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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

EXPLORATION/ REMOTE CAMP SUPPLEMENTARY QUESTIONNAIRE

Applicant: Department of National Defence **Licence No: _____**
(For NWB Use Only)

ADMINISTRATIVE INFORMATION

1. Environment Manager: **N/A** Tel: **N/A** E-mail: **N/A**

   Please contact Major Christopher Greaves for referral to the North Warning System Office Environmental Representative.

2. Project Manager: **Major Christopher Greaves** Tel: **819-939-4963**
   E-mail: **Christopher.Greaves@forces.gc.ca**

3. Does the applicant hold the necessary property rights? **Yes**

4. Is the applicant an 'operator' for another company (i.e., the holder of the property rights)? If so, please provide letter of authorization.

5. Duration of the Project

   ☐ One year or less Start and completion dates: _____
   X Multi Year:

   If Multi-Year indicate proposed schedule of on site activities
   Start: C**urrent ongoing operations which began in the 1950s** Completion: **not applicable**

CAMP CLASSIFICATION

6. Type of Camp

   ☐ Mobile (self-propelled)
   ☐ Temporary
   ☐ Seasonally Occupied:
   X Permanent – **National Defence Long Rang Radar Site and Logistics Support Site**
   ☐ Other:_____

7. What is the design, maximum and expected average population of the camp?

CAM-M, Cambridge Bay is staffed with an annual average site population of 18 to 22 people per day. Site numbers increase during the summer due to seasonal construction and occasional large groups of Third Party visitors.

8. Provide history of the site if it has been used in the past.

CAM-M was built in the 1950's as one of the Distant Early Warning Line (DEW Line) radar sites. The DEW Line stretched from Alaska to Greenland. In the 1980's, the DEW line in Canada evolved into the North Warning System (NWS) with radar sites extending from the Yukon across the arctic and down the Labrador Coast. CAM-M was modernized as part of this transition. Over the years, the Prime Mission of the radar sites remains unchanged: to detect airborne objects within the Arctic surveillance area.

CAM-M has been manned since the 1950's. It consists of a Long Range Radar (LRR) site and a Logistics Support Site (LSS). The LSS is a dispatch center for the unmanned LRR CAM-3 and for ten (10) Short Range Radar (SRR) sites. CAM-M's facilities include site buildings with their integral mechanical and electrical systems, power generation system, fuel tanks, radar, antennas, satellite ground terminals, weather equipment, and roads.

CAMP LOCATION

9. Please describe proposed camp location in relation to biogeographical and geomorphological features, and water bodies.

CAM-M is situated in Nunavut on the south shore of Victoria Island in the Arctic Ocean. The site is located on 1,627 acres of land along the coastal margin of extensive rolling plateau which rises gently inland from the top of steep cliffs (12 to 24 m high) on the western arm of Cambridge Bay. The geographical coordinates are: 69° 6'58.00"N, 105° 7'8.00"W.

The terrain consists of a gently rising plateau broken by innumerable swamp-margined lakes and ponds (about 30 m above sea level). Surface materials in the area consist of sands, gravels, and cobbles, overlain by organic muds and fine sands in wet areas. The most prominent feature is Mount Pelly, 160 m high, located approximately 11 km northwest of the site. Vegetation includes grasses, wildflowers, and arctic willow in drier areas and grassy swards, sedges, mosses, and wildflowers in wetter areas.

In the immediate vicinity of the site, arctic fox, arctic hare, ptarmigan, ravens, raptors, and waterfowl can be seen. Ravens have nested on-site. Raptors perch on the facilities of the site as the offer good vantage points over the flat terrain. Beyond the immediate vicinity of the site wildlife is abundant with muskox, caribou, arctic fox, and seal.

10. How was the location of the camp selected? Was the site previously used? Was assistance from the Regional Inuit Association Land Manager sought? Include maps and/or aerial photographs.

The CAM-M site was selected based on the requirements of the Department of National Defence. Site maps have been included in the submission for this Water Use Licence Renewal/Amendment.

11. Is the camp or any aspect of the project located on:

X	Crown Lands	Permit Number (s)/Expiry Date: ____**N/A**_____
☐	Commissioners Lands	Permit Number (s)/Expiry Date: _____
☐	Inuit Owned Lands	Permit Number (s)/Expiry Date: _____

12. Closest Communities (direction and distance in km):

Cambridge Bay, Nunavut, 2.5 km east on the north shore of the main inlet and 4 km away by road.

13. Has the proponent notified and consulted the nearby communities and potentially interested parties about the proposed work?

Not applicable. The site has been at this location since the 1950's and its prime mission remains unchanged. The local community, Cambridge Bay, is familiar with the radar site. Some site employees include Cambridge Bay residents and northern hires from other communities. For work, job openings are posted in a variety of ways including ads in northern newspapers and on Raytheon's website.

14. Will the project have impacts on traditional water use areas used by the nearby communities? Will the project have impacts on local fish and wildlife habitats?

No.

PURPOSE OF THE CAMP

15.
- ☐ Mining (includes exploration drilling)
- ☐ Tourism (hunting, fishing, wildlife observation, adventure/expedition, etc.) (Omit questions # 16 to 21)
- **X** Other ___**National Defence**_____

16. Activities (check all applicable)

Not applicable - not a mining camp.
- ☐ Preliminary site visit
- ☐ Prospecting
- ☐ Geological mapping
- ☐ Geophysical survey
- ☐ Diamond drilling
- ☐ Reverse circulation drilling
- ☐ Evaluation Drilling/Bulk Sampling (also complete separate questionnaire)
- ☐ Other: _____

17. Type of deposit (exploration focus):

Not applicable - not a mining camp.
- ☐ Lead Zinc
- ☐ Diamond
- ☐ Gold
- ☐ Uranium

☐ Other: _____

DRILLING INFORMATION

18. Drilling Activities
Not applicable - not a mining camp.
☐ Land Based drilling
☐ Drilling on ice

19. Describe what will be done with drill cuttings?
Not applicable - not a mining camp.

20. Describe what will be done with drill water?
Not applicable - not a mining camp.

21. List the brand names and constituents of the drill additives to be used? Includes MSDS sheets and provide confirmation that the additives are non-toxic and biodegradable.
Not applicable - not a mining camp.

22. Will any core testing be done on site? Describe.
Not applicable - not a mining camp.

SPILL CONTINGENCY PLANNING

23. The proponent is required to have a site specific Spill Contingency Plan prepared and submitted with the application This Plan should be prepared in accordance with the *NWT Environmental Protection Act, Spill Contingency Planning and Reporting Regulations, July 22, 1998* and *A Guide to the Spill Contingency Planning and Reporting Regulations, June 2002*. Please include for review.

North Warning System Spill Contingency Plan has been included in the submission for this Water Use Licence Renewal/Amendment (Annex Q2).

24. How many spill kits will be on site and where will they be located?

Two (2) spill kits are on-site
- the POL (petroleum, oil, lubricants) Spill Kit is located in the hangar; and
- the Chemical Spill Kit is located in the LSS building.

See CAM-M Site Plan (Annex Q4) for spill kit locations.

25. Please describe the types, quantities, and method of storage of fuel and chemicals on site, and provide MSDS sheets.

Jet A1 is the fuel used on-site. Jet A1 fuel and locations are listed below.

LOCID	Location	Fuel Usage	Tank Size (L)	Max Fill Volume (L)	Usable Volume (L)
Environment Canada ID # & System Name: EC-00003865, CAM-M Beach to Summit					
CAMW22A	Summit	PGS	946,300	890,038	845,653
CAMW22D	Summit	PGS	75,000	70,494	69,428
CAMW21G	Summit	Vehicle Refueller	4,100	3878	3770
CAMW20B	Airstrip	Aviation	69,200	65,084	63,427
CAMW20C	Airstrip	Aviation	69,200	65,084	63,427
CAMW22C	Beach	Aviation/PGS	946,300	890,038	845,653
CAMW20D	Beach	Aviation/PGS	946,300	890,038	845,653
		Summit Totals:	1,025,400	964,410	918,851
		Airstrip Totals:	138,400	130,168	126,854
		Beach Totals:	1,892,600	1,780,076	1,691,306
		Site Totals:	3,056,400	2,874,654	2,737,011

Other items such as batteries, aerosols, and cleaning products are stored in the warehouses and in the buildings where they are used. Drums of oil and glycol and a limited number of cylinders are stored in the warehouse as shown on the CAM-M Site Plan (Annex Q4). A Safety Data Sheet for Jet A1 is attached (See Annex Q5).

WATER SUPPLY AND TREATMENT

26. Describe the location of water sources.

The water source is the lake. See CAM-M Site Plan (Annex Q4).

27. Estimated water use (in cubic metres/day):

X Domestic Use**: 3650 m³ Annually** Water Source: **Water Lake**
☐ Drilling: _____ Water Source: _____
☐ Other: _____ Water Source: _____

28. Describe water intake for camp operations? Is the water intake equipped with a mesh screen to prevent entrapment of fish? (see *DFO 1995, Freshwater Intake End-of-Pipe Fish Screen Guideline*) Describe:

Water is pumped from a natural fresh water lake to the site raw water tanks. The water is pumped automatically as the tanks reach a low level. Water from the raw water tanks is distributed through the station for domestic use. There is a screen on the water intake.

29. Will drinking water quality be monitored? What parameters will be analyzed and at what frequency?

Yes, the drinking water quality is monitored on a quarterly basis and monthly basis when site is ramped up. Bacteriological water tests are performed at two locations. Both samples are collected from regular consumption and food preparation areas.

The water is tested for bacteriological parameters including E. coli and Total Coliforms. A Heterotrophic Plate Count (HPC) is also completed. All water analysis must pass guidelines prior to water consumption.

On an annual basis a chemical water sample analysis is performed by an outside testing facility. Two samples are taken: one from the water source (lake) and one from a point of consumption inside the building. The samples are shipped to a testing facility where they are analyzed for the physical and chemical water properties listed below.

Physical and Chemical Parameters:

Alkalinity	**Hardness**	**Phenols**
Ammonia	**Hydrogen sulphide**	**Potassium**
BODS	**Iron**	**Sodium**
Calcium	**Mamesium**	**Sulphate**
Chloride	**Manganese**	**Tannin and lignin**
Colour	**Nitrate**	**Total Dissolved Solids**
Conductivity	**Nitrite**	**Total Kieldahl Nitrogen (TKN)**
Chemical Oxygen Demand	**PCBs**	**Turbidity**
Fluoride	**pH**	

Bacteriological Parameters:

E. coli	**Heterotrophie Plate Count (HPC)**
Fecal streptococci	**Total and Fecal coliforms**

30. Will drinking water be treated? How?

Site drinking water is treated using multiple filters (including granular activated carbon filters) and ultraviolet (UV) light.

31. Will water be stored on site?

Raw (untreated) water is stored in two (2) 7,500 liter raw water storage tanks next to the monitoring point, CDL-1 (the flow meter in the fill line to the raw water tanks). Treated drinking water is piped directly to water taps. See CAM-M Site Plan (Annex Q4).

WASTE TREATMENT AND DISPOSAL

32. Describe the characteristics, quantities, treatment and disposal methods for:

X Camp Sewage (blackwater)

The sewage (blackwater) and grey water at CAM-M are both handled by a tertiary wastewater treatment system, Cycle-let® located in the sewage treatment plant which includes the sampling

port CDL-2. The system is monitored and maintained by on-site personnel. 60 to 80% of the treated water is recycled as on-site urinal/toilet flush water, with the excess passing to a designated outfall area.

An average of 6 cubic meters per day of sewage (blackwater) and grey water is processed. Of this 3.6 to 4.8 cubic meters per day of the treated water is recycled as urinal/toilet flush water and 1.2 to 2.4 cubic meters per day is discharged at the outfall area.

See CAM-M Site Plan (Annex Q4) for the location of the sewage treatment plant.

X Camp Greywater

Grey water and sewage (blackwater) are both handled by the sewage system described above. Please see "Camp Sewage (blackwater)" above.

X Solid Waste

Solid waste is sent to the Cambridge Bay community landfill twice a week. Approximately 1 to 1.4 cubic meters per day of solid waste is generated.

X Bulky Items/Scrap Metal

These items are packaged and stored on-site until they can be transported for disposal off-site at an appropriate facility; typically this occurs every two to four years.

X Waste Oil/Hazardous Waste

These items are packaged and shipped to a licensed disposal facility every year

.

An average annual inventory typically includes:
- 25 drums Waste oil
- 3 drums Waste glycol
- 6 drums Waste fuel
- 1 crate Waste paint
- 1 drum Waste oil filters
- 1 crate Waste batteries, wet, filled with acid
- 1 crate Waste batteries, non-spillable
- 1 cylinder Waste acetylene, dissolved
- 1 to 2 cylinders Waste refrigerant gases.

See CAM-M Site Plan (Annex Q4) for the locations where HAZMAT is stored on-site.

☐ Empty Barrels/Fuel Drums

These items are re-used to contain the same liquids.

☐ Other:

33. Please describe incineration system if used on site. What types of wastes will be incinerated?

An incineration system is not currently in use at this site; but may be considered for the future, all planning would be in consultation with the Government of Nunavut, Guideline for the Burning and Incineration of Solid Waste. Solid waste would be sorted, only waste paper products and packaging, untreated wood and natural fiber textiles would be incinerated on-site.

34. Where and how will non-combustible waste be disposed of? If in a municipality in Nunavut, has authorization been granted?

All non-hazardous non-combustible domestic solid waste is disposed of through a contract with the Hamlet of Cambridge Bay for the deposit of waste in the local municipal dump.

35. Describe location (relative to water bodies and camp facilities) dimensions and volume, and freeboard for all sumps (if applicable).

Not applicable

36. Will leachate monitoring be done? What parameters will be sampled and analyzed, and at what frequency?

Not applicable

OPERATION AND MAINTENANCE

37. Have the water supply and waste treatment and disposal methods been used and proven in cold climate? What known O&M problems may occur? What contingency plans are in place?

Both the water supply and waste treatment and disposal methods at this site have been in use for many years and they are proven in cold climates.

ABANDONMENT AND RESTORATION

38. Provide a detailed description of progressive and final abandonment and restoration activities at the site.

Not applicable. The Prime Mission is scheduled to at least 2035. No abandonment or restoration is planned at this time. As indicated in the current Water Use Licence for this site (Part H); a site Abandonment and Restoration Plan will be submitted to NWB six months prior to the decommissioning of CAM-M.

BASELINE DATA

39. Has or will any baseline information be collected as part of this project? Provide bibliography.

- ☐ Physical Environment (Landscape and Terrain, Air, Water, etc.)
- ☐ Biological Environment (Vegetation, Wildlife, Birds, Fish and Other Aquatic Organisms, etc.)
- ☐ Socio-Economic Environment (Archaeology, Land and Resources Use,
- ☐ Demographics, Social and Culture Patterns, etc.)
- ☐ Other: _____

REGULATORY INFORMATION

40. At a minimum, you should ensure you have a copy of and consult the documents below for compliance with existing regulatory requirements:

- ✓ ARTICLE 13 – *NCLA -Nunavut Land Claims Agreement*
- ✓ NWNSRTA – *The Nunavut Waters and Nunavut Surface Rights Tribunal Act, 2002*
- ✓ *Northwest Territories Waters Regulations, 1993*
- ✓ NWB - Water Licensing in Nunavut - Interim Procedures and Information Guide for Applicants
- ✓ NWB - Interim Rules of Practice and Procedure for Public Hearings
- ✓ RWED – *Environmental Protection Act, R-068-93- Spill Contingency Planning and Reporting Regulations, 1993*
- ✓ RWED A Guide to the Spill Contingency Planning and Reporting Regulations, 2002
- ✓ NWTWB - Guidelines for Contingency Planning
- ✓ *Canadian Environmental Protection Act, 1999 (CEPA)*
- ✓ *Fisheries Act, RS 1985* - s.34, 35, 36 and 37
- ✓ DFO - Freshwater Intake End of Pipe Fish Screen Guideline
- ✓ NWTWB - Guidelines for the Discharge of Treated Municipal Wastewater in the NWT
- ✓ Canadian Council for Ministers of the Environment (CCME); Canadian Drinking Water Quality Guidelines, 1987
- ✓ Public Health Act - Camp Sanitation Regulations
- ✓ Public Health Act - Water Supply Regulations
- ✓ *Territorial Lands Act* and *Territorial Land Use Regulations*; Updated 2000