11. The Licensee shall measure and record the annual quantities of Sewage solids removed from the Sewage Disposal Facility.

12. Additional monitoring stations, sampling and analysis may be requested by an Inspector.

13. The Licensee shall include all of the data and information required by the Monitoring Program within the Licensee's Annual Report, as required under Part B, Item 1, or as requested by an Inspector.

14. Modifications to the Monitoring Program including the Monitoring Program Stations and parameters may be made only upon written approval from the Board.

APPENDIX E –
ECCC Comments on 2014 WL Application

Environment Canada Environnement Canada

Environmental Protection Operations Directorate (EPOD)
Prairie and Northern Region (PNR)
Qimugjuk Building
P. O. Box 1870
Iqaluit, NU X0A 0H0

Janurary 6th, 2014

EC file: 6200 000 005
NWB file: 3BM-TAL0813

Megan Porter, Licence Administrator Assistant
Erik Skiby,Assistant Technical Advisor
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0 Via: megan.porter@nwb-oen.ca

Attention: Erik Skiby

RE: Renewal/amendment of Type "B" municipal water licence, Hamlet of Taloyoak

Please find attached Environment Canada's (EC) submission to the Nunavut Water Board with our technical comments on the renewal/amendment of a Type "B" municipal water licence for water use and waste disposal activities associated with the Hamlet of Taloyoak in the Kitikmeot Region of Nunavut. The amendment is to incorporate and regulate an un-engineered wetland area as part of the sewage and solid waste facilities for the Hamlet's water license.

For further clarification on any aspect of the submission, please contact John Price at (867) 975-4636 or john.price@ec.gc.ca.

Sincerely,

Carey Ogilvie
Head, Environmental Assessment North

Attachment(s) – Review of Taloyoak Water License Renewal

cc: Anne Wilson (Senior Sector Expert, EPOD-PNR, EC)
Michael Mohammed (Senior Environmental Assessment Coordinator, EPOD-PNR, EC)

Review of Taloyoak Water License Renewal

EC offers the following technical comments regarding water quality considerations for the Taloyoak Sewage Lagoon System:

1. EC recommends that regulated limits be set for sewage effluent (as defined in the water licence) at the point where the detention lagoon discharges to the wetland channel. Water quality objectives should be met at the end of the wetland, prior to discharge to fish-bearing waters.

2. EC notes that the wetland treatment area photos (Page 22) depict a stream-like flow, rather than a more widely-dispersed flow typical of wetland treatment areas. In order to optimize treatment of effluent in the wetland area, EC recommends that the Proponent explore drainage management options to increase effluent treatment/retention time in the wetland area.

3. Treatment would be improved by a minimum wastewater retention period of 365 days. EC recommends that evaluation of the existing retention time be carried out, and that an assessment be done of the need to plan for retention or control structures for the natural lake lagoon.

4. EC notes that the wetland channel down-gradient from the sewage lagoon system is used to provide “natural remediation” to effluent from the sewage lagoon system and to leachate from the solid waste facility. EC recommends that the wetland component of the treatment system be characterized to evaluate the capacity of the wetland (i.e. retention times, hydraulic and organic loading rates) and determine how to optimize treatment.

5. The Proponent is encouraged to investigate options to improve the quality of final effluent by controlling inputs into the wastewater system through diverting hazardous chemicals.

6. All effluent discharges must meet the *Fisheries Act* requirement that any deposits to waters frequented by fishes be non-deleterious. EC recommends that effluent quality at the end of the treatment system should strive to meet or exceed the *Wastewater Systems Effluent Regulations* SOR/2012-139 Fisheries Act Registration 2012-06-29.

   Specifically:
   a. Average carbonaceous biochemical oxygen demand (CBOD) due to the quantity of CBOD matter of less than or equal to 25 mg/L;
   b. Average concentration of suspended solids of less than or equal to 25 mg/L;
   c. Average concentration of total residual chlorine of less than or equal to 0.02 mg/L ;

d. Maximum concentration of un-ionized ammonia of less than 1.25 mg/L, expressed as nitrogen (N), at 15°C ± 1°C; and
e. Non-acutely lethal effluent.

Although the new *Wastewater Systems Effluent Regulations* do not currently apply to the North, EC recommends monitoring and sampling be aligned with the requirements of the *Wastewater Systems Effluent Regulations*.

7. EC recommends that a Monitoring Plan be developed, including, but not limited to, the following components:
    a. Lagoon system should be inspected weekly to ensure the integrity of all components;
    b. Effluent sampling during discharge to the wetland area;
    c. Toxicity testing should be performed on the effluent once a year, using the rainbow trout toxicity test. The sample should come from the point designated by the NWB as the final discharge point.
    d. Water quality monitoring of sampling sites along the wetland discharge path; and
    e. Contingency planning to address situations including, but not limited to:
        i. Effluent does not meet release criteria at annual release period;
        ii. Effluent does not meet release criteria and lagoon is full;
        iii. Erosion of lagoon berms and/or effluent decant point; and
        iv. Lagoon has less than the required capacity and effluent is not being held long enough for sufficient treatment.

8. All monitoring information should be recorded.

9. EC recommends that a Lagoon Spill Plan be developed to address any spills or releases of wastewater that does not meet the release criteria. Potential situations to plan for could include, but are not limited to:
    a) Breach of lagoon berm;
    b) Influent exceeds capacity of lagoon; and
    c) Erosion of lagoon outflow areas.

    EC recommends that the Plan includes spill response procedures and reporting procedures.

10. EC recommends the use of secondary containment, such as a lined pad and berms, for storage and transfer of substances and/or products that are potentially deleterious to fish.

11. EC recommends that a detailed Operation and Maintenance Plan, including updated diagrams, be provided for both the Solid Waste Facility and the Sewage Lagoon System. The plan should identify measures that are to be taken to ensure treatment efficiencies are not reduced over the operating life of the

lagoon. In addition, an O&M checklist, complete with record-keeping forms, should be developed for both the Solid Waste Facility and the Sewage Lagoon System.

EC offers the following technical comments regarding water quality considerations for the Taloyoak Solid Waste facility:

1. EC notes that "burning on site" is listed as a waste treatment method (water licence renewal application, Page 10). EC recommends this practice be discontinued as the release of toxic by-products (including dioxins and furans) can lead to contamination of air, soil, and water, and subsequent uptake through the food chain;

2. EC notes that the water licence does not specify effluent quality standards for leachate released from the solid waste facility. EC recommends that the water licence be revised to include regulated limits for leachate run-off from the solid waste disposal facility (at a minimum, pH, TSS, and metals). EC suggests that the compliance point be established where the leachate enters the wetland area. Contingency measures should be developed to manage leachate that does not meet the regulated limits.

3. Compliance with the *Fisheries Act* is mandatory and therefore all discharges to fish-bearing waters must be non-deleterious. Consequently, the Proponent must ensure that discharges from the solid waste facility do not result in the deposit of a deleterious substance into the marine receiving environment.

4. EC notes that, although hazardous wastes are segregated from other wastes within the metals dump area, there are no measures for appropriate storage and disposal of these items at this time. EC recommends that the Proponent develop and implement a Hazardous Waste Management Plan, including as a minimum:
    a) Site requirements, including signage;
    b) Appropriate secondary containment;
    c) Recording keeping and waste tracking;
    d) Leachate Management Plan;
    e) Spill/Release Contingency Plan;
    f) Procedures for handling, storage, shipping and monitoring of hazardous wastes;
    g) Final Disposal Plan; and
    h) Personnel training.

5. EC notes that a new monitoring station, located at sampling station TAL-5 (hazardous storage cell retention water) will be sampled only when decanting is required. EC recommends that the Water Board establish regulated limits for the release of hazardous storage cell retention water.

6. In order to reduce the generation of leachate, EC recommends the use of Best Practices to minimize water / snow contact with the waste. Such measures could include:
    a. Snow fencing;
    b. Ditches to divert clean water away from waste disposal site;
    c. Maintenance of slope / grade away from waste disposal site;
    d. Removal of snow from disposal site prior to placement of waste during winter;
    e. Removal of snow from disposal site prior to spring thaw;
    f. Regular compaction of wastes;
    g. Intermediate covering (prior to spring thaw), in addition to final capping of wastes;
    h. Regular visual inspections for integrity of Solid Waste Falicity (SWF) and water management system; and
    i. Regular maintenance of SWF features and prompt repair as required.

7. EC recommends that the Proponent ensures that leachate run-off from the solid waste disposal site into the wetland channel is compatible with the treatment provided by the wetland area and will not upset the treatment process.

8. EC recommends that the environmental monitoring includes, but is not limited to:
    a. Surface water monitoring;
    b. Groundwater monitoring;
    c. Leachate monitoring; and
    d. Monitoring of integrity of solid waste disposal facility.

9. EC recommends that the Proponent develop contingency plans that include, but are not limited to, the following situations:
    a. Monitoring results that indicate the development of a leachate plume outside waste disposal area; and
    b. Monitoring results that indicate contamination of surface water and/or groundwater.

10. EC recommends that a post-closure plan includes detailed information regarding post-closure monitoring of:
    a. Leachate;
    b. Surface water quality;
    c. Groundwater quality;
    d. Cover integrity (avoidance of cracking, ponding, erosion); and
    e. Integrity of clean water diversion structures (such as ditches).

11. EC notes that scrap vehicles, appliances, tires, and vehicle parts are disposed in the metal dump area. EC recommends that refrigerants and fluids from this waste be recovered and managed in accordance with Best Practices and

applicable legislation. Establishing a backhaul program may assist with managing scrap metal and tires.

12. The following publications may be of assistance:

    a. The Yukon Solid Waste Action Plan http://www.community.gov.yk.ca/cd/waste_management.html

    b. Magee, G. and Rice, W. 2002. Rethinking Landfill Development and Operation in Permafrost Regions, in Cold Regions Engineering: Pages 910-921.

    c. Wastewater Systems Effluent Regulations http://laws-lois.justice.gc.ca/eng/regulations/sor-2012-139/FullText.html