Water Resources Division
Resource Management Directorate
Nunavut Regional Office
P.O. Box 100
Iqaluit, NU, X0A 0H0

Your file - Votre référence
3BM-NAU2123
Our file - Notre référence
GC Docs # :108983761

January 25, 2023

Richard Dwyer
Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU, X0B 1J0
E-mail: Licencing@nwb-oen.ca

Re: Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) Comments on Updated Drawings Provided in the Water Licence Amendment Application for the Municipality of Naujaat, Type B Water Licence No. 3BM-NAU2126

Dear Mr. Dwyer,

Thank you for the January 19, 2023 invitation to review the updated drawings for the new lagoon and wetland-treatment-area submitted by the applicant with the water licence amendment application for the Municipality of Naujaat, Type B Water Licence No. 3BM-NAU2126.

CIRNAC examined the updated drawings pursuant to its mandated responsibilities under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Department of Crown-Indigenous Relations and Northern Affairs Act*. Please find CIRNAC comments and recommendations in the attached Technical Review Memorandum.

These concerns and recommendations are in addition to the comments previously submitted to the Board on January 10, 2023.

If there are any questions or concerns, please contact me at (867) 975-4282 or Christine.Wilson3@rcaanc-cirnac.gc.ca

Regards,

Christine Wilson

Christine Wilson,
Industrial Coordinator

Canada

Technical Review Memorandum

Date: January 25, 2023

To: Richard Dwyer – Manager of Licensing, Nunavut Water Board

From: Christine Wilson – Industrial Coordinator, CIRNAC

Subject: **Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) Comments on Updated Drawings Provided in the Water Licence Amendment Application for the Municipality of Naujaat, Type B Water Licence No. 3BM-NAU2126**

A. BACKGROUND

The Municipality of Naujaat is located within the Kivalliq Region, Nunavut, on the northern shore of Repulse Bay, on the south shore of the Rae Isthmus, at the geographical coordinates 66° 31' N and 86° 14' W. The Municipality operates a water supply facility and solid and sewage waste management facilities under the Type B Municipal Licence No. 3BM-NAU2126.

The Government of Nunavut, Community of Government Services (GN-CGS) is applying, on behalf of the Municipality of Naujaat, for an amendment of their water licence. Proposed amendments include changes to the Sewage Disposal Facility (SDF) with the addition of a pre-treatment lagoon with a 12 month holding capacity and diversion ditch to allow surface water to bypass the new lagoon. As well as an amendment to the SDF effluent parameters BOD_5 and TSS.

CIRNAC provides the following comments and recommendations to the updated drawings provided on Jan 19, 2023. A summary of the subjects of recommendations can be found in Table 1. Documents reviewed as part of the submissions can be found in Table 2 of Section B. Detailed technical review comments and requests for clarification can be found in Section C.

Table 1: Summary of Recommendations

Recommendation Number	Subject
R-08	Secondary Cell- Capacity
R-09	Secondary Cell- Holding Time and Flowrate
R-10	WWTF Operation and Maintenance Plans
R-11	Monitoring Program- Effluent Volumes
R-12	Cut-off Berm and Perimeter Ditches

B. DOCUMENTS REVIEWED AND REFERENCED

The following table (Table 2) provides a list of the documents reviewed under the submission and referenced during the review.

Table 2: Documents Reviewed

Document Title	Author, File No., Rev., Date
Application for Water Licence Amendment	Community and Government Services, December 19, 2022
Naujaat WWTF - Pre-Design Report	Dillion Consulting, June 17, 2022
Cover Letter	Community and Government Services, December 19, 2022
Summary English-IMLE	Community and Government Services, Not dated
3BM-NAU2126 212233 Naujaat Sewage Lagoon 99% Review	Dillon Consulting, January 16, 2023

C. RESULTS OF REVIEW

8. Secondary Cell- Capacity

In the document titled “Cover Letter” provided with the amendment package, the applicant states:

“*The treatment facility will be designed with a new upstream primary lagoon cell that is impermeable. The existing downstream natural depression that is acting as the current lagoon will become a secondary treatment cell, and the existing downstream wetland-treatment-area (WTA) will remain in use. Seasonal effluent pump out to the secondary cell and WTA is to occur late in the summer season to allow spring freshet to pass and to allow the wetland to recharge to promote its ability to support effluent biodegradation.”*

Comment:
CIRNAC noted that the application discusses the continued use of the current lagoon to act as a secondary cell. Clear information on the holding capacity of the WTA was not provided.

Recommendation:
(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.

9. Secondary Cell- Holding Time and Flowrate

In the document titled “Cover Letter” provided with the amendment package, the applicant states:

“*The lagoon discharge point will be by controlled manual pump out into the secondary lagoon that will then exfiltrate into the WTA which will remain at the same location. The decant system will be designed with a flowrate below 2500 m3/day to ensure effluent has sufficient residency time in the WTA. An updated Operations and Maintenance Plan will be submitted to NWB once the new lagoon is commissioned.”*

Comment:
CIRNAC noted that the application does not include information on the proposed flowrates for decant from the new lagoon to WTA or information on the effluent hold times in the secondary cell.

Recommendation:
(R-09) CIRNAC recommends that the applicant provide more information on flowrates and holding times to the Board prior to approval of this amendment.

10. Wastewater Treatment Facility (WWTF) Operation and Maintenance Plans

Section 2.6.6 titled “Wetland Modifications” of the WWTF Pre-Design Report states:

“Flow attenuation devices require annual maintenance to provide optimal performance and treatment.
Examples of annual maintenance activities include the following:

- *Re-grade attenuation devices as required;*
- *Repair cuts and channels in attenuation devices with pit run or larger rock;*
- *Address water velocities by installing additional attenuation dams and/or silt fences as appropriate;*
- *Add rock to Scree slopes as required; and,*
- *Address channeling throughout the wetland with attenuation dams and/or silt fences.”*

Comment:
CIRNAC recognizes the importance of maintaining the flow attenuation devices in the WTA to achieve effluent quality limits.

Recommendation:
(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.

11. Monitoring Program- Effluent Volumes

In the document titled “Cover Letter” provided with the amendment package, the applicant states:

“*The lagoon discharge point will be by controlled manual pump out into the secondary lagoon that will then exfiltrate into the WTA which will remain at the same location. The decant system will be designed with a flowrate below 2500 m3/day to ensure effluent has sufficient residency time in the WTA. An updated Operations and Maintenance Plan will be submitted to NWB once the new lagoon is commissioned*.”

Additionally, in section 2.6.5 of the WWTF Pre-Design Report, it is stated:

"*The study completed by EXP in 2018 titled Recommendations for the Development of Nunavut Municipal Wastewater Management Standards concluded that a lagoon discharge rate of less than 2,500 m3/day would be necessary in achieving effluent CBOD5 and TSS concentrations that comply with the effluent limits at the regulatory compliance point (REP-6). According to EXP's conclusions and the proposed lagoon volume, a 60-day decant scenario would be required for a lagoon discharge rate of less than 2,500 m3/day*."

Comment:
CIRNAC notes the importance of maintaining the decant flowrates to the WTA to achieve effluent quality limits .

Recommendation:
(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.

12. Cut-off Berm and Perimeter Ditches

The document titled "English Summary" provided with the application package states:

"The new system has been designed as to allow surface runoff to bypass the lagoon through perimeter ditching and continue its path down the wetland to contribute to the ecology of the wetland and into the Hudson's Bay."

Also included in section 2.2.4 titled "Design Considerations" of the WWTF Pre-Design Report for conceptual design option 3, states:

"The primary cell will be located in the upper valley of the existing wastewater treatment area, with the east slope of the valley sloping towards the proposed lagoon footprint. The WWTF design will incorporate a cut-off berm on the east valley to direct surface runoff away from the lagoon surface and maximize lagoon storage volume."

Subsequently, in section 3.9 titled "Upstream Flow Diversion", of the WWTF Pre-Design Report states:

"All upstream runoff will be diverted around the lagoon footprint using ditches and directed towards the valley and existing wetland. Culverts will be designed to handle spring freshet and prevent any washout of the access road. A factor of safety will be applied to the sizing of ditching and culverts to account for future climate change conditions and changing precipitation patterns for the lifespan of the sewage treatment system."

Comment:
CIRNAC noted that in the updated drawings submitted by the applicant to the Nunavut Water Board on Jan 18th, 2023 do not include the a cut-off berm or perimeter ditches.

Recommendation:
(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.