General Water Licence Application
(Application for a new Water Licence)

Document Date: April 2013

Application Submission Date:
__05/16/2014_____
Month/Day/Year

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DOCUMENT MANAGEMENT

Original Document Date: April 2010

DOCUMENT AMENDMENTS

	Description	Date
(1)	Updated for public distribution as separate document from NWB Guide 4	June 2010
(2)	Updated NWB logos and reformatted table to allow rows to break across page	May 2011
(3)	Update NWB logo	April 2013
(4)		
(5)		
(6)		
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(9)		
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GENERAL WATER LICENCE APPLICATION
(APPLICATION FOR NEW WATER LICENCE)

The applicant is referred to the NWB's Guide 4: *Guide to Completing and Submitting a Water Licence Application for a New Licence* for more information about this application form.

LICENCE NO:
(for NWB use only)

1. APPLICANT (PROPOSED LICENSEE) CONTACT INFORMATION (name, address)

Rodney Watson
Department of National Defence
101 Colonel By Drive
Ottawa, ON K1A 0K2
Phone: 613-943-8277
Fax:
e-mail: RODNEY.WATSON@forces.gc.ca

2. APPLICANT REPRESENTATIVE CONTACT INFORMATION if different from Block 1 (name, address)

Tamara Van Dyck (DCC)
101 Colonel By Drive
Ottawa, ON K1A 0K2
Phone: 613-995-9741
Fax:
e-mail: Tamara.VanDyck@dcc-cdc.gc.ca
(Attach authorization letter.)

3. NAME OF PROJECT (including the name of the project location)

Nanisivik Naval Facility (NNF) Construction Project

4. LOCATION OF UNDERTAKING

Project Extents

NW:	Latitude: (**73° 3' 45.72" N**)	Longitude: (**84° 32' 20.40" W**)
NE:	Latitude: (**73° 3' 44.39" N**)	Longitude: (**84° 33' 51.12" W**)
SE:	Latitude: (**73° 4' 05.83" N**)	Longitude: (**84° 34' 01.23" W**)
SW:	Latitude: (**73° 3' 58.32" N**)	Longitude: (**84° 32' 16.44" W**)

Camp Location(s)

Latitude: (**73° 4' 01.09" N**) Longitude: (**84° 32' 49.9" W**)

5. MAP - Attach a topographical map, indicating the main components of the undertaking.

NTS Map Sheet No.: **N/A** Map Name: **Lease Site Plan** Map Scale: **1:3000**

6. NATURE OF INTEREST IN THE LAND - Check any of the following that are applicable to the proposed undertaking (at least one box under the 'Surface' header must be checked).

Sub-surface

☐ Mineral Lease from Nunavut Tunngavik Incorporated (NTI)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ Mineral Lease from Indian and Northern Affairs Canada (INAC)
Date (expected date) of issuance: _____ Date of expiry: _____

Surface

☐ Crown Land Use Authorization from Indian and Northern Affairs Canada (INAC)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ Inuit Owned Land (IOL) Authorization from Kitikmeot Inuit Association (KIA)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ IOL Authorization from Kivalliq Inuit Association (KivIA)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ IOL Authorization from Qikiqtani Inuit Association (QIA)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ Commissioner's Land Use Authorization
Date (expected date) of issuance: _____ Date of expiry: _____

☒ Other: **Government of Canada owned land – Administered by the Department of Fisheries and Oceans**
Date (expected date) of issuance: _____ Date of expiry: _____

Name of entity(s) holding authorizations:
_____

7. NUNAVUT PLANNING COMMISSION (NPC) DETERMINATION

Indicate the land use planning area in which the project is located.

☒ North Baffin
☐ South Baffin
☐ Akunniq
☐ Keewatin
☐ Sanikiluaq
☐ West Kitikmeot

Is a land use plan conformity determination required?

☒ Yes ☐ No

If Yes, indicate date issued and attach copy **March 12, 2009**
If No, provide written confirmation from NPC confirming that a land use plan conformity review is not required.

8. NUNAVUT IMPACT REVIEW BOARD (NIRB) DETERMINATION

Is an Article 12 Part 4 screening determination required?

☒ Yes ☐ No

If Yes, indicate date issued and attach copy. **Issued October 24, 2013**
If No, provide written confirmation from NIRB confirming that a screening determination is not required.

9. DESCRIPTION OF UNDERTAKING – List and attach plans and drawings or project proposal.

In 2007, the Prime Minister announced plans to increase Canadian military presence in Canadian Arctic waters. This increased presence is associated with patrolling of naval vessels in Arctic waters during the navigable season, as well as a deep-water naval facility to support the patrol vessels. The Nanisivik Naval Facility will serve primarily as a deep-water berthing and refuelling station to serve the Arctic / Offshore Patrol Ships (AOPS), Canadian Coast Guard and other government vessels during the navigable season in the Northwest Passage (i.e., July to October). The Nanisivik Naval Facility may also serve to receive, marshal, hold and distribute cargo and goods from commercial vessels for the Government of Canada.

A full project proposal has been developed for this project and is available on the Nunavut Impact Review Board –Public Registry.

Project Schedule

The Nanisivik Naval Facility will be constructed over a four-year period. Materials and equipment will be dropped at the site prior to construction. Site preparation will commence in August 2014, commissioning is scheduled for October 2017 and final acceptance will occur by summer 2018. The facility will be operated from July through October and be shut down and secured from November to June each year. On-site support will be provided on an as-needed basis. The general schedule for construction and operation of the Project is outlined below.

General Schedule for Construction and Operation of Nanisivik Naval Facility

Stage of Project	Component	Schedule
Site Preparation	50-60 person construction camp	08/2014 - 09/2018
	Quarry development	08/2014 - 10/2016
	Road maintenance/upgrades (GN responsibility)	08/2014 - 10/2018
Construction	Wharf	07/2015 - 10/2017
	Bulk liquids storage facility	06/2016 - 07/2018
	Buildings	06/2016 - 07/2018
	Utilities	06/2016 - 07/2018
	Camp demobilization	09/2018
Operation	Berthing and fuelling facilities	2018 - 2067 minimum

CONSTRUCTION ACTIVITY:

The Project site is accessible by water via the existing deep-water berth, by air via the Arctic Bay airport and by ground via the existing road from Arctic Bay to Nanisivik.

The existing dock will be used during construction and operation to transport equipment and bulk material on cargo ships or barges.

The airport at Arctic Bay will be used to transport personnel during construction and operation; chartered aircraft will be used when fiscally responsible and to minimize the impact to regular-scheduled commercial flights.

The existing all-weather road between Arctic Bay and the Project site will be used during construction and operation to transport personnel and materials between Arctic Bay and the Project site.

Discussions between DND and the Government of Nunavut (GN) regarding the official Nunavut highway are progressing. In December 2012, the Treasury Board approved a DND request to use the Capital Assistance Program as a method to provide funding contributions to the Government of Nunavut for the upgrade and ongoing maintenance of the road. Working with the GN to keep the road open during the Project operational periods will also benefit the community of Arctic Bay; people will still be able to use the road for work, recreation and to travel for hunting and fishing. It is expected that DND will provide the bulk of the funding, while ownership, maintenance and responsibility for the road will remain with the Government of Nunavut.

Camp Site

The construction camp will be established for four work seasons from 2014 to 2018 and it will house approximately 50-60 persons to construct the facility. The construction camp shelters will be pre-built mobile trailers transported to the work camp location via sealift vessel. Existing DND trailers at the site may be used by personnel during preparation of the construction camp.

The location of the construction camp is currently expected to be on the existing concrete slab, south of the Helicopter Landing Area.

Decommissioning of the construction camp will entail complete removal of all camp structures and facilities, with the exception of the existing DND trailers, which will remain on-site to support personnel during NNF operations. Camp structures and facilities will be transported off site for reuse or disposal.

Note: Detailed plans for the location, operation and decommissioning of the camp will be the responsibility of the construction contractor. The award of the contract is expected to occur in June 2014. Once the contractor develops the plans, these will be reviewed by DND / DCC and submitted to the NWB.

Roads

Existing roads will be used to the extent possible. Existing roads will be upgraded and new roads will be constructed to provide access to the various components of the Nanisivik Naval Facility. Modifications will be required for pipeline crossings and associated culverts, and pipeline guard rails will be included as

required to protect against potential vehicle impacts. The access roads are described below:

- Main Access Road runs predominantly north-south from the Wharf to the southern site boundary
- Landing Beach Access Road branches east from the Main Access Road and follows the eastern shoreline
- Cargo Staging Road branches west from the Main Access Road to the Cargo Staging and Marshalling Area
- Bulk Liquids Storage Facility access will consist of two access roads: Pumps Access Road branches south from the Cargo Staging Road; Naval Distillate Access Road branches west from the south end of the Main Access Road
- Helicopter Landing Area Access Road branches east from the south end of the Main Access Road

All roads will be constructed of compacted fill and will incorporate corrugated steel culverts a minimum of 1 m below the road surface, where required. One sleeved crossing for the Cargo Staging Road will be constructed for the pipeline. The sleeved crossing shall consist of a precast concrete box culvert installed below the road and covered with 1.0 m thickness of aggregate.

Wharf

The existing Wharf structure will be used, as is, with very minor improvements to maintain or improve its functionality. As such, very little work will be carried out in or near the water and there will be no dredging or pile driving.

Upgrades will include standard wharf hardware such as removable foam-filled fenders, bollards, lighting, ladders, bull rails, safety equipment, spill boom (in a seacan), flag mast, wind sock and other required amenities to meet applicable codes and DND standards. The concrete decks on Cell #1 will not be replaced; however, Cell #2 and Cell #3 will be upgraded to acceptable standards. Steel plating (banding) and unloading and fuelling hose(s) will also be included as part of the Project. Appendages will be removed and holes repaired. A fuelling manifold will be required for both naval distillate and diesel, and a wharf operator shelter will be constructed.

A cathodic protection system will be required on the Wharf to control corrosion. The design will include a passive cathodic protection system, such as sacrificial anodes, to limit corrosion and extend the life the existing structure.

The Project will include geotechnical and geothermal investigation through the use of thermistors, inclinometers and boreholes.

Shoreline protection will consist of minor repairs (e.g., riprap) to the shoreline at two locations.

Cargo Staging and Marshalling Area

An existing area of approximately 8,000 m^2 located southwest of the Wharf will be graded and local aggregate material will be placed to establish the Cargo Storage and Marshalling Area. In addition, a

secure laydown area will be provided in the fenced Bulk Liquids Storage Facility.

Bulk Liquids Storage Facility

Earthworks will be required to construct the Bulk Liquids Storage Facility, which will contain the naval distillate and diesel tanks, the POL storage area, generators and the electrical house, the general purpose storage building and a secure laydown area.

The naval distillate tanks storage area will be terraced. A compacted gravel pad will be constructed at grade to provide a foundation for each naval distillate and diesel tank. Containment berms around the perimeter of each naval distillate tank and the POL storage area will be constructed from compacted gravel. An engineered steel containment dike will constructed around the diesel tanks. Each naval distillate will have a separate containment cell. An arctic-rated geomembrane liner will be installed inside the containment cells and covered with a 0.15 m layer of compacted gravel. A sump will be installed each containment cell; a portable pump will be used to manage accumulated water. Access ramps for all-terrain vehicles will be constructed for each bermed cell.

A 2.4 m high security fence will be installed around the perimeter of the Bulk Liquids Storage Facility (approximately 800 m^2).

Pipelines

Pipelines will be constructed to deliver naval distillate from the Wharf to and from the Bulk Liquids Storage Facility, and to transfer diesel from the Wharf to the Bulk Liquids Storage Facility. Pipe will be transported to the site to assemble the 250-mm diameter naval distillate and 150-mm diameter diesel pipelines.

Cast-in-place or precast concrete foundations for the pipelines will be placed on compacted crushed aggregate at grade. Pipelines will be welded, coated and placed on the foundations. Prior to commissioning, hydrostatic testing of the pipelines will be conducted. All pipelines will be grounded.

Buildings

An unheated general purpose storage building, which will consist of a stick-built, steel frame structure on a concrete foundation, will be located within the fenced Bulk Liquids Storage Facility. The steel frame will be pre-fabricated in southern Canada and shipped to the site for assembly. The general purpose storage building will be used for light repair work and storage and will include lights, louvered ventilation, windows, man doors, one garage door, a work bench and an eyewash station.

A wharf operator shelter, located at the Wharf, will consist of a skid-mounted module with viewing windows on three sides. The module will be electrically powered during occupancy (for lighting, a unit heater and a laptop), and will include a work station, EDS button and eyewash station.

Minor upgrades may be required to the three existing DND trailers on-site. Two of the trailers will be used to support on-site personnel during fuelling operations and the third trailer will be used for utilities (i.e., generator, potable water and wastewater tanks). The trailers will be electrically powered during occupancy.

Helicopter Landing Area

The Helicopter Landing Area will consist of a large, marked flat area free of obstruction, located at the north end of the existing concrete slab. Fuel transfer will occur through the use of a portable hand pump.

Power Generation

Power generation will be required for fuel pumps, various heaters, motor-operated valves/instrumentation, the general purpose storage building, wharf operator shelter, DND trailers and for area lighting during fuelling operations. Two self-sufficient redundant generator modules will be the design basis for the power plant located within the fenced Bulk Liquids Storage Facility. It will include a modular-type electrical house, complete with the required equipment and amenities to control distribution of power throughout the site. It will be either a dedicated module or attached to the generator modules.

Power generation equipment, with the exception of the generator in the utility DND trailer, will be located within the fenced boundaries of the Bulk Liquids Storage Facility. All temperature-sensitive electrical equipment will be removable for winter storage. Generators will only operate when the site is occupied.

Lighting

Lighting will be installed on 10 to 15 m high poles at the Wharf and on tanks at the Bulk Liquids Storage Facility. There will be no lighting on roads.

Pits and Quarries

It is estimated that approximately 5,100 m^3 of rock will be required for riprap and slope protection, and approximately 39,000 m^3 of crushed aggregate will be required to construct the facility. The Project will require the development of a quarry.

The proposed aggregate quarry location is approximately 3 km southeast from the Nanisivik Naval Facility and contains both quarried rock and aggregate. This area was selected because it has previously been used by others as a quarry and does not require opening a new land area for this purpose. DND will require the construction contractor to apply to AANDC for a quarry permit and comply with all requirements. DND will also comply with the requirement to keep carving stone sources off limits for aggregate production.

Additional surveys of the borrow area were conducted in the summer of 2013; this additional information has been provided to the construction contractor. The construction contractor will be required to prepare a Quarry Development Plan and a Quarry Abandonment and Restoration Plan; these plans will be submitted to the appropriate regulatory bodies. Once available, the following information will be provided to the NWB, NIRB and AANDC by DND:

- Conceptual design of quarries
- Depth of overburden
- Presence of carving stone deposits
- Evidence or potential for thermokarst development, ice lenses, flooding, erosion, sedimentation and

slumping

- Relative moisture content of the ground
- Blasting methods, if required
- Explosive type(s), hazard class, volumes, uses, location and method of storage, if required
- Methodology used to determine acid rock drainage (ARD) and metal leaching potential and associated results
- Proposed safety measures

To minimize potential environmental effects with respect to borrow pits/quarries, the Project will follow common industry practices, including those listed in the *Northern Use Guidelines: Pits and Quarries* (INAC 2009). Mitigation will include the following:

- The area for borrow pits/quarries will be kept to the minimum required to construct the Project and will be concentrated as much as possible to limit the area of disturbance.
- Overburden and granular materials will be tested for acid rock drainage (ARD) and metal leaching potential and, if found, these areas should be avoided. If they cannot be avoided, specialized disposal procedures for sulphide-bearing rock will be developed (e.g., immediate disposal upon excavation, placement in covered holding areas until final disposal).
- Natural drainage patterns will be maintained.
- Erosion control measures (e.g., silt fencing, riprap) will be used to control erosion and sediment deposition.
- Water discharged from borrow pit/quarry operations will meet all requirements of the water licence obtained for the Project.
- To prevent permafrost degradation, in-pit water will be minimized by directing surface water away from the site and ice-rich material at a location where melt water will not re-enter the pit.
- Borrow areas will be regularly inspected to eliminate unstable slopes and depressions and restore natural drainage patterns.
- Dust suppression methods (e.g., water) will be implemented.
- Storage, handling, transportation and preparation and use of explosives, if required, will follow all applicable guidelines and regulations.
- An Abandonment and Restoration Plan will be developed and implemented for all borrow pits/quarries.

Arctic / Offshore Patrol Ships (AOPS)

The specific operations of the AOPS vessels are not known at this time because the first ship will not begin operations until the Arctic shipping season in 2019. Based on current plans, two AOPS vessels will conduct operations in the North during the shipping season (approximately early July to early October). When in operation, the Royal Canadian Navy (RCN), using current practices that the Joint Task Force North (JTFN) has in place for the conduct of operations by DND and Royal Canadian Air Force (RCAF) in the north, will advise and consult with Northern stakeholders beforehand. It should be noted that Nanisivik and the waters of the area will not be patrolled any more or less than other regions of the Arctic. The main purpose of AOPS visiting the Nanisivik area is for refuelling, and it is expected that they will leave port shortly thereafter.

AOPS vessels will visit the facility four to ten times per deployment. In terms of actual operations at sea, most of the time AOPS vessels will not operate in the vicinity of the facility unless coming to refuel. Operations at sea will mostly be limited to Baffin Bay, the Beaufort Sea, Lancaster Sound and Hudson Bay with occasional planned visits to Arctic communities for community relations and other types of support operations. At present, only two ships will deploy to the Arctic for the shipping season, and in many cases they will operate in the vicinity of Canadian Coast Guard icebreakers operating in the Arctic. These at-sea operations will take place from July to early October in areas where the ice coverage is minimal or receding.

For patrol and other operations, there are established processes for the deployment of ships into Arctic waters that satisfy the requirements outlined in the Nunavut Land Claim Agreement, resources and self-government agreements, as well as ensure compliance with federal and territorial environmental legislation. The Nunavut Land Claim Agreement contains access provisions that require notification prior to the conduct of activities in their settlement regions, as well as engagement. All ship movement and activities will be incorporated into the current process used by Joint Task Force North for the deployment and operations conducted by DND and Canadian Air Force in the Arctic. DND currently provides detailed notification and consultation for all northern activities and operations. As the Project is focused solely on infrastructure, at a minimum the ships will abide by the Standard Operating Procedures (SOPs) and regulations already in place for ships operating in the Arctic.

When AOPS are deployed in the Arctic, AOPS ships will support search and rescue operations and emergency response to incidents such as oil spills on an as-required and as-available basis. The Canadian Coast Guard will be the lead on any search and rescue operation; however, support will be provided to them by the Navy should it be required / requested.

FACILITY OPERATION

The Nanisivik Naval Facility will be operated from July to October, and unmanned from November to June each year. Heat and power will not be maintained when the facility is unmanned.

Note: Detailed plans for the facility operation will be the responsibility of the construction contractor. The award of the contract is expected to occur in June 2014. The plans will be prepared in future years, based from the concept of facility operations and the equipment that is subsequently installed. Once the contractor develops the plans, these will be reviewed by DND / DCC and submitted to the NWB.

Wharf

The Wharf will be used to berth and refuel the AOPS and other government ships during the navigable season in the Northwest Passage (i.e., July to October). The Wharf will also serve to receive bulk fuel, cargo and goods from commercial vessels for Government purposes, and load recyclables and waste for off-site recycling/disposal during the navigable season. Naval distillate and diesel will be received at the Wharf and transferred via pipelines to the Bulk Liquids Storage Facility. Oily wastewater received from AOPS vessels will be stored in drums in the POL storage area within the Bulk Liquids Storage Facility. Bull rails around the perimeter of the Wharf deck will prevent accidental roll-off of vehicles. Cargo will be stored at the Cargo Staging and Marshalling Area or in the secure laydown area within the Bulk Liquids Storage Facility.

The Wharf will have general lighting for personnel safety, vehicle traffic and vessel security during the operating season. Power will be available for lighting and Wharf service-related activities.

Maintenance of shoreline erosion protection will involve periodic addition of riprap and shaping of the riprap profile, if required.

During operation of the facility, chain-type ladders and removable foam-filled fenders will be connected to the Wharf and removed during the winter. Life saving and fire suppression equipment will be provided at the Wharf. Pollution control equipment, including spill containment and clean-up equipment will be provided at the Wharf and will be sufficient to contain and control spills from vessels and loading vehicles.

In the event of an emergency, the fuel transfer system will be shut down from the Bulk Liquids Storage Facility, the Wharf or the vessel.

Cargo Staging and Marshalling Area

The Cargo Staging and Marshalling Area will be used for storage of equipment and cargo received at the Wharf. In addition, a secure laydown area will be provided in the fenced Bulk Liquids Storage Facility.

Bulk Liquid Storage Facility

Up to 7.5 million litres of naval distillate will be stored in tanks at the Bulk Liquids Storage Facility. Naval distillate will be transferred from the Wharf receiving facility to the Bulk Liquids Storage Facility for storage, and from the Bulk Liquids Storage Facility to refuel vessels at the Wharf. Naval distillate flow rate will be monitored and controlled.

Approximately 100,000 L of diesel will be stored in tanks at the Bulk Liquids Storage Facility. Diesel will be transferred from the Wharf receiving facility to the Bulk Liquids Storage Facility for storage. Within the Bulk Liquids Storage Facility, the diesel will be transferred from the storage tanks to the power generation modules and a diesel dispenser for fuelling mobile equipment will be installed. Diesel flow rate will be monitored and controlled.

Approximately 15 drums (3,000 L) of aviation fuel will be stored in the POL storage area within the fenced Bulk Liquids Storage Facility.

Approximately 50 drums (10,000 L) of oily wastewater will be stored at the Bulk Liquids Storage Facility.

All fuels storage and transfer facilities will be monitored for leaks. Welded steel drip pans or equivalent will be installed to contain leaks and drips under the Wharf ship-to-shore connection, at all hose connection points and under sample points. Mobile equipment diesel refuelling stations and all areas for storage of hydrocarbons will be equipped with a containment area and liner.

Note: Detailed plans for the operation of the fuel facility will be the responsibility of the construction contractor. The award of the contract is expected to occur in June 2014. The contractor will be expected to develop plans such as melt water handling and processing. Once the contractor develops the plans, these will be reviewed by DND / DCC and submitted to the NWB.

Buildings

The general purpose storage building and the wharf operator shelter will provide facilities to operate and manage the Nanisivik Naval Facility. DND trailers will be used to support on-site personnel during fuelling operations. All buildings will be electrically powered and heated during occupancy (with the exception of the general purpose storage building, which will be unheated).

Lighting

Lighting will be installed on 10 to 15 m high poles at the Wharf and on tanks at the Bulk Liquids Storage Facility. There will be no lighting on roads.

Water Supply

DND trailers will be used to support on-site personnel during fuelling operations. There is no requirement for potable water on site during operations. There will be no water withdrawals from any water body (i.e., East Twin Lake (Quasaqtoq Lake), Twin Lakes Creek, Strathcona Sound) during operation.

Wastewater

DND trailers will be used to support on-site personnel during fuelling operations. There is no requirement for wastewater treatment on site during operations and wastewater will be removed in drums by ships. Oily wastewater will be collected and shipped for treatment off-site to a location in southern Canada at the end of the summer season.

Collection sumps for rainwater and melt water will be located in the northwest corner of each secondary containment cell in the Bulk Liquids Storage Facility. Water collected in the sumps at the Bulk Liquids Storage Facility will be tested and, if necessary, drained through an oil-water separator. Uncontaminated water will be released on land to a location approved by AANDC as indicated on the water licence. A portable pump will be used to manage accumulated water.

Note: Detailed plans for the handling and processing of wastewater, rainwater and meltwater will be the responsibility of the construction contractor. The award of the contract is expected to occur in June 2014. Once the contractor develops the plans, these will be reviewed by DND / DCC and submitted to the NWB.

Solid Waste

During operation, solid waste will be 3R (reduce, reuse, recycle) managed on-site, stored in ISO shipping containers and shipped off-site to southern Canada to an approved disposal facility at the end of each season. Recyclable material will be separated from other waste, compacted and stored for off-site transport. A waste storage shelter will be constructed to store waste until it can be removed from the site; waste will not be incinerated during operation.

Public Access and Public Safety Measures

At this time, perimeter fencing around the entire Nanisivik Naval Facility is not envisioned. However, the Bulk Liquids Storage Facility, which will contain the general purpose storage building, secure laydown area, electrical house and generators, and all fuel, oily wastewater and POLs, will be fenced (approximately 800m^2).

While unmanned, all facilities will be locked and secured, and appropriate panels will be installed over windows. Routine ranger security patrols will be conducted.

10. OPTIONS – Provide a brief explanation of the alternative methods or locations that were considered to carry out the project.

Project Alternatives

The location for the Nanisivik Naval Facility was selected for the following reasons:

- Proximity to the Northwest Passage
- Access to Eastern Arctic
- Steaming distance from St. John's and Halifax
- Existing docking infrastructure on federally-administered land

DND and DCC contracted an architectural and engineering design consultant to design the Nanisivik Naval Facility to meet Minimum Military Requirements and all current DND requirements for the Project. The conceptual design of the Project included an evaluation of options. The table below provides a summary of the alternatives considered for Project components, the alternative selected, and the rationale for the selection.

Alternatives Considered for Project Components

Project Component	Alternatives Considered	Selected Alternative	Rationale
Wharf	• Encapsulation of existing dock cells with new larger diameter cells • Interconnecting arcs between the cells • Filling between the old cells and new sheet piles	Use existing wharf with minor upgrades	• The existing wharf structure is suitable for use • Minor upgrades will maintain or improve its functionality and meet applicable codes and DND standards
	• Sheet pile bulkhead constructed behind existing cells • Cut down shoreline slopes between existing cells and adjacent outer cells • Repair existing structure		
	• Install new, smaller diameter sheet pile cells between existing cells • Repair existing structure		
	• Use existing wharf with minor upgrades		
Bulk Liquids Storage Facility	• Five 22-m diameter vertical tanks for naval distillate with earthen containment berms • Five 10-m diameter vertical tanks for diesel with earthen containment berms • Five 10-m diameter vertical tanks for oily wastewater and grey water with earthen containment berms	• Earthen containment berms • 22-m diameter vertical tanks for naval distillate • 3-m diameter horizontal tanks for diesel • Drums for oily wastewater and aviation fuel	• Provides the most economical method of storing required volumes of hydrocarbon products
	• Three 30-m diameter vertical tanks for naval distillate with earthen containment berms • 14 4-m diameter horizontal double-walled tanks for diesel with steel containment liner • 14 4-m diameter horizontal double-walled tanks for oily wastewater with steel containment liner		
	• Two 22-m diameter vertical tanks for naval distillate with earthen containment berms • Two 3-m diameter horizontal double-walled tanks for diesel with earthen containment berms • Oily wastewater and aviation fuel stored in drums with earthen containment berms		
General Purpose	• Two-storey, site-fabricated building with warehouse and service garage	One one-storey, stick-built, pre-	• Simple construction methods

Storage Building(s)	• One-storey, linear, modular (primarily pre-fabricated) building with warehouse and service garage • Combination of pre-fabricated and site-fabricated buildings connected by walkways • One one-storey, pre-fabricated steel frame structure	fabricated steel frame structure	• Provides optimum solution for operational requirements of the building
Potable Water Supply during Construction	• Pumping and treatment of raw seawater • Trucking of surface water from East Twin Lake for delivery to water treatment facility on-site • Supplied by local community	Water supply from local community or from East Twin Lake	• Potable water requirements are now minimal, and servicing by the local community is the most economic option • However, if the volume of water is a burden on the local community during construction, the construction camp will obtain potable water from East Twin Lake
Potable Water Supply during Operation	• Pumping and treatment of raw seawater • Trucking of surface water from East Twin Lake for delivery to water treatment facility on-site • Supplied by local community	There is no requirement for potable water on site during operations.	• With most permanent buildings now removed from the scope and because DND will only use the small site office currently on site, the need for water services during operations is minimal.
Wastewater during Construction	• Black water treatment with moving bed biofilm reactor (MBBR) • Grey water storage and shipping • Black water and grey water treatment with membrane bioreactor (MBR) • Black water and grey water treatment with MBBR • Wastewater management supplied by local community • Uncontaminated wastewater collected in sumps released to an approved location as indicated on the water licence	Wastewater management supplied by local community or on-site sewage lagoon and uncontaminated wastewater released to an approved location as indicated on the water licence	• Wastewater management requirements will be minimal and most economically serviced by local community However, if the volume of wastewater is a burden on the local community during construction, the construction camp will build an on-site sewage lagoon.
Wastewater during Operation	• Black water treatment with moving bed biofilm reactor (MBBR) • Grey water storage and shipping • Black water and grey water treatment with membrane bioreactor (MBR)	Wastewater will be removed in drums by ships.	• With most permanent buildings now removed from the scope and because DND will only use the small site office

	• Black water and grey water treatment with MBBR • Wastewater management supplied by local community • Uncontaminated wastewater collected in sumps released to an approved location as indicated on the water licence		currently on site, the need for wastewater services during operations is minimal.
Solid Waste Management during Construction	• Solid waste compaction • Storage and shipping of compacted waste • Solid waste incineration • Storage and shipping of incinerated waste	Waste that is suitable for incineration will be incinerated on-site in accordance with the Government of Nunavut guidelines. Waste that cannot be incinerated on-site will be compacted and shipped to southern Canada for disposal	• Long-term sustainability
Solid Waste Management during Operation	• Solid waste compaction • Storage and shipping of compacted waste • Solid waste incineration • Storage and shipping of incinerated waste	Waste will be compacted and shipped to southern Canada for disposal	• Long-term sustainability
Fire Protection for Naval Distillate Tanks	• Foam fire-extinguishing system • Passive fire protection by providing adequate spacing between tanks to prevent a fire spreading from one tank to the other	Passive fire protection	• Reduces water storage requirements for fire fighting • More cost effective

11. CLASSIFICATION OF PRIMARY UNDERTAKING - Indicate the primary classification of undertaking by checking one of the following boxes.

☒ Industrial ☐ Agricultural
☐ Mining and Milling (includes exploration/drilling/exploration camps)
☐ Conservation
☐ Municipal (includes camps/lodges) ☐ Recreational
☐ Power ☐ Miscellaneous (describe below):

_____

See Schedule II of *Northwest Territories Waters Regulations* for Description of Undertakings.

Information in accordance with applicable Supplemental Information Guidelines (SIG) must be submitted with a New Water Licence Application. Indicate which SIG(s) are applicable to your application.

☒ Hydrostatic Testing **(Contractor may decide to use freshwater or a combination of seawater and freshwater)**
☐ Tannery
☐ Tourist / Remote Camp
☐ Landfarm & On-Site Storage of Hydrocarbon Contaminated Soil
☐ Onshore Oil and Gas Exploration Drilling
☐ Mineral Exploration / Remote Camp
☐ Advanced Exploration
☐ Mine Development
☒ Municipal **(Construction Camp)**
☐ General Water Works
☐ Power

12. WATER USE - Check the appropriate box(s) to indicate the type(s) of water use(s) being applied for.

☒ To obtain water for camp/ municipal purposes **(from the community of Arctic Bay or from East Twin Lake [Quasaqtoq Lake] if Arctic Bay is unable to supply potable water for the construction camp)**
☒ To obtain water for industrial purposes **(hydrostatic testing, concrete production, aggregate compaction and dust control)**
☐ To cross a watercourse
☐ To divert a watercourse
☐ To alter the flow of, or store water
☐ To modify the bed or bank of a watercourse
☐ Flood control
☐ Other: _____

During construction, the construction camp will require support from the local community for potable water via daily truck delivery provided by Construction Contractor. However, if it is determined that the volume of water withdrawal would place a burden on the community, water will be withdrawn from East Twin Lake (Quasaqtoq Lake) and a potable water treatment system will be constructed. East Twin Lake (Quasaqtoq Lake) is located approximately 8 km southeast of the facility.

If water withdrawals are required, a seasonal floating raft complete with intake pipe will be installed at the end of an existing causeway into East Twin Lake (Quasaqtoq Lake) to allow for water extraction. East Twin Lake (Quasaqtoq Lake) may support fish; therefore an intake end-of-pipe fish screen will be included.

A tanker truck will connect a suction hose to the pipe and pump water from the lake into the truck tank. The water will be transported from the lake to raw water storage tanks. The estimated rate of water demand for a 60-person construction camp is 11.4 m^3/day (based on 190 L/person/day).

The raw water will be treated using either a conventional water treatment system or a membrane water treatment system. A conventional water treatment system will consist of filtration and disinfection but may include coagulation, flocculation and clarification, while a membrane water treatment system could include coagulation, filtration and disinfection. Chlorine and ultraviolet radiation (UV) will be used for disinfection. Treated water will be stored in potable water storage tanks.

During operation, there will be no requirement for potable water on site and there will be no requirement for on-site water treatment.

13. QUANTITY AND QUALITY OF WATER INVOLVED - For each type of water use indicated in Block 12, provide the source of water, the quality of the water source and available capacity, the estimated quantity to be used in cubic meters per day, method of extraction, as well as the quantities and qualities of water to be returned to source.

Construction Camp

Name of water source(s) (show location(s) on map):

Marcil Lake, potable water source for the community of Arctic Bay

If required, East Twin Lake (Quasaqtoq Lake), previous potable water source for the Nanisivik mine & community

Describe the quality of the water source(s) and the available capacity:

Marcil Lake is the main potable water source for the Community of Arctic Bay. The water quality is monitored, managed and maintained by the community and currently satisfying the drinking water regulations. The available capacity of Marcil Lake is 50,000 m3/year according the community's water license renewal application.
If required, the raw water quality from East Twin Lake is based on worst case scenario for freshwater where pH is between 6 & 8, turbidity less than 100 NTU, TSS less than 10 mg/L, TDS less than 500 mg/L, hardness less than 500 mg/L, TOC less than 2 mg/L, TC less than 50 MPN/100m, and temperature between 0.5°C & 10°C. The available capacity for East Twin Lake is unknown but is estimated at more than 50,000 m3/year since East Twin Lake was the water source for the Nanisivik mine & community for at least 20 years.

Provide the overall estimated quantity of water to be used:

11.4 m^3/day for construction camp

Provide the estimated quantity(s) of water to be used from each source:

N/A, since water for the construction camp will be taken from only one of the above mentioned sources.

Indicate the estimated quantities to be used for each purpose (camp, drilling, etc.)

The 11.4 m^3/day of water will be used to support the construction camp only.

Describe the method of extraction(s):

Via water truck from the local community of Arctic Bay water truck fill station.
If required, via a seasonal floating raft located on East Twin Lake complete with 50 mm diameter intake pipe and pump connected to a water truck.

Estimated quantity(s) of water returned to source(s):

NONE

Domestic wastewater from the construction camp (11.4 m^3/day) is to be disposed of at the community of Arctic Bay sewage lagoon.

If required, domestic wastewater from the construction camp (11.4 m^3/day) will be treated via an on-site sewage lagoon and discharged seasonally to an approved AANDC location as indicated on the water licence.

Describe the quality of water(s) returned to source(s):

Domestic wastewater generated from the construction camp will be disposed of in the local community of Arctic Bay sewage lagoon.

If the project was required to use East Twin Lakes as a resource for potable water all

wastewater generated by the construction camp would be deposited to an approved sewage lagoon (sump). Treated effluent, which would meet the effluent quality requirements of the water licence issued by the Nunavut Water Board, would be discharged once at the end of each construction season. All wastewater that meets with discharge criteria would be released to an approved AANDC location as indicated on the water licence.

Hydrostatic Testing and Construction (Industrial)

Name of water source(s) (show location(s) on map):

Seawater from Strathcona Sound (if used for hydrostatic testing)

Freshwater from Twin Lakes Creek (concrete, compaction, dust control and tank rinsing)

Describe the quality of the water source(s) and the available capacity:

The physical characteristics of seawater from Strathcona Sound can be characterized by low turbidity less than 10 NTU but with high conductivity. The estimated raw water quality parameters are pH between 6 & 8, TSS less than 10 mg/L, TDS between 10,000 & 25,000 mg/L, TC between 10 & 100 MPN/100m, and hardness between 2,000 & 5,000 mg/L.

The physical characteristics of freshwater from Twin Lakes Creek can be characterized by low turbidity between 10 & 20 NTU but with high conductivity resulting from elevated concentrations of metals. The estimated raw water quality parameters are pH between 7 & 8, TSS less than 10 mg/L, TDS less than 5000 mg/L, TC less than 50 MPN/100m, and hardness less than 500 mg/L.

Provide the overall estimated quantity of water to be used:

5,300 m^3 is required for hydrostatic testing, concrete, compaction, dust control and rinsing.

Provide the estimated quantity(s) of water to be used from each source:

If seawater is used for hydrostatic testing:

Seawater from Strathcona Sound 4,000 m^3

Freshwater from Twin Lakes Creek 3,300 m^3

If seawater is NOT used for hydrostatic testing:

Freshwater from Twin Lakes Creek 5,300 m^3

Indicate the estimated quantities to be used for each purpose (camp, drilling, etc.)

Hydrostatic Testing	**4,000 m^3**	
Tank Rinsing	**200 m^3**	(if seawater is used for hydrostatic testing)
Concrete Production	**200 m^3**	
Compaction & Dust Control	**900 m^3**	

Describe the method of extraction(s):

A seasonal floating raft complete with screened intake pipe

Estimated quantity(s) of water returned to source(s):

4,200 m^3 (water used for hydrostatic testing and rinsing)

Describe the quality of water(s) returned to source(s):

***CCME Water Quality Guidelines* prior to release**

14. **WASTE** – Check the appropriate box(s) to indicate the types of waste(s) generated and deposited.

- ☒ Sewage
- ☒ Solid Waste
- ☒ Hazardous
- ☒ Bulky Items/Scrap Metal
- ☐ Animal Waste
- ☐ Other (describe): _____
- ☒ Waste oil
- ☒ Greywater
- ☒ Sludges
- ☐ Contaminated soil and/or water

Other than the potential camp sewage lagoon no other waste will be deposited on this site.

During construction, the construction camp will require support from the local community for wastewater management via daily truck pick-up and delivery to the community treatment facility (truck provided and operated by Construction Contractor). However, if daily pick-up and management of wastewater places a burden on the local community, an on-site sewage lagoon will be constructed. The flow rate of domestic wastewater during construction is expected to equal the estimated potable water consumption rate of 11.4 m^3/day, which is equal to 190 L/person/day for a 60-person construction camp.

If wastewater treatment is required during construction, a facultative lagoon system will be constructed west of the Cargo Storage and Marshalling Area. The facultative lagoon system would consist of a wastewater equalization tank, wastewater treatment lagoon and effluent discharge. The holding tank would store wastewater until it is transferred to the lagoon for treatment. Samples will be collected and analyzed for biological oxygen demand (BOD), total suspended solids (TSS), ammonia, fecal coliform bacteria, pH, and oil and grease prior to discharge of the effluent to verify that the effluent meets the conditions of the licence. Treated effluent, which would meet the effluent quality requirements of the water licence issued by the Nunavut Water Board, would be discharged once at the end of each construction season. All wastewater that meets with discharge criteria would be released to an approved AANDC location as indicated on the water licence.

A sewage truck may be required to transfer wastewater from the construction camp to the lagoon system.

During operation, on-site wastewater treatment is not required; wastewater generated during operation will be removed in drums by ships for disposal in the south. The facility will provide a minimum of 10,000 L (50 drums) of storage capacity for oily wastewater (OWW) transferred from vessels and generated at the site from the Bulk Liquids Storage Facility operations and containment berms. OWW drums will be stored in the petroleum, oils and lubricants (POL) storage area within the Bulk Liquids Storage Facility. Oily wastewater will be collected and shipped off site to an approved location in southern Canada at the end of the summer season for treatment.

Collection sumps for rainwater and melt water will be located in each secondary containment cell in the Bulk Liquids Storage Facility. Water collected in the sumps will be tested and, if necessary, drained through an oil-water separator. OWW will be stored in the POL storage area, and uncontaminated water will be

released on land to a location approved by AANDC as indicated on the water licence issued for the Project.

Chemicals and Hazardous Materials

In addition to the fuels and oily wastewater described previously, the following chemicals are expected to be stored and used at the Nanisivik Naval Facility:

- Petroleum, oils and lubricants
- Paint and corrosion-protection coatings
- Chemicals for water treatment system (if required during construction)
- Chemicals for wastewater treatment system (if required during construction)
- Batteries
- Janitorial supplies

Petroleum, oils and lubricants will be stored in original shipping drums and pails on pallets or metal racks at the Bulk Liquids Storage Facility. The POL storage area within the Bulk Liquids Storage Facility will be approximately 150 m^2 with storage capacity for up to 250 drums of POL, OWW and aviation fuel. A bermed and lined containment area will provide secondary containment.

All other chemicals will be stored in appropriate hazardous material storage containers in the location of their use at the general purpose storage building, which will be located within the fenced boundaries of the Bulk Liquids Storage Facility. Any and all waste generated from this material will be transported according to regulatory requirements and disposed of at approved southern waste facilities.

Recyclable material will be separated from other waste, compacted and stored for off-site transport. All other solid waste that is suitable for incineration generated at the camp site will be incinerated on-site in accordance with the Government of Nunavut (2012) *Guidelines for the Burning and Incineration of Solid Waste*. Power will be provided by diesel-powered generators at the camp site.

15. QUANTITY AND QUALITY OF WASTE INVOLVED – For each type of waste indicated in Block 14, describe its composition, quantity in cubic meters/day, method of treatment and method of disposal.

Type of Waste	Composition	Quantity Generated	Treatment Method	Disposal Method
Sewage/Greywater	Camp generated domestic waste	Less than 11.3 (m3/day)	Community or Camp Sewage Lagoon	Off-site or On-site disposal
Organic Sludges	Component of Camp generated domestic Waste	Less than 1 m3/day	Community or Camp Sewage Lagoon	Off-site or On-site disposal
Kitchen waste	Food Waste, Packaging etc.	60-100 (m3/year)	incineration	On-site disposal

Paper and cardboard	Misc. paper and cardboard	40-48 (m3/year)	incineration	On-site disposal
Wood Pallets	wood	60-80 (m3/year)	incineration	On-site disposal
Plastics	Plastics	20-32 (m3/year)	recycled	Off-site disposal, southern facility
Glass	glass	8-16 (m3/year)	recycled	Off-site disposal, southern facility
Metals	various	16-32 (m3/year)	recycled	Off-site disposal, southern facility
Oily water separator sludge	sludge	88-140 (m3/year)	Packaged for shipping	Off-site disposal, southern facility
Diesel generator waste oil	oil	16-32 (m3/year)	Packaged for shipping	Off-site disposal, southern facility
Waste Cooking Oil	oil	4-8 (m3/year)	Packaged for shipping	Off-site disposal, southern facility

16. **OTHER AUTHORIZATIONS** – In addition to the sub-surface and surface land use authorizations provided in Block 6, indicate any other authorizations required in relation to the proposed undertaking. For each provide the following:

Authorization: **Land Use Permit for Quarry Area**

Administering Agency: **Aboriginal Affairs and Northern Development Canada (AANDC)**

Project Activity: **Quarry development and operation during construction**

Date (expected date) of issuance: **August 2014** Date of expiry: **October 2017**

17. **PREDICTED ENVIRONMENTAL IMPACTS OF UNDERTAKING AND PROPOSED MITIGATION MEASURES** - Describe direct, indirect, and cumulative impacts related to water and waste.

Geophysical Environment

The Project site is relatively flat and was previously developed for the DFO wharf and the Nanisivik mine. The area south of the Project site is dominated by moderately steep high-relief hills with few areas of level ground. The hills rise from sea level at the Strathcona Sound to approximately 650 m near the site of the former Nanisivik Airfield. East Twin Lake (Quasaqtoq Lake) is located at an approximate elevation of 372 m.

Soil samples collected at the Project site in 2008 were found to contain concentrations of substances exceeding the Canadian Council of Ministers of the Environment (CCME) Soil Quality Guidelines for Industrial Use (SQGIL) including the following (AECOM 2009c):

- copper, lead and zinc
- arsenic and cadmium
- petroleum hydrocarbon constituents

Because of the results of soil sampling in 2008, an abandonment and reclamation plan for the former mine site was developed by Breakwater Resources including remediation of contaminated soils. Petroleum storage tanks used for the Nanisivik mine have being removed from the Project site. Remediation of petroleum-impacted soils at the site is ongoing.

Aquatic Environment

The closest bodies of water to the Project site include Twin Lakes Creek located along the western site boundary, and Strathcona Sound, on which the Wharf is located.

Surface water data is plentiful as a result of Water License requirements to operate the former Nanisivik mine. Studies were carried out in Twin Lakes Creek during 1988, 1989 and annually beginning in 1995 through 2000. These studies indicated that metal loadings in Twin Lakes Creek, and ultimately Strathcona Sound, increased as a result of mining activities. The dominant source of metal loadings was located in the west area and resulted from both naturally occurring and anthropogenic sources of sulphides.

Water samples collected from Twin Lakes Creek in 2008 suggested that concentrations of aluminum, cadmium, iron and zinc exceeded CCME Water Quality Guidelines for Freshwater Life (WQG_{FL}). Elevated concentrations of metals in Twin Lakes Creek were linked to source inputs and natural mineralization (runoff from Gossan areas) from elsewhere in the drainage area, and were not linked to source areas at the site (AECOM 2009c).

Shallow groundwater flow was encountered at approximate depths of 0.7 to 2.5 m at the Project site and likely occurred seasonally (AECOM 2009c). Groundwater samples collected at the site had concentrations of cadmium and zinc exceeding the CCME WQG_{FL} (AECOM 2009c).

Sediments sampled from Twin Lakes Creek exceeded the CCME Interim Sediment Quality Guidelines (ISQG) for aluminum, cadmium, lead and zinc in nearly all samples collected. Elevated concentrations of metals in Twin Lakes Creek were linked to source inputs and natural mineralization (runoff from Gossan areas) from elsewhere in the drainage area (AECOM 2009c).

Sediments sampled from Strathcona Sound generally exceeded the CCME ISQG for cadmium, copper, lead and zinc (AECOM 2009b).

The Nanisivik Naval Facility has the potential to interact with the biophysical and socio-economic environments during all phases of the Project. Preliminary identification of environmental effects has considered site preparation, construction and operation, including vessel use of the Wharf and potential accidents and malfunctions. Decommissioning has not been planned at this time, but with the exception of

decommissioning of the Wharf, it is expected to have similar effects on the biophysical environment as construction. Very little work will be carried out in or near the water as part of construction of the Project; decommissioning will likely result in a greater amount of in-water work.

The following components of the physical environment could be affected by the Nanisivik Naval Facility:

- Ground stability and permafrost
- Water quality
- Sediment and soil quality
- Air quality
- Noise levels

The following components of the biological environment could be affected by the Nanisivik Naval Facility:

- Wildlife and wildlife habitat
- Birds and bird habitat
- Aquatic species (fish and marine mammals) and habitat

The following components of the socio-economic environment could be affected by the Nanisivik Naval Facility:

- Employment
- Community infrastructure

The following sections discuss the potential environmental effects of the Project and describe mitigation.

Potential Environmental Effects on Physical Environment

Ground Stability and Permafrost

The following Project activities have potential to have environmental effects on ground stability and permafrost:

- Site Preparation
- Quarry Development
- Road Upgrades
- Wharf Upgrades
- Cargo Staging and Marshalling Areas
- Bulk Liquids Storage Facility
- Wastewater Treatment Lagoon (if required during construction)

The earthworks involved for these components/activities, particularly excavation, may result in thawing of permafrost and settlement of the soils. Project siting and design will minimize requirements for excavation (e.g., camp site and DND trailers will be located on the existing concrete slab, fuel tanks will be located within containment cells consisting of compacted gravel containment berms lined with an arctic-rated geomembrane liner, and the general purpose storage building will be unheated). Foundations and roads will be constructed on grade and will be designed to protect the permafrost. Design and construction of the

site infrastructure has been completed by qualified personnel with experience in Arctic engineering, and detailed design of the facility included the collection of geotechnical information for stability. Existing and additional thermistors and slope indicators will continue to be monitored. An Abandonment and Restoration Plan will be developed and implemented for all quarries.

The following mitigation measures will be implemented wherever technically and economically feasible to minimize potential adverse environmental effects on ground stability and permafrost:

- Heated camp structures will be elevated above ground surface.
- Site grading will be conducted to avoid exposure and melting of permafrost (e.g., minimal excavation, addition of fill).
- To prevent permafrost degradation, the depth of excavation will be limited to the active layer, surface water will be directed away from the site, and ice-rich material at a location where melt-water will not re-enter the excavation.

Water Quality

The following Project activities have potential to have environmental effects on water quality:

- Wharf upgrades
- Wastewater treatment lagoon (if required during construction)
- Fuel transfer

The existing Wharf structure will be used, as is, with very minor improvements to maintain or improve its functionality. Very little work will be carried out in or near the water. Upgrading of shoreline protection may result in the suspension of metal-contaminated sediments into the water column. During construction, the marine environment will be monitored for turbidity. If persistent turbidity plumes exist, mitigation measures to reduce or prevent potentially adverse environmental effects could include the use of silt curtains or silt booms (if practical or effective in the currents and tidal environment of the Wharf). Their use will be reassessed at time of construction.

During construction, the construction camp will require support from the local community for wastewater management via daily disposal of wastewater in the community sewage lagoon via sewage truck. However, if daily disposal and management of wastewater places a burden on the local community, a facultative lagoon system will be constructed, and treated effluent will be discharged into an AANDC approved location. Water released will meet the effluent quality requirements of the water licence from the Nunavut Water Board. Samples will be collected and analyzed for biological oxygen demand (BOD), total suspended solids (TSS), ammonia, fecal coliform bacteria, pH and oil and grease prior to discharge of the effluent to verify that the effluent meets the conditions of the licence.

Fuel transfer to and from vessels at the Wharf will be conducted by qualified personnel following standard procedures. The facility design will include appropriate fuel transfer equipment to safely receive fuel from tankers and to refuel naval vessels; naval vessels will deploy a spill boom prior to all refuelling operations. An Environmental Management System will be developed and implemented to avoid accidental releases of petroleum hydrocarbons from the facility. Leak detection systems will be installed on storage tanks and will be monitored to detect leaks. All fuel storage areas will have secondary containment and sumps to collect oily wastewater for treatment. In the event that an accidental release of petroleum hydrocarbons occurs,

the facility will have an emergency shut-off that can be activated at the Bulk Liquids Storage Facility, at the Wharf and from vessels. A Spill Contingency Plan and Emergency Response Plan will be developed and will be implemented as part of the Environmental Management System. Spill response equipment will also be available to contain and clean up the spill, whether it occurs on land or in the marine environment at the Wharf.

There will be no construction within 30 m of Twin Lakes Creek. Standard construction and engineering practices will be employed to avoid environmental effects of land-based construction on water quality. Uncontaminated water collected at sumps will be released to an AANDC approved location on land and will not affect water quality.

Code of Environmental Stewardship:

As part of its environmental sustainability objective, DND and the Canadian Armed Forces adopted the following code of environmental stewardship. DND and the Canadian Armed Forces shall:

- Integrate environmental concerns with other relevant concerns including those from operations, finance, safety, health and economic development in decision-making
- Meet or exceed the letter and spirit of all federal laws
- Improve the level of environmental awareness throughout DND and the Canadian Forces through environmental awareness training, and encourage and recognise the actions of personnel leading to positive impacts on the environment
- Recognize that the life cycle aspects of hazardous material management (initial selection, procurement, use, handling, storage, transportation and disposal) is an essential factor in all planning with particular emphasis on determining whether the material should even be acquired given its characteristics (DAOD 4003-1, Hazardous Materials Management)
- Ensure that environmental considerations are integrated into procurement policies and practices
- Practise pollution prevention in day-to-day activities and operations by seeking cost-effective ways of reducing the consumption of raw materials, toxic substances, energy, water, and other resources, and of reducing the generation of waste and noise
- Acquire, manage and dispose of lands in a manner that is environmentally sound, including the protection of ecologically significant areas

Cumulative Effects

The following projects and/or activities were identified projects and/or activities that have potential to interact cumulatively with the Nanisivik Naval Facility:

- Hunting and outfitting activities from the community of Arctic Bay
- Arctic Offshore Patrol Ships

Potential environmental effects of the Nanisivik Naval Facility that may overlap temporally and spatially with other projects in the region include the following:

- Wildlife disturbance and mortality
- Marine mammal disturbance
- Water and sediment quality

A Wildlife Mitigation and Monitoring Plan will be implemented for the Nanisivik Naval Facility. If an increase in wildlife mortality or marine mammal incidents occurs, additional mitigation measures and monitoring may be required. Because construction and operation of the Project will only occur during the navigable season (i.e., not during ice conditions), there will be no effect on winter hunting activities.

Accidental releases of petroleum hydrocarbons into the marine environment may result in adverse environmental effects to water and sediment quality; however, environmental effects of spills and leaks as a result of the Project will be avoided or reduced through the following measures:

- Implementation of an Environmental Management System
- Monitoring of leak detection systems
- Secondary containment and sumps to collect oily wastewater for treatment
- Emergency shut-off systems
- Spill Contingency Plan
- Emergency Response Plan
- Availability of spill response equipment

Additionally, naval vessels will deploy a spill boom prior to all refuelling operations.

The AOPS and the Nanisivik Naval Facility will result in a small contribution to the existing ship traffic: approximately one or two ships per year during construction and approximately six to eight ships per year during operation.

Therefore, it is not anticipated that the environmental effects of the Project will act in combination with past, present and reasonably foreseeable future projects and/or activities to result in significant adverse cumulative environmental effects.

18. WATER RIGHTS OF EXISTING AND OTHER USERS OF WATER

Provide the names, addresses and nature of use for any known persons or properties that may be adversely affected by the proposed undertaking, including those that hold licences for water use in precedent to the application, domestic users, in-stream users, authorized waste depositors, owners of property, occupiers of property, and/or holders of outfitting concessions, registered trapline holders, and holders of other rights of a similar nature.

Advise the Board if compensation has been paid and/or agreement(s) for compensation have been reached with any existing or other users.

N/A

19. INUIT WATER RIGHTS

Advise the Board of any substantial affect of the quality, quantity or flow of waters flowing through Inuit Owned Land (IOL), and advise the Board if negotiations have commenced or an agreement to

pay compensation for any loss or damage has been reached with one or more Designated Inuit Organization (DIO).

N/A

20. CONSULTATION – Provide a summary of any consultation meetings including when the meetings were held, where and with whom. Include a list of concerns expressed and measures to address concerns.

Public Involvement

The objective of the consultation process is to provide information on the Nanisivik Naval Facility, and it is an opportunity for stakeholders or interested parties to provide input and comment on the environmental assessment. The consultation process also identifies the potential involvement of regulatory authorities and solicits further information (e.g., traditional knowledge) about the site.

DND and DCC initiated consultation on the Nanisivik Naval Facility with interested parties in September 2006, and these have been ongoing, with the most recent consultation in October 2012. Project status briefings have been provided to the governing council of Arctic Bay on an annual basis. A summary of all stakeholder consultations to date is provided in conjunction with this application as a standalone file.

DND is planning on visiting Arctic Bay in July 2014 to provide a project status update.

The following organizations have been contacted:

- Hamlet of Arctic Bay
  - Mayor and Council
  - Senior Administration Officer
  - Community Land and Resources Committee
  - Ikajutit Hunters and Trappers Association
  - Arctic Bay Economic Development Officer
  - MLA for Quttikuq
- Government of Nunavut
  - Community and Government Services
  - Economic Development and Transportation
  - Department of Health and Social Services
  - Environment
  - Executive and Intergovernmental Affairs
- Nunavut Tunngavik Inc.
- Qikiqtani Inuit Association
- Nunavut Impact Review Board
- Nunavut Planning Commission
- Nunavut Water Board
- Aboriginal Affairs and Northern Development Canada
- Canadian Northern Economic Development Agency
- Fisheries and Oceans Canada
  - Central and Arctic Region

- Canadian Coast Guard

Through the original PSIR submission to NIRB in 2011, the following stakeholders have also provided input to the Project:

- Transport Canada
- Environment Canada

To support development of the Inuit Participation Plan, the following interested parties were also consulted:

- Representative of Arctic College
- Arctic Bay business owners
- Arctic Bay Housing Manager
- Several residents of Arctic Bay

Additional stakeholders or interested parties may be identified through the consultation process. Through the consultation process, the following information will be communicated to interested parties:

- Involvement: who is coordinating the Project, who is the proponent
- Project description
  - Location
  - Infrastructure
  - Construction
  - Operation
  - Schedule
- Project rationale
- Existing environment
- Potential environmental effects and how they will be mitigated
- Possible job/employment opportunities for local communities
- Who/where people can go to voice their opinions/concerns, ask questions
- Regulatory framework and approvals

In addition to providing information on the Project, through consultation activities, DND/DCC has been soliciting the following information from interested parties:

- Local and traditional knowledge of the area
- Potential effects of the Project on the community
- Public comments or concerns regarding the Project

Methodologies to satisfy consultation requirements include:

- Mail/email correspondence
- Targeted stakeholder/interest group meetings
- Traditional knowledge workshops
- Public information sessions

Since 2008, the DND Project team has visited Arctic Bay on many occasions, most often meeting with the Mayor and Council of the Hamlet. At these meetings, project updates have been presented, and the Project team has answered questions that the officials have asked.

In February 2011, an open house was held at the community centre, and members of the community attended. Four main questions were raised at this session, and these questions are representative of those that have been raised throughout the consultation process:

1. Will the facility operate year round?

2. Will DND personnel take up all of the available seats on the limited flights in and out of the community?

3. Will the road be kept open?

4. Will there be jobs at the facility, and if so, how many?

Answers to these questions are provided below:

1. The community has been advised that the Nanisivik Naval Facility will not be a year-round operating base or station; it will only be open during the navigable (i.e., ice-free) season (i.e., July to October).

2. DND acknowledges the importance of the airline to the community and commits to using charter flights for large groups of people (particularly during construction). However, DND must reserve the right to use commercial flights for small groups (i.e., one or two persons) coming to the site, where it would be cost prohibitive to use a charter. Although the community was concerned about available seats on commercial flights they also see the need for commercial flights to be economically viable; some commented that if there is more demand for flights to the community this may result in more flights being scheduled to Arctic Bay, which would benefit the community.

3. The residents of Arctic Bay have been advised that the road is a requirement for the site and that DND is in discussions with the Government of Nunavut about making it possible. The community has also been advised that DND does not require the road in the winter, and it will not keep the road open after naval operations end each season.

4. DND has conducted a study on Arctic Bay's capacity to respond to employment needs and business opportunities during the construction and operation of the Nanisivik Naval Facility. A plan is being prepared to encourage prospective construction contractors to maximize the use of local labour and businesses.

21. SECURITY INFORMATION

Provide an estimate of the total financial security for final reclamation equal to the total outstanding reclamation liability for land and water combined sufficient to cover the highest liability over the life

of the undertaking. Estimates of reclamation costs must be based on the cost of having the necessary reclamation work done by a third party contractor if the operator defaults. The estimate must also include contingency factors appropriate to the particular work to be undertaken.

Where applicable, the financial security assessment should be prepared in a manner consistent with the principals respecting mine site reclamation and implementation found in the *Mine Site Reclamation Policy for Nunavut,* Indian and Northern Affairs Canada, 2002.

N/A

22. FINANCIAL INFORMATION

Provide a statement of financial responsibility.

If the applicant is a business entity, provide a list of the officers of the company.

If the applicant is a business entity attach a copy of the Certificate of Incorporation or evidence of registration of the company name.

The Nanisivik Naval Facility project is fully funded by the Government of Canada.

23. STUDIES UNDERTAKEN TO DATE - List and attach copies of studies, reports, research, etc.

Reports on Field Surveys and Investigations Carried Out for the Nanisivik Naval Facility

	Report	Description
1	Geotechnical Report: Final Report (Stantec 2012)	Geotechnical investigation for the Nanisivik Naval Facility.
2	Fish Habitat Assessment (WorleyParsons 2011)	Fisheries habitat assessment for the Nanisivik Naval Facility.
3	Geotechnical Report (Stantec 2010)	Geotechnical investigation for the Nanisivik Naval Facility.
4	SPG Hydro International Inc. 2009. Site Inspection and Condition Report Nanisivik Wharf Nunavut Technical Report. For: PWGSC	A general evaluation and inspection of the existing conditions of the wharf. Topographic and bathymetry surveys were completed.
5	AECOM Canada Ltd. April 2009a. Nanisivik Naval Facility Site Remedial Planning. For: DND and PWGSC	Environmental Baseline Study (EBS) of the Nanisivik Dock Site Property, Baffin Region, Nunavut.
6	AECOM Canada Ltd. March 2009b. Nanisivik Mine Sealift Dock Site Environmental Baseline Study. For: PWGSC	A baseline study of the existing conditions at the dock site.

7	AECOM Canada Ltd. January 2009c. Nanisivik DND Dock Site – Phase III Field Investigation Report. For: PWGSC	Phase III Environmental Site Assessment including (i) the review of historical site use and existing environmental information; (ii) identification of data gaps; and (iii) completion of a field investigation focused around the further identification and delineation of contaminated soils, groundwater, surface waters and sediments at or adjacent to the site.
8	Points West Heritage Consulting Ltd. November 2008. Archaeological Investigations at Nanisivik, Nunavut. For: Gartner Lee Limited (AECOM)	An archaeological assessment was conducted as part of environmental baseline studies relating to National Defence Canada's proposal to build a deep sea naval facility at Nanisivik. No archaeological sites were observed within the identified Project area.

24. PROPOSED TIME SCHEDULE – Indicate the proposed start and completion dates for each applicable phase of development (construction, operation, closure, and post closure).

Construction			
Proposed Start Date:	**08/2014** (month/year)	Proposed Completion Date:	**09/2018** (month/year)
Operation			
Proposed Start Date:	**09/2018** (month/year)	Proposed Completion Date:	**Indeterminate** (month/year)
Closure			
Proposed Start Date:	**Indeterminate** (month/year)	Proposed Completion Date:	**Indeterminate** (month/year)
Post - Closure			
Proposed Start Date:	**Indeterminate** (month/year)	Proposed Completion Date:	**Indeterminate** (month/year)

The infrastructure component of the NNF Construction Project has been projected to be till 2067. However, this is only based on the anticipated lifespan of the infrastructure not the lifespan of the Operation. The Government of Canada has no plans, at this time, to Abandon this site.

For each applicable phase of development indicate which season(s) activities occur.

Construction
☐ Winter ☐ Spring ☒ Summer ☐ Fall ☐ All season

Operation
☐ Winter ☐ Spring ☒ Summer ☐ Fall ☐ All season

Closure
☐ Winter ☐ Spring ☒ Summer ☐ Fall ☐ All season

Post - Closure
☐ Winter ☐ Spring ☒ Summer ☐ Fall ☐ All season

25. PROPOSED TERM OF LICENCE

Number of years (maximum of 25 years):
5 years

Requested Date of Issuance: **08/2014** (month/year) Requested Expiry Date: **10/2018** (month/year)

(The requested date of issuance must be at least three (3) months from the date of application for a type B water licence and at least one (1) year from the date of application for a type A water licence, to allow for processing of the water licence application. These timeframes are approximate and do not account for the time to complete any pre-licensing land use planning or development impact requirements, time for the applicant to prepare and submit a water licence application in accordance with any project specific guidelines issued by the NWB, or the time for the applicant to respond to requests for additional information. See the NWB's *Guide 5: Processing Water Licence Applications* for more information)

26. **ANNUAL REPORTING –** If not using the NWB's *Standardized Form for Annual Reporting*, provide details regarding the content of annual reports and a proposed outline or template of the annual report.

This project will utilize the NWB's *Standardized Form for Annual Reporting.*

27. **CHECKLIST –** The following must be included with the application for the water licensing process to begin.

Written confirmation from the NPC confirming that NPC's requirements regarding land use plan conformity have been addressed.

☒ Yes ☐ No If no, date expected: _____

Written confirmation from the NIRB confirming that NIRB's requirements regarding development impact assessment have been addressed.

☒ Yes ☐ No If no, date expected: _____

Completed General Water Licence Application form.

☒ Yes ☐ No If no, date expected: _____

Information addressing Supplemental Information Guideline (SIG) , where applicable (see Block 11)

☒ Yes ☐ No If no, date expected: _____

English Summary of Application.

☒ Yes ☐ No If no, date expected: _____

Inuktitut and/or Inuinnaqtun Summary of Application.

☒ Yes ☐ No If no, date expected:

Application Fee of $30.00 CDN (Payee Receiver General for Canada).

☐ Yes ☒ No If no, date expected: **N/A**

Water Use Fee Deposit of $30.00 CDN (Payee Receiver General for Canada). The actual water use fee will be calculated by the NWB based upon the amount of water authorized for use in accordance with the Regulations at the time of issuance of the licence.

☐ Yes ☒ No If no, date expected: **N/A**

28. SIGNATURE

Name (Print)	Title (Print)	Signature	Date
Rodney Watson	**Project Manager, Nanisivik Naval Facility**		**June 5, 2014**

List of documents accompanying the Water Use Licence application:

131024-09DN018-Screening Decision Report-OT2E.pdf
NANISIVIK NAVAL FACILITY NORTHERN STAKEHOLDER CONSULTATIONS 2007-2012.pdf
NNF Contract Specification for Emergency and Spill Response Plans.pdf
NNF NPC Determination Mar 2009.pdf
NNF Overall Site Plan.pdf
NNF Site Plan including water sources.pdf
NNF Site Post Construction drawings.pdf
NNF Spill Contingency Plan (NIRB 2013).pdf
NNF WUL Type B Executive Summary 2014 Final.pdf
NNF WUL Type B Executive Summary 2014 Final-Inuktitut.doc
Quarry Location Plan (compressed).jpeg