EXECUTIVE SUMMARY:

Hamlet of Gjoa Haven has prepared the Annual Report 2017 to be submitted to the Nunavut Water Board to meet requirements of the Nunavut Water Board Licence 3BM-GJO 1318, Part B General Conditions, through part H conditions to the monitoring program. This report covers the period from January 01st, 2017 to December 31st 2017.

The Licensee has drawn water from the big Swan Lake through twin intake pumps, transformed the reheated intake water by 6 inch HDPE buried line to the Treatment Plant building 3.0 km away where this water has been treated using pressure filters followed by chlorination before truck fill outside by the hamlet trucks and delivered to household tanks for community water needs. Quantity of water uses during this period was about **45,919** m3, within allowable limit 62,000 m3 annually.

Sewage waste collected from household sewage tanks using hamlet operated vacuum trucks, hauled to community sewage lagoon and discharge at the designated dropping point. Raw sewage stayed inside the lagoon during the period Oct through June for almost 9 months freezing where these receive primary treatment naturally. Annual decanting carried during October to reduce quantity inside and make room for new candidate sewage waste. Samples collected from defined designated monitoring stations and tested at Taiga Laboratory Yellowknife.

Batteries, waste oil and waste paint drums replaced inside the seacan placed at Solid waste facility – plan for shipping out from site with certified handler. Non-hazardous waste disposed at the Solid waste facility using hamlet operated truck and pushed down with local cover materials.

Water system upgrade and SCADA monitoring repair:

About 1200m length of the buried water line was replaced in 2015 with HDPE insulated pipes of same diameter, but upgrading of reheat stations and re-sizing of pumps and heat exchanger carried during May-Oct 2017. This replacement was required to continue water supply from intake pump house that has suffered winter freeze-up partly during last 2-3 years. Monitoring of water supply, SCADA upgrading, PLC program and Chlorine measuring device replacement were carried during the summer and fall. With this replacement, water intake and supply efficiency increased but no changes to system, structure or program.

Increased amount of Chlorine in treated water were reported in some occurrences but minimized such escalation of chlorine by controlling the dosing and reducing the amount of extra chlorine addition into overnight trucked water. No other concern was reported in treated water or raw water quality. The licensee has maintained of sending water samples for parameters test to Taiga Lab in Yellowknife and bacteriological test samples to EHO lab in Cambridge Bay.

The amended and additional O&M manual for Free Chlorine measuring system, SCADA sensors and PLC upgrade including the as-built drawings were received and ready to send to Nunavut Water Board separately.

Part B: General Conditions:

- Tabular Form of Annual water consumption and sewage disposal are filled in NWB Form
- Quantities were measured on daily basis of water distribution and sewage disposal
- New engineered lagoon is in operation and changes the monitoring point to new drop-off and decanting locations.
- No modification to sewage waste wetland or solid waste site during 2017
- No unauthorized discharge or disposal to effluent or waste during this period.
- O&M manuals for sewage and solid waste facilities remains active, except an addition to Chlorine measuring and SCADA system upgrade for Water treatment and supply.
- Monitoring stations locations marked and updated with sign for the new station GJO-2 and GJO-4. Scope signage in standard Official languages of Nunavut not yet completed.
- No device Meter was used for volume measurement, however, truck-fill measurement uses
- Plan of Compliance remained active and implemented as approved by the Board.

Part C: Water Use:

- All water drawn from the Swan Lake for annual demand which was about **45,919** cubic metres and within the allowable annual limit **62,000** cubic metres.
- No erosion at the intake point or close proximity of pumps sucking point. Intake screen inside the lake intake point with clearance from bed and allowance frozen layer on top by 3m plus. No material removed from lake or intake bed near the screen.

Part D: Waste Disposal

- The municipal sewage waste contains both grey and black water; urinal& toilet flush water mix with bath & kitchen water in the same tank. Combined sewage stay inside the house tank for average 3-4 days before collecting by vacuum truck to discharge into the lagoon.
- Amount of sewage generated during this period 01 Jan - 31 Dec is less than 43,000 m3. Quantity of sewage is calculated considering 90-95 % of water supply by truck.
- All sewage and solid waste disposal done to the designated location of sewage lagoon and waste facility using hamlet operated trucks. Sewage and effluent samples were taken from location Station GJO-3A and Final Discharge Point GJO-4, test result shown contaminants parameters within allowable limits (FC: 10,000 CFU/dl; BOD_5:80; TSS: 100; P^H: 6-9; Oil & grease: none for station GJO-4). Results are attached including a summary.
- Freeboard at sewage lagoon remained more than1.0 m since it was decanted.
- The existing wetland area and facilities used for effluent treatment and remediation. Test results shown the effluent from Final Discharge Point (GJO-4) within limiting values (BOD: 80; TSS:100; 10,000 CFU/dl; P^H: 6-9) and not acutely toxic to Rainbow Trout or crustacean fish food.

Non-hazardous domestic Solid Waste:

- Solid wastes were disposed in the waste facility which is fenced in 3-sides and and leachate run-off at the downstream where sampled and tested at Taiga Lab. It requires some works to segregate hazardous waste from regular waste and secure confined or containment.
- Light materials, paper, paper boards and loose materials segregated and reduced by slow burning inside trench and pushed down burn ashes under the cover materials inside.
- Animal carcass supposed to bury inside sand-pit and cover, but lack proper cell inside the facility has limited the activity and therefore could not be secured. The AANDC inspector has raised this concern during the inspection. The Licensee will prepare some measures in coming summer to deal with animal carcass management.

Part E-G: Modification, construction, operation, A&R

- No modifications to sewage or solid waste facilities and operational plan since developed.
- Upgrading to SCADA control, PLCs system and Free Chlorine measuring devices carried during this period. The operational manual and as-built drawing are ready for submission to the Board.
- No spills occurred during this period. No reclamation to facilities and therefore, no activities related to vegetation growth or seed deposition carried.

Part H: Monitoring Program

- Annual monitoring of sewage and solid waste effluent has been carried during the summer and fall by the Licensee and the consultant at the water treatment system. Annual cleanup to water storage tank was carried and water samples were tested before delivery. Effluent samples were taken from monitoring stations where available as indicated in Part H of the licence, tested at Taiga Laboratory, Yellowknife (CALA approved). Test results are included.

  Station GJO-4 noted as the Final Discharge point from wetland to ocean; therefore, parameters constraints are mostly applicable for sample taken from this station.

  Station GJO-2 has been re-arranged on the wetland where sewage effluent run off merges to solid waste effluent before ending to Final point GJO-4. GPS addresses were established for new location and included in the report.