



Environment and
Climate Change Canada

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ENVIRONMENT AND CLIMATE CHANGE
CANADA'S INTERVENTION
TO THE NUNAVUT WATER
BOARD

RESPECTING THE CITY OF IQALUIT
MUNICIPAL WATER LICENCE
3AM-IQA0612

MARCH 30, 2016

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2.0 List of Acronyms

cBOD – Carbonaceous Biochemical Oxygen Demand
EC – Environment Canada (used when referencing documents submitted before the department was renamed)
ECCC – Environment and Climate Change Canada
EQC – Effluent Quality Criteria
INAC – Indigenous and Northern Affairs Canada
N - Nitrogen
NWB – Nunavut Water Board
WSER - Wastewater Systems Effluent Regulations

3.0 Executive Summary

The City of Iqaluit submitted an application to the Nunavut Water Board (NWB) for the renewal of the Municipal Type "A" Water Licence 3AM-IQA0612, on March 9, 2015. The City of Iqaluit is seeking a 25 year renewal of the current licence. The scope of the renewed licence includes the municipal operations and infrastructure required by the City (the withdrawal and use of water, water supply facilities, utilidor, the sewage treatment facility, the existing landfill, and discharge of treated effluent).

Environment and Climate Change Canada (ECCC) has participated throughout the application review process. This submission summarizes the results of ECCC's technical review. It also reflects ongoing discussions with the City of Iqaluit and other intervenors, as well as information and commitments which were provided to ECCC throughout the review process.

ECCC has identified the following technical issues to be taken forward to the Water Licence hearing:

- Implementation of secondary treatment of sewage
- Effluent quality criteria for municipal wastewater
- Management of contaminated sediments from the various landfill water management ponds
- Licence term
- Renewal licence terms and conditions.

In this intervention ECCC presents recommendations for consideration by the NWB. ECCC notes that there are terms and conditions in the expiring licence which will be taken forward in the renewal licence and will require amendments; these changes will be discussed in conjunction with the above concerns, as well as in the context of requirements for future management plans.

ECCC's specialist advice is provided based on our mandate, in the context of the *Canadian Environmental Protection Act* and the pollution prevention provisions of the *Fisheries Act*.

4.0 ECCC's Technical Review Comments

ECCC's technical comments reflect the current scope under consideration for the renewal licence. The scope of the water licence renewal application has been changed over the course of the renewal and includes the following as outlined in the NWB's Pre-Hearing Conference Report:

- Maximum annual withdrawal of 1,100,000 m³ from Lake Geraldine to the City of Iqaluit Water Treatment Plant
- Upgrade, operation and the eventual decommissioning of the infrastructure for managing wastewater at the existing West 40 Wastewater Treatment Plant and backup Sewage Lagoon
- Operation and the eventual decommissioning of the infrastructure for managing surface water run-off at the solid waste management facility at the existing West 40 Landfill
- Changes to the Monitoring Program (as provided by the City on February 5, 2016 in accordance with the List of Commitments attached as Appendix D to this Report)
- Request for the length of the term of the amended and renewed Licence to be ten (10) years.

The following have been withdrawn from consideration in this licence renewal application and would be expected to be reviewed in a future licence amendment process:

- Construction, operation and the eventual decommissioning of surface water management infrastructure associated with a new solid waste management facility approximately 7.5 kilometres northwest of Iqaluit City Center
- Construction, operation and the eventual decommissioning of an additional location for water extraction to supplement Lake Geraldine from Apex River
- Construction, operation and eventual decommissioning of a new quarry.

ECCC notes that there are terms and conditions in the expiring licence which will be taken forward in the renewal licence and require amendments (Part. E. Waste Disposal and Waste Management Plans, Part F. Conditions Applying to Construction, Part J. Conditions Applying to Abandonment and Restoration, Schedule A. Definitions and Schedule C. monitoring). These changes will be discussed in conjunction with the list of concerns, as well as in the context of requirements for future management plans.

ECCC has the following issues within the amended scope of the licence renewal:

1. Implementation of secondary treatment of sewage
2. Effluent quality criteria for municipal wastewater
3. Management of contaminated sediments from the various landfill water management ponds
4. Licence term
5. Renewal licence terms and conditions

The comments raised in ECCC's intervention are in no way to be interpreted as any type of acknowledgement, compliance, permission, approval, authorization, or release of liability related to any requirements to comply with federal or territorial statutes and regulations. Responsibility for achieving regulatory compliance and cost-effective risk and liability reduction lies solely with the City of Iqaluit.

4.1. Implementation of Secondary Treatment of Sewage

The City of Iqaluit is currently investigating treatment system options to improve wastewater quality following on recommendations from the July 2015 Nunami Stantec report "Iqaluit WWTP Upgrade/Expansion Feasibility Study".

ECCC is satisfied with the progress on the wastewater treatment system thus far and anticipates continued involvement with the City of Iqaluit as the upgrade moves forward. In regards to the effluent treatment performance targets Nunasi Stantec has indicated that specific effluent quality requirements will drive detailed design specifications. It is a requirement under the *Fisheries Act* that effluent is non-deleterious. One indication or measure of deleteriousness is the use of Rainbow Trout bioassay testing; effluent must be non-acutely toxic.

Recommendation:

ECCC recommends that the wastewater system upgrade design specifications ensure that appropriate effluent quality is achieved, such that discharges are compliant with Section 36(3) of the *Fisheries Act*.

4.2. Effluent Quality Criteria for Municipal Wastewater Effluent

Past water licences for the City of Iqaluit have included discharge criteria for the sewage effluent. ECCC notes that the effluent outfall is about 20 m above the tidal high water mark accordingly it would not be inappropriate for the renewal licence to include regulatory limits. Alternatively, the NWB may elect not to regulate effluent which discharges ultimately to the marine receiving environment. If that is the case ECCC recommends that the specified effluent criteria are considered as performance objectives with the inclusion of regular monitoring in the renewal licence.

ECCC acknowledges that the Wastewater Systems Effluent Regulations (WSER) do not apply in the North. However, they do provide a standard for due diligence in order to ensure compliance with the *Fisheries Act*. ECCC recommends that the City should strive to meet or exceed the WSER effluent quality standards at the end of the treatment system. The regulations include the following criteria:

- Average carbonaceous biochemical oxygen demand (CBOD) is less than or equal to 25 mg/L
- Average concentration of suspended solids in the effluent is less than or equal to 25 mg/L
- Average concentration of total residual chlorine in the effluent is less than or equal to 0.02 mg/L
- Maximum concentration of un-ionized ammonia in the effluent is less than 1.25 mg/L, expressed as nitrogen (N), at 15°C ± 1°C
- Effluent is non-acutely lethal.

Recommendation:

ECCC recommends that effluent quality criteria be set which represent non-deleterious effluent and that monitoring and sampling take into account the requirements of the WSER.

4.3. Management of Contaminated Sediments from the Various Landfill Water Management Ponds

The City of Iqaluit has stated that a plan for the disposal of the sediments contained at the bottom of each pond will be developed when the City is preparing for the final abandonment and restoration of the West 40 landfill. The treatment and discharge of landfill fire runoff is outside the scope of this renewal (it is being managed in consultation with Indigenous and Northern Affairs Canada (INAC) Inspectors and ECCC Enforcement) and the City has advised regulators that sediment that is generated from the treatment process will be disposed of properly as part of the treatment contract. However, the sediments contained in the landfill holding ponds and the fire runoff treatment ponds should be characterized so that appropriate plans for closure can be developed.

Recommendation:

ECCC recommends that sediments in water management ponds at the landfill be chemically characterized and the volumes estimated in advance of closure planning for the existing landfill.

4.4. Licence term

The City of Iqaluit has revised the licence term requested from 25 years to 10 years. INAC has recommended a licence duration of five to ten years which ECCC has no objection to given the expectation that the Type A water licence will be opened up for review in conjunction with amendments for the solid waste site, the new quarry, and any other activities outside the scope of the renewal licence.

4.5. Renewal Licence Terms and Conditions

Recommendations:

ECCC has the following recommendations for the renewal licence terms and conditions related to Part. E. Waste Disposal and Waste Management Plans; Part. J. Conditions Applying to Abandonment and Restoration; and Schedule C. Monitoring:

Part. E. Waste Disposal and Waste Management Plans

With deferral of the new landfill development the previous plan will need to be revised to reflect current plans and timing. ECCC recommends that the City provide:

- Details regarding the life expectancy of the existing landfill (including available capacity in terms of volume/space and in years as well as required Solid Waste Management methods)
- A progressive closure plan for the existing landfill with implementation details
- A schedule that includes milestones for the new landfill (such as provision of a plan, licence amendment application target date, construction/ operation target dates)
- Closure target date for existing landfill
- Updates on each of these items in the annual report

Additionally, it is not clear how long open burning via use of a burn box is planned to continue. The City should provide additional details regarding the burn box including:

- Mitigation measures to minimize the generation and release of contaminants
- Planned burn box closure date
- How wood waste will be managed after use of the burn box is discontinued

The City should also provide an estimated date for when the study regarding incineration technologies is expected to be completed.

Part J. Conditions Applying to Abandonment and Restoration

ECCC recommends that the terminology be updated to use the terms “Closure and Reclamation” rather than abandonment and restoration (noting that the existing definitions include reclamation but not restoration).

Schedule C. Monitoring

As discussed at the technical sessions there was general agreement on changes to the monitoring schedule. These include:

- Removal of bioassay testing requirements for stations IQA-02 and IQA-04 before treatment system upgrade
- Removal of testing requirements for chlorinated alkanes with the understanding that this can move into a research realm
- The City would use a single concentration bioassay test for acute lethality instead of the LC50 Bioassay (EPS1/RM/13). If there is a test failure and un-ionized ammonia concentrations are less than or equal to 1.25 mg/L, the Procedure for pH Stabilization during testing of acute lethality of Wastewater Effluent to Rainbow Trout can be used (EPS1/RM/50).

5.0 ECCC's Mandate, Roles and Responsibilities

The mandate of ECCC is determined by the statutes and regulations under the responsibility of the assigned 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 is provided based on our mandate, in the context of the *Canadian Environmental Protection Act*, and the pollution prevention provisions of the *Fisheries Act*.

ECCC is participating in the review of the Renewal Type "A" Water Licence Application for the City of Iqaluit in order to provide specialist expertise, information, and knowledge to support the NWB and regulators.

