NWB Tools

Richard Dwyer <richard.dwyer@nwb-oen.ca>

3AM-IQA1626 CIRNAC follow-up questions for the City of Iqaluit generated at today's Technical Meeting

Campbell, Bridget (AADNC/AANDC) <bridget.campbell@canada.ca> Thu, Sep 17, 2020 at 2:38 PM
To: Amy Elgersma <A.Elgersma@city.iqaluit.nu.ca>, "Rustom, Alan" <Alan.Rustom@colliersprojectleaders.com>
Cc: "Okonkwo, Godwin (AADNC/AANDC)" <godwin.okonkwo@canada.ca>, Karén Kharatyan <karen.kharatyan@nwb-oen.ca>, Richard Dwyer <richard.dwyer@nwb-oen.ca>, Derek Donald <derek.donald@nwb-oen.ca>, "Grozic, Ed" <Ed.Grozic@tetratech.com>, "Hoos, Rick" <Rick.Hoos@tetratech.com>

Hello Amy, Alan, and team,

Please find attached Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) follow-up questions, recommendations, and requests for documents, as discussed in today's Technical Meeting for the City of Iqaluit amendment application for water licence 3AM-IQA1626, held by teleconference. You will find a new column to the responses submitted by the City of Iqaluit. For your convenience, specific questions have been bolded in the final column, and a summary of these questions is provided on the page following the table.

As discussed, CIRNAC is satisfied to receive individual answers to each question in table format, or to receive revised documents for review, or a combination of both methods.

If you require further clarification, I invite you to call my phone or reply to this e-mail. Due to Covid-19 office capacity restrictions, I am regularly in the office and can respond to calls between 8:30am – 12pm on week days.

Kind regards,

Bridget Campbell

Coordinator, Water Resources, Nunavut Regional Office

Crown-Indigenous Relations and Northern Affairs Canada

bridget.campbell@canada.ca / Tel: (867) 975-4282

Coordinatrice, Resources hydriques, Bureau régional du Nunavut

Relations Couronne-Autochtones et Affaires du Nord Canada

bridget.campbell@canada.ca / Tel: (867) 975-4282

3AM-1626_CIRNAC_Table_Further Questions _ Technical Meeting_ City of Iqaluit Response to ECCC and CIRNAC Comments.docx
88K

Comment #	Document/Topic Category	Agency	Comment # in Letter	CIRNAC Recommendations	City of Iqaluit Response	CIRNAC Reply and Follow-Up Questions
1	Facility Monitoring Plan (FMP)	ECCC	1	Provide raw and summarized data (including field results, laboratory reports, a tabulated summary, and a comparison of monitored parameters to relevant guidelines) for the baseline conditions assessment of the Waste Transfer Station and landfill conducted by Dillon Consulting in 2019.	To be included in 100 % submission	
2	FMP	ECCC	1	Clarify whether additional baseline monitoring is planned.	Additional baseline monitoring is not planned.	
3	Method Statement of Construction, Jan 2020 (MSC)	ECCC	2	The proponent identify measures to ensure the containment of unbaled C&D debris and any unbaled MSW within the landfill cell.	Details on baled wastes removed from this document, as this is related to operations rather than construction. Text details on baled waste placement added to Operations & Maintenance (O&M) Manual Sections 8.3.1 and 9.1.	
4	MSC		2	Contingency measures, such as potential cover sources, should be available to ensure containment of unbaled waste in the event of any extended or recurring operational issues at the Waste Transfer Station.	This is an operations issue and is thus not addressed in the MSC document. Text reflecting this comment has been added to the O&M Manual Sections 8.3.1 and 9.1.	
5	MSC		2	ECCC recommends that the proponent conduct an evaluation of the durability of the baled wastes' plastic cover, which should include a discussion of alternative cover methods	This is an operations issue and is thus not addressed in the MSC document. Text reflecting this comment has been added to the O&M Manual Sections 8.3.1 and 9.1.	
6	MSC, Operations and Maintenance Manual (Revised Final), Jan 2020 (OMM)	ECCC	3	The proponent sample project borrow source locations in order to identify any ARD/ML potential that could affect water quality. Testing should be completed using static and kinetic methods to characterize representative units.	This is outside the scope of the detailed design process and will be addressed by the City of Iqaluit and/or EXP.	
7	MSC, OMM	ECCC	3	The proponent should avoid quarry/units that are determined to have ARD/ML potential.	This is outside the scope of the detailed design process and will be addressed by the City of Iqaluit and/or EXP.	
8	MSC, Leachate Treatment System Evaluation memo, 30 Aug 2019	ECCC	4	The proponent identify treatment options beyond the existing system, and determine the lead-time needed to install and commission the treatment system.	Three options for leachate collection and/or treatment are provided in the August 30, 2019 memo. Lead times vary by option.	
9	OMM	ECCC	5	the proponent clarify whether the leachate retention ponds would provide at least two years of effluent and precipitation storage capacity under the upper range precipitation projection scenario (i.e., annual increase of 9 percent over baseline climate).	To account for a 9% increase over baseline conditions, storage volume of the lagoons will have to be increased from 11,000m^3 to 14,000m^3.	
10	Environmental Protection Plan (Revised Final) – Construction Phase, Jan 2020 (EPP-C), Environmental Protection Plan – Operations, Closure and Post-Closure Phases, Jan 2020 (EPP-O)	ECCC	6	The proponent revise the Environmental Protection Plans to include groundwater as an environmental consideration for this project.	To be included in 100 % submission	
11	EPP-C, EPP-O	ECCC	7	The mitigation measures tables located in Section 4.0 of both	Section 4.0 of both Environmental Protection Plans (EPP-C, EPP- O)	

Comment #	Document/Topic Category	Agency	Comment # in Letter	CIRNAC Recommendations	City of Iqaluit Response	CIRNAC Reply and Follow-Up Questions
				Environmental Protection Plans (EPPs) each include a measure specifying that erosion and sediment control activities be conducted in accordance with the Erosion and Sediment Control Plan.	have been updated as requested.	
12	EPP-C, EPP-O, Proponent Response to NWB, 2 June 2020	ECCC	8	the proponent submit the monitoring and inspection sections of the Environmental Protection Plans prior to commencement of construction.	Monitoring and Inspection section of the Construction Phase EPP document updated accordingly.	
13	Erosion and Sediment Control Plan, Jan 2020 (ESC)	ECCC	9	Conduct sediment monitoring in relation to any project disturbances in or near water (e.g., in-stream construction)	Section 4.3 of the Erosion and Sediment Control Plan document updated accordingly.	
14	ESC	ECCC	9	Conduct TSS/turbidity monitoring routinely during in-stream works, and identify thresholds and accompanying management actions in advance of such in-stream works.	Section 4.3 of the Erosion and Sediment Control Plan document updated accordingly.	
15	Facility Monitoring Plan, Jan 2020 (FMP)	ECCC	10	The proponent increase the frequency of visual monitoring during and following freshet and major rainfall events, particularly with respect to monitoring for signs of erosion and monitoring the capacity of the leachate holding ponds.	To be included in 100 % submission	
16	FMP	ECCC	11	the proponent add TSS and phenols to the surface water monitoring parameters listed in Section 3.5.1 (Surface Water Monitoring Plan) of the Facility Monitoring Plan.	To be included in 100 % submission	
17	FMP	ECCC	12	Include the monitoring of dissolved metals, in addition to total metals, for groundwater samples	To be included in 100 % submission	
18	FMP	ECCC	12	Incorporate a description of how the groundwater monitoring results will be assessed (for example, compare results to baseline sample concentrations, applicable license requirements and recognized groundwater guidelines) into Section 3.7 (Active Layer Groundwater Monitoring) of the Facility Monitoring Plan.	To be included in 100 % submission	
19	FMP	ECCC	13	the proponent characterize the effluent to determine compatibility with the wastewater treatment process prior to transporting effluent to the City's Waste Water Treatment Plant (WWTP). The proponent may need to implement alternative small-scale treatment if effluent quality would render the options discussed unacceptable.	Section 12.2 of the Operations and Maintenance Manual and Section 3.9 of the Facility Monitoring Plan have been updated accordingly.	
20	OMM	ECCC	14	Provide details for assessing landfill leachate/effluent characteristics	Section 12.2 of the Operations and Maintenance Manual has been updated accordingly.	
21	OMM	ECCC	14	Include a summary in the annual report of the landfill leachate management system, including leachate generation rates, leachate/effluent characteristics, holding pond capacity, and an update on leachate management/treatment.	Section 12.2 of the Operations and Maintenance Manual has been updated accordingly.	
22	OMM	ECCC	15	Provide secondary containment for the leachate holding tank	Section 12.1 of the Operations and Maintenance Manual has been	

Comment #	Document/Topic Category	Agency	Comment # in Letter	CIRNAC Recommendations	City of Iqaluit Response	CIRNAC Reply and Follow-Up Questions
					updated accordingly.	
23	*OMM*	*ECCC*	*15*	*Characterize the WTS leachate to determine compatibility with the wastewater treatment process prior to transporting leachate to the City's WWTP*	*Section 12.1 of the Operations and Maintenance Manual has been updated accordingly.*	
24	*OMM*	*ECCC*	*15*	*Track the WTS leachate generation rates/volumes and treatment/disposal details*	*Section 12.1 of the Operations and Maintenance Manual has been updated accordingly.*	
25	*OMM*	*ECCC*	*15*	*Report the WTS leachate generation rates/volumes, treatment/disposal details, and characterization results in the annual report*	*Section 14.0, item 10 of the Operations and Maintenance Manual has been updated accordingly.*	
26	*OMM*	*ECCC*	*16*	*An update (in the Annual Report) on the capacity of the landfill cell currently in use, including the installation timing calculation (inputs and result)*	*Refer to Section 14.0, item 7 of the Operations and Maintenance Manual*	
27	*OMM*	*ECCC*	*16*	*Discuss (in the Annual Report) the required actions/schedule for the design and installation of the next lined disposal area in the sequence (i.e., development of design documents, tendering and delivery of construction materials, installation)*	*Refer to Section 14.0, item 7 of the Operations and Maintenance Manual*	
28	*Executive Summary document (April 2020) (ESD), MSC*	*ECCC*	*17*	*Identify and describe measures to prevent/mitigate the challenges described above(i.e., substantial volumes of poor quality leachate, down time during mechanical breakdowns andfor maintenance), and discuss their anticipated effectiveness*	*See Addendum B – Extended Responses*	
29	*ESD, MSC*	*ECCC*	*17*	*Describe how the effectiveness of these prevention/mitigation measures will be monitored*	*See Addendum B – Extended Responses*	
30	*ESD, MSC*	*ECCC*	*17*	*Document lessons-learned to inform subsequent stages of construction and operation*	*See Addendum B – Extended Responses*	
31	Reclamation of the West 40 Landfill	CIRNAC	1	CIRNAC recommends the City provide an update on plans for reclaiming the West 40 landfill including: ▪ An estimated schedule for reclamation work; and ▪ details on site drainage, including where all the ditches would be on the decommissioned site, their drainage directions and how they connect with the offsite retention pond	This is outside the scope of the detailed design process and will be addressed by the City of Iqaluit and/or AECOM. *AECOM Response: The date of closure of the West 40 Landfill is dependent on the schedule for the new landfill. The West 40 Landfill will not be closed until the new landfill and transfer* *Station are commissioned and fully operational. The landfill is currently filling to a proposed final design elevation that has been developed to provide the City with disposal capacity until the new facilities are operational. As of the 2019 projections it appears that the landfill has capacity until sometime in 2022/23. The landfill has just completed a 2020 survey and is in the process of evaluating the remaining airspace and therefore determining site life. As is the normal practice, a final closure design and closure report will not be developed until the landfill is in fact closed. A final design cannot be developed until the final fill elevations and contours are realized. The final closure report and design will address final landform shape, final slopes, final cover design, surface water drainage and controls, and long term monitoring* *and maintenance requirements.*	OK – Resolved. CIRNAC recommends that an amended licence include a condition for the applicant to provide the final closure design report one year prior to reclamation work being undertaken. Additionally, we suggest the plan be provided within one year of closure of the West 40 landfill.

Comment #	Document/Topic Category	Agency	Comment # in Letter	CIRNAC Recommendations	City of Iqaluit Response	CIRNAC Reply and Follow-Up Questions
32	OMM	CIRNAC	2	CIRNAC recommends the applicant provide rationale for not controlling leachate and contact water from the bale storage area at the waste transfer station.	Drawings will be revised to include asphalt pad, asphalt curbing to control runon and runoff, and the sump.	CIRNAC to confirm this is included in 100% drawings – request timeline for submission.
33	OMM	CIRNAC	2	Additionally, they should explain how they will ensure proper drainage at the waste transfer treatment site with such small grades.	See comment 45.	
34	Landfill Leachate Treatment	CIRNAC	3	CIRNAC recommends the applicant clarify what the current position is for treating landfill leachate, their plan for collecting the necessary data for an informed decision, and the factors that will control their decision.	As outlined in the Operations and Maintenance Manual, the approach to leachate management will be to hold it for up to two years in new engineered lagoons. Routine samples will be taken by the City and the data reviewed by Dillon. If untreated leachate at the outlet of the second holding pond is found to exceed discharge limits set by the NWB, then additional treatment will be designed and installed. The nature of additional treatment technology will depend on the parameters in exceedance, but are expected to be met with the addition of aeration to the lagoons, metal precipitation and filtration.	Three options are discussed for discharging the ponds: · Transporting effluent to the West 40 landfill; · Transporting effluent to the City's wastewater treatment plant; and · Controlled release of effluent to a gravel bed diffuser or treatment in a wetland. Based on the response and discussions in the Technical Meeting, it is still not clear: **Which leachate treatment option was chosen? Will leachate be discharged to the environment?** CIRNAC recommends the applicant monitor and report on the leachate, before the ponds become full. This could be included in a management plan or as a licence condition. Monitoring of both quantity and quality should be done throughout the open water season, with results reported and analyzed every year for at least the first 5 years. If results indicate the need for water treatment, choice of methodologies and their implementation should occur within one year.
35	Landfill leachate collection, Design Drawings (90%)	CIRNAC	4.1	provide more detail on leachate collection pipes including: ▪ Showing leachate piping intended for Cell 1 in detail and providing conceptual layout for piping for the remaining cells; ▪ Providing details in the drawings for piping diameter, perforation and clean out/inspection access (if any); ▪ Providing details on whether leachate piping would be placed on cell floor orwithin leachate collection trenches; and ▪ Providing evidence to demonstrate how the leachate pipe will not be deformed under waste loading	The leachate collection piping in the cells has been removed due to the assumption that the waste mass and underlying granulars will freeze along with any piping in the granulars. An 8 m wide strip, reduced to 4 m for the 100% submission will allow leachate to run off of or percolate through the baled material and exist into the 4 m strip. The leachate can then flow to the leachate collection sump for pumping out to the leachate lagoons.	The explanation is hard to interpret without a drawing showing new concept of leachate collection. The responses seem to indicate leachate will still flow to sumps from cells far away from those sumps, and it is unclear: **How will this work once landfill is closed?** CIRNAC to confirm this is included in 100% drawings – request timeline for submission.
36	Landfill leachate collection, Design Drawings (90%)	CIRNAC	4.2	provide information on the leachate sumps including: ▪ More detail on design intent for leachate sump in each cell once the cells are at capacity; and ▪ An explanation on the choice of manholes to lower pumps into the sump.	The sump in Cell 1 will be removed and the berm between Cell 1 and 4 removed so leachate from Cells 1 to 6 will flow to the Cell 4 sump. When a cell that has a sump is closed the manhole in the sump will be extended through the cap allowing for leachate to be removed via	The key concern is a low point in which leachate can accumulate remaining after sump or manhole removal. The concept of Cell 1 connection into Cell 4 is clear from the answer provided, but it is

Comment #	Document/Topic Category	Agency	Comment # in Letter	CIRNAC Recommendations	City of Iqaluit Response	CIRNAC Reply and Follow-Up Questions
					pumping from the sumps in subsequent cells.	unclear: H**ow will the sump be "removed"?** CIRNAC to confirm this is included in 100% drawings – request timeline for submission.
37	Landfill leachate collection, Design Drawings (90%)	CIRNAC	4.3	provide more information on the liner system including: ▪ Thermal or settlement slack in the geomembrane placement requirements; and ▪ Details on the proposed geotextile.	Technical Specifications Section 33 47 14 Geomembranes, Clause 3.4 requires the Contractor to prepare and submit a thermal compensation plan. Technical Specifications Section 31 32 21 provides minimum requirement details for proposed geotextiles Type A, Type B, and Type C.	The Technical Specifications referred to in the response are not available for review. The response for thermal slack is satisfactory, but without the specifications, the department cannot comment on the geotextile. The department recommends that the thermal compensation plan be submitted for approval prior to construction.
38	Landfill leachate collection, Design Drawings (90%)	CIRNAC	4.4	CIRNAC recommends the applicant provide clarification in design intent for Cell 10 leachate collection to ensure all leachate from Cells 10, 11 and 12 can be removed.	Grades have been reviewed.	The grades been reviewed. **Have they been revised? If so, how?** CIRNAC to confirm this is included in 100% drawings – request timeline for submission.
39	Surface water management at landfill, Design Drawings (90%)	CIRNAC	5.1	CIRNAC recommends the applicant provide details on surface water ditching on north side of Cell 1 to convey drainage around the bermed area.	A profile section of this ditch has been added to drawing C08.	CIRNAC to confirm this is included in 100% drawings – request timeline for submission.
40	Surface water management at landfill, Design Drawings (90%)	CIRNAC	5.2	CIRNAC recommends the applicant provide information on the stormwater berm in Cell 1. Specifically, if the berm is temporary, information should be provided in the drawings on the design intent for removal of the berm. If the berm is permanent, then information should be provided on how filling of bales should occur at the berm location.	A note has been added to the relevant drawings indicating the berm is temporary and to be removed by the Owner prior to waste being placed in that location.	OK – Resolved.
41	Surface water management at landfill, Design Drawings (90%)	CIRNAC	5.3	CIRNAC recommends the applicant provide rationale for why erosion control features were not deemed necessary in the following areas: ▪ Sediment traps along west side of west access road and along south side of south access road; and ▪ Fibre rolls and silt fence on both sides of Leachate lagoon road.	On the west side of the west road the grade slopes to the west, and the northern most sediment trap on the east side would capture that flow. The area to the south of the south road is higher than the ground to the north. Two sediment traps will be added to the south side of the road.	The applicant provided sufficient rationale regarding the sediment traps. Please clarify: **Rationale for why erosion control features were not deemed necessary in the fibre rolls and silt fence on both sides of Leachate lagoon road.** **Whether flow from west ditch on west access road is designed to flow into northernmost sediment trap.**
42	Fencing, Design Drawings	CIRNAC	6	CIRNAC recommends the applicant provide clarification on where fencing and gates are to be installed and, if no fencing is	Fencing is to be installed at the toe of the leachate lagoons berms. Fencing is to be installed initially around Cell 1, and will be moved and extended as the landfill expands. A gate is located on the	The response provided by the applicant indicates where fencing will be installed, but does not fully

Comment #	Document/Topic Category	Agency	Comment # in Letter	CIRNAC Recommendations	City of Iqaluit Response	CIRNAC Reply and Follow-Up Questions
	(90%)			planned around the landfill site, provide details on how wildlife and general public will be restricted from access.	western side connecting to the berm that separates the two lagoons.	address the question of site security and wildlife deterrents. CIRNAC recommends that site access be addressed in the Operation and Maintenance Plan or Manual, specifically: **What are the procedures for gate closures?** **How will wildlife and general public be restricted from access?** **What will be the response procedures if public/wildlife accesses the site?**
43	Permafrost, MSC, FMP, OMM	CIRNAC	7.1	CIRNAC recommends the applicant describe what construction methodologies will be used to minimize impact on permafrost of construction activities. Additionally, they should provide a basis for the design approach recognizing the geotechnical and permafrost conditions that exist at the landfill site.	This is documented in the Wood Geothermal Modelling and Geotechnical Recommendations report dated May 2019 and is included in the 100% package.	CIRNAC to confirm this is included in 100% drawings – request timeline for submission. The Wood report does not describe the construction methodologies that will be used to minimize impact on permafrost (mitigate permafrost degradation) due to proposed construction activities at the WTS, Landfill and Access Road. The Wood report is entirely silent on the design, construction, and approach for mitigating permafrost degradation along the Access Road. So, the reviewer referred to The Method Statement of Construction Report which also does not address design basis, construction methodology and activities to mitigate permafrost degradation. The entire Method Statement of Construction Report only refers to Permafrost 3 times in 2 sections – Section 4.2.5 referring to CSA Standard S500 - Thermosyphon foundations for buildings in permafrost regions and a thermal analysis, and Section 5.2.15 proposing a monitoring network. **What construction methodologies will be used to minimize impact on permafrost of construction activities?**
44	Permafrost, MSC, FMP, OMM	CIRNAC	7.2	CIRNAC recommends the applicant describe permafrost conditions at the proposed leachate pond location and explain how permafrost conditions have been addressed in the design, construction and operation of the ponds.	This is documented in the Wood Geothermal Modelling and Geotechnical Recommendations report dated May 2019 and is included in the 100% package.	The requested information was not found in the Wood Report, and the 100% submission is still unavailable for review. It is unclear : **How have permafrost conditions at the proposed leachate pond location been addressed in the design, construction and**

Comment #	Document/Topic Category	Agency	Comment # in Letter	CIRNAC Recommendations	City of Iqaluit Response	CIRNAC Reply and Follow-Up Questions
						operation of the ponds?
45	Permafrost, MSC, FMP, OMM	CIRNAC	7.3	CIRNAC recommends the applicant describe the rationale for thermistor locations and how they will monitor ground temperature changes within and below the facilities.	Grading has been revisited and approved by Wood (project geotechnical consultant). No changes to the current grading plan design are proposed.	The requested information was not found in the Wood Report, and the 100% submission is still unavailable for review. It is unclear : **What is the rationale for thermistor locations?** **How will the thermistors monitor ground temperature changes within and below the facilities, including the WTS, Landfill and Access Road?**
46	Permafrost, MSC, FMP, OMM	CIRNAC	7.4	CIRNAC recommends the applicant explain why it was not deemed necessary to consider heat generation from decomposing municipal waste in the thermal modelling of the landfill.	This is documented in the Wood Geothermal Modelling and Geotechnical Recommendations report dated May 2019 and is included in the 100% package.	The requested information was not found in the Wood Report, and the 100% submission is still unavailable for review. It is unclear : **Why was heat generation from decomposing municipal waste not considered in the thermal modeling of the landfill?**
47	Waste transfer station geotechnical report	CIRNAC	8	CIRNAC recommends the applicant identify where this report can be found.	This is outside the scope of the detailed design process and will be addressed by the City of Iqaluit and/or EXP. *EXP Response: EXP completed the geotechnical report for the TS in 2018 I believe and provided Colliers with a copy of the report for the 2019 Landfill Site and TS Design RFP.*	CIRNAC to confirm this is included in this Geotechnical Report – request timeline for submission. **When will this be available for review/reference?**
48	Design Drawings (90%)	CIRNAC	9	CIRNAC recommends the applicant clarify the construction methodology for cuts and ditches at the landfill.	Specific construction methods are determined by the contractor, not the designer. This is outside the scope of the detailed design process.	The Designer is obliged to provide construction direction to the Contractor regarding what will be permitted and what will not be permitted construction practices specific to mitigation permafrost degradation and environmental impacts. **What is the proposed strategy to protect permafrost during cutting and digging?** CIRNAC is seeking a commitment from the applicant to provide this methodology for review at least 60 days prior to work being undertaken.
49	OMM	CIRNAC	10.1	CIRNAC recommends the applicant describe if non-baled waste in the landfill will be compacted, and how solid waste will be handled at the landfill in event of a mechanical breakdown of the baling or shredding equipment.	Text has been added to Section 8.3.1 of the Operations and Maintenance Manual.	CIRNAC to confirm this is included in revised O&M manual – request timeline for submission.

Comment #	Document/Topic Category	Agency	Comment # in Letter	CIRNAC Recommendations	City of Iqaluit Response	CIRNAC Reply and Follow-Up Questions
50	OMM	CIRNAC	10.2	CIRNAC recommends the applicant clarify what household hazardous wastes will be accepted and if the hazardous waste storage area includes secondary containment.	Household Hazardous Wastes will be collected according to the regulatory environment in the City of Iqaluit and the Government of Nunavut, and are therefore subject to change. Hazardous waste storage does include secondary containment (Loraday Building Model No: LEP/L73-4012 Built in Accordance to FM 6049 Standard/Non-Combustible/40ft. Storage Building or equivalent). Section 4.1.5 and Section 4.1.6 of the Operations and Maintenance Manual have been updated accordingly.	Please clarify: **What are the acceptable and non-acceptable household hazardous wastes?** CIRNAC recommends that the Operation and Maintenance Manual include the list of acceptable and non-acceptable wastes upon commissioning of the facility to provide guidance to the operating staff, and that the Manual be updated as required as the regulatory environment changes. CIRNAC to confirm this is included in revised O&M manual – request timeline for submission.
51	OMM	CIRNAC	10.3	CIRNAC recommends the applicant provide additional detail on leachate pumping including: objective criteria for when pumping is required (e.g. maximum allowable leachate head); method to be used to measure the leachate head and the level in the sump; and requirements for monitoring of pond levels and hoses for leaks during pumping operations.	The leachate head in the landfill sumps will be measured by a staff gauge bolted to the interior of the manhole. Hoses would not be used for leachate pumping - flanged and bolted solid wall HDPE piping would be installed at the start of the season and removed and stored at the end of the pumping season. Given the slope and the HDPE lining of the lagoons a HDPE staff gauge will be welded to the lagoon liner. The pump will be controlled by floats in the cell sumps, with the allowable head equal to the depth of the sump of 1.0 m or approximately 300 mm over the floor of the cell.	The applicant provided additional details which generated more questions: **- How will the bolts be protected from corrosion?** **- How will personnel respond if the staff gauge is dislodged by ice?** **- The extraction pipe will be removed for winter. Will the float system also be removed?** **- The response seems to indicate an automated system, while the Operation and Maintenance Manual indicates a manual operation - which is correct?** CIRNAC to confirm details included in revised O&M manual and 100% submission – request timeline for submission.
52	OMM	CIRNAC	10.4	CIRNAC recommends a water license condition be developed to require additional cover if nuisances occur.	Ok.	OK – Resolved.

Summary of Recommendations to NWB:

1 CIRNAC recommends that an amended licence include a condition for the applicant to provide the final closure design report one year prior to reclamation work being undertaken. Additionally, we suggest the plan be provided within one year of closure of the West 40 landfill.

3 CIRNAC recommends the applicant monitor and report on the leachate, before the ponds become full. This could be included in a management plan or as a licence condition.

10.4 CIRNAC recommends a water licence condition be developed to require additional cover if nuisances occur.

Summary of questions and/or commitments sought from City of Iqaluit:

1 Resolved.

2 When will the 100% submission (draft/redline version) be available for review?

3 Which leachate treatment option was chosen? Will leachate be discharged to the environment?

4.1 How will leachate flow through sumps work once landfill is closed?

4.2 How will the sump be “removed”?

4.3 CIRNAC recommends that the thermal compensation plan be submitted for approval prior to construction.

4.4 Have the grades been revised? If so, how?

5.1 When will the 100% submission (draft/redline version) be available for review?

5.2 Resolved

5.3 Clarify Rationale for why erosion control features were not deemed necessary in the fibre rolls and silt fence on both sides of Leachate lagoon road. Clarify Whether flow from west ditch on west access road is designed to flow into northernmost sediment trap.

6 What are the procedures for gate closures? How will wildlife and general public be restricted from access? What will be the response procedures if public/wildlife accesses the site?

7.1 What construction methodologies will be used to minimize impact on permafrost of construction activities?

7.2 How have permafrost conditions at the proposed leachate pond location been addressed in the design, construction and operation of the ponds?

7.3 What is the rationale for thermistor locations? How will the thermistors monitor ground temperature changes within and below the facilities, including the WTS, Landfill and Access Road?

7.4 Why was heat generation from decomposing municipal waste not considered in the thermal modeling of the landfill?

8 When does the City plan to provide the *Geotechnical Report for the TS for the 2019 Landfill Site and TS Design RFP?*

9 What is the proposed strategy to protect permafrost during cutting and digging?

10.1 When will the revised Operation and Maintenance Manual be available for review?

10.2 What are the acceptable and non-acceptable household hazardous wastes?

10.3 How will the bolts be protected from corrosion? How will personnel respond if the staff gauge is dislodged by ice? The extraction pipe will be removed for winter. Will the float system also be removed? The response seems to indicate an automated system, while the Operation and Maintenance Manual indicates a manual operation - which is correct?

10.4 Resolved