



Water Resources Division
Resource Management Directorate
Nunavut Regional Office
918 Sivumugiaq Street
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Your file - Votre référence
8BC-SHE1929
Our file - Notre référence
GCdocs#134361091

March 18, 2025

Richard Dwyer
Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU, X0B 1J0
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**Re: Crown-Indigenous Relations and Northern Affairs Canada's review of
Department of National Defence's Amendment Application for the CAM-3 North
Warning System Long Range Radar Site, Shepherd Bay, Nunavut Project**

Dear Richard,

Thank you for the opportunity to review Department of National Defence's Amendment Application for the CAM-3 North Warning System Long Range Radar Site, Shepherd Bay, Nunavut Project, for Type B Water Licence No. 8BC-SHE1929.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) examined the application and supporting documents 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* and provides the following Technical Review Memorandum for the Board's consideration.

The applicant shall confirm with the Nunavut Water Board that all outstanding water license fees have been paid in full prior to approval of this application. CIRNAC recommends that the Licensee adequately address the concerns raised herein before consideration is given to the proposed amendment.

Please contact me or Andrew Keim by email at john.macinnis@rcaanc-cirnac.gc.ca or andrew.keim@rcaanc-cirnac.gc.ca if there are any questions or concerns.

Sincerely,

John MacInnis
Senior Environmental Assessment Specialist



Technical Review Memorandum

Date: March 18, 2025

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

From: John MacInnis, Senior Environmental Assessment Specialist, Crown-Indigenous Relations and Northern Affairs Canada

Subject: Crown-Indigenous Relations and Northern Affairs Canada's review of Department of National Defence's Amendment Application for the CAM-3 North Warning System Long Range Radar Site, Shepherd Bay, Nunavut Project

Region: ☒ Kitikmeot ☐ Kivalliq ☐ Qikiqtani

A. BACKGROUND

On February 14, 2025, the Nunavut Water Board invited interested parties to comment on Department of National Defence's Amendment Application for the CAM-3 North Warning System Long Range Radar Site, Shepherd Bay, Nunavut Project, for Type B Water Licence No. 8BC-SHE1929.

CAM-3 is a long-range radar site for the North Warning System, which is a chain of radar sites that detects and allows for early responses to potential threats entering North American air space. CAM-3 is an unmanned site, situated in Nunavut on the Boothia Peninsula on the east side of Shepherd Bay, but it is visited by CAM-M (Cambridge Bay) staff on scheduled quarterly preventive and corrective maintenance trips and on an as-needed basis. During the months of May to September, the site may have an average of 5 to 20 personnel on-site due to seasonal project activity and occasional third-party visitors.

CAM-3 is intended to be attended full time by at least nine (9) staff. During the winter of 2023-2024, staff found the designated water lake froze to the bottom, which eliminated opportunity for water draw. Another lake exists to the north of the designated water lake, which is slightly deeper. The proposed change to the water licence is to include the lake to the north in the water licence for water draw to support camp operations. The Licensee indicated that the overall amount of water drawn for the site would not change, and proposed to use melted snow, in the event both lakes freeze to the bottom.

CIRNAC provides the following comments and recommendations about the application. A summary of subjects and recommendations is shown in Table 1.



Table 1: Summary of Recommendations.

Recommendation Number	Subject
R-01	Potential for Washouts and Erosion
R-02	Berm Water Sampling Procedures
R-03	Water Source Characteristics

B. DOCUMENTS REVIEWED AND REFERENCED

The following table (Table 2) lists the documents reviewed under the submission and references during the review.

Table 2: Documents reviewed and referenced.

Document Title	Author, File No., Rev., Date
Distribution Review NPC NIRB Received	Nunavut Water Board, February 2025
Application for Water Licence Amendment 2025	Licensee, February 2025
NWB Renewal/Amendment Water Licence No. 8BC-SHE1929	Nunavut Water Board, April 2019
NWB Amendment Water Licence No: 8BC-SHE1929 – Amendment No. 1	Nunavut Water Board, April 2022
CAM-3 Executive Summary	Licensee (undated)
CAM-3 Inspection 2022	CIRNAC, October 2022
CAM-3 NTS Map	Department of Energy, Mines, and Resources (undated)
CAM-3 Remote Camp Questionnaire 2024 (final)	Licensee (undated)
NWB Licence Compliance Assessment 2024	Licensee, January 2024
150590 - NPC Conformity 2024 CAM-3	Nunavut Planning Commission, December 2024
181221-03DN117-Screening Decision Report	Nunavut Impact Review Board, December 2018
NWS Sewage Disposal at Remote Nunavut LRRs Plan	Nasittuq, September 2023
NWS Spill Plan 2	Nasittuq, March 2024
PLN-EHS-15 CAM-3 Draft Landfarm Plan 2024	Nasittuq, January 2024
Screening for Water Licence Amendment	Nunavut Impact Review Board, October 2003
Site Description 2024	Nasittuq (undated)
SP-52 Berm Water Sampling Standard Procedure	Nasittuq, February 2023
North Warning System Project, Culvert Replacements at Station CAM-3, Water Licence 8BC-SHE1929, Department of National Defense	Nunavut Water Board, November 2019
Spill Contingency Plan for the North Warning System	Raytheon Canada, July 2021



Sewage Disposal Plan: Sumps for Sewage Outfalls at CAM-3, FOX-3, DYE-M, and BAF-3	Raytheon Canada, July 2021
CAM-3 Landfarm Design and Management Plan	Raytheon Canada, October 2021
QA/QC Plan for Berm Water Sampling at CAM-M, CAM-3, FOX-M, FOX-3, DYE-M and BAF-3	Raytheon Canada, July 2021
2021 Annual Nunavut Water Board Report for CAM-3 for the North Warning System	Raytheon Canada, March 2022
2022 CAM-3 Annual Nunavut Water Board Report for the North Warning System	Nasittuq, March 2023
2023 CAM-3 Annual Nunavut Water Board Report for the North Warning System	Nasittuq, March 2024

C. RESULTS OF REVIEW

1. Potential for Washouts and Erosion

Comment:

The Inspector was notified during an inspection in 2022 that the Licensee was withdrawing water from another source (the proposed water source in the current application) due to washouts of the water lake road. The Licensee later clarified that water withdrawals from the other source were discontinued, and plans were in place to install new culverts. CIRNAC is seeking clarification if other areas are prone to washouts and erosion, particularly those within the vicinity of the proposed water source.

Recommendation:

(R-01) CIRNAC recommends that the Licensee clarify if other areas near the proposed water source are prone to washouts and erosion and describe sediment and erosion controls that will be used to minimize damage to watercourses.

2. Berm Water Sampling Procedures

Comment:

CIRNAC notes that the document titled "SP-52 Berm Water Sampling Standard Procedure" has some inconsistencies relative to plan that was approved by the Board (dated July 16, 2021). Table 3 below provides a comparison of each document.

Table 3: Comparison of lab sampling protocols in the approved and new plans (see Table 3-1 in the approved plan and Table 2.4-1 in the new plan).

Parameter	Bottle		Preservative		Sampling		Hold Time	
	Approved	New	Approved	New	Approved	New	Approved	New
Dissolved Metals (dissolved lead)	125 mL plastic	1 x 80 mL plastic with HNO ₃ acid	nitric acid (may be marked as HNO ₃)	NA	Field filtered. No rinse (do not discard the preservative*) Note: Cross	Filter using the syringe and filter attachment. Fill to neck. Do not discard	28 days	Keep cool. Hold time is 6 months.



BTE	2 x 40 mL VOC glass vials	2 x 40 mL VOC vials	May contain a preservative tablet such as sodium bicarbonate	NA	out "Metals" and write "Lead". Fill slowly and completely – no headspace. No rinse (do not discard the preservative tablet).	preservative liquid. Do not dip into berm. Fill slowly and completely – no air bubbles present. Do not discard preservative tablet. Do not dip into berm (fill by pouring from the 250 mL bottle).	7 days	Keep cool. Holding time is 14 days.
pH	250-1000 mL	1 x 250 mL plastic bottle	None	NA	Grab, fill bottle to top with water.	Fill to neck	14 days	Keep cool. Hold time extremely short Use pH strips to supplement analysis.
Oil & Grease (total)	1 L amber glass bottle	2 x 250 mL Amber Glass bottles (no preservative)	None	NA	Grab, Fill bottle to the top with water.	Grab	14 days	Keep cool. Return to the laboratory within 7 days of sampling.

It is unclear to CIRNAC why there is a large discrepancy between hold times, given the similarities in collection and sampling. CIRNAC also notes that Section 2.5.3 in the new plan may benefit from revisions. For example, the first step in collecting dissolved metals states: "*Locate the bottle for Dissolved Metals (125 ml with acid preservative) and have it within arms reach.*", which may create confusion for personnel in the field when they are planning to use 80 mL bottles. Lastly, the sampling decision tree in Appendix B of the new plan does not include notifying the Inspector 10 days before discharging berm water (this information was included in the approved plan). CIRNAC understands that this remains an ongoing requirement of the water licence (Part D, Item 19).

Recommendation:

(R-02) CIRNAC recommends that the Licensee clarify why the hold times are different, including whether longer hold times will impact the validity of laboratory measurements, and update Section 2.5.3 and Appendix B of the new plan.

3. Water Source Characteristics

Comment:

The Licensee is proposing to use an additional lake as a water source to support camp operations and melted snow as an alternate water source if designated lakes freeze to the bottom during the winter. In its review, CIRNAC was unable to identify detailed information about the proposed new lake in the documents listed in Table 2, including the status of the existing aquatic habitat (e.g., water quality, species composition, etc.), or how any future water withdrawals would impact the lake environment.



CIRNAC is also seeking clarification on which factors may be contributing to the complete freezing of the water lake. Freezing was reported to have occurred during the winter of 2022-2023, but this observation was not recorded in previous annual reports submitted by the Licensee. CIRNAC is aware that changes in climatic conditions (e.g., colder temperatures, reduced mixing by wind) are expected to affect freezing conditions in the lake, but notes other factors may be relevant, including changes in site hydrology, lake water quality, and water withdrawal rates. CIRNAC understands that the withdrawal rates reported in the annual reports are below the requirements of the water licence, but notes that lake withdrawals, potentially combined with other factors, have the potential to contribute to lake drawdown. Part C, Item 4 of the water licence provides direction on drawdowns:

“Where the use of Water is of a sufficient volume that the source Water body may be drawn down, the Licensee shall submit, for approval of the Board in writing, the following information: the volume required, a hydrological overview of the water body, details of impacts, and proposed mitigation measures.”

Recommendation:

(R-03) CIRNAC recommends that the Licensee provide further information on the proposed lake, demonstrating that it is suitable as a water source, and describe factors that may be contributing to the freezing of the designated lake, including the potential impacts of water withdrawal on lake drawdown.