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Joseph Mackenzie, Chair
Wek'èezhìi Land and Water Board
PO Box 32
Wekweètì, NT X1A 3S3
Canada

24 July 2021

Dear Mr. Mackenzie:

Subject: DDMI Submission – Processed Kimberlite Management Plan, Version 6

Diavik Diamond Mines (2012) Inc.'s (DDMI) is pleased to submit the Processed Kimberlite Management Plan Version 6 (PK Management Plan Version 6) to the Wek'èezhìi Land and Water Board (WLWB or the 'Board'). The PK Management Plan Version 6 is an update to the WLWB-approved[1] Processed Kimberlite Containment Facility (PKCF) Plan Version 5.1 developed to meet directives[2] in the Board's approval of Version 5.0. The PK Management Plan Version 6 reflects proposed changes to the Phase 7 Dam Raise previously approved by the Board. This updated Plan also meets the requirements of Part G, Condition 4 and Schedule 6, Condition 2 of Water License W2015L2-0001.

The PKCF-related requirements in the aforementioned Board directives, the directives associated with Version 4 of the Plan[3], and the location of the required information in the Plan, are noted in the Conformity Table in PK Management Plan Version 6. DDMI's updates to PK Management Plan in Version 6 reflect the following modifications to the PKCF Phase 7 Dam Raise and Phase 7 Spillway previously approved by the WLWB[4]:

- Utilizing a 473 meters (m) elevation Coarse Processed Kimberlite (CPK) Berm constructed upstream (in the inner perimeter) of the the final lined rockfill dam raise to elevation 469 m to contain Fine Processed Kimberlite (FPK) above elevation 469 m in the PKCF.
- Containing pond water below the 469 m elevation in the PKCF.
- Constructing and operating a Phase 7 cemented rockfill (CRF) lined trapezoidal spillway with a 32 m base width and 3 horizontal to 1 vertical side slopes and a maximum invert elevation of 468.2 m to align with the modified Phase 7 final raise.

[1] WLWB Decision Letter Re PKC Facility Plan Version 5.1, February 25, 2021
[2] WLWB Reasons for Decision Re PKCF Plan Version 5.0, August 21, 2020
[3] WLWB Reasons for Decision Re PKCF Plan Version 4.0, May 28, 2018
[4] WLWB Reasons for Decision Re PKCF Phase 7 Dam Raise, October 9, 2018

DDMI will continue to maintain a minimum operational freeboard of 0.4 m below the lowest surveyed point of the dam crest liner with the proposed modifications to the Phase 7 dam raise and Phase 7 spillway as per Part G, Condition 27a, of the Diavik Water Licence (W2015L2-0001).

In addition to the request for the Board's approval of the PK Management Plan Version 6, DDMI is also seeking the WLWB's approval, under Part E, Condition 10, of the following related design reports with associated Issued for Construction (IFC) drawings included with this submission:

- Updated Phase 7 Final Raise Design for the PKCF; and
- PKCF Phase 7 Spillway Design Update.

This submission includes a Quality Assurance and Quality Control (QA/QC) Plan for the construction of the Phase 7 final raise and spillway (see Section 5 of the PKC Facility Phase 7 Dam Raise Construction Technical Specifications in Appendix C of the Updated Phase 7 Final Raise Design Report for the PKCF). The QA/QC Plan meets requirements of a QA/QC Control Manual as per Part E, Condition 25, of the Diavik Water Licence.

As noted above, the updated Phase 7 final raise design is a modification/update of the Phase 7 Dam Raise Design (Golder 2018) approved by the Board. The final raise design is not a raise of the PKCF Dams. It is a raise of coarse processed kimberlite (CPK) to support fine processed kimberlite (FPK) deposition and will not retain a pond. The Phase 7 Dam raise to elevation 469 m that is scheduled to be complete by fall 2021 is the final raise of the dams. Hence, there will be no change in the footprint of the dams for the updated final raise.

DDMI also notes that prior to this submission, the proposed modfications to the WLWB-approved Phase 7 final raise and the Phase 7 spillway were subjected to a review by the independent Diavik Geotechnical Review Board (DGRB). The DGRB's Letter of Acceptance of the proposed modifications to Phase 7 final raise and Phase 7 spillway and a Table of Conformity to the DGRB's recommendations are included with this submission. This submission also includes tables of conformity to information requirements for PKCF design reports and QA/QC control manuals as per Schedule 5, Conditions 3 and 6 of the Diavik Water Licence.

If the PK Management Plan Version 6 and associated design reports are approved by the WLWB, DDMI intends to commence and complete construction of the Phase 7 final raise and Phase 7 spillway within the short construction window in Summer/Fall 2021 before the Winter months, as this work is critical to maintaining Processed Kimberlite storage capacity in the PKCF until commencement of the operations phase of the Processed Kimberlite to Mine Workings Project in Q4, 2022. Prior to construction, DDMI will meet project notification requirements as per Part E, Condition 5 of the Diavik Water Licence.

We trust that the PK Management Plan Version 6 and associated documents 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 Projects

cc: Kassandra DeFrancis, WLWB
Anneli Jokela, WLWB

Attachments:

- Conformance Table of Requirements for the PK Management Plan V6
- Table of Conformity to PKCF Design Report Requirements (Schedule 5, Condition 3 of the Diavik Water Licence)
- Table of Conformity to QA/QC Control Manual Requirements (Schedule 5, Condition 6 of the Diavik Water Licence)
- Table of Conformity to DGRB Recommendations
- PK Management Plan Version 6
- Updated Phase 7 Final Raise Design for the PKCF
- PKCF Phase 7 Spillway Design Update
- QA/QC Plan (see Section 5 of the of the PKC Facility Phase 7 Dam Raise Construction Technical Specifications
- DGRB Letter of Acceptance Re Phase 7 Spillway and Dam Raise

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Table of Conformance Table of Requirements for the PK Management Plan V6		
Directive	**Section**	**Comment**
Water Accumulation against the PKC Facility RFD – 15 May 2018		
1. The Board approves temporary (up to 14 days) accumulation of ponded surface water against the PKC Facility Dams caused by snow melt, rainfall, or excess process water discharge. This approval only applies to the Phase 6 Dam raise and to ponded water that is not connected to the PKC Facility Pond. The Board expects that the ponded surface water would be addressed by day 14. Upon accumulation of ponded surface water against the PKC Facility Dams, DDMI is required to: a. Immediately notify the Inspector and the Board; b. Report the following in the Annual Dam Safety Inspection of the PKC Facility: 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 *v.* Any corrective actions and assessment	3.2	N/A
2. DDMI is required to include a full list of contingencies (including but not limited to those provided in response to EMAB's comments 2, 3, and 4) to address ponded water accumulated against the Dams in the PKC Facility Plan	3.2.3, 3.3, 3.4 and 3.5	Each section lists various monitoring and contingency plans to manage PKCF Pond size and temporary accumulation of water against the dams.
3. The Board approves temporary (up to 14 days) accumulation of the PKC Facility Pond against the PKC Facility Dams as approved by the Engineer of Record. This approval only applies to the Phase 6 Dam raise. The Board expects that the PKC Facility Pond against the Dam(s) would be addressed by day 14. Upon accumulation of the PKC Facility Pond against the PKC Facility Dams as approved the Engineer of Record, DDMI is required to: a. Immediately notify the Inspector and the Board; b. Report the following in the Annual Dam Safety Inspection of the PKC Facility: 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 v. Any corrective actions and assessment.	3.5	N/A

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Table of Conformance Table of Requirements for the PK Management Plan V6		
Directive	**Section**	**Comment**
c. Increase the frequency of key monitoring data; the details of what to monitor and when to monitor can be at the discretion of the Engineer of Record; d. Conduct a complete evaluation of the key monitoring data on an expedited basis while the ponded water is against (or near) the PKC Facility Dams.		
4. Test the emergency response plan (ERP) prior to the freshet the first year that the water balance indicates PKC Facility Pond water is expected to pond against the Dam. In subsequent years, the frequency of subsequent ERP testing should be at the discretion of the Engineer of Record.	3.5	N/A
5. Provide the results of the stability analyses mentioned in response to EMAB comment 2 and a discussion of how this data can be used to form a quantitative performance objective. This information can be provided in the PKC Facility Plan. If DDMI determines that a QPO is appropriate to address stability issues related to water ponding, DDMI can include the QPO in the Operation Maintenance and Surveillance (OMS) manual. DDMI must note in the Annual Water Licence Report whether a QPO was added to the OMS Manual or not and include rationale.	3.5	N/A.
6. The Board has not approved DDMI's request for extended accumulation of the PKC Facility Pond against the PKC Facility Dams.	3.5	N/A
PKCF Plan V4 Reasons for Decision – 28 May 2018		
2. Require DDMI to replace the statement in Section 3.3.4 of the PKC Facility Plan that "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 via the Process Plant or direct discharge" with "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".	3.4.4	Sentence referenced by the Board was originally in Section 3.4.4; the required change is included in this section.
3. Require DDMI to delete the following from the PKC Facility Plan: "If DDMI identifies the need to move water from the PKCF during operations, water pumped from the PKCF pond for release to the receiving environment will meet all applicable effluent quality criteria specified in the Type A Water License W2015L2-0001".	3.2.2	N/A
4. Require DDMI to add the following statement to the PKC Facility Plan: "The PKC pond water would not rise above the FPK beaches or the perimeter CPK berm, with the exception of a runoff event in excess of the design flood event. FPK is deposited downstream of the approximately 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 100 m from the dam at NOWL 464.6 m".	3.5	N/A

Table of Conformance Table of Requirements for the PK Management Plan V6		
Directive	**Section**	**Comment**
5. Require DDMI to replace all instances of "potential seepage" or "potential PKCF dam seepage" in the PKC Facility Plan with "PKC interception well water".	-	Completed throughout document, as applicable. Historical references to seepage from the dams remain, as do references to 'potential seepage' (for example, in relation to the purpose of the Collection Ponds).
PKCF Plan Version 5.0 Reasons for Decision, August 21, 2020		
Directive	**Section**	**Comment**
Revision A: Add the following statement: "DDMI will maintain the entire Phase 7 downstream rockfill elevation above 465.8 metres."	2.2.5	N/A
Revision B(i): Beginning 45 days prior to freshet 2021 and biweekly thereafter until freshet 2021 has ended, DDMI will submit to the Board a description of the current status of the water balance, current PKC Facility 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 PKC Facility Plan requirements during freshet 2021.	3.5	N/A
Revision B(ii): DDMI will notify the Board and the Inspector as soon as possible if any of the triggers in its TARP are activated, describe the trigger, identify what actions will be taken and state when they will be implemented.	3.5	N/A
Revision B(iii): DDMI will test the emergency response plan (ERP) prior to 2021 freshet.	3.5	N/A
Revision C: Include a statement that in the case of a temporary or early shutdown prior to or during freshet 2021, the company will apply the same resources and diligence to monitor and maintain the PKC Facility and implement the TARP as it would during operations.	3.5	N/A
Revision D: Refer to the inflow design flood (IDF) when discussing the minimum freeboard in the PKC Facility Plan. This may require revisions in several locations in the Plan.	Applicable sections throughout, including Section 2.1, 3.4.1, and 3.6.	N/A
Revision E: State that Pond 3 will be managed so that it can hold the IDF.	Sections 2.1, 3.4.1, and 3.6	N/A

Table of Conformance Table of Requirements for the PK Management Plan V6		
Directive	**Section**	**Comment**
Revision F(i): Update the summary to reflect the current Version number of the PKC Facility Plan (GNWT – ENR Comment 1).	Summary updated to reflect current PK Management Plan Version number i.e. 6.	N/A
Revision F(ii): Update the page numbers for Figure 6 and Table 1 in the Table of Contents (GNWT-ENR Comment 2).	Page numbers of all figures and tables updated in Table of Contents	N/A
Revision F(iii): Add clarification regarding the "northwest corner" of the facility (GNWT-ENR Comment 3).	Section 1.2 and Figure 2	N/A
Revision F(iv): Update Figure 2 to clearly show the northwest corner of the facility (GNWT-ENR Comment 3).	Figure 2	N/A
Revision F(v): Update Table 1 and Section 1.3 to reflect A21 pipe mining status (GNWT-ENR Comment 4).	Table 1 and Section 1.3	N/A
Revision F(vi): Add a definition for the acronym "EDF" (GNWT-ENR Comment 9).	EDF and IDF definitions added to Glossary of Terms	N/A
Revision F(vii): Replace the statement "Water cannot be pumped from collection ponds to the PKC pond when water levels in the PKC are at or above the normal operating level of El 464.6 m" with "Water cannot be pumped from collection ponds to the PKC pond when water levels in the PKC are at or above the normal operating level of0.4 m below the lowest point of the dam crest liner. This is currently 464.6m and will become 468.6m." (WLWB comment 12). This statement accommodates the dam raise to 469 metres, as agreed to by DDMI.	Section 3.2.3	N/A

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Table of Conformity to PKCF Design Report Requirements (Schedule 5, Condition 3 of the Diavik Water Licence)		
Schedule 5 Condition 3		**DDMI Response**
a	a description of existing conditions beneath the footprint of the structure and extending at least fifty (50) metres beyond the footprint in either direction, including the distribution of the frozen and unfrozen soil and rock materials along representative cross sections of the dams;	The updated Phase 7 final raise design is a modification/update of the Phase 7 Dam Raise Design (Golder 2018) approved by the WLWB. The final raise design is not a raise of the PKC Facility Dams. It is a raise of CPK to support FPK deposition and will not retain a pond. The Phase 7 Dam raise to elev. 469 m that is scheduled to be complete by fall 2021 is the final raise of the dams. No change in the footprint of the dams for the updated final raise. Refer to Section 5.0 in Phase 7 Dam Raise Design Report (Golder 2018) approved by the WLWB for foundation conditions.
b	an explanation for any significant lateral variations in soil materials and the implications of the soil variability on the West Dam design;	No change. Refer to Section 5.0 Phase 7 Dam Raise Design Report (Golder 2018) approved by the WLWB.
c	intended depth of excavation for each of the cross sections selected;	No excavation planned.
d	a description of the variability of the spatial and engineering properties of the soil;	No change. Refer to Section 5.0 Phase 7 Dam Raise Design Report (Golder 2018) approved by the WLWB.
e	the interpreted engineering properties of unfrozen materials below the depth of excavation within the areas delineated in the cross sections in Condition 2 i);	No change. Refer to Section 5.0 in Phase 7 Dam Raise Design Report (Golder 2018) approved by the WLWB.
f	representative cross sections showing the various stages of Dam raises when geothermal modelling and short-term slope stability analyses are to be conducted;	Refer to Section 8.0 of the Updated Phase 7 Final Raise Design for slope stability modelling assessment for updated final raise geometries, including stages of construction. Note that the final raise is not a raise of the perimeter dams and will not contain water. The final raise is CPK raised to support FPK deposition. Refer to Section 7.0 in Phase 7 Dam Raise Design Report (Golder 2018) approved by the WLWB for analyses to support the final raise design of the PKC Facility Dams.
g	a schedule indicating the time of year when the Construction of each lift will be carried out;	Refer to Section 6.0 in the Updated Phase 7 Final Raise Design.
h	representative cross sections showing the final configuration of the upstream toe of all dams when operation of the facility commences;	No change in final configuration of dams.

Table of Conformity to PKCF Design Report Requirements (Schedule 5, Condition 3 of the Diavik Water Licence)		
Schedule 5 Condition 3		**DDMI Response**
i	an evaluation of the magnitude of differential settlement related to the taliks underneath the proposed dams, as well as foundation movement related to frost heave and thaw settlement over the design life of the structure; and,	No change from Phase 7 Dam Raise Design. Settlement is not expected as dam foundations are frozen and expected to remain frozen. Additional evaluation of long-term foundation performance is being completed as part of PKC Facility closure design efforts.
j	the results of revised geothermal modelling throughout the intermediate and final stages of Construction	No new thermal modelling required for updated final raise design. Refer to Section 7.0 in the Phase 7 Dam Raise Design Report (Golder 2018) approved by the WLWB.

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Table of Conformity to QA/QC Control Manual Requirements (Schedule 5, Condition 6 of the Diavik Water Licence)		
	Schedule 5 Condition 6	**DDMI Response**
a	a complete characterization of the soil and/or rock properties of both insitu and placed materials necessary to meet performance objectives for each structure;	The Phase 7 final raise is constructed with CPK and requirements for this raise are presented in Section 2.3.6, 2.4.9, 2.5.9, and 2.7.1 of the Rev 4 Phase 7 Construction Technical Specifications (Appendix C of the Updated Phase 7 Final Raise Design Report).
b	the procedures to be followed upon identification of any unacceptable materials, that includes reporting, removal, replacement, specifications for insitu remediation and/or replacement materials;	Refer to Tables 1-7, 5-2, 5-2 and Sections 5.1.1 and 5.1.2 in Rev 4 Phase 7 Construction Technical Specifications (Appendix C of the Updated Phase 7 Final Raise Design Report), which include actions and responsibilities associated with work that fails to meet the design. Also refer to Section 2.4 in the Rev 4 Phase 7 Construction Technical Specifications (Appendix C of the Updated Phase 7 Final Raise Design Report), which includes requirements to remove materials that do not meet the specifications.
c	the protocol and schedule for inspections and sampling during the Construction of each structure;	Refer to Tables 5-3 and 5-4 in the Rev 4 Phase 7 Construction Technical Specifications (Appendix C of the Updated Phase 7 Final Raise Design Report). QC and QA oversight is ongoing during Phase 7 construction. Sign offs are required by QC and QA for each stage of the construction. The Sign off check lists are attached to the Rev 4 Phase 7 Construction Technical Specifications.
d	the frequency of visual inspections for the identification of material types, stratigraphy, ice content and distribution, and any other parameters as may be identified in Condition 6 a) above; and,	Same as item C.
e	the schedule of sampling for confirmatory laboratory testing of the materials identified in Conditions 6 a) and 6 b) above.	Same as item C and D.

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Table of Conformity to DGRB Recommendations on the Updated Phase 7 Raise and Spillway		
DGRB Comment or Recommendation	**DDMI (Golder) Response**	**Location in Design Report**
Given the more frequent operation of the spillway, monitoring and repair of any erosion should be part of routine maintenance activities at the PKC facility. Use of the NW decant pumping should still be used to minimize spillway operation occurrence and duration.	Implemented and part of current operational procedures.	N/A
Since Pond 3 will be used more routinely to accept overflow from the PKC, an engineered spillway design should be considered, rather than a low spot in the dike	Assessment of Pond 3 was undertaken and the existing spillway was determined to be sufficient based on the capacity of Pond 3 and the facility risk rating. The facility will be managed with a robust decant system under an established level (~427.4 m) in order to ensure it is capable of storing the PKC IDF.	N/A
The use of bedding material for the rockfill protective layer may provide additional resilience for the spillway chute.	A finer-grained bedding layer below the spillway chute rockfill lining material is not considered necessary. The rockfill has been sized for the flows and a finer grained bedding layer would not be expected to provide additional resilience. The chute will be inspected following significant flow events to confirm performance.	N/A
The proposed upstream raise of the CPK embankment founded partially on FPK requires a high level of engineering given its configuration. This engineering should embrace and include: • The experience to date with similar construction at Diavik, • The investigations of the FPK foundation materials, • The presence of variable frozen and thawed ground, • The monitoring of excess pore pressures during fill placement,	Information was added into the Rev 0 version of the design report. It should be noted that this comment from the DGRB relates to upstream stability which is a construction safety consideration. It is not a concern for downstream stability that could lead to a potential release of FPK.	Refer to Sections 2.6, 2.7, and 9.1.

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Table of Conformity to DGRB Recommendations on the Updated Phase 7 Raise and Spillway		
DGRB Comment or Recommendation	**DDMI (Golder) Response**	**Location in Design Report**
• Freshet / summer melting; and • Any observations of local slumping.		
Limit equilibrium slope stability analyses should be calibrated against these various experience-based observations and sensitivity cases run that consider the range of potential conditions that could be encountered. In accordance with CDA guidelines, target factors of safety should reflect these uncertainties such that a construction undrained factor of safety of 1.5 may be warranted which exceeds D5 requirements.	It is not possible to calibrate stability because there are too many variables that affect stability. DDMI has not reported any instabilities of note since upstream CPK placement started in 2016. A factor of safety of 1.3, as defined in CDA and D5, is considered acceptable for short-term construction safety that is not a risk for release of FPK and considering conservative assumptions used for the assessment.	See Section 8.0 in the design report.
Additional instrumentation and implementation of the observational method should be used to verify assumptions made in the analysis and modify the upstream section if necessary as it is raised.	Installation of thermistors is recommended to provide additional information on thermal conditions in FPK below CPK, and the observational method will continue to be used for upstream CPK placement.	See section 9.1 in the design report.

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Diavik Diamond Mines (2012) Inc.

Processed Kimberlite Management Plan

Version 6

Document #: OPCO-034-1210 R5

24 July 2021

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.

Summary

The Processed Kimberlite (PK) Management Plan (Version 6) 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). This PK Management Plan provides information on PKCF:

- 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 facility.

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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 (also 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). This PK Management Plan (Version 6) fulfils the requirement of Part G, Condition 4 of the Type A Water License W2015L2-0001 issued by the Wek’èezhìi 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.

1.2 Changes from Previously Approved PKC Facility Plan (V5.1, 2020)

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) 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).

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 km^2 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 theA154 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 iscomplete. 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 DDMI 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.

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

Kimberlite Pipe	Access	Mine Status
A154 North	• A154 open pit • A154 Underground (common decline with A418)	• Open pit mining completed Q3 2008 • Underground mining active
A154 South	• A154 open pit • A154 Underground (common decline with A418)	• Open pit mining completed Q3 2010 • Underground mining active
A418	• A418 open pit • A418 Underground (common decline with A154)	• Open pit mining completed Q3 2012 • Underground mining active
A21	• A21 open pit • A21 Underground	• 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 thePKC 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.

Figure 1: DDMI Site (Satellite Image from July 2020)

Figure 2: Components of the PKCF

2. 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).

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 m^3 to 1,200,000 m^3 prior to 2016. The pond is now typically operated at volumes of approximately2,000 m^3 and will increase to approximately 100,000 m^3 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;
- 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 the spillway;
- Manage Pond 3 to store an IDF from the PKC catchment; 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 storageand 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 SouthPKCF 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 boththe 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 as shown in the photo below. 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 notthe 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 includes 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 is 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 465.8 m. DDMI will maintain the entire Phase 7 downstream rockfill elevation above 465.8 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.

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 whereit 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 PKC 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.

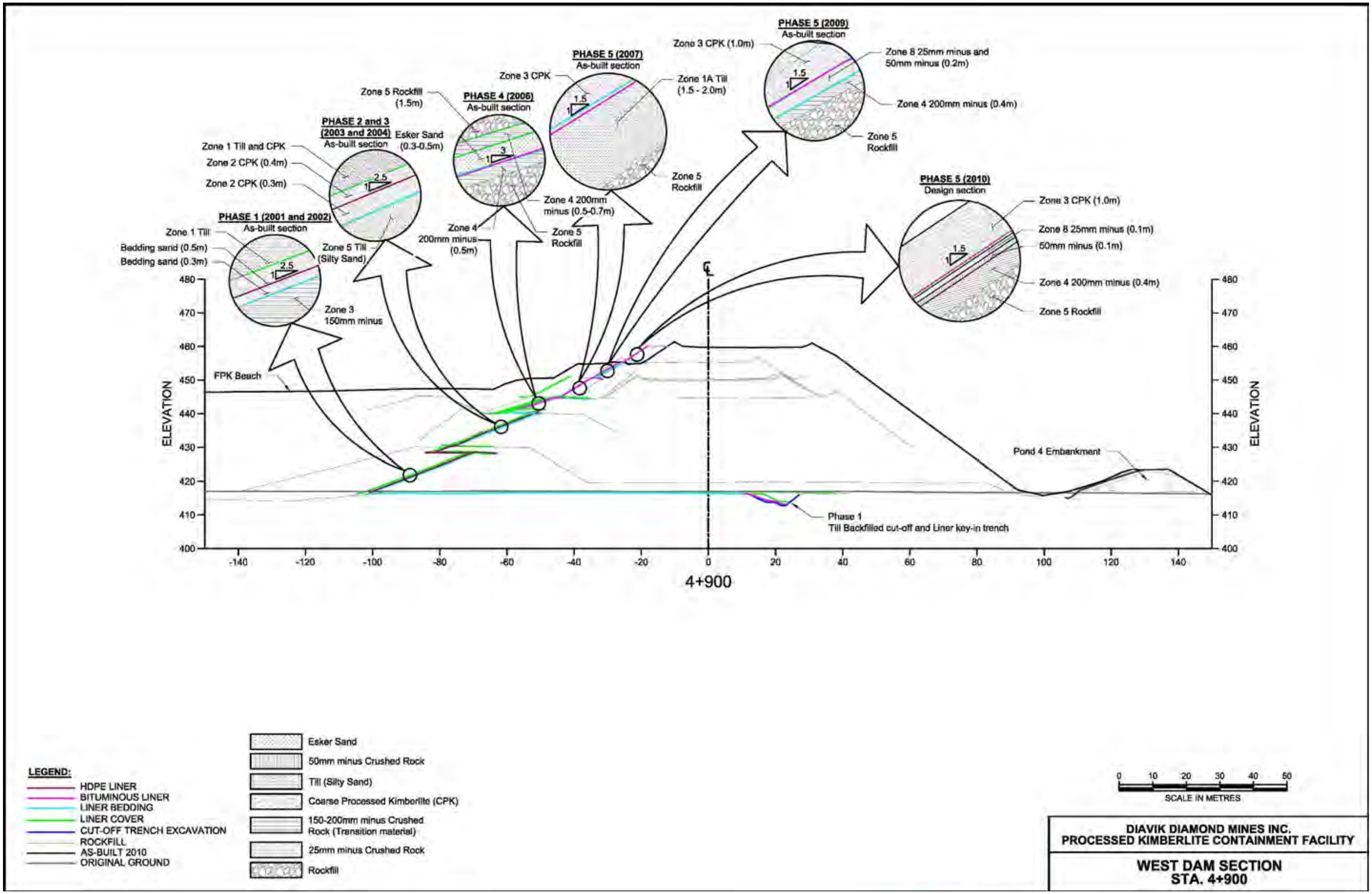
Table 2: PKCF dam construction activities

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 should be 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.

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).

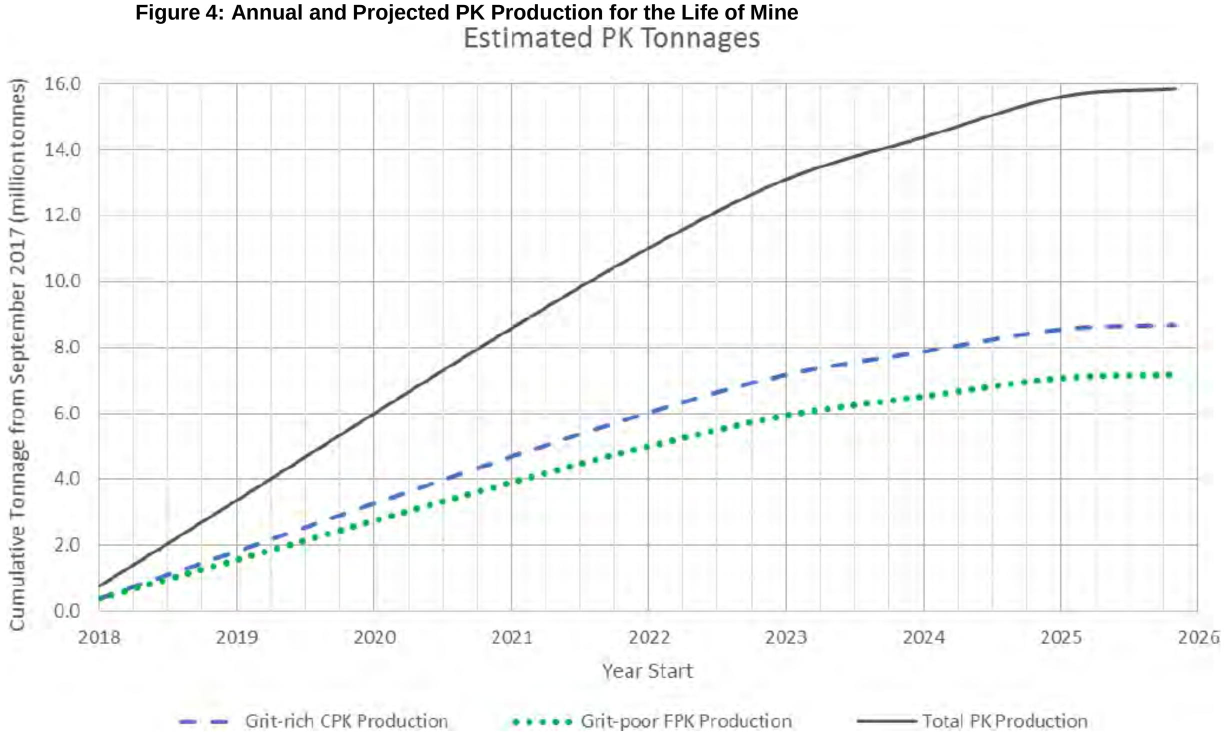
FPK produced during processing is measured in the Process Plant using an in-line meter. CPK produced is measured by scales in the Process Plant. Table 3 provides the annual kimberlite processing tonnages and Figure 4 illustrates the actual and projected annual PK production based on current life-of-mine 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
2007	2,549,168	10,542,282	8,472,208	2,070,073

Year	Annual PK (tonnes)	Cumulative PK (tonnes)	Cumulative FPK (tonnes)	Cumulative CPK (tonnes)
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

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 volumeof 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 positiveimpacts 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 m^3 to 1,200,000 m^3 prior to 2016. The pond is now typically operated at volumes around 2,000 m^3 and will increase to approximately 100,000 m^3 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 1:500-year storm) the spillway permits excess water to discharge from the PKCF to Pond 3.

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 thedams 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.

1. *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.

2. *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.

3. *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.

4. *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.

5. *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.

6. *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 isa 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 the end of October 2022. 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 PKC Facility or the North Inlet. Water cannot be pumped from collection ponds to the PKC pond when water levels in the PKC are at or above the normal operating level of 0.4 m below the lowest point of the dam crest liner. This is currently 464.6 m and will become 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 will evolve 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 6 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 2.2.7regarding 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 aGeotechnical 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 perimeterupstream 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 0.4 m below the dam crest and an elevation of 464.6 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), will replace the existing Phase 6 spillway in 2021. The Phase 7 spillway is to align with the planned 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.

The modified Phase 7 spillway will be a cemented rockfill (CRF) lined trapezoidal spillway with a 32 m base width and 3 horizontal to 1 vertical side slopes and a maximum invert elevation of 468.2 m. An upstream approach channel will be 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. DDMI continues to maintain enough storage to hold an IDFfor 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, and no seepage has exited the West PKCF Dam since early 2015. 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 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 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 bypumping 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 underall 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.

The following additional measures will be implemented by DDMI as part of PKCF Pond Management:

- Beginning 45 days prior to freshet 2021 and biweekly thereafter until freshet 2021 has ended, DDMI will submit to the Board a description of the current status of the water balance, current PKC Facility 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 PKC Facility Plan requirements during freshet 2021.
- DDMI will notify the Board and the Inspector as soon as possible if any of the triggers in its Trigger Action Response Plan for PKC 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 2021 freshet.

In the case of temporary or early shutdown prior to or during freshet 2021, DDMI will apply the same resources and diligence to monitor and maintain the PKC Facility and implement the TARP as it would during operations.

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 after 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 storean 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

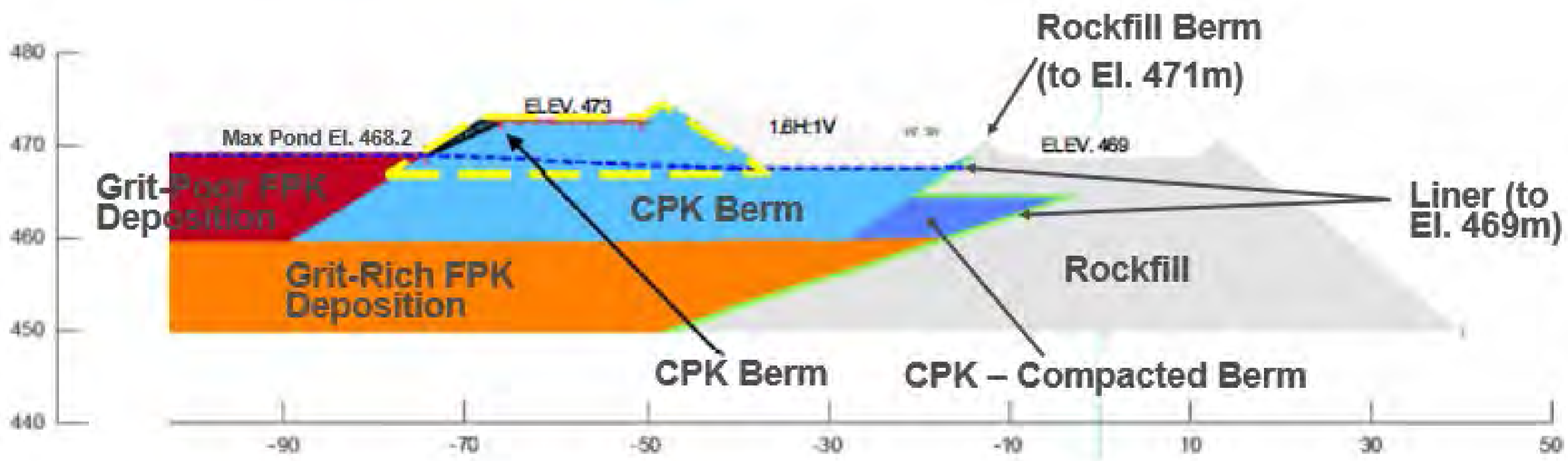
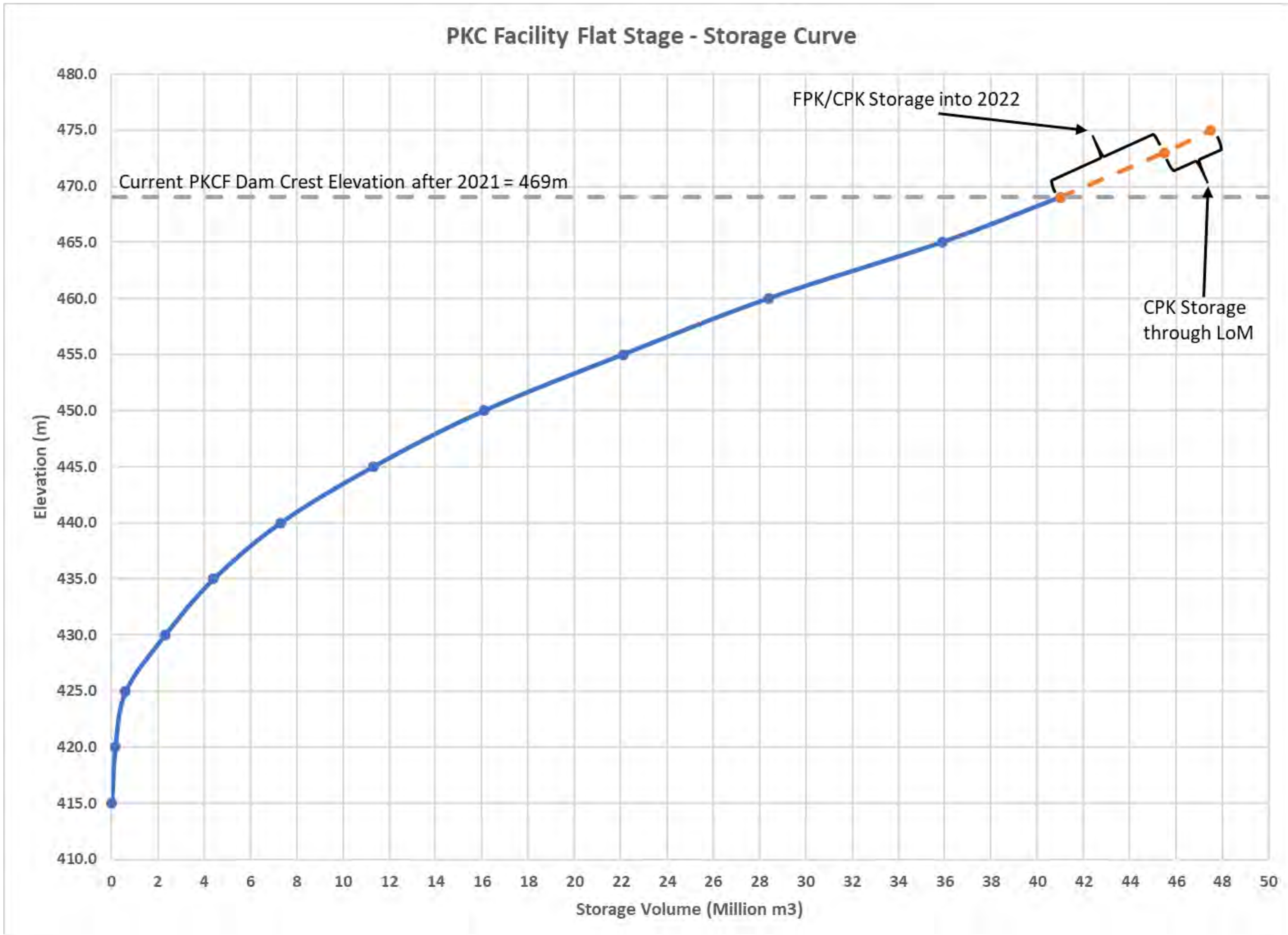


Figure 7 Stage volume curve of PKC facility projected up to hypothetical 475m elevation



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-goingand 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	9.0×10^{-4}
Strength Parameters	
Cohesion	0
Friction angle (degrees)	32
Permeability Coefficient at Dry Density of 1.74 t/m^3 (cm/s)	5.5×10^{-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 our deposition model and are factored in when planning dam raises.

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 thefacility 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	North Dam	63+293	under liner	3H:1V	Jun 2008	operational
PKCN-T3320A-KT PKCN-T3320B-KT PKCN-T3320C-KT PKCN-T3320D-KT	North Dam	63+464	key trench (fill)	horizontal	Oct 2009	operational
PKCN-T3450-DS	North Dam	63+588	under liner	3H:1V	Jun 2008	operational
PKCN-T3716-KT	North Dam	63+842	under key liner	horizontal	Nov 2009	operational
PKCN-T4030-US	North Dam	64+181	FPK beach	vertical	Sep 2011	operational
PCKN-T4038E-KT PCKN-T4038W-KT	North Dam	64+186	over key liner	horizontal	Sep 2010	operational
PKCN-T4060-DS	North Dam	64+211	under liner	3H:1V	Jun 2008	operational
PKCN-T4350-US	North Dam	64+477	upstream through FPK beach, key trench fill and into bedrock	vertical	Sep 2013	operational
PKCN-T4589-DS	North Dam	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	West Dam	65+006	downstream rockfill, key trench	vertical	2017	operational
PKCW-T5006A-KT PKCW-T5006B-KT	West Dam	65+036	downstream rockfill, liner cut-off fill and foundation	vertical	Oct 2006	operational
PKCW-T5080-KT	West Dam	65+109	downstream rockfill, liner cut-off fill and foundation	vertical	Oct 2006	operational
PKCW-T5140A-KT PKCW-T5140B-KT	West Dam	65+171	downstream rockfill, liner cut-off fill and foundation	vertical	Oct 2006	operational
PKCW-T5041A-KT PKCW-T5041B-KT	West Dam	65+194	downstream rockfill, key trench	vertical	2017	operational
PKCW-T5094-US	West Dam	65+244	upstream through FPK beach and upstream rockfill pipe berm	vertical	Oct 2013	operational
PKCW-T5200-US	West Dam	65+341	upstream through FPK beach and upstream rockfill	vertical	Mar 2013	operational
PKCW-T5375-DS	West Dam	65+517	downstream in liner bedding	1.5H:1V	Dec 2007	operational
PKCW-T5385-DS	West Dam	65+525	downstream in liner bedding	1.5H:1V	Dec 2007	operational
PKCW-T5395-DS	West Dam	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	FPK beach	62+415	North Barge Road	vertical	Mar 2013	operational
PKBNE-T1818	FPK beach	64+233	beach, northeast Main Cell	horizontal	Oct 2005	operational

* Not for appro