Crown-Indigenous Relations and Northern Affairs Canada
Relations Couronne-Autochtones et Affaires du Nord Canada

Water Resources Division
Resource Management Directorate
Nunavut Regional Office
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Your file - Votre référence
3AM-CHE----
Our file - Notre référence
GC Docs # : 114928858

June 19, 2023

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's (CIRNAC) Review of the Municipality of Chesterfield Inlet's Water Licence Renewal and Amendment Application to upgrade existing Type B Water Licence no 3BM-CHE1523 to Type A Water Licence 3AM-CHE----

Dear Mr. Hunter,

Thank you for the May 23, 2023 invitation to review the referenced licence renewal and amendment application submitted by Government of Nunavut Community and Government Services (GN-CGS), on behalf of the Municipality of Chesterfield Inlet to upgrade its existing Type B Water Licence no. 3BM-CHE1523 to Type A Water Licence.

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*. CIRNAC's comments and recommendations in the attached Technical Memorandum.

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

Regards,

Christine Wilson,
Industrial Coordinator

Canada

GCDOCS # 114928858

Technical Review Memorandum

Date: June 5, 2023

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

From: Christine Wilson – Industrial Coordinator, CIRNAC

Subject: **Crown-Indigenous Relations and Northern Affairs Canada's (CIRNAC) Review of the Municipality of Chesterfield Inlet's Water Licence Renewal and Amendment Application to upgrade existing Type B Water Licence 3BM-CHE1523 to Type A Water Licence 3AM-CHE----**

Region: ☐ Kitikmeot ☒ Kivalliq ☐ Qikiqtani

A. BACKGROUND

On January 3, 2023 the Nunavut Water Board (the Board) invited CIRNAC to comment on an application for amendment/renewal of water licence 3BM-CHE1523 which was submitted on behalf of Municipality of Chesterfield Inlet (Licensee) by Government of Nunavut, Community and Government Services (GN-CGS).

On January 12, the Board advised CIRNAC that the application process was paused, it was determined that a type 'A' licence was required for the undertaking.

On March 22, GN-CGS, on behalf of the Licensee, submitted an application to the NWB to amend and upgrade its existing type 'B' water licence 3BM-CHE1523 to a type 'A' water licence 3AM-CHE---- for a 10-year term, valid until 2033.

The Licensee has proposed no changes to municipal operations, the previous licences' fresh water usage was based on daily withdrawal of potable water from the Water Supply Facility rather than daily withdrawal from the fresh water source during the annual resupply of reservoir. It is estimated that up to 2,000m^3/day, to a total of 23,000m^3/year, could be required over the duration of this licence. Currently, water licence 3BM-CHE1523 allows for 299m^3/day, therefore only the daily fresh water withdrawal is requested to be amended.

The Licensee pumps fresh water from the First (Puiqsuk) Lake, through a transmission line to the reservoir for storage. Fresh water is then piped from the reservoir to the Water Supply Facility for treatment and delivery, by truck, to the community.

In April 2019 a modification to the water licence was approved by the Board, for an upgrade to the 3.26km fresh water transmission line from First Lake to the reservoir. The transmission line was commission in 2020.

The Licensee provides trucked sewage collection service that deposits wastewater into the Sewage Disposal Facility (SDF), located 2.2 km west of the community. The SDF consists

of two sewage holding cells and a wetland treatment area. Solid waste is collected from the community and deposited in the Solid Waste Facility which consists of the fenced municipal solid waste area (MSW) and a separate metal disposal area approximately 200 meters South of the MSW.

CIRNAC provided the following comments and recommendations relating to the application. 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 can be found in Section C.

Table 1: Summary of Recommendations

Recommendation Number	Subject
R-01	**Water Use Records**
R-02	**Daily Water Use, Additional Monitoring Station**
R-03	**Environmental Monitoring Program and Quality Assurance/ Quality Control Plan (QA/QC Plan)**
R-04	**Operations and Maintenance Plan (O&M Plan), Solid Waste Facility, Landfarm**
R-05	**O&M Plan, Solid Waste Facility, Monitoring Stations Locations**
R-06	**O&M Plan, Sewage Disposal Facility, Sludge Management Plan**
R-07	**O&M Plan, Sewage Disposal Facility, Sludge Management Plan**
R-08	**O&M Plan Sewage Disposal Facility, Monitoring**
R-09	**Geotechnical/ Engineering Inspection**

B. DOCUMENTS REVIEWED AND REFERENCED

The following table 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
Authorization Letter	Municipality of Chesterfield Inlet, July 27, 2022
Application for water licence amendment and renewal	GN-CGS, March 20, 2023

Document Title	Author, File No., Rev., Date
Executive Summary	GN-CGS
Cover letter	GN-CGS, December 19, 2022
Environmental Monitoring Program and Quality Assurance/ Quality Control Plan	GN-CGS, December 2022
NPC Conformity, File #149998	NPC, March 7, 2023
Environmental Emergency Spill Contingency Plan	GN-CGS, V2, March 2023
2023 Plan for Compliance	GN-CGS
OM Plan Chesterfield Inlet, Sewage Disposal Facility 2023	GN-CGS, 2023
OM Plan Solid Waste Facility 2023	GN-CGS, 2023
OM Plan Water Supply Facility 2023	GN-CGS, 2023
Response Letter to Recommendations	GN-CGS, May 3, 2023
CIRNAC Completeness Review	Christine Wilson, April 11, 2023
Annual Report 2022	GN-CGS, 2022
Water Licence Inspection Report 2021	CIRNAC, November 12, 2021
CIRNAC Response Applicants Response on completeness	Christine Wilson, May 8, 2023
Water Licence Inspection Report 2017	CIRNAC, April 19, 2018
Water Licence Inspection Report 2015	CIRNAC, March 3, 2016
Water Licence Inspection Report 2018	CIRNAC, Feb. 12, 2019
3BM-CHE1523 Renewal-Amendment	Nunavut Water Board, May 15, 2015

C. RESULTS OF REVIEW

1. Water Use Records

Water licence 3BM-CHE1523, part b, item 1(c) states: *"The Licensee shall file an Annual Report with the Board, no later than March 31 of the year following the calendar year reported, which shall contain the following information:*

c. the daily, monthly and annual quantities in cubic metres of freshwater obtained from all sources"

Comment: The daily water use has been metered from the Water Supply Facility rather then from the fresh water intake at First Lake. The fresh water intake at First Lake is used only during annual resupply of the reservoir.

Recommendation: (R-01) Subject to the approval of the Board, CIRNAC recommends that the daily volume of water withdrawn from First Lake during the annual resupply be recorded as monitoring station CHE-1.These records shall be submitted with the Annual Report under Part B item 1(c).

2. Daily Water Use, Additional Monitoring Station

Water licence 3BM-CHE1523, part h, item 2 states: *"The Licensee shall measure and record, in cubic metres, the daily, monthly and annual quantities of Water extracted for all purposes at Monitoring Program Station CHE-1, and Water extracted at the Water Supply Facility pump-house."*

Comment: The daily volume of water withdrawn has been metered at the Water Supply Facility, pump-house and not from the water intake at First Lake. If the intention is to meter both the daily water use and withdrawal from the source, an additional monitoring station needs to be added at the Water Supply Facility, pump-house.

Recommendation: (R-02) CIRNAC recommends that a new monitoring station (CHE-1a) be added to the monitoring program. The station should be located at the Water Supply Facility, pump-house to meter the daily volume of water used as follows.

Monitoring Station ID	Description	Status
CHE-1	Raw Water supply intake at First Lake	Active (volume)
CHE-1a	**Daily Water Withdrawn from Water Supply Facility, pump-house**	**New (volume)**
CHE-2	Runoff from the Solid Waste Disposal Facility	Active (quality)
CHE-3	Effluent from the Sewage Holding Cell 1	Active (quality)
CHE-3a	Effluent from Sewage Holding Cell 2	New (quality)
CHE-4	Final Discharge Point for Effluent from the wetland treatment area prior to Finger Bay (Compliance Point)	Active (quality)

3. Environmental Monitoring Program and Quality Assurance/ Quality Control Plan (QA/QC Plan)

Table 2 in the QA/QC Plan under the heading "*Water Quality Parameters*" three monitoring stations have been listed with the parameters that are required for collection at those locations.

Station	Water Quality Parameters	
CHE-3 CHE-3a CHE-4	• Total Alkalinity (as CaCO3) • Total Ammonia (as N) • BOD_5 • Chloride (Cl) • Conductivity • Fecal Coliforms • Hardness (as CaCO3) • Mercury (Hg) • Nitrate+Nitrite (as N) • Oil and Grease • Sulfate (SO4) • Aluminium (Al) • Arsenic (As) • Cadmium (Cd) • Calcium (Ca)	• Chromium (Cr) • Cobalt (Co) • Copper (Cu) • Iron (Fe) • Lead (Pb) • Magnesium (Mg) • Manganese (Mn) • Nickel (Ni) • Potassium (K) • Sodium (Na) • Zinc (Zn) • Total Organic Carbon • Total Suspended Solids • pH • Total Phenols

Comment: Monitoring station CHE-2 is not referenced in this table or in the QA/QC Plan. In accordance with the water licence, monitoring station CHE-2 is to be sampled for the parameters above, as well as total petroleum hydrocarbon, polycyclic aromatic hydrocarbons and benzene, toluene ethylbenzene, xylene.

Recommendation: (R-03) CIRNAC recommends that an addendum is submitted to the QA/QC Plan to include monitoring station CHE-2.

4. Operations and Maintenance Plan (O&M Plan), Solid Waste Facility, Landfarm

Section 5.3 of the Solid Waste Facility, O&M Plan under the heading "*Hazardous Waste Management Plan*" it is stated: "*Contaminated soil can be accepted in a designated area and is typically stored in 205 L steel drums or bags approved for contaminated soil storage and must be shipped out of the municipality. Private entities responsible for creating the contaminated soil must contact the SAO to discuss storage options and provide a plan to ship the contaminants out of the municipality. The decision to store contaminated soil from industrial sources rests with the municipality.*"

Comment: Block 14 of the application indicates that contaminated soils will be disposed of in a landfarm, as seen below:

Type of Waste	Composition	Quantity Generated	Treatment Method	Disposal Method
Sewage	Greywater, washroom waste, etc. collected from sewage tanks	23,000 m^3/year	Lagoon and wetlands area	Truck discharge to lagoon, annual decanting into wetlands
Household Solid Waste	Household waste, small metal waste, tires, electronics, paper, wood, etc.	6.15 m^3/capita/year	Compact and cover with granular material	Collection from household bins and drop-off at solid waste site
Hazardous Waste	Batteries, paint, antifreeze	0.62 m^3/capita/year	Segregate from household solid waste	Store in sea cans, batteries in lined battery boxes
Bulky Items/Scrap Metal	Auto body parts, snowmobiles, atvs, appliances	3.16 m^3/capita/year	Segregate from household solid waste	Compact and cover with granular material
Contaminated Soil	Hydrocarbon contaminated soil	Based on spill events	Landfarm	Landfarm

Recommendation: (R-04) CIRNAC recommends that the Licensee clarify the use of the landfarm for disposal for contaminated soils. If the landfarm is to be used by the Municipality for soil remediation a letter of authorization should be provided by the owner.

5. O&M Plan, Solid Waste Facility, Monitoring Stations Locations

Water licence 3BM-CHE1523, part f, item 2 states "*The Licensee shall update and resubmit as a stand-alone document, the Solid Waste Disposal Facilities Operation and Maintenance Manual by August 31, 2015, to the Board for approval in writing. The Plan shall be prepared where appropriate in accordance with the Guidelines for the Preparation of an Operation and Maintenance Manual for Sewage and Solid Waste Disposal Facilities in the Northwest Territories (GNWT-MACA, 1996), and the Guidelines for the Planning, Design, Operations and Maintenance of Modified Solid Waste Sites in the Northwest Territories (GNWT -MACA, 2003). This updated Manual shall include but not be limited to the following:*

a. Solid Waste Disposal Facilities Operation and Maintenance Plan;
b. Hazardous Waste Management Plan;
c. Monitoring Program Station descriptions and locations including GPS.

Comment: A new O&M Plan for the Solid Waste Facility was provided with the application. A description of the monitoring station and GPS locations are included in the document as follows:

Table 2 Monitoring Program Station description and locations

Station	Description	Latitude	Longitude
CHE-2	Runoff from the Solid Waste Disposal Facility	63° 34’ 62”	90° 75’ 64”

The coordinates are included as required by the condition of the licence, though the coordinates appear to be transposed.

Recommendation: CIRNAC recommends that an addendum be submitted to this plan to include the corrected GPS location of monitoring station CHE-2.

6. O&M Plan, Sewage Disposal Facility, Sludge Management Plan

Water licence 3BM-CHE1523, part h, item 7 states *“The Licensee shall measure and record the annual quantities of sludge removed from the Sewage Holding Cells along with the methods of storage, treatment, and disposal. This information shall be included in the Annual Report.”*

Comment: The Sewage Disposal Facility, O&M Plan states: “*The sewage sludge has not been sampled in Chesterfield Inlet. Before an appropriate sludge management plan can be developed, the sludge should be sampled to obtain its chemical and physical characteristics. Additionally, the volume of sludge in the detention cell should be measured. The annual quantities of sewage sludge removed from the detention cells also needs to be measured and reported to the NWB in the Hamlet’s Annual Report. Once the chemical composition of the sludge is understood, a sludge management plan can be developed to explore the best options for removal and disposal.*

Recommendation: CIRNAC recommends that the samples and analysis required to determine appropriate sludge management disposal is completed to ensure that disposal options are contemplated when planning for the new Sewage Disposal Facility. GN-CGS has indicated that the lifespan of the current Sewage Disposal Facility is 2029.

7. O&M Plan, Sewage Disposal Facility, Monitoring

Section 8.0 of the Sewage Disposal Facility, O&M Plan includes a table (table 2) under the heading “*Licence requirements related O&M of the SDF”, states:*

Requirements	Reported
Monthly and annual quantities of wastewater disposal	Annual report submitted to NWB
Notice of commencement of monitoring program and observed flow	Notice given to the CIRNAC inspector
A summary of modifications and/or major maintenance work carried out on the SDF	Proposal submitted to NWB 60 days prior
A list of spills and unauthorized discharges.	Annual report submitted to NWB
A summary of any studies requested for the SDF and future planned studies planned	Annual report submitted to NWB
Monitoring Program Station CHE-2 shall not exceed the effluent quality limits: • 80 mg/L BOD_5 • 100 mg/L TSS • 1 x 10^4 CFU/dl Fecal Coliform • No visible sheen of Oil and grease • 6-9 pH	Annual report submitted to NWB
The Licensee shall carry out inspections at Monitoring Program Stations CHE-3, CHE-3a and CHE-4 weekly from May to August inclusive, to determine presence of Effluent or Water flow.	Annual report submitted to NWB
A freeboard of 1.0 m in the lagoon must be maintained	Annual report submitted to NWB

Comment: In accordance with water licence 3BM-CHE1523, part d, item 2, monitoring station **CHE-4** shall not exceed the following parameters:

Parameter	Maximum Concentration of any Grab Sample
BOD_5	80 mg/L
Total Suspended Solid	100 mg/L
Fecal Coliform	1x 10^4 CFU/100mL
Oil and Grease	No visible sheen
pH	between 6 and 9

Recommendation: CIRNAC recommends that an addendum be submitted to the plan to correct the monitoring station to CHE-4 referenced in section 8 of the O&M Plan for the Sewage Disposal Facility.

8. O&M Plan Sewage Disposal Facility, Monitoring

Section 8.0 of the O&M Plan for the Sewage Disposal Facility includes a table (table 3) with the monitoring stations associated with the Sewage Disposal Facility. The table reads as follows:

Station	Description	Latitude	Longitude
CHE-3	Effluent from Sewage Holding Cell 1	63° 34' 45" N	90° 75' 14" W
CHE-3a	Effluent from Sewage Holding Cell 2	63° 34' 38" N	90° 75' 16" W
CHE-4	Final Discharge Point for Effluent from the wetland treatment area prior to Finger Bay	63° 34' 97" N	90° 76' 01" W

Comment: A description of the monitoring stations and GPS locations are included in the plan as required by water licence 3BM-CHE1523, Part F item 3 though the coordinates appear to be transposed.

Recommendation: CIRNAC recommends that an addendum be submitted to the plan to include the corrected GPS location of the monitoring stations

9. Geotechnical/ Engineering Inspection

Water Licence 3BM-CHE1523, Part F item 6 and 7 state: *"6. An inspection of all engineered facilities related to the management of Water and Waste shall be carried out by an Engineer at a minimum of once annually, and before commissioning any engineered facility related to the management of Water and Waste. The Engineer's report shall be submitted to the Board within sixty (60) days of the inspection, including a cover letter from the Licensee outlining an implementation plan to address each of the Engineer's recommendations.*

7. An inspection of all engineered facilities related to the management of Water and Waste shall be conducted by a Geotechnical Engineer in accordance with the Canadian Dam Safety Guidelines, at least one (1) year prior to the expiry of the Licence, during the open Water period (June/July/August). The Geotechnical Engineer's report shall be submitted to the Board for review within sixty (60) days of the inspection, including a cover letter from the Licensee outlining an implementation plan to address the Engineer's recommendations."

Comment: CIRNAC reviewed the information provided in the amendment/renewal application as well as the Nunavut Water Board's FTP website for any inspection of the

water/waste management structures in Chesterfield Inlet. CIRNAC acknowledges the GN-CGS efforts to resolve the Municipalities' compliance with this condition, as it relates to municipal water licences Territory-wide, though the absence of any inspection is unacceptable.

The GN-CGS has committed to proposing a reasonable plan to resolve this issue and provide the information to the Board for consideration by 2024.

Recommendation: (R-10) Subject to the Board approval, CIRNAC recommends that GN-CGS prepare a report which analyzes the type of structures and frequency of inspections required for the Municipality of Chesterfield Inlet's undertakings. This submission must be provided to the Board by March 31st, 2025. In the meantime CIRNAC recommends that the Board consider modifying the licence condition allow additional 15 days reporting timeline be added to the current 60-days requirement.