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Department of Environment

Ministère de l'Environnement

July 27, 2007

Richard Dwyer  
Licensing Trainee  
Nunavut Water Board

**via Email to:** [licensingtrainee@nwb.nunavut.ca](mailto:licensingtrainee@nwb.nunavut.ca)

**RE: NWB FILE # 3BM-KUG – HAMLET OF KUGLUKTUK – WATER LICENSE  
AMENDMENT APPLICATION**

Dear Mr. Dwyer:

The Government of Nunavut, Department of Environment (DOE) has reviewed the amendment water license application from the Hamlet of Kugluktuk regarding their sewage treatment and solid waste management facilities. Based on the DOE mandate under the *Environmental Protection Act*, we have the following comments to make.

**A. SEWAGE TREATMENT**

**1. Sewage Lagoon Design Drawing**

Reference: *Detailed Design Report for the Improvement to the Sewage Lagoon and Solid Waste Disposal Facility*, Page 6 & 19

The proponent proposed a new sewage lagoon be constructed to replace the existing lagoon, but design drawings submitted have not been signed off by a professional engineer registered in Nunavut; this needs to be addressed.

Additionally, the proponent indicated sides of the new lagoon will be lined, and the liner at the base will be keyed into the permafrost. The base of the lagoon will not be lined as permafrost will seal the base. The proponent indicated via test pitting that the depth of permafrost occurs above the base of the lagoon, but the DOE is concerned global warming and warming effect of sewage may affect the integrity and the depth of permafrost; this needs to be clarified with further information such as thermal modeling result.

**2. Treatment Wetland**

Reference: *Schematic Design for the Improvements to the Sewage Lagoon and Solid Waste Disposal Facility*; Appendix E

The proponent uses a predictive model developed by Alberta Department of Environment to describe the assimilative capacity of wetland. A temperature correction of 5<sup>0</sup>C is applied to the model. Is there any evidence that the model is effective in predicting wetland assimilative capacities in northern climates? Are there any case studies in the north where similar designs for sewage effluent treatment have shown to meet effluent discharge criteria as discussed in the project proposal?

### 3. Sewage Sludge Disposal

Reference: *Sewage Treatment Facility Operation and Maintenance (O&M) Plan*, Page 6, 7 & 13

The proponent stated that de-sludging of the new sewage lagoon will occur every 5 to 10 years, but provides no details on how this operation will occur and where the sludge will be disposed of. The proponent indicated sludge from the existing lagoon will be landfarmed and used as an interim cover for the landfill; it is not sure if this technique will be utilized for the new lagoon, and the proponent should clarify this. Additionally, it is not clear how and when (time of year) will sludge removal occur? For example, where will the community's sewage go when the lagoon is being de-sludged?

## **B. SOLID WASTE MANAGEMENT**

### 4. Landfarm

Reference: *Detailed Design Report for the Improvement to the Sewage Lagoon and Solid Waste Disposal Facility*, Page 32-33

*Solid Waste Management Facility Operation and Maintenance (O&M) Plan*, Page 5

The proponent stated that the current landfarm (for treatment of hydrocarbon contaminated soil) is not efficient because contaminated soil is permanently frozen and compacted, and suggested a new landfarm may be constructed **if needed**. The uncertainty of the proponent's intent to address the inefficiency issue should be clarified.

Additionally, the current proposed monitoring program outlined in the Solid Waste Management Facility Operation & Maintenance Plan indicated visual inspection of oil/grease will be carried out near the solid waste facility, but there is no mentioning of hydrocarbon testing near the landfarm; this needs to be addressed to prevent hydrocarbon contamination of local soil and water resources. Finally,

run-off from the landfarm should be collected in a sump, and be tested and treated if necessary prior to discharge to prevent hydrocarbon contamination.

## 5. Hazardous Waste Storage Area

Reference: *Detailed Design Report for the Improvement to the Sewage Lagoon and Solid Waste Disposal Facility*, Page 30-32

The existing hazardous waste storage area is located within the proposed new sewage lagoon area. The proponent stated existing hazardous wastes will be treated and/or removed, but there is no mentioning of testing of potential soil and/or water contamination of the area prior to construction of the new sewage lagoon.

Additionally, there appears to be no consideration of drainage for the new hazardous waste storage area, and the DOE is concerned that ponding of contaminated water could occur. Drainage should be directed towards a sump, inspected for contamination, and treated if necessary prior to discharge. Finally, an active system of snow removal should also occur to reduce runoff from the hazardous waste storage area during snow melt.

## 6. Open-burning

Reference: *Solid Waste Management Facility Operation and Maintenance (O&M) Plan*, Page 5-9

The proponent states that open burning of combustible municipal solid waste will be burned daily when condition is suitable. The DOE does not encourage open-burning, but will accept this technique as it is the only viable option in the presence for waste volume reduction and management. Based on the DOE *Municipal Solid Wastes Suitable for Open Burning* policy, we have the following comments and recommendations to make:

- Municipal solid wastes that are conditionally suitable for open burning are paper products, paperboard packing and untreated wood wastes only.
- The principle of source reduction should be utilized to reduce, reuse and recycle materials otherwise bound for landfill.
- Building demolition wastes should not be burned unless they have been sorted to remove non-wood waste such as roofing materials, electrical wire, plastics, asbestos and other non-wood wastes.
- Waste wood treated with preservatives such as creosote, pentachlorophenol or heavy metal solutions shall not be burned.

Examples of treated wood materials include railroad ties, telephone/hydro poles, pilings, cribbing and foundations.

- Having applicable permits for burning.

The DOE thanks the NWB for giving us the opportunity to review and provide comments on the amendment license application by the Kugluktuk Hamlet. Please contact us if you have any further questions or comments.

Yours sincerely,

***Original signed by***

Helen Yeh  
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Department of Environment  
Government of Nunavut