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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: **William Wyman** Tel: **342-552-0501**
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2. Project Manager: **Colonel Donald Henley** Tel: **613-901-9108**
E-mail: **Donald.henley@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: _____
 Multi Year:

If Multi-Year indicate proposed schedule of on site activities

Start: **Current ongoing operations which began in the late 1980s**

Completion: **N/A**

CAMP CLASSIFICATION

6. Type of Camp

Mobile (self-propelled)
 Temporary
 Seasonally Occupied: **Intermittently until 1Apr2022**
 Permanent: **Permanent attendance commencing 1Apr2022**
 Other: **Quarterly until 1Apr2022**

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

BAF-3, Brevoort Island is a Long Range Radar Site (LRR) for the North Warning System (NWS). BAF-3 is an unmanned site, but it is visited by staff from Iqaluit, the Logistics Support Site (LSS-Q), on scheduled quarterly preventive and corrective maintenance trips and on an as needed basis. From

May to September there may be an average of 5 to 20 personnel on-site due to seasonal project activity and occasional Third Party visitors.

Staffing levels at BAF-3 are planned to increase beginning April 1st 2022 to year-round attendance of at least nine staff members.

Present to April 1, 2022:

During this time BAF-3 is not planned to be attended year-round. It will be visited by staff from LSS-Q on quarterly maintenance trips, and on an as-needed basis.

April 1, 2022 onward:

As of April 1, 2022 BAF-3 is planned to be attended full time (365 days of the year) by at least 9 staff.

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

BAF-3 is a modern site, built in the 1980's. It was built in the same location as an abandoned United States Air Force (USAF) relay station. BAF-3 is part of the North Warning System (NWS) with radar sites extending from Yukon across the Arctic and down the Labrador coast. On 31 October 1995, the site transitioned from manned to unmanned status. Over the years, the Prime Mission of the radar sites remains unchanged: to detect airborne objects within the Arctic Surveillance area.

BAF-3's facilities include site buildings with their integral mechanical and electrical systems, power generation system, fuel tank, radar, antennas, satellite ground terminals, weather equipment, and roads

For more information please refer to the attached document "Q3 – BAF-3 Site Description + Site Plan".

CAMP LOCATION

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

BAF-3 is located near the southern end of Brevoort Island, off the east coast of Baffin Island, Nunavut. The site is 366 m above sea level. BAF-3 is 250 km North East of Iqaluit. The geographical coordinates of the site are: 63° 20' 24"N, 64° 08' 40"W.

Brevoort Island is approximately 40 km long and 10 km wide. It is an irregular hilly island consisting of mostly igneous or metamorphic bedrock overlain in places by stony, sandy, glacial fill intermixed with fluvial and marine deposits. Water and wind generated erosion move the poorly-developed, mineral soil into valleys and hollows, leaving slopes and hilltops bare. There is a general lack of vegetation, much of the ground is either barren or covered with a thin veneer of lichen.

Land mammals are not abundant on Brevoort Island. Lemmings and arctic hare have been reported. Polar bears use coastal portions of the island extensively in winter and there is evidence of denning and the presence of young on the south side of the island. A few caribou,

arctic foxes, and arctic wolves may come and go across the frozen Robinson Sound, but they are not thought to be resident on the island.

Marine mammals are more numerous than land mammals at Brevoort Island. Walrus make use of the straits between Brevoort Island and the Lemieux Islands to the east. Walrus are present in the area all summer and a large scale movement into the Lemieux Islands in mid-September. Other marine mammals occurring in the water around Brevoort Island include harp seal, ringed seal, and bearded seal. Scattered whale sightings, including records of narwhal, bowhead, minke, and beluga whales have been reported.

Bird life on and around Brevoort Island is limited. Nesting colonies of glaucous gulls have been reported. Nesting by black guillemot is suspected on the southeastern end of Brevoort Island.

For more information please refer to the attached document “Q3 – BAF-3 Site Description + Site Plan”.

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 BAF-3 site was selected based on the requirements of the Department of National Defence, and was previously a radar site. 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:

<input checked="" type="checkbox"/>	Crown Lands	Permit Number (s)/Expiry Date: N/A
<input type="checkbox"/>	Commissioners Lands	Permit Number (s)/Expiry Date: _____
<input type="checkbox"/>	Inuit Owned Lands	Permit Number (s)/Expiry Date: _____

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

The closest communities to BAF-3 are:

- 1. Iqaluit, 220 km to the west. Flight time from Iqaluit is 1 hours and 15 minutes by helicopter under normal conditions; and**
- 2. Pangnirtung, 320 km to the North West.**

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

Not applicable. The site is unmanned and is visited by the Operation & Maintenance Contractor based in LSS-Q, Iqaluit. These employees include Iqaluit 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)
 Other: **National Defence**

16. Activities (check all applicable)

N/A – 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):

N/A – not a mining camp

Lead Zinc
 Diamond
 Gold
 Uranium
 Other: _____

DRILLING INFORMATION

18. Drilling Activities

N/A – not a mining camp

Land Based drilling
 Drilling on ice

19. Describe what will be done with drill cuttings?

N/A – not a mining camp

20. Describe what will be done with drill water?

N/A – 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.

N/A – not a mining camp

22. Will any core testing be done on site? Describe.

N/A – 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.

Please see the attached document “Q2 - PLN-EHS-2 REV 10 Spill Contingency Plan (16.F.3.b).”

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 located in the Garage at the summit; and**
- the Chemical Spill Kit located in the Technical Services Module.**

See BAF-3 Site Plan (Annex Q3, page 11) 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)
BREW22G	Summit	PGS	90,000	84,528	82,857
BREW22H	Summit	PGS	90,000	84,528	82,857
BREW22I	Summit	PGS	90,000	84,528	82,857
BREW22J	Summit	PGS	90,000	84,528	82,857
BREW22K	Summit	PGS	90,000	84,528	82,857
BREW22Q	Summit	PGS	50,000	46,917	45,981
BREW22R	Summit	PGS	50,000	46,917	45,981
BREW21C	Summit	Vehicle Refueller	9,000	8,472	8,277

LOCID	Location	Fuel Usage	Tank Size (L)	Max Fill Volume (L)	Usable Volume (L)
BREW20A	Summit	Aviation	46,000	43,259	42,129
BREW22L	Beach	PGS	90,000	84,528	82,857
BREW22M	Beach	PGS	90,000	84,528	82,857
BREW22N	Beach	PGS	90,000	84,528	82,857
BREW22O	Beach	PGS	90,000	84,528	82,857
BREW22P	Beach	PGS	90,000	84,528	82,857
BREW22F	Summit	PGS	9,000	8,472	8,277
Summit Totals:			568,000	533,418	522,801
Beach Totals:			450,000	422,640	414,285
Site Totals:			1,018,000	956,058	937,086

Other items such as batteries, aerosols, and cleaning products are stored in the warehouse 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 BAF-3 Site Plan (Annex Q3, page 11). A Safety Data Sheet for Jet A1 is attached (See Annex Q2, page 46).

WATER SUPPLY AND TREATMENT

26. Describe the location of water sources.

The water source is the water lake. See the BAF-3 Site Plan Drawing in the attachment “Q3 – BAF-3 Site Description + Site Plan”, page 11.

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

Domestic Use: 2950 m³ Annually estimated upon increased staffing Water Source: Water Lake
 Drilling: _____ Water Source: _____
 Other: 50 m³ Annually (industrial use) Water Source: Water Lake

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 from a natural fresh water lake is pumped via pipeline into two large storage tanks; the water intake is equipped with a mesh screen. The two raw water tanks are located at the station; water from these tanks is distributed through the station for domestic use.

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 fully staffed. 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. Bacteriological parameters are listed in the table below.

Bacteriological Parameters
E. coli
Fecal streptococci
Heterotrophic Plate Count (HPC)
Total and Fecal coliforms

On an annual basis a chemical water sample analysis is performed by an accredited laboratory. 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
Phenols
Alkalinity as CaCO ₃
Colour
Conductivity
Dissolved Organic Carbon (DOC)
Fluoride (F)
Hardness as CaCO ₃
Ion Balance
Ammonia as N (N-NH ₃)
Nitrate as N (N-NO ₂)
Nitrite as N (N-NO ₃)
pH
Sulphide (S ²⁻)
Sulphate (SO ₄)
Tannin & Lignin
Total Dissolved Solids (TDS)
Total Kjeldahl Nitrogen (TKN)
Turbidity
Calcium (Ca)
Chloride (Cl)
Copper (Cu)
Iron (Fe)
Potassium (K)
Magnesium (Mg)
Manganese (Mn)
Sodium (Na)
Lead (Pb)
Polychlorinated Biphenyls (PCBs)

30. Will drink 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 854,000 litre raw water storage tanks next to the monitoring point, BAF-1 (the flow meter in the fill line to the raw water tanks). Treated drinking water is piped directly to water taps. See BAF-3 Site Plan (Annex Q3, page 11).

WASTE TREATMENT AND DISPOSAL

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

X Camp Sewage (blackwater)

Sewage (blackwater) and greywater are combined in the sewage system. The sewage system comprises a sump, holding tank, and masticating pump within the building train. Sewage is not discharged daily. When the septic tank nears or reaches capacity, the sewage is discharged out the sewage outfall pipe to the receiving sump.

Up to 10 m³ is discharged from two to five times a year, depending on the number of people that have visited the site.

The site has one incinerating toilet which reduces sewage to ash; the ash is disposed of off-site. The incinerating toilet's cycling time (interval between usages) does not make it practical to support anything but a short site visit by a few staff. It is primarily in place in case the site fails in the winter and freezes. Under these conditions, a small crew would be dispatched to the site to restore power and thaw the site. The incinerating toilet would be used until the sewage system was thawed and returned to a serviceable state. It cannot meet the demands of a ramped up site.

Sewage sampling is conducted if the outfall sump requires discharge. The sampling point is BAF-2, the final discharge point of the sewage outfall sump, as shown on the Site Plan Drawing.

Sewage effluent samples are analyzed for:

Biochemical Oxygen Demand (BOD), fecal coliforms, pH, phenols, and oil & grease.

For more information please see the attached document "Q4 – PLN-EHS-11 Sewage Disposal Plan".

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

Nonhazardous, combustible solid waste typically includes paper, paper product, cardboard, rags, kitchen waste, and etc. The quantity depends on the number of people on-site. In a year where the site is attended for long periods, the amount of non-hazardous, combustible solid waste would be an estimated 150 m³. This type of waste is incinerated in an on-site incinerator as described in item 33. Ash from the incinerator is removed from the site.

Currently all ash and non-combustible hazardous waste is packaged and shipped to Iqaluit for disposal.

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 one or two years.

An average annual inventory typically includes:

- 12 drums Waste oil**
- 2 drums Waste glycol**
- 11 drums Waste fuel**
- 1 drum Waste paint**
- 1 drum Waste oil filters**
- 1 crate Waste batteries, wet, filled with acid**
- 1 crate Waste batteries, nonspillable**
- 1 cylinder Waste acetylene, dissolved**
- 1 to 2 cylinders Waste refrigerant gases.**

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 currently in use at this site. All burning is compliant with the Government of Nunavut, *Guideline for the Burning and Incineration of Solid Waste*. Solid waste is sorted, only domestic waste is incinerated on-site.

The on-site incinerator is a Consumat System Inc. Model C-32P. It is a forced air incinerator designed to handle combustible waste such as paper, cardboard cartons, wood scrap, combustible floor sweepings, and cafeteria waste.

The general performance characteristics are:

“The incinerator comprises a refractory lined combustion chamber (no grate is required) into which waste is loaded and to which a small supply of air is admitted. The waste is initially heated by an auxiliary burner and undergoes essentially a pyrolysis process. For normal wastes the reaction proceeds automatically without the need for additional fuel. The advantage of this method of primary burning, as opposed to the more usual technique of inducing active

combustion by the introduction of large volumes of forced air, is that waste decomposes under quiescent conditions. Consequently carry over of particulate matter, which would subsequently contribute stack emissions, is minimized.”

“The partial combustion products pass into an after burning secondary chamber, which is mounted immediately above the main combustion chamber.”

“The gases are admixed with additional air and elevated in temperature to ensure successful burn out of smoke. The gases are cooled before discharge by entrained ambient air.”

(Ref: Operations and Maintenance Manual for Brevoort Long Range Radar Site, Volume 9 – Interior Architectural Systems, 820E20 Packaged Incinerator, dated 1988-12-01, Issued by the Department of National Defence)

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 City of Iqaluit 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).

N/A

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

N/A

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 I); a site Abandonment and Restoration Plan will be submitted to NWB six months prior to the decommissioning of the BAF-3 radar site.

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*