 27, 2022.

Background

Throughout 2020 and 2021, Diavik Diamond Mines (2012) Inc. (DDMI) supported virtual workshops (Water Quality Criteria Workshops) with both Participation Agreement signatories and other potentially impacted Indigenous groups that participated in the Processed Kimberlite to Mine Workings (PKMW) Environmental Assessment.

The intent of these workshops was to discuss recommendations from the twelfth session of the TK Panel (2019), specifically those recommendations referring to water quality. Measure 2 of the Reasons for Decision Report from the PKMW Project³ states that “Diavik will work collaboratively with Indigenous groups to develop criteria for determining if water in the pit lake is acceptable for cultural use” and that “water quality objectives need clear, measurable and culturally relevant criteria” (MVRB 2020: 82). Accordingly, DDMI requested workshops with Participation Agreement and non-Participation Agreement communities to develop and discuss these criteria in relation to closure planning.

On May 3 and 4, 2021, leadership of the Northwest Territory Métis Nation (NWTMN) participated in a virtual workshop with DDMI staff and consultants. Leadership was asked to develop ideas around what potential qualities of water make it acceptable for cultural use, and to review a summary of water quality properties based on IK shared throughout other workshops held in 2020 and 2021 (Table 1).

All questions were encouraged by facilitators, but guiding discussion questions included:

- What are the good properties you look for in other lakes you use?
- What are the properties of water that make it suitable for cultural use?
- What do you need to know (i.e., what are the properties) in order to drink water from the land?
- What needs to happen to see if the spirit returns to the pit lake?
- Do people expect to draw water from the pit lake for cultural use?
- How will the properties of the pit lake with PK change your use of the big lake?

³[Mackenzie Valley Review Board. 2020. Diavik Diamond Mines Inc. Depositing Processed Kimberlite into Pit\(s\) and Underground. Reasons for Decision. EA 1819-01. January 2020.](#)

Table 1. Summary of Water Quality Workshops (2020-2021). The list describes various qualities of water that make it suitable for cultural use, discussed by Indigenous participants during workshops held in 2020 and 2021.

Property
Healthy, edible fish, healthy wildlife, animals using the water; edible fish
Clean smell (can have a fishy smell) and taste (affected by fish, wildlife, plants, rocks, temperature, location, saltiness, sediments); clean smell (can have a fishy smell)
Clear colour (natural, not murky, no oil, film, scum, not too much algae); Clear (natural, no oil, foam, scum, not too much algae, nothing floating or disturbed in the water i.e., pollen, dust); Healthy look and taste (especially for tea making), no smell
Free of contaminants/chemicals
Moving, flowing (from wind or current); not stagnant
Healthy flora and fauna in the water; Shoreline plants are healthy (e.g., willows, reeds, sedges)
History of the area (TK says it has been used); Shoreline rocks are worn from use
Quality of snow/ice
Cold water high in oxygen; temperature is important
Can drink unaltered; don't have to boil it
Free of deposits or by-products (e.g., crushed gravel, PK), and does not exceed the acceptable Canadian Water Quality Guideline levels

In 2022, as COVID restrictions lifted, additional workshops were held in-person with the NWTMN. In the first workshop, leadership requested that questions related to Indigenous Knowledge (IK) of water quality should be asked of NWTMN Elders. In response, Diavik supported a second workshop on April 27, 2022. Further, DDMI prepared a proposed cultural use water quality criteria list to submit to regulators which participants in the second workshop were asked to review (see Figure 1). Specifically, it was proposed that water acceptable for cultural use must have these properties:

1. looks clear;
2. feels cool or cold;
3. smells clean and healthy;
4. tastes fresh; and
5. sounds alive.

For the second workshop, discussion was semi-directed as Elders had many questions about the mine itself as well as water quality. Guiding discussion included the following questions:

- Does the *Diavik Proposed Cultural Water Quality Criteria* capture your ideas?
- Is there anything else that should be added?
- Do you have any suggestions on how to measure or monitor the proposed cultural water quality criteria?

Figure 1: Five key criteria of water acceptable for cultural use based on the input received from Indigenous groups

PROPOSED CRITERIA	COMMENT
looks clear	water / ice should be free of foam, grease, soap, sediment, dust, dirt, materials
feels cool or cold	temperature is affected by location, depth, climate change, industrial development
smells clean and healthy	smell is affected by fish, wildlife, plants, rocks, temperature, location, saltiness, materials, sediments, industrial development; can have a fishy smell but not overpowering
tastes fresh	taste is affected by affected by fish, wildlife, plants, rocks, temperature, location, saltiness, sediments, industrial development
sounds alive	water sounds are affected by movement as well as activity by people, fish, wildlife, birds, etc.)

Summary: What We Heard (Workshop #1)

- Questions related to TK of water quality need to be asked of NWTMN Elders.
- It is important to NWTMN to have funding to hire consultants to carry out independent reviews of Diavik's science / processes. It is important that NWTMN is included in monitoring, and they would like to be included in the TK Panel. Further discussions on how NWTMN can be included in monitoring are important to continue.
- The Project area is important now and historically to NWTMN for harvesting and cultural, spiritual, and other uses. NWTMN have been impacted by mining processes.
- IBA/benefits/impacts from DDMI on NWTMN are important to discuss.⁴
- NWTMN would like to have a better understanding of the PKMW Project and other Diavik closure processes (including the science and an understanding of cumulative effects and contaminants). Continued and ongoing discussions on closure plans more broadly, and emergency plans/mitigation measures, are important.
- It is important to see what other groups are doing/saying about Diavik processes.
- It is important to start building a relationship with Diavik.
- The PKMW concepts have not been tested in other places; since water is integral to NWTMN cultural and identity, it is important to get this process right.
- NWTMN members are not comfortable with the idea of mixing water from the pit lakes with water from Lac de Gras and stated they would be unlikely to use water from the pit lakes following closure: *"...the concept and idea of having something not so polluted that you can open it up and put it into Lac de Gras-this concept of having anything that's polluted and thinking you can downsize it by distributing it with other water, I don't think that's right."* (Paul Harrington)

⁴ Gord Macdonald, Manager (Closure) joined the meeting on day 2 to address these concerns. Diavik also stated several times that this was not the intent of this workshop.

- NWTMN has concerns related to Diavik's operations, specifically, effects on water quality, including: cumulative effects; impacts of PK and contaminants on water; dust; human health; impacts to caribou; fish; birds; benthic and pelagic microorganisms including zooplankton, bugs; plans to reconnect the pits with Lac de Gras; increased time spent for harvesting, especially caribou; safety, health of people and the environment; Diavik's zone of influence; impacts of chemicals used in the blasting process.
- Water in the pit lakes should not be mixed with water from Lac de Gras until all Indigenous groups, including NWTMN, agree it is okay.
- Honoraria should be paid to all participating NWTMN members when engaging with Diavik.
- Re: Covid-19, on site testing of the sewage should be completed.
- NWTMN members reviewed Table 1 and agreed with what was included. They recommended that the following should be added:
 - healthy birds;
 - the importance of examining cumulative effects (i.e., should look at total contaminants on properties, not just from one piece of operations/ company);
 - water free of chemicals, dirt, dust; and
 - Elders want healthy edible fish and wildlife, no mercury, oil, clean water with no sulfuric acids.

*... my idea of clean water is going to be when it's cold, there's no sediment in it.
[Garry Bailey]*

*The confidence in my drinking water would be that there is stuff living in it.
[Trevor Beck]*

...back in the day, you go down to the river in Hay River, and just about every boat on the river, there was a cup in that boat, tied to the boat. We used to just use them, drink the water out of the river. The string was tied to the cup so the kids that used those cups wouldn't lose them. We don't do that anymore, we can't. [Paul Harrington]

- To feel comfortable drinking the water around Diavik, NWTMN members would like to know water had been tested and that there had been treatment done. Members felt that it will be difficult, if not impossible, for the water to go back to its' natural state (or the state it was in prior to Diavik's operations).

Summary: What We Heard (Workshop #2)

- The water in tundra lakes near Lac de Gras is known to be clear with far fewer contaminants than water in the Fort Smith area (e.g., Slave River) that is affected by oil sands. As in the first workshop, participants repeated that people would not go to the pit lakes for water in the future.

- Workshop participants inquired about scientific baseline testing of water and fish and ongoing testing of benthic organisms as well as bacteria, biohazards, viruses, parasites, waste, organics and nutrients such as nitrogen and phosphorus.
- More comprehensive modelling to account for future impacts of climate change and cumulative impacts was highlighted as being important. Ongoing monitoring of weather and temperature will be key, especially related to closure planning. Participants expressed concern related to Diavik's plans to bury waste on-site and challenged the assumption (based on Diavik's modelling) that contaminants from the dump will not leach into surrounding water.
- Continuing to test fish and water in Lac de Gras is important to make sure there are no contaminants.
- NWTMN reiterated that they want to be involved and trained in ongoing monitoring programs and to provide advice on what needs to be monitored; participants also inquired about training for Indigenous individuals on scientific approaches to monitoring going forward. For example, members recommended that fish be monitored (specifically, taste, spine, texture, look, liver, general health, internal organs) both in the pit lakes and Lac de Gras. Large fish should be tested as impacts to their population are different compared with smaller fish; participants are concerned about bioaccumulation, suggesting that monitoring of slimy sculpin may not capture impacts to other ecosystem components or the ecosystem as a whole. NWTMN has applied for funding for a guardians program but there are still questions around how it will be carried out; NWTMN would like to monitor collaboratively with other Indigenous groups, and in partnership with the NWT Métis Cultural Institute.
- Birds use of water can be an indicator of aquatic health and used in monitoring programs.
- Speaking to "old" and experienced people that fish and Elders is also a good way to document knowledge of fish (i.e., IK documented alongside western science).
- Participants recommended that lakes above and below Lac de Gras be monitored for water quality.
- People want the spirit to return to the area. When there are animals, birds, plants and fish that return (flora and fauna that were in the area before Diavik operations began), that is a sign that the spirit has returned.
- Diavik needs to be accountable. Monitoring should be ongoing after mine closure, until 2050 according to some participants and 50 years plus according to other participants
- As in the first workshop, people expressed frustration that the NWTMN are not involved in DDMI processes to the extent they would like to be, largely because the NWTMN was not a signatory to the Environmental Agreement. This role as intervenors is frustrating.
- Participants highlighted their use of the Lac de Gras area, hunting and trapping, and how Métis guides led explorers through the area. Some place names around Lac de Gras were provided by Métis guides. More work needs to be done around documenting historical references to this area.

- Some workshop participants shared their sadness around the current state of the area compared to how it was left by their NWTMN ancestors.
- Common sense as far as it applies to what is meant by water quality means different things to different cultures; participants reiterated that water is culturally and spiritually significant for a wide array of reasons, and this can be difficult to explain especially in a workshop setting and not on the land.

Action Items and Next Steps (Workshop #1)

- Diavik aims to complete workshops with Participation Agreement and other potentially affected Indigenous groups identified during the PKMW EA, with the combined outcomes used to develop recommended cultural use water quality criteria to submit to regulators in 2022. Update: Workshops completed in April 2022.
- Copies of detailed workshop notes, and this summary document to be provided to NWTMN. Update: Provided on May 25, 2021, resent on October 14, 2021, on November 29, 2021, on February 2, 2022 by DDMI staff.
- Diavik to provide links to reports / videos from EMAB / previous AEMP and TK Panel findings. Update: Links provided on May 14, 2021 by DDMI staff.
- President Bailey provided a dollar estimate during the meeting as the basis for their proposed door-to-door Elder interview approach; this budget will be shared with DDMI after the meeting. Myra will continue to work with NWTMN, especially Tim and Ursula, to work out final budgeting for upcoming next steps in May / June 2021 for the PK to Mine Workings Project. This budgeting will include work to hire staff in each community to interview Elders about water quality criteria. Update: DDMI supported the second workshop with Elders on April 27, 2022
- Diavik will continue to work with NWTMN on finalizing an engagement protocol and building a relationship; an offer to visit the mine site was extended to NWTMN when conditions allow. Update: Engagement protocol signed on September 14, 2021 by President Garry Bailey
- Diavik will continue to update NWTMN on closure processes, business opportunities, employment, and potential ways that NWTMN can be involved in monitoring and closure going forward.
- NWTMN confirmed that their primary contact for Diavik engagements was Tim Heron. Update: Lorne Napier has stepped into this position as of the spring 2022.
- DDMI confirmed that Myra Berrub continues to be the primary contact.

Action Items and Next Steps (Workshop #2)

- People want to know that Lac de Gras water will be free of harmful benthic organisms as well as bacteria, biohazards, viruses, parasites, waste, organics and nutrients such as nitrogen and phosphorus. Testing and ongoing monitoring should

address this. There must be independent monitoring of Diavik by Indigenous groups.

- Diavik should pay for training of Indigenous Guardians to continue monitoring the site long into the future (50 years?). This training will enable Guardians to use IK and western science when carrying out monitoring. A comprehensive guardianship/monitoring program (that focuses on cultural monitoring) for the impacted communities, including NWTMN, should be established– for water, fish, air, wildlife, flora and fauna. “We need to see animals and fish return to live there. We want to see the life return to the area – with plants and animals.” It is very important to NWTMN members that cultural monitoring take place, and it should be done in collaboration with other Indigenous groups and with the NWT Métis Cultural Institute.”
- Ongoing testing of fish should not be limited to slimy sculpin, but should also include:
 - a. Large fish testing (as appropriate);
 - b. Testing on taste, texture, look, liver general health, insides, spine; and
 - c. Testing of fish on lakes south and north of Lac De Gras.
- Fish and water testing should take place on a lake (outside of the impact zone, at least 60 kms away) to test and monitor to compare to Lac de Gras.
- Birds use of water can be an indicator of aquatic health, and included as an indicator species in monitoring programs. People know that water quality is good for cultural use when it is being used by birds; for this reason, birds should be part of a monitoring program.
- The following criterion should be added to the proposed list of water quality criteria submitted to the WRRB, or understood to be part of the existing “sounds alive” criterion: the spirit returns to an area when wildlife, plants, birds, fish, people, etc. come back to the area and renew their relationship with the land as it was before.

Participant Questions (Workshop #1)

The following is a list of questions asked of Diavik by workshop participants. Responses are further detailed in accompanying detailed workshop notes.

- Allan: If your people are coming in from the south, do they do the same thing they do here at the airports in Hay River and Fort Smith, there’s a screening going on before they go on the plane?
 - Tara: That’s correct. For all points of pick up they do antigen testing at the points of pick up, and also the pre-screening requirements.
- Allan: That’s even from the south then, from Edmonton?
 - Tara: Correct. Every point of pick up that we have, they do the same protocols.
- Paul: Are there direct flights right from down south to Diavik?
 - Tara: Yes, one of the changes was that people aren’t allowed to take commercial aircraft to site anymore, so we do have several points of pick up that are charter

flights that go from the point of pick up to Diavik without a stop in Yellowknife or the north.

- Garry: You mentioned 125 million karats to date, what's the value of that?
 - Myra: I don't know that number, Tara, or Sean? We might have to get back to you on that.
- Garry: ...the NWTMN has never been part of Diavik when it comes to Impact Benefit Agreements [IBAs]. To date I don't understand why not.
 - Myra: You are correct, we don't have an IBA with NWTMN. Those agreements were established before the mine went into commercial production in 2000 and 2001. It wasn't the intent of the discussion today but we can take that offside in our ongoing discussions.
- Trevor: With Covid and the different restrictions, is that going to extend the life of the mine? Is that still 2025? Will these delays extend it, thanks.
 - Myra: The impact of Covid may end up shortening the life of mine. We have not seen that the impact of these delays would be increasing the life of mine. We haven't had much interruption by way of production and output. We anticipated that but now that we are early in 2021, markets have recovered and we have been able to maintain operations.
- Garry: How would we be able to get on this Panel? The NWTMN should be on this Panel, that's a start.
 - Myra: The Panel grew out of the environmental agreement where it is the participation agreement partners that are signatories. They have membership in that Panel. Definitely worth a discussion to understand how we could include NWTMN's input to that work. Open to exploring how we can include that.
- Allan: How did you miss us to start with? Who is representing the Métis, is it the NSMA?
 - Myra: The NSMA are represented, yes.
- Garry: I guess the groups that are involved are the ones that have an IBA, so as far as there are agreements, then they are a part of the Panel, I take it?
 - Myra: There is an environmental agreement which they are signatories to. It's within there that these are the members of this Panel.
- Lloyd: I think there was concerns, I thought my community in Fort Resolution talked about why they wanted to put it [PK] back into the water and cover it up? I don't know if you're correct when you say the recommendation was from Aboriginal people to put it back into the water.
 - Sean: That's true. I didn't mean to imply that everyone recommended it or that everyone thought it was a good idea, it's just it did come up in a TK Panel session almost a decade ago. Through this EA and water license amendment, the big focus has been on the safety to the lake because those open pits will eventually be reconnected to Lac de Gras. You can see on the slide here, the photo on the top left-right now they are open holes, over 600 m deep. Once we put PK in them and close the mine, we'll flood them with lake water. Then it will be filled with water to the top. It will be part of the lake again. The concern continues to be that that PK is safe at the bottom of the lake and won't contaminate the lake. And that's what we're here to talk about, is how do we monitor to make sure it's safe.

- We have done modelling and independent expert review panels, independent from us, to confirm the modeling seems correct and it will be safe. But modelling is one thing and we need to monitor it and see it. How do we give ourselves that confidence? We still have the option to not connect this with Lac de Gras, if it doesn't end up being safe and the models are incorrect, there are still alternative options for us in terms of managing that.
- Garry: We need to be more involved when we're talking about what chemicals are in the PKC. What are the effects of it? There's a reason they don't want to leave it out on the surface, I'd like to understand why that is.
 - Sean: That's fair. For today and tomorrow we can focus on this PK to Mine Workings question, but I'd be happy to meet and discuss closure more broadly and involve whatever experts are necessary. Our plan hasn't been to put all the rock back in the holes, we thought about it 20 years ago but there was some concern. It would take 20 years to put it back underground, so the plan now is to just fill it with water. We can discuss that.
 - Tim: It's a new technology that's never been proven anywhere else. So far, you've got the WRRB given the Minister of ENR the direction to go ahead and sign the agreement and the water license. We have to figure out how, if anything gets out from that, and into the watershed, how are we going to monitor, and how fast is an emergency plan going to be put into place to stop it from getting into the rest of the watershed?
 - Sean: That's a good point. That's a lot of what we want to talk about it today. For everyone's information, Ekati has filled up one of their mines with PK, so it has been done before. They filled up one almost to the top. They're filling up a second one now, Gahcho Kué is doing a similar plan. The difference for us is that we are really connected to Lac de Gras.
 - Lloyd: What happens if this PK that you put into the pits contaminants the lake, what back up plan do you have? You haven't shared that with us, you said you have a back up plan but that's as far as you said. My question would be, what back up plan do you have and how are you going to mitigate contamination of the lake if it begins?
 - Sean: Thanks Lloyd. I'll start with the question I didn't answer properly, about funding and independent reviews and that element. The way that's being managed so far, it's through the WRRB process. They've required us to pay for this independent expert panel. It's a group of experts that don't work for us. They were chosen by WRRB and that was through a public review. A lot of different groups put forward people they thought were the best experts, and the WRRB chose them, and we paid the bill. The idea was rather than us giving eight different organizations money to hire their own experts, and you get eight different technical expert reviews, the WRRB formed a group of experts who were world class people and we funded that group and then they provided a review that was available to everyone. That's how the MVEIRB and WRRB handled that re: technical reviews. I think it worked pretty well but there can be challenges. To your second point about the contingency plan. Once we close and flood the mine, there will still be the dike that is completely impermeable. That's

- what we've been using to hold back water. That dike will still be in place. If the water is not clean, we won't breach the dike. Right now, the plan is to cut holes in the dike and reconnect it to the big lake so water and fish can flow back and forth. But if the water is not okay, we won't dig channels or little rivers through the dike. One option would be to wait longer and let it settle. We could look at pumping the water out and treating it at our water treatment plant. We could look at treating it, spreading lime on the lake. There's a few options if the water doesn't end up being okay. We've modelled it a lot, done a lot of reviews, everything to date shows it should be clean. If it isn't, we have the ability to keep it separate from the big lake.
- Lloyd: The other question I have, on the middle drawing, you have the PK in the bottom of that hole, and PK water on top, and pit lake water. This PK in the bottom, in the orange, where is that coming from, is that coming from the mine directly? ... The PK you put into the sludge pit that's cordoned off, you treat it. Now you're saying you put PK into that mine that you just dug out, and not even treat it at all and throw it in there? Why are you treating it on one hand in the pit, and now you'll put PK into the pit you just dug out, without treating it? What's the difference?
 - Sean: It's the same material. It's not going to be different. We will take it out, process it, take the diamonds out, and put it back where it came from. It's the same material, not a different process.
 - Myra: This might be the piece that's missing. We have four pits. And you only see three on this picture. The A21 pit is back here. When we pull that kimberlite out of the ground and process it, rather than going into the PK containment facility, it will go directly into the 418 pit because we will have finished mining there. That's where the opportunity has arisen, where we didn't look at this opportunity previously. Back 20 years ago when we were first planning the mine, this came up, but because of the timing of mining these different pits, it wasn't an opportunity. But now that this 418 pit is going to close earlier than the others, we can take the PK from A21 and put it into 418. We're not taking stuff out of the PKC to put into the 418, this is stuff that is coming from A21. It's going through the same processes that the PK in the PKC have undergone, but it's different PK.
 - Lloyd: this PK you're going to put into that pit that you just dug out all the diamonds from, it has chemicals in there, right?
 - Sean: It doesn't have chemicals-we take the kimberlite out of the ground, it's chunky rocks. We crush the rocks up, they get washed with water and we sort it, crushing and shaking it on metal tables with running water, and then we float the diamonds out. There are x-rays and an air gun that blows puffs of air so it's pretty much a mechanical process, it's not like gold mining where you use chemicals. It's a pretty clean process compared to other metal mining techniques. The main concern with the PK is not the chemistry, it's not a toxic, but it's mostly the physical stability-it's a fine muck, so it's more of a safety process, it's not that it has a lot chemicals.
 - Lloyd: Just to be clear, the PK that you dump into the cordoned off pit, there are no chemicals in there. So why do you put lime and other stuff in there?

- Sean: We are not planning to put lime in there. ... but if the chemistry is off or the water quality is unacceptable-
- Lloyd: Unacceptable to what?
- Sean: We have scientific criteria, concentration limits, and that's part of the water license amendment. We have aquatic effects benchmarks and we need to meet those criteria in the top 40m. Part two would be unacceptable based on the criteria we are talking about today. In addition to concentration, nickel, nitrate, etc. that's the piece we're trying to identify.
- Paul: This is a little bit new for me. I grew up around Pine Point mines, I know there are chemicals from blasting, that's one of the bad ones that you end up with when you mine. The other thing is that when you break ground, it doubles in size. So I can see the predicament you're having with your waste, when you dig a hole and the waste doubles in size, and you have to put it somewhere. I assume the alternative of laying it out on the land and making hills doesn't seem to correspond with your plans on what to do with all that waste. Somebody's come up with this good idea of putting it back in the hole. I've heard that before, seen that before, but there is ramifications, and you need to find those out. I'm not clear that I disagree or agree, but is that part of the reason for going to that route, is because of all the other waste that needs to be put someplace, and there's only so much land mass you have to deal with where you're mining?
 - Sean: If we don't put it back in the hole, we'll have to make the dam higher, raise it another 4-6 m. That's the PKC where we've been putting it for the last 18 years. It's really big, 6 km around. If we don't put it back underground, we will have to raise the entire dam. That's why we went through this process for the last 3 years, instead of making the PKC higher. The challenge is what you've described, Paul.
- Paul: Won't there be displacement? When you're putting that in there, why would you put more water in from Lac de Gras? What are you going to do with the water? When you start filling it up there's going to be water that has to be displaced, what are you going to do with that water?
 - Sean: The hole will be dry. We pump the water out of it so it's totally dry, that hole is empty.
- Tim: On the spiritual side, which is connected to the medicinal purposes, are you looking at getting information from the Elders on the strengths of the vegetation you use for medicinal purposes? Because if you get dirty water, it may have an effect on the strength of its' usage. When I was younger, when I was starting with climate change, I heard the Elders saying, how strong is that medicine now with the air quality? We have to look at the water quality too that's helping it grow.
 - Joanne: There has been that kind of concern expressed. Not only for medicine but for caribou habitat and other animals in the area. So that's certainly one aspect of water quality that we need to think about and plan for
- Tim: When Paul was speaking, he hit the nail on the head with the water, especially with levels. That's coming back into Lac de Gras, and where you guys use the other lakes external to it as storage, what are those levels that can't get back into Lac de Gras? How's it going to affect the aquatics / chemistry in those lakes, the water

temperature, the fish habitat in the future? Those are things we need to know. We can't concentrate just on Lac de Gras, it's the other storage areas you guys use.

- Sean: While we're filling the pits, we will be making sure we monitor the water level in Lac de Gras to make sure it doesn't go down too far and we don't expose the lake bed. Based on the modelling so far, it shouldn't change the water level very much because Lac de Gras is really big and we'll take about 10 months to fill these, slow enough that it won't affect the water level. In terms of chemistry, we will continue to do the AEMP monitoring. We collect water samples end to end on Lac de Gras. It's a 60 km long lake, and we collect samples along that whole area. So water flows from Lac du Sauvage past Diavik to the Coppermine River. That goes from about 500 km to the Arctic, so we will continue to monitor Lac de Gras at the top of the Coppermine. Everything ends at the Coppermine so we are always monitoring the chemistry there too. That's the lake sample, and there is sampling on all the ponds on the island, every month when there is water in the summer. Those are the main water ones.
- Allan: You mentioned earlier you have these other Aboriginal groups doing whatever at the mine, going out checking fish and water. What's the results that you get back from them when you have you workshops with them?
 - Joanne: Generally, they haven't found a problem, all of their observations and comments have been recorded, and so when we look back at all of those sessions and reports, essentially the Elders are saying they don't really see change. They don't see change in water quality and in the fish. That's their overall picture that they're painting for us.
- Allan: Thank you for that. I haven't been up there, it's my first time talking about it. I've been to Gahcho Kué and Snap Lake also, and what I've seen up there is quite amazing, the care they have for the environment. I'm wondering if Diavik has the same.
 - Sean: I would certainly like to say that we do, we have similar management plans and similar monitoring to Gahcho Kué overall. Honestly I think we are especially careful in the way we operate because we are right in Lac de Gras. We have to be very careful. We have a water treatment plant, we collect water and we have to monitor carefully.
- Allan: I am an Elder also, but sometimes we do make mistakes also. This is why I asked earlier if the evidence you are getting from the Elders, or whoever on the Panel, is clear, is understandable. Do they know what their talking about, do you understand what their trying to say? Communication is a great thing.
 - Joanne: Allan, one of the things we do as part of the Panel process is we review their words on a daily basis in great detail. Then we also ensure that there's a comfort level present before recommendations are made. We double and triple check with everyone on the Panel about how they feel about recommendations. That proves to be really useful because sometimes they modify those recommendations after they've had time to think about them and hear from other Elders. To me, working with them requires me as an individual to honour them and make sure that we are being true to not only their words but their intentions.

- Tim: It's for Natasha. Could you send those links to me, I believe Joanne has my email address. I can send them to the councils and they can have a look and see if everything is being covered. We don't know what this group is advising you on, we don't know if our interests are being covered or not. Like I pointed out, you always got to go to the councils of the communities. They'll address any concerns. Thank you.
 - Natasha: We will make sure those links get sent out to everybody so that they can be shared.
- Garry: I don't know nothing about that PKC, how you clean it, what chemicals are in it, how hazardous it is to animals, to the water, is it going to get into the fish? I don't have any answers at all. It's unfortunate. We're hear from two days. I thought I would be coming with the questions. Thanks.
 - Myra: Natasha, your first set of questions is more general in terms of what is important in terms of water. Regardless of where we're sitting or any specific lake we might be thinking of, just generally, what would you consider is important in terms of water? Maybe we could focus on that aspect to get a general understanding.
- Paul: Thank you. This meeting that we're having, it's not consultation, is it? Is it consultation for what's to come? If it is, I don't know if we should be sitting here until we work out an IBA.
 - Sean: This isn't meant to be consultation.
- Betty: Is this the first time you've come to us for a meeting? Nobody has come to us to create a meeting. Now you're rushing us, and that's unfair. We have a lot of things to answer to and we need to answer them properly. We want to continue to have good water. You're pushing it too fast here. It's not our fault you have timelines to meet. Thank you.
 - Myra: I appreciate that you're feeling rushed Betty. I will say we have been working through this process since last July. Everybody is busy, Covid happened and there are a lot of different pressures, but we have been working for some time to share this information.
- Allan: Do you have samples from the water that's there now, to see how clear it is, from when you take it out, do your whatever you need to do with it, for the clearance of it, from the taste?
 - Gord: We have a pretty extensive monitoring program and this is something we want to build into annual updates for your community. We measure the water on the site, before it goes to the treatment system. Then throughout the lake, at a number of points several times a year, we have been monitoring other things, the bugs in the water, the fish. That's something, the zone of influence, all those things combine into a program. We would like to come and talk to you each year and see how that's progressing. As we're moving towards closure, we expect to see the zone of influence getting smaller, and as we reduce and eliminate the blasting, we hope to be able to show that we are having less of an impact
- Tim: What was the water chemistry before development, where is that water chemistry today, while you're still in development? These sort of issues are important-are these guys telling us the truth or are they lying? Science you plug it

into a machine and it will give you the answer. But if you put the wrong numbers in that machine, you going to get the wrong answer too. And sometimes it's done that way.

- Gord: Just to try to briefly summarize: we do have water quality information back to 1996, before Diavik was there. We've continued to collect the chemistry. The biggest change we have seen is a change in the phosphorus levels in the lake. Phosphorus is a nutrient and it helps things grow. You tend to not want that in water and in extreme situations it can increase algae. But we're nowhere near the end to that extreme, but we have seen changes. There is more algae in the water and you can measure that change over time. It happens closer to the mine site and doesn't happen further from the mine site. That's the main change. It's groundwater: it seeps in and then when we discharge it into the lake it has more nutrients. But it still doesn't increase the phosphorus levels in the lake much. As soon as we go to closure and we infill those pits with water, we won't be discharging it and the chlorophyll will go back to the same levels. But that's the biggest difference we've seen. We can see differences in the water but all of them are at very low levels, nothing that gets anything close to what we would worry about. But we can measure the differences.
- Tim: With the phosphorus levels, what is it doing to the oxygen levels in the water?
 - Gord: If you get high levels of algal growth you get less oxygen. But we monitor the oxygen and it is nowhere near enough algae to consume oxygen in the water.
- Paul: So the mine will close but the commitment is there to continue monitoring, is that what I'm hearing? We need to be a part of this.
 - Gord: That's exactly what we want-when I talk about this engagement going forward, what we're doing and how we can involve you in what we're doing is all part of this.
- Garry: Who is going to be in charge of the funding aspect we're talking about, about, interviews and hiring somebody?
 - Gord: Garry, you can work directly with Myra on that.
- Garry: I will try to do [the work] it in May, but what's your date for June 1? [Regulatory report submission date]
 - Gord: It was ideally June 1, but if it's pushed to the end of June, we can make it work; let them know we need a few more weeks to include feedback from your group.
- Garry: The monitoring of the dikes: yesterday you mentioned there might be a possibility of the pits being contaminated and if it was contaminated a bit, you would pump the water out so they don't breach the dike, go over the dike. I was wondering about that last night. If you pump it out, where would you put the water?
 - Sean: We would be filling this pit in 2026, 2027. We will still have the water treatment plant on site. If the water was worse than we expect we could pump it out and treat it. In reality we would have to wait longer before we could breach the dikes. That's how we would treat it, with the current plant.
 - Garry: You pump it out, treat it, and then put it back?
 - Sean: It would probably be-we'd pump it out and then the treated water goes in the lake and we would probably bring lake water in to keep it all even. It would

be a bit of a refreshing, cycling the water and treating it that way. That would be a worst case and we are not expected to have to do that.

- Tim: You said the monitoring will go to 2050, but your breaching is going to take in 2028. With the monitoring, if it comes up with scientific or TK evidence, especially when it comes to water, how is going to be treated if the water treatment plant is disassembled or removed?
 - Sean: Right now the plan is to take the treatment plant out in 2028. At that next start before filling the pits with water, we have to do another modelling update and that will go through another expert review and get approval from WRRB. And then we have to do another modelling set, and that model will protect chemistry for next 200 years. At that point we would have the chemical information, the TK, and the updated modelling based on all the inputs. We would use that to make the decision to take down the water plant. If things changed in the future, maybe we would have to make a new treatment plant. There is that chance, that's why we will keep monitoring, we said until 2050. If at 2050 it's getting worse, we would have to keep monitoring it. In the worst case it might mean we have to do active water treatment. We hope it won't be necessary and we don't want the site presence on the island forever, but it remains a worst case option that we could do.
- Garry: I have a different question. I haven't been part of developing the process, I don't know what [costs / billing has been]- we should be billing for everybody that's in this roof, can you answer that?
 - Myra: The budget did not include honoraria for everybody in the room.
 - Garry: I'm not trying to double-dip but we get donations to people, families that need medical assistance, travel money, funerals, scholarships. But that money that we invoice for, all the presidents in this room and Tim, it would go towards something like that. Is there a way we can do that or?
 - Myra: I'm not certain who she included or didn't include, I sent an email to get some clarification from that.
- Tim: Could you talk a little more on your wind power, what's the effect on using that as an energy, it takes so much wind to turn them. What's the effect coming out of it? Their movement must get disturbed. What is it doing to the environment?
 - Sean: The blades are 30 m long, they spin pretty slow, it's a relatively slow spin. Depending on how windy it is, sometimes we get zero power from them and on a windy day we can get half our power from them. When we first installed them we did monitoring to see if we were impacting birds.
- Tim: How loud are they [Diavik wind turbines]?
 - Sean: They are a lot quieter than ones you may have seen down south. They don't have a gear box. A lot of ones down south have a loud hum. Ours, because it's cold, it's simple design. It's a lot quieter than one you see down south. You can sometimes hear the blades if it's really windy.
- Tim: So that noise level, is it being monitored? It may have an effect on wildlife.
 - Sean: It's not because relative to the mine site it's not something you can hear. We have a 1-km away, the diesel power plants are much louder. There's more significant noise sources than the wind towers.

- Tim: But all your noise has got to be put together. And what's the impact?
- Sean: We monitor the impacts on wildlife and do those observations. We don't think much about the wind towers but we make all those observations, how they are cumulatively being impacted by the mine site.

Participant Questions (Workshop #2)

- Dennis: There's nothing really toxic in there now? ...It's just crushed kimberlite?
 - Sean: Yeah, correct. We don't add any chemicals when we do the processing.
- Dennis: So there shouldn't be anything really. So when you say culturally appropriate, cultural monitoring, you mean First Nations people will monitor on their own?
 - Sean: Yeah. ...For closure broadly, we're starting to develop more of like a cultural monitoring program, post-closure, that would go for like a couple decades or something.
- Gordon: So you say there's no chemicals in that [PK] at all? ...Can we get chemicals from [the PK]?
 - Sean: ...There is some...there's no chemicals. It's...not like toxic.
 - Gordon: You said there was none.
 - Sean: Yeah.
 - Dennis: You don't add.
 - Sean: We don't add chemicals.
- Dennis: ...it's really just like fertilizer... When you blow it up, it burns and makes you diesel, right?
 - Earl: That is mixed with diesel fuel.
 - Sean: Yeah.
- Dennis: So just how completely [does] that burn, depends on how much air there is in it? How completely does it burn? What does it mean?
 - Sean: ...It's never complete, there's always a bit.
 - Dennis: So it never completely burns?
 - Sean: Yeah. ...What we end up with is a bit of nitrate, which is like a nutrient. So you don't want-if you have too high levels of nitrate, it can cause algal blooms, and you can kill off the lake. Because if you get a big algal bloom, the oxygen will go down and other things can't survive. But we have very low concentrations of nitrate.
- Archie: What happens to the machinery when you close?
 - Sean: [We are looking at that now. We will sell, donate, or put in the landfill].
 - Jeanette: What happens to the other infrastructure?
 - Sean: The question was, what goes on with all the other infrastructure, like the buildings? Anything not hazardous-most of our buildings are made of metal, they're structural metal or else the smaller ones are just wood, modular-type

things. Anything like metal or wood or plastic, we have a big landfill on site where we put all that stuff. If there's no value in taking it all apart and sending it south, we would put it in the landfill.

- Earl/Archie (?): Why can't you get the salvage company for steel to come in there and take it out, rather than bury it underground?
 - o Sean: Why not bring a salvage company for the steel, rather than bury it? That's an excellent question and we're figuring that out now. It really just depends on the value of scrap steel.
- Archie: That's where I got a problem. You guys come in, you take our resources, you make millions and millions and then you say it costs too much to take the garbage you are leaving behind and you're going to bury it in on our land. It doesn't make sense. Why don't you spend a few of those millions you made and take that garbage out of here?
 - o Sean: Yeah. It's a fair point, and we hear those concerns a lot. I think it's just important to-the material we would leave behind in the landfill is not hazardous.
- Dennis: ...When can you get some actual numbers showing cadmium levels... or dioxin levels or anything like that? ...If you have a base of what's in there and comparative [to that of] the Slave River, then people are going to go, holy shit. What are we doing drinking this water? ...That's what I'm interested in...some actual numbers.
 - o Sean: The concentrations in Lac de Gras are extremely low.
- Jeanette: Do you have numbers from before the mine started, so that we can compare to what's there now?
 - o Sean: Yeah. We have a program called the Aquatic Effects Monitoring Program [AEMP]. We go out twice a year, once right now in the end of winter, and then once in summer, in August, September.
- Lorne: Did you do any baseline benthic studies when you first started? Because that's the first place it's going to show up, right?
 - o Sean: Yeah.
- Earl: Where your plant is and at the end of the lake where Coppermine River runs out to a little camp, is that one of your sample sites leaving the lake?
 - o Sean: Yeah. One of the sample sites is right next to that camp.
- Lorne: I just had a quick question about your kimberlite. How long of a process-or do you have a timeline that shows from your finish to your reclamation, your closure, to when you're going to flood the pits, and then the monitoring afterwards? You're saying 2050 is the timeline that you're going to end your monitoring, is that going to be continuous all the way through to whenever-?
 - o Sean: [We're] going to continue until early 2025, maybe mid-2025 when we close. Then it kind of depends when we close, but we'll flood the pits with water from the lake as soon as we can, basically the first summer after we close...
- Lorne: You're basically waiting... [What about benthics and organisms and whatnot in the pit lake?]

- o Sean: Yeah... Because the sediment will be so deep, it'll be almost 300 meters underwater. It won't really be a place for them to live because it's just so deep.
- Earl: During your water quality studies, do you have a way of capturing the carbon emissions that are given off... Hundreds of thousands of liters of fuel are given off in Lac de Gras emissions coming from that. And that settles in the water also, so is there a way of- was that part of your capture program, carbon?
 - o Sean: ...We do track all of the emissions, we calculated all that based on fuel usage. We use currently about a little over 80 million litres of diesel a year.
- Jeanette: I have a question. After preparing the material in the summary, I was looking at some of the things that they should be looking for. And then I was wondering, are they also checking to see if the water will be free from any biohazards or parasites, any other bacteria? Do they look for that as well? Because I don't see that in the content... they say it should be healthy or be clear, free from chemicals that type of thing. But I haven't seen anything specific to biohazards. Are they checking for that as well?
 - o Sean: I wouldn't say that we've really thought of that, so I think that's good input. I think we could look at that.
- Lorne: ...For water and invasive species and stuff like that- does that modeling, does it allow for that? Does it allow for climate change? For the impacts or the adaptation portion part of it? Or is it just specific to one subject or the area? [Will the PK cause a higher concentration of pollutants?]
 - o Sean: The modeling does include climate change but I would say climate change doesn't really matter to this model. The big thing that this model is trying to answer is – if you go back to that picture with the pit, with the grey PK in the bottom – so what this 200 year model is really trying to answer is- over the next 200 years, this kimberlite will slowly consolidate. When we deposit it, there's a lot of water in between the sand grains and over 200 years, that will slowly squish down, consolidate. As that happens, the water that's in between all the grains of sand will squish upwards or push upwards. Then basically you'll end up with a layer of water here that has higher concentrations of metals because it basically is the water that comes from that processed kimberlite. The big thing the model is predicting or doing for 200 years is showing that water, that squishes up slowly over 200 years will stay there and it won't mix up. That's partly because it's over 200 meters deep, so that's good. In shallower lakes, you get the turnover every spring and fall with the heating of the water. Because it's so deep, that doesn't hit there. But we did some modeling with climate change, warmer temperatures to see if that changed it.
- Lorne: Where are you looking at putting the PK, or are you going to use it all, are you going to be putting that PK back into the pits?
 - o Sean: That's what this sort of dark gray would be, the PK, that we'll put back.
 - o Lorne: And you're saying there's phosphorus [in the PK]...?
 - o Sean: Just nitrate in the PK, because the nitrate comes from the blasting.

- o Lorne: So once [the PK is settled and water is] reaching up to the top, I can't find a higher concentration of [nitrates and phosphorus] than within the bottom of the [pit]?
- o Sean: We're expecting a thin layer, or a bar, of higher concentration water at the bottom. That will stay there for 200 years, we've modeled it for 200 years. And then you'll have a 200 to 250 metre thick layer of just normal lake water above it. But it's not that this water down here is toxic. If something went down there, it wouldn't be something that would kill an animal or kill a fish. It's just higher concentration water.
- o Earl: That's 200 years... and nobody is going to be here to see it.
- Vita: [Does NWTMN have an environmental scientist that can be used as an advisor to Diavik?]
- Jeanette: [Who does this get reported back from?]
 - o Joanne: This information will go back to the participants, leadership and Diavik and will then go to the regulators. [Re: conditions of water license...] That's why your input is so important. If you could think about it in terms of providing guidance for future generations of environmental monitors or guardians, people who are going to be watching what's going on on the land and in the water at the site, what should they be looking for to determine if it's good, if it's healthy or if some action needs to be taken?
- Jeanette: What do you know about the historical [inaudible 00:23:40] in that area? What does Rio Tinto know about that area? The history. Does anybody know? Do you know?
 - o Tara: Well, we do get that from the sessions that we have with all of our communities. We at Diavik-we've had since 2012 a TK Panel that goes up to site, shares information, shares TK-
 - o Jeanette: And how far back are they going in history? Do you know that from your panel discussions?
 - o Sean: Well, I mean the panel discussions that Tara's talking about are more of an operations-more like looking at the future. When we did our environmental assessment back in the '90s, in the late '90s, there was a lot of discussions with different Indigenous governments back then about traditional use of the area.
 - o Jeanette: Did anyone mention the Métis traditional music area? Did anyone bring anything up on that other than the North Slave Métis Alliance...?
 - o Sean: They did. They wrote a large report back then. They submitted it back in the '90s or late '90s about the whole...big picture. So that's probably the biggest piece from the Métis Nation.
- Vita: Are they still testing the fish up there?
 - o Sean: Since the late '90s. It's mostly the lake trout up there, so we would do that every year. Then it was every three years for a while. And it was just showing no changes to the big lake trout. So we stopped doing that program back in 2014.

- Leonard: Do people eat those [slimy sculpin]?
 - o Sean: No, it's just-
 - o Leonard: Then why would you want-?
 - o Sean: Just because they're more sensitive than the big fish, because they're smaller. So we sample them for metals, look at their tissue, see what the chemistry is, their length, their weight, the different size of the organs to see if it's changing.
- Leonard: Fish tasting or fish testing?
 - o Sean: There's a separate one for-I'm talking about more the scientific one. And then, we have a fish tasting, like a fish camp that Natasha and Joanne have been to for the last 10 years or so. We're doing it a bit regularly, but about every three years we do it. So we did it last summer that we just had.
- Leonard: [Inaudible] Do they use that in diamond mining?
 - o Sean: No. We don't really add any chemicals to the rocks when we were taking them. We just want what the rocks already have.
- Leonard: When...you guys leave, are there any plans to restock the lake with fish?
 - o Sean: No, there's lots of fish in the lake, so there's no need to restock it. ...Just for people's information, we're doing a separate project right now to remediate Frame Lake
- Vita: Is it just direct studies or an independent organization... study on behalf of Diavik?
 - o Natasha: Vita is asking if it's Diavik or other mining companies doing the studies. That was after Leonard spoke.
 - o Joanne: The TK Camp, that was set up by Diavik. Natasha and I worked on that for over 10 years, 10, 12 years. We're independent, and there's also Golder Associates that have been doing the science part of it. They come out to the camp at the same time as the Elders. They're sharing knowledge between the fish biologist and the Elders at the same time.
- Leonard: [Why were NWTMN not participating?]
 - o Natasha: Because NWTMN did not sign the participation agreement.
- Dennis: Your sampling was having impacts on fish population, is that what you're saying?
 - o Sean: Yeah. Because we were having to kill lots of fish
- Dennis: And those are working with the communities that have signed the participation agreement?
 - o Sean: Yeah. Correct.
- Vita: Was there primarily just trout in that area or-?
 - o Joanne: No, no, no. There's Whitefish there too. So we're not sure why we didn't catch any Whitefish this year.
- Vita: Who would've done fishing in that area?
 - o Joanne: ...Certainly all of the communities that are involved with Diavik, they've all been heavy traditional users of that area. People recognize each other,

especially the Elders on the TK Panel and at the fish camp. Some had family ties several generations old from that common use of that area.

- Mary: ...You said when you guys are...going to cover that hole with the water from left. Right? That hole that you are going to put all your garbage in: what about these 100 tonne trucks? What are you going to do with those when they break down? You just going to put them in there and what are you going to do with them?
 - o Sean: The garbage, that's scrap metal. That's not going in the lake or in the pit. That's a pile like up on the island. It won't be in the lake, but all the equipment-
- Dennis: But there won't be any trucks there?
 - o Sean: ...For the trucks, the idea is we would send them south. ... Probably sell them. I mean, it'll definitely be a good deal I'm sure.
- Lorne: Do they have a specific training program for environmental monitoring? Specifically, to train Aboriginal people to learn environmental monitoring.
 - o Natasha: Once again, that's a scientific piece... I encourage you to use your time around the cultural piece.
- Calvin: Checking the fish from the water area... Would that part be in here already? I read it and it doesn't seem like it, because if the fish from that area is healthy and we check them say for nine, 10 years, and they're still healthy, that water should be good. ...They said, they started checking, when? The big fish, you said it was every three years from 2003?
 - o Sean: We started in the late '90s.
- Lorne: [Could we suggest a guardianship program?] The TK monitoring, quality monitoring: say you have monitoring or wildlife monitoring. When you put those all together, do you consider that a guardian monitoring program? So would that be something like, say, if they were to propose a Diavik guardian program specific to Diavik itself and surrounding area, would that be something that would be workable in the future or would you have to work with other groups to be able to make that happen?
 - o Sean: I think that's what we're trying to figure out now. It's a tough one. The question is who? Who does it really? How is it done?
- Dennis: So right now, what questions have to be answered in order to move this license forward? What do we have to do right now?
 - o Joanne: The six questions are up.
 - o Natasha: In your presentation, there are discussion questions. There are three of them. When you see this table, if you flip it over on the other side or the next slide after that, it says discussion questions. That's really what we're trying to focus on. Are you comfortable with Diavik submitting this table to the WRRB? That it looks clear, etc.? Those five criteria: do they capture your ideas? Is there anything else that should be added?
 - o Dennis: Would that only include these five criteria?
 - o Natasha: Just for water, to answer the very specific question: what are clear, measurable, and culturally relevant criteria for water quality?

Appendix A – Agenda and Informed Consent Form

Agenda

Diavik Diamond Mines Inc. Water Quality Workshop

Northwest Territory Métis Nation May 3-4, 2021

Day One: May 3, 2021	
12:45-1:00	Online Workshop Microphone Testing and Overall “How-To” (Myra) <i>Please log into the workshop at 12:45 so that we can make sure everybody is connected.</i>
1:00-1:20	Opening Prayer (NWTMN) Opening Circle (Everybody) Workshop Welcome, Overview and (Facilitators)
1:20-2:00	Diavik Diamond Mines Inc. (Diavik) <ul style="list-style-type: none"> Overview of Diavik and the Traditional Knowledge Panel Why are we here? <ul style="list-style-type: none"> Background around the need to develop “clear, measurable, and culturally relevant” criteria for water quality at closure
2:00-3:30	What is Healthy Water according to Indigenous Knowledge? (Facilitators) <ul style="list-style-type: none"> Overview of how the DDMI TK Panel and Aquatic Effects Monitoring Program have been developing ways to measure healthy water (i.e. water quality) Overview of how other Indigenous communities across Canada are measuring water quality according to their ways of knowing
<i>Break</i>	

3:40-5:00	Discussion Questions <ul style="list-style-type: none"> • What are the good properties you look for in other lakes you use? • What are the properties of water that make it suitable for cultural use? • What do you need to know (i.e. what are the properties) in order to drink water from the land? • What needs to happen to see if the spirit returns to the pit lake?
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Day Two: May 4, 2021

8:15-8:30	Online Workshop Microphone Testing and Overall “How-To” (Myra) <i>Please log into the workshop at 8:15 so that we can make sure everybody is connected.</i> Welcome and Comment Circle
8:30-9:00	Refresher on Closure Plans for Pit Lake (Diavik)
9:00-11:00	Exploring Water Quality Criteria for the Pit Lakes <ul style="list-style-type: none"> • Do people expect to draw water from the pit lake for cultural use? • How will the properties of the pit lake with PK change your use of the big lake?
<i>Break</i>	
11:10-11:45	Exploring Water Quality Criteria for the Pit Lakes <ul style="list-style-type: none"> • Discussion continued
11:45-12:00	Closing Circle Closing Prayer

Agenda

Diavik Diamond Mines Inc.

Cultural Water Quality Criteria Verification Workshop

Northwest Territory Métis Nation

April 27, 2022

Fort Smith, NT

8:30	Coffee
9:00	Opening Prayer (NWTMN) Opening Circle (Everybody) Workshop Welcome
9:30	Why Are We Here? (Diavik) <ul style="list-style-type: none"> Background around the need to develop “clear, measurable, and culturally relevant” criteria for water quality at closure Update on engagement with other IGOs Outcome <i>Diavik Proposed Cultural Water Quality Criteria</i>
10:00	What Have We Done So Far? (Diavik) <ul style="list-style-type: none"> Review of engagement with NWTMN
10:30	Did We Hear Right? (Facilitators) <ul style="list-style-type: none"> Does the <i>Workshop Summary for DDMI Water Quality Criteria for Cultural Use Workshop from May 3-4, 2021</i> capture your ideas?
12:00	<i>Lunch</i>
1:00	Discussion Questions (Facilitators) <ul style="list-style-type: none"> Does the <i>Diavik Proposed Cultural Water Quality Criteria</i> capture your ideas? Is there anything else that should be added? Do you have any suggestions on how to measure or monitor the proposed cultural water quality criteria?
3:45	Review of What We Heard Today (Facilitators) Next Steps (Diavik)
4:00	Closing Circle (Everybody) Closing Prayer (NWTMN)

Northwest Territory Métis Nation

Diavik Diamond Mines Inc.

Water Quality Workshop

May 3-4, 2021

Informed Consent Form

I, _____ on May ____, 2021 give permission for Diavik Diamond Mines (2012) Inc. and its Contractors (i.e., Thorpe Consulting Services and Joanne Barnaby Consulting), to take notes, photographs and / or audio and video recordings related to my participation in meetings, workshops and events related to the Water Quality Workshop conducted on behalf of Diavik Diamond Mines Inc. (DDMI).

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;
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 Indigenous Organization, DDMI and / or its contractors may use the information collected to contribute to caring for water in the NWT and NU;
5. DDMI, Natasha Thorpe and Joanne Barnaby may share my information in either reports, presentations, and/or photographs provided it is within the context of this workshop scope and that they provide such information to my Indigenous organization;
6. I agree that my contributions may also be used for future educational, cultural, heritage, and environmental purposes that are outside the scope of this workshop and that my representative Indigenous organization, 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 my Indigenous organization policy and the DDML and NWTMN Engagement Protocol for the Processed Kimberlite to Mine Workings Project;
8. I am free to request that any information I share is removed, erased or deleted from draft materials and that final copies will be provided to me;
9. My information will be summarized and included in a report which will be publicly available; and
10. I understand that DDML, Joanne Barnaby and Natasha Thorpe cannot ensure the protection of my information (e.g. Traditional Knowledge) from public release once the reports are released (e.g., via youtube.com, Facebook, other social media, or Indigenous group websites),

Signed on May ____, 2021 in _____, Northwest Territories.

Signatures:

Participant

Indigenous Organization

Contractor

Witness

Translated by: _____

Northwest Territory Métis Nation

Diavik Diamond Mines Inc.

Water Quality Workshop

April 27, 2022

Informed Consent Form

I, _____ on April 27, 2022 give permission for Diavik Diamond Mines (2012) Inc. and its Contractors (i.e., Thorpe Consulting Services and Joanne Barnaby Consulting), to take notes, photographs and / or audio and video recordings related to my participation in meetings, workshops and events related to the Water Quality Workshop conducted on behalf of Diavik Diamond Mines Inc. (DDMI).

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Signed on April 27, 2022 in For Smith, Northwest Territories.

Signatures:

Participant

NWTMN

Contractor

Witness

Appendix B – Workshop Presentations



Presented to the
Northwest Territory Métis Nation
Diavik Diamond Mines (2012) Inc.
Water Quality Workshop
May 3-4, 2021

Facilitators and Support:
Joanne Barnaby, Natasha Thorpe,
Sarah Ravensbergen

Water Quality Criteria

Culturally important indicators for water quality monitoring

What has been done so far?

- ▶ Community Aquatic Effects Monitoring Program (AEMP) overview (2003, 2007, 2009, 2012, 2015, 2018)
- ▶ TK Panel Sessions (e.g. TK Panel 12)

Regulators state that: “water quality objectives need clear, measurable and culturally relevant criteria.”¹

Water Quality Criteria Workshops



¹ Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite to Mine Workings

Aquatic Effects Monitoring Program (AEMP): Background

AEMP Development

- ▶ AEMP TK Study established by DDMI with 5 Indigenous parties
- ▶ Two-way flow of information, resources, and knowledge between TK holders and scientists regarding the health of fish and water in Lac de Gras
- ▶ 2003, 2007, 2009, 2012, 2015, 2018



NWTMN Contributions and Input

- ▶ NWTMN active in voicing water-related insights (e.g. September 2019 Mackenzie Valley Environmental Impact Review Board Hearing)
- ▶ Concerns about processed kimberlite (PK) in pits and plans to reconnect pits; cumulative impacts; harvesting; safety, quality, health of people and wildlife (e.g. contaminants, impacts to caribou)

AEMP: Water Quality

▶ AEMP TK Program components:

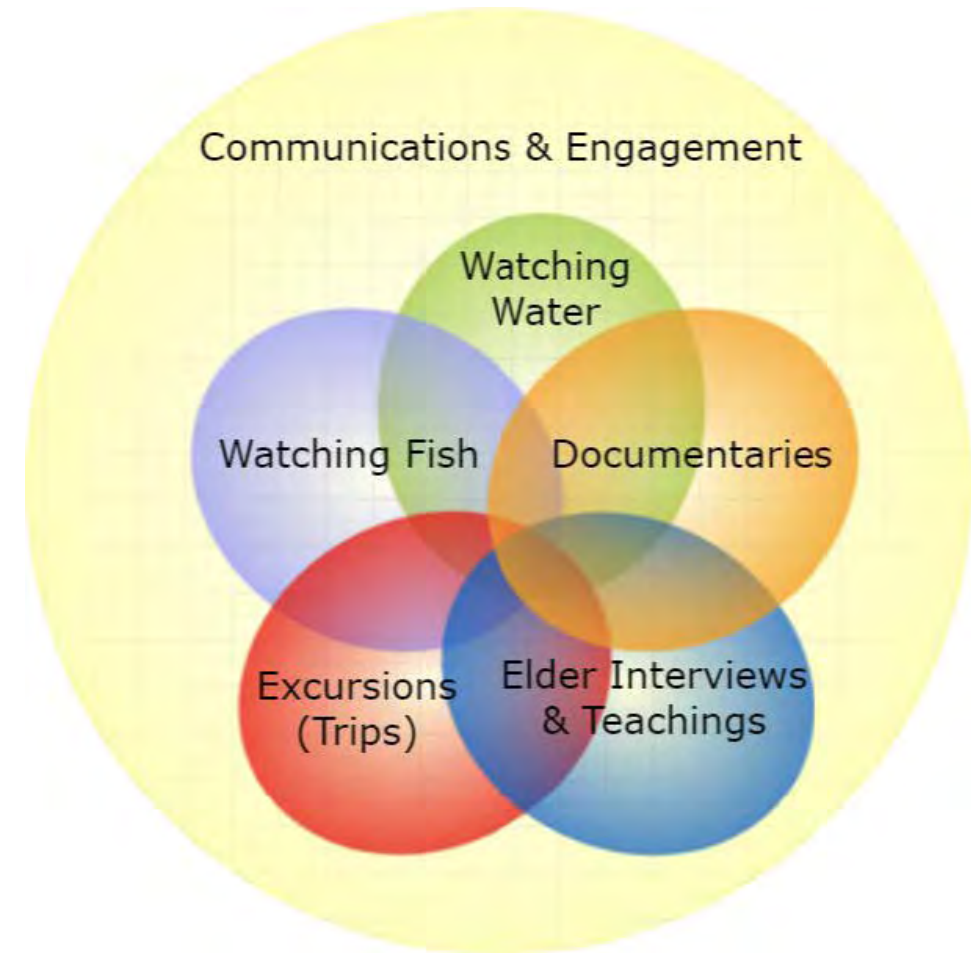
1. Communications and Engagement
2. Watching Fish: Fish Palatability and Texture Studies

3. Watching Water: Water Quality and Quantity Studies

4. Elder Interviews and Teachings
5. Excursions (Trips)
6. Documentaries

▶ Water quality as part of the entire ecosystem

▶ Water clarity; movement; temperature; vegetation; fish activity; taste



AEMP Field Form

Date: Recorder:

Location/Depth: Sample ID: Group/Person:

Collection Features: (Circle what best describes the feature)

Temperature: Cold Average Warm

Depth: Deep Average Shallow

Clarity: See bottom Murky Cannot see your hand in water

Movement: Still Some Running

Colour: Blue Green Yellow Other

Other:

Taste Test:

Tea: Good Average Poor

Water: Good Average Poor



Overall Description:

*Why was this water testing location chosen?
How can you tell when water is healthy or
unhealthy?*

*If water had words, what would it say about
how it is doing? It is happy? Hurting? Why?
What can you teach us about water?*

Traditional Knowledge Panel Summary

TK Panel #12 Purpose



- ▶ Explore disposing of processed kimberlite (PK) in the open pits and underground mining areas (A418 and possibly A154 and A21)
- ▶ Consider water quality and fish habitat within the pits upon closure regardless of whether there is PK in the pits



TK Panel #12 Summary

- ▶ 12.7: The TK Panel would like Diavik to test water in the pits for at least two years (until the water is deemed good) and compare this to water in Lac de Gras. Water samples will be collected from multiple depths at various times throughout each year and tested according to the AEMP protocols. Taste tests will be done after scientific sampling tells us the water is drinkable, where they will watch for smell, clarity (turbidity), temperature, colouration, scum on the water or tea, and water and tea for taste.



TK Panel #12 Summary

- ▶ 12.8: When scientists and the TK Panel agree that the pit water is safe (i.e., drinkable) and stable (i.e., consistent), then breaching of the dikes can occur to allow water to flow back and forth but prevent fish from entering the pits, at least initially.



Indigenous Ways of Watching Water: Canadian Examples

Other Examples...

Tr'ondëk Hwëch'in Water Quality Indicators¹

Table 1. Summary of indicators used by TH Elders to determine if traditional drinking water sources are safe for human consumption.

Indicator	Description
Sensorial Properties	
Color	Water should be clear with no color (e.g., tap water can be grayish or yellow).
Turbidity	The term "White Water" refers to clear water that you could see through. This means that water with limited turbidity is desirable.
Running Water	Water should be fast flowing and not stagnant.
Nothing Growing	No moss or plants should be growing on the rocks.
No animals in vicinity	There should be no animals around to contaminate the water. Ducks swimming in water can be a sign that it is not contaminated.
Makes Good Tea	Water should make red tea. Bad water makes black tea that leaves stains in your cup.
Odor	There should be no smell.
Taste	It should have a "fresh" taste.
	It should taste "good."
	It should not taste like chlorine.
Prior Knowledge and Use	
Prior Use	The water source has been used by many generations.
Knowledge of sources of contamination	There should be nothing above the water source in the watershed (e.g., no outhouses, septic fields, or resource extraction).
Water Quality Testing	Several Elders noted that they would like water quality sampling to be conducted at the water sources they use.

¹ <https://www.mdpi.com/2073-4441/11/3/624#:~:text=Water%20%7C%20Free%20Full%2DText%20%7C,Water%20Sources%20in%20Yukon%2C%20Canada>

Inuu'tuti: Baker Lake Aquatic Cumulative Effects Monitoring Program¹

Indicator Types	TK Measurement Indicators	Western Science Measurement Indicators	
Taste & smell (Organoleptics)	Taste of "land"	Organic carbon	Nutrient concentrations
		pH	Chlorophyll a
		Conductivity	
	Saltiness	Conductivity	Hardness
		Salinity	Alkalinity
		Chloride, sodium	
	Fishy smell	Specific algal community	Chlorophyll a
		Nutrient concentrations: nitrogen species, phosphorus	
		Salinity	Chloride, sodium
	Water is "refreshing"	pH	Temperature
		Copper, iron, manganese, sodium	Hardness
		Total suspended solids	Turbidity
		Total dissolved solids	Flow

¹ <https://www.afn.ca/wp-content/uploads/2019/03/10-Integrated-Water-Management-Hutchinson-Environmental-Sciences-Ltd.pdf>

Culturally relevant water quality criteria: Indigenous Guardians Toolkit¹

- ▶ Mikisew Cree First Nation Community Based Monitoring² and the Athabasca River Watershed (Fort McKay, Athabasca Chipewyan)
 - ▶ Indigenous indicators of water quality and climate change (weather conditions, flow, winter ice conditions, algae, foamy scum, dirty water, scum on tea pots and boats, smell, colour, proximity to development project/site, perceived contamination)³
 - ▶ Water quality index for each site (green, yellow, red)
 - ▶ Water quantity/level: Aboriginal Base Flow and Extreme Flow
 - ▶ Place names important

¹ <https://www.indigenousguardianstoolkit.ca/>

² <http://mikisewgir.com/cbm>

³ <https://www.ourcommons.ca/Content/Committee/421/ENVI/Brief/BR8622379/br-external/MikisewCreeFirstNation-e.pdf>

Why are we here today?

We need “clear, measurable and culturally relevant criteria” for measuring water quality

► Consider:

- What are the good properties you look for in other lakes you use?
- What are the properties of water that make it suitable for cultural use?
- What do you need to know (i.e. what are the properties) in order to drink water from the land?
- What needs to happen to see if the spirit returns to the pit lake?
- Do people expect to draw water from the pit lake for cultural use?
- How will the properties of the pit lake with PK change your use of the big lake?



Next Steps

- ▶ Workshop summaries and transcription files returned to each community
- ▶ Summary report from all workshops



Thank you!

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Presented to the
Northwest Territory Métis Nation
Diavik Diamond Mines (2012) Inc.
Water Quality Workshop
April 27, 2022

Facilitators and Support:
Joanne Barnaby, Natasha Thorpe,
Sarah Ravensbergen



Update: Cultural Water Quality Criteria

Agenda

- ▶ Why Are We Here? (Diavik)
- ▶ What Have We Done So Far? (Diavik)
- ▶ Did We Hear Right? (Facilitators)
 - ▶ From Indigenous Groups
 - ▶ From NWTMN
- ▶ Discussion Questions (Facilitators)



Context: Why are we here?

Processed Kimberlite to Mine Workings Project

- ✓ to develop “clear, measurable, and culturally relevant” criteria for pit water quality at closure
 - Measures to protect cultural use of the lake:
Traditional Knowledge, engagement, monitoring, reporting



Processed Kimberlite to Mine Workings Project

Regulatory Approvals

- Report on EA and Reasons for Decision – recommendations, including “measures” approved by GNWT Minister responsible (June 4, 2020)
 - measures to prevent or reduce the risk of impacts on water and build confidence in the project
- Water License Amendment – approved (June 8, 2021)

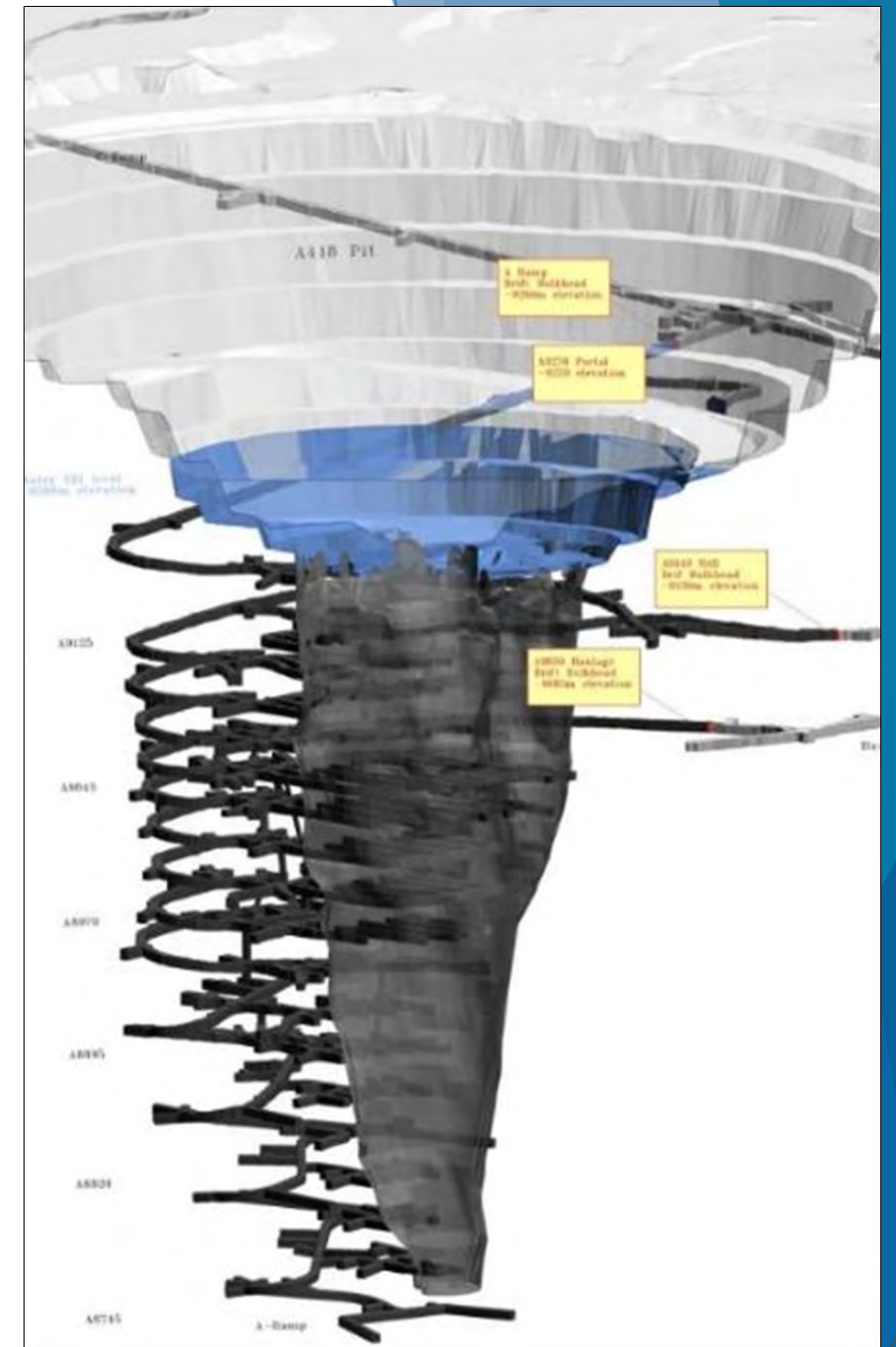
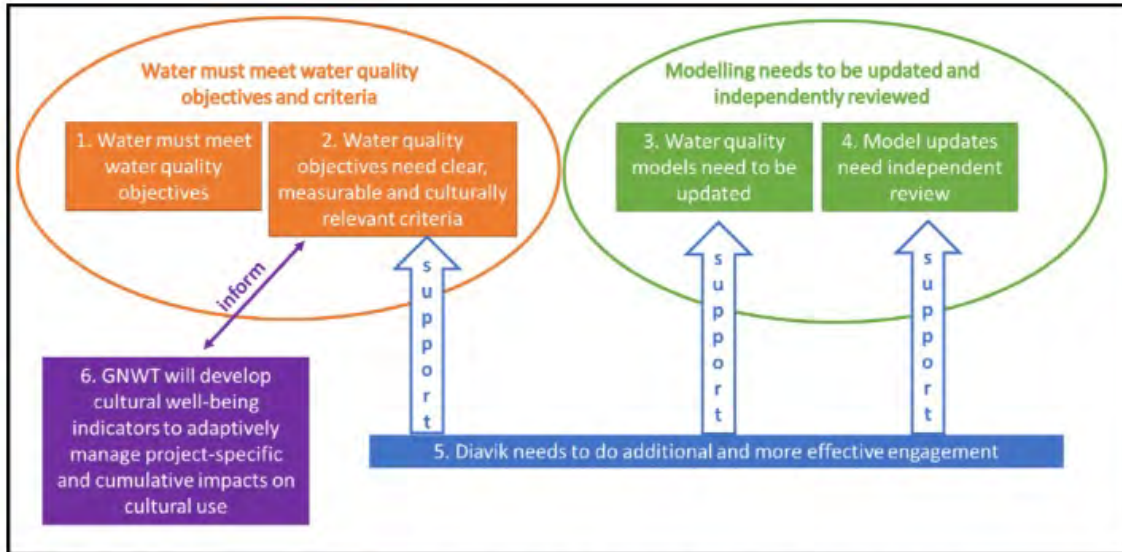
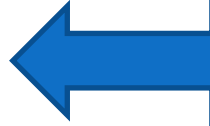


Figure 21: The holistic suite of measures to protect water, fish, wildlife and cultural use, and build confidence to reduce cultural impacts

What has been done so far?

- ▶ Community Aquatic Effects Monitoring Program (AEMP) overview (2003, 2007, 2009, 2012, 2015, 2018, 2021)
- ▶ TK Panel Sessions (e.g. TK Panel 12)
- ▶ Regulators state that: “water quality objectives need clear, measurable and culturally relevant criteria.”¹
- ▶ Cultural Water Quality Criteria Workshops with Indigenous Groups (2020, 2021)
- ▶ Proposed Cultural Water Quality Criteria for Submission to WLWB (2022)



May 3-4, 2021,
with NWTMN
leadership

¹ Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite to Mine Workings

PKMW Project Engagement with Indigenous Groups

Indigenous Community	Regulatory and Closure Update Engagement	PKMW Engagement Protocol (Measure 5)	PKMW Cultural Water Quality Criteria Workshop (Measure 2)
KIA	Completed (June 30, 2020)	Approved (August 18, 2020)	Completed (October 13-14, 2020)
LKDFN	Completed (June 10, 2020)	Executed (July 10, 2020)	Completed (September 24, December 3, 2020)
NSMA	Completed (May 26, 2020)	Executed (July 30, 2020)	Completed (September 22-23, 2020)
TG	Completed (June 23, 2020)	TG feedback; DDMI draft 2 and Tłıchʼo Waghàà Eleyatits'eedı (September 5 / 11, 2020)	Completed (November 5, 12-13, 2020)
YKDFN	Completed (May 28, 2020)	Approved (February 17, 2022)	Completed (June 3-4, 2021)

Indigenous Community	Regulatory and Closure Update Engagement	PKMW Engagement Protocol (Measure 5)	PKMW Cultural Water Quality Criteria Workshop (Measure 2)
DKFN	Completed (December 7 & 11, 2020)	Executed September 10, 2021	Completed (May 12-13, 2021)
NWTMN	Completed (September 1, 2020)	Approved September 14, 2021	Initial meeting completed (May 3-4, 2021)
FRMG	Completed (August 24, 2020)	in draft	Proposed

Diavik Proposed Cultural Water Quality Criteria

Submission to the Wek'èezhìi Land and Water Board of proposed water quality criteria that are culturally relevant, based on engagements with potentially affected Indigenous groups of the Processed Kimberlite to Mine Workings Project (EA1819-01 and W2015L2-0001)

PROPOSED CRITERIA		COMMENT
looks clear		water / ice should be free of foam, grease, soap, sediment, dust, dirt, materials
feels cool or cold		temperature is affected by location, depth, climate change, industrial development
smells clean and healthy		smell is affected by fish, wildlife, plants, rocks, temperature, location, saltiness, materials, sediments, industrial development; can have a fishy smell but not overpowering
tastes fresh		taste is affected by affected by fish, wildlife, plants, rocks, temperature, location, saltiness, sediments, industrial development
sounds alive		water sounds are affected by movement as well as activity by people, fish, wildlife, birds, etc.)

The criteria will be monitored:

1. prior to flooding of the pit(s)
2. prior to breaching the dam and reconnection of the pit lake with Lac de Gras
3. after reconnection with Lac de Gras

What We Heard: Summary of Workshops with Indigenous Groups

We need “clear, measurable and culturally relevant criteria” for measuring water quality

Summary of Virtual Cultural Water Quality Workshops (2020-2021)



- ▶ healthy, edible fish, healthy wildlife, animals using the water
- ▶ clean smell (can have a fishy smell) and taste (affected by fish, wildlife, plants, rocks, temperature, location, saltiness, sediments)
- ▶ clear colour (natural, not murky, no oil, film, scum, not too much algae); nothing floating or disturbed in the water (i.e. pollen, dust); healthy look and taste (especially for tea making); no smell
- ▶ free of contaminants/ chemicals

Summary of Virtual Cultural Water Quality Workshops (2020-2021)

- ▶ moving, flowing (from wind or current): not stagnant
- ▶ healthy flora and fauna in the water; shoreline plants are healthy (e.g. willows, reeds, sedges)
- ▶ history of the area (TK says it has been used): shoreline rocks are worn from use
- ▶ quality of snow/ice
- ▶ cold water high in oxygen (temperature is important)
- ▶ can drink unaltered (i.e. don't have to boil it)
- ▶ free of deposits or by-products (e.g. crushed gravel, PK), and does not exceed the acceptable Canadian water quality guideline levels



What We Heard: Summary of Workshop with NWTMN

We need “clear, measurable and culturally relevant criteria” for
measuring water quality

Ongoing NWTMN Contributions and Input: Before May 2021 Workshop

- ▶ NWTMN voiced water-related insights and concerns (e.g. September 2019 Mackenzie Valley Environmental Impact Review Board Hearing)
- ▶ Concerns about processed kimberlite (PK) in pits and plans to reconnect pits
 - ▶ cumulative impacts; harvesting; safety, quality, health of people and wildlife (e.g. contaminants, impacts to caribou)

NWTMN Water Quality Criteria Workshop: Questions You Discussed

1. What are the good properties you look for in other lakes you use?
2. What are the properties of water that make it suitable for cultural use?
3. What do you need to know (i.e. what are the properties) in order to drink water from the land?



NWTMN Water Quality Criteria Workshop: Questions You Discussed (cont'd)

4. What needs to happen to see if the spirit returns to the pit lake?
5. Do people expect to draw water from the pit lake for cultural use?
6. How will the properties of the pit lake with PK change your use of the big lake?

► Refer to NWTMN May 3-4, 2021 Workshop
Summary and Detailed Notes for more detail



NWTMN Water Quality Criteria Workshop: What We Heard

- ▶ Agree with list (summary from all Indigenous Groups), but requested addition of:
- ▶ healthy birds
- ▶ cumulative effects
- ▶ water free of chemicals, dirt, dust
- ▶ Elders want healthy edible fish and wildlife, no mercury, oil, clean water with no sulfuric acids



NWTMN Water Quality Criteria Workshop:

What We Heard

... my idea of clean water is going to be when it's cold, there's no sediment in it. [Garry Bailey]

The confidence in my drinking water would be that there is stuff living in it. [Trevor Beck]

...back in the day, you go down to the river in Hay River, and just about every boat on the river, there was a cup in that boat, tied to the boat. We used to just use them, drink the water out of the river. The string was tied to the cup so the kids that used those cups wouldn't lose them. We don't do that anymore, we can't. [Paul Harrington]

What we heard: May 3-4, 2021

- ▶ Project area important today and in past for harvesting and cultural, spiritual, and other uses: NWTMN have been impacted by mine processes
- ▶ To feel comfortable drinking the water around Diavik, NWTMN members would like to know water had been tested and that there had been treatment done. Members felt that it will be difficult, if not impossible, for the water to go back to its' natural state (or the state it was in prior to Diavik's operations)
- ▶ Important to have funding to hire / do independent reviews of Diavik's science / processes, and to include NWTMN in monitoring and TK Panel going forward (want to hear what other groups are saying, start building relationships)
- ▶ Honoraria should be paid to all participating NWTMN members when engaging with Diavik

What we heard: May 3-4, 2021 – Operations Concerns Related to Water Quality

- Cumulative effects
- Impacts of PK and contaminants on water
- Dust
- Impacts to caribou, fish, birds, benthic and pelagic microorganisms including zooplankton, bugs
- Increased time spent for harvesting, especially caribou
- Health, safety, of people and the environment
- Diavik's zone of influence
- Impacts of chemicals used in the blasting process

What we heard: May 3-4, 2021 – Closure Planning

- ▶ NWTMN would like a better understanding of PK to Mine Workings, other closure plans - continued and ongoing discussions on closure plans more broadly, and emergency plans / mitigation measures, are important
- ▶ The PK to Mine Workings concepts have not been tested in other places; water is integral to NWTMN cultural and identity, it is important to get this process right
- ▶ NWTMN members are not comfortable with the idea of mixing water from the pit lakes with water from Lac de Gras: *"...the concept and idea of having something not so polluted that you can open it up and put it into Lac de Gras-this concept of having anything that's polluted and thinking you can downsize it by distributing it with other water, I don't think that's right"* (Paul Harrington)
- ▶ Water in the pit lakes should not be mixed with water from Lac de Gras until all Indigenous groups, including NWTMN, agree it is okay.

What Diavik Heard: Submission to Wek'èezhìi Land and Water Board

We need “clear, measurable and culturally relevant criteria” for
measuring water quality

Diavik Proposed Cultural Water Quality Criteria

Submission to the Wek'èezhìi Land and Water Board of proposed water quality criteria that are culturally relevant, based on engagements with potentially affected Indigenous groups of the Processed Kimberlite to Mine Workings Project (EA1819-01 and W2015L2-0001)

PROPOSED CRITERIA		COMMENT
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sounds alive		water sounds are affected by movement as well as activity by people, fish, wildlife, birds, etc.)

The criteria will be monitored:

1. prior to flooding of the pit(s)
2. prior to breaching the dam and reconnection of the pit lake with Lac de Gras
3. after reconnection with Lac de Gras

Discussion Questions

1. Do the Diavik Proposed Cultural Water Quality Criteria capture your ideas?
2. Is there anything else that should be added?
3. Do you have any suggestions on how to measure or monitor the proposed cultural water quality criteria?



Next Steps

- ▶ Workshop summaries and transcription files returned to each community
- ▶ Summary report



Thank you!

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Appendix C – Workshop Evaluation Summary

DDMI Water Quality Workshop Evaluation Form

Thank you for participating in the online Water Quality Workshop held by Diavik Diamond Mines (2012) Inc. in May, 2021. We hope you enjoyed your time meeting with the group. We appreciate feedback on your experience. Your responses will help us maintain and improve future sessions.

1. How would you rate the session for working and communicating together?
 - ☐ Very good
 - ☐ Good
 - ☐ Neither good nor poor
 - ☐ Poor
 - ☐ Very Poor

2. How would you rate the session for mutual respect among participants?
 - ☐ Very good
 - ☐ Good
 - ☐ Neither good nor poor
 - ☐ Poor
 - ☐ Very Poor

3. How would you rate the opportunities for you to share your knowledge and experiences?
 - ☐ Too many opportunities
 - ☐ Enough opportunities
 - ☐ Too few opportunities

4. How would you rate the recording and documenting of TK during the session?
 - ☐ Very good
 - ☐ Good
 - ☐ Neither good nor poor
 - ☐ Poor
 - ☐ Very Poor

5. How would you rate the facilitation of the session?
 - ☐ Very good
 - ☐ Good
 - ☐ Neither good nor poor
 - ☐ Poor
 - ☐ Very Poor

6. How would you rate the **outcomes and findings of the session?**

- ☐ Very good
- ☐ Good
- ☐ Neither good nor poor
- ☐ Poor
- ☐ Very Poor

7. How would you rate the **amount of time** to discuss the topic(s) during the session?

- ☐ Too much time
- ☐ Enough time
- ☐ Too little time

8. How would you rate the **technical quality of** the session?

- ☐ Very good
- ☐ Good
- ☐ Neither good nor poor
- ☐ Poor
- ☐ Very Poor

9. How would you rate the **logistics** for the session?

- ☐ Very good
- ☐ Good
- ☐ Neither good nor poor
- ☐ Poor
- ☐ Very Poor

10. **Overall**, how would you rate the session?

- ☐ Very good
- ☐ Good
- ☐ Neither good nor poor
- ☐ Poor
- ☐ Very Poor

11. What were the strengths of the session? What did you enjoy about the session?

12. How could the session be improved?



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Public Hearing Intervention

Diavik Water Licence Amendment – Processed Kimberlite to Mine Workings

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As people we would use the water to wash ourselves and drink the water [at Lac de Gras]. People just don't go on the land for nothing, people would go on the land and use the water. Today it seems like we don't go anywhere, but in the future maybe 30-50 years there may be some people that want to do their own thing and survive on the land. Those are things that I am thinking about, maybe somebody might be going out on the land, sleeping on the ground, using the water. Not only the human, but also the wildlife.
(Elder Joseph Judas, 12-Nov-2020)

1. Background

Diavik is applying for a water license to store processed kimberlite (PK) in pits and underground mine workings. After the Environmental Assessment (EA) (EA1819-01, 2020) of this proposal, the Review Board concluded that additional mitigation measures are necessary to prevent significant adverse impact on cultural use of Lac de Gras. The measures set out by the Board are intended to prevent or reduce the risks of impact on water, build confidence in the project, and reduce the likelihood of adverse impacts on cultural use of Lac de Gras.

The Tłıchǫ Government has worked with elders to examine how to build and maintain this confidence over time so cultural use of the area can continue. In this intervention report, we describe the monitoring and collaboration we believe is required at each step, both before breaching the dykes between the pit and Lac de Gras and after. The work with the elders was jointly funded by Diavik and the Tłıchǫ Government.



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This report focuses on Tłıchǫ elder guidance with respect to what it means for water to be safe, clean, and healthy for cultural use. This elder guidance is intended to be reviewed and incorporated into water licence conditions. The elders note that they feel the area is already affected by mining, as illustrated by this quote by elder Louis Zoe:

Our ancestors that travelled into that area of Lac De Gras and on the east island where people use to hunt and camp on. That island that's where the caribou would migrate on to the island and continue south. For that reason, they call the island Eka de¹; it's a caribou island. So today as the mine exists, we are not going to reclaim that island. But when we make a recommendation, with the amount of damage that is being done to that island, [it] should do a little bit of good for the island and also the water. We may not drink water in that area, but I am not the only one thinking about this in this manner because we love our land. This is our land; that's the reason why we are talking about it. We are not only talking about it on behalf of ourselves, but the children coming after us for the future generations they may be using the land, and going on the environment so they can live off the land. All the damage that is being created, we don't want to further damage the land. (November 11, 2020)

There are three principles that the elders and the Tłıchǫ Government consider to be vital to maintaining confidence in cultural use of Lac de Gras. These are:

Principle 1: Elders and the Tłıchǫ Government will know the water is safe through both ways of knowing: from traditional knowledge based on sight, smell, and taste of the water **and** based on scientific water quality monitoring. There needs to be continuous collaboration and full consideration of both ways of knowing.

Principle 2: Elders and the Tłıchǫ Government have identified the requirement for Tłıchǫ involvement and review in monitoring, to protect confidence and cultural use.

Principle 3: Elders and the Tłıchǫ Government have specifically set out scientific and traditional knowledge monitoring approaches for each of stage of the Project.

¹ The "island" (where Diavik has their project) is called Eka de, which means "fat island". "Eka" means "fat" and "de" means island.



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1.1. Relevant EA Measures

During the EA process, the Review Board set legally-binding EA measures that Diavik must follow, including: meeting water quality criteria that will protect people, aquatic life, wildlife, and cultural use of the area (EA Measure 1); more engagement with Indigenous Governments and Organizations to develop criteria for determining if water quality is acceptable for cultural use (EA Measure 2); updating modelling at each stage of the Project (EA Measure 3), and conducting independent review of Diavik's water quality modelling at each stage (EA Measure 4).

The Tłıchǫ Government expects that all EA measures will be fully implemented in a way consistent with their intent and purpose.

The Tłıchǫ Government notes that substantial progress has been made towards implementing these measures (although EA Measure 1 is a requirement that will be tested with time). With respect to EA Measure 2, Diavik has worked closely with the Tłıchǫ Government on the question of cultural criteria. The Tłıchǫ Government has carefully followed the updated modelling, and participated as witnesses throughout the independent review.

The Tłıchǫ Government posed specific questions to the independent panel, aimed at testing whether the new modelling and independent review were leading to greater confidence in the results. The independent reviewers stated that they felt the model would assist with understanding whether the silt would settle, that the base case results of the model show that water quality in the upper 40 m of A418 is not expected to exceed the AEMP water quality guidelines, and that Diavik's modelling generally is consistent with best practices and appears to cover all relevant variables (Independent Panel Final Report, Tinis, Azam, and Wells, 2020).

The Panel's final report includes many recommendations for Diavik to consider, and the Tłıchǫ Government considers their implementation to be vital to maintain confidence. The Tłıchǫ Government looks forward to the continuing engagement of the Independent Panel, as required under EA Measure 4.



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The Tłıchǫ Government will also carefully review all of the technical recommendations made by other parties, particularly the Environmental Monitoring Advisory Board (EMAB). Notably, the elders and the Tłıchǫ Government rely strongly on the advice of the EMAB and the consultants retained by them. Thorough consideration of their advice is an important part of maintaining confidence in the water quality in the region. There may be a need for further technical adjustments, such as modelling with worst-case conditions, considering more adverse concentrations in porewater, progressing the monitoring of Lac de Gras, and monitoring suspended sediment conditions during PK placement in the pit (including the interface of the PK and overlying water) (EMAB 2020).

2. Elder Technical Guidance on Cultural Criteria

The Tłıchǫ Government has been working closely with elders on cultural water quality criteria.

The Tłıchǫ Government ran elder meetings on November 5th, 11th, and 12th of 2020 to discuss water quality criteria and how to protect cultural use. The elders who participated in these meetings were Joseph Judas, Charlie Apples, Charlie Jim Nitsiza, and Louie Zoe.

The elder meetings centred around these four questions:

- a) How will you know if the water around Diavik Mine is good for cultural use?
- b) How will you know if the water around Diavik Mine is NOT good for cultural use?
- c) What are the good conditions you look for compared to other lakes?
- d) What could change your use of Lac de Gras?

The elders discussed these questions at length, considering the criteria for acceptable cultural use of Lac de Gras. The outcome of this discussion was framed in two ways: **how clean** does the water need to be; and **how to know** if the water is clean and healthy.

2.1 How Clean Does the Water in the Pit(s) and Lac de Gras Need to Be?

In the environmental assessment process, the elders and the Tłıchǫ Government suggested that the water quality should not be altered, and that the waters and lands of Lac de Gras – including the pit lakes – must remain healthy for humans, terrestrial wildlife, and aquatic life.

These two points were made again in the November meetings, however new emphasis and priorities were identified about monitoring and Tłıchǫ participation. Three overarching principles were identified by the elders and the Tłıchǫ Government.



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Principle 1: Elders and the Tłıchǫ Government will know the water is safe through both ways of knowing, from traditional knowledge based on sight, smell, and taste of the water, and based on scientific water quality monitoring. There needs to be continuous collaboration and full consideration of both ways of knowing.

The elders and Tłıchǫ Government want to see decisions made gradually, as the evidence from science and traditional knowledge emerges. We will rely on both forms of knowledge, and our trust relies on participating in the science, as well as relying on long term traditional knowledge (TK).

Cultural Water Quality Criteria:

- Scientific criteria: Water in the pit lakes and Lac de Gras must meet AEMP benchmarks² and guidelines for the protection of aquatic life, wildlife, and people.
- TK Criteria: Water must also appear “good” to Tłıchǫ elders and monitors, based on the following TK criteria: clarity, temperature, color, scum or unnatural material, smell, taste.

The elders spoke about how the water in Lac de Gras needs to be safe and clean enough for fish and other aquatic species to be healthy.

In the past, in Behchokǫ, fish is very healthy ... that's what we grow up on, fish was very healthy back then, but today [we] catch fish and even the texture and health of the fish differentiates from the past because of the [Giant] mine site that exists. Similar to this, the mine site that exists on the Lac de Gras, on the east island, water is going to change, of course water is never the same because once the water mixes within the pit, it's going to differentiate within the water ... When they have aquatic fish monitoring, checking the water and the fish, we would check the fish and there would be some kind of spots on the fish, maybe it's because of the water, maybe it's the fish food, phytoplankton, zooplankton, those things may not be healthy. (Elder Charlie Apples, 12-Nov-2020)

There are many traditional knowledge monitoring approaches set out through the Diavik TK Panel (See TK Panel Session #12, 2019). These have had participation from and by various Tłıchǫ elders, and generally speaking the methods established through the TK Panel are valuable and important to follow.

² AEMP benchmarks should be kept up to date with the latest science to ensure they are protective of aquatic life, wildlife, and people.



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The scientific and TK criteria set out above are included in Table 1 below, in terms of what is needed for the perspectives of monitoring, modelling, and on-site experience.

Principle 2: Elders and the Tłıchǫ Government have identified the requirement for Tłıchǫ involvement and review in monitoring to protect confidence and cultural use.

To understand whether the water in the pit and Lac de Gras is healthy, the elders repeatedly stated that there must be Tłıchǫ Government involvement in monitoring at every stage. This is consistent with the Report of EA, which noted that “collaborative development, use, and monitoring of these criteria will allow change to be measured in ways that are meaningful and understandable for communities and cultural users” (Review Board, 2020, p.81). EA measure 4 specifically requires Diavik to support indigenous long-term monitoring.

Since the issuance of the EA report, the Tłıchǫ Government has worked in collaboration with the elders and Diavik to tie the cultural criteria to decision points (see Table 1), and identify elder and Tłıchǫ Government involvement throughout. This collaborative development, if maintained, will go a long way towards ensuring the criteria continue to be met over time and protection objectives – including “cultural use” – are achieved.

The elders were firm in stating that the Tłıchǫ Government and its people need to be actively engaged in the monitoring design and implementation. This, the elders explained, is central to building confidence among Tłıchǫ people in being able to harvest, drink water, and camp in and around Lac de Gras again.

I am still concerned to see the outcome of it, whether the water will be as clean as it was, not according to their [Diavik] standard, but [pause]. Like I say, the animals were travelling around that area because they're there before the mine came and they'll be there after the mine closes as well ... some animals are living off of plants alone in the area ... if it's consumed by animals how healthy would that be? ...Monitoring should be done by the Aboriginal standard, and I really believe that. (Elder Louie Zoe, 11-Nov-2020)

It's hard to really prove that any water quality might change down the road to sufficient standard ... we should have most of our people that work or do some sampling with them [Diavik] in order to do monitoring and that might give us some good indication what they are doing... (Elder Charlie Apples, 11-Nov-2020)

I still want to see that our leaders are working with them [Diavik] and have the elders working with them and doing the studying and monitoring and all that [together]. (Elder Charlie Jim Nitsiza, 12-Nov-2020)



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The elders said they want to see and experience the water ‘with their own eyes’ so that they can see the process and water for themselves.

If we see with our own eyes then we can talk about things. If we didn't really see it, we won't be able to [talk about it] ... If they want to take a tour it would be good to have a tour in the summer months [when its warm] so we can see with our own eyes... (Elder Louie Zoe, 12-Nov-2020)

It's not like we will be there collecting water all the time, but people who are in control and monitoring the water ... that's the only way we will know about this, the effects of the water, if they monitor the water... and we have to have a say in this portion of the water licence because that's where our ancestors used to work on the land, and this is our land. (Elder Joseph Judas, 12-Nov-2020)

Furthermore, the elders also stressed the importance of water being sampled regularly, using scientific and traditional knowledge monitoring methods.

The best outcome would be if the water would go back to normal ... [that] what would come out of there has the same quality with the existing Lac de Gras water, it will be satisfactory. Like I say, for two years monitoring after everything is all done I don't think it's sufficient time ... need more time to do the monitoring. (Elder Charlie Jim Nitisza, 12-Nov-2020)

The elders expect that monitoring efforts, and the overall health and safety of Lac de Gras, meet the standards set out in aquatic life protection guidelines and AEMP benchmarks.

2.2 How to Know if the Water in Lac de Gras is Healthy?

Principle 3: Elders and the Tłıchǫ Government have set out specific monitoring approaches for each stage of the Project.

To evaluate the health and safety of water quality over the course of the closure process, the elders suggested completing monitoring at four specific stages: **1) Before depositing processed kimberlite into the pit(s) and underground; 2) before filling the pit(s) with water from Lac de Gras; 3) before reconnecting (partially or fully) the pit lake(s); and 4) Immediately after the breach and continuing afterwards.** This will provide the Tłıchǫ Government and the elders with an in-depth understanding of changes in water quality, and build confidence in the closure process for future cultural use.



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Table 1 below summarizes the monitoring approach recommended by the elders and the Tłıchǫ Government at each of these time frames, combining scientific and traditional knowledge approaches to ensure water is suitable for cultural use.

Table 1: Monitoring approaches for maintaining confidence in cultural use

Time Frame	Monitoring Approach
Before depositing processed kimberlite into the pit(s) and underground	<p><i>Monitor:</i> Continue AEMP monitoring.</p> <p><i>Model:</i> Address Independent Review Panel (IRP) recommendations and confirm modelled pit water quality meets AEMP benchmarks³ and model representations of TK criteria.</p> <p><i>Experience:</i> Elder and TG staff site visit before PK in pits to observe conditions, and to understand all key processes for PK placement. Note: Elders may want to see all components of the process for placement. There needs to be an inspection of pits and approach to placement of the PK in the pits – elders need to see it “with their own eyes.”</p>
Before filling the pit(s) with water from Lac de Gras	<p><i>Monitor:</i> Test and treat PK water and communicate about results with elders and Tłıchǫ Government.</p> <p><i>Model:</i> Ensure there is strong modelling & IRP review (as required by EA measures 3 and 4) of how the PK & PK pore water will influence the pit water quality. Confirm modelled pit water quality meets AEMP benchmarks and model representations of TK criteria.</p> <p><i>Experience:</i> Facilitate visual inspection by elders and TG staff site.</p>
Before reconnecting (partially or fully) the pit lake(s) containing PK to Lac de Gras <i>“My greatest concern, I understand and know what the company is</i>	<p><i>Monitoring:</i></p> <ul style="list-style-type: none"> Take water samples in the pit and compare to AEMP benchmarks and TK criteria. Sample at various depths and locations in the pit. Monitor every year at several different times of year until the water “stays good” (for example, stable for 2-3 years). Conduct more frequent or continuous monitoring in the pit to show, for example, if the turbidity from the PK water is slowly mixing.

³ The TG expects AEMP benchmarks will be kept up to date with the latest science to ensure they are protective of aquatic life, terrestrial wildlife, and people.



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<p><i>planning on doing, if you were to pour some fresh water into the pit and a quarter of it halfway down is where they are going to dump processed kimberlite, what kind of mixture will the water and processed kimberlite going to settle down in the future? This is my personal concern ... I am cautious about what mixture processed kimberlite with water [will make]...” (Elder Joseph Judas, Nov. 12, 2020)</i></p>	<ul style="list-style-type: none"> • Continue AEMP monitoring, and start annual monitoring at one far field (FFA) site. Check areas in Lac de Gras that are far away from the pit and close to the pit (possibly MF3-2 and MF3-7), as well as in the pit itself and compare data from those three locations. • Conduct toxicity tests with samples from the pit lake. <p><i>Modelling:</i> Update and review modelling (per EA measure 3 & 4) and confirm that modelled water quality in pits and Lac de Gras will meet and continue to meet AEMP benchmarks and model representations of TK criteria.</p> <p>The IRP shall review modelling and ‘model inputs’, which include some water samples is required by measures. Per measure 3 and 4.</p> <p><i>Experience:</i></p> <ul style="list-style-type: none"> • Complete a visual inspection by monitors, including the verification monitoring at the same time. • Facilitate visit by the elders every year before the pits are breached. • Allow TG staff and elders to check the TK criteria.
<p>After the breach, and annually afterwards</p> <p><i>“When it rains or snows, the water the snow would melt. If we break the dyke, what would happen if the water starts flowing into the [lake]? And because of the waves, the water will be flowing into the open pits. What would happen if the water flows back and forth from the pit to the open lake in Lac De Gras? The fish, the aquatic life might be</i></p>	<p><i>Monitor:</i></p> <ul style="list-style-type: none"> • Take water samples in the pit at several different times of year and compare to AEMP benchmarks and guidelines. • Sample at various depths and locations in the pit, with allowances made for fewer samples. • Conduct more frequent or continuous monitoring in the pit(s) to show, for example, if the PK water is slowly mixing. • Continue AEMP monitoring, including far field monitoring – such as areas that are far away in Lac de Gras and areas that are close in Lac de Gras right beside the pit (possibly MF3-2 and MF3-7), as well as in the pit itself and compare data from those three locations. • Maintain at least 10 years of annual monitoring, and then continued (perhaps less frequent) monitoring as part of the AEMP until at least 2050. • Reduce (or increase) monitoring frequency over time based on results, and in consultation with the Tłıchǫ Government. Elders



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<p><i>affected.” (Elder Joseph Judas, Nov. 11, 2020)</i></p>	<p>and TG prefer to see stable conditions for a at least a few years after reconnection before any reductions in monitoring.</p> <ul style="list-style-type: none"> • Conduct verification monitoring. <p><i>Experience:</i></p> <ul style="list-style-type: none"> • Complete a visual inspection by elders and monitors. • Allow monitors and elders to check the TK criteria.
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3. Conclusion

...The lake itself is quite sensitive... we might feel forever consequences that will never be repaired. If we make a mistake or the company make a mistake on our behalf ... we might destroy the fish habitat and the whole stream where people are living. For me, I am concerned that we just don't want to rush making decisions as to what we should plan on doing ... because we have to live with it after the mine is closed and left the country. This is my concern. (Elder Joseph Judas, 12-Nov-2020)

The level of water quality protection needs to be adequate for Tłıchǫ cultural use. This means that water quality must meet the guidelines for protection of most sensitive species that use the water (as set out by scientific modelling, independent panel review, and monitoring), in addition to being understood as ‘good’ from a cultural or TK perspective. Harmonizing the relationship between scientific modeling and TK perspectives can be achieved through a robust monitoring approach that is developed, designed, and implemented by the Tłıchǫ Government, working closely with Diavik.

The water licence, future amendment, or WLWB-approved closure criteria should be clear, specific, and encompassing of elder guidance about what level of protection must be achieved and maintained in the pit lakes and Lac de Gras.

References

- Diavik Diamond Mine, NT. 2019. Diavik Traditional Knowledge Panel Session 12: Options for pit closure. Sept. 12-16, 2019.
- Tinis, Scott, Shahid Azam, Scott Wells. 2020. Diavik mines PKMW hydrodynamic and water quality modelling: Independent panel final report.

Workshop Summary for Diavik Diamond Mines (2012) Inc. Water Quality Criteria for Cultural Use Workshop

Yellowknives Dene First Nation, Yellowknife, NT
June 3-4, 2021



Natasha Thorpe, Joanne Barnaby,
Sarah Ravensbergen

For: Yellowknives Dene First
Nation, Yellowknife, NT

July 14, 2021 V1.0

Photos: Natasha Thorpe, Colleen English

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Executive Summary

On June 3-4, 2021, the Yellowknives Dene First Nation (YKDFN) participated in a workshop¹ with Diavik Diamond Mines Inc. (DDMI/Diavik) to: (1) share recommendations from the ongoing Aquatic Effects Monitoring Program (AEMP) and the 2019 twelfth session of the TK Panel, specifically related to water quality criteria that include cultural use and (2) further discuss the concept of cultural criteria for water quality as a condition that must be met for Diavik to put PK into the pits. The [*Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite \(PK\) to Mine Workings*](#)² Measure 2 states that water quality objectives need clear, measurable and culturally relevant criteria; DDMI requested these workshops with Participant Agreement (PA) and non-PA communities to discuss these criteria in relation to closure planning.

Many of the properties and cultural uses of water raised by YKDFN participants in the workshop are consistent with previous YKDFN input noted during the TK Panel 12 session (and previous TK Panel sessions) as well as AEMP activities (starting in 2002). Participants agreed that properties of water that make it suitable for cultural use include the following: it is clear, cold, and flowing, with no unnatural sediments, contaminants, or chemicals; looks clear; tastes fresh and makes tea that tastes good; has healthy fish and wildlife living in and around it, and healthy shoreline plants with no bubbles around the shore. Workshop participants agreed that water is important for drinking, cooking, washing, fishing, travel and transportation and sustaining other subsistence harvesting. Members would prefer not to use water from the pit lake for cultural use with or without PK. Several other topics or concerns were raised by YKDFN participants during the workshop, including: timely and ongoing communication between Diavik and YKDFN; conducting their own independent monitoring activities; ensuring that youth are involved throughout the process; highlighting the importance of TK monitoring conducted alongside scientific monitoring far into the future; having Dene language included in the monitoring process; climate change; specific concerns and recommendations related to closure planning.

The information gathered in this workshop was shared for review with YKDFN through meeting notes and this summary document. Their contributions will be combined with information gathered from workshops with other PA and non-PA communities into a summary report for DDMI. Next, DDMI plans to use the combined workshops' outcomes to develop draft cultural use water quality criteria to submit to regulators.

¹ The workshop was held in person at XX venue with all participants, DDMI staff, and Joanne Barnaby. Natasha Thorpe and Sarah Ravensbergen joined by Microsoft Teams.

² [*Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite \(PK\) to Mine Workings*](#)

List of Participants

Anonymous, YKDFN
Alfred Baillargeon, YKDFN
Paul Betsina, YKDFN
Angus Charlo, YKDFN
Andrew Crapeau, YKDFN
Mary Jane Francis, YKDFN
Peter Liske, YKDFN
Jonas Noel, YKDFN
Chief Edward Sangris , YKDFN
Jonas Sangris, YKDFN
Modeste Sangris, YKDFN
Peter D Sangris, YKDFN
Therese Sangris, YKDFN
Ted Tsetta, YKDFN

Lena Drygeese (Interpreter), YKDFN

Ryan Miller, (Staff), YKDFN

Myra Berrub (DDMI)
Gord Macdonald (DDMI)
Tara Marchiori (DDMI)
Sean Sinclair (DDMI)
Richard Storrie (DDMI)

Joanne Barnaby (Consultant, Facilitator)
Natasha Thorpe (Consultant, Facilitator)
Sarah Ravensbergen (Consultant, Support)

Background and Scope of Work

Diavik Diamond Mines (2012) Inc. (DDMI, or Diavik) supported virtual workshops (Water Quality Criteria Workshops) with both Participation Agreement (PA) and non-PA communities. The intent of these workshops was to: (1) share recommendations from the ongoing Aquatic Effects Monitoring Program and the 2019 twelfth session of the TK Panel, specifically related to water quality criteria that include cultural use and (2) further discuss the concept of cultural criteria for water quality as a condition that must be met for Diavik to put PK into the pits. Diavik recently received approval through an environmental assessment process whereby the [*Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite to Mine Workings*](#) Measure 2 states that water quality objectives need clear, measurable and culturally relevant criteria.

Diavik has expanded on what was shared during the TK Panel Session 12 and prepared proposed criteria for community review. The intent of the workshops was to provide an opportunity for feedback on the proposed criteria and further develop these criteria to include the recommendations of the broader potentially impacted Indigenous communities. These criteria and the feedback from workshops will be shared with the Wek'èezhìi Land and Water Board as part of the water license amendment during the regulatory process in Q4 2020.

During the workshop, Diavik presented the proposed plans for storing processed kimberlite (PK) underground in pits, rather than in the current containment area (i.e. processed kimberlite containment, or PKC). As noted in section 12.8 of the TK Panel 12 Report, TK Panel members recommend that only when scientists and the TK Panel agree that the pit water is safe (i.e., drinkable) and stable (i.e., consistent), then breaching of the dikes can occur to allow water to flow back and forth but prevent fish from entering the pits, at least initially.

As well as providing YKDFN participants the opportunity to give feedback on proposed closure details, the workshop also focused on a discussion of healthy water according to Indigenous Knowledge perspectives. Natasha Thorpe and Joanne Barnaby presented an overview of the many ways YKDFN members have already contributed to developing ways to measure healthy water (e.g. through the DDMI TK Panel and Aquatic Effects Monitoring Program), and shared examples from other Indigenous communities across Canada that are measuring water quality according to their ways of knowing.

A discussion was facilitated based on the following questions:

- What are the good properties (i.e., things) you look for in other lakes you use?

- What are the properties (i.e., things) of water that make it suitable for cultural use?
- What needs to happen to see if the spirit returns to the pit lake?
- Do people expect to draw water from the pit lake for cultural use?
- What properties (i.e., things) in the pit lake could change your use of the big lake?

Summary of Key Findings

Properties of water that make it suitable for cultural use

Many of the properties and cultural uses of water raised in the workshop are consistent with previous YKDFN input during the TK Panel 12 sessions and AEMP activities (Table 1). Properties of water that participants expressed make it suitable for use include that it is clear, cold, and flowing, with no unnatural sediments, contaminants, or chemicals. It should look clear and one should be able to see the bottom; it should taste fresh and make tea that tastes good. It should have healthy fish and wildlife living in and around it, and healthy shoreline plants with no bubbles around the shore (this is a sign that oxygen has left the water). Participants noted it is understood that water that's in the bush in woodland areas gets filtered naturally:

In MacKay Lake area, there's a barrenlands and water too, you can go 6ft from the shore and you can see a rock down in the water. You can still see that rock. The water is clear and clean and cold from the barrenland and the ocean, it filters through all the woodland area. My dad used to tell me a lot of stories about the water, the wildlife, we go there, and nobody has died from water because their water is clean and clear.

[Jonas Noel]

One participant described how some Elders can identify the origin of water just by it's unique taste:

A few years ago I was out working at McKay Lake, we were drilling holes in the ice, the ice road. On the last day, I bottled a bunch of water into bottles to bring home, and my grandmother she didn't know where I was, that I was out working. I got some a bottle, and I told her, have some. Her first sip, she knew where it was from exactly, 'this is MacKay Lake water, right?' How the heck did you know? It's one of those things that Elders know. It's hard for them to describe, to put into words, when they know, they'd know. [Paul Betsina]

Table 1. Properties of water that make it suitable for cultural use

Property	Quote (from workshop)	Sources (outside of workshop)
<p>Looks clear and can see the bottom (not murky, no unnatural / suspended sediments, soap, dust, dirt, nothing floating or disturbed in the water)</p> <p>Ice should also be clear (green)</p>	<p><i>In the barrenlands when you go walk about and you see a small pond or something, you can see to the bottom, that's good water when you see that. [Peter Sangris]</i></p> <p><i>One of the things that we have learned throughout the years, talking with the Elders [about water is], the condition of the ice, coloration of the ice. You can tell whether the water is good or not. Right now on Great Slaver Lake, the colouration of the lake is green and dark. But if you go to MacKay Lake, it's blue. If the ice is green, that tells you that the water is clear. If you go to the east arm you couldn't notice the difference at the narrow island. [Chief Edward Sangris]</i></p> <p><i>I don't want green water. But yeah, blue or clear crystal blue is an indication of clear water. Green is the top end of colouration and green is starting to show. If you can visualize that at the bottom as a greyish, light greyish to dark greyish, then you have to be concerned. With all these layers above, the summer and winter, you get to really know the difference. You see it on Great Slave Lake, pristine, what I'm talking about-in the summer they have groundwater, because of the water that's affected the water quality, sediments, onto the lake because of high water. Those are things we have to look out for. You look at that too because slow contamination and contamination of snow and effects on the lake water too. Those are kind of things that-it might not matter now but it will matter to people in the future. [Chief Edward Sangris]</i></p> <p><i>Just wanted to say about the watershed, Lac de Gras, how comes out from Yellowknife a long way, follow the watershed. So the wall that may contaminate Lac de Gras can affect us. Not only when we travel to other communities and our neighbours to the north, actually take their drinking water right from the river. They have pumphouses set up, so we have to think, have to protect that, we have to be cautious. That's why-I'm still worried about the part where we'll be putting the materials back into the pits and then put water on top of it. Because sediment from the water, it tends to move around and they never do settle down solid, so if the water is</i></p>	<p>Raised in YKDFN AEMP Planning Meetings: February 23, 2012; May 11, 2012; June 5-6, 2012</p>

	<i>freezing and thawing, the sediments will be disturbed and flow down the rivers, so we have to watch out for that. [Angus Charlo]</i>	
Free of contaminants / chemicals	<i>I don't think any of that has been done before and there is the lake, it's right on the lake. We really have to think about the future. The Elders, when they speak from experience, the Elders said that all wildlife, this water, you have to really consider all that, and that mine is right on the lake. The only thing holding it is the dam. If it overflows with water, or the water after it goes into the pits, if it overflows without being good quality, the whole lake is going to get contaminated by the chemicals that they use. So we have to really keep a close eye and monitor that. We are saying this for the future generations. [Chief Edward Sangris]</i>	Raised in YKDFN AEMP Planning Meetings: February 23, 2012; May 11, 2012; June 5-6, 2012
Cool / cold temperature	<i>And some of the fish we caught, they had long bodies and big heads: that's cold water. So stuff like that, that's probably where we would go. [Andrew Crapeau]</i>	Raised in YKDFN AEMP Planning Meetings: February 23, 2012; May 11, 2012; June 5-6, 2012
Known as an area of cultural use	<i>If we go somewhere on the lake, we know there's no mine around, no hesitation, just drink water. But if we know there's an old mine near it, we'll hesitate. [Jonas Sangris]</i> <i>...when I was coming with my brother and my dad, and my dad, they would say this kind of snow is good, that kind of snow is not, that's the kind of knowledge they passed on. [Chief Edward Sangris]</i>	Raised in YKDFN AEMP Planning Meetings: February 23, 2012; May 11, 2012; June 5-6, 2012
Home to / used by fish, bird, wildlife (healthy)	<i>It was clear but natural ... the animals and people, to drink it. [Alfred Baillargeon]</i> <i>...water is good for everything. I'm sure that there are different kinds of water, when you go from the land and even at the Yellowknife River, we know that at Yellowknife River area. Water is not good there, we can't drink water from that area, we know because of the fish. [Andrew Crapeau]</i>	Raised in YKDFN AEMP Planning Meetings: February 23, 2012; May 11, 2012; June 5-6, 2012
Tastes fresh (and makes good tea)	<i>You can't take water from the shores of Dettah anymore. When I was kid I used to drink water from the shores there right from my house. Long time ago we used the lake, right up to my house. Around this land we used to break off some icicles from the lake... We used to do all that and the water is good for plants, it was good, the berries used to taste so good when you go out on the land, the water, it was so pure. ... A lot of people mention about good clean water. I know it is very important.</i>	Raised in YKDFN AEMP Planning Meetings: February 23, 2012; May 11, 2012; June 5-6, 2012

	<i>Without water, we cannot have a good cup of tea, you cannot do anything. [Andrew Crapeau]</i>	
Can drink unfiltered	<i>We don't have to filter it or anything. That's what we have to protect and we all know that. [Angus Charlo]</i>	Raised in YKDFN AEMP Planning Meetings: February 23, 2012; May 11, 2012; June 5-6, 2012
Healthy shoreline plants / vegetation	<i>As long as it's cold, it's clear, it's flowing, doesn't have any of those saturated minerals or stuff like that, doesn't grow fungus along the shore, not bubbly. That's one of the things I was taught too, when you look along the shore, on inland bays and ponds, lots of bubbles on the shore mean all the oxygen is leaving the water so if you don't see-I wouldn't drink that kind of water. You don't see that in big lakes or the rivers. It's a good clear indication that it's good water. You're probably looking for a scientific answer from us, but don't expect that. Like I said, all we have is what our Elders know. [Paul Betsina]</i>	Raised in YKDFN AEMP Planning Meetings: February 23, 2012; May 11, 2012; June 5-6, 2012
No bubbles on the shore		
Moving / flowing	<i>...without water we can't live. Any company, all the people it seems like they want only money. Money is not that important, but water. Water is really important to me. So we really have to watch out for water flow, where it is coming from, where it's going to, sometimes big lakes have clean water and sometimes they don't. [Jonas Sangris]</i>	

Cultural uses of water

YKDFN participants agreed that water is essential for drinking, cooking, washing, fishing, transportation and sustaining other subsistence harvesting (especially traveling on waterbodies throughout the area and supporting harvesting). Participants talked at length about how water is precious, and supports not just YKDFN, but all life:

Dene people out on the land, they have always caught fish for their food and water to drink, we can't play around with things that are on the land and the water. The water is for survival. That's how we live. That's how we breathe. We drink water and it makes things good. ... on the land, they know ... what to do for their Elders teachings, we know how to do things because the old times, their families taught them. [Therese Sangris]

Water is for all beings, all life, all people, plants, everything. Everything needs water on this earth. [Peter Liske]

We use water for everything, drinking, washing, everything. [Mary Jane Francis]

Water is precious. The clouds pick up the water and it rains on us, it makes things grow. And we have to continue our culture. Everything that I've heard, I hear, I think it's the best to go forward. ...you go north to MacKay Lake, there's thousands of lakes. That's where I think we got the precious water there. [Anonymous]

Everybody knows fuel and gas as precious, to travel back and forth. But water is more precious than any of that. [Angus Charlo]

Participants discussed how safe, reliable travel on water is very important for maintaining YKDFN cultural activities, ways of life (camping, trapping, etc.) and supporting the intergenerational transmission of Dene knowledge:

...the Chief in the past used to travel by canoe to Fort Res, after 1900 ... You travel a long way to go hunting. ... And the Elders would say to each other, they talk to each other because they wanted their people to survive. [Alfred Baillargeon]

We travel by boat that way, we travel on the boat routes that we know, that we've known all our lives. ...you've got to know your way [Mary Jane Francis]

Too much talking, we should be out on the land ... all the time. We have to look out and we have to teach each other and we have to talk to each other to give each other information wherever we go on the land. You feel good with fresh air and clean water. You feel good on our land. But we always have to worry now, and you don't feel good. Meetings like this, I would like to see more people around their teenage years, they don't like to say anything, they can take information, we want them to learn... and later on we can talk to each other about they heard, because that's how I learned when I was young. You sit and listen and... listen to Elders tell each other stories of the land, and that's how I learned. [Alfred Baillargeon]

Participants were clear that members would prefer not to use water from the pit lake for cultural use and that having PK in the pit lake would change members' use of the water in Lac de Gras. Participants noted that their cultural use of the water has already been affected, so considering additional impacts and cumulative effects on water are very important:

So you asked about if water quality will look and taste the same, I don't think so... After all this work, I don't think the quality of the water will be the same. [Chief Edward Sangris]

It's really critical to our people because now, with closure, we have seen the devastation of our wildlife, the caribou have disappeared. Like I said, everybody points their finger at everybody else. Industry is going on our land. It has had some cumulative effects to the animals, the water. The water has to be good 30 years after the mine closes, but what about 50 years, 100, our great-great grandchildren? They'll see the difference in water quality, especially into this day and age when we have problems with climate change. That's the way of life for our people. [Chief Edward Sangris]

Today I look at this, we cannot drink water from the [Great Slave] lake. In the past, even people, old ladies, they would put fishnets right on the shore. They used to do that because water was good, lots of fish. Now, today, you try to do that, this lake here, you catch a fish and it's really soft. It's not as firm as before when the water cleaner. [Therese Sangris]

Returning the spirit to the pit lake

While every person's relationship with spirit is personal, generally, Indigenous peoples have long recognized that there is spirit in water. During the workshop, YKDFN participants shared their thoughts:

...when you look at the water, you pray for water. [Therese Sangris]

...we try to remember our ancestors whenever we go out on the land. [Therese Sangris]

Participants discussed their responsibility to care for the spirit of the water, and that water affected by industrial activities has had the spirit altered:

We used to go out wherever we needed, to trap or to find clean water so we can survive, for our people. At that time there was no mines open. There were no mines open and the water, the lakes, the river, we used to just sit there, get clean water from the shores. ...we used to go in the lake area, we used to set a trap there, my brother, Jonas, we used to camp there. He had a camp there and a cabin he used and we stayed there ... my husband was trapping and we went out to get wood, and we went to the lake, we figured out where good place was. I used to look at the fish I would catch, they were really good healthy fish. I used to go out on the land trapping, anything, we used

to work as a team. But now there's mines all over the place on our land. I wonder how the water is now. [Therese Sangris]

The industry has caused a lot of things to disappear, the intrusion of many things along that road. Our land is not the way it was before. I see that my heart is sad when I talk about those things. [Chief Edward Sangris]

Many participants emphasized their feelings of responsibility toward caring for water, as Dene people, and their desire to see the spirit return to the water and return to as natural a state as possible:

As long as the sun rises, you have to look after everything, the sun, environment, the river, the water, the land, the grass. We have to keep in mind that we are obligated, the Dene people, to look after these things for our people. [Chief Edward Sangris]

...want to make it clean again. We live for water. [Jonas Noel]

...we, the YKDFN consider ourselves guardians of the water, and what happens in our territory affects a lot of people. First Nation communities are built along shorelines. [Angus Charlo]

The industry will walk away, but if they don't come back, our people will still be here, trying to survive on the land, provide for their families. So we need to really look at this issue working together. Collaborating to make this better, to have a better understanding of what the company is going to do, how we as Dene people want to see remediation on our land, affected by industry. [Chief Edward Sangris]

Other

Other topics or concerns were raised by YKDFN participants during the workshop including: timely and ongoing communication between Diavik and YKDFN; conducting their own independent monitoring activities; ensuring that youth are involved throughout the process; highlighting the importance of TK monitoring conducted alongside scientific monitoring far into the future; having Dene language included in the monitoring process; climate change; specific concerns and recommendations related to closure planning. The relationship between YKDFN and water as well as the responsibility of YKDFN as guardians of their territories continues to evolve within the broader framework of caribou loss and change in caribou behaviour related to mining activities (including illegal / disrespectful harvesting of caribou off of the winter road to the mine).

Participants noted that YKDFN would like ongoing support and to work in a collaborative, way with Diavik going forward. YKDFN members would like consistent and clear communication of planning and to know what is going on at site, particularly given concerns around emergency planning and management given Diavik's location on an island:

What that seems like to me is that more information needs to be shared from Diavik's side. There needs to be more verification, more insurance that the community members know what it is that they're providing their knowledge to. [Ryan Miller]

Ekati is dumping-but they're on the land, the mainland. We have a bit of relief, try to agree with them. But with Diavik, it's so crucial how we look at the remediation of DDMI because it's surrounded by water, and water is essential for all human beings and all living things on earth. [Chief Edward Sangris]

YKDFN members expressed the need to do their own independent monitoring activities, noting that 'long term' means much longer than what Diavik considers to be long term. Elders are particularly concerned about contamination given that perceptions are based on previous experiences, e.g. contamination from Giant Mine:

Right now the Elders are right, they are leery of dumping PK into the open pit. That's what they say now, what's after, what is the water quality going to be 1500 years from now? Those are the concerns of the Elders. [Chief Edward Sangris]

We want to see for ourselves in the future how it looks, how the water is, see the proof. [Alfred Baillargeon]

One recommendation is interview people: we want them to monitor our land forever. [Alfred Baillargeon]

...we want to do our own [monitoring], we want to be comfortable with it. . [Andrew Crapeau]

Before they close it, you should take a look at the whole place, and see if it's good. We don't want the water to be contaminated for future use, for generations to come. [Therese Sangris]

In addition to long term monitoring, YKDFN youth should be involved in the process, and respectful and appropriate TK monitoring conducted alongside scientific monitoring should continue far into the future:

We have to teach our young kinds when we take them out on the land. We have to show them, we can't just talk to them we have to show them. In the future when we are gone and the young people take over, they have to know what to look out for. [Jonas Sangris]

...young people that are just doing their things, 14, 15, they should come to the meetings and learn and listen. ...they learn too much other things, other people but they need to learn how our ancestors teach their story too. [Therese Sangris]

...if TK is going to be mixed with scientific knowledge, it needs to be done in a way that includes both sides. [Ryan Miller]

Some participants noted that it is important for their own language and ways of passing on knowledge through stories to be included in activities and monitoring going forward:

If I speak in my language to my nephew and all he answers back is ya, ya, ya. When you take people out on the land I want to speak in my language. If we don't start doing that... everything is going to be lost. [Alfred Baillargeon]

That's the way dad used to talk with me. I was probably one of the fortunate ones that when I go to work every morning, [my] dad sitting at the window every morning having coffee. Mum said, dad's getting old, she said if you know that, spend more time with him. I am so glad she said that. The last five years of his life, I spent every morning with him, and he told me stories, his last days that he was here. I was waiting for his last ... then finally he said, my son, I know you come here to get your last lessons. I thought long and hard, what am I going to tell you. I can tell you is, you knew this day was coming. That's why you spent the last few years with him. All my messages are in the storyline, in the story. The stories are anything that happens that you have to deal with. Just think back and you will remember the messages within these stories. That's how he taught me. [Angus Charlo]

Participants also recommended that monitoring should take place year round, not just in the summer; testing of ice and snow should also be completed, and sediment in the pits at varying levels should also be tested regularly according to science and Indigenous knowledge. Whatever route Diavik decides to go, YKDFN members would like to see the monitoring process with their own eyes:

We have to see with our eyes. If you do it without us being there, it won't work. [Alfred Baillargeon]

Finally, some workshop participants reiterated previously expressed recommendations around the PK to mine workings.

- keeping the PK in the current PKC and raising the walls;
- capping the PKC / putting a dome over it in some manner (e.g. using the gravel currently on airstrip and roads be used to cover the PK that's put into the pit, before putting water on top of the gravel);
- burying and freezing the PK; and
- drying the PK in the PKC in some manner.

Given that permitting is approved for the PKMW at this stage, DDMI will continue to seek deeper understanding around the values and concerns behind these recommendations in order to apply them moving forward with closure planning.

Participant Questions

The following is a list of questions asked of Diavik by workshop participants. Responses are further detailed in workshop notes.

1. Angus: What I'm saying is, you build the dam around the pit to pump the water out years ago. You started it and you've got a pit. Just leave it as it is, fill it back in with that PK. And use the natural gravel that you built the road, was that natural gravel that they built the road with?
 - a. Gord: One thing you need to understand is that if you could build it the way you describe, the water will still get in. If we don't fill the water with water from Lac de Gras, it will fill with groundwater that is seeping in. That groundwater is poorer quality than Lac de Gras. It will fill up with groundwater if we don't put lake water in it.
2. Angus: You've already started treating the water that is [there already] before you came here and, it's after the fact, that you've already started to [do the work] last year. Why are you coming here now?
 - a. Sean: It's a hard one. We're talking about two different things. The work that we started three years ago is for the rock pile cover. So we might not have met with you but we did go through a process 3, 4, 5 years ago for that. That cover was approved with the water boards, we started that cover. Then today we are talking more about the PK going underground. That side of things.
3. Ted: Do we have anybody from our band sitting on WRRB?
 - a. Myra: Rachel Crapeau is sitting on the water board.
4. Ted: I'm not sure, I know she was there before, is she still an active board member on behalf of YKDFN?
 - a. Sean: She is an active board member. She wasn't appointed by the YKDFN, she was appointed by the federal government. But she is a YKDFN member.
5. Angus: The question I have is, anytime along this line, that these contaminants, the slurry part, starts mixing in and getting lighter, contaminates the rest of the water that's in there. Is there any time along this project that you can reverse it? Because if anything starts going wrong and it starts getting worse and the water is not cleaning out itself, is there any part of this project that you're doing that you can reverse it?
 - a. Sean: Once we put the PK back underground, we can't reverse it. We can't take it back out. But what we could do is keep the pit lake separate if it ended up being unsafe. The PK would have to stay there, but it doesn't have to reconnect with Lac de Gras. we would treat it, do whatever we could to make it safe again. And all the modeling and sampling so far say it will be safe.
 - b. Angus: What you're saying is once we start this, we are committed, we can't reverse anything? Even if it doesn't work properly the way you're planning, we're committed to it. We can't say, oh it's not working. We can't reverse it, or fix it. But that last sentence I'm talking about it, fix it. We got to have a

system in place, something to fix, so that if this doesn't work, what can we do to fix it? I don't want to see this go ahead until something is in place that we can fall back on to make it safe. Once we start on this the way it is, as it is, we're committed, we can't reverse it. We've got to have something in place so that we can fix it, so we can make it safer if it isn't working. Mahsi.

- c. Sean: There is two opportunities to make sure that it's safe. Before we fill the pit with water from Lac de Gras, we can sample this, the bottom, there will be some water there. And we can get rid of it, pump it out and treat it, because this will still be during operations. We could get rid of any-if the water isn't clean we can pump it out and treat it. The other important step is that-the most important, is the decision to reconnect it to Lac de Gras. we can be out there while it is still separate, just a small pit lake separate from the big lake. If it's not safe or clean, we can keep it separate. We can treat it using different water treatment methods, or wait longer if it takes more time for the fine sediment to sink to the bottom before we reconnect it. I should clarify that this is the plan for all three pits. The plan for all three is the same, we'll fill with water from Lac de Gras and then reconnect. Flooding and reconnecting them with the lake has always been a requirement for us from the beginning.
- d. Angus: I was thinking about something to fall back on. Saying that you can pump that water out and retreat it. My question is, if that doesn't work, would you look at the possibility of filling that with materials like I said earlier, as an insurance, an alternative measure? Some of the Elders I talked with earlier, they agree with what I'm saying, backfill it and cap it and put a bubble on top of it, with all the material, and have vegetation and that. Cap it and seal it. That is what I'm thinking about and some of the other Elders are thinking about. Mahsi.
- e. Sean: One of the challenges with this PK is that it's a really fine wet sand, squishy. So this is where we've been putting PK for the last 18 years. Are plan is to cover the outside with rock. But the challenge with the inside is that it's very fine material and it's very wet. If we put rock on it, it will squish into it, it will stick. We can't make a normal cover like what you're suggesting. Right now our plan for this is to leave water over the middle so it's a safe body of water that wildlife could swim over so they don't get stuck in the mud. This PK we're putting underground will be similar, very soft. We thought about this, if we tried to put rock on top, we would have to drive trucks to the bottom of the open pit and tip them and dump rocks off the side. The rocks would squish into the PK and like putting rocks on toothpaste, it would squish through and the rocks would sink. That's the challenge. You can't cover it with rocks because they sink. This is why we need to use water as a cover. Water will stay on top.
- f. Angus: I'm thinking of that material down there not being solid, fine material. Why would you open it up to the rest of Lac de Gras? You've already got it

contained, the dam is there, in time it will tip itself out. The other thing, isn't there something lighter that will sink down but still be able to cap that, separate from the water? Something that's like a membrane? Not that it will stick to the bottom, to cap that off but not enough to put pressure on it, to keep it separate from the clean water? What you're saying is opening it up and leaving the water and buoyancy that's not there, it's just enough to keep itself down but there is nothing to keep it separate from the water. If you can find a way to cap it and keep it down there, that's something we should look into.

- g. Sean: That's a good idea. I think there's one thing I didn't mention that might also be helpful. When we finish the deposition in 2025, we expect the PK to be this far from the bottom, right at this yellow line. But over 200 years, it will squish, settle, consolidate, so the models suggest it will squish down another 150 meters down and that will take about 200 years. Most of it will happen in the first 50 years. That's the other challenges with making some sort of cover, is that the whole surface is going to go down a long way.

Conclusions and Next Steps

Diavik aims to complete workshops with eight Participation Agreement (PA) and non-PA communities, with the combined outcomes used to develop draft cultural use water quality criteria to submit to regulators.

Appendix A – Agenda and Informed Consent Form

Diavik Diamond Mines Inc. Water Quality Workshop Agenda

Yellowknives Dene First Nation Chief Drygeese Building, Dettah, NT June 3 - 4, 2021

Day One: June 3, 2021

9:30-10:00	Coffee and Online Workshop Microphone Testing and Overall “How-To” (Myra)
10:00-10:20	Opening Prayer (YKDFN) Opening Circle (Everybody) Workshop Welcome, Overview and (Facilitators)
10:20-11:00	Diavik Diamond Mines Inc. (Diavik) <ul style="list-style-type: none">• Overview of Diavik and the Traditional Knowledge Panel Why are we here? <ul style="list-style-type: none">• Background around the need to develop “clear, measurable, and culturally relevant” criteria for water quality at closure
11:00-12:00	What is Healthy Water according to Indigenous Knowledge? (Facilitators) <ul style="list-style-type: none">• Overview of how the DDMI TK Panel and Aquatic Effects Monitoring Program have been developing ways to measure healthy water (i.e. water quality)
<i>Break</i>	<i>Lunch provided</i>
1:00-4:00	Discussion Questions <ul style="list-style-type: none">• What are the good things you look for in other lakes you use?• What are the things about water that make it suitable for cultural use?• What are the things you need to know in order to drink water from the land?• What needs to happen to see if the spirit returns to the pit lake?

Day Two: June 4, 2021

9:30-10:00	Coffee and Online Workshop Microphone Testing and Overall “How-To” (Myra) Welcome and Sharing Circle
10:00-10:30	Refresher on Closure Plans for Pit Lake (Diavik)
10:30-12:00	Exploring Water Quality Criteria for the Pit Lakes <ul style="list-style-type: none">• Do people expect to draw water from the pit lake for cultural use?• How will us use the big lake (Lac de Gras) knowing that the pit lake has PK?
<i>Break</i>	<i>Lunch provided</i>
1:00-3:30	Exploring Water Quality Criteria for the Pit Lakes <ul style="list-style-type: none">• Discussion continued
3:30-4:00	Closing Thoughts and Sharing Circle Closing Prayer

Note: Lunch will be provided. Breaks will also be as-needed.

Yellowknives Dene First Nation

Diavik Diamond Mines Inc.

Water Quality Workshop

June 3-4, 2021

Dettah, NT

Informed Consent Form

I, _____ on June 3, 2021 give permission for Diavik Diamond Mines (2012) Inc. and its contractors (i.e., Thorpe Consulting Services and Joanne Barnaby Consulting), to take notes, photographs and / or audio and video recordings related to my participation in meetings, workshops and events related to the Water Quality Workshop conducted on behalf of Diavik Diamond Mines Inc. (DDMI).

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 and that my Indigenous Organization will give me the opportunity to review/verify my contributions;
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 Indigenous Organization, DDMI may use the information collected to contribute to caring for water in the NWT and NU;
5. DDMI, and / or its contractors may share my information in either reports, presentations, and/or photographs provided it is within the context of this workshop scope and that they provide such information to my Indigenous organization;
6. I agree that my contributions may also be used by my Indigenous Organization for future educational, cultural, heritage, and environmental purposes that are outside the scope of this workshop and that my representative Indigenous organization, 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 my Indigenous organization policy and the DDML and YKDFN Engagement Protocol for the Processed Kimberlite to Mine Workings Project;
8. I am free to request that any information I share is removed, erased or deleted from draft materials and that final copies will be provided to me;
9. My information will be summarized and included in a report which will be publicly available; and
10. I understand that DDML, Joanne Barnaby and Natasha Thorpe cannot ensure the protection of my information (e.g. Traditional Knowledge) from public release once the reports are released (e.g., via youtube.com, Facebook, other social media, or Indigenous group websites),

Signed on June 3, 2021 in Dettah, Northwest Territories.

Signatures:

Participant

 *Joanne Barnaby*

Contractor

Yellowknives Dene First Nation

Indigenous Organization

Witness

Translated by: _____ (Interpreter if required)

Appendix B – Presentations

Presented to the Yellowknives Dene First Nation

Diavik Diamond Mines (2012) Inc.
Water Quality Workshop
June 3-4, 2021

Facilitators: Joanne Barnaby, Natasha Thorpe
Support: Sarah Ravensbergen



Water Quality Criteria

Culturally important indicators for water quality monitoring



What has been done so far?

- ▶ Community Aquatic Effects Monitoring Program (AEMP) overview (2003, 2007, 2009, 2012, 2015, 2018)
- ▶ TK Panel Sessions (e.g. TK Panel 12)

Regulators state that: “water quality objectives need clear, measurable and culturally relevant criteria.”¹

Water Quality Criteria Workshops



¹ Report of Environmental Assessment and Reasons for Decision, Processed Kimberlite to Mine Workings

Aquatic Effects Monitoring Program (AEMP): Contributions from Yellowknives Dene First Nation

AEMP Summary: Yellowknives Dene First Nation Input

- ▶ AEMP Planning Meetings: February 23, 2012; May 11, 2012; June 5-6, 2012 with Mike Francois, Modeste Sangris, Therese Sangris, Fred Sangris, Randy Baillargeon, Jonas Noel, Peter Sangris, Judy Charlo, Alfred Baillargeon, Isadore Tsetta, Lena Drygeese, Celene Drygeese, Berna Martin, Ed Sangris, Paul Mackenzie, Randy Boulanger, Jonas Sangris, Randy Freeman
- ▶ Water provides life to all flora and fauna: without water, there is no life.
- ▶ Land is recognized for healing qualities and taking care of the Dene; important to pay respect with offerings/prayers
- ▶ Healthy water should be: cold (supports healthy fish), not greasy/slimy, flowing; colour is important (e.g. blue is good, green is okay); health of fish is connected to quality of the water
- ▶ Check water by looking, determining clarity, boiling/making tea to see if there is a slimy residue; YKDFN should be participating in monitoring with scientists to see if they are collecting the right information and enough.



AEMP Summary: Water Quality

- ▶ Judy: We need the youth involved in watching the land. Be careful when doing studies, we want to be involved and help.
- ▶ Jonas: Important to observe wind, direction of water flow, and sunset to know what fish and animals are doing.
- ▶ Alfred: We need to check again to see how fish and water are doing, as well as small animals. ...We need to make decisions on our land for the sake of the future.
- ▶ Eddie: Water is alive and we need to respect it. We need to be careful how we talk about it... Elders never say that water is no good as it is alive and listening.
- ▶ Modeste: Water might be a different quality depending on the time of year.
- ▶ In the past, ancestors told stories about fish. Now, the Elders are trying to teach scientists their stories. They are using their stories to determine the health of fish and water.
- ▶ Elders emphasized the importance of their involvement in monitoring activities so they can see for themselves. They want to know what is happening to the land and water. They recognize gaps in their own knowledge (especially around groundwater), and they can learn from mining company studies about these types of effects.

AEMP Summary: Water Quality

- ▶ Judy emphasized the importance of preserving the land and water for future generations. Their survival depends on the health of the environment. Many of the Elders have grandchildren that they think about when they attend meetings.
- ▶ Alfred: We need to check how the grass under the water near shore looks. Treated water being put back into Lac de Gras will change the lake and affect everything in the water.
- ▶ Alfred: There are some areas between islands in Lac de Gras where I am not sure about the water quality. A couple of rivers connect and water flows; we need to test the water near and between these islands. The water coming into Lac de Gras is okay, as it is ahead of development. We should test the bay area of Lac de Gras near the mine. Water flows out of Lac de Gras, too.
- ▶ Important YKDFN concerns: pollution/dust on land and in water; algal growth (less food for fish); changes in water levels/colour of the water; effects of blasting, spills/seepage on water and human health/illness (reactions, viruses, etc.); effects from previous mining (e.g. yellow rivers); winter roads; clear communication about what is being monitored and where; safety concerns near pits for humans/wildlife; use of chemicals; water quality in the Coppermine River, other rivers and streams in the LDG area; confidentiality and respect of TK shared.

AEMP Field Form

Date: Recorder:

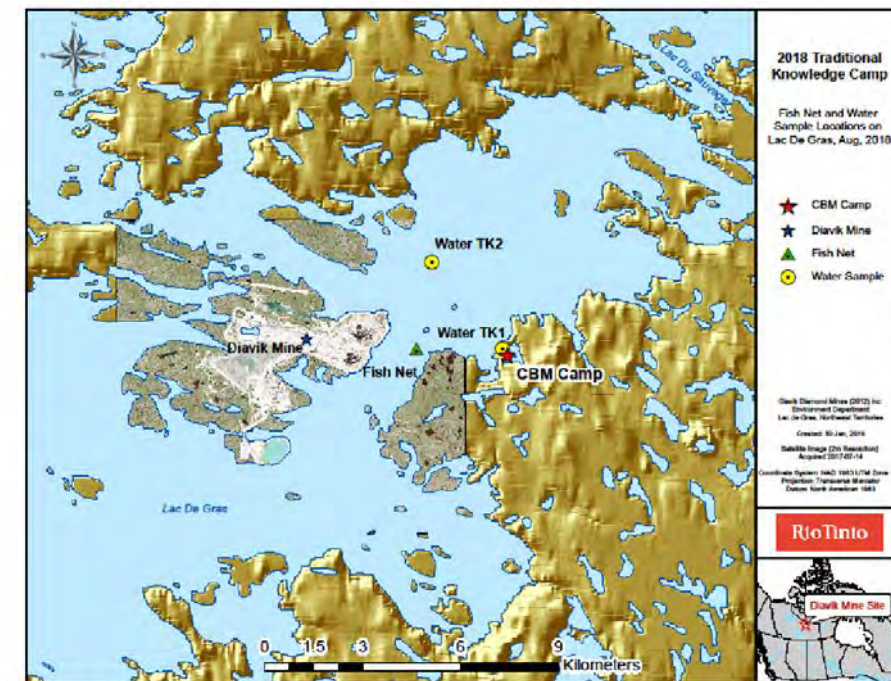
Location/Depth: Sample ID: Group/Person:

Collection Features: (Circle what best describes the feature)

Temperature:	Cold	Average	Warm
Depth:	Deep	Average	Shallow
Clarity:	See bottom	Murky	Cannot see your hand in water
Movement:	Still	Some	Running
Colour:	Blue	Green	Yellow
Other:			

Taste Test:

Tea:	Good	Average	Poor
Water:	Good	Average	Poor



Overall Description:

*Why was this water testing location chosen?
How can you tell when water is healthy or unhealthy?*

*If water had words, what would it say about how it is doing? It is happy? Hurting? Why?
What can you teach us about water?*

Traditional Knowledge Panel Summary

TK Panel #12 Summary

- ▶ The TK Panel put forth the following guidance points around monitoring:
 - ▶ We want to build on the existing AEMP and camp to expand TK testing and to build scientific testing methods and skills with young people.
 - ▶ Even after the TK Panel is satisfied that Diavik is released of responsibilities, the pits and mine site need to be monitored every year, indefinitely.



TK Panel #12 Summary Continued



- ▶ 12.7: The TK Panel would like Diavik to test water in the pits for at least two years (until the water is deemed good) and compare this to water in Lac de Gras. Water samples will be collected from multiple depths at various times throughout each year and tested according to the AEMP protocols. Taste tests will be done after scientific sampling tells us the water is drinkable, where they will watch for smell, clarity (turbidity), temperature, colouration, scum on the water or tea, and water and tea for taste.
- ▶ 12.8: When scientists and the TK Panel agree that the pit water is safe (i.e., drinkable) and stable (i.e., consistent), then breaching of the dikes can occur to allow water to flow back and forth but prevent fish from entering the pits, at least initially.

Indigenous Ways of Watching Water: Canadian Examples

Tr'ondëk Hwëch'in Water Quality Indicators¹

Table 1. Summary of indicators used by TH Elders to determine if traditional drinking water sources are safe for human consumption.

Indicator	Description
Sensorial Properties	
Color	Water should be clear with no color (e.g., tap water can be grayish or yellow).
Turbidity	The term "White Water" refers to clear water that you could see through. This means that water with limited turbidity is desirable.
Running Water	Water should be fast flowing and not stagnant.
Nothing Growing	No moss or plants should be growing on the rocks.
No animals in vicinity	There should be no animals around to contaminate the water. Ducks swimming in water can be a sign that it is not contaminated.
Makes Good Tea	Water should make red tea. Bad water makes black tea that leaves stains in your cup.
Odor	There should be no smell.
Taste	It should have a "fresh" taste. It should taste "good." It should not taste like chlorine.
Prior Knowledge and Use	
Prior Use	The water source has been used by many generations.
Knowledge of sources of contamination	There should be nothing above the water source in the watershed (e.g., no outhouses, septic fields, or resource extraction).
Water Quality Testing	Several Elders noted that they would like water quality sampling to be conducted at the water sources they use.

¹ <https://www.mdpi.com/2073-4441/11/3/624#:~:text=Water%20%7C%20Free%20Full%2DText%20%7C,Water%20Sources%20in%20Yukon%2C%20Canada>

Why are we here today?

- ▶ We need “clear, measurable and culturally relevant criteria” for measuring water quality
- ▶ Consider:
 - ▶ What are the good properties you look for in other lakes you use?
 - ▶ What are the properties of water that make it suitable for cultural use?
 - ▶ What needs to happen to see if the spirit returns to the pit lake?
 - ▶ Do people expect to draw water from the pit lake for cultural use?
 - ▶ What properties in the pit lake could change your use of the big lake?



Summary Table: Results from previous WQ workshops

Table 1. Properties of water that make it suitable for cultural use.

Healthy, edible fish, healthy wildlife, animals using the water, edible fish
Clean smell (can have a fishy smell) and taste (affected by fish, wildlife, plants, rocks, temperature, location, saltiness, sediments); clean smell (can have a fishy smell)
Clear colour (natural, not murky, no oil, film, scum, not too much algae); Clear (natural, no oil, foam, scum, not too much algae, nothing floating or disturbed in the water i.e. pollen, dust); Healthy look and taste (especially for tea making), no smell
Free of contaminants/chemicals
Moving, flowing (from wind or current); not stagnant
Healthy flora and fauna in the water; Shoreline plants are healthy (e.g. willows, reeds, sedges)
History of the area (TK says it has been used); Shoreline rocks are worn from use
Quality of snow/ice
Cold water high in oxygen, temperature is important
Can drink unaltered; don't have to boil it
Free of deposits or by-products (e.g. crushed gravel, PK) and does not exceed the acceptable Canadian water quality guideline levels

Next Steps

- ▶ Workshop summaries and notes returned to each community
- ▶ Summary report from all workshops being assembled

Thank you!





Rio Tinto

Water Quality Criteria –

Culturally important indicators for water quality monitoring

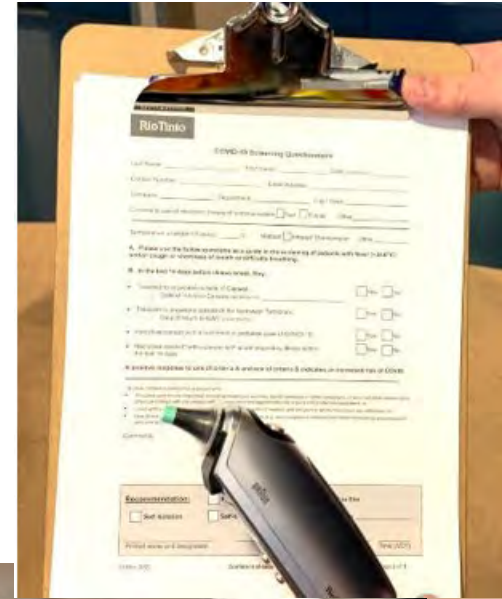
Yellowknives Dene First Nation

June 3rd & 4th, 2021, Chief Drygeese Conference Centre, Dettah

Safety share

COVID-19 Preventative Measures to Reduce Exposure

- self-screening (health line, temperature, symptoms)
- testing at point of pick-up
- testing on-site (upon arrival, mid-rotation and prior to departure)
- physical distancing
- increased sanitation and hygiene

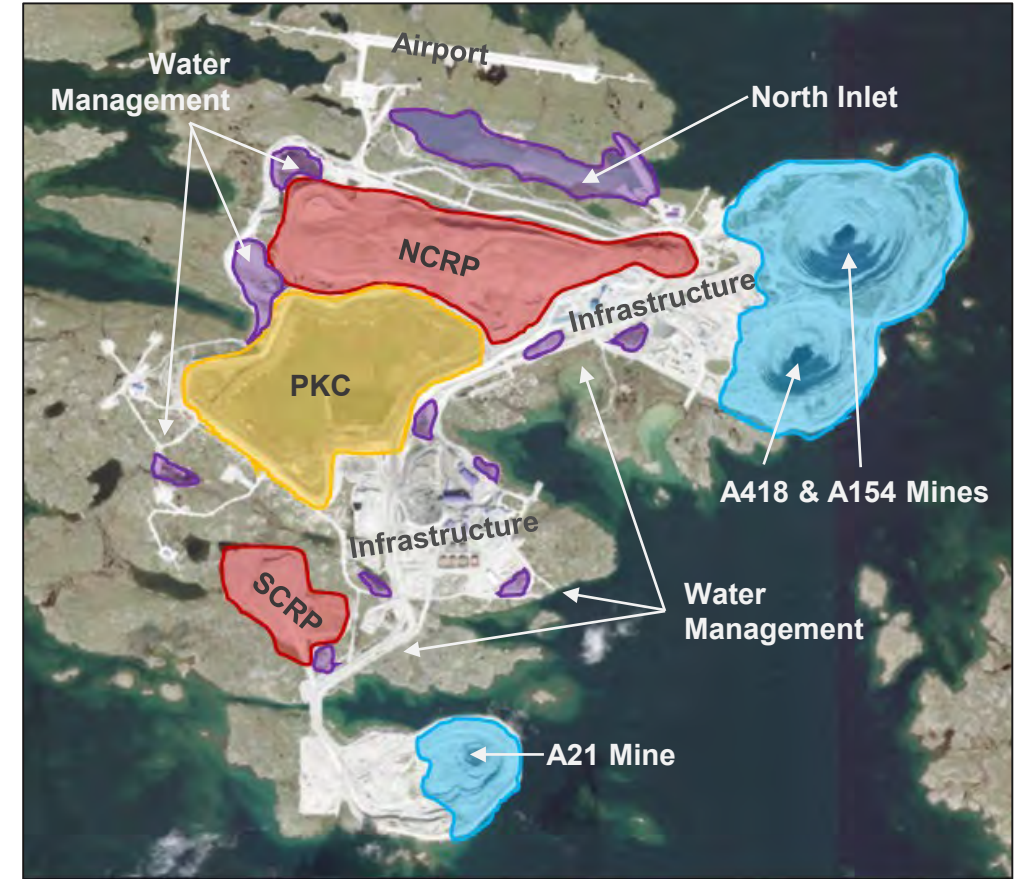


Diavik at a glance



- Joint Venture: **60% Rio Tinto** (owner and operator) and **40% Dominion Diamond Mines**
- **~1,100 employees** including contractors
- Discovered in 1995, operations commenced in 2003
- Produce around **6-7 million carats** per year
- **Over 125 million carats** produced since 2003
- Current mine plan: production **ending in 2025**
- Four kimberlite pipes mined using open pit and underground mining methods
 - A154 North
 - A154 South
 - A418
 - A21

Diavik Mine and Closure Planning



Mine Workings: Remove mobile equipment and hazardous materials, flood with water from Lac de Gras; dikes to be breached to allow full reconnection once criteria have been met.

Rock Piles: Sloped thermal till + rock cover to freeze potentially acid generating rock within NCRP; wildlife access ramps for safe passage on SCR.

Processed Kimberlite Containment: Rock cover on outer beach to separate PK from people and wildlife; water pond to cover the inner extra fine material where rock cannot be placed.

North Inlet and Water Management: Reconnect natural drainages once criteria have been met to allow surface runoff flow into LDG resulting in mixing zones. Partially reconnect North Inlet while natural bioremediation of hydrocarbon impacted sediments takes place.

Infrastructure: Removal of all mine infrastructure, disposal of all inert materials in on-site landfill unless they can be practically recycled, donated or sold; Targeted revegetation; Investigate alternative options where some infrastructure left behind to fulfill alternative regional vision for future use.

Context: Why are we here?

Processed Kimberlite to Mine Workings Project

- ✓ to develop “clear, measurable, and culturally relevant” criteria for pit water quality at closure
- January 2018 to June 2020 – Environmental Assessment (approved by Minister)
- Now – Water Licence Amendment
- Future – Measures to protect cultural use of the lake: TK, engagement, monitoring, reporting

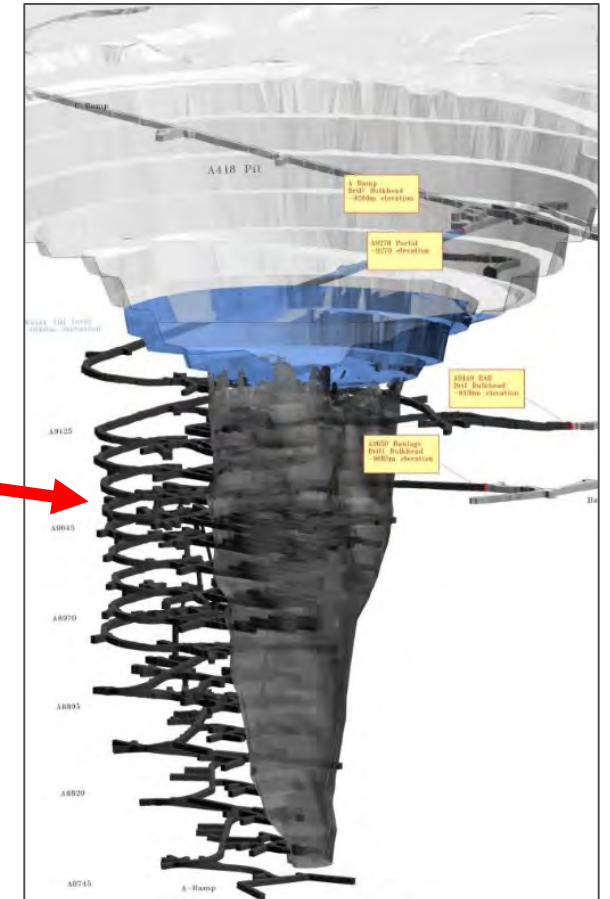


Approved Processed Kimberlite Storage Options

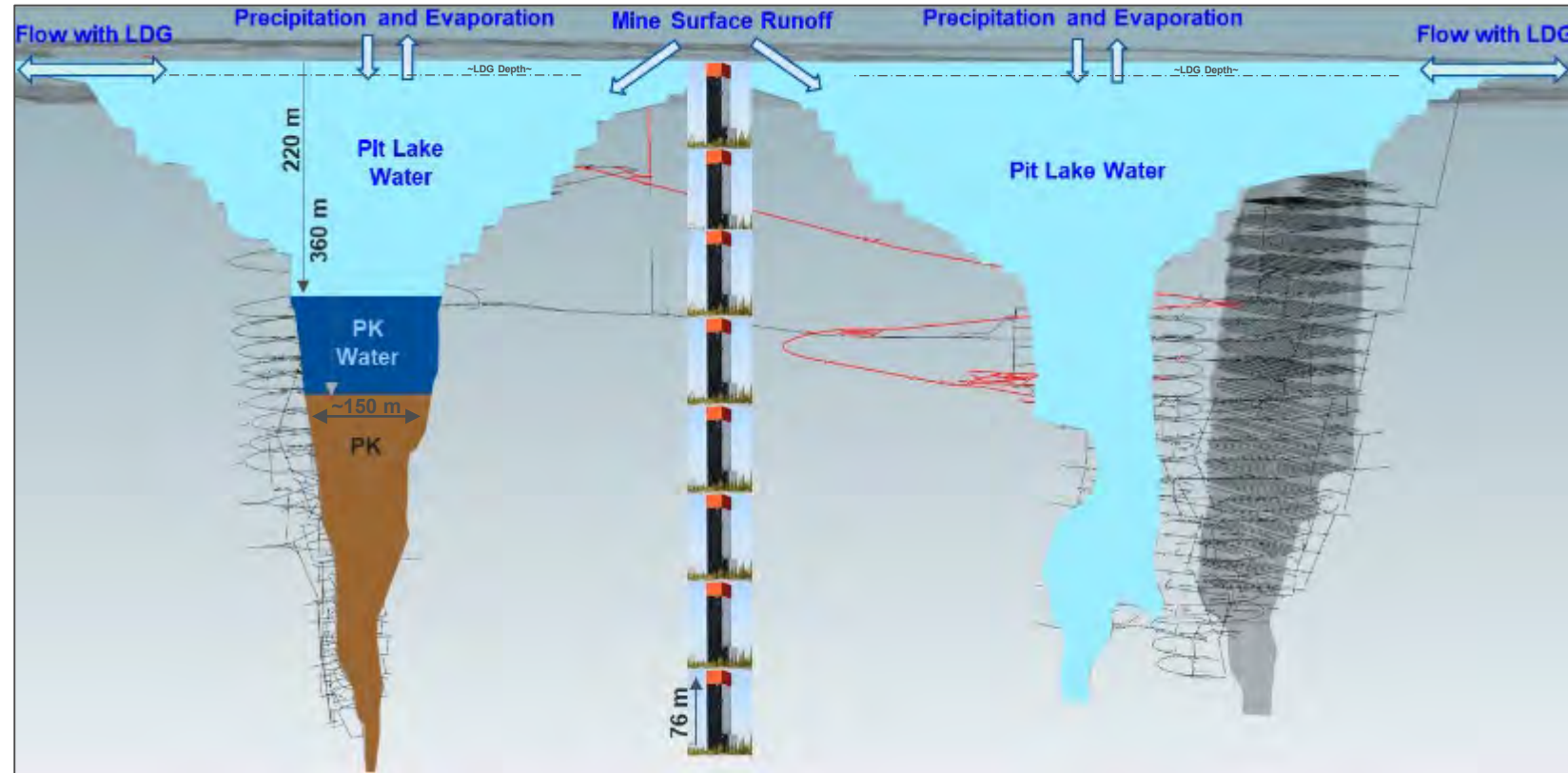
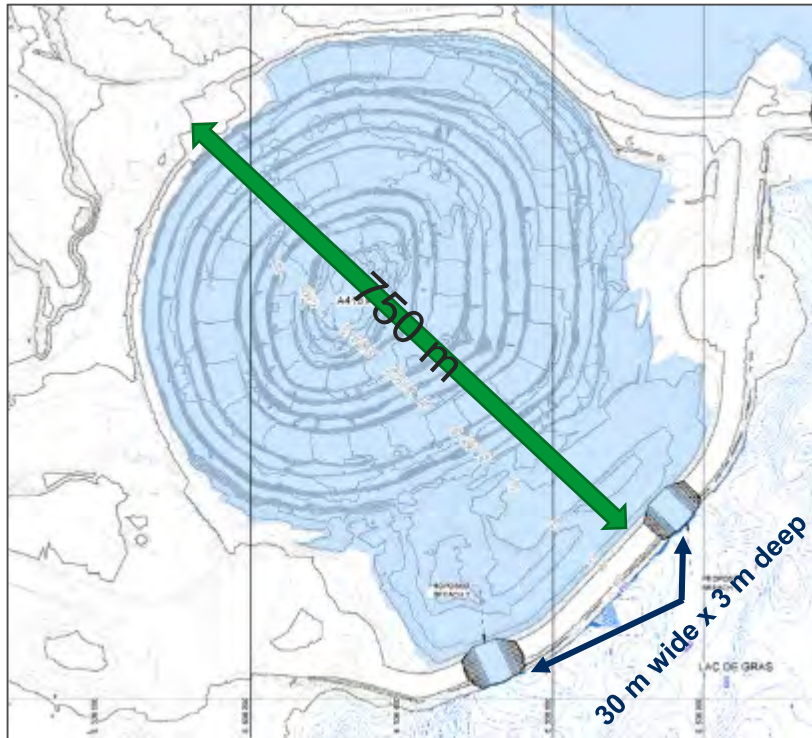
1. Processed kimberlite is currently stored within the Processed Kimberlite Containment (PKC) Facility



2. Processed kimberlite could be stored within the Mine Workings



Flooded Mine Workings Post-closure

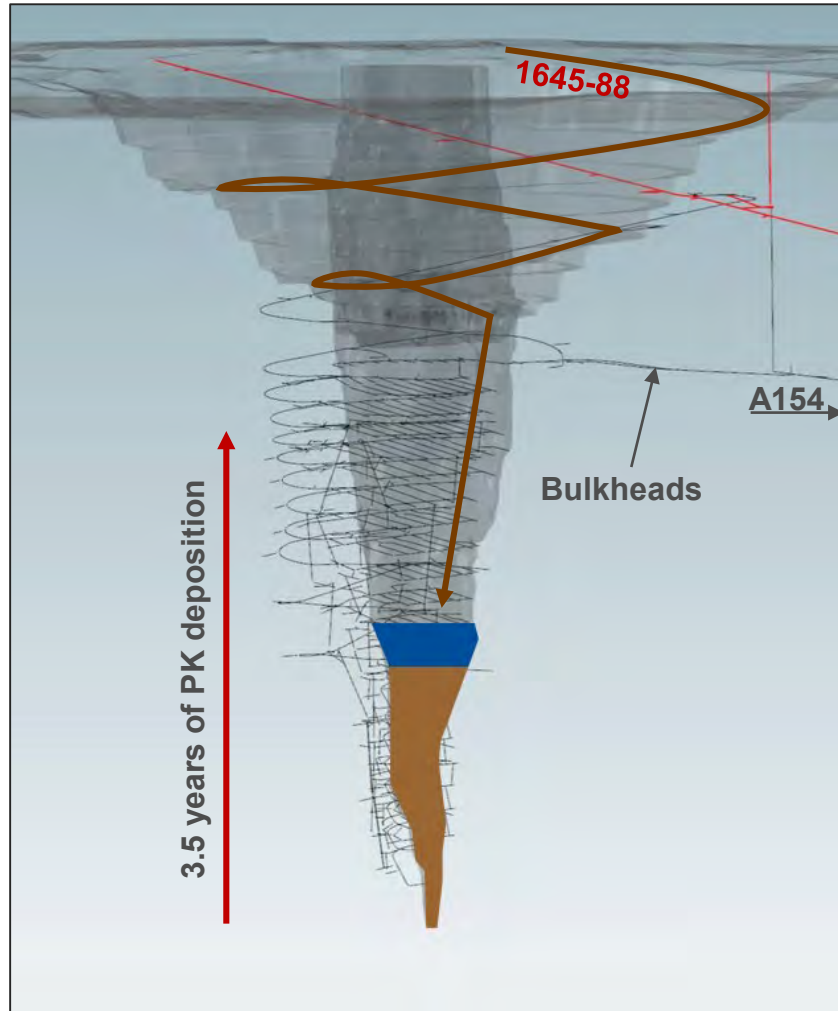


✓ **WLWB Approved for Recommendation: PKMW Water License Amendment**

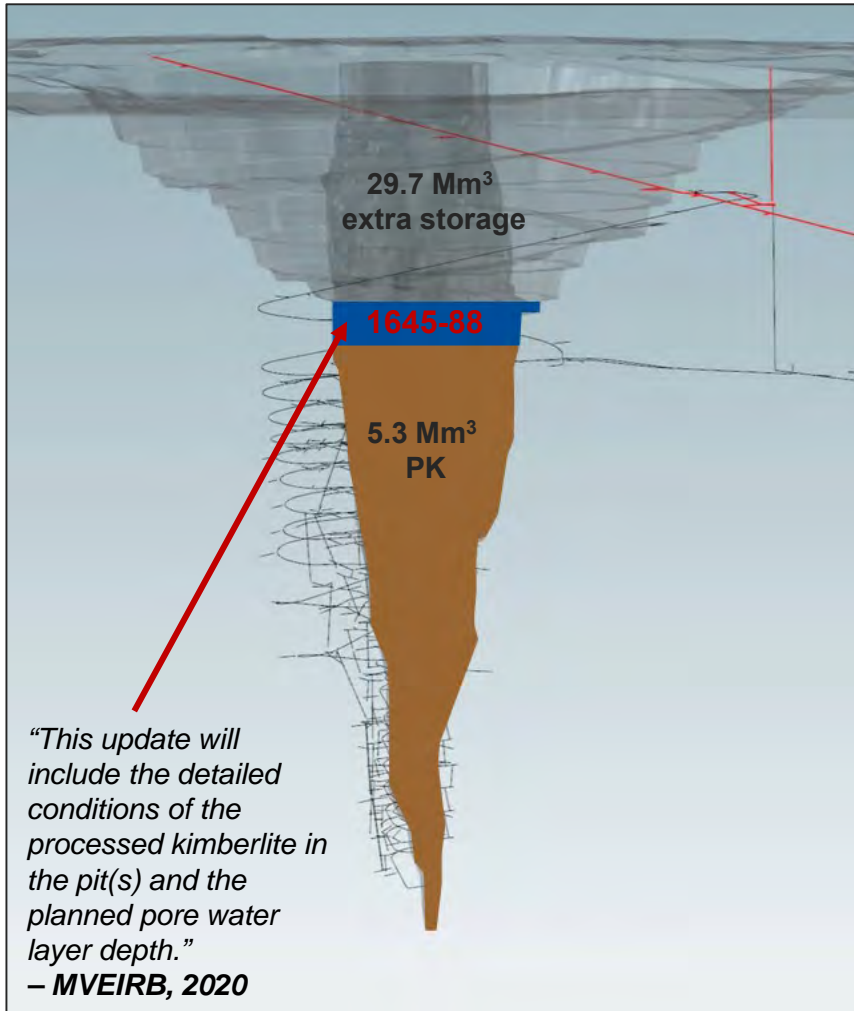
✓ During Deposition – Collect Data of Actual Conditions

SNP Sampling

- PK slurry decant water sampling bi-weekly



✓ Before Flooding – Incorporate As-built Data



Monitoring

- Measure actual volume and chemistry of overlying PK water
- Measure actual volume and depth of PK solids

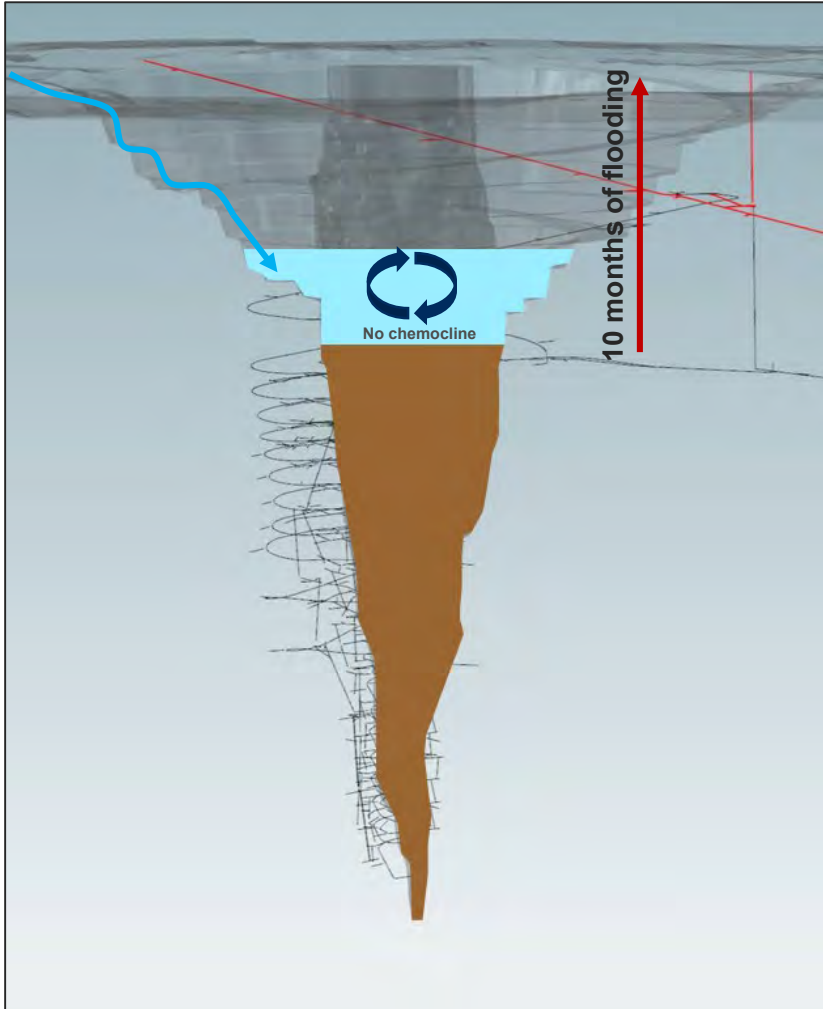
Stage 2 Model and IRP Review

- Incorporate as-builts into **Fill Model**
- **Long-term Model** uses new fill model initial conditions and updated consolidation and porewater data collected during deposition

Adaptive Management

- Modification to initial porewater layer thickness informed by results of Stage 2 model

✓ During Flooding – Watching



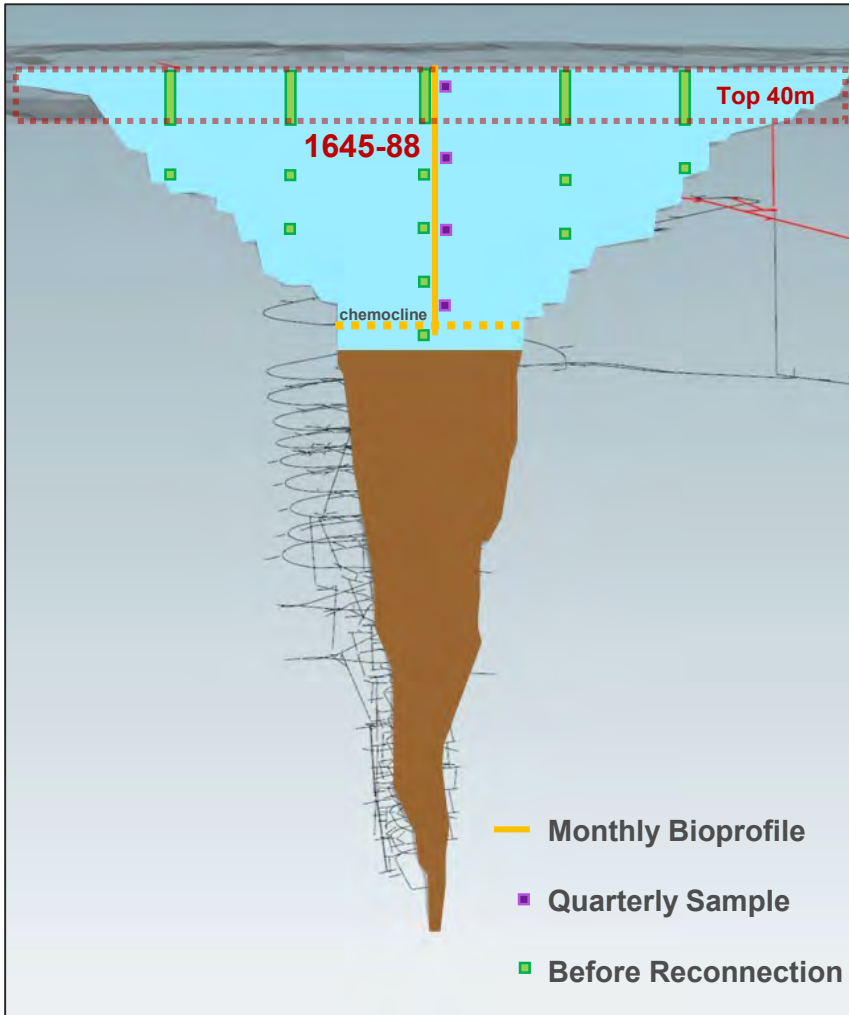
Monitoring

- Observations of filling process
- Model conservatively assumes complete mixing of PK water with lake water
- No sampling is planned for safety reasons

Adaptive Management

- Processed Kimberlite Containment Plan to describe filling methodology
- Initial cap of PK water could reduce mixing / disturbance of underlying PK solids and PK water

✓ Before Reconnection to LDG – Confirming Initial Conditions



Monitoring

- Monitor development and stability of chemocline (if present)
- Comprehensive measurements of actual water quality throughout pit lake

Stage 3 Model and IRP Review

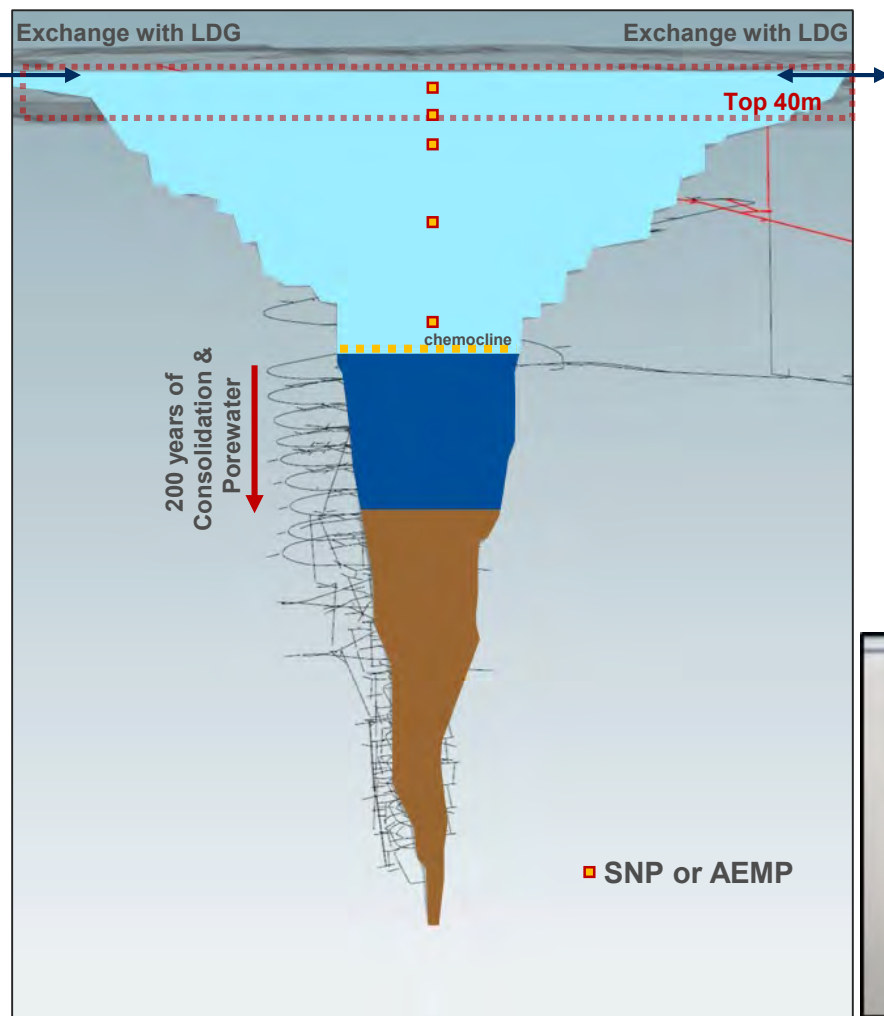
- Measured water quality replaces **Fill Model**
- **Long-term Model** uses measured initial conditions

Adaptive Management

- In situ treatment until water quality in top 40m meets criteria



✓ After Reconnection to LDG – Long-Term Closure Monitoring

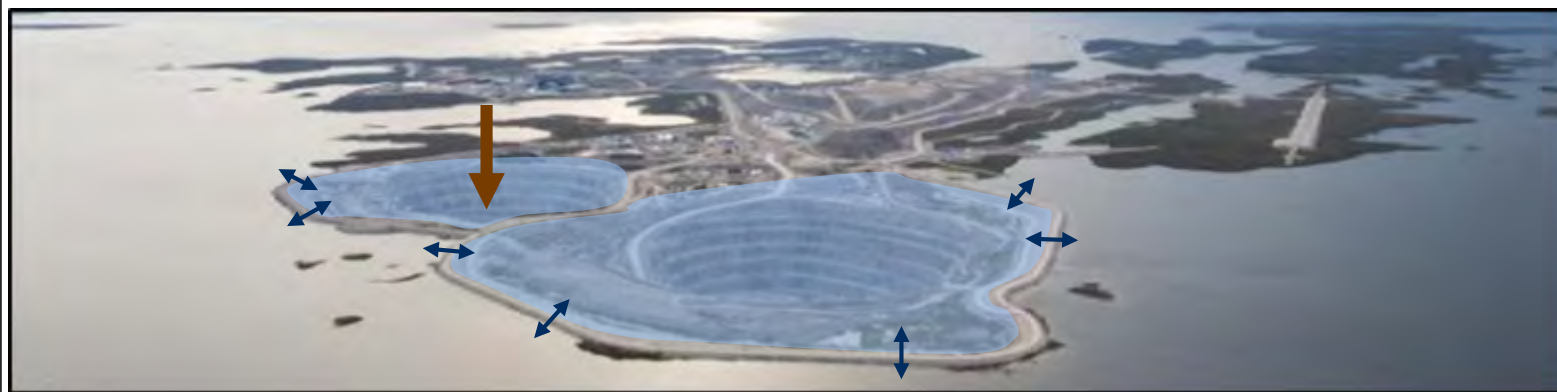


Monitoring

- Sampling of the pit lake and LDG will continue after reconnection either through the closure SNP or AEMP program and that exact requirements will be approved through CRP updates

AEMP Response Framework (adaptive management)

- AEMP response framework applied to top 40m of pit water



PKMW Measure 2:

Water quality objectives need clear, measurable and culturally relevant criteria

Diavik has met with all potentially affected Indigenous groups to share the water quality criteria recommendations from TK Panel session 12 and presented the same draft Cultural Criteria.

After positive initial feedback we have advanced the Criteria and would like to discuss these in more detail

- Does YKDFN have recommendations for different / modified criteria?

TK Panel #12 Summary Continued

- ▶ 12.7: The TK Panel would like Diavik to test water in the pits for at least two years (until the water is deemed good) and compare this to water in Lac de Gras. Water samples will be collected from multiple depths at various times throughout each year and tested according to the AEMP protocols. Taste tests will be done after scientific sampling tells us the water is drinkable, where they will watch for smell, clarity (turbidity), temperature, colouration, scum on the water or tea, and water and tea for taste.
- ▶ 12.8: When scientists and the TK Panel agree that the pit water is safe (i.e., drinkable) and stable (i.e., consistent), then breaching of the dikes can occur to allow water to flow back and forth but prevent fish from entering the pits, at least initially.



Water Quality Cultural Use Proposed Closure Criteria

Criteria: “Traditional Knowledge Panel verification that water is substantially unaltered and healthy for people, wildlife and aquatic life”

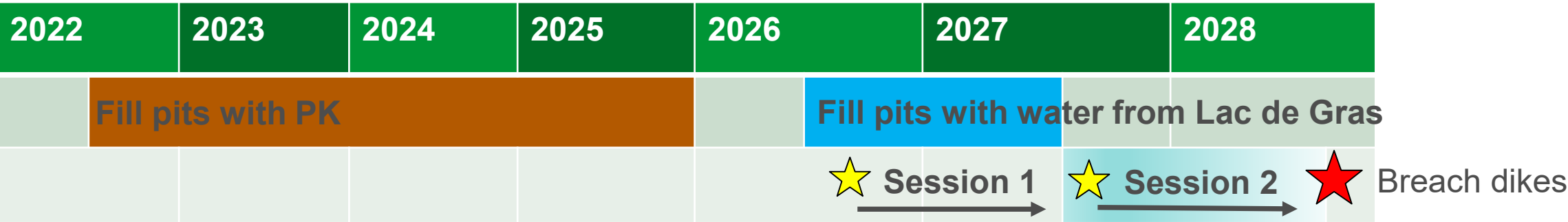
Measurement: Summer site inspection and signoff by TK Panel based on:

1. Review of scientific water quality
2. Review of acute and chronic toxicity testing
3. Traditional water quality sampling

Based on two stage review the Panel will confirm if pit water is safe to be reconnected with LDG



Water Quality Cultural Use Proposed Closure Criteria



Measurement

site inspection and signoff by TK Panel

- 1. Review of scientific water quality
- 2. Review of toxicity testing
- 3. Traditional water quality sampling

Science:

- Scientific water quality analysis (chemical water analysis) (rec 12.7)
- Toxicity testing (lab fish test) (rec 12.8)

Traditional Knowledge:

Session 1

- Observe filling of pit and validate sampling locations for scientific and TK testing (rec 12.7)

Session 2

- Review science (above)
- Observe water clarity; temperature; colour; presence of scum or unnatural material around the pit lake area (rec 12.7)
- Observe water smell and taste (rec 12.8)

Criteria Measurement 1 & 2 – Water Quality and Toxicity

TKP#12 rec.12.7

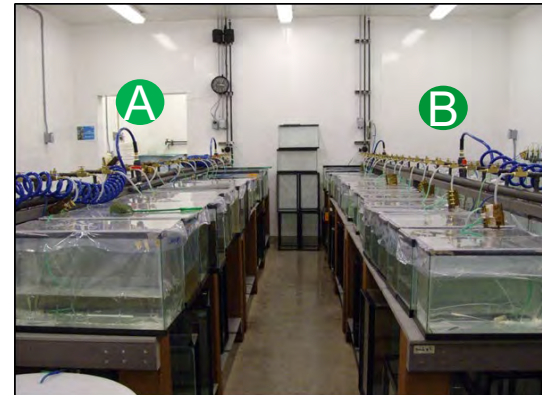
Session 1 (2026/2027): During pit flooding with water

- Select sample locations in pit with PK and in Lac de Gras
---- Sampling (2027 – 2028) ----

TKP#12 rec.12.8

Session 2 (2028): After water has settled

- Review and compare the results of water quality and fish health before reconnecting to Lac De Gras



Criteria Measurement 3 – Traditional Water Quality

TKP#12 rec.12.7

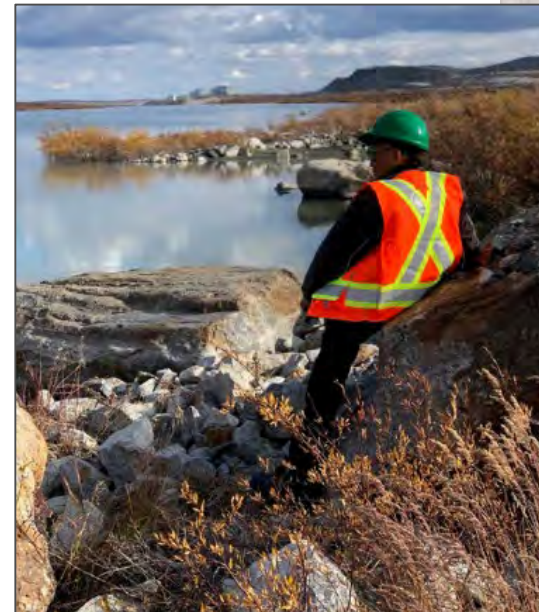
Session 1 (2026/2027): During pit flooding with water

- Observe water in pit and Lac de Gras

TKP#12 rec.12.8

Session 2 (2028): After water has settled

- Observe water in pit and Lac de Gras
- Inspect clarity, temperature, colour and presence of scum or unnatural material, smell and taste around the pit lake area compared to Lac de Gras
- Confirm if pit meets criteria to connect with Lac de Gras



Summary Table: Results from previous WQ workshops

Table 1. Properties of water that make it suitable for cultural use.

Healthy, edible fish, healthy wildlife, animals using the water; edible fish
Clean smell (can have a fishy smell) and taste (affected by fish, wildlife, plants, rocks, temperature, location, saltiness, sediments); clean smell (can have a fishy smell)
Clear colour (natural, not murky, no oil, film, scum, not too much algae); Clear (natural, no oil, foam, scum, not too much algae, nothing floating or disturbed in the water i.e. pollen, dust); Healthy look and taste (especially for tea making), no smell
Free of contaminants/chemicals
Moving, flowing (from wind or current); not stagnant
Healthy flora and fauna in the water; Shoreline plants are healthy (e.g. willows, reeds, sedges)
History of the area (TK says it has been used); Shoreline rocks are worn from use
Quality of snow/ice
Cold water high in oxygen; temperature is important
Can drink unaltered; don't have to boil it
Free of deposits or by-products (e.g. crushed gravel, PK), and does not exceed the acceptable Canadian water quality guideline levels

Appendix C – Evaluation Form

DDMI Water Quality Workshop Evaluation Form

Thank you for participating in the online Water Quality Workshop held by Diavik Diamond Mines (2012) Inc. on June 3-4, 2021. We appreciate feedback on your experience. Your responses will help us maintain and improve future sessions.

1. How would you rate the session for working and communicating together?
 - ☐ Good
 - ☐ Neither good nor poor
 - ☐ Poor

2. How would you rate the session for mutual respect among participants?
 - ☐ Good
 - ☐ Neither good nor poor
 - ☐ Poor

3. How would you rate the opportunities for you to share your knowledge and experiences?
 - ☐ Too many opportunities
 - ☐ Enough opportunities
 - ☐ Too few opportunities

4. How would you rate the recording and documenting your contributions during the session?
 - ☐ Very good
 - ☐ Good
 - ☐ Neither good nor poor
 - ☐ Poor
 - ☐ Very Poor

5. How would you rate the facilitation of the session?
 - ☐ Good
 - ☐ Neither good nor poor
 - ☐ Poor

6. How would you rate the outcomes and findings of the session?
 - ☐ Good
 - ☐ Neither good nor poor
 - ☐ Poor

7. How would you rate the amount of time to discuss the topic(s) during the session?

- ☐ Too much time
- ☐ Enough time
- ☐ Too little time

8. How would you rate the technical quality of the session?

- ☐ Good
- ☐ Neither good nor poor
- ☐ Poor

9. How would you rate the logistics for the session?

- ☐ Good
- ☐ Neither good nor poor
- ☐ Poor

10. How would you rate the interpreting of the session?

- ☐ Good
- ☐ Neither good nor poor
- ☐ Poor

11. Overall, how would you rate the session?

- ☐ Very good
- ☐ Good
- ☐ Neither good nor poor
- ☐ Poor
- ☐ Very Poor

12. What were the strengths of the session? What did you enjoy about the session?

13. How might the session be improved?

Appendix B – Sample Agenda and Informed Consent Form

Agenda

Diavik Diamond Mines Inc. Water Quality Workshop

North Slave Métis Alliance
Yellowknife, NT
September 22-23, 2020

Participants

Wayne Langenhan (Elder/Knowledge Holder)
Shirley Coumont (Elder/Knowledge Holder)
Melissa MacLellan (Elder/Knowledge Holder)
Marc Whitford (EMAB Member)
Adelaide Mufandaedza (NSMA Staff)

Myra Berrub (DDMI)
Sean Sinclair (DDMI)
Joanne Barnaby (Consultant, Facilitator)
Natasha Thorpe (Consultant, Facilitator)
Sarah Ravensbergen (Notetaker)

Day One: September 22, 2020

12:45-1:00	Online Workshop Microphone Testing and Overall “How-To” (Myra) <i>Please log into the workshop at 12:45 so that we can make sure everybody is connected and has reviewed the informed consent form.</i>
1:00-1:30	Opening Prayer (NSMA) Opening Circle (Everybody) Workshop Welcome, Overview and (Facilitators)
1:30-1:50	Why are we here? (Diavik) <ul style="list-style-type: none">• Background around the need to develop “clear, measurable, and culturally relevant” criteria for water quality at closure

- 1:50-3:00 **What is Healthy Water according to Indigenous Knowledge?** (Facilitators)
- Overview of how the DDMI TK Panel and Aquatic Effects Monitoring Program have been developing ways to measure healthy water (i.e. water quality)
 - Overview of how other Indigenous communities across Canada are measuring water quality according to their ways of knowing

Discussion Questions

- What are the good properties you look for in other lakes you use?
- What are the properties of water that make it suitable for cultural use?
- What needs to happen to see if the spirit returns to the pit lake?

Day Two: September 23, 2020

12:45-1:00 Online Workshop Microphone Testing and Overall “How-To” (Myra) *Please log into the workshop at 12:45 so that we can make sure everybody is connected.*

Welcome and Comment Circle

1:00-1:30 **Refresher on Closure Plans for Pit Lake (Diavik)**

1:30-2:45 **Exploring Water Quality Criteria for the Pit Lakes**

- Do people expect to draw water from the pit lake for cultural use?
- What properties in the pit lake could change your use of the big lake?

2:45-3:00 Closing Circle
Closing Prayer

North Slave Métis Alliance

Diavik Diamond Mines Inc.

Water Quality Workshop

September 22-23, 2020

Yellowknife, NT

Informed Consent Form

I, _____ on September ____, 2020 give permission for Diavik Diamond Mines (2012) Inc. and its Contractors (i.e., Thorpe Consulting Services and Joanne Barnaby Consulting), to take notes, photographs and / or audio and video recordings related to my participation in meetings, workshops and events related to the Water Quality Workshop conducted on behalf of Diavik Diamond Mines Inc. (DDMI).

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;
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 Indigenous Organization, DDMI and / or its contractors may use the information collected to contribute to caring for water in the NWT and NU;
5. DDMI, Natasha Thorpe and Joanne Barnaby may share my information in either reports, presentations, and/or photographs provided it is within the context of this workshop scope and that they provide such information to my Indigenous organization;
6. I agree that my contributions may also be used for future educational, cultural, heritage, and environmental purposes that are outside the scope of this workshop and that my representative Indigenous organization, 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 my Indigenous organization policy and the DDML and NSMA Engagement Protocol for the Processed Kimberlite to Mine Workings Project;
8. I am free to request that any information I share is removed, erased or deleted from draft materials and that final copies will be provided to me;
9. My information will be summarized and included in a report which will be publicly available; and
10. I understand that DDML, Joanne Barnaby and Natasha Thorpe cannot ensure the protection of my information (e.g. Traditional Knowledge) from public release once the reports are released (e.g., via youtube.com, Facebook, other social media, or Indigenous group websites),

Signed on September ____, 2020 in _____, Northwest Territories.

Signatures:

Participant

Indigenous Organization

Contractor

Witness

Translated by: _____

Appendix C – Workshop PowerPoint Presentations

Please see Appendix A for presentations specific to each workshop.

Appendix D – Properties and Indicators of Water that Make it Suitable for Cultural Use

Appendix D: Properties and Indicators of Water That Make It Suitable for Cultural Use (V2.0)

Property	Indicator	Supporting Quotes ¹	Possible methods for tracking
P1) Looks clear² <i>This applies to water in all states (including liquid water and ice), and includes the following: water should be natural, not murky, no oil, foam, grease, soap, sediment, dust, dirt, film, scum, not too much algae, nothing floating or disturbed in the water (i.e., pollen); can see the bottom.</i>	I1a) Free of contaminants, chemicals and biohazards ² <i>Water should be free of unnatural materials, such as deposits or by-products from industrial activities such as mining and farming (e.g., crushed gravel, PK, mercury, sulphuric acid, ammonium nitrate, etc.).</i>	<i>The colour of your water, the clarity [is important]. Like Slave Lake, the east arm, you can tell the difference between the water when you get past certain places. Before, when you used to go towards the east arm, you used to be able to see the water clear by Stony Point. ... Now the last few years, when I went that way, you can't even see the bottom of the water and it doesn't even get clear ... the water is murky looking.</i> <i>If it's too murky, we go to another lake, go get another ice, near a river, or another part of the lake, go get ice sometimes.</i> <i>...if the water is no good, you can tell. It's kind of oily like.</i> <i>...we all agree we like it clear, that it's not stagnant water. Deeper water.</i> <i>...my idea of clean water is going to be when it's cold, there's no sediment in it.</i>	Clean water boils faster and freezes best. Another way of knowing is the 'tea stain effect': the stain / residue left on tea pots, cups, taps, water treatment tanks from water.

¹ For brevity, note that this column is not an exhaustive list of all of the quotes that speak to each indicator. Quotes from each community were chosen to showcase the breadth of input; to ensure confidentiality, quotes have been anonymized.

² Sources: DKFN WQ Workshop, May 12, 13, 2021; KIA WQ Workshop, October 13, 16, 2020 and raised in KIA AEMP Planning Meetings January 21, 2012, Feb. 4, 2012, June, 2012; LKDFN WQ Workshop, September 24, December 3, 2020 and raised in LKDFN AEMP Planning Meetings May 8, 9, 2012, June 5-6, 2012; NSMA WQ Workshop, September 22, 23, 2020 and raised in NSMA AEMP Planning Meetings January 21, 2012, Feb. 4, 2012, June, 2012; NWTMN WQ Workshop, May 3, 4, 2021; TG WQ Workshop, November 5, 11, 20, 2020 and raised in TG AEMP Planning Meetings February 24, 2012, May 10, 2012, June 5-6, 2012.

		<p><i>Are they also checking to see if the water will be free from any biohazards or parasites, any other bacteria? ...It should be healthy or be clear, free from chemicals, that type of thing.</i></p>	
		<p><i>Like before, in the past from our Elders, the north side of the lake and all those shallow water and gravel bottoms, that's where all of our clear, clear, clean water was coming from. Now the mines have replaced those clear water, shallow water and gravel parts that we used to get our clear water, that's fell through at home today. Great Slave Lake on the north side, now all that's changing because when we disturb the land, we are getting lots of mercury coming out of the land, too. When you crush up the gravel and you get natural mercury coming into the water.</i></p> <p><i>Even though snow is very good for drinking water but I always have this in my mind that there are chemicals in that snow, from fallout in the world. When you see fallout, especially around closer to the mine, it becomes more prominent, the taste in the water, the colour of the snow, the land itself will have dust.</i></p> <p><i>...to have a healthy water, you want to have clean, healthy water [to] drink your tea. Elders always taking water from the river, because in the community, the water, they put something in there, chlorine. You make tea, it tastes a little bit different. Something like that, in Lac de Gras. You can tell if it's no good.</i></p> <p><i>...the water should be free of any deposits or by-products of the mining operation. ...We have to make sure that what's in the water is basically okay at the time and there's nothing in there that you may miss like</i></p>	

		<p><i>crushed gravel or debris or any PK that may have been dumped... [...you mean that's still floating around in the water, like if the gravel sinks to the bottom, is that okay?] No.</i></p> <p><i>This is what they want; we want healthy edible fish and wildlife, no mercury, oil. When we talk about water, we want clean water, no sulfuric acids.</i></p> <p><i>In the past, in Behchokò, fish is very healthy ... that's what we grow up on, fish was very healthy back then, but today [we] catch fish and even the texture and health of the fish differentiates from the past because of the [Giant] mine site that exists. Similar to this, the mine site that exists on the Lac de Gras, on the east island, water is going to change, of course water is never the same because once the water mixes within the pit, it's going to differentiate within the water ... When they have aquatic fish monitoring, checking the water and the fish, we would check the fish and there would be some kind of spots on the fish, maybe it's because of the water, maybe it's the fish food, phytoplankton, zooplankton, those things may not be healthy.</i></p>	
<p>P2) Feels cold</p> <p><i>Water is the 'right' temperature (cool, cold)</i>³</p>	<p><i>I2a) High in oxygen (i.e. linked to I2b, I2c, I2d)</i></p>	<p><i>The temperature of the water [is important]. That let's fish know when it's time to breed and all that's changing over the years. The flushing from the Alberta side, maybe they're flushing so much stuff hitting the</i></p>	<p>Support water guardians to measure water and oxygen levels in water.</p>

³ Sources: DKFN WQ Workshop, May 12, 13, 2021; KIA WQ Workshop, October 13, 16, 2020 and raised in KIA AEMP Planning Meetings January 21, 2012, Feb. 4, 2012, June, 2012; NSMA WQ Workshop, September 22, 23, 2020 and raised in NSMA AEMP Planning Meetings January 21, 2012, Feb. 4, 2012, June, 2012; NWTMN WQ Workshop, May 3, 4, 2021 and April 27, 2022; TG WQ Workshop, November 5, 11, 20, 2020 and raised in TG AEMP Planning Meetings February 24, 2012, May 10, 2012, June 5-6, 2012.

		<p><i>cold water and once the warm waters hit the cold waters in the winter, goes under the cold waters.</i></p> <p><i>That's what makes us catch fish one after the other, when we find these lakes with no rivers or streams or anything else, if it's closed right around and has no oxygen coming in from other parts of the lake or other parts, streams or anything. Fish have a tendency to need a lot of oxygen, so when we make holes, we open up oxygen levels for the fish and the fish gather around these holes that we make, that's what makes us catch so many fish, one right after the other. That's what I was thinking about for this pit, maybe at least a year or so when the water is deemed clean and the fish will come out clean as well.</i></p> <p><i>The preference is to get cold water for most people...</i></p> <p><i>... my idea of clean water is going to be when it's cold, there's no sediment in it.</i></p>	
	<p>I2b) Home to or used by healthy fish, birds, wildlife⁴</p> <p><i>Especially fish and ducks; moose, caribou, bear, beavers, also important indicator species.</i></p>	<p><i>Just like what [community member] said there, if the caribou were to go back through the mine site, again it's like an island, the caribou used to go through there, so they wouldn't have to enter the water, go around the water shores. If the caribou start doing that again, maybe the water is good enough to drink or good enough to eat the fish if it's going to be like that again. Maybe then we'll have a chance to see caribou on this side again. If that's the case then, maybe I would go</i></p>	<p>Support water guardians to watch water for presence/absence of healthy fish, birds, wildlife and take samples for</p>

⁴ Sources: DKFN WQ Workshop, May 12, 13, 2021; KIA WQ Workshop, October 13, 16, 2020 and raised in KIA AEMP Planning Meetings January 21, 2012, Feb. 4, 2012, June, 2012; LKDFN WQ Workshop, September 24, December 3, 2020 and raised in LKDFN AEMP Planning Meetings May 8, 9, 2012, June 5 6, 2012; NSMA WQ Workshop, September 22, 23, 2020 and raised in NSMA AEMP Planning Meetings January 21, 2012, Feb. 4, 2012, June, 2012; NWTMN WQ Workshop, May 3, 4, 2021 and April 27, 2022; TG WQ Workshop, November 5, 11, 20, 2020 and raised in TG AEMP Planning Meetings February 24, 2012, May 10, 2012, June 5-6, 2012.

		<p><i>fishing over there and eat the fish or drink the water. If it's good enough for them, then it should be good for us. Because the caribou probably know better than I do in water and stuff like that.</i></p> <p><i>Water would be clean, because fish go there.</i></p> <p><i>They [animals, fish] hang around there [Lac de Gras] too, around the lake, they depend on the water. ...everything has to be safe where they hang around.</i></p> <p><i>...the fish being edible would be a good sign of healthy water...</i></p> <p><i>We also have birds, geese, swans, ducks. They fly, eat, drink water, land in those ponds. We've been complaining about Pine Point, geese have been landing in there. Cancer is going crazy is our territory and we are scared it's because of the mines. The water has to be just like this water I have right here, it has to be that good.</i></p> <p><i>In the past, in Behchokò, fish is very healthy ... that's what we grow up on, fish was very healthy back then, but today [we] catch fish and even the texture and health of the fish differentiates from the past because of the [Giant] mine site that exists. Similar to this, the mine site that exists on the Lac de Gras, on the east island, water is going to change, of course water is never the same because once the water mixes within the pit, it's going to differentiate within the water ... When they have aquatic fish monitoring, checking the water and the fish, we would check the fish and there would be some kind of spots on the fish, maybe it's because of the</i></p>	<p>bugs [or inspect fish for worms].</p>
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		<p><i>water, maybe it's the fish food, phytoplankton, zooplankton, those things may not be healthy.</i></p>	
	<p>I2c) Abundant with healthy (green) vegetation⁴</p> <p>I2d) Rich in micro-organisms (including bugs)⁴</p> <p><i>This includes healthy shoreline plants (e.g., willows, reeds, sedges).</i></p>	<p><i>Q: How do you know water is healthy? ...</i></p> <p><i>...you get it from the animals, you get it from the fish, the birds...</i></p> <p><i>Watching the environment, the ecosystem around us, the animals, the plants, the fish.</i></p> <p><i>We're looking at the water, whether it's healthy or not, but we got the living little things that live in the water. We have to really look at those because they're the ones that are there.</i></p> <p><i>...people sitting here can tell us how healthy the water is by looking at the plants around the edge of the lake.</i></p> <p><i>I would say to look for plants in the area, healthy willow trees growing, healthy sedges, weeds growing by too that we could take sample of, look at and through TK grapple that it looks okay, then take a sample and it would be okay scientifically okay as well. When I go to a place for recreational fishing or something, I would look at healthy plants first.</i></p> <p><i>The confidence in my drinking water would be that there is stuff living in it.</i></p> <p><i>I am still concerned to see the outcome of it, whether the water will be as clean as it was, not according to their [Diavik] standard, but [pause]. Like I say, the animals were travelling around that area because they're there before the mine came, and they'll be there after the mine closes as well ... some animals are living off of plants alone in the area ... if it's consumed by</i></p>	<p>Support guardians to watch shoreline and water bodies for plant growth.</p>

		<i>animals how healthy would that be? ...Monitoring should be done by the Aboriginal standard, and I really believe that.</i>	
P3) Smells clean and healthy⁴ <i>This can be affected by fish, wildlife, plants, rocks, temperature, location, saltiness, sediments; can have a fishy smell.</i>	Linked to I2b	<i>It'd be good for us to see where our ancestors lived at one time at camp and survived off the land. ...I used to check those places. ... You still could see there are still places where you could smell the gas.</i> <i>Q: What would be good water from your perspective?</i> <i>Just the common site conditions, smell conditions, I guess fish conditions too, maybe the history of the area, and the conditions of the fish. I think what's important for me when I'm out on the land and I need to collect water is understanding the history of these lakes as well.</i> <i>Smell, I would say first, not just the look, but the smell. You know when you're around a swamp, I wouldn't drink that water because of the smell. So, if there's a nice clean smell or even the smell of fish, that shows me that that's healthy water.</i>	Support guardians to conduct smell testing of water samples.
P4) Tastes fresh⁴ <i>This can be affected by fish, wildlife, plants, rocks, temperature, location, saltiness, sediments, materials, etc.</i>	Linked to I2b	<i>Listening to my dad, he trapped in a lot of lakes. He used to commercial fish up in the East Arm, six miles. He used to trap these inland lakes. There used to be an old man that used to go set a net in one of the lakes. My dad would always wonder why, because he lived on the edge of Great Slave Lake. One day my dad was up there trapping and thought he would run his net to have some fish. My dad said it was the best tasting fish that he had ever had. Throughout his commercial fishing year, too. He never had fish that tasted that good. Undisturbed,</i>	Conduct water and tea tasting events.

		<p><i>these inland lakes where the fish are: good quality water.</i></p> <p><i>When we test the water last few times at Lac de Gras, we can taste the difference from the middle to the shore.</i></p> <p><i>...to have a healthy water, you want to have clean, healthy water [to] drink your tea. Elders always taking water from the river, because in the community, the water, they put something in there, chlorine. You make tea, it tastes a little bit different. Something like that, in Lac de Gras. You can tell if it's no good.</i></p> <p><i>...some lakes have minerals in them that might change the taste of the water... But if you don't know what that mineral is, I wouldn't be drinking whole gallons of the water.</i></p>	
<p>P5) Sounds alive (i.e., moving / flowing)⁴</p> <p><i>From wind or current, not stale or stagnant. However, fast / irregular movement associated with extreme weather events such as flooding can severely decrease water quality. Spirit returns to an area when wildlife, plants, birds, fish, etc. come back to the area and</i></p>	Linked to I2b	<p><i>The temperature of the water. That let's fish know when it's time to breed and all that's changing over the years. The flushing from the Alberta side, maybe they're flushing so much stuff hitting the cold water and once the warm waters hit the cold waters in the winter, goes under the cold waters.</i></p> <p><i>From a perspective, the water quality, good properties for [community] water, good water taste, no scum and smell, should be moving water, either river system or winds, moving water is the best out of it. For good water properties it should be clear, have a good water taste, and no scum and smell, and we see generally river system, moving water or current, river system or moving water. All the water from the land north, it goes right to McLeod Bay, I know that. So, it's flowing all</i></p>	Watch water for flow patterns and note changes.

<p><i>renew their relationship with the land as it was before.</i></p>		<p><i>over. These arms, all the water from the north goes to McLeod Bay, just what I'm worrying about, the water.</i></p> <p><i>...look for growth, if all algae, not so much drinkable, right. More algae, less drinkable. Got to have movement.</i></p> <p><i>It's going to go into the bottom of the pit, was my understanding, I think we had concerns about what chemicals will get loose and eventually flow into Great Slave Lake. There were talks about it being able to stay down at the bottom, which we didn't believe that.</i></p> <p><i>If you go deeper down [the open pit] there is no movement down there, what we are saying is the water is not going to move, it's going to sit there and settle and stale...</i></p> <p><i>All the animals and the birds and the people that traditionally use that land... For me, that's the spirit of the lake. It's when all the animals that traditionally were there, that traditionally used that for millennia, if they come back.</i></p>	
	<p>I5a) Known as an area of cultural use⁴</p> <p><i>For example, continues to live through IK, placenames and stories that tell of good water. Some participants described this as the 'memory' of a place. Historical use evidence through physical signs</i></p>	<p><i>Yeah, I guess if we're on the land program and say, if we'll have kids and they're going out, even snow, when there's no water, we can't get to the water, we're going to melt snow. You'd want them to go to an area that has no tracks, no yellow in it, no branches and stuff. You want them to get to a good spot, you direct them to it. Same thing with ice, you direct them to where they should go and get the water and get the ice or get the snow. And that comes from the direction from the Elders, kind of thing.</i></p> <p><i>...anytime I've been out on the land and have had to collect water, I've got that family history and</i></p>	<p>Assemble list of place-names related to water; study these to see what makes them important water sites.</p>

	<p><i>such as shoreline rocks are worn from use. Feeling of security on the land; water allows participants to practice cultural activities (e.g., fishing, harvesting, ceremonies, intergenerational knowledge transmission.)</i></p>	<p><i>understanding, knowing where my parents or grandparents have always collected water in the area. So I think now I just know where to collect safe drinking water. Having that history passed down is very helpful as well.</i></p> <p><i>...I check the rocks too, to see how old they are, how big, how much water is being used, if the water rushed fast, see if they get moved a lot, do other people use it... But rocks are different in this area. But would be really hesitant because of that, if I saw the rocks and they didn't look like regular lake or didn't look how they should, that would make me really hesitant.</i></p> <p><i>...an Elder will give me so many things to look, that's what I'm saying. I don't have that when you're asking about TK like that. I would prefer to get it from people that lived out on the land, like in Fort Res, from people living off the land, people who had fish scales for windows, never had running water, power, toilets, stuff like that. All this stuff came into place in their time, they did things like chopped holes in the ice. I did it a bit when I was young-but they really did that. They're the ones that can answer that properly. If you want the true answers and the best answers, you have to look to the Elders. The stories they've told me, they remember when they were kids, they lived out there, 1963, when it was established here and they got moved into the community. I was born in 1973 so I was born into running water, I got to see that come into play later on. I'm not going to claim to be the almighty that knows the answers. I'll get my Elders that will give me the guidance.</i></p>	<p>Document signs of human use at shoreline.</p>
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		<p><i>As people we would use the water to wash ourselves and drink the water [at Lac de Gras]. People just don't go on the land for nothing, people would go on the land and use the water. Today it seems like we don't go anywhere, but in the future maybe 30-50 years there may be some people that want to do their own thing and survive on the land. Those are things that I am thinking about, maybe somebody might be going out on the land, sleeping on the ground, using the water. Not only the human, but also the wildlife.</i></p> <p><i>All the animals and the birds and the people that traditionally use that land... For me, that's the spirit of the lake. It's when all the animals that traditionally were there, that traditionally used that for millennia, if they come back.</i></p>	
	<p>I5b) Safe to drink unaltered⁴</p> <p><i>Does not require boiling, filtering, or treating to be consumed and enjoyed.</i></p>	<p><i>...somebody said they used to dip their cups in the water and drink it. Guaranteed, you won't do that now because you don't know what's in the water anymore. Like I said before, we used to travel in the east arm, you could see that water just clear.</i></p> <p><i>Treated water in communities is really different from freshwater we get from the lake, from the water. Lot of us in wintertime, we prefer ice to treated water in the community. Community water sometimes really tastes bland, which has a lot of chemicals in it, be it whatever types of chemicals they are putting in the water in the communities. To make water drinkable in a community, these chemicals in the communities, that's what Elders don't really put up with is that community water. They prefer water that is from the river, or ice from the river, they prefer that.</i></p>	<p>Support community members to conduct 'out of the cup' tests (Do you feel comfortable drinking from the cup off your boat?)</p>

		<p><i>With all the changes in the water, communities, you have to boil your water, that kind of things, we don't want to happen here. We don't want to have to boil the water here. We're living in a clean environment here, for many, many years.</i></p> <p><i>...there's two types of water, waters that are pristine and pure and have been there since time immemorial. And when mankind comes in anyway and disturbs the water and causes the water to change in some manner, that's an affront to nature. It takes time for that water to eventually heal itself and return to its natural state.</i></p> <p><i>...back in the day, you go down to the river in Hay River, and just about every boat on the river, there was a cup in that boat, tied to the boat. We used to just use them, drink the water out of the river. The string was tied to the cup so the kids that used those cups wouldn't lose them. We don't do that anymore, we can't.</i></p>	
P6) Water AEMP benchmarks (that are kept up to date and accurate) and Canadian	<p>I6a) Within Canadian Environmental Quality Guidelines (CEQGs)⁷</p> <p>I6b) Meets testing criteria as set out by the AEMP</p>	<p><i>If you guys really want us to measure, you might have to prepare to try high bars. I know that all, science has bars too, but sometimes the land users and Elders, even myself we want higher.</i></p> <p><i>EMAB provided several detailed recommendations on monitoring at the Mackenzie Valley Environmental Impact Review Board hearing last September [see EMAB document 'Intervention to the Mackenzie Valley</i></p>	<p>Monitor cumulative effects</p> <p>Conduct scientific water quality testing</p>

⁷ Sources: DKFN WQ Workshop, May 12, 13, 2021; KIA WQ Workshop, October 13, 16, 2020 and raised in KIA AEMP Planning Meetings January 21, 2012, Feb. 4, 2012, June, 2012; LKDFN WQ Workshop, September 24, December 3, 2020 and raised in LKDFN AEMP Planning Meetings May 8, 9, 2012, June 5 6, 2012; NSMA WQ Workshop, September 22, 23, 2020 and raised in NSMA AEMP Planning Meetings January 21, 2012, Feb. 4, 2012, June, 2012; NWTMN WQ Workshop, May 3, 4, 2021 and April 27, 2022; TG WQ Workshop, November 5, 11, 20, 2020 and raised in TG AEMP Planning Meetings February 24, 2012, May 10, 2012, June 5-6, 2012. Some workshop participants felt that Canadian Environmental Quality Guidelines (CEQGs) should be used as a benchmark, but others felt that these guidelines are not rigorous enough.

Environmental Quality Guidelines (CEQGs)⁵⁶		<p><i>Environmental Impact Review Board on DDMI Diamond Mines EA1819-01'2]. That might be worth considering. What we need to know is, we need to monitor fish, confirm below 40m, the fish. We need a thorough investigation of whether fish are benthic or invertebrates, and are in the pit lakes. And freshwater, or some other way, take samples and analyze. Sample both water inside the pit lake, sample down to where the PK water forms a separate layer. Diavik has proposed several locations for the pit lake, it needs to meet the quality of the monitoring program, benchmarks.</i></p> <p><i>[Interviewer: So if they took samples and they tested them in the laboratories, and the Elders also tested it, say at the on the land camp, do you think people would want to drink water or take water from the pit lake, if the results were that the water was safe or healthy?] If I know it's really healthy... I could drink out of it there, if it's really clear, and as long as it's safe, then I would drink maybe one small amount sip. [laughter]</i></p>	<p>Support guardians to monitor water through the AEMP (i.e. IK and science)</p>
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⁵ Sources: DKFN WQ Workshop, May 12, 13, 2021; KIA WQ Workshop, October 13, 16, 2020 and raised in KIA AEMP Planning Meetings January 21, 2012, Feb. 4, 2012, June, 2012; LKDFN WQ Workshop, September 24, December 3, 2020 and raised in LKDFN AEMP Planning Meetings May 8, 9, 2012, June 5 6, 2012; NSMA WQ Workshop, September 22, 23, 2020 and raised in NSMA AEMP Planning Meetings January 21, 2012, Feb. 4, 2012, June, 2012; NWTMN WQ Workshop, May 3, 4, 2021 and April 27, 2022; TG WQ Workshop, November 5, 11, 20, 2020 and raised in TG AEMP Planning Meetings February 24, 2012, May 10, 2012, June 5-6, 2012. Some workshop participants felt that Canadian Water Quality Guidelines should be used as a benchmark, but others felt that these guidelines are not rigorous enough.

⁶ Sources: DKFN WQ Workshop, May 12, 13, 2021; KIA WQ Workshop, October 13, 16, 2020 and raised in KIA AEMP Planning Meetings January 21, 2012, Feb. 4, 2012, June, 2012; LKDFN WQ Workshop, September 24, December 3, 2020 and raised in LKDFN AEMP Planning Meetings May 8, 9, 2012, June 5 6, 2012; NSMA WQ Workshop, September 22, 23, 2020 and raised in NSMA AEMP Planning Meetings January 21, 2012, Feb. 4, 2012, June, 2012; NWTMN WQ Workshop, May 3, 4, 2021 and April 27, 2022; TG WQ Workshop, November 5, 11, 20, 2020 and raised in TG AEMP Planning Meetings February 24, 2012, May 10, 2012, June 5-6, 2012. Some workshop participants felt that Canadian water quality guidelines should be used as a benchmark, but others felt that these guidelines are not rigorous enough.

		<p><i>...I think it would be good to use Canada's criteria for clean water before we try to eat any of the stuff. Before we try to do any of the-watch animals eating the food or plants just for my own sake, I don't want anyone to get sick.</i></p> <p><i>Listening to my leaders and politicians. Lo and behold, they know what TK is because they are talking it, they heard it from their parents, grandparents. But on the water quality, for Sean and Gord, western science part of it, what was the water quality pre-development, and what is the water quality before post-development? You're asking us to give us our TK. We've got to bring out scientists in the room, and that's our Elders. They'll tell you what to look for. What was the water chemistry before development, where is that water chemistry today, while you're still in development? These sort of issues are important-are these guys telling us the truth or are they bull shit lying? Science you plug it into a machine and it will give you the answer. But if you put the wrong numbers in that machine, you going to get the wrong answer too.</i></p> <p><i>The best outcome would be if the water would go back to normal ... [that] what would come out of there has the same quality with the existing Lac de Gras water, it will be satisfactory. Like I say, for two years monitoring after everything is all done I don't think it's sufficient time ... need more time to do the monitoring.</i></p> <p><i>It's known that a lot of negative impacts take time to show up; everything will be good at a certain point. And we hit that certain point, then negative impacts start showing up in large numbers.</i></p>	
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RE: Diavik will work collaboratively with Indigenous groups to develop criteria for determining if water in the pit lake(s) is acceptable for cultural use: YKDFN's summary report on Diavik's cultural quality criteria workshop, April 13th, 2022

1) Outstanding community member concerns:

- a. Water quality
- b. Caribou health and migration
- c. Processed kimberlite (PK) in water (PK in pits)
- d. If Diavik site will be safe for Caribou after closure and reclamation operations are complete
- e. Fish Health

2) Areas of improvement

- a. Elders MUST be provided sufficient background information and time to answer and respond to the pertinent workshop questions before lunch. After lunch general discussion may proceed. Workshops continuing past 1:00 pm risk losing participant attention, acute consultation burn-out due to not having time to rest, feeling physically and mentally lethargic after a meal, etc.
 - i. YKDFN staff noted this may have occurred at the measure 2 verification session, reducing the quantity and quality of responses provided by workshop participants
- b. Water quality workshops should have included an on-the-land component near water to allow participants to provide their knowledge in a thought-provoking context.
- c. Diavik staff and/or facilitators must speak in a manner that interpreters are able to meaningfully interpret.
 - i. Speak slowly
 - ii. Pause for 1-2 Mississippi's between sentences/thoughts
 - iii. Speak at the volume requested by the interpreter, this will vary based on location and interpretation equipment and method
 - iv. If the speaker knows they will be using words that may be difficult to interpret, they must meet with the interpreter before the presentation to discuss a means for accurate interpretation of the words.

3) Outstanding YKDFN staff concerns

- a. YKDFN staff are very limited, especially those who work on regulatory matters. The Measures have been ruled without ruling on who's obligation is it to provide capacity funding. Future measures must address this issue for meaningful consultation and engagement to occur.
 - b. Uncertain if YKDFN workshop participants were given sufficient time to consider the list of cultural water quality criteria presented and did not formally approve the proposed cultural water quality criteria.
 - c. Uncertain if YKDFN participants were able to meaningfully provide information on cultural water quality criteria inside of a building, rather than being on the land and providing information in a more conducive setting.
 - d. Measure 2 workshops have not yet engaged on the how the cultural water quality criteria will be measured.
 - i. YKDFN staff recommend further engagement on this topic. There must be discussions on how criteria are measured both by traditional and scientific means.
- 4) Positive remarks on Diavik staff presenting without a facilitator
- a. Allows for direct relationship between community members and Diavik staff. Perceived as more respectful and transparent by workshop participants.
 - b. Diavik staff answered community questions openly and to their fullest extent.
 - c. Scientific jargon was rarely used by Diavik's technical staff, instead adequate time was taking to explain concepts and elaborate on difficult-to-interpret words and phrases.
 - d. YKDFN staff noticed sincere desire from Diavik's staff to answer questions and share what information they had.

Mahsi,

Ryan

Appendix E – DDMI Community Engagement Record

DDMI Community Engagement Record

DATE & TIME	ENGAGEMENT TRIGGER	ATTENDEES	LOCATION/ ENGAGEMENT ACTIVITY TYPE*	ISSUE(S) RAISED	DDMI RESPONSE	OVERVIEW OF ISSUE(S) RESOLVED [1]	OVERVIEW OF ISSUE(S) UNRESOLVED	MATERIALS PROVIDED TO ENGAGEMENT PARTY	MINUTES (Y/N)
2020-05-26, 13:00-14:30	Business, Regulatory and Closure Update Engagement (including proposed engagement framework for PKMW)	DDMI (President, Closure Team, Communities and Communications Team); North Slave Metis Alliance (President, Vice President, Board Secretary/Treasurer. Board Member, Business Development Manager, Manager, Environment, Regulatory Analyst, Conservation Planner, four Community Members)	Virtual Meeting (via video and telephone conference)	update; no issues raised	n/a	n/a	n/a	digital copy of presentation	N
2020-05-28, 13:00-14:30	Regulatory and Closure Update Engagement (including proposed engagement framework for PKMW)	DDMI (Closure Team Members); Yellowknives Dene First Nation (Director Environment, Regulatory Staff)	Virtual Meeting (via video and telephone conference)	update; no issues raised	n/a	n/a	n/a	digital copy of presentation	N
2020-06-10, 17:00-18:00	Regulatory and Closure Update Engagement (including proposed	DDMI (Closure Team Members, Communities Staff); Lutsel K'e Dene First Nation (Director,	Virtual Meeting (via telephone conference)	update; no issues raised	n/a	n/a	n/a	digital copy of presentation	N

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	engagement framework for PKMW)	Wildlife, Lands and Environment, WLE Committee)							
2020-06-18	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; Manager, Closure, DDMI; Director Environment, YKDFN; Regulatory Staff, YKDFN	email	PKMW Protocol draft 1 shared for review	n/a	Collaborative engagement on-going to review and revise draft protocol	n/a	DDMI and YKDFN Engagement Protocol for PKMW – DRAFT 1	n/a
2020-06-23, 13:00-15:30	Regulatory and Closure Update Engagement (including proposed engagement framework for PKMW)	DDMI (Closure Team Members, Communities Staff); Tlicho Government (Manager, Lands, Regulatory Specialist, Technical Advisor and Consultant)	Virtual Meeting (via video and telephone conference)	update; no issues raised	n/a	n/a	n/a	digital copy of presentation	N
2020-06-30, 10:00-11:30	Regulatory and Closure Update Engagement (including proposed engagement framework for PKMW)	DDMI (Closure Team Members, Communities Staff); Kitikmeot Inuit Association (Sr. Lands Officer, Sr. Environment Officer)	Virtual Meeting (via telephone conference)	update; no issues raised	n/a	n/a	n/a	digital copy of presentation	N

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July 2020	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; Manager, Closure, DDMI; Director, Environment, YKDFN; Project Coordinator, YKDFN	emails	DDMI - weekly and bi-weekly follow up to draft protocol	n/a	n/a	DDMI - awaiting YKDFN feedback on draft protocol	n/a	n/a
2020-07-10	DDMI and LKDFN Engagement Protocol for PKMW- EXECUTED	Principal Advisor, Communities and Social Performance, Closure, DDMI; Director, Wildlife, Lands and Environment Department, LKDFN	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2020-07-30	DDMI and NSMA Engagement Protocol for PKMW - EXECUTED	Principal Advisor, Communities and Social Performance, Closure, DDMI; President, NSMA	n/a	n/a	n/a	n/a	n/a	n/a	n/a
August 2020	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI;	emails	DDMI - weekly and bi-weekly follow up to draft protocol	n/a	n/a	DDMI - awaiting YKDFN feedback on draft protocol	n/a	n/a

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		Manager, Closure, DDMI; Director, Environment, YKDFN; Project Coordinator, YKDFN							
2020-08-18	DDMI and KIA Engagement Protocol for PKMW- APPROVED (note email dated 2020-11-03 from Director, Lands, Environment and Resources)	Principal Advisor, Communities and Social Performance, Closure, DDMI; Senior Project Officer, KIA	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2020-08-24, 17:30-19:30	Regulatory Update Engagement (including proposed engagement framework)	DDMI (Closure Team Members, Communities Staff); Fort Resolution Metis Government (Environment Staff, Board Members, Consultant)	Virtual Meeting (via video conference)	FRMG requested resourcing to enable their engagement in project	requested resourcing proposal for consideration	On-going engagement requests from DDMI to establish engagement process with FRMG	DDMI- requested resourcing proposal not yet received from FRMG	digital copy of presentation	N
September 2020	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; Manager, Closure, DDMI; Director,	emails	DDMI - weekly and bi-weekly follow up to draft protocol	n/a	n/a	DDMI - awaiting YKDFN feedback on draft protocol	n/a	n/a

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		Environment, YKDFN; Project Coordinator, YKDFN							
2020-09-01, 9:30-11:30	Regulatory Update Engagement (including proposed engagement framework for PKMW)	DDMI (Closure Team Members, Communities Staff); Northwest Territory Metis Nation (President, Land and Resources Manager, Consultants?)	Virtual Meeting (via telephone conference)	NWTMN requested resourcing to enable their engagement in project	requested resourcing proposal for 2020 for consideration		DDMI-requested resourcing proposal not yet received from NWTMN	digital copy of presentation	N
2020-09-04	PKMW Engagement	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; President, FRMG; Project Assessment Analyst, GNWT	Email	correspondence from FRMG to GNWT and DDMI requesting a meeting	available to meet	n/a	FRMG will not meet with DDMI before meeting together with GNWT; to DDMI's knowledge, GNWT has not responded	n/a	n/a
2020-09-11	DDMI and TG Engagement Protocol for PKMW- AGREEMENT referencing Tł̨chq̨ Weghàà	Manager and Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager of Lands, TG	n/a	n/a	n/a	n/a	n/a	n/a	n/a

DATE & TIME	ENGAGEMENT TRIGGER	ATTENDEES	LOCATION/ ENGAGEMENT ACTIVITY TYPE*	ISSUE(S) RAISED	DDMI RESPONSE	OVERVIEW OF ISSUE(S) RESOLVED [1]	OVERVIEW OF ISSUE(S) UNRESOLVED	MATERIALS PROVIDED TO ENGAGEMENT PARTY	MINUTES (Y/N)
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2020-09-15	PKMW Engagement	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG	email	DDMI - request for clarification for reason for mtg request with GNWT	n/a	n/a	FRMG will not meet with DDMI before meeting together with GNWT; to DDMI's knowledge, GNWT has not responded	n/a	n/a
2020-09-22 and 2020-09-23, 13:00-15:30	PKMW cultural water quality criteria	DDMI (Closure Team Members, Communities Staff); NSMA (Elders, Knowledge Holders, Staff)	virtual workshop	PKMW cultural water quality criteria	n/a	n/a	n/a	workshop presentations and supporting material	n/a
2020-09-24, 12:30-17:00	PKMW cultural water quality criteria	DDMI (Closure Team Members, Communities Staff); LKDFN (Wildlife Committee, Elders, Staff, consultant), facilitators	virtual workshop	PKMW cultural water quality criteria, part 1	n/a	n/a	n/a	workshop presentations and supporting material	n/a

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2020-09-30	PKMW Engagement	Principal Advisor, Communities and Social Performance, Closure, DDMI; President, FRMG; Environment Coordinator, FRMG	email	FRMG - advise that President L. Cardinal will respond	n/a	n/a	FRMG will not meet with DDMI before meeting together with GNWT; to DDMI's knowledge, GNWT has not responded	n/a	n/a
October 2020	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; Manager, Closure, DDMI; Director, Environment, YKDFN; Project Coordinator, YKDFN	emails	DDMI - bi-weekly follow up to draft protocol	n/a	n/a	DDMI - awaiting YKDFN feedback on draft protocol; cultural water quality criteria workshop planning	n/a	n/a
2020-10-08	PKMW Engagement	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG	call	President has advised they want to engage; proposing meeting with GNWT&DDMI last two weeks of Oct, proposal for capacity funding to follow	n/a	n/a	FRMG will not meet with DDMI before meeting together with GNWT; to DDMI's knowledge, GNWT has not responded	n/a	N

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2020-10-16 and 2020-10-19, 9:00-12:00	PKMW cultural water quality criteria	DDMI (Closure Team Members, Communities Staff); KIA (Elders, Staff); facilitators	virtual workshop	PKMW cultural water quality criteria	n/a	n/a	n/a	workshop presentations and supporting material	n/a
2020-10-30, 10:30-11:30	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Director, Environment, YKDFN; Project Coordinator, YKDFN	Virtual Meeting (via video conference)	reviewed YKDFN edits/comments to draft protocol live (no document shared)	n/a	n/a	on-going review of draft protocol	n/a	N
2020-11-03	DDMI and KIA Engagement Protocol for PKMW	Director, Lands, Environment and Resources, KIA; Principal Advisor, Communities and Social Performance, Closure, DDMI; Executive Director, KIA: Senior Project Officer, KIA	email	No need for formal engagement protocol as there is already over 20 years of established practices and relationships between the groups that facilitates engagement	Agreed	n/a	n/a	n/a	N
2020-11-04, 2020-11-12, 2020-11-13	PKMW cultural water quality criteria	DDMI (Closure Team Members, Communities Staff, consultant); TG (Elders, Staff, consultant)	virtual workshop	PKMW cultural water quality criteria, TG facilitated session	n/a	n/a	n/a	workshop presentations and supporting material	n/a

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2020-11-09	PKMW Engagement	Principal Advisor, Communities and Social Performance, Closure, DDMI; President, FRMG; Environment Coordinator, FRMG	email	DDMI - request update re meeting with GNWT; FRMG still waiting for response from GNWT	n/a	n/a	FRMG will not meet with DDMI before meeting together with GNWT; to DDMI's knowledge, GNWT has not responded	n/a	n/a
2020-11-16	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; Director, Environment, YKDFN; Project Coordinator, YKDFN	email	YKDFN - shared response to draft (1) protocol; formal request for capacity funding to support engagement	request supporting information re capacity funding	n/a	on-going review of draft protocol - use of YKDFN Traditional Knowledge; capacity funding	DDMI and YKDFN Engagement Protocol for PKMW – DRAFT 1 - YKDFN edits/comments	n/a
2020-11-25	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Director, Environment, YKDFN; Project Coordinator, YKDFN	call	reviewed draft protocol; cultural water quality criteria workshop planning	n/a	n/a	on-going review of draft protocol - use of YKDFN Traditional Knowledge; capacity funding; workshop planning	draft workshop agenda and supporting material	N
2020-11-30	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Manager, Communities and Social Performance, DDMI; CEO, YKDFN	call	draft protocol; capacity funding	n/a	n/a	draft protocol; capacity funding	n/a	N

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2020-12-02	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; Director, Environment, YKDFN; Project Coordinator, YKDFN	email	DDMI - PKMW Protocol draft 2 shared for review; offer to meet with YKDFN members to provide PKMW update	n/a	n/a	DDMI - request meeting to review draft protocol and capacity funding request	DDMI and YKDFN Engagement Protocol for PKMW – DRAFT 2	n/a
2020-12-03, 13:30-14:30	PKMW cultural water quality criteria	DDMI (Closure Team Members, Communities Staff); LKDFN (Wildlife Committee, Elder, Staff), facilitator	virtual workshop	PKMW cultural water quality criteria, part 2	n/a	n/a	n/a	workshop presentations and supporting material	n/a
2020-12-07, 13:00-14:00; 2020-12-11 10:00-11:30	PKMW Project introduction (including Regulatory Update Engagement and proposed engagement	DDMI (Closure Team Members, Communities Staff); Deninu Kué First Nation (Councillor, Consultant)	Virtual Meeting (via telephone conference)	update; no issues raised	n/a	n/a	n/a	digital copy of presentation	N
2021-01-26	PKMW cultural water quality criteria - FINAL	Principal Advisor, Communities and Social Performance, Closure, DDMI; Director, Wildlife, Lands and Environment, LKDFN	email	PKMW cultural water quality criteria	n/a	n/a	n/a	Summary report	n/a

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February 2021	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Communities and Social Performance, DDMI; Director, Environment, YKDFN; CEO, YKDFN	in person meeting; call; emails	capacity funding; cultural water quality criteria planning	n/a	tentative workshop dates set; focus efforts on advancing cultural WQ workshop until regulatory manager in-role	renew efforts on PKMW Engagement Protocol draft once regulatory manger in-role	draft workshop agenda and supporting material	Y
2021-02-02	PKMW cultural water quality criteria - FINALIZED	Principal Advisor, Communities and Social Performance, DDMI; Senior Project Officer, KIA	Email	PKMW cultural water quality criteria	n/a	n/a	n/a	Final report	n/a
2021-02-15	PKMW cultural water quality criteria - FINALIZED	Principal Advisor, Communities and Social Performance, DDMI; Environment Manager, NSMA	Email	PKMW cultural water quality criteria	n/a	n/a	n/a	Final report	n/a

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March 2021	PKMW cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; Director, Environment, YKDFN; CEO, YKDFN; Assistant CEO, YKDFN	emails	lack of capacity; postpone cultural water quality criteria workshop	n/a	n/a	on-going workshop planning	n/a	n/a
April 2021	PKMW cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Director, Environment, YKDFN; Regulatory Manager, YKDFN	emails; in person meeting	resume workshop planning	n/a	n/a	on-going workshop planning	n/a	N
May 2021	PKMW cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Director, Environment, YKDFN; Regulatory Manager, YKDFN; Project Coordinator, YKDFN	emails; calls	workshop planning	n/a	n/a	on-going workshop planning	n/a	N
2021-05-03 13:00-17:00 and 2021-05-	PKMW cultural water quality criteria	DDMI (Closure Team Members, Communities Staff);	virtual workshop	PKMW cultural water quality criteria	n/a	n/a	n/a	workshop presentations and supporting material	n/a

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04, 9:00-12:00		NWTMN (leadership, staff); facilitators							
2021-05-05, 15:30-17:00	PKMW cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Regulatory Manager, YKDFN	Virtual Meeting (via video conference)	DDMI presented introduction to Diavik operations and PKMW project to new YKDFN Regulatory Manager in preparation for cultural water quality criteria workshop	n/a	n/a	n/a	Diavik Mine Introduction and PKMW Project presentation	N
2021-05-11	proposed engagement framework	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Staff, FRMG; President, FRMG	Email	Request to understand if FRMG would like a separate engagement to the PKMW engagement process with NWTMN (proposed to include engagements with each of the council communities of Fort Resolution,	n/a	see email referenced from FRMG (2021-09-16)	n/a	n/a	N

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				Fort Smith and Hay River					
2021-05-12 and 2021-05-13, 17:30-21:30	PKMW cultural water quality criteria	DDMI (Closure Team Members, Communities Staff); DKFN (Land Users, Councillors, Staff, consultant); facilitators	virtual workshop	PKMW cultural water quality criteria	n/a	n/a	n/a	workshop presentations and supporting material	n/a
2021-06-03 & 2021-06-04, 10:00-16:00	PKMW cultural water quality criteria	DDMI (President, Closure Team Members, Environment Staff, Communities Staff); YKDFN (Chief Sangris, Elders, Project Coordinator); third party facilitators, translator	in person workshop	PKMW cultural water quality criteria	n/a	n/a	n/a	workshop presentations and supporting material	n/a
July 2021	PKMW cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Director, Environment, YKDFN; Regulatory Manager,	emails; video calls	PKMW cultural water quality criteria - bi-weekly updates	n/a	n/a	on-going discussions re PKMW project to inform YKDFN staff and advance verification of cultural water quality criteria workshop outcomes	draft workshop summary report	N

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		YKDFN; Project Coordinator, YKDFN							
2021-08-23	PKMW cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Chief of Dettah, YKDFN; Chief of N'dilo, YKDFN; Director, Environment, YKDFN; Regulatory Manager, YKDFN	letter	PKMW proposed cultural water quality criteria for submission to WLWB	n/a	n/a	n/a	n/a	n/a
2021-08-26	proposed PKMW cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Staff, FRMG; President, FRMG; Manager, Closure, DDMI	letter	Shared proposed PKMW cultural water quality criteria to be submitted to WLWB	n/a		On-going	n/a	N

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2021-09-09; 14:00-15:00	PKMW cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Regulatory Manager, YKDFN	Virtual Meeting (via video conference)	PKMW water quality criteria - science-based discussion to complement cultural use	n/a	n/a	n/a	n/a	N
2021-09-09 - 2021-09-13	PKMW cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; President, FRMG; Environment Coordinator, FRMG	emails	DDMI - follow up to letter sent Aug 26th; request meeting with FRMG	n/a	Scheduled meeting 2021-09-16	n/a	n/a	n/a
2021-09-10	DDMI and DKFN Engagement Protocol for PKMW - EXECUTED	Principal Advisor, Communities and Social Performance, Closure, DDMI; SAO, DKFN	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2021-09-14	DDMI and NWTMN Engagement Protocol for PKMW - APPROVED	Principal Advisor, Communities and Social Performance, Closure, DDMI; President, and Land and Resources Manager, NWTMN	n/a	n/a	n/a	n/a	n/a	n/a	n/a

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2021-09-15	PKMW cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; President, FRMG; (Cc: Manager, Closure, DDMI; Environment Coordinator, FRMG; Executive Director, MVEIRB; Manager, Regulatory, WLWB; Manager, Socio-economics, GNWT)	letter	FRMG - advise that L. Cardinal is no longer president; FRMG seeking engagement on cultural water quality criteria	n/a	n/a	cultural water quality criteria engagement	n/a	n/a
2021-09-16, 10:00-11:00	PKMW cultural water quality criteria, proposed	DDMI (Closure Team Members, Communities Staff); KIA (Elders, Staff)	virtual workshop	PKMW cultural water quality criteria, proposed for submission to WLWB	n/a	n/a	n/a	workshop report, workshop presentations and supporting material	n/a
2021-09-16	PKMW cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Environment Coordinator, FRMG; (Cc: President, FRMG; Senior Advisor, Communities and Social Performance, DDMI; Executive Director, MVEIRB; Manager, Regulatory,	email	FRMG - request for the meeting to discuss engagement plan moving forward for cultural water quality criteria; separate from NWTMN	agree to discuss engagement plan moving forward	cultural water quality criteria engagement separate from NWTMN	n/a	n/a	n/a

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		WLWB; Manager, Socio-economics, GNWT)							
18:00-19:00	PKMW cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; President, FRMG; Council, FRMG; Environment Coordinator, FRMG; consultant, FRMG	Virtual Meeting (via video conference)	Discussed the letter from FRMG; create a path forward on engagement protocol and cultural water quality criteria engagement	n/a	n/a	on-going engagement planning	n/a	N
2021-09-18	PKMW cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; President, FRMG; Environment Coordinator, FRMG	email	FRMG - request for meeting honoraria	yes	honoraria for meeting	n/a	n/a	n/a

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2021-09-21	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; President, FRMG; Environment Coordinator, FRMG; consultant, FRMG	email	DDMI - shared PKMW Engagement Protocol DRAFT 1 and capacity funding budget; suggest follow up meeting Sept 27th	n/a	n/a	on-going review of engagement protocol, including cultural water quality criteria engagement and capacity funding	DDMI and FRMG Engagement Protocol for PKMW – DRAFT 1	n/a
2021-09-24	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; President, FRMG; Environment Coordinator, FRMG; consultant, FRMG	email	DDMI - follow up to draft (1) protocol and capacity funding	n/a	n/a	on-going review of engagement protocol, including cultural water quality criteria engagement and capacity funding	no	n/a
2021-09-24, 15:30-16:30	PKMW cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Principal Advisor, Closure Readiness, DDMI; Regulatory Manager, YKDFN	Virtual Meeting (via video conference)	PKMW water quality criteria - science-based discussion to complement cultural use	n/a	n/a	n/a	n/a	Y

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2021-09-27, 9:00-10:00	PKMW cultural water quality criteria, proposed for WLWB submission	DDMI (Closure Team Members, Communities Staff); NSMA (Elders, Knowledge Holders, Staff)	virtual workshop	PKMW cultural water quality criteria, proposed for submission to WLWB	n/a	n/a	n/a	Workshop report, workshop presentations and supporting material	n/a
2021-09-28	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; President, FRMG; Environment Coordinator, FRMG; consultant, FRMG; Finance, DDMI	email	DDMI - follow up; suggest meeting Sept 29th; Cc'd finance to initiate new vendor set-up	n/a	n/a	on-going review of engagement protocol, including cultural water quality criteria engagement and capacity funding	n/a	n/a
2021-10-01	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG	call (mssg)	FRMG - suggest meeting Oct 5th	yes	n/a	on-going review of engagement protocol, including cultural water quality criteria engagement and capacity funding	n/a	n/a

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2021-10-04	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; President, FRMG; Environment Coordinator, FRMG; consultant, FRMG	letter	FRMG - response to capacity funding	n/a	n/a	on-going review of engagement protocol, including cultural water quality criteria engagement and capacity funding	n/a	n/a
2021-10-05	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; President, FRMG; Environment Coordinator, FRMG; consultant, FRMG	email	DDMI - PKMW Protocol draft 2 shared, updated based on FRMG feedback	n/a	n/a	on-going review of engagement protocol, including cultural water quality criteria engagement and capacity funding	DDMI and FRMG Engagement Protocol for PKMW – DRAFT 2	n/a
18:00-19:00	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; President,	Virtual Meeting (via video conference)	Discussed Oct 4th letter from FRMG, protocol draft (2), capacity funding and tight timeline; next meeting Oct 13th	n/a	n/a	on-going review of engagement protocol, including cultural water quality criteria engagement and capacity funding	n/a	N

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		FRMG; Council, FRMG; Environment Coordinator, FRMG; consultant, FRMG							
2021-10-07	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; President, FRMG; Environment Coordinator, FRMG; consultant, FRMG	email and letter	DDMI - PKMW Protocol draft 3 shared, updated based on FRMG feedback; cultural water quality criteria engagement approach	n/a	n/a	on-going review of engagement protocol, including cultural water quality criteria engagement and capacity funding	DDMI and FRMG Engagement Protocol for PKMW – DRAFT 2; letter response to FRMG letter (Oct 4th)	n/a
2021-10-12	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; President, FRMG; Environment Coordinator, FRMG; consultant, FRMG	email	DDMI - follow up to email and letter Oct 7th; confirm if FRMG still available to meet Oct 13th	n/a	n/a	on-going review of engagement protocol, including cultural water quality criteria engagement and capacity funding	n/a	n/a

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2021-10-13	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG	email	FRMG - request to reschedule meeting to Oct 19th	new meeting invitation sent	n/a	n/a	n/a	n/a
2021-10-18	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; President, FRMG; Environment Coordinator, FRMG; consultant, FRMG	email	DDMI - confirm FRMG still available to meet Oct 19th	n/a	n/a	n/a	n/a	n/a
2021-10-19	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG	email	FRMG - request to reschedule meeting to Oct 21st or 25th	new meeting invitation sent for Oct 25th	n/a	n/a	n/a	n/a
2021-10-20, 17:00-18:00	PKMW cultural water quality criteria, proposed for WLWB submission	DDMI (Closure Team Members, Communities Staff); LKDFN (Wildlife	virtual workshop	PKMW cultural water quality criteria, proposed for WLWB session	n/a	n/a	n/a	Workshop report, workshop presentations and supporting material	n/a

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		Committee, Elders, Staff, consultant)							
2021-10-25	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG	email	DDMI - confirm FRMG still available to meet this evening	n/a	n/a	n/a	n/a	n/a
		Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG	email	FRMG - request to reschedule meeting to Oct 27th or 28th	new meeting invitation sent for Oct 27th	n/a	n/a	n/a	n/a
2021-10-26	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Director, Environment, YKDFN	email	DDMI - resume review of draft (2) protocol; cultural water quality criteria verification	n/a	n/a	n/a	n/a	n/a

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2021-10-27	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG	email	DDMI - confirm FRMG still available to meet this evening	n/a	n/a	n/a	n/a	n/a
		Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG		FRMG - request to reschedule meeting to Oct 28th	new meeting invitation sent for Oct 28th	n/a	n/a	n/a	n/a
2021-10-28	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; President, FRMG; Environment Coordinator, FRMG	letter	FRMG - response to DDMI letter (Oct 7)	given content of letter, will cancel meeting and will provide response to letter	n/a	on-going review of engagement protocol, including cultural water quality criteria engagement and capacity funding	n/a	n/a
2021-11-02	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; President,	letter	DDMI - response to FRMG letter (Oct 28)	n/a	n/a	on-going review of engagement protocol, including cultural water quality criteria engagement and capacity funding	n/a	n/a

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		FRMG; Environment Coordinator, FRMG; consultant, FRMG							
2021-11-08, 9:00-10:00	PKMW cultural water quality criteria, proposed WLWB submission	DDMI (Closure Team Members, Communities Staff, consultant); TG (staff, consultant)	virtual workshop	PKMW cultural water quality criteria, proposed submission to WLWB	n/a	n/a	n/a	report, workshop presentations and supporting material	n/a
2021-11-19, 15:00-16:00	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; Regulatory Manager, YKDFN	Virtual Meeting (via video conference)	YKDFN - shared response to draft (2) protocol; capacity funding	n/a	n/a	on-going review of draft protocol; DDMI capacity funding terms reasonable to YKDFN	DDMI and YKDFN Engagement Protocol for PKMW – DRAFT 2 - YKDFN edits/comments	N
2021-11-23	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; Regulatory Manager, YKDFN	email	DDMI - PKMW Protocol draft 3 shared for review; including draft Terms of Reference for capacity funding	n/a	n/a	on-going review of draft protocol, capacity funding	DDMI and YKDFN Engagement Protocol for PKMW – DRAFT 3	n/a

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2021-11-24	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG	call	DDMI - request to meet to follow up on previous letters/proposals	n/a	n/a	on-going review of engagement protocol, including cultural water quality criteria engagement and capacity funding	n/a	n/a
2021-11-26	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG	text	FRMG - suggest meeting Nov 29th	n/a	n/a	n/a	n/a	n/a
2021-11-26, 16:00-17:00	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Regulatory Manager, YKDFN	Virtual Meeting (via video conference)	reviewed draft protocol; capacity funding; cultural water quality criteria verification	n/a	n/a	on-going review of draft protocol, capacity funding	n/a	N
2021-11-27	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; A/Director, Environment, YKDFN; Regulatory Manager, YKDFN	email	YKDFN - shared response to draft (3) protocol; capacity funding	n/a	n/a	on-going review of draft protocol, capacity funding; to be finalized with A/Director Environment	DDMI and YKDFN Engagement Protocol for PKMW – DRAFT 3 - YKDFN edits/comments	n/a

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2021-11-29	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG	text	FRMG - request to reschedule meeting to Nov 30th	n/a	n/a	n/a	n/a	n/a
2021-11-29, 15:00-16:00	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; A/Director Environment, YKDFN	Virtual Meeting (via video conference)	capacity funding	n/a	n/a	on-going review capacity funding	n/a	N
2021-11-30	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; A/Director Environment, YKDFN	email	DDMI - PKMW Protocol draft 4 shared for review	n/a	n/a	on-going review of draft protocol, capacity funding	n/a	n/a
2021-11-30	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG	call	FRMG - plan to finalize protocol before holidays; a couple of changes to confirm with President; DDMI to call back Dec 8th	n/a	n/a	on-going review of engagement protocol, including cultural water quality criteria engagement and capacity funding	n/a	N

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2021-11-30, 18:00-20:00	PKMW cultural water quality criteria, verification and proposed WLWB submission	DDMI (Closure Team Members, Communities Staff); DKFN (Land Users, Councillors, Staff, consultant)	virtual workshop	PKMW cultural water quality criteria, verification session and proposed submission to WLWB	n/a	n/a	n/a	Draft report, workshop presentations and supporting material	n/a
December 2021	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Communities and Social Performance, DDMI; A/Director Environment, YKDFN; CEO, YKDFN	emails	several requests to meet with A/Director, Environment; CEO; YKDFN last minute cancellation; meeting rescheduled for 13-Jan-2022	n/a	n/a	n/a	n/a	n/a
2021-12-07	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; President, FRMG; Environment Coordinator, FRMG; consultant, FRMG	email	DDMI - follow up to call Nov 30th	n/a	n/a	n/a	n/a	n/a

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2021-12-08	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Environment Coordinator, FRMG	face-to-face	plan for protocol follow up meeting on Dec 15th	meeting invitation sent for Dec 15th	n/a	n/a	n/a	n/a
2021-12-14	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; President, FRMG; Environment Coordinator, FRMG; consultant, FRMG	email	DDMI - confirm FRMG still available to meet Dec 15th	n/a	n/a	n/a	n/a	n/a
2021-12-15	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG	text	FRMG - request to reschedule meeting to following week	new meeting invitation sent for Dec 20th	n/a	n/a	n/a	n/a

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2021-12-20	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; President, FRMG; Environment Coordinator, FRMG; consultant, FRMG	email; call (voicemail, box full); text	DDMI - confirm FRMG still available to meet this evening	n/a	n/a	n/a	n/a	n/a
2021-12-21	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG	text	FRMG - request to reschedule meeting to following week (w/c Dec 27th) or week after (w/c Jan 3rd)	please advise of firm date for early Jan or will advise WLWB that we have not been able to reach an agreement	n/a	n/a	n/a	n/a
2022-01-04	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG	text	FRMG - advise they will be forwarding copy of engagement plan; request meeting w/c Jan 10th	DDMI is available, please advise of firm date	n/a	on-going review of engagement protocol, including cultural water quality criteria engagement and capacity funding	n/a	n/a

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2022-01-06	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; President, FRMG; Environment Coordinator, FRMG; consultant, FRMG	email	DDMI - follow up email to FRMG text (Jan 4th); we have not yet seen draft engagement plan, please send; request meeting Jan 11th-13th, 17th or 19th	n/a	n/a	on-going review of engagement protocol, including cultural water quality criteria engagement and capacity funding	n/a	n/a
2022-01-10	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; President, FRMG; Environment Coordinator, FRMG; consultant, FRMG	text	FRMG - advise of positive COVID case in community; hope to have engagement plan approved this week or next (w/c Jan 17th)	please share draft plan while working remotely	n/a	n/a	n/a	n/a
2022-01-12	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; A/Manager, Communities and Social Performance, DDMI; A/Director Environment, YKDFN;	email	YKDFN - postpone meeting scheduled for Jan 13th	n/a	n/a	n/a	n/a	n/a

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		Project Coordinator, YKDFN							
2022-01-14	DDMI and YKDFN Engagement Protocol for PKMW	Principal Advisor, Communities and Social Performance, Closure, DDMI; A/Director Environment, YKDFN (Cc: Manager, Communities and Social Performance, DDMI; Manager, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; Project Coordinator, YKDFN)	letter	DDMI - advise YKDFN of upcoming submission to WLWB re status of PKMW Engagement Protocol and efforts by DDMI to advance; DDMI to request approval of PKMW Engagement Plan from WLWB	n/a	n/a	DDMI has not been able to finalize PKMW Engagement Protocol with YKDFN despite considerable time and effort	n/a	n/a
2022-01-14	protocol	Principal Advisor, Communities and Social Performance, Closure, DDMI; President, FRMG; (Cc: Manager, Closure, DDMI; A/Manager, Communities and Social Performance,	letter	DDMI - advise FRMG of upcoming submission to WLWB re status of PKMW Engagement Protocol and efforts by DDMI	n/a	n/a	DDMI has not been able to finalize PKMW Engagement Protocol with YKDFN despite considerable time and effort	n/a	n/a

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		DDMI; Environment Coordinator, FRMG)		to advance; DDMI to request approval of PKMW Engagement Plan from WLWB					
2022-01-19, 13:30-17:00	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Communities and Social Performance, DDMI; Senior Advisor, Communities and Social Performance, DDMI; Project Coordinator, YKDFN	Virtual Meeting (via video conference)	YKDFN - shared response to draft (4) protocol; data sharing agreement - YKDFN to share Jan 28th	n/a	n/a	on-going review of draft protocol, data sharing agreement	DDMI and YKDFN Engagement Protocol for PKMW – DRAFT 4 - YKDFN edits/comments	Y
2022-01-24, 14:00-16:00	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; Project Coordinator, YKDFN	Virtual Meeting (via video conference)	plan to advance protocol	n/a	n/a	on-going review of draft protocol, data sharing agreement (YKDFN to provide draft)	YKDFN shared draft tasks to advance engagement protocol to approval	Y

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2022-01-28	Regulatory Challenges	A/Manager, Communities and Social Performance, DDMI; CEO, YKDFN	Virtual Meeting (via video conference)	DDMI delayed in meeting regulatory commitments despite multiple efforts to engage with YKDFN	n/a	n/a	CEO advised meeting with A/Director, Environment, YKDFN	n/a	N
2022-01-30	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	A/Manager, Communities and Social Performance, DDMI; A/Director, Environment, YKDFN	email	DDMI - request meeting with A/Director to advance engagement	n/a	n/a	n/a	n/a	n/a
2022-01-31	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; A/Director Environment, YKDFN (Cc: Manager, Communities and Social Performance, DDMI; Manager, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; Project Coordinator, YKDFN)	letter	DDMI - advise YKDFN of upcoming submission to WLWB re status of PKMW Engagement Protocol and efforts by DDMI to advance; DDMI to request approval of PKMW Engagement Plan from WLWB	n/a	n/a	DDMI has not been able to finalize PKMW Engagement Protocol with YKDFN despite considerable time and effort; DDMI still waiting for Data Sharing Agreement draft from YKDFN	n/a	n/a

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2022-02-03	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Communities and Social Performance, DDMI; Manager, Closure, DDMI; Senior Advisor, Communities and Social Performance, DDMI; A/Director, Environment, YKDFN; Project Coordinator, YKDFN	email	PKMW Protocol draft	n/a	YKDFN able to move forward with Engagement Protocol without Data Sharing Agreement	n/a	DDMI and YKDFN Engagement Protocol for PKMW – DRAFT 5	n/a
2022-02-07, 15:00-17:30	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; Project Coordinator, YKDFN	Virtual Meeting (via video conference)	PKMW Protocol draft	n/a	n/a	on-going review of draft protocol, data sharing agreement	n/a	Y
2022-02-09	DDMI and NSMA Engagement Protocol for PKMW, Annual Review – EXECUTED	Principal Advisor, Communities and Social Performance, Closure, DDMI; A/President, NSMA	n/a	n/a	n/a	n/a	n/a	n/a	n/a

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2022-02-10	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; A/Manager, Communities and Social Performance, DDMI; Director, Environment, YKDFN; Project Coordinator, YKDFN	email	YKDFN - shared response to draft (5) protocol	n/a	n/a	on-going review of draft protocol, data sharing agreement, capacity funding	DDMI and YKDFN Engagement Protocol for PKMW – DRAFT 5 - YKDFN edits/comments	n/a
2022-02-10	DDMI and KIA Engagement Protocol for PKMW, Annual Review – APPROVED	Principal Advisor, Communities and Social Performance, Closure, DDMI; Land and Environment Project Officer, KIA	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2022-02-11	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; A/Manager, Communities and Social Performance, DDMI; Director, Environment, YKDFN; Project Coordinator, YKDFN	email	YKDFN - shared additional response to draft (5) protocol	n/a	n/a	on-going review of draft protocol, data sharing agreement, capacity funding	DDMI and YKDFN Engagement Protocol for PKMW – DRAFT 5 - YKDFN edits/comments	n/a
	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; A/Manager,	email	DDMI - PKMW Protocol draft 6 shared for review	n/a	n/a	on-going review of draft protocol, capacity funding	DDMI and YKDFN Engagement Protocol for PKMW – DRAFT 6	n/a

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		Communities and Social Performance, DDMI; Director, Environment, YKDFN; Project Coordinator, YKDFN							
2022-02-14	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; A/Manager, Communities and Social Performance, DDMI; Director, Environment, YKDFN; Project Coordinator, YKDFN	emails	DDMI - request response to draft 6 prior to submission to WLWB planned Feb 15th	n/a	n/a	on-going review of draft protocol, capacity funding	n/a	n/a
2022-02-15, 12:00-13:15	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; A/Manager, Communities and Social Performance, DDMI; Director, Environment, YKDFN; Project Coordinator, YKDFN	Virtual Meeting (via video conference)	discussion to review remaining draft comments; understand final requirements to finalize protocol	n/a	n/a	on-going review of draft protocol, capacity funding	n/a	Y
	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; A/Manager,	email	DDMI - PKMW Protocol draft 7 (final) shared for review	n/a	n/a	on-going review of draft protocol, capacity funding	DDMI and YKDFN Engagement Protocol for PKMW – DRAFT 7	n/a

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		Communities and Social Performance, DDMI; Director, Environment, YKDFN; Project Coordinator, YKDFN							
2022-02-16	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; Project Coordinator, YKDFN	email	YKDFN - shared response to draft (7) protocol	n/a	n/a	on-going review of draft protocol, data sharing agreement	DDMI and YKDFN Engagement Protocol for PKMW – DRAFT 7 - YKDFN edits/comments	n/a
2022-02-17, 9:30-10:00 and 15:30-17:15	DDMI and YKDFN Engagement Protocol for PKMW - DRAFT	Principal Advisor, Communities and Social Performance, Closure, DDMI; A/Manager, Communities and Social Performance, DDMI; Director, Environment, YKDFN; Project Coordinator, YKDFN	Virtual Meeting (via video conference)	discussion to review new draft comments	n/a	n/a	on-going review of draft protocol	n/a	N
2022-02-17	DDMI and YKDFN Engagement Protocol for PKMW – APPROVED	Principal Advisor, Communities and Social Performance, Closure, DDMI; A/Director, Environment, YKDFN	n/a	n/a	n/a	n/a	n/a	n/a	n/a

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2022-02-17	PKMW and Regulatory Update	Principal Advisor, Communities and Social Performance, Closure, DDMI; Advisor, Communities and Social Performance, DDMI; Director, Wildlife, Lands and Environment Department, LKDFN	Email	LKDFN Lands and DDMI follow up - PKMW Engagement Protocol update and 2022 Engagements	n/a	n/a	n/a	n/a	n/a
2022-02-22	PKMW and Regulatory Update	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; Director, Wildlife, Lands and Environment Department, LKDFN; Regulatory Consultant, LKDFN	email	Re-shared PKMW cultural water quality proposed criteria for WLWB (letter) in response to LKDFN comments at water license amendment technical hearing	n/a	n/a	n/a	n/a	n/a
2022-02-22	Cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Manager, Closure, DDMI; SAO, DKFN; Lands Staff, DKFN; Councillor, DKFN	Email	Cultural water quality criteria: follow up on draft report for finalization	n/a	n/a	DKFN auto-reply - office remains closed until February 21st due to COVID"		n/a

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2022-02-23	PKMW cultural water quality criteria - VERIFIED	Principal Advisor, Communities and Social Performance, DDMI; Lands Coordinator, DKFN	Email	PKMW cultural water quality criteria	n/a	n/a	n/a	n/a	n/a
2022-03-08	Engagement Protocol and cultural water quality criteria	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG	Call and emails	FRMG committed to share draft Engagement Protocol in next day or two; DDMI will share cultural water quality criteria engagement proposal	n/a	n/a	Still awaiting draft engagement protocol	DDMI shared last draft Engagement Protocol and cultural water quality criteria engagement proposal	n/a
2022-03-11	Engagement Protocol	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG	Email	DDMI follow up request for draft engagement protocol	n/a	n/a	Still awaiting draft engagement protocol	n/a	n/a
2022-03-21	Cultural water quality criteria	Advisor, Communities and Social Performance, DDMI; Manager, Land and Resources, NWTMN	Call	Cultural water quality criteria: discussed planning/logistics for workshop in Fort Smith with both the Hay River Metis council and the Fort Smith Metis council during	n/a	n/a	n/a	n/a	n/a

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				the week of April 25-29.					
2022-03-27	Engagement Protocol	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG	Email	FRMG confirming DDMI's receipt of draft Engagement Protocol	Not received by DDMI; please send	n/a	Still awaiting draft engagement protocol	n/a	n/a
2022-04-13, 10:00-16:00	PKMW cultural water quality criteria – verification of report and proposed WLWB submission	Principal Advisor, Communities and Social Performance, Closure, DDMI; Principal Advisor, Closure Planning and Design, DDMI; YKDFN (Elders, Project Coordinator); translator	Chief Drygeese Community Centre, Dettah / in person workshop	PKMW cultural water quality criteria – verification session of report from June 2021 workshop and proposed submission to WLWB	n/a	n/a	n/a	Draft summary report, workshop presentations and supporting material	n/a
2022-04-27, 9:00-17:00	PKMW cultural water quality criteria and proposed WLWB submission	A/Manager, Communities and Social Performance, DDMI; Principal Advisor, Closure Planning and Design, DDMI; NWTMN (Elders, staff)	Fort Smith / in person workshop	PKMW cultural water quality criteria – verification of May 2021 session with leadership, proposed submission to WLWB, and additional	n/a	n/a	n/a	Draft summary report, workshop presentations and supporting material	n/a

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				feedback from Elders					
2022-04-27	Engagement Protocol	Principal Advisor, Communities and Social Performance, Closure, DDMI; Environment Coordinator, FRMG	Email	FRMG confirming DDMI's receipt of draft Engagement Protocol	DDMI response (2022-05-09): not received by DDMI; please send	n/a	Still awaiting draft engagement protocol	n/a	n/a
2022-06-02	PKMW cultural water quality criteria - VERIFIED	Principal Advisor, Communities and Social Performance, DDMI; Project Coordinator, YKDFN	Email, letter, call	PKMW cultural water quality criteria, follow up letter	n/a	n/a	n/a	n/a	n/a
2022-06-03	PKMW cultural water quality criteria - VERIFIED	Principal Advisor, Communities and Social Performance, DDMI; Manager, Land and Resources, NWTMN	call	PKMW cultural water quality criteria	n/a	n/a	n/a	Draft summary report	n/a

*It is noted that all engagements undertaken between March 2020 and June 2021 were virtual due to restrictions arising from the COVID-19 pandemic.

