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Building Nunavut Together
Nunavuliuqatigiingniq
Bâtir le Nunavut ensemble

March 1, 2023

Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1L0

Attention: Richard Dwyer, Manager of Licensing

RE: 3BM-NAU2126 –Municipality of Naujaat – Renewal and Amendment Application

Dear Richard,

The Government of Nunavut Department of Community and Government Services (CGS) on behalf of the Municipality of Naujaat has prepared a response to the comments submitted by Crown Indigenous Relations and Northern Affairs Canada (CIRNAC) on the water license renewal and amendment application.

Regards,

Kayla Clouter

Kayla Clouter
Project Manager
Government of Nunavut
Community and Government Services
Email: kclouter@gov.nu.ca

<table>
<tr><th>Agency</th><th>Comment</th><th>Recommendation</th><th>Licensee Response</th></tr>
<tr><td>CIRNAC</td><td>08</td><td>(R-08) CIRNAC recommends that the applicant provide information on the working capacity of the secondary cell and the total working capacity of the WTA, prior to the last point of control, with the addition of the proposed amendments.</td><td>The existing natural depression is currently identified as the secondary treatment cell. There are no modifications or amendments proposed to this body of water. There are attenuation berms proposed for the WTA downstream of the natural depression (i.e., Berm 1). To clarify, the natural depression shouldn't be considered a secondary lagoon cell and should be considered a wetland cell.

In reference to Drawing 110 of the 99% design package, the WTA is split up into 7 wetland cells by the attenuation berms. The natural depression would be considered wetland cell 1. Each cell will have a depth ranging from 0.3 m, up to 1.0 m. The water depth of the WTA will vary with flow throughout the treatment season. To clarify, we are recommending a decant rate from the primary lagoon cell of 1,950 m3/day under a 60 day decant period. The wetland cells have a working volume as shown in the table below:

<table>
<tr><th>Wetland Cell</th><th>Area</th><th>Working Volume at 0.3 m depth</th><th>Working Volume at 1.0 m depth</th></tr>
<tr><td>1 (Natural Depression)</td><td>32,345 m^2</td><td>9,704 m^3</td><td>32,345 m^3</td></tr>
<tr><td>2</td><td>9,856 m^2</td><td>2,957 m^3</td><td>9,856 m^3</td></tr>
<tr><td>3</td><td>6,088 m^2</td><td>1,826 m^3</td><td>6,088 m^3</td></tr>
<tr><td>4</td><td>34,848 m^2</td><td>10,454 m^3</td><td>34,848 m^3</td></tr>
<tr><td>5</td><td>13,402 m^2</td><td>4,021 m^3</td><td>13,402 m^3</td></tr>
<tr><td>6</td><td>13,395 m^2</td><td>4,019 m^3</td><td>13,395 m^3</td></tr>
<tr><td>7</td><td>1,022 m^2</td><td>307 m^3</td><td>1022 m^3</td></tr>
<tr><td>Total</td><td>110,956 m^2</td><td>33,287 m^3</td><td>110,956 m^3</td></tr>
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CIRNAC	09	(R-09) CIRNAC recommends that the applicant provide more information on flowrates and holding times to the Board prior to approval of this amendment.	As stated above the existing natural depression is currently identified as the secondary treatment cell. There are no modifications or amendments proposed to this body of water. No survey data is available on the natural depression. The 2017 *Wetland Treatment Area Study in Naujaat, Nunavut* as prepared by the Centre for Water Resources Studies (CWS) at Dalhousie University sampled at the natural depression and observed concentration reductions when comparing raw wastewater to the WTA influent (effluent from the natural depression). Dillon used these sampling results to calibrate a kinetic model to conservatively estimate the concentration reductions across new lagoon cell and the existing natural depression. Based on a 60 day decant from the primary lagoon cell and a flow rate (decant rate) of 1,950 m3/d, a holding time approaching 16.5 days is estimated through the natural depression.
CIRNAC	10	(R-10) CIRNAC recommends that the Operation and Maintenance plan be provided 60 days prior to the commissioning of the new WWTF and include specification on flowrate and measures to maintain the structures in the WTA to ensure the facility will function as designed.	The Operation and Maintenance plan will be provided prior to the commissioning of the WWTF and will include the recommended information.
CIRNAC	11	(R-11) CIRNAC recommends that the Monitoring Program includes daily recorded decant volumes from the new lagoon to the WTA to ensure the WWTF is operating as designed.	The licensee agrees.
CIRNAC	12	(R-12) CIRNAC recommends that the applicant provide the outstanding drawings to the Nunavut Water Board or a rational as to why this component is no longer considered part of the necessary design before approval of this amendment is considered.	The 99% drawing package shows flow diversion ditching around the lagoon (Drawing 101, 102, 105, 106). Drawing 106 shows culverts to direct water under the access road from upstream of the lagoon. There is also drainage piping shown under the lagoon to direct water from under the liner if anything is captured. Drainage in the vicinity of the lagoon is characterized by overland flow from small upstream catchments that collect in depressions and then spill down the valleys. Northwest of the lagoon area is relatively flat with depressions that collect water. The Geotechnical Investigation concluded that infiltration into the soils is anticipated to be moderate to substantial during the spring freshet and shallow subsurface flow is expected to travel along the bottom of the active layer of bedrock. Bedrock depths range from 0.0 to 4.3 m below ground. Soils in the area are generally sandy to clayey sand and shallow groundwater flow is anticipated to mimic surface water flow directions. Culverts will be placed at three (3) locations where overland flow paths are intercepted by the access road. Around the lagoon, it is anticipated that surface water will be directed to ditches that route flows around and away from the lagoon.