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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: **343-552-0501**
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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: _____
   X Multi Year:

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

CAMP CLASSIFICATION

6. Type of Camp

   ☐ Mobile (self-propelled)
   ☐ Temporary
   X Seasonally Occupied: **Intermittently May to Sept until Oct 1 2023**
   X Permanent: **Permanent attendance commencing Oct 1 2023**
   X Other: **Quarterly until Oct 1 2023**

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

DYE-M, Cape Dyer is a Long Range Radar Site (LRR) for the North Warning System (NWS). DYE-M is an unmanned site, but it is visited by staff from Iqaluit, the Logistic 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 DYE-M are planned to increase beginning April 1st 2022 and to gradually increase to year-round attendance of at least nine staff members as of October 1st 2023.

Present to April 1, 2022:
During this time DYE-M 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. 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.

April 1 2022 to September 30 2023:
During this time DYE-M is planned to be attended by at least 9 staff for the summer months (182 days of the year). During the winter (October 1 to March 31) it will be visited by staff from LSS-Q on quarterly maintenance trips.

1 Oct 2023 onward:
As of 1 Oct 2023 DYE-M 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.

DYE-M was built in the 1950s as one of the Distant Early Warning Line (DEW Line) radar sites which stretched from Alaska to Greenland. In the 1980s, 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. DYE-M was modernized as part of this transition.

On 31 October 1995, the site changed 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.

DYE-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.

Please find attached Annex Q3 for a site description of DYE-M

CAMP LOCATION

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

DYE-M, Cape Dyer, is in Nunavut at the extreme eastern edge of Baffin Island. Sheer cliffs of over 610 m are the predominant feature of the area. The site consists of a summit at 725 m above sea level, and a lower site on the north side of Sunneshine Fiord. The coordinates are: 66° 40' 05"N, 61° 21' 13"W.

DYE-M is located on the eastern edge of a mountainous peninsula. The terrain is rugged and boulder strewn with very little soil, consisting of mostly silt. Vegetation on the upper site is sparse, consisting of grass, wildflowers, mosses, and lichen. Vegetation at the lower site is more abundant, including wildflowers, creeping willows, and sedges. Several small ice fields exist within twenty kilometers of the site. The sheer cliffs, some over 610 m high along the coastline are the most prominent features of the site.

Caribou are occasional seen at the lower site, and periodically polar bears are encountered at both the summit and the lower site, particularly during the start of the open water season when they are forced ashore by the break-up of the land-last ice. Cape Dyer is a major denning area for polar bears on south eastern Baffin. Arctic foxes are often seen in the region and near the site.

The coastal waters are important habitat to walrus, seals, and many species of whales and porpoises. Walrus are thought to overwinter along the edge of fast ice and in the pack ice off southeastern Baffin Island. Both walrus and seals are hunted in the fiords around Cape Dyer by hunters from neighbouring communities. The offshore waters of Davis Strait provide important breeding and migration areas for hooded seal. Historical evidence and scientific data indicates that Bowhead whales occur in the Davis Strait, Baffin Bay, and Cumberland Sound. During fall and early winter, Bowhead whales migrate southward along the east coast of Baffin Island to the Cumberland Sound region Also during this time, there is a migration of narwhals south along the east coast of Baffin Island to their overwintering areas in the Davis Strait and west Greenland

The Meta Incognita Peninsula contains a relatively high density of peregrine falcon and gyrfalcon nests. Colonies of 6,000 and 50,000 fulmars are located respectively at Exeter Sound to the south and Scott Inlet to the north of the site. The Canadian Wildlife Service has recognized western Baffin Bay as key migratory bird habitat site. This area contains millions of seabirds including the following species: blacklegged kittiwake, thick-billed murre, and black guillemot. Colonies of Sabine's gull can be found south and west of the site.

For more information please refer to the attached document "Q3 - DYE-M 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 DYE-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):

Iqaluit, 462 km South West; Pangnirtung, 200km South West; Qikiqtarjuaq, 155km 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)
- **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.

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?

Three (3) spill kits are on-site:
- the POL (petroleum, oil, lubricants) Spill kit located in the Maintenance Shop;
- the Asbestos Response Kit located in the C train; and
- the Chemical Spill Kit located in the C train.

See DYE-M Site Plan (Annex Q3, page 10) 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. The MSDS for Jet A1 is included in Annex Q2, page 46.

LOCID	Location	Fuel Usage	Tank Size (L)	Max Fill Volume (L)	Usable Volume (L)
DYEW22J	Summit	PGS	69,200	65,084	63,427
DYEW22K	Summit	PGS	69,200	65,084	63,427
DYEW21E	Summit	Vehicle Refueller	4,125	3,878	3,770
DYEW20A	Summit	PGS	946,300	890,038	845,653
DYEW20B	Summit	PGS	69,200	65,084	63,427
DYEW20G	Beach	PGS	91,000	84,631	78,708
DYEW20H	Beach	PGS	91,000	84,631	78,708
DYEW20I	Beach	PGS	91,000	84,631	78,708
DYEW20J	Beach	PGS	91,000	84,631	78,708
DYEW20K	Beach	PGS	91,000	84,631	78,708
DYEW20L	Beach	PGS	91,000	84,631	78,708
DYEW20M	Beach	PGS	91,000	84,631	78,708
DYEW20N	Beach	PGS	91,000	84,631	78,708
DYEW20O	Beach	PGS	91,000	84,631	78,708
DYEW20P	Beach	PGS	91,000	84,631	78,708
DYEW20Q	Beach	PGS	91,000	84,631	78,708
DYEW22L	Summit	PGS	90,000	84,528	82,857
DYEW22M	Summit	PGS	90,000	84,528	82,857
DYEW22N	Summit	PGS	90,000	84,528	82,857
DYEW22R	Summit	PGS	50,000	46,917	45,981
		Summit Totals:	**1,478,025**	**1,389,669**	**1,334,256**
		Beach Totals:	**1,001,000**	**930,941**	**865,788**
		Site Totals:	**2,479,025**	**2,320,610**	**2,200,044**

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 also stored in the warehouse.

See DYE-M Site Plan (Annex Q3, page 10) for HAZMAT storage locations.

WATER SUPPLY AND TREATMENT

26. Describe the location of water sources.

There are two water sources:
- The water lake, located at the end of the water lake road at the summit.
- The meltwater water source, located on the first level area below the summit where meltwater pools before flowing through a culvert under the road. This road is the first road to be cleared in the spring.

See the DYE-M Site Plan Drawing ("Q3 – DYE-M Site Description + Site Plan", page 9).

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

X Domestic Use**: 2950 m³ Annually estimated upon increased staffing**
Water Source: **Water Lake**

☐ Drilling: _____ Water Source: _____

X 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 source is pumped into a water truck; the water intake is equipped with a mesh screen. The water is then transferred to the four raw water tanks 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 CaCO3
Colour
Conductivity
Dissolved Organic Carbon (DOC)
Fluoride (F)
Hardness as CaCO3
Ion Balance
Ammonia as N (N-NH3)
Nitrate as N (N-NO2)
Nitrite as N (N-NO3)
pH
Sulphide (S2-)

Sulphate (SO4)
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 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 five 10,000 raw water storage tanks in the garage and three 10,000 liter raw water storage tanks next to the monitoring point, DYE-1 (the flow meter in the fill line to the raw water tanks). Raw water from the garage tanks is metered when it is transferred by truck into the raw water tanks in the building train. Treated drinking water is piped directly to water taps. See DYE-M Site Plan (Annex Q3, page 9).

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 m^3 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.

The sampling point is DYE-2 the final discharge point of the sewage outfall, as shown on the DYE-M Site Plan Drawing (Annex Q3, page 9)

Sewage effluent samples will be 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

Currently all solid waste is packaged and shipped to LSS-Q for disposal. There are future plans to develop an on-site alternative; whereby domestic waste would be segregated and incinerated on-site. This alternative would implement the use of an appropriate incinerator as outlined in the Government of Nunavut*, Guideline for the Burning and Incineration of Solid Waste*.

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.

See DYE-M Site Plan (Annex Q3, page 9) 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 domestic waste 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 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).

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 I); a site Abandonment and Restoration Plan will be submitted to NWB six months prior to the decommissioning of the DYE-M 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