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Department of Community and Government Services
Nunalingni Kavamatkunnilu Pivikhaqautikkut
Ministère des Services Communautaires et gouvernementaux

October 15, 2013

Re: Response to Technical Review Memorandum by AANDC

Renewal Application for Licence 3BM-GJO0409, Hamlet of Gjoa Haven, NU

In response to the Technical Review Memorandum, we would like to explain those items and sections as outlined for clarification. We also note that the review process was prepared based on submission by GN & GN hired consultant and on inspection reports, subsequent compliance plans and obligation submitted by GN CGS also carried information and commitment for consideration in meeting requested requirements.

1 Project Descriptions

First Renewal application submitted by Dillon Consulting Ltd in 2010, after that, some improvement and information updated in our compliance plans dated Dec 12, 2012 and Aug 19, 2013. Another updated Renewal application was submitted on Aug 18, 2013 by CGS. Summary of those plans and renewal request are as follows:

- Notable improvement has been recorded in terms of facility monitoring, water & waste water sampling, signage installation, facility containment & securing, operators training, requirements identify and management planning. Information was submitted to the Board time to time with compliances including O&M manuals for sewage lagoon and Solid Waste facilities (Aug 15,'13).
- Summer 2012 through 2013, samples results shown excellent improvement & compliances of sewage effluent and leachate run-off parameters.
- No evidence of E. coli or Bacteria noticed in supply water. Other parameters including turbidity, TSS, TDS, Cu, Fe, Mn, Ca, SO₄, NO₂, NO₃, P^H, oil & grease all are within very low level or absent compare to the respective MAC limits for water and wastewater.

2, Section A General Conditions of Licence

- A number of commitments and goals have been reached by this short time comprising Annual Reports, facility monitoring, reporting, sample testing, operator's training, awareness and compliances, QA/QC of facilities and environmental protection.
- Quantity of water supply and sewage disposal are measured on truck fill and Fluid Manger reports. There is no other technical device for these items.
- Fresh water intake volume is also measures from pipe flow rate and pump running duration daily



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- No decanting from lagoon. Amount of effluent discharge through overflow pipe is continuous and happened only in summer & fall.
- The Licensee will continue reporting in every year activities by March 31 of the following year.
- Water was drawn from the Swan Lake during the period of 2009 and 2010. There were some improvements carried in terms thawing, repairing and control monitoring for the line completed in January 15, 2009. But due to some human error and lack of adequate training, the line frozen in Jan 17, 2009. Because of extreme cold weather, repair works delayed until summer thawing. The water supply for the gap duration carried from truck fill station at the intake pumphouse. The final repair of frozen line completed in summer 2010 and thereafter water supply continued through the treatment plant. The licensee is looking into the missing annual reports submission for 2009 and 2010, once find a copy or information requiring the report, will be updated with the Board as requested.

Section B Water Use

Water released outside from the pipeline during the period of February and March 2013, was not continuous and only happened on a certain day and time. Also, it wasn't always through from fresh water intake, sometimes only from the section of the pipeline affected due to freezing up. We explain the information received from the plant operator as below:

- On March 01, 2013, the plant operator noticed temperature dropping to 1°C (temperature for normal flow inside pipe 7-10°C) at Reheat Station- 2 (RHS -2). This dropping of temperature is the sign of possible freezing the line.
- On March 02, 2013 between 12:00-12:45 a.m., the waterline frozen and stopped water supply to the treatment plant. The operator assisted with a local contractor managed to bring the flow back in the pipe line and supply water to treatment plant at 3:00 a.m. by reheating the water from both ends of RHS-1 and RHS-2, released excess water outside the pipeline and allowed water continuous flow. At that time water was flowing at a lower rate of 6 Lps (Liter/second).
- On the same day at 9:00 p. m, the main pump was stopped due to lower flow and water level inside the tank was at 3.25m and water system went back to recirculation mode.
- On March 03, 2013 at 12:45 a. m, waterline was frozen at the section between RHS-1 and RHS-2.
 The plant operator with the help of local contractor managed to bring back the flow of water by
 continuous reheating at both ends and releasing water outside from this section. Once the heat
 regained, water started flowing normal and maintained flow rate as regular.



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2. Section C Operation and Maintenance

- The solid waste site is protected with a berm and fence at the side of wetland where sewage effluent final discharge runs outside the solid waste site. Run-off from solid waste site flows onto the ditch area at the south-west corner inside the facility and retain there with the berm.
- The only time the leachate-water can go out through overflow at the S-W corner (where previous overflow pipe removed and filled, but at a lower height) and this can happened during early summer when snow melt water collects from surrounding area inside and outside of solid waste facility. This overflow is within the monitoring station on wetland and after that the discharge takes place over the meandering vegetated spongy wide area before final drop to ocean.
- Run-off from solid waste facility retains inside the facility most of the time and dry up- a new station has been set up there (GJO-5) for sampling when requires for decanting the run-off. But, no sample was available after the July sample from this station.
- The sewage lagoon is confined with a berm all around and far away from solid waste facility.
 Retained sewage water runs through overflow pipe into the second cell and then finally flows onto wetland through the permeable lower height berm.
- Sewage effluent can only be mixed with solid waste run-off at the final discharge point to oceanwhich is allowed and designed that way.
- The licensee is aware of capacity and isolation of hazardous materials from general dump. A plan for waste segregation, hazardous materials isolation, composting and possible shipping out is already implemented from this summer. Hamlet has completed an environmental inspection and prepared a list of work scope, cost and schedule for such improvement for solid waste site. Major activities of cleanup and segregation are in plan for next summer 2014.

2, section D Modification and construction

- Current lagoon collapsed in 2006 and raw sewage discharged outside as noted in the letter. After 2006, containment has been improved with addition berm materials and rise in freeboard as per requirement. The only information about the berm is localized seepage across the berm at areas in the place of previous overflow pipe removal and through section of larger pervious materials.
 Seepage happens only in mid-summer when retain sewage completely melts and shape to flow.
- There is new overflow pipe between the primary and secondary cell which regulates sewage discharge from primary cell. AANDC inspection reports this information time to time, but no evidence or possibility of collapse after the occurrence in 2006.
- A Dam stability inspection has been carried by a consulting Geotechnical Engineer on Sep 17 & 18, 2013 and received draft report with comments summary as:



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The slopes of the lagoon berm are very steep and are being subjected to seepage forces in some areas, the fill that has been dumped on top of the original berm is very loose since it was not graded or compacted and the material used in construction of the berm is very permeable and as such the lagoon is expected to continue leaking. The slopes of the berm are considered inherently unstable and could fail at any time. It is therefore, recommended that the use of this lagoon should be discontinued and the lagoon decommissioned when the new lagoon is operational.

- New lagoon is completed and will be available for operation after final inspection certificate. The approved design drawing and construction drawing for this new lagoon has been submitted to the Board as required under Part E of the Licence. As-built drawing O&M manual for new lagoon will be submitted to the Board once receipt from the consultant.
- The lagoon has been initiated with the request of the hamlet with approval and with the requirement of sewage disposal due to issues of existing lagoon.
- The abandonment and restoration plan for current lagoon yet to be prepared by the consultant as part of the contract for new lagoon project. The Board will be updated within the scheduled duration of compliance to part G of the Licence.

We like to thanks the Board for facilitating the Licence Amendment Review process and requesting to include other information in our subsequent submission as well. Should you have any question or concern, please contact me at 867-983-4156 or by e-mail.

Regards,

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Cc. Phyllis Beaulieu, Manager of Licensing, Nunavut Water Board Murray Ball, manager of Water Resources, AANDC Rory MacDonald, Water Resources Technician, AANDC