



**Mackenzie Valley Land and Water Board**  
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**Staff Report**

<b>Applicant:</b> Department of Indian Affairs and Northern Development – Contaminants and Remediation Division (DIAND-CARD)	
<b>Location:</b> Gordon Lake, NT	<b>Application:</b> MV2016L8-0006
<b>Date Prepared:</b> June 11, 2018	<b>Meeting Date:</b> June 20, 2018
<b>Subject:</b> Tailings and Soil Containment Area – Design Modification	

**1. Purpose/Report Summary**

The purpose of this Report is to present to the Mackenzie Valley Land and Water Board (MVLWB/the Board) a Design Modification to the Tailings and Soil Containment Area (TSCA), submitted by Department of Indian Affairs and Northern Development – Contaminants and Remediation Division (DIAND-CARD) to fulfill Part E, condition 2 of Water Licence (Licence) MV2016L8-0006.

**2. Background**

- March 29, 2018 – TSCA – Final Detailed Construction Plan accepted by the Board;
- May 17, 2018 – Design Modification to the TSCA received;
- May 17, 2018 – Review commenced;
- May 30, 2018 – Reviewer comments and recommendations due and received;
- June 5, 2018 – Responses due and received;
- **June 20, 2018 – Design Modification to the Tailings and Soil Containment Area presented to the Board for decision.**

**3. Discussion**

History

On February 8, 2018, DIAND-CARD submitted a Final Detailed Construction Plan for the Tailings and Soil Containment Area (TSCA) as required to satisfy Part D, condition 6 of Licence MV2016L8-0006. The Board accepted this submission on February 13, 2018, stipulating that the borrow materials could not be used until the required geochemical results were provided to the Board, with confirmation of conformity to be determined by Board staff (attached). On March 2, 2018, DIAND-CARD submitted a technical memo containing the geochemical results and conformity was confirmed by Board staff on March 29, 2018 (attached).

## Submission

On May 17, 2018, DIAND-CARD submitted a Design Modification to the Tailings and Soil Containment Area (attached) to fulfill Part E, condition 2 of Licence MV2016L8-0006. This included information gathered during a March 20-21, 2018 field investigation which investigated the conditions of the foundations of the existing dykes of the TSCA and included a topographical survey of the facility. The outcome of the investigation resulted in a few changes to the overall engineered facility design.

## **4. Comments**

Part E of Licence MV2016L8-0006 states the following:

*1. The Licensee may, without written approval from the Board, carry out Modifications to the Water Supply and Waste Disposal Facilities provided the following requirements are met:*

- a) The Licensee has notified the Board and an Inspector in writing of such proposed Modifications at least 60 days prior to beginning the Modifications;*
- b) The Modifications do not place the Licensee in contravention of either the Licence or the Act;*
- c) The Board has not, during the 60 days following notification of the proposed Modifications, informed the Licensee that review of the proposal will require more than 60 days;*
- d) An Inspector has authorized the proposed Modifications and provided a letter of notification to the Board; and,*
- e) The Board has not rejected the proposed Modifications.*

*2. Modifications for which all of the conditions referred to in Part E, item 1 have not been met, may be carried out only with written approval from the Board.*

DIAND-CARD has submitted their Design Modification to fulfill Part E, condition 2 because it does not require a submission 60-days prior to beginning the Modification. This allows DIAND-CARD to commence work upon the date of approval by the Board.

## **5. Reviewer Comments**

By May 30, 2018, comments and recommendations on the Design Modification were received from 2 reviewers:

- Environment and Climate Change Canada (ECCC); and
- Government of the Northwest Territories – Environment and Natural Resources (GNWT-ENR).

DIAND-CARD responded on June 5, 2018. The Review Summary and Attachments (attached) presents the concerns identified through this review.

The GNWT commented that a meeting was held between ENR and DIAND-CARD staff on May 24, 2018, during which various topics were discussed. They outlined that the information provided by CARD was very helpful, and ENR summarized the topics discussed in their comments. ENR did not provide any recommendations.

ECCC provided 2 comments related to the hydrological data used by DIAND-CARD and requested additional details to provide further clarity on how seepage and runoff will be managed. Board staff are of the opinion that DIAND-CARD's responses adequately addressed the concerns identified by ECCC.

## 6. Security

Not applicable. Remediation projects carried out by the Federal Government do not require financial security deposits.

## 7. Conclusion

Board staff concludes that further information was provided by DIAND-CARD in their responses to reviewer comments.

Board staff suggest this submission is in conformity with the requirements of Licence MV2016L8-0006, and there are no outstanding issues or concerns with this submission.

## 8. Recommendation

Board staff recommend the Board **make a motion to approve the Tailings and Soil Containment Area Design Modification**, as submitted to fulfill Part E, condition 2 of Licence MV2016L8-0006.

A draft decision letter is attached.

## 9. Attachments

- [Design Modification submission](#)
- [February 13, 2018 – Board letter](#)
- [March 29, 2018 – Board staff letter](#)
- Review Summary and Attachments
- Draft Decision Letter from the Board

Respectfully submitted,



Kierney Leach  
Technical Regulatory Specialist

**Review Comment Table**

<b>Board:</b>	MVLWB
<b>Review Item:</b>	INAC-CARD - Gordon Lake Remediation Project - Modification to the Tailings and Soil Containment Area Design (MV2016L8-0006)
<b>File(s):</b>	<a href="#">MV2016L8-0006</a>
<b>Proponent:</b>	INAC - Contaminants and Remediation Directorate
<b>Document(s):</b>	<a href="#">Modification to the Tailings and Soil Containment Area Design</a> (9MB)
<b>Item For Review Distributed On:</b>	May 17 at 17:19 <a href="#">Distribution List</a>
<b>Reviewer Comments Due By:</b>	May 30, 2018
<b>Proponent Responses Due By:</b>	June 5, 2018
<b>Item Description:</b>	<p>On February 8, 2018, Indigenous and Northern Affairs Canada – Contaminants and Remediation Division (INAC-CARD) submitted a Tailings and Soil Containment Area - Final Detailed Construction Plan for the Gordon Lake Group Remediation Project. This was required by Part D, condition 6 of Licence MV2016L8-0006. The Tailings and Soil Containment Area – Final Detailed Construction Plan was accepted by the Board on March 29, 2018.</p> <p><b>On May 17, 2018 INAC-CARD submitted a Tailings and Soil Containment Area Design Modification to the Board under Part E, condition 2 of Licence MV2016L8-0006; therefore this Modification is for Board approval.</b></p> <p>Reviewers are invited to submit questions, comments and recommendations on this submission using the Online Review System (ORS) by the review comment deadline specified below.</p> <p>All documents that have been uploaded to this review are also available on our public registry. If you have any questions or comments about the ORS, please contact Board staff identified below.</p>
<b>General Reviewer Information:</b>	<p>In addition to the email distribution list, the following organizations received review materials by fax:</p> <p>NWT Metis Nation - Tim Heron, NWTMN IMA Coordinator (867) 872-3586; <a href="mailto:rcc.nwtmn@northwestel.net">rcc.nwtmn@northwestel.net</a></p>
<b>Contact Information:</b>	<p>Jacqueline Ho 867-766-7465  Jen Potten 867-766-7468  Kierney Leach 867-766-7470</p>

## Comment Summary

Environment and Climate Change Canada: Gabriel Bernard-Lacaille				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Analysis
3	General File	<b>Comment</b> <a href="#">(doc)</a> ECCC Comments Cover Letter <b>Recommendation</b>		Noted.
1	ECCC 1 - Updated Report : Gordon Lake Group Design Basis; Section 1.2.1 Climate and Hydrology	<b>Comment</b> In section 1.2.1, Indigenous and Northern Affairs Canada Contaminants and Remediation Division (the Proponent) states that it is using an intensity-duration-frequency (IDF) curve in order to determine 1:100 and 1:1000 rain events at the site. However, these curves are based on Environment and Climate Change Canada (ECCC) analyses that were done on weather data ranging from 1963 to 1996. However, data from the last 22 years (1996 to 2018) has not been included. <b>Recommendation</b> ECCC recommends that the Proponent provide rationale for only using the 1963 to 1996 weather data set and that the Proponent update the intensity-duration-frequency curves to ensure that they incorporate recent weather data to determine the 1:100 and 1:000 rain events.	<b>June 5:</b> At the time the Gordon Lake project started Stantec used the best data that was available. Since then the Environment Canada (EC) has updated its database and more data is now available. However, the IDF curve provided by Environment Canada is still outdated and corresponds to dates until 1996. Stantec has downloaded the precipitation database until 2016 and can update the IDF curve for the last 30 years, as well as 1:100, 1 in 1000 year return events, using statistical analyses. For the project only 24 hr event is considered, shorter duration events do not require updating. The changes are expected to be fairly minor and are not expected to impact the design.	Acceptable response.
2	ECCC 2 - Updated Report : Gordon Lake Group Design Basis; Section 1.1 - Background & Appendix B - Hydrological	<b>Comment</b> In Appendix B, the Proponent states that the Tailings and Soil Containment Areas (TSCA) will have diversion ditches around the perimeter in order the manage site runoff and seepage. However, in section 1.1 Background, the Prpponent implies that perimeter ditches may not be	<b>June 5:</b> INAC acknowledges the concern in terms of site runoff and seepage from the TSCA and is determining the best plan of action. The runoff from the top of the TSCA will have no contact with the waste, therefore it will be considered as non-impacted runoff, suitable to the discharged to fresh waters. We expect there will be no seepage from the	Acceptable response.

<p>Analysis - Section 1.0 Introduction</p>	<p>required based on visual observations. Therefore it is not clear how the Proponent is planning to manage seepage and runoff from the TSCA. Subsection 36(3) of the federal Fisheries Act, administered by ECCC prohibits the discharge of deleterious substances to waters frequented by fish, or to a place where those substances might enter such waters. Therefore, the Proponent must ensure that, at all times during the Project, deleterious substances are prevented from entering into fish-bearing waters.</p> <p><b>Recommendation</b> ECCC recommends that the Proponent clarify how they will manage site runoff and seepage from the TSCA.</p>	<p>TSCA as a result of a lack of observed groundwater beneath the TSCA. Recent test pitting conducted within the perimeter of the TSCA confirms this. Although seepage is not expected, there is always a small chance that some minor seepage may occur as a result of imperfections during liner installation and or residual pore pressures within the placed waste which are expected to subside over time. This minor seepage will be released from the TSCA through the toe drains to reduce the risk from water pressure causing liner problems and is expected to dissipate over time. Please refer to INAC’s response to a similar comment made by a reviewer on the Tailings and Cover Design Plan that indicated that the expected rates of seepage on the east side will be negligible such that any seepage collection through the ditches would be impractical or not possible. During construction the final toe drain and perimeter ditching locations will be determined and a field decision will be made on how best to manage potential seepage from the TSCA. The possible options could be mixing the toe drain material with limestone to precipitate metals or directing seepage into collection ditches or sedimentation/polishing ponds. The mitigation measures if deemed necessary will be located between the toe of the TSCA and the lake shoreline to eliminate any contaminated seepage from entering Gordon Lake. In addition a monitoring program will be in place to monitor potential seepage. The monitoring will include visual observations and water quality, as well as groundwater monitoring wells. The monitoring of TSCA discharge, groundwater, and surface water is included as part of the Surveillance</p>	
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			Network Program (SNP) Stations required under the Water License.	
<b>GNWT - ENR: Central Email GNWT</b>				
<b>ID</b>	<b>Topic</b>	<b>Reviewer Comment/Recommendation</b>	<b>Proponent Response</b>	<b>Board Staff Analysis</b>
4	General File	<b>Comment</b> ( <a href="#">doc</a> ) ENR Letter with Comments and Recommendations <b>Recommendation</b>	Thank you for your review.	Noted.
1	Topic 1: Meeting	<b>Comment</b> A meeting was held between ENR and INAC CARD staff on May 24th, 2018, during which various topics were discussed. The additional information provided by CARD was very helpful and a summary of these topics are outlined below. <b>Recommendation</b> N/A	n/a	Noted.
2	Topic 2: Drainage	<b>Comment</b> It is noted in the design that based on field observations and perimeter ditches may not be required; however, it was still indicated that minor ditching may be required to direct surface water runoff away from the TSCA and to prevent water from pooling at the toe drain. Specific rationale regarding how these decisions will be made was not clear. Additionally, Section 2.3 notes that the design involved "provision of surface runoff ditches in selected areas to ensure positive drainage away from the TSCA and prevent any pooling against the embankments" and Section 2.5.4 mentions that the water management system will include diversion ditches. During the May 24 meeting, INAC CARD staff clarified that originally a perimeter ditch was to be constructed around the	n/a	Noted.

		<p>entirety of the TSCA; however, this component has now been removed from the design plan. During construction, ditching will be field-fit on-site in areas where drainage is not favourable in preventing water from interacting with the TSCA. INAC CARD also noted that ditching would likely be limited to the west side of the TSCA but may also be required on the east side between the TSCA and Gordon Lake. Minimizing ditching on the east side helps to avoid encroachment between the buffer zone around Gordon Lake that may have occurred should ditching have been required across the entire east side of the TSCA.</p> <p><b>Recommendation N/A</b></p>		
3	Topic 3: Dyke Stability	<p><b>Comment</b> Section 1.1 notes that dike stability may be compromised in some areas due to the presence of organics beneath the foundation of dykes. This is assumed to be one of the reasons for the design changes behind the modification request. However, a linkage between the modified design and the potential for dike instability isn't clear. Additionally, Section 1.1 notes that "there was an opportunity to reduce Zone F in some areas to avoid design limits from encroaching the buffer zones. In some areas it is anticipated that Zone F can be eliminated altogether to simplify the construction." Again, it isn't clear if this has been incorporated into the project design. During the meeting, INAC CARD provided additional</p>		Noted.



		<p>information in this regard. In responses to concerns about dike stability, additional test pitting was conducted around the dike to determine the extent of organic material. The results of this investigation indicated that organic material wasn't present to the extent believed and as a result the dike was much more stable than originally anticipated. Further to this, Zone F had originally been proposed to support areas where dike stability may have been of concern. Given the results of the additional investigations, it was determined that Zone F was no longer required.</p> <p><b>Recommendation N/A</b></p>		
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Environmental Protection Operations Directorate  
Prairie & Northern Region  
5019 52<sup>nd</sup> Street, 4<sup>th</sup> Floor  
P.O. Box 2310  
Yellowknife, NT X1A 2P7

ECCC File: 5100 000 072/002  
MVLWB File: MV2016L8-0006

May 29, 2018

Via online submission

Jen Potten  
Regulatory Coordinator  
Mackenzie Valley Land and Water Board  
7th Floor, 4922 48th Street  
P.O. Box 2130  
Yellowknife, NT X1A 2P6

Dear Ms. Potten

**RE: MV2016L8-0006 – Indigenous and Northern Affairs Canada’s Contaminants and Remediation Division – Gordon Lake Remediation Project - Modification to the Tailings and Soil Containment Area Design**

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Mackenzie Valley Land and Water Board (MVLWB) regarding the above-mentioned Modification to the Tailings and Soil Containment Area Design and is submitting comments via online submission as requested by the MVLWB. ECCC’s specialist advice is provided based on our mandate, in the context of the Canadian Environmental Protection Act, the pollution prevention provisions of the Fisheries Act.

Should you require further information, please do not hesitate to contact me at (867) 669-4746 or [Gabriel.Bernard-Lacaille@canada.ca](mailto:Gabriel.Bernard-Lacaille@canada.ca)

Sincerely,

*[original signed by]*

Gabriel Bernard-Lacaille  
A/ Senior Environmental Assessment Coordinator

Attachment(s): ECCC Comments Excel Sheet

cc: Georgina Williston, Head, Environmental Assessment North (NT and NU)



May 30, 2018

Jen Potten  
Regulatory Officer  
Mackenzie Valley Land and Water Board  
7<sup>th</sup> Floor – 4910 50<sup>th</sup> Avenue  
P.O. Box 2130  
Yellowknife, NT  
X1A 2P6

Dear Ms. Potten,

**Re: INAC CARD  
Water Licence – MV2016L8-0006  
Modification to the Tailings and Soil Containment Area (TSCA) Design  
Request for Comments**

The Department of Environment and Natural Resources (ENR), Government of the Northwest Territories has reviewed the modification at reference based on its mandated responsibilities under the *Environmental Protection Act*, the *Forest Management Act*, the *Forest Protection Act*, the *Species at Risk (NWT) Act*, the *Waters Act* and the *Wildlife Act* and provides the following comments and recommendations for the consideration of the Board.

**Topic 1: Meeting**

**Comment(s):**

A meeting was held between ENR and INAC CARD staff on May 24<sup>th</sup>, 2018, during which various topics were discussed. The additional information provided by CARD was very helpful and a summary of these topics are outlined below.

**Recommendation(s):**

N/A

## **Topic 2: Drainage**

### **Comment(s):**

It is noted in the design that based on field observations and perimeter ditches may not be required; however, it was still indicated that minor ditching may be required to direct surface water runoff away from the TSCA and to prevent water from pooling at the toe drain. Specific rationale regarding how these decisions will be made was not clear.

Additionally, Section 2.3 notes that the design involved “provision of surface runoff ditches in selected areas to ensure positive drainage away from the TSCA and prevent any pooling against the embankments” and Section 2.5.4 mentions that the water management system will include diversion ditches.

During the May 24 meeting, INAC CARD staff clarified that originally a perimeter ditch was to be constructed around the entirety of the TSCA; however, this component has now been removed from the design plan. During construction, ditching will be field-fit on-site in areas where drainage is not favourable in preventing water from interacting with the TSCA. INAC CARD also noted that ditching would likely be limited to the west side of the TSCA but may also be required on the east side between the TSCA and Gordon Lake. Minimizing ditching on the east side helps to avoid encroachment between the buffer zone around Gordon Lake that may have occurred should ditching have been required across the entire east side of the TSCA.

### **Recommendation(s):**

N/A

## **Topic 3: Dyke Stability**

### **Comment(s):**

Section 1.1 notes that dike stability may be compromised in some areas due to the presence of organics beneath the foundation of dykes. This is assumed to be one of the reasons for the design changes behind the modification request. However, a linkage between the modified design and the potential for dike instability isn't clear.

Additionally, Section 1.1 notes that “there was an opportunity to reduce Zone F in some areas to avoid design limits from encroaching the buffer zones. In some areas it is anticipated that Zone F can be eliminated altogether to simplify the construction.” Again, it isn't clear if this has been incorporated into the project design.

During the meeting, INAC CARD provided additional information in this regard. In responses to concerns about dike stability, additional test pitting was conducted around the dike to determine the extent of organic material. The results of this investigation indicated that organic material wasn't present to the extent believed and as a result the dike was much more stable than originally anticipated.

Further to this, Zone F had originally been proposed to support areas where dike stability may have been of concern. Given the results of the additional investigations, it was determined that Zone F was no longer required.

**Recommendation(s):**

N/A

Comments were provided by ENR technical experts in the Water Resources Division and the North Slave Region and were coordinated and collated by the Environmental Assessment and Monitoring Section (EAM), Conservation, Assessment and Monitoring Division (CAM).

Should you have any questions or concerns, please do not hesitate to contact Patrick Clancy, Environmental Regulatory Analyst at (867) 767-9233 Ext: 53096 or email [patrick.clancy@gov.nt.ca](mailto:patrick.clancy@gov.nt.ca).

Sincerely,



Patrick Clancy  
Environmental Regulatory Analyst  
Environmental Assessment and Monitoring Section  
Conservation, Assessment and Monitoring Division  
Department of Environment and Natural Resources  
Government of the Northwest Territories