



Water Resources Division
Resource Management Directorate
Nunavut Regional Office
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Your file - Votre référence
3AM-ARV2232
Our file - Notre référence
GCDOCS# 114802434

June 24, 2023

Robert Hunter
Licensing Administrator
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU, X0B 1J0
sent via e-mail: licensing@nwb-oen.ca

Re: Crown-Indigenous Relations and Northern Affairs Canada's Review of the 2022 Annual Report for Water Licence 3AM-ARV2232 from the Hamlet of Arviat in the Kivalliq Region of Nunavut

Dear Mr. Hunter,

Thank you for the March 29, 2023 invitation to review the referenced Annual Report, submitted by the Government of Nunavut, Department of Community and Government Services on behalf of the Licensee. This annual review is for Arviat's Type A Water Licence No. 3AM-ARV2232.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) examined the application 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 Memorandum.

It is unclear to CIRNAC which water quality criteria the water quality parameters are being compared to in Schedule I. CIRNAC requests the Nunavut Water Board specify the water quality criteria as a term and condition of the water licence.

If there are any questions or concerns, please contact me at michelle.blade@rcaanc-cirnac.gc.ca or Andrew Keim at 305-501-4047 or Andrew.Keim@canada.ca.

Sincerely,

Michelle Blade,
Regional Water Coordinator



Technical Review Memorandum

Date: June 24, 2023

To: Robert Hunter, Licensing Administrator, Nunavut Water Board

From: Michelle Blade, Regional Water Coordinator, CIRNAC

Subject: Crown-Indigenous Relations and Northern Affairs Canada's Review of the 2022 Annual Report for Water Licence 3AM-ARV2232 from the Hamlet of Arviat in the Kivalliq Region of Nunavut

Region: ☐ Kitikmeot ☒ Kivalliq ☐ Qikiqtani

A. BACKGROUND

The Hamlet of Arviat is located in the Kivalliq Region of Nunavut. The population of the community is 2,766 (2021 Census). The scope of the Licence includes the use of water to supply the residents of the Hamlet with drinking water. The municipality obtains its water from Wolf Creek, located 8.0 km southwest of the Hamlet.

The scope of the Licence also includes the deposit of waste (sewage and other municipal waste). The Hamlet of Arviat provides daily-trucked sewage collection service. Sewage is trucked to a sewage lagoon approximately 2.8 km southwest of the Hamlet that was commissioned in 2005. Effluent seeps at a slow continuous rate through the exfiltration lagoon berm and into the wetland treatment area. The sewage is then treated by traveling through the wetland treatment area towards Hudson Bay, approximately 100 m from the discharge point. The Hamlet of Arviat solid waste management facilities consists of a landfill, bulky metals area, and hazardous waste storage area. Solid waste is collected and trucked to the landfill approximately 2.8 km southwest of the Hamlet. The bulky metals area is located 0.7 km north of the landfill area. The bulky metals area includes segregation of materials such as tires, appliances, and vehicles. The Hamlet of Arviat owns and operates an industrial shredder for the items stored at this site, which reduces the volume of materials stored at this location annually. Hazardous waste is stored next to the Hamlet garage.

The Government of Nunavut, Department of Community and Government Services (GN-CGS) has identified that the Municipality of Arviat sewage lagoon is undersized and the project to upgrade and expand the wastewater infrastructure has been approved by Nunavut Impact Review Board. The Government of Nunavut states in the 2022 Annual Report the:

- Sewage Disposal Facility is in design, construction anticipated to begin spring 2025,
- Wetland Treatment Area Performance study anticipated to be done summer 2023,
- Solid waste site upgrades planning anticipated to be completed in 2023, and



- Consultants are still evaluating if the old lagoon cells can be repurposed, if not an Abandonment and Restoration plan will be submitted.

CIRNAC provides the following comments and recommendations pertaining to the 2022 annual report. A summary of the subjects of recommendations can be found in Table 1. Documents reviewed as part of this submission can be found in Table 2 of Section B. Detailed technical review comments can be found in Section C.

Table 1: Summary of Recommendations

Recommendation Number	Subject
R-01	Quantity of water used
R-02	Daily water quantity reporting requirements
R-03	Sewage discharge reporting requirements
R-04	Sludge removal reporting
R-05	Water quality monitoring sampling locations
R-06	Water quality monitoring sampling frequency
R-07	Water quality monitoring summary report
R-08	Station ID ARV-4 exceedances
R-09	Emergency Decant
R-10	Arviat Sewage Treatment Facility Operation and Maintenance Plan

B. DOCUMENTS REVIEWED

The following table (Table 2) provides a summary of the documents reviewed under the submission.

Table 2: Documents Reviewed

Document Title	Author, File No., Rev., Date
3AM-ARV2232 2022 Annual Report	Government of Nunavut, Community and Government Services (GN-CGS) on behalf of the Hamlet of Arviat



Document Title	Author, File No., Rev., Date
TYPE "A" WATER LICENCE NO: 3AM-ARV2232	Nunavut Water Board, 13 July 2022
TYPE "A" WATER LICENCE NO: 3AM-ARV2232 Reasons for Decision	Nunavut Water Board, 13 July 2022
CIRNAC comments on 3AM-ARV1016 2020 Annual Report	CIRNAC, 9 August 2021
Water Licence Inspection Form	CIRNAC, 27 June 2018
ARVIAT SEWAGE TREATMENT FACILITY OPERATION AND MAINTENANCE PLAN	Government of Nunavut, March 2021

C. RESULTS OF REVIEW

1. Quantity of water used

Comment:

Water licence 3AM-ARV2232 allows for 235,393 cubic metres of water per annum to be pumped from Wolf Creek to a water reservoir during open water season in support of community needs. Table 2 of the 2022 Annual Report estimates 126,663 cubic metres of water was transferred from Wolf Creek to Raw Water Cells between July 19th, 2022 and October 4th, 2022. Table 1 of the 2022 Annual Report indicates 109,726.413 cubic metres of water is obtained annually from all sources; between 8290.404 and 9756.418 cubic metres of water is obtained from all sources monthly.

Recommendation:

(R-01) CIRNAC recommends the Government of Nunavut provide the name and/or origin of all the undefined sources of water tabulated in Table 1, and clarify why the annual total of water obtained from all sources in Table 1 is less than the total of water removed from Wolf Creek in Table 2.

2. Daily water quantity reporting requirements

Comment:

Water licence 3AM-ARV2232 requires reporting of the daily, monthly and annual quantities in cubic metres of fresh water withdrawn from Wolf Creek at Monitoring Station ARV-1. Daily flow meter readings are recorded in Appendix E of the 2022 Annual report however it is unclear as to the units used in reporting the flow meter readings.



Recommendation:

(R-02) CIRNAC recommends that the Government of Nunavut clarify the units of the daily flow meter readings used in Appendix E.

3. Sewage discharge reporting requirements

Comment:

Water licence 3AM-ARV2232 requires reporting of the monthly and annual quantities in cubic metres of any sewage discharged into the Sewage Disposal Facility at Monitoring Station ARV-3. The 2022 Annual Report states no meter exists to measure the sewage discharge volumes, therefore sewage discharge volumes are considered equal to the water consumption volumes of 109,726.413 cubic metres annually. Water licence 3AM-ARV2232 allows for only 235,393 cubic metres of water per annum.

Recommendation:

(R-03) CIRNAC recommends the Government of Nunavut devise a reporting system for measuring the quantity of sewage discharged into the Sewage Disposal Facility.

4. Sludge removal reporting

Comment:

Water licence 3AM-ARV2232 requires reporting of the monthly and annual quantities in cubic metres of sludge removed from the Sewage Disposal Facility. CIRNAC was unable to locate the sludge removal values in the 2022 Annual Report.

Recommendation:

(R-04) CIRNAC recommends the Government of Nunavut specify where the 2022 sludge removal quantities are reported.

5. Water quality monitoring sampling locations

Comment:

Water licence 3AM-ARV2232 requires water quality monitoring at active Station ID ARV-1, ARV-2a, ARV-3, ARV-3a, ARV-4, ARV-5, ARV-6, and ARV-9. The 2022 Annual Report provides analytical results for Station IDs ARV-2, ARV-4, ARV-5, and ARV-6 only.



Recommendation:

(R-05) CIRNAC recommends the Government of Nunavut specify where the 2022 analytical results are reported for active Station IDs ARV-1, ARV-3, ARV-3a, and ARV-9.

6. Water quality monitoring sampling frequency

Comment:

The 2022 Annual Report provides analytical results for Station IDs ARV-2, ARV-4, ARV-5, and ARV-6 sampled on July 18, 2022 and September 21, 2022. Water licence 3AM-ARV2232 requires: monthly analysis for Station ID ARV-2a during periods of observed flow and prior to discharge, as well as monthly analyses for Station IDs ARV-4, ARV-5, and ARV-6 during periods of observed flow.

Recommendation:

(R-06) CIRNAC recommends the Government of Nunavut report the period of observed flow for Station IDs ARV-2a, ARV-4, ARV-5, and ARV-6, and the dates of discharge for Station ID ARV-2a.

7. Water quality monitoring summary report

Comment:

The 2022 Annual Report provides a summary report for Station ID ARV-4 in Appendix A. Water licence 3AM-ARV2232 requires a summary report which includes all data and information generated under the Monitoring Program.

Recommendation:

(R-07) CIRNAC recommends the Government of Nunavut provide a summary report for all Station IDs with water quality results compared to water quality monitoring criteria in the 2022 Annual Report.

8. Station ID ARV-4 exceedances

Comment:

The 2022 Annual Report provides a summary table for Station ID ARV-4 effluent quality limits in Appendix A. Exceedances were noted for fecal coliforms on July 20, 2022 and total suspended solids on September 26, 2022.



Recommendation:

(R-08) CIRNAC recommends the Government of Nunavut provide an explanation for the exceedances and the plan implemented to avoid effluent quality limit exceedances in 2023.

9. Emergency Decant

Comment:

On March 28, 2022, GN-CGS applied for an authorized Emergency Decant. No sampling results were provided in the 2022 Annual Report with respect to the decant.

Recommendation:

(R-09) CIRNAC recommends the Government of Nunavut include the emergency decant sampling results in the 2022 Annual Report.

10. Arviat Sewage Treatment Facility Operation and Maintenance Plan

Comment:

The file title on the NWB website indicates the “Arviat Sewage Treatment Facility Operation and Maintenance Plan” was updated on March 2022. However, the plan dates to March 2021 and refers to Water Licence No. 3AM-ARV1016.

Recommendation:

(R-10) CIRNAC recommends the plan date and water licence number are updated. CIRNAC recommends that the Government of Nunavut add a page at the front of the plan that records updates and lists, in chronological order: what sections were updated, when they were updated, for what reason, and by whom. This would allow plan users to more readily note the changes that have been made.