P.O. Box 119
Gjoa Haven, NU X0B 1J0
Tel: (867) 360-6338
Fax: (867) 360-6369

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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

EXPLORATION/ REMOTE CAMP SUPPLEMENTARY QUESTIONNAIRE

Applicant: Nasittuq Corporation **Licence No:** _____
(For NWB Use Only)

ADMINISTRATIVE INFORMATION

1. Environment Manager: Scott Charland Tel: 613-234-9033 ext. 626 Fax: 613-234-2671
E-mail: scott.charland@nasittuq.com

2. Project Manager: Jacques Plante Tel: 613-234-9033 ext. 833 Fax: 613-234-2671
E-mail: jacques.plante@nasittuq.com

3. Does the applicant hold the necessary property rights? No.

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

   Please see attached **Annex A** which contains the authorization in:

   a. the letter dated 06 December 2007, Serial No. NWS-0757, to Ms Dionne Fillatrault, Director of Licensing, Nunavut Water Board from Ms Nancy Morin, Supply Team Leader/NWS Contract Authority, North Warning System.
   The second paragraph explains that Nasittuq was awarded a contract by Canada to operate and maintain the North Warning System (NWS) in November 2001 and that "possession, care, custody and control over the NWS passed from Canada to Nasittuq"; and

   b. Article A2 Infrastructure and Scope of Work for the North Warning System Operation and Maintenance (excerpt from Contract Serial No. W8485-98RH01/01-NX).
   Paragraph 3 states "As of the Effective Date {of the contract}, possession and control over the North Warning System as defined in the SOW {Statement of Work} shall pass from the Crown over to the Contractor who shall have care and custody of the same."

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: 1950's Completion: 2030

CAMP CLASSIFICATION

6. Type of Camp

- ☐ Mobile (self-propelled)
- ☐ Temporary
- ☐ Seasonally Occupied: _____
- ☐ Permanent
- [X] Other: National Defence Long Range Radar Site.

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

BAF-3 is a Long Range Radar Site (LRR) for the North Warning System (NWS). BAF-3 is an unmanned site, but it is visited by LSS-Q staff on scheduled quarterly preventive and corrective maintenance trips and on an as needed basis. During the months of May to September there may be an average of 14 to 30 personnel on-site due to seasonal project activity, including clean-up and remediation of a fuel spill from 2007, and occasional Third Party visitors.

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 the 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 is a Long Range Radar (LRR) site. BAF-3'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.

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 and covers 2524 acres of land. BAF-3 is 250 km NE of Iqaluit. The geographical coordinates are: 63° 20' 24" N, 64° 08' 40" W.

Brevoort Island is 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, thin, mineral soil into valleys and hollows, leaving slopes and hilltops bare. There is a general paucity of vegetation, much of the ground being barren or covered with a thin veneer of lichen.

9. Continued.

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 occurs in mid-September. Other marine mammals occurring in waters around Brevoort Island include harp seal, ringed seal, and bearded seal. Scattered whale sightings, including records of bowhead, minke, and beluga have been reported.

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

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 location of the site was based on the National Prime Mission (National Defence) requirements.

See attached **Annex B** BAF-3 Site Plan Drawings (Serial H-B199/2-8400-101 and Serial H-B199/2-8400-102) and **Annex C** BAF-3 Aerial Photo.

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

[X]	Crown Lands	Permit Number (s)/Expiry Date: Not applicable
[ ]	Commissioners Lands	Permit Number (s)/Expiry Date: _____
[ ]	Inuit Owned Lands	Permit Number (s)/Expiry Date: _____

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

The closest community is Iqaluit, 250 km (156 miles) to the southwest.

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 Nasittuq employees based in LSS-Q, Iqaluit. Employees, permanent and seasonal, include Iqaluit residents and northern hires from other communities.

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.)
- [X] Other National Prime Mission (National Defence radar site)
  (therefore questions # 16 to 22 are not applicable.)

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.

Nasittuq's Spill Contingency Plan is attached as **Annex D**.

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 Air Terminal Building; and
- Chemical Spill Kit is located in the Technical Services Module.

The locations are shown on the **Annex B** BAF-3 Site Plan Drawings (Serial H-B199/2-8400-101 and Serial H-B199/2-8400-102).

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 tanks and locations are listed below.

Tank Size	LOC ID	Actual Capacity*	Location	Type of fuel
943,600L	BREW22A	798,286L	Summit	Aviation/PGS
307,300L	BREW22B	259,976L	Summit	Aviation/PGS
943,600L	BREW22C	798,286L	Beach	Aviation/PGS
653,700L	BREW22D	553,030L	Beach	Aviation/PGS
9,000L	BREW22F	8,460L	Summit	PGS
46,000L	BREW20A	43,240L	Helipad	Aviation
SUMMIT TOTAL		1,109,962L		
BEACH TOTAL		1,351,316L		
TOTAL:		2,461,278L		

Tanks: The total volume of usable fuel on site is 2,461,278L.

See **Annex E** for the Jet A1 MSDS.

25. Continued.

Other items such as batteries, aerosols, and cleaning products are stored in the Technical Services Module and in the buildings where they are used. Drums of oil and glycol are stored in the Technical Services Module, while cylinders are stored in the Garage. See **Annex B** BAF-3 Site Plan Drawing (Serial H-B199/2-8400-102).

WATER SUPPLY AND TREATMENT

26. Describe the location of water sources.

The water source is the lake. See **Annex B** BAF-3 Site Plan Drawing (Serial H-B199/2-8400-101).

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

[X] Domestic Use: up to 3 cubic metres/day during ramp up with site at full capacity 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 use varies depending on the number of people on-site, i.e. from 0 m^3/day (unmanned status) to a maximum of 3 m^3/day (height of seasonal activity, ramped up site at full capacity). The seasonal activity from May to September varies from year to year; one season may have no projects, while the next season's projects may have the site at full capacity. Water is pumped through a water pipeline from the water lake. Water is trucked only if the pipeline is unserviceable. There is a screen on the water intake.

Please note that water is not drawn daily from the water lake. The site has two 854 m^3 (854,000 liters) raw water tanks; only one tank is in use for raw water storage. At capacity, the water level in the tank is 23 feet high. There is approximately 37,000 liters per foot of water. The water is used by site personnel and is also part of the site's fire suppression system. When the water in the tanks reaches a low level, an alarm alerts Nasittuq staff to fill the tank.

The highest water usage when the site is at full capacity would typically be 31 days of 3 m^3/day for a total of 93 m^3/month. This is equivalent to 2.5 feet of water. The tank is filled at various levels as required and as time permits.

The site's current Licence NWB6BAF0409 – Type "B" allows the drawing of 10 m^3/day every day which is 310 m^3 in a 31-day month. Nasittuq requests a licence that allows the

28. Continued.

drawing of up to 310 m^3 (equivalent to 8 ft 4 inches of water) each month. Based on a full capacity site using 2.5 feet of water a month, this will allow site staff the option of longer intervals between filling the tank, i.e. they will be able to fill the tank after one month (2.5 feet water used) or two months (5 feet water used). Please note that when the site is unmanned, and only quarterly preventive/corrective maintenance visits occur, the water usage is greatly reduced and no pumping may occur during the entire period between October and April.

The lowest level allowed for the tank is approximately 260 m^3. In order to fill the tank from this lowest allowed level, Nasittuq requests a licence that also allows the drawing of 594 m^3/day (594,000 liters) once in a year. Please note that the filling of the water tank from the lowest allowed level is a worst case scenario and is not expected to be a regular occurrence.

In the event that the second tank is put back into use for raw water storage, Nasittuq requests a licence that also allows the drawing of 854 m^3 (854,000 liters) to fill the second tank.

Nasittuq requests a licence that requires the recording of the daily quantity of raw water drawn from the water lake. We wish to confirm that the monitoring point for the water intake, BAF-1, is the flow meter installed inside the heated water storage building in the fill line to the raw water tank and is not at the intake at the water lake itself. The flow meter is installed at this location for ease of reading and maintenance.

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 test is performed at two locations on site to be determined by site technicians. Both samples are taken from regular consumption and food preparation areas. The bacteriological tests check the water for *E. coli* and Total Coliforms. A Heterotrophic Plate Count (HPC) is also done. All must pass for the water to be consumed.

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 test for the physical and chemical water properties listed below.

Physical and Chemical Parameters:

Alkalinity	Hardness	Phenols
Ammonia	Hydrogen sulphide	Potassium
BOD5	Iron	Sodium
Calcium	Magnesium	Sulphate
Chloride	Manganese	Tannin and lignin
Colour	Nitrate	Total Dissolved Solids
Conductivity	Nitrite	Total Kjeldahl Nitrogen (TKN)
Chemical Oxygen Demand	PCBs	Turbidity
Fluoride	pH	

29. Continued

Bacteriological Parameters:

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

30. Will drinking water be treated? How?

The drinking water is treated by sediment filters, granular activated carbon filters and an ultraviolet (UV) filtration system.

31. Will water be stored on site?

The site has two 854 m^3 (854,000 liters) raw water tanks; only one tank is in use for raw water storage. See **Annex B** BAF-3 Site Plan Drawing (Serial H-B199/2-8400-102).

Drinking water is piped directly to water taps.

WASTE TREATMENT AND DISPOSAL

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

[X] Camp Sewage (blackwater)

The sewage collection and disposal system meets the requirements set by the Department of National Defence when the site was built in the mid 1980's (ref: Operation and Maintenance Manual for Brevoort Long Range Radar Site, Volume 1 – Site Infrastructure, 261.E10 Sewage and Disposal, dated 1988-12-01, Issued by the Department of National Defence.) Sewage (blackwater) and greywater are collected and combined in the sewage septic tank which is a three compartment tank with a hydraulic capacity of 6000 liters per day. The effluent from the septic tank discharges out the outfall pipe onto the designated outfall area.

In 1995, the site changed from manned to unmanned status. Since then the site is visited by LSS-Q staff on scheduled quarterly preventive and corrective maintenance trips and on an as needed basis. Little sewage is generated during these visits. During the months of May to September the site may be returned to manned status (ramped up) to support project activity. The amount of sewage depends on the number of people on-site.

The site has one incinerating toilet which reduces sewage to ash; the ash is disposed of in the approved landfill. The incinerating toilet's cycling time (interval between usage) 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

32. Continued.

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.

We request the sewage effluent sampling be done during the month when the site is ramped up when there is active discharge, or a minimum once annually during those years when there is no ramp-up. The sampling point is BAF-2, the end of the outfall pipe, as shown in **Annex B** BAF-3 Site Plan Drawing (Serial No. H-B199/2-8400-102).

Sewage effluent samples will be analyzed for:
a) Biochemical Oxygen Demand (BOD), total suspended solids (TSS), fecal coliforms, pH, phenols, and oil & grease;
b) total arsenic, total copper, total iron, total mercury, total zinc, sulphate, total cadmium, total chromium, total lead, and total nickel; and
c) nitrate-nitrite, sodium, magnesium, conductivity, ammonia nitrogen, potassium, and calcium.

[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 is typically paper, paper products, cardboard, rags, kitchen waste, etc. The quantity depends on the number of people on-site and the amount of this type of waste generated by project activity during a given year, but an estimate would be 148 m^3 for a year that included a ramped up site at capacity for four months. This is the situation at BAF-3 as clean-up and remediation of a fuel spill from 2007 occurs each summer. This type of solid waste will be incinerated by an incinerator (as described in Item 33). Ash from the incinerator will be disposed of in the approved landfill. Nasittuq will strive to achieve compliance with the Canada-Wide Standards for Mercury Emissions and Canada-Wide Standards for Dioxins and Furans by separating out and not incinerating waste that may generate hazardous emissions such as treated wood, plastics, rubber, electrical wire, hazardous materials, and articles containing hazardous materials.

Nonhazardous, noncombustible solid waste will be disposed of in the approved landfill.

[X] Bulky Items/Scrap Metal

These items are stored on a pallet line and retrograded for disposal outside of Nunavut as required, typically every two to four years.

32. Continued.

[X] Waste Oil/Hazardous Waste

These items are retrograded to a licensed disposal facility located outside of Nunavut every one or two years.

An average annual retrograde typically includes:
- 7 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 refrigerant gases.

Please note that the waste resulting from the cleanup of the 2007 fuel spill remains on-site for now.

[X] 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?**

The incinerator is a Consumat Systems 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 restaurant/cafeteria waste.

The general performance characteristics are as follows.

"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 to stack emissions, is minimized."

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

33. Continued.

"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: Operation and Maintenance Manual for Brevoort Long Range Radar Site, Volume 9 – Interior Architectural Systems, 820.E20 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?**

Non-combustible, nonhazardous waste will be disposed of in the approved landfill on-site. Non-combustible, hazardous waste is retrograded to a licensed disposal facility outside of Nunavut every one or two years.

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?

The water supply has been in use at the site by Nasittuq Corp. for many years and is proven in cold climates.

The sewage treatment and disposal methods have been used on-site by Nasittuq Corp. for many years and are proven in cold climates.

The incinerator has been in use at the site by Nasittuq Corp. for many years and is 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 2030. No abandonment or restoration is planned at this time.

BASELINE DATA

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

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

Bibliography:

Initial Environmental Evaluation of the North Warning System Project Eleven Long Range Radar Sites and the Short Range Radar Development Site, Volume One. Monenco-Eyretechnics Group, October 1987.

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

33. Continued.

- ✓ 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