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9545-1-3PELG / CIDMS # 159674

August 7th, 2007

Phyllis Beaulieu
Licensing Administrator
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU, X0A 1J0

Re: Licence Renewal Application – Kugaaruk Sewage Lagoon – Government of Nunavut, Department of Community and Government Services

Indian and Northern Affairs Canada (INAC) has performed a review of the licence application for the Hamlet of Kugaaruk sewage lagoon submitted to the Nunavut Water Board (NWB). In conducting our review INAC has made reference all documents in the 3BM-PEL file on the FTP-site.

Sewage and Solid Waste Sites, Detailed Design Report, Phase 2 (July 2007)

Section 3.2, Design Outline, mentions rock will be blasted out of the centre of the lagoon area to substantially increase the capacity of the lagoon. INAC requests a statement from the applicant, in the Detailed Design Report, as to the competency of the rock underlying the proposed lagoon. Does the applicant have a contingency plan in the event the rock underlying the proposed lagoon is incompetent?

Section 3.3.4, Decant System, states *"the lagoon will be annually discharged by emptying effluent into the receiving environment from the discharge end of the lagoon using a 300mm diameter HDPE pipe embedded at the base of the berm."*
INAC requests the applicant include a statement in the Detailed Design Report addressing the following INAC concerns.

a. Constructing a pipe or any conduit through an embankment dam is considered to be poor practice from a dam safety and stability perspective due to the potential for concentrated seepage flow, deformation or cracking of the pipe and the inability to inspect its condition.
b. The pipe is composed of HDPE, which may be incapable of withstanding imposed loads.
c. The pipe may freeze up due to the cold ground temperatures at the dam toe.

Furthermore, INAC recognizes the above concerns were also identified in the Cape Dorest Sewage Lagoon Application. Though the Cape Dorest and the Kugaaruk

Sewage Lagoon Applications are distinct, INAC feels the above technical comments from the NWB's review of the Cape Dorest Sewage Lagoon Application also apply to the Kugaaruk Sewage Lagoon Application.

Section 3.4, Spill Contingency Plan (SCP), states "*a full Spill Contingency Plan will be included in the Operations and Maintenance Manual once the new site is complete*". INAC agrees with Mr. Livingston's suggestion that the plan be submitted within thirty (30) days of licencing (see page 4 of the July 10th letter from Mr. Livingston to Phyllis Beaulieu). INAC suggest the NWB require the applicant to include the INAC Inspector as an initial contact for all spills, similar to what is presented for Earle Baddaloo. INAC also requests the opportunity to review the said SCP once it is submitted to the NWB. Additionally, INAC suggests a final Operations and Management Plan be submitted with thirty (30) days of licencing.

Section 3.5, Landfarm, notes that sewage sludge excavated from the lagoon will likely be treated in a landfarm within the municipal solid waste facility. INAC suggests the NWB include a licence condition requiring that a Sewage Sludge Disposal Plan be submitted a minimum of thirty days prior to disposal in the landfarm. The Sewage Sludge Disposal Plan should include information pertaining to the location of sewage disposal, the quantities to be disposed of, the design of the land farm and monitoring plans.

Section 3.7, Monitoring, describes the proposed sampling parameters, frequency and location. Since the wetland model as presented cannot be substantiated by any Nunavut specific guidelines, INAC would prefer the applicant present all bi-monthly sampling results as a portion of the Annual Report. Presenting such data will aid in the verification of treatment wetlands as a sewage treatment method north of sixty. INAC suggests that data be presented in an electronic format that will lend itself to analysis. The sample points presented in Section 3.7.3 will provide valued information as to the treatment effectiveness of the proposed lagoon design. That said, INAC suggests sample points 1 and 2 be incorporated as SNP sites. This will provided insight into the effectiveness of the proposed sewage treatment system, while also providing further data to support this type of treatment approach in Nunavut from an Inspectors perspective.

Furthermore, INAC recommends the sampling locations be selected in concert with the INAC Inspector. Specifically, the exact location of all SNP sites should be determined during the next inspection. The final sampling locations should then be presented on a map, which clearly presents the sampling locations. Until such a time that the INAC Inspector is able to visit the site to determine the final SNP sites, the individual responsible for sample collection within the Hamlet staff should clearly mark the sampling location for the sake of consistency.

INAC would encourage the applicant to consult the *INAC QA and QC Guidelines for use by Class "B" Licensees in Collecting Representative Water samples in the Field and for submission of a QA/QC Plan (1996).* This will ensure that all data collected as part of the monitoring program is of value for future analysis.

Part II

The measured historical values for BOD_5, Total Suspended Solids, Fecal Coliform and Ammonia (as presented in pages 4-6) should be verified in the Annual Report. Any discrepancies between the data presented in this application (as maximum expected limits) and future monitoring data should be clearly described. INAC suggest the NWB include the requirement for discussion on discrepancies between data set as a condition of the Annual Report.

The applicant has listed three contingencies should the sewage lagoon not be completed prior to winter conditions (see pages 10, 11 of Part II). INAC requests the proponent inform the INAC Inspector of their preferred contingency plan in a timely manner should a contingency measures be required. Furthermore, INAC requests the applicant be required to submit a project contingency plan to the NWB for review in the event the sewage lagoon construction is not complete prior to winter conditions.

AMEC Response to Nunavut Water Board Review

In their response to NWB Review, question 6a, AMEC states *"the proponent agrees that thermal monitoring is important to provide additional data that could be used to develop mitigation against potential seepage and thawing. Hence monitoring program is proposed during operation of lagoon."* In referencing Section 3.7, Monitoring Program, of Detailed Design Report, Phase 2 (July 2007) there is no mention of thermistors being used as part of the Monitoring Program. INAC requests that the applicant clarify whether of not thermistors will be used in monitoring. If the applicant intends on using thermistors for thermal monitoring INAC requests the applicant provide details as to the location of the thermistors, preferably within the design plans.

Should you have any questions or comments, please do not hesitate to contact me at (867) 975-4548 or by email at BathoryS@ainc-ianc.gc.ca.

Sincerely,

Original Signed By

Stephen Bathory
Regional Coordinator