



Northwest Territories Environment and Natural Resources

Conservation, Assessment and Monitoring Division
Environmental Impact Assessment Section
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October 30, 2015

Liz Castaneda
Inuvialuit Water Board
P.O. Box 2531
125 Mackenzie Road
Suite 302, Professional Building
Inuvik, NT X0E 0T0

**Re: Hamlet of Paulatuk
Water Licence Application – N3L3-1619
Type B Municipal Water Licence Renewal
Request for Review and Comments**

Dear Mrs. Castaneda,

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

Topic 1: Part A - Scope and Definitions of Paulatuk Water Licence

Comment(s):

To make acceptable updates and be consistent with other Water Licences issued in the NWT, the NWT Water Board may consider adding or adjusting the following definitions within *Part A - Scope and Definitions* of Paulatuk Water Licence:

Minister means a duly appointed member of the Executive Council who is responsible for the *Waters Act* or the department responsible for administering the Act.

Modification means a change, other than an expansion, that does not alter the purpose or function of that structure.

Municipal Sewage Sludge is a mixture of water and non-stabilized solids separated from various types of wastewater as a result of a natural or artificial process.

Professional Engineer means a person registered with the Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists to practice as a Professional Engineer in the Northwest Territories in accordance with the Engineering and Geoscience Professions Act, S.N.W.T. 2006, V.16, or amendments, and whose principal field of specialization is appropriate to address the components of the undertaking at hand.

Reclamation means activities which facilitate the return of areas affected by the Waste Disposal Facilities to a viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment, human activities, and surrounding environment.

Regulations means Regulations promulgated pursuant to section 63 of the Act.

Spill Contingency Plan means a document, developed in accordance with Indian and Northern Affairs Canada's April 2007 Guidelines for Spill Contingency Planning, that describes the set of procedures to be implemented to prevent and minimize the effects of a spill.

Surveillance Network Program means a monitoring program established to define environmental sampling and analysis requirements, as detailed in Annex A of this Licence, to collect Water quality data, and to assess discharge quality, Licence compliance, and potential for impacts to the environment.

Unauthorized discharge means a release or discharge of any Water or Waste not authorized under this Licence.

Waste means any substance defined as Waste by section 1 of the Act.

Recommendation(s):

- 1) ENR recommends that the above stated definitions be added to Paulatuk Water Licence to provide further clarity, understanding and support of terms used throughout the Water Licence.

Topic 2: Changes to Part B – General Conditions

Comment(s):

The following (or similar) conditions are currently being used in Part B of other Northwest Territories (NWT) Water Licences.

Recommendation(s):

1) ENR recommends that the following general conditions to be added to Paulatuk Water Licence as necessary to maintain consistency with other recent Type B municipal Water Licences:

- The Licensee shall operate in accordance with the plans and programs approved pursuant to the conditions of this Licence and with any revisions to the plans and programs as may be made pursuant to the conditions of this Licence and as approved by the Board. If any plan is not approved by the Board, the Licensee shall revise the plan as requested by the Board.
- All information submitted to the Board for this Licence shall a) Be submitted in a form acceptable to the Board; b) Be in accordance with the Mackenzie Valley Land and Water Board's March 2012, *Document Submission Standards*; and, c) Include a section within each submission which identifies where the pertinent requirements of the Licence are addressed.

Topic 3: Part D – Conditions Applying to Waste Disposal

Comment(s):

ENR notes that the following conditions have been added to Part D of other NWT Water Licences:

Recommendation(s):

1) ENR recommends that the following conditions, additions and clarifications are added to the Paulatuk Water Licence in order to maintain consistency with other recent Type B Municipal Water Licences in the NWT.

- The Licensee shall ensure that any unauthorized Wastes associated with this undertaking do not enter any Waters.
- The Licensee shall immediately notify an Inspector of the exceedance of any effluent quality criterion.

ENR further notes examples where Water Licence conditions under *Conditions Applying to Waste Disposal (Part D)* have been regrouped under Sewage and Solid Waste for clarification purposes for the Licensee (see recently approved Water Licence for the Village of Fort Simpson MV2015L3-0001).

Topic 4: SNP Effluent Monitoring – CBOD₅ and TSS

Comment(s):

CBOD₅ – Paulatuk’s current licence requires monitoring of Biochemical Oxygen Demand (BOD₅) in Part D Item 2 & SNP section B.1, which has been a past typical sampling requirement in Water Licences. The BOD₅ parameter is however being gradually replaced by Carbonaceous Biochemical Oxygen Demand (CBOD₅) with the adoption of the Canada-wide Wastewater System Effluent Regulations (WSER) in all 9 NWT communities to which these regulations will be applied to in the future. As such, these communities were or will be required to monitor the two parameters for a period of 2 years to establish a BOD₅/CBOD₅ ratio, period after which BOD₅ can be replaced by CBOD₅ and the ratio can be used to interpret past BOD₅ data, as necessary.

While Paulatuk is not amongst the NWT communities to which the WSER will apply in the future, the BOD₅ sampling requirement should nevertheless gradually be replaced by CBOD₅ sampling requirements, so that future wastewater treatment performance for Paulatuk can be compared to other facilities in the NWT. To establish a BOD₅/cBOD₅ ratio specific to Paulatuk’s wastewater treatment system, monitoring of both BOD₅ and cBOD₅ should occur for one full year (as described within the Water Licence – once in the spring and once in the fall). Once a ratio is established for Paulatuk, the requirement to monitor BOD₅ could be removed from the licence.

Recommendation(s):

- 1) ENR recommends BOD₅ and cBOD₅ be monitored for a full year period, after which monitoring of BOD₅ can be replaced by cBOD₅.

Topic 5: Effluent Monitoring – Suggestions for Wastewater SNP Sampling Stations Additions

Comment(s):

The most recent ENR inspection report dated October 2015 identifies that the Hamlet is currently not completing the effluent monitoring required under the current Water Licence. ENR also notes that the Sewage Treatment Facility O&M Manual (section 3.2.1) suggests that 2 new SNP monitoring stations could be added in the wetland (WM-1 & WE-1); one station half way through and the other at the end of the wetland prior to entering the receiving water body (or Darnley Bay).

While more sampling points would help the Hamlet to assess how the downstream wetland treatment is contributing to the overall process, any addition to the SNP section of Paulatuk’s Water Licence once adopted would mean that the Hamlet would be required to conduct this sampling for the duration of their Water Licence. As the Hamlet has not been able to fulfill their current sampling obligations, it would appear

prudent and reasonable to focus on meeting their current obligations first. In addition, the additional data will to confirm the effectiveness of the current treatment system.

Sampling events conducted by the inspector established that wastewater effluent leaving the lagoon at TSS levels of 388 mg/L which exceeds the Water Licence EQC limit of 120 mg/L at 1619-2. Once the Hamlet begins to routinely collect effluent discharge data, decisions can be made regarding the efficacy of the treatment system, and whether improvement need to be considered.

Recommendation(s):

- 1) ENR recommends that the SNP sampling requirement remains unchanged.
- 2) Current reference to AANDC inspector in section 3.2.2 or the Sewage Treatment Facility O&M Manual should be replaced by the ENR inspector in the current post-devolution environment.

Topic 6: Sludge Management

Comment(s):

The Sewage Lagoon O&M Manual provides clear instructions on how to collect sludge measurements from the bottom of the lagoon, and other related sludge management procedures. Responses provided to IR requests (section 4 d) iii) indicates that no sludge management has been conducted to date at the Hamlet's sewage lagoon.

Regular de-sludging was identified as one best practice in recent Dalhousie research conducted on Arctic wastewater treatment system performance. Routine maintenance should be completed on treatment lagoons in order to ensure the facilities are operating as efficiently as possible.

Recommendation(s):

- 1) ENR recommends that a routine maintenance schedule be developed and implemented at the sewage lagoon.

Topic 7: Proper Hazardous Waste Management and Containment

Comment(s):

The most recent ENR inspection report dated October 2015 reported sighting of unused liner rolls that have not yet to be put into place to construct the hazardous wastes temporary storage area. It was also specified that contaminated snow was reportedly brought on site in the past, as well as the presence of 2 bags of suspected contaminated soil of unknown origin. While Paulatuk does not operate a landfarm, Water Licence conditions B:1 c), D:7, D:8 and D:9 indicate that contaminated soils

and materials may be temporarily accepted/stored at the SWF until they are shipped out to an approved facility.

ENR notes that the current SWF O&M Manual does not specifically described these types of wastes which may be considered under the broad categories of 1) Pathogenic wastes; 2) Radioactive wastes and 3) Hazardous wastes. The SWF O&M Manual specifies a temporary acceptance of these materials that *may be placed in specifically designated areas of the solid waste facility for storage until they can be shipped south by barge* (section 3.1.2), without specifying the exact location of the SWF that would accommodate these temporary transitional storages prior to shipments.

Management of contaminated materials should be clearly identify and describe within the Hamlet's current SWF O&M Manual to avoid confusion on how these materials should be stored and contained in order to prevent any potential impacts. May the Hamlet decide that contaminated materials should no longer be accepted/received at Paulatuk SWF because of their associated contamination risks, this decision should be clearly identified within Paulatuk SWF O&M Manual and Water Licence conditions. Submitted documents during the current Water Licence renewal process indicated communities concerns of SWF leachates to contaminate the sewage lagoon that drains into Darnley Bay (see Abandonment and Restoration Plan). The Board may wish to add the necessary conditions to Paulatuk new licence in order to require the Hamlet to adequately manage, store and contain any/all contaminated materials transitioning at their SWF facility (hazardous waste site).

Recommendation(s):

- 1) ENR recommends that the SWF O&M Manual clearly identifies the Hamlet intent and associated procedures relating to the acceptance for temporary storage only of contaminated materials at the SWF.
- 2) ENR recommends Water Licence conditions to foster groundwater protection through appropriate management, storage and containment of transitioning contaminated materials at the SWF.

Topic 8: Spill Contingency Plan – Flow chart of Response Organization

Comment(s):

A flow chart was provided within Paulatuk Spill Contingency Plan which summarizes responses procedures and contact information to be used in the eventuality of a spill emergency.

To foster expedite emergency response organization and prevent any delays, contact information for the Hamlet Foreman and Hamlet SAO should also be provided in case these individuals are not the first responder at any potential spill sites.

This flow chart should be posted in a highly visible place within the Hamlet office, and at all wastes/chemicals management locations/facilities.

Recommendation(s):

- 1) ENR recommends that the flow chart is updated to include the Hamlet Foreman and SAO contact information. ENR also recommends for this informative diagram to be highly visible at all waste management locations and/or facilities, to provide the necessary support in case of a spill emergency.

Topic 9: Spill Contingency Plan – Spill-related Contaminated Wastes

Comment(s):

Section 3.3.1 (number 4) specifies that spill contaminated soil is to be recovered and properly disposed according to an Environmental Health Officer. Section 3.3.4 (number 9) also refers to contaminated ice/slush that should be scraped and shoveled into a barrel – and that barrels filled with contaminated snow should be stored at an appropriate location (section 3.3.5 – number 8). Contaminated soil from spill events are said to be easily recovered (compared to spill on/in water) and that all efforts should be made to prevent these land spills from reaching open water bodies (section 3.3.6).

In section 3.5 entitled “Procedures for Transferring, Storing and Managing Spill-Related Wastes”, it would appear that the location in Paulatuk where spill related contaminated snow, ice, water and soil would be transferred to (while assumed to be the hazardous waste site currently in construction at the SWF) was not specified.

Recommendation(s):

- 1) ENR recommends that currently used temporary locations within Paulatuk, as well as final approved destination for reception of spill-related contaminated wastes, be provided within section 3.5 of the current Spill Contingency Plan.

Topic 10: Spill Contingency Plan – Spill Kits

Comment(s):

The first map presented in the Spill Contingency Plan (p. 4) identifies two sampling locations for spill kits at the Hamlet, being the Maintenance garage and the truck fill station.

Community concerns of potential impacts of the SWF on the current sewage lagoon were identified in the Water Licence questionnaire. Furthermore, the October 2015 ENR inspection report stated evidence of a hydrocarbon or hydraulic spill on site [lagoon discharge chute] located in between the SWF and the lagoon. To facilitate access to spill kits material for spills occurring at the SWF or at the sewage lagoon

site, a third spill kit should be located where practical at the sewage lagoon or at the SWF in order to prevent/minimize potential impacts of spills occurring at the SWF could and/or in the sewage lagoon area. Once approved, this third spill kit storage location could be added to the map referred to above. Furthermore, the map provided in p. 29 of the Water Licence questionnaire (which display the various types of wastes stored at the SWF) can also be included within the Spill Contingency Plan to facilitate the access (as required) to various type of wastes and minimize confusion or delays in the eventuality of spill emergency.

Furthermore and as described in AANDC 2007 Spill Contingency Guidelines, any surrounding drainage flow path may be further identified on these maps in other to be able to predict the trajectory that accidental spill flow paths could be taking in order to best plan any required actions during an accidental spill event.

Recommendation(s):

- 1) ENR recommends for a third spill kit storage location be considered at the SWF. Furthermore, ENR recommends for the above described further maps and/or details to be added to Paulatuk Spill Contingency Plan for provide further support and clarity to the Hamlet staff in the eventuality of a spill contingency event.

Topic 11: Part X – Conditions Applying to Spill Contingency Planning

Recommendation(s):

- 1) ENR recommends that the following conditions/clauses related to Spill Contingency Planning within the Paulatuk Water Licence be updated for consistency with other recently issued municipal Water Licences:

Conditions relating to Spill Contingency Planning are currently integrated/included under Part B General Conditions (Items 1 k), 7), Part E – Conditions Applying to Operation and Maintenance (Items 1, 4 & 5), and Part G – Condition Applying to Construction (Item 1). In order to improve clarity and consistency with recent Water Licences issued in the NWT, the NWT Water Board may consider that a section specific to Spill Contingency Planning (Eg. Part X – Conditions Applying to Spill Contingency Planning) be added to the Hamlet of Paulatuk Water Licence.

Typically, conditions such as the following are also are currently being used:

- The Licensee shall act in accordance with the Spill Contingency Plan submitted to the Board on July 2015 until a revised plan is approved by the Board.
- The Licensee shall act in accordance with the approved Spill Contingency Plan, and shall annually review the Plan and make the necessary revisions to reflect changes in operations, technology, chemicals or fuels, or as

directed by the Board. Revised Plans shall include a brief summary of the changes made, and shall be submitted to the Board, for approval, at least sixty (60) days prior to any proposed changes to the requirements in the approved Plan.

- If, during the term of this Licence, a spill or an Unauthorized Discharge of Waste occurs or is foreseeable, the Licensee shall:
 - a) Implement the Spill Contingency Planning
 - b) Report the incident immediately via the 24-hour NWT Spill Report Line at (867) 920-8130 in accordance with the instructions contained in the Spill Report Form NWT 1752/0593;
 - c) Report each spill and Unauthorized Discharge to the Board and an Inspector within 24 hours; and,
 - d) Within thirty (30) days of the spill or Unauthorized Discharge reported under (reference to Part and items as immediately above), submit to the Board and an Inspector a detailed report. The detailed report shall include descriptions of root causes, response actions, and any changes to procedures to prevent similar occurrences in the future.

- All spills and Unauthorized Discharges of Water or Waste shall be reclaimed to the satisfaction of an inspector.

Topic 12: Part G: Operations & Maintenance Plan(O&M)/Templates and Revisions

Comment(s):

Paulatuk's current O&M manuals (or plans) were well prepared and contained a lot of very useful information. O&M Plan Templates were recently introduced by the MVLWB and are now available to NWT communities. Some details from these template such as: specific wetland information (discharge flow rate out (m³/year), area (Ha), operating depth (m), list of plants in the wetland, estimated hydraulic loading rate (cm/day), estimated hydraulic retention time (days), etc.); monitoring of lagoon color (indicative of treatment performance); removal maintenance of floating debris in the lagoon (as identified in most recent ENR inspection report); removal of algal mats or plant growth in the lagoon; repairs/replacement of damaged signs; inspection frequency of the state of the truck pad and access road, etc. may be missing from the current O&M plan.

Upon next review of Paulatuk O&M plans, the remaining information required in the templates should be provided to the Board. The following conditions were used to address similar concerns in other recently issued municipal Water Licences (e.g. Fort Simpson):

- a) The Licensee shall act in accordance with the **Operations and Maintenance Plans** submitted to the Board on _____ until a revised plan is approved by the Board.
- b) The Licensee shall submit to the Board, for approval, a revised **Operations and Maintenance Plan for the Sewage Disposal Facilities** which shall include but not be limited to, the information set out in the *Operations and Maintenance Plan Template – Sewage Treatment Facility*. The Licensee shall submit the Plan within ninety (90) days of receiving the Template.
- c) The Licensee shall act in accordance with the approved Operations and Maintenance Plans referred to in Part E, items 2 and 3, and shall annually review the Plans and make any necessary revisions to reflect changes in operations, technology, and the results from research and other studies, or as directed by the Board. Revised Plans shall include a brief summary of the changes made, and shall be submitted to the Board, for approval, at least sixty (60) days prior to any proposed changes to the requirements in the approved Plan.

Recommendation(s):

- 1) ENR recommends the Paulatuk Water Licence include a requirement that additional information as required under the O&M Plan Templates be provided to the Board.

Topic 13: Operation and Manual - Sewage Lagoon Manual

Comment(s):

- Under subsection “3.2.2 – Operation from Break-up to Freeze-up”, it says that “[...] the Hamlet must provide notice to an AANDC Inspector [...]”. This is no longer correct since April 1, 2014.
- Under subsection “3.3.1 – Characterization of Sludge”, it says “However, contaminants such as heavy metals, solvents and petroleum products may enter the lagoon due to municipal activities.” This is unclear and could use more detail.
- Under subsection “3.3.3 – Methods for performing sludge depth measurements”, it says that a sludge depth measurement should be performed annually. Has this work been done in the past? Please note that this is not a requirement in the Municipal Water Licence.
- Subsection “3.4 – Lagoon and Wetland Monitoring Program (Surveillance Monitoring Network)” title is wrong.

- As a general comment, the plan does not include maintenance and inspection requirements for sewage trucks even though they can be a source of pollution due to spills.

Recommendation(s):

- 1) ENR recommend changing “AANDC Inspector” to “ENR Water Resource Officer (Inspector)”.
- 2) Examples should be listed of municipal activities that could lead to contaminants such as heavy metals, solvents and petroleum products entering the sewage lagoon.
- 3) Provide past results if such work was conducted. Otherwise recommend working with ENR Water Resource Officer to consider conducting this work following the methodology described in the plan if there is interest.
- 4) Change “Surveillance Monitoring Network” to “Surveillance Network Program” and demonstrate how the Hamlet intends to fulfil the SNP requirements (e.g. sampling, monitoring and annual reporting) as this has not been done in recent years.
- 5) Include general maintenance and inspection requirements for sewage trucks to prevent spills and contamination.

Topic 14: Paulatuk Response to IR

Comment(s):

- Under Item “3b. Distribution list of plan recipients as per section 1.3 of the Spill Contingency Plan”, it says “Inuvik Office” in the third row.

Recommendation(s):

- 1) Change to “Inuvik”.

Topic 15: Spill Contingency Plan

Comment(s):

- As a general comment, the proposed Spill Contingency Plan only covers the Sewage Disposal and Solid Waste Facilities but omits the Water Supply Facilities.
- Subsection “1.9 Hazardous Materials Stored on Site” does not include mercury containing products.

- Section 3 “Action Plan” does not include the Water Supply Facilities as a potential spill source.
- The Spill Contingency Plan does not mention training and spill reporting requirements as per the Water Licence.
- Reminder that the Spill Contingency Plan should be reviewed annually as per Part E: Conditions applying to operation and maintenance, Item 5, of the Water Licence.

Recommendation(s):

- 1) Include spill contingency measures for the Water Supply Facilities as well given that there are chemical products and fuel stored on site and heavy equipment operating near the water supply. Include Water Supply Facilities in maps and drawings as a potential spill site.
- 2) Add mercury containing products (e.g. thermostats, fluorescent lights, switches, etc.) to the list of hazardous materials stored on site. Some of these products were observed at the time of the last inspection by the Water Resource Officer on August 11, 2015. As a reminder, ENR can handle the final disposal of mercury containing products at no cost other than shipping.
- 3) Include the Water Supply Facilities as a potential spill source and describe the potential spill sizes from various sources identified.
- 4) Add annual training and spill reporting requirements as per Part B: General Conditions, Items 1 G and H of the Water Licence.
- 5) Note this requirement in the Spill Contingency Plan so that the Hamlet remembers to do this exercise on an annual basis. Additionally, it would be best if the Hamlet could obtain the original digital document of the Spill Contingency Plan so that it may be easily updated as needed.

Topic 16: Water Licence Questionnaire 2015

Comment(s):

- Under “Section 5: Solid Waste Disposal”, the Hamlet notes that it is using a dead animal incinerator. Burning animal carcasses is not authorized as per Part D: Conditions Applying to Waste Disposal, Item 10, of the Water Licence. Authorized products such as paper, paperboard packaging and untreated wood may be burned.
- Under “Section 5: Solid Waste Disposal”, the Hamlet notes that it is looking into developing a hazardous waste disposal area at the Solid Waste Disposal Facilities.

- Under “Section 7: Water Quality Monitoring Program”, the Hamlet notes that it intends to take on additional sampling responsibility as part of their Surveillance Network Program which falls under the Water Licence.

Recommendation(s):

- 1) Dispose of animal carcasses in designated animal pit and cover with fill material periodically to deter any wildlife and other nuisances. Make necessary changes to the O&M Plans.
- 2) Complete the designated area that was being built as observed during the last inspection by the Water Resource Officer on August 11, 2015. The site was already being used despite not being completed.
- 3) Ensure that there is enough capacity and that current personnel are able to take on additional responsibility with regards to the Surveillance Network Program. Current sampling requirements have not been fulfilled in recent years. The Hamlet should demonstrate how it intends to be compliant in the future before taking on any additional sampling responsibilities.

Topic 17: Operations and Maintenance - Solid Waste Facility Manual

Comment(s):

- Under subsection “3.1.4 Animal Carcasses”, the plan notes that Hamlet crews will be responsible for incinerating animal carcasses. Burning animal carcasses is not authorized as per Part D: Conditions Applying to Waste Disposal, Item 10, of the Water Licence.
- Subsection “3.7 Site Personnel Duties and Responsibilities” lists Site Operator duties.
- Subsection “4.9 Fire Maintenance” notes that “There is no burning of waste at any time in the solid waste facility, aside from incineration of animal carcasses, cardboard, and untreated wood”. Burning animal carcasses is not authorized as per Part D: Conditions Applying to Waste Disposal, Item 10, of the Water Licence.
- Subsection “9.3 Bear Safety” does not include any local contact information for ENR personnel.

Recommendation(s):

- 1) Dispose of animal carcasses in designated animal pit and cover with fill material periodically to deter any wildlife and other nuisances.

- 2) Add sampling, monitoring and reporting duties to the list of duties so that Site Operators are aware of their responsibilities as per the Surveillance Network Program and trained appropriately. Compare Water Licence and supporting documents requirements against the responsibilities of staff outlined in subsection 3.7. Ensure that everything is consistent.
- 3) Remove animal carcasses in the list, keep cardboard and untreated wood, and add paper.
- 4) Include ENR personnel contact information: Bobby Ruben – (867) 580-3021

Comments and recommendations were provided by ENR technical experts in the Water Resources Division, the Environment Division and the Inuvik Region and were coordinated and collated by the Environmental Impact Assessment Section, Conservation, Assessment and Monitoring Division (CAM).

If you have any questions or concerns, please do not hesitate to contact Patrick at 920-6118 or patrick_clancy@gov.nt.ca.

Sincerely,



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