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NWB File: 3BM-KIM0911
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Via Email: *licensingadmin@nunavutwaterboard.org*

Re: Amendment Application for Water License 3BM-KIM0911

On behalf of Environment Canada (EC), I have reviewed the information submitted with the above-mentioned application. The following specialist advice has been provided pursuant to the *Canadian Environmental Protection Act*, and Section 36(3) of the *Fisheries Act*.

Background
The Hamlet of Kimmirut (Hamlet) is applying to amend their current water license. In 2000-2001 a new location for the Sewage Treatment Lagoon was selected. Due to slope stability and safety issues with the access road to the lagoon the new location was never used. As per the most recent inspection report of January 8, 2008, the current sewage treatment system consists of sewage being discharged into a ditch which then flows downslope into the ocean. The construction of the Enhanced Sewage Disposal Facility and the road to the facility were to start this summer, and be commissioned in 2010, but are pending available funding.

This amendment specifically addresses the following: sewage effluent discharge criteria; flow monitoring requirements for sewage lagoon discharge; and the method of sewage disposal during construction of the Enhanced Sewage Disposal Facility. Additionally, the Hamlet has provided the Nunavut Water Board (Board) with three plans for review; these include: Plan for Compliance; Quarry Management Plan; and Draft Operations Maintenance (O&M) Manual for the Wastewater Treatment Facility.

Environment Canada provides the following recommendations for the Board's consideration with respect to the above mentioned Water License Amendment:

Sewage Effluent Discharge Criteria
Based on May 11, 2009 letter from Trow Associates Inc. (Trow) to Bhabesh Roy, Municipal Planning Engineer with the Government of Nunavut, it is understood that the Hamlet is proposing to:

- Set the compliance point at the outlet of the lower lagoon (KIM-6 and KIM-7)
  - EC is not opposed to the compliance point being set at the outlet of the lower lagoon (KIM-6 and KIM-7), and removing KIM-3 from the license requirements.
- Set the discharge criteria as follows: BOD 135 mg/L, TSS 140 mg/L, Faecal Coliforms $1x10^6$ CFU/100ml, Oil and grease to have no visible sheen, and pH between 6 and 9.

- EC was advised by Trow during a teleconference Feb. 13, 2009 that the predicted effluent quality from the lagoon would be 216-230 mg/L for BOD5 and 172-240 mg/L for TSS. Has the design changed to result in substantially lower predictions? Or are these lower numbers based only on the application of Iqaluit's dilution rates? EC is not opposed to the proposed discharge criteria, if the Hamlet can demonstrate by meeting these limits at the lower lagoon outlet, BOD and TSS are measured as being 45 mg/L or less, by the end of the wetland.
- Monitoring frequency performed by the Hamlet should be sufficient to inform how the system can best be managed to optimize treatment. For example, timing of discharge will be a factor in how effectively the wetland can take up nutrients and incorporate solids; discharge should occur gradually over the warmer months to ensure that the effluent has enough treatment time in the wetland system.

- "The water license be amended such that in the event the results of the monitoring program exceeding the effluent criteria listed above, the precipitation record will be reviewed to determine the actual rate of dilution and the affect it would have on the monitoring sample," as a quote from the above-mentioned May 11, 2009 letter.
  - EC recommends that the Hamlet's better characterize the precipitation and dilution rates whether or not there is an exceedance in effluent criteria. Following the Feb. 13 teleconference, Trow Engineering (on behalf of the Hamlet) was to provide an estimate of the upstream lake flows to identify the effect of flow on effluent quality predictions.
  - EC does not support subsequent dilution studies as the response to licence exceedances; other contingency actions should be planned for in the event of higher-than-expected effluent quality results. The Hamlet should have a contingency plan in place that stipulates how to respond to an exceedance of licence effluent criteria (e.g. could the effluent be stopped from discharging, or retained longer in the wetlands), and what measures will be taken to ensure discharge criteria are met on an ongoing basis. This plan should be included in the O&M Manual.
  - If monitoring of the discharge quality from the wetlands shows that better than anticipated treatment is being achieved, there may be justification for revisiting lagoon effluent criteria.
- EC notes that the CCME Strategy for the Management of Municipal Wastewater has been signed, and that northern jurisdictions can expect performance standards for BOD5 and TSS to be regulated following a five year period which starts in 2009. We anticipate that the standards for these parameters may be higher than the 25 mg/L for each that is proposed for the southern jurisdictions and the Yukon. Also, it should be noted that carbonaceous Biological Oxygen Demand (cBOD) will be the regulated parameter, and it would be prudent to add this to the list of licence parameters now, in order to gain some idea of the system's track record over the next five years.

Flow Monitoring Requirements for Sewage Lagoon Discharge

- It is important to measure the quantity of effluent entering the wetland to ensure that proper treatment is occurring, especially given the high amount of precipitation entering into the lagoons. The Hamlet proposes to estimate sewage based on the pumping rate and the duration of pumping at sampling locations KIM-5 and KIM-7. EC agrees that this is a more accurate method of measuring discharge than the traditional method of setting discharge rates to equal water consumption rates.

Method of Sewage Disposal During Construction

- The Hamlet must ensure that any effluent discharged must be in compliance with Section 36(3) of the *Fisheries Act*. According to the *Fisheries Act*, Section 36(3), the deposition of deleterious substances of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter any such water, is prohibited.

Plan for Compliance

- The current Plan for Compliance does not fully demonstrate how the Hamlet will come into compliance with the current Water License. EC is concerned that renovation of the road and upgrading of the lagoon system has been postponed until 2010 or possibly later.
- The current disposal method is unacceptable, and steps should be taken to install treatment without delay.

Quarry Management Plan

- Section D, Management and Restoration Plan
    - In order to properly evaluate this section and assess the restoration of the site, review of the Abandonment and Restoration Plan is needed. Management of drainage and erosion control measures are particularly relevant during the operation of the quarry in order to ensure that no deleterious substances enter any fish-bearing waters or sensitive environments. In the *Answers to the Requirement/questions to the Hamlet of Kimmirut's Water License 3BM-KIM0911* the Hamlet states that a "consultant will be working on this plan." EC requests that the Hamlet provide a timeline for the completion of this Plan.
- Appendix E, Spill Contingency Planning
    - The information provided in Appendix E is not a spill plan, but the requirements of a spill plan. A Spill Contingency Plan specific to the quarry operations and infrastructure should be prepared. The plan should include, but not be limited to: information to facilitate response to spills which might occur during construction and operation and decommissioning of the quarry; a list and location of available spill response equipment; and, a list of names of trained personnel who will be on-site and/or available in the case of a spill. Please refer to the Spill Response Plan included in the Draft O&M Manual Wastewater Treatment Facility as an example.

Draft Operation and Maintenance Manual – Wastewater Treatment Facility

- Chapter 6, Normal Operating Procedures, Section 1, Berrn Maintenance and Inspections
    - The maintenance and inspection of the berms is important and this information needs to be provided in the final version of the O&M Manual.
- Chapter 6, Normal Operating Procedures, Section 2 Sludge Management
    - EC would like to request more information regarding the Sludge Management Plan. It is unclear when desludging will occur. Currently the plan says that "degradation of the performance of the lagoon is normally caused by sludge accumulation and will be the indicator to desludge the lagoon." How will this be determined?
    - EC requests that the Hamlet provide an estimate of the quantities of sludges likely to be produced, and an estimate on the frequency of the extraction from the lagoons.

    - EC also requests that desludging procedures be developed for environmentally sound removal and disposal. These procedures should include characterization to ensure disposal options are appropriate.
- Chapter 6, QA/QC Program, Section 4, Compliance Point
    - In the event of a non-compliant sample, how will the effluent flow be stopped and held until compliance can be met?
- Chapter 7, Spill Contingency Plan, Section 4, Contacts & Regulatory Authorities
    - It should be noted that EC has mandated responsibilities arising from the *Fisheries Act* 36(3), in addition to the *Canadian Environmental Protection Act*, and as such both acts should be listed under 'Legislation'. As well, on page 4 of the Spill Response Plan for the Wastewater Treatment Facility, the phone number for the Environment Canada Enforcement office is incorrect. The correct number is (867) 975-4644.
- Chapter 7, Spill Contingency Plan, Section 6, Reportable Spill Quantities
    - All necessary information is included in this section; however, the following statement should be made very clear in the document, all spills, regardless of quantity, that occur near or into fish-bearing water, shall be reported immediately to the 24-hour Spill Line, (867) 920-8130.
- Chapter 7, Spill Contingency Plan, Section 8.3, Spill Kit Location
    - No spill kit locations are provided in this document. The final copy of the Spill Contingency Plan should include specific locations of spill kits.
- Chapter 8, Maintenance
    - It should not be necessary to wait until the wastewater treatment system is in place prior to completing this section. Based on the design, it should be possible to identify required maintenance and the likely frequency of this maintenance. This section should be reviewed and, if necessary, updated after commissioning.
- Chapter 9, Testing and Certification Data
    - Based on the design, it should be possible to complete some aspects of this section, or if not, then the Hamlet should identify what information is required to complete this section.

If there are any changes in the proposed activities, EC should be notified, as further review may be necessary. If you have any questions regarding the foregoing please contact Carrie Spavor at (867) 975-4631 or via email at carrie.spavor@ec.gc.ca.

Yours truly,

Original signed by

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cc: Carey Ogilvie (Head, EA-North, Environment Canada, Yellowknife, NT)
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