



Environment and  
Climate Change Canada

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

IN REGARD TO THE GOVERNMENT OF  
NUNAVUT, DEPARTMENT OF  
COMMUNITY AND GOVERNMENT  
SERVICES, HAMLET OF RANKIN INLET:  
WATER LICENCE RENEWAL  
APPLICATION (3AM-GRA1015)

FEBRUARY 26, 2016

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## 2.0 List of Acronyms

AANDC – Aboriginal Affairs and Northern Development Canada (used when referencing documents submitted before this department was renamed)

cBOD5 – Carbonaceous Biochemical Oxygen Demand

CCME – Canadian Council of Ministers of the Environment

EC – Environment Canada (used when referencing documents submitted before the department was renamed)

ECCC – Environment and Climate Change Canada

EQC – Effluent Quality Criteria

GN - Government of Nunavut

GNCGS – Government of Nunavut Community and Government Services

NWB – Nunavut Water Board

O&M – Operation and Maintenance

QA – Quality Assurance

QC – Quality Control

STF - Sewage Treatment Facility

TPH - Total Petroleum Hydrocarbons

WSER - Wastewater Systems Effluent Regulations

### 3.0 Executive Summary

The Government of Nunavut (GN), Department of Community and Government Services submitted an application to the Nunavut Water Board (NWB) for the renewal of the Hamlet of Rankin Inlet Type "A" Water Licence 3AM-GRA1015, on March 9, 2015. The GN is seeking a 25 year renewal of the current licence. The scope of the renewed licence includes the municipal infrastructure required by the Hamlet (the withdrawal and use of water, water supply facilities, utilidor, the sewage treatment facility, and discharge of treated effluent).

Environment and Climate Change Canada (ECCC) participated throughout the application review process. This submission summarizes the results of ECCC's technical review. It also reflects ongoing discussions with the GN, 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:

- marine discharge quality and monitoring
- secondary treatment of sewage wastewater
- management of oils and grease.

In this intervention ECCC presents recommendations for ways to address these outstanding issues, for consideration by the NWB. In support of these recommendations, a summary of ECCC's technical comments is attached as "Appendix A".

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*. The Licensee should comply with the above-mentioned legislation during all phases and in all undertakings related to the municipal licence renewal.

## 4.0 ECCC's Technical Review Comments

ECCC reviewed the NWB (3AM-GRA1015) Type "A" Water Licence Renewal Application documentation, associated management plans, as well as the updated information submitted February 16, 2016.

ECCC's comments and recommendations in this intervention are intended to provide expert advice to the GN and decision-makers. These comments and recommendations are in accordance with ECCC's program-related responsibilities and associated guidelines and policies. ECCC's comments reflect issues outstanding after technical discussions with the GN.

ECCC's comments focused on:

- marine discharge quality and monitoring (including update of the Quality Control/Quality Assurance (QA/QC) Plan),
- secondary treatment of sewage wastewater,
- updates to the Sewage Treatment Facility (STF) Operation and Maintenance Plan, and
- management of oils and grease.

A summary of the outstanding issues and recommendations are below. In support of these recommendations, a summary of ECCC's technical comments is attached as "Appendix A".

### 4.1 Monitoring of Marine Discharge Quality

Municipal wastewater receives primary treatment in the Sewage Treatment Facility, and then is discharged to Prairie Bay using an underwater pipe with a diffuser. The municipal water licence currently does not set effluent quality criteria to regulate discharge quality to the marine receiving environment. The municipal water licence requires quarterly monitoring of effluent for parameters as specified in Part H.4 of the current licence. The specified suite of parameters for ongoing monitoring is appropriate. However, ECCC recommends two changes:

- Item 4 specifies monitoring "Oil and Grease (visual)". In order to differentiate the hydrocarbon sources, Total Petroleum Hydrocarbons should be analyzed using a method that measures mineral sources of hydrocarbons (e.g. ASTM D7678 PHC test or other), as well, the lab test for total oil and grease should also be done to measure all hydrocarbons including biological lipids.
- Analyze for cBOD5 either in addition to or in place of BOD5 to determine the pollutant removal from wastewater.

With respect to the QA/QC Plan, ECCC recommends that Item H.9 be carried forward in the renewal licence and that the Plan be submitted for Board approval. It is noted that Item H.10 requires annual review of the Plan, (the reference therein to Part J should be corrected) and ECCC supports retaining this requirement in the renewal licence.

## **4.2 Future infrastructure upgrades**

The installation of secondary treatment is not being considered by the GN; the primary treatment system was installed approximately four years ago and is functioning. Primary treatment consists of solids removal, and effluent quality is variable depending on the time of year, with more dilute effluent during the winter, and more concentrated effluent during the summer.

It is acknowledged that the water licence does not regulate effluent quality for marine discharges, as was identified by the GN. ECCC and the GN have agreed to continue discussing the matter outside the water licence renewal process. However, the necessary improvement of effluent quality will require upgrading of facilities which are regulated under water licence 3AM-GRA1015. ECCC seeks a commitment from the GN to identify options for secondary treatment, and to develop a plan to implement secondary treatment within a specific time frame, to ensure compliance with the *Fisheries Act*.

The GN had initially requested a licence term of 25 years. A shorter licence term would be appropriate to align with the planning horizon for treatment upgrades. ECCC suggests that a term of 8 years be considered by the Board, as previously put forward by the parties and agreed to by the GN.

## **4.3 Plans**

The STF Operation and Maintenance Plan has been updated to discuss the diversion of hazardous wastes as requested by ECCC.

## **4.4 Disposal of Oils and Greases**

High levels of processing plant and other waste fats are entering the municipal wastewater stream. The GN has indicated that commercial facilities operating in the Hamlet have been approached regarding disposal of grease. Improvements have not been achieved. ECCC recommends that there be further compliance promotion on appropriate oil and grease disposal.

## 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*, the pollution prevention provisions of the *Fisheries Act*.

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

## **6.0 Conclusions**

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 GN.

ECCC is prepared to discuss the outstanding concerns and looks forward to participating in the ongoing Hamlet of Rankin Inlet Type "A" Water Licence Amendment process.



## APPENDIX A: Summary of ECCC's Technical Comments and Status / Path Forward

TC #	Reference to Comments	ECCC's Comment / Rationale	ECCC's Technical Comment	GN response to Technical Comments	Status/Path Forward
7	Discharge Criteria and Requirements	<p>The effluent quality downstream of the treatment system should be such that discharge to the ocean will comply with Section 36(3) of the <i>Fisheries Act</i> at end-of-pipe.</p> <p>Although the Wastewater Systems Effluent Regulations (WSER) do not currently apply to Nunavut, EC recommends monitoring and sampling be aligned with the requirements of the Wastewater Systems Effluent Regulations.</p>	Develop and submit a wastewater treatment plan to the NWB that outlines steps to optimize the current effluent management and address the need for treatment going forward.	<p>As identified by EC, the Wastewater Systems Effluent Regulations do not currently apply to Nunavut.</p> <p>As per the CCME Canada-wide Strategy for the Management of Municipal Wastewater Effluent ...” a coordinating committee will be established under CCME...Its activities will include... addressing issues related to facilities in Canada’s far north” The Strategy goes on to state “Due to the extreme climatic conditions and remoteness of Canada’s Far North, a viable means to improve human and environmental health protection needs to be carefully considered. Therefore, a window of up to five years is provided to undertake research into factors that affect performance of wastewater facilities in northern conditions. During this period of time, the governments of the Northwest Territories, Nunavut, Quebec, Newfoundland and Labrador and the federal government will work collaboratively..” In response to this Strategy the Government of Nunavut, in collaboration with Dalhousie University, has conducted extensive wastewater research in Nunavut, beginning in 2010 and to be completed in 2016. The coordinating committee – including representation from EC – acknowledges that this research is essential to developing northern standards. Until these standards have been developed for the north it seems premature to adopt the WSER, as the CCME Strategy itself identifies that these requirements may not be applicable to the North. The current Licence Renewal should not be hindered by comparison of effluent quality to the current WSER standards.</p>	<p>ECCC would like to emphasize that the general prohibitions of the <i>Fisheries Act</i> applies to Rankin Inlet’s effluent discharge. The response focuses on the applicability of the <i>Wastewater Systems Effluent Regulations</i> (WSER) and associated work on northern wastewater standards. However, the intent in mentioning the WSERs is to provide examples to the municipality and GN of due diligence in meeting the requirements of the <i>Fisheries Act</i> at the marine discharge point.</p> <p>The water licence currently does not set effluent quality criteria to regulate discharge quality. It does require quarterly monitoring of effluent for parameters as specified in Part H. Item 4. This list is generally appropriate for ongoing monitoring. However, ECCC recommends two changes. Item 4. specifies Oil and Grease (visual); however, to differentiate hydrocarbon sources, it is recommended that Total Petroleum Hydrocarbons be analyzed. Analysis for cBOD5 is also recommended, either in addition to or in place of BOD5.</p>

8	Design Life	Sewage Treatment Facility (STF) Operation and Maintenance (O&M) Plan (updated September 2015)	Describe the design life of the STF and the wastewater management system components. Develop a plan to replace or upgrade system components as required.	The Sewage Treatment Facility was recently upgraded, including the installation of the Monster Auger system in 2012. As-built drawings are available on the NWB ftp site. At present there is no infrastructure plan to upgrade the system to achieve secondary treatment.	At present there is no infrastructure plan to upgrade the wastewater system to achieve secondary treatment. ECCC is prepared to discuss a path forward with the GN in a separate venue from the water licence renewal process; however, the necessary improvement of effluent quality will require upgrading of facilities which are regulated under water licence 3AM-GRA1015.  ECCC seeks a commitment from the GN to investigate options for secondary treatment, and to develop a plan for implementation.
9	Diversion of Hazardous Wastes and Incompatible Materials	STF O&M Plan (updated September 2015)	The STF O&M Plan should include a description of how hazardous wastes and incompatible materials are diverted from the wastewater system in order to minimize the effects of the effluent on the receiving environment. Provide a description of how these materials will be managed.	The Sewage Treatment Facility Operation & Maintenance Plan will be revised to include a description of how hazardous wastes are diverted from the wastewater system, and submitted to the NWB by January 31, 2016.	A revised Sewage Treatment Facility Operation & Maintenance Plan was provided on February 16, 2016.  ECCC is satisfied with this response.

10	Total Petroleum Hydrocarbons	Third Quarter Report (2015)	<p>Monitor for Total Petroleum Hydrocarbons to determine whether these are entering the treatment plant.</p> <p>If TPH are entering the wastewater treatment system, the source(s) should be identified and diverted from the wastewater stream.</p>	<p>High levels of animal fats in the wastewater stream have previously been identified due to the fish processing plant (Kivalliq Arctic Foods) and restaurants/grocery stores within the community. GNCGS will sample for Total Petroleum Hydrocarbons with the fourth quarter sampling of Monitoring Program Station GRA-3, effluent discharge from the Sewage Treatment Facility, however if Total Petroleum Hydrocarbons are not present in the sample, it is requested that this is not a routine sample required since the high levels of animal fats have previously been identified due to animal fats.</p>	<p>The GN clarified the sources of extremely high levels of oil and grease have already been identified as being from animal fats from the processing plant, restaurants and grocery stores. The Hamlet should indicate alternative disposal options for these waste fats and oils.</p> <p>The GN advises that commercial facilities have been approached regarding disposal of grease but practices have not necessarily improved. Further compliance promotion is recommended on appropriate oil and grease disposal.</p>
11	Sample Blanks	Environmental Monitoring Program and Quality Assurance/Quality Control (QA /QC) Plan	<p>Routinely collect an appropriate proportion of field blanks and travel blanks during monitoring events at each sampling location, in alignment with best practices.</p>	<p>The laboratory will be contacted to determine the appropriate number of field blanks to be included with the required sample. Duplicate sampling is typically carried out in conjunction with samples taken during AANDC Inspections.</p>	<p>ECCC recommends that Item H.9 be retained in the renewal licence, and that the plan be submitted for approval. It is noted that Item H.10 requires annual review of the plan, and that the reference to Part J should be corrected.</p>