



ENVIRONMENT AND CLIMATE CHANGE CANADA'S FINAL WRITTEN SUBMISSION TO THE NUNAVUT WATER BOARD

RESPECTING THE CITY OF IQALUIT'S TYPE A
MUNICIPAL WATER LICENCE AMENDMENT
APPLICATION

JANUARY 11, 2021



Executive Summary

The City of Iqaluit (the Proponent) is proposing to amend their Municipal Type A Water Licence (WL). The scope of the amended Type A WL (3AM-IQA1626) will include the construction and operation of new Solid Waste Management facilities to serve the City's near and long-term (75 years) municipal solid waste disposal needs. Key elements of the project include a solid waste transfer station (WTS), an engineered balefill/landfill site (Landfill), and an access road leading to the Landfill from the WTS.

Environment and Climate Change Canada (ECCC) has participated in all phases of the WL process, providing its specialist, expert information or knowledge available to the department in accordance with the Nunavut Agreement. ECCC has provided comments on the preliminary technical assessment-completeness check and has undertaken a full technical review of the application. ECCC has also attended the Technical Meeting and Pre-Hearing Conference held via teleconference September 17 and 23, 2020, respectively.

This final written submission summarizes the results of ECCC's technical review of information provided by the Proponent, as well as information and commitments provided by the Proponent throughout the review process thus far. The comments and recommendations provided relate to ECCC's mandate in the context of the *Canadian Environmental Protection Act* and the pollution prevention provisions of the *Fisheries Act*, and are intended for consideration by the NWB.

ECCC's outstanding concerns are in regards to effluent discharge and leachate management. In particular, it is unclear whether or how the leachate management contingency to discharge to the gravel level spreader would be protective of the receiving environment. Leachate management methods, including contingency measures, should incorporate appropriate mitigations to avoid adverse effects in the receiving environment.

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1.0 List of Acronyms

CEPA – *Canadian Environmental Protection Act*

ECCC – Environment and Climate Change Canada

EPP – Environmental Protection Plan

NWB – Nunavut Water Board

O&M – Operations and Maintenance

TSS – Total Suspended Solids

WL – Water Licence

WTS – Waste Transfer Station

WWTP – Waste Water Treatment Plant

2.0 Introduction

The City of Iqaluit (the Proponent) is proposing to amend their Municipal Type A Water Licence (WL). The scope of the amended Type A WL (3AM-IQA1626) will include the construction and operation of new Solid Waste Management facilities to serve the City's near and long-term (75 years) municipal solid waste disposal needs. Key elements of the project include a solid waste transfer station (WTS), an engineered balefill/landfill site (Landfill), and an access road leading to the Landfill from the WTS.

The amendment application was received by the Nunavut Water Board (NWB) in April 2020. Environment and Climate Change Canada (ECCC) has participated in all phases of the review and has provided comments on the preliminary technical assessment-completeness check and has undertaken a full technical review of the application. ECCC participated in a Technical Meeting and Pre-Hearing Conference that were held via teleconference on September 17 and 23, 2020, respectively. ECCC provides expert advice based on its mandate and has provided the Proponent with expertise on various management plans.

ECCC is continuing its participation in this WL process by way of this final written submission to the NWB, which summarizes ECCC's technical review of the information provided in the WL review process. ECCC has identified outstanding concerns and provides recommendations for consideration by the NWB. These outstanding concerns are related to effluent discharge and leachate management.

3.0 ECCC's Mandate

The mandate of Environment and Climate Change Canada (ECCC) is determined by the statutes and regulations under the responsibility of the Minister of Environment and Climate Change. In delivering this mandate, ECCC is responsible for the development and implementation of policies, guidelines, codes of practice, inter-jurisdictional and international agreements, and related programs.

ECCC's specialist advice for this review has been provided pursuant to the *Canadian Environmental Protection Act* (CEPA) and the pollution prevention provisions of the *Fisheries Act*. ECCC regulates the use of toxic chemicals, and develops and implements environmental quality guidelines pursuant to CEPA. ECCC also administers the pollution provisions of the *Fisheries Act*, which prohibits the deposit of a deleterious substance into fish-bearing waters.

Additional information on ECCC's mandate can be found at <https://www.canada.ca/en/environment-climate-change/corporate/mandate.html>.

4.0 ECCC's Technical Review Comments

In ECCC's November 26, 2020 submission regarding the October 9, 2020 memo from Dillon Consulting to City of Iqaluit, et al. (Subject: *July 2020 Regulator (ECCC/CIRNAC) Comments – Responses October 9*), ECCC noted that the Proponent's October 9, 2020, responses to the following commitments/topics are acceptable. Consequently, ECCC considers these topics to be addressed and resolved.

- Commitment 1 (Topic: Baseline monitoring)
- Commitment 2 (Topic: Unbaled waste)
- Commitment 3 (Topic: Acid Rock Drainage/Metal Leaching)
- Commitment 5 (Topic: Leachate treatment – Landfill)
- Commitment 7 (Topic: Environmental Protection Plans, Section 4.0 – Mitigation measures tables)
- Commitment 9 (Topic: Total Suspended Solids)
- Commitment 10 (Topic: Visual monitoring)
- Commitment 11 (Topic: Landfill surface monitoring)
- Commitment 16 (Topic: Liner installation timing and planning)

ECCC's November 26, 2020, submission also indicated that a number of commitments/topics required additional clarification and/or information. ECCC has reviewed the Proponent's December 15, 2020, response document, updated plans and supplemental information, and provides comments in subsections 4.1-4.8 on the Commitments/topics that ECCC considers resolved and those that are still outstanding.

In summary, ECCC has concluded that the recent Proponent responses (dated December 15, 2020) address the following Proponent Commitments, and considers these commitments/topics to be resolved:

- Commitment 4 (Topic: Leachate Treatment – Landfill)
- Commitment 6 (Topic: Groundwater)
- Commitment 8 (Topic: Environmental Protection Plans, Section 5.0 Monitoring and Inspection)
- Commitment 12 (Topic: Groundwater Monitoring)
- Commitment 15 (Topic: Leachate Management – Waste Transfer Station)
- Commitment 17 (Topic: New Technology/ Lessons Learned)

ECCC considers the following Proponent's Commitments to be unresolved and is providing additional comments and recommendations regarding these Commitments:

- Commitment 13 (Topic: Effluent Discharge)
- Commitment 14 (Topic: Leachate Management – Landfill)

REFERENCES:

- September 17, 2020, Summary of ECCC's outstanding technical comments and requests presented at Nunavut Water Board Technical Meeting
- November 26, 2020, letter from ECCC re: *3AM-IQA1626 City of Iqaluit Water Licence Amendment Application*
- December 15, 2020, letter from Dillon Consulting Ltd. to City of Iqaluit re: *City of Iqaluit Landfill and Waste Transfer Station Regulator Response Package*
- December 15, 2020, Response to Regulators memo from Dillon Consulting Ltd. to City of Iqaluit (Subject: *November 2020 Regulator (ECCC/CIRNAC) Comments Iqaluit Landfill and Waste Transfer Station Project 3AM-IQA1626 – Responses*)
- Updated *Environmental Protection Plan – Operations, Closure and Post-Closure Phases*
- Updated *Environmental Protection Plan – Construction Phase*
- Updated *Facility Monitoring Program*
- Updated *Operations and Maintenance Manual*
- Commitment 17 Supplemental Information document (Dillon Consulting Ltd.; December 2020)

4.1 ECCC #1 – Commitment 4: Leachate treatment – Landfill

Previous ECCC recommendation (September 17, 2020): ECCC recommends that the proponent identify treatment options beyond the existing system, and determine the lead-time needed to install and commission the treatment system.

ECCC suggests this recommendation could be resolved by inclusion of a licence condition that requires the City of Iqaluit to (1) characterize the leachate and (2) submit a treatment plan for Board approval.

Previous ECCC comment/recommendation (November 26, 2020, submission): ECCC recommends that the Proponent clarify whether a licence condition will be requested by the City of Iqaluit to resolve Commitment 4.

Proponent response: Table 1 of the Proponent's response document indicates that a license condition will be requested by the Proponent.

ECCC comment/recommendation: The Proponent's response is acceptable. ECCC has no further comments on this topic.

4.2 ECCC #2 – Commitment 6: Groundwater

Previous ECCC recommendation (September 17, 2020): ECCC recommends that the proponent revise the Environmental Protection Plans [i.e., EPP - Construction Phase; and EPP - Operations, Closure and Post-Closure Phases] to include groundwater as an environmental consideration for this project.

Previous ECCC comment/recommendation (November 26, 2020, submission): ECCC recommends that the EPP - Operations, Closure and Post-Closure Phases document also describe

the contingency mitigations that will be available, should monitoring results indicate the migration (or possible migration) of contaminant(s) into groundwater.

Proponent response: The Proponent provided an updated Environmental Protection Plan – Operations, Closure, and Post-Closure Phases document in response to Commitment 6. Section 6.3 of this document outlines response measures for suspected groundwater contamination.

ECCC comment/recommendation: The Proponent's response is acceptable. ECCC has no further comments on this topic.

4.3 ECCC #3 – Commitment 8: Environmental Protection Plans, Section 5.0 Monitoring and Inspection

Previous ECCC recommendation (September 17, 2020): ECCC recommends that the proponent submit the monitoring and inspection sections of the Environmental Protection Plans [i.e., EPP-Construction Phase; and EPP-Operations, Closure and Post-Closure Phases] prior to commencement of construction.

ECCC requests that the City:

- Submit the updated monitoring and inspection section (i.e., Section 5.0) of the Environmental Protection Plan – Construction Phase document for review; and
- Update and submit the monitoring and inspection section (i.e., Section 5.0) of the Environmental Protection Plan – Operations, Closure and Post-Closure Phases document for review.

Previous ECCC recommendation (November 26, 2020, submission): ECCC provides the following recommendations for Section 5.0 of the EPP - Construction Phase document, with respect to the monitoring and inspection activities to be included in the site-specific Construction Monitoring Plan:

- Incorporate the sediment and TSS/turbidity monitoring requirements from Section 4.3 (Surface Water Mitigation Measures and Best Management Practices) of the updated Erosion and Sediment Control Plan.
- Revise the final bullet of the Construction Monitoring Plan requirements as follows:
 - Replace the phrase “inspect the water for any signs of contaminants” with “inspect the water for any visible sheen or debris”; and
 - Identify appropriate thresholds for terrestrial discharges.

Proponent response: The Proponent provided an updated Environmental Protection Plan – Construction Phase document in response to Commitment 8.

ECCC comment/recommendation: The Proponent's response is acceptable. ECCC has no further comments on this topic.

4.4 ECCC #4 – Commitment 12: Groundwater Monitoring

Previous ECCC recommendation (September 17, 2020): ECCC recommends that the proponent:

- Include the monitoring of dissolved metals, in addition to total metals, for groundwater samples; and
- 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.

Previous ECCC comment/recommendation (November 26, 2020, submission): ECCC recommends that the groundwater monitoring parameters listed in Section 3.6 (Active Layer Groundwater Monitoring) of the Facility Monitoring Plan be updated to include both total metals and dissolved metals, rather than simply ‘metals’.

Proponent response: The Proponent provided an updated Facility Monitoring Plan document in response to Commitment 12.

ECCC comment/recommendation: The Proponent's response is acceptable. ECCC has no further comments on this topic.

4.5 ECCC #5 – Commitment 13: Effluent Discharge

Previous ECCC recommendation (September 17, 2020): ECCC recommends that 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.

ECCC requests that the City provide the updated Section 12.2 of the Operations and Maintenance Manual and the updated Section 3.9 of the Facility Monitoring Plan for review.

Previous ECCC comment/recommendation (November 26, 2020, submission): It is unclear whether the option “*Discharge to the level spreader under the approval and monitoring of the NWB*” is the same or different as the contingency described as “*controlled release of effluent to a gravel bed diffuser*”. Both of these potential leachate management options are included in Section 12.2 (Landfill) of the revised Operations and Maintenance Manual. ECCC recommends that the Proponent clarify the description of these two options.

Section 12.2 (Landfill) of the revised Operations and Maintenance Manual (Version 4.0) includes a list of landfill leachate monitoring parameters, as does the updated Section 3.8 (Effluent Discharge Limits) of the Facility Monitoring Plan. ECCC notes that ‘total phenols’ is listed in the revised O&M manual list, but not in the FMP list. ECCC recommends that Section 3.8 (Effluent Discharge Limits) of the Facility Monitoring Plan be updated to include ‘total phenols’ in the list of landfill leachate monitoring parameters.

Proponent response: The Proponent provided an updated Operations and Maintenance Manual and updated Facility Monitoring Plan in response to Commitment 13.

The Operations and Maintenance Manual no longer includes references to a gravel bed diffuser, and has expanded the description of the option “*discharge to the level spreader*”. Section 12.2 (Landfill) of the updated O&M manual describes the following leachate management contingency options:

In the event of the ponds filling faster than expected or poor quality leachate is measured that cannot be treated in the holding ponds, three options are available:

- 1. Haul via pumper truck and dispose of at the West 40 site (either into the existing uncapped wastemass or into the leachate holding pond);*
- 2. Haul via pumper truck and dispose of at the City WWTP (acknowledging the potential impacts to the WWTP process if the strength is significantly above the plant's rated capacity. The leachate should be analyzed prior to discharge and depending on strength may need to be diluted and discharged over an extended period of time;*
- 3. Discharge to the gravel level spreader downstream of the lagoons under the approval and monitoring of the NWB.*

ECCC comment/recommendation: As the Operations and Maintenance (O&M) Manual does not provide details regarding the proposed leachate management contingency “*Discharge to the gravel level spreader downstream of the lagoons under the approval and monitoring of the NWB*” (Section 12.2, O&M manual), it is unclear whether or how such a discharge method would be protective of the receiving environment.

ECCC notes that leachate management methods, including contingency measures, should incorporate appropriate mitigations to avoid adverse effects in the receiving environment. ECCC recommends that mitigations be incorporated into the contingency option “*Discharge to the gravel level spreader...*” to avoid adverse effects in the receiving environment.

4.6 ECCC #6 – Commitment 14: Leachate Management – Landfill

Previous ECCC recommendation (September 17, 2020): ECCC recommends that the proponent:

- Provide details for assessing landfill leachate/effluent characteristics; and
- 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.

ECCC requests that the City provide the updated Section 12.2 of the Operations and Maintenance Manual for review.

Previous ECCC comment/recommendation (November 26, 2020, submission): ECCC's comments and recommendations regarding the Proponent's response to Commitment 13 also apply to the response to Commitment 14.

Proponent response: The Proponent provided an updated Operations and Maintenance Manual and updated Facility Monitoring Plan in response to Commitment 14.

ECCC comment/recommendation: See Commitment 13. ECCC's comment/recommendation is the same for both Commitment 13 and Commitment 14.

4.7 ECCC #7 – Commitment 15: Leachate Management – WTS

Previous ECCC recommendation (September 17, 2020): ECCC recommends that the proponent:

- Provide secondary containment for the leachate holding tank;
- Characterize the WTS leachate to determine compatibility with the wastewater treatment process prior to transporting leachate to the City's WWTP;
- Track the WTS leachate generation rates/volumes and treatment/disposal details; and
- Report the WTS leachate generation rates/volumes, treatment/disposal details, and characterization results in the annual report.

ECCC requests that the City provide the updated Sections 12.1 and 14.0 of the Operations and Maintenance Manual for review.

Previous ECCC comment/recommendation (November 26, 2020, submission): It is unclear whether WTS leachate will necessarily be characterized to ensure compatibility with the WWTP treatment process, as the response indicates that WTS leachate should be characterized *at the request of the WWTP operator*.

ECCC notes that Section 3.8 (Effluent Discharge Limits) of the updated Facility Monitoring Plan states: *The City WWTP (designed in 2016 and commissioned in 2019) was intended for processing organic loading, namely BOD and TSS. Based on typical leachate quality, this has a risk of upsetting the plant.*

Given the risk of upsetting the treatment plant, ECCC recommends that WTS leachate be characterized prior to transfer to the WWTP until compatibility is confirmed, and that the O&M manual include wording to this effect.

Proponent response: The Proponent provided an updated Operations and Maintenance Manual document in response to Commitment 15.

ECCC comment/recommendation: The Proponent's response is acceptable. ECCC has no further comments on this topic.

4.8 ECCC #8 – Commitment 17: New Technologies/Lessons Learned

Previous ECCC recommendation (September 17, 2020): ECCC recommends that the proponent:

- Identify and describe measures to prevent/mitigate the challenges described (i.e., substantial volumes of poor quality leachate, and down time during mechanical breakdowns and for maintenance), and discuss their anticipated effectiveness;
- Describe how the effectiveness of these prevention/mitigation measures will be monitored; and
- Document lessons-learned to inform subsequent stages of construction and operation.

ECCC requests that the City provide the outstanding information for review, and suggests that the Proponent contact the City of Yellowknife to see if there are common elements in the proposed system that may lead to problems. ECCC can provide the City of Iqaluit with contact information for the City of Yellowknife's Manager of Sustainability and Solid Waste.

Previous ECCC comment/recommendation (November 26, 2020, submission): It is unclear how the revised Operations and Maintenance Manual addresses Commitment 17. ECCC requests that the Proponent clarify which sections of the O&M manual pertain to the following aspects of ECCC's recommendation:

- Identify and describe measures to prevent/mitigate the challenges described (i.e., substantial volumes of poor quality leachate, and down time during mechanical breakdowns and for maintenance), and discuss their anticipated effectiveness;
- Describe how the effectiveness of these prevention/mitigation measures will be monitored; and
- Document lessons-learned to inform subsequent stages of construction and operation.

ECCC also requests that the Proponent provide an update regarding the discussion referenced on page 251 of the Commitment Response document.

Proponent response: The Proponent provided an updated Operations and Maintenance Manual document and a Supplemental Information document in response to Commitment 17.

ECCC comment/recommendation: ECCC encourages the Proponent to contact the City of Yellowknife to see if there are common elements in the proposed system that may lead to problems; contact details are provided below. ECCC has no further comments on this topic.

Contact information:

Chris Vaughn
Manager, Sustainability and Solid Waste
Public Works and Engineering
City of Yellowknife
T: 867.669.3404
cvaughn@yellowknife.ca

5.0 Closing Remarks

ECCC acknowledges and appreciates the effort that the Proponent has taken to provide information and address concerns brought forward by parties through the WL process. ECCC would like to thank NWB for this opportunity to provide input to the City of Iqaluit's WL amendment review and looks forward to continuing its participation.

ECCC's technical review comments and recommendations are not to be interpreted as any type of acknowledgement, compliance, permission, approval, authorization, or release of liability related to any requirements for the Proponent to comply with federal or territorial statutes and regulations.