Leak Testing of the new South Lagoon of Hall Beach

Nunavut Excavating has advised EXP of the following course of action for ascertaining the source of leakage from the new South Sewage Lagoon in Hall Beach and advancing remedial work to stop the leakage.

Justification

During July 2018 it was reported that bubbles were observed in the liquid retained in the new south sewage lagoon, and that the cell was completely drained by the end of July. In response to this event EXP Services Inc. (EXP) mobilized to the site on August, 2018 to conduct an assessment of the sewage lagoon cell. The assessment was conducted with the assistance of the contractor, Nunavut Excavating, who operated available equipment to assist in the work. The assessment was conducted to identify possible causes and remediation measures to restore service of the sewage lagoon cell. As the liner system is overlain by about 0.45m minimum of cover material and sand, the assessment was limited to areas of concern interpreted from site observations and locations adjacent to those to identify conditions of the liner. The work conducted as part of the assessment was limited to 4 areas and remedial work on the discharge locations. The lagoon was put back into service in 2019 and in July 2020, it was observed that there was an uncontrolled discharge of the new south sewage lagoon drained the sewage within a short period of time. The Hamlet of Hall Beach filed a spill report upon the observation of the spill. This event identified the need for further investigations to identify possible causes and execute remedial measures to stop the uncontrolled discharge.

Procedures

Nunavut Excavation has advised EXP of the following strategy to identify and remediate the source of the leakage in the south sewage lagoon, and EXP has reviewed the strategy.

1. Execute an organized leak detection exercise of the sewage lagoon base in a segment by segment manner applying an approximate 15 metre 15 metre segment size;

2. Initiate the leak detection exercise by starting at the lowest point in the lagoon, and excavating a minimum of 25 cm toward the Geosynthetic Clay Liner (GCL);

3. Introduce water from the North Sewage Lagoon into the 15 metre by 15 metre segment;

4. Observe the retention of water in the 15 metre by 15 metre segment to ascertain if a leak in the GCL is occurring;

5. Execute remedial work in the segment by patching the area of the leak;

6. Reintroduce water from the North Sewage Lagoon to test the patch;

7. Move onto the next segment and repeat the procedure.

Effectively, the Contractor will be creating a "puddle" at the lowest point in the lagoon, followed by the gradual increase in the "puddle" size after making sure that the water is retained by the liner. This methodology will be labor intensive, but it will provide a method of tracking work completed as the leak detection and remediation progresses. The "puddles" will be developed in 15 metre by 15 metre segments, which will be recorded on a site plan for a permanent record of the work and future reference.

An alternate source of water may be the seasonal tundra ponds adjacent to the lagoon. This source of water will provide a "cleaner" water for the program to identify and remediate the source of the leakage in the south sewage lagoon.

Spill Mitigation

The discharge of treated wastewater from the south sewage lagoon cell, which will have originated from the north sewage lagoon, as part of the program to identify and remediate the source of the leakage in the south sewage lagoon, will be considered to be part of the spill notification that was previously sent to the Board. The quality of the discharge of the treated waste water is expected by be of the same quality as the licensed effluent discharge from the north sewage lagoon.

Sincerely,

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