Summary of Issues Responses

Introduction

The Nunatsiavut Government (NG) is proposing to develop a new airport to service Nain, the northernmost Inuit Community in Labrador, Newfoundland and Labrador (NL). Nain lies north of Unity Bay, about 50 kilometres (km) from the Atlantic Ocean via the Labrador Sea and 370 km north of Happy Valley-Goose Bay. Due to design of the existing airstrip, along with mountainous terrain and strong winds, flights are frequently cancelled at Nain. These cancellations affect delivery of essential goods such as food and medical supplies and movement of people in and out of the community. The New Nain Airport (the Project) will be situated at a higher elevation, have less surrounding mountains, and have more favourable wind directions, which allows for more consistent and safe aircraft travel to and from Nain. The current Nain airstrip is located on the coast with an official elevation of 21 ft (6 m) above mean sea level and during storm surges, the airstrip has been partially flooded by sea water. Storm surges cause erosion that can affect load-bearing capacity of the airstrip which could result in the airstrip becoming unusable in short or long-term.

The main Project components will include:

- Runway: new 2,133 m (7,000 ft) long gravel airstrip, with approach lighting and surrounding fence and service road.
- Airport: includes a multi-functional terminal building, aircraft (fixed wing and rotary) parking apron, taxiways, maintenance building, freight and storage warehouse, de-icing pad, and fuelling area
- Access road, a new gravel road approximately 12 km in length to connect the town of Nain to the new airport.

The Physical Activities Regulations of the Canadian *Impact Assessment Act* (IAA) identify activities that constitute designated projects. Designated projects under these regulations include construction and operation of new aerodromes that would meet specified thresholds or criteria.

On December 4, 2023, NG Infrastructure submitted an Initial Project Description (IPD) to the Impact Assessment Agency of Canada (IAAC); this document represented the registration of the Project under the IAA. This submission triggered a public comment period in which feedback is received from the public, Indigenous communities, and other regulatory agencies. Following the end of the comment period, IAAC compiled a Summary of Issues and provided them to NG Infrastructure on February 27, 2024. This document represents NG Infrastructure's direct responses to the Summary of Issues. A draft Detailed Project Description (DPD) has also been prepared to provide additional Project information and address the Summary of Issues, in accordance with the Planning Phase of the IAA process. Where applicable, responses to the Summary of Issues refer to the more extensive content in the DPD.

Responses

1. Clarify whether the Local Study Area encompasses an area sufficient to address all project components.

Response:

Local study areas have been selected to characterize baseline conditions and describe potential Project effects in the Detailed Project Description. The local study areas are specific to each environmental component and generally involve applying a buffer to Project infrastructure to account for both direct and indirect effects. The selection of a local study area follows the environmental assessment (IAAC 2022) process, and as such the local study area presented in the DPD is considered sufficient to address the Project components.

2. Need to clarify the location of all proposed project components, works and activities, such as the siting, construction, and design of sedimentation ponds; the location of rock quarries; details about the construction of the stormwater management infrastructure, potable water systems, and wastewater treatment plant; and siting of the airport radar system.

Response:

The location of all project components is provided on Figures 1 and 2. A list of components and summary description is provided below, with additional details being provided in the DPD. There is no radar system associated with the Project.

Runway

The runway will measure approximately 2,133 m in length and 45 m in width. It will be oriented at 120º/300º (magnetic) to optimize approaches and take-offs into prevailing winds, achieving a usability of 95% for aircraft capable of operating in crosswinds of 20 knots. The runway will be developed by blasting rock for fill due to the topography of the area and the limitations of overburden soils. The construction plan involves approximately 2 million cubic metres (m^3) of material to cut and 3 million m^3 of fill, with the runway constructed primarily using local rock material. The runway surface will be gravel treated with EK35®, a synthetic fluid that stabilizes gravel runways and improves operational and safety conditions. Additional features include a perimeter road for maintenance activities, a fence for safety and security, and approach lights SSLAR (Simplified Short Approach Lighting System) installed at each end of the runway over a distance of 720 m in line with the runway centreline, as required for the airport's precision approach CAT I capability.

Airport

The main airport area will house the supporting infrastructure. The following is a description of the various components included in the airport:

- **Apron and Taxiways:** The apron, designed for aircraft parking, loading, and servicing, can accommodate short-term parking for two Boeing 737-800 aircraft and long-term parking for three AGN II aircraft. It includes a fuelling pad, de-icing pad, and two helicopter parking stands sized for the AgustaWestland AW101/CH-149 Cormorant. The airport requires two taxiways to connect the apron to the runway, reducing runway occupancy time and minimizing congestion. Each taxiway will be 23 m wide with a 5 m safety buffer. Apron floodlighting will be installed to minimize glare for pilots and controllers. The apron and taxiways will be constructed using the same rock materials as the runway and stabilized with EK35®. Taxiways will be graded at a maximum of 1.5% slope towards a runoff collection area.

- **Terminal building:** The terminal building is the main space to welcome arriving and departing passengers to and from the airport. This building contains the passenger waiting area, check-in and boarding counter, baggage handling system, restaurant, cafeteria or vending machines area, offices for airport management, flight preparation and pilot rest room, multi-service room / offices, restrooms, mechanical, electrical and communication equipment room. The waiting room will be designed to accommodate approximately 96 passengers. The terminal will be located on the east-facing side of the apron, which is closer to the overall airport entrance and separates passenger related activities from fuel facilities, airport maintenance and cargo activities. The terminal building will be approximately 1,344 square metres (m^2).

- **Parking area:** The landside parking lot will be located adjacent to the air terminal building and will have a 200 millimetres (mm) gravel surface layered on a 500 mm granular subbase. Since the parking lot has a gravel surface and no parking lines will be applied, standard parking stalls and accessibility parking stalls will need to be identified using signage and/or curb stops to delineate each stall. The parking lot will be large enough to accommodate the minimum number of required stalls and will allow for over-sized parking stalls.

- **Maintenance garage:** The maintenance garage is designed for the upkeep and storage of various machinery, vehicles, and equipment used for airport maintenance tasks like snow removal and gravel and sand spreading. The garage includes seven bays: three double service bays for heavy machinery, one double bay for smaller vehicles and equipment, and a single bay for sand storage. These bays are double-height to accommodate large machinery. The garage also features a repair workshop with a workbench, various machines and tools, and necessary outlets. Additionally, it houses an office for administrative tasks, a washroom with a shower, a break room for employees, and storage space for equipment, tools, parts, and supplies.

- **Cargo Warehouse**: A 2-storey, 1,250 m^2 cargo warehouse will be used for short-term storage and handling of freight goods and supplies. The warehouse will include a reception desk, maintenance and parking areas for vehicles, mechanical and electrical rooms, janitorial and server rooms, general and freight storage areas, frozen goods and cooler rooms, offices, break rooms, meeting and locker rooms, support spaces, and restrooms.

Located west of the passenger terminal, it will have direct access to the apron and runway. The warehouse will also house seven bays dedicated to various functions such as a general warehouse, freight storage, repair and maintenance garage, and vehicle parking garage.

- **Power generation and fuel storage**: The airport will be powered by two main 1,125 kW diesel-fired generators and a third standby generator of the same capacity, all housed in a single building in the southwest part of the apron. One generator will power the airport's ancillary systems (HVAC, cooling, security), while the other will meet increased demand as needed. The generator building will feature a 6 to 10 m high exhaust stack to diffuse exhaust fumes and minimize impact on airport operations. The generators will use a modern, efficient diesel energy system with high-pressure common-rail fuel injection to maximize fuel vaporization and combustion rate. Specific engine specifications will be determined in future engineering designs.

  To provide fuel for the power generators, diesel storage tanks will be set up in the southwest portion of the apron. The tanks will be double-walled for secondary containment, and raised on skids. The capacity of the storage area will be approximately 1,000,000 litres (L) to fuel eight months of operation. The diesel tanks will be connected to power generation building through aboveground piping. This piping will also be connected to a diesel fuel dispensing system on the apron for maintenance equipment.

- **Water supply, treatment and storage**: The airport will require approximately 13 L/minute of potable water at peak hour, with a maximum daily demand of 11,250 L/day, to support the terminal, warehouse, and maintenance garage buildings. In the event of a fire, the airport will also require 7,275 L/min of non-potable water for fire suppression.

  The primary option for potable water supply being considered is withdrawal from Kauk Brook; however, further investigation will occur before Project development to confirm the proposed water supply. Water supply infrastructure will consist of an intake in the proposed surface water source, a raw water pump station and building complete with electrical supply and a raw water transmission main from the water source to the airport site. A balancing raw water storage tank will also be required at the airport site, in addition to the treated water storage tanks noted above. The water treatment building will contain pumps and tanks for testing and adding disinfection chemicals, specifically sodium hypochlorite, which will be stored in a secondary containment.

  For fire suppression, two 510 m^3 storage tanks will be built on concrete slabs, equipped with an active mixer system to mix the chlorinated water and prevent freezing. Tanks will be initially filled via the potable water source, and their water level will be monitored and maintained through throughout Project operation. Collected stormwater from the airport may be considered as a non-potable water supply to maintain fire suppression tanks. This water will be diverted in a sustainable manner in accordance with applicable *Water Resources Act* requirements.

- **Field Electrical Center (FEC) building**: The airfield electrical lighting power equipment and a backup power system will be stored in the FEC building located in the eastern portion of the apron. The FEC will have a monitoring station where electricians can review status of equipment and historical data related to the airfield lighting system. The backup power system will consist of a single 175 kW diesel-fired generator to support emergency airfield lighting system use. The generator will be operated by oil and a fuel tank will be located under the generator.

- **Sewage collection and wastewater treatment**: All domestic wastewater from the terminal, maintenance building, and warehouse will gravity flow through PVC pipe to a septic tank. This tank will be concrete and approximately 7 m^3 in volume. Waste will be stored in the tank for a time to allow particles to settle out of the wastewater, and then it will be pumped into the septic field via dosing chamber and pump station. The septic tank will be buried a sufficient depth to prevent freezing. The septic field will consist of six absorption trenches which allow the wastewater to infiltrate down into the surrounding soil. Each absorption trench consists of a 100 mm diameter perforated drainage pipe within a layer of crushed stone, which sits above a 1 m deep layer of soil. The absorption trenches will each be approximately 30 m long, and will be covered with backfill.

- **Aviation fuel station**: An aircraft refueling pad will be located near the maintenance garage; it will be constructed with a concrete surface to prevent potential infiltration of fuel to the ground. An HDPE membrane will also be installed between the pad and subgrade, to further protect against potential contaminant infiltration. The fueling pad will be connected to a drainage runoff collection system; this system will consist of a PVC pipe with a concrete bedding that will convey spilled fuel to an oil/water separator. Waste oil/fuel collected from the separator will be transported to Nain for disposal, and clean surface water runoff from the fueling pad will be

directed to the stormwater collection area (Section 2.2.4.6). The dispensing system for aviation fuel will be adjacent to the fueling pad; it will be equipped with a 30,000 L aboveground storage tank. This tank will be double-walled for secondary containment.

- **De-icing pad:** A designated area will be established to de-ice aircraft in winter. This area will be a concrete pad designed to contain de-icing glycol fluid and water; it will have a central drain and sump to store waste glycol during de-icing. Waste glycol collected from the sump will be pumped out and transported to Nain for disposal. During summer, precipitation that accumulates in the pad and sump will be released to the stormwater collection area via PVC pipe.
- **Construction camp:** A temporary camp will be set up to accommodate construction workers. Initially, the camp will be placed within the construction staging area (noted below). As construction progresses, the camp will be moved to the future parking area at the airport, when that site is cleared and the embankment built up. The camp will consist of mobile trailers with bedrooms, restrooms, and a kitchen/cafeteria. Power and heat will be supplied by gas-fired generators, and a small modular wastewater treatment unit will be used to handle domestic effluent. Until the access road is fully built, equipment and supplies (including potable water) will be transported to and from the construction camp via smaller marine barge vessel, with workers transported via smaller boats.

Access road

The access road joining the airport to Nain will be gravel and measure approximately 12 km long. The width of the road surface be approximately 12 m wide. A total width of 36 m along the road alignment will potentially be impacted to account for the right-of-way and ditches on each side of the road surface. The access road width will accommodate larger maintenance and operations equipment such as single unit trucks and snowplows, as well as local passenger vehicles (half ton trucks, snowmobiles, ATVs) and passenger busses.

Pull off areas will be included to allow people to safely park and leave their vehicles a corridor for hunting, fishing, trapping, and accessing cabins. The typical pull off area will be 10 m in width and 50 m in length, with 50 m long tapers to transition the pull off areas to the main corridor.

Rock borrow areas

The Nain region includes rough and mountainous topography, which requires extensive cut and fill material to develop stable subgrades for the runway and airport, and to a lesser extent, the access road. Material is also needed for backfill material and surface pavement. Multiple rock outcrops close to the Project infrastructure have been identified as good candidates to provide fill material. These borrow areas have been delineated on Figure 1 as the maximum expected extent where rock borrow material will be collected; however, the actual areas required will be subject to further investigation.

Construction landing area, staging area, and access

Since there is no existing access to the proposed airport site, the initial stages of construction will require equipment and supplies to be ferried from Nain and offloaded using a roll-on/roll-off barge vessel. A coastal landing site will be set up to the south of the airport to facilitate the offload of large equipment where it will be transported to the airport site using a temporary access road. Minor preparatory work on shore (e.g., tree and brush clearing, removal of large rocks, placement of gravel) may be required to establish this area (Figure 3). A temporary access road will be constructed from the barge landing area to the airport area for equipment transportation. The temporary access road design criteria will be similar to the airport access road in terms of geometrics and cross section. The road will be cleared of vegetation, and the temporary access road alignment follows the topography avoiding steep grades, wetlands, and significant cuts and fills where possible cut and fill construction techniques may be used to create an appropriate grade for vehicle travel.

Following establishment of the coastal landing area and initial development of the temporary access road, a construction staging area will be established between the landing area and airport. This area will be cleared of vegetation and graded as needed to allow for equipment and materials (e.g., construction machinery, fuel, aggregate) storage. A temporary construction camp will also be set up at this location; this camp will be moved the airport site parking area once it is cleared and embankment built up. The construction laydown/storage area will maintain a minimum 30 m buffer from the coastline and any watercourses in the area.

The construction landing area, staging area, and temporary access road will be discontinued and reclaimed at the end of the construction phase.

Stormwater Management

Stormwater management infrastructure will be required to effectively manage runoff during Project operations. The runway will be graded with 2.5% slope on each side of the centreline to allow for runoff drainage. Ditches will be situated a minimum of 75 m from the runway centerline on either side of the runway. The ditches will be 3 m wide to account for rock spalls and snow accumulation during the winter months. Reinforced concrete culverts will be installed to maintain drainage north to south across the runway and manage rainwater runoff and melting snow.

Taxiways will be graded at 1.5% slope towards the area in between the apron, taxiways and runway. This area will serve as a runoff collection area, with a low point culvert drain that directs water east away from the airport. Areas with the potential for chemical contamination, i.e., the fuelling pad and de-icing pad have drains to direct clean stormwater to the runoff collection area. The pads will be equipped with mechanisms to contain spilled fuel and de-icing glycol for proper disposal; these chemicals will not be released to the environment.

Emergency roof drainage on Project buildings will be achieved using combination roof drain/overflow drains. These fixtures utilize a primary roof drain installed at roof level, plus a secondary emergency drain with an inlet 100 mm above the roof level. This will prevent water from accumulating upon a blockage of the primary drain. No emergency overflow scuppers will be provided for any of the buildings. Drains will also be installed around all foundations to facilitate water flow away from buildings.

Drainage ditches will be also installed alongside the access road, as well as culverts and a bridge to allow the natural watercourses to pass beneath the road.

3. Need for more information on the proposed construction of the temporary access road from the shoreline, any necessary marine infrastructure and related activities required to bring supplies to land (e.g., temporary wharf structure and/or dredging), and projected marine vessel activity during construction. This information is needed to understand direct and indirect impacts to fish and fish habitat and other marine resources. Where impacts are predicted, describe measures that will be implemented to mitigate potential impacts to fish and fish habitat and the marine environment.

Response:

All construction equipment and materials will be transported to Nain (Unity Bay) for temporary storage in advance of construction. This process will include a large, initial cargo ship delivery, and potentially 3 or 4 barge loads from the St. Lawrence / Goose Bay area to Nain for three construction seasons when the Nain harbour is ice-free.

Site preparation (tree and brush clearing) will take place in winter using local crews from Nain accessing the site via snowmobile. Following this activity, equipment, machinery, worker camp, fuel reservoir and other supplies (food, etc.) will be transported to the airport site via roll-on/roll-off barge vessel. Construction personnel will be transported to and from site using smaller boats. The coastal landing site will be set up to the south of the airport to facilitate the offload of large equipment where it will be transported to the airport site using a temporary access road. Minor preparatory work on shore (e.g., tree and brush clearing, removal of large rocks, placement of gravel) may be required to establish this area.

The roll-on/roll-off barge will be equipped with a hydraulic ramp that can be lowered onto the beach to permit vehicles, materials and equipment to be offloaded. The barge would access the beach at high tide so that there is sufficient water to keep the barge from bottoming out. As the tide goes out, the barge bottoms out at the shoreline, allowing the ramp to be lowered and contents offloaded. At high tide, the barge will float to allow the barge to leave the area. Figure 3 shows the locations of the landing and staging area.

No structures will be developed in the water for docking of marine vessels; this approach will limit disturbance to the shoreline and tidal area. No equipment or marine vessel will be fueled on or near the water. Fuel containers will be offloaded along with the construction equipment and stored at the staging area (30 m from coast and watercourses). Equipment fuelling will only be conducted in designated areas away from watercourses and water bodies.

The current estimation of total barge trips for the construction phase of the Project is 244. Barge use will be discontinued following development of the Project access road to connect with Nain. Demobilization of equipment will be similar to the initial stages of construction, with use of a cargo ship and 3 to 4 barge trips from Nain.

The single barge for Project use will be part of a broader set of marine traffic already existing in the Nain area (marine /commercial vessels, ferry, community navigation smaller boat use). Environmental monitoring will be implemented during barge trips to observe and avoid marine mammals.

Refer to Summary of Issues response #2 for a description of the coastal staging area and temporary access road, and refer to Summary of Issues response #13 for a summary of potential impacts to the marine environment as a result of these activities.

4. Concerns about the use of light de-icing as opposed to the use of a de-icing/anti-icing facility and the management of waste de-icing fluids.

Response:

A de-icing area will be constructed on the airport apron (Figure 2). This area will be a concrete pad designed to contain de-icing glycol fluid and water; it will have a central drain and sump to store waste glycol during de-icing. Waste glycol collected from the sump will be pumped out and transported to Nain for disposal. Glycol contaminated water will not be discharged to surrounding area. During the summer season, runoff from the de-icing pad will be directed to the overall stormwater collection and conveyance system via PVC pipe. A large de-icing facility that is typical of large airports is not considered necessary for the Project. Aircraft operators will be responsible to evaluate their aircraft during freezing conditions. If weather conditions pose risk for extensive ice build-up on aircraft, flights will be postponed at the location of origin (i.e. not Nain) rather than increase de-icing activities at the New Nain Airport.

5. Comments on the ownership of the data collected by the proponent and consultants for the various studies conducted as part of project planning.

Response:

All data collected in support of the Project is owned by the Nunatsiavut Government.

6. Comments on the results of the feasibility study of a power supply for the terminal, including alternatives to diesel, such as wind and solar. Recommend applying the Northern Responsible Energy Approach for Community Heat and Electricity Program to the feasibility study[1].

Response:

Given the importance of consistent, reliable power supply for critical airport functions, the use of diesel-fired generators is a necessity for safe operation of the Project.

The electrical power supply feasibility study explored the extent to which alternative sources, such as wind and solar, could supplement and offset the use of generators. The study concluded that alternative sources include many benefits related to operational savings and greenhouse gas reduction; however, the capital costs associated with developing these sources are substantial. Therefore, the current project design has not incorporated alternative electricity sources. Consideration of alternative sources will continue to be evaluated as project design progresses and into the operations phase, and if these sources are adopted NG Infrastructure will explore subsidy options, including the Responsible Energy Approach for Community Heat and Electricity Program, to help reduce capital costs.

7. Need for information on the transportation of diesel to the airport and the capacity of the jet fuel storage tank.

Response:

All fuel required at the airport (aviation fuel and diesel) will be transported to Nain via ship and offloaded to existing storage tanks located in Nain, which is the current process for the existing airport. Fuel will be transferred periodically using tanker trucks to the new airport. The double-walled storage tank in the aviation fuel station will have a volume of approximately 30,000 L.

8. Comments on the importance of using project design engineers who have experience working in northern climates and permafrost.

Response:

For the preliminary design and subsequent 60% design, engineers who have experience working in Northern climates and permafrost were used. CVs for these engineers are attached.

9. Comments on using Inuit specific designs for the terminal building (e.g., architectural design).

Response:

The current conceptual design of the terminal building includes inspiration from Inuit art and northern landscapes. Artist renderings of the terminal building were provided at the June 12, 2024, community open house meeting in Nain.

10. Importance of considering plans for decommissioning the New Nain Airport, in consultation with the local community.

Response:

The Project is planned to be in operation for greater than 50 years. Detailed plans for decommissioning and reclamation will be developed closer to the end of the Project's life. These plans will be based on consultation with the local community to determine the end land use of the site and in accordance with the reclamation criteria at that time.

Fish and Fish Habitat

11. Need to clarify whether the survey data and information collected is sufficient to identify and locate aquatic invasive species and prevent their introduction into unaffected water bodies.

Response:

The desktop and field studies did not identify the presence of any invasive freshwater fish or shellfish species within the Regional Study Area (RSA). Limited fish sampling was conducted at watercourses where fish presence was likely. No invasive fish species were captured during sampling effort; however, there is still potential for their presence. Measures to prevent introduction of potentially present invasive fish and shellfish species will be provided within a construction environmental management plan and will include measures, such as not discharging water from one watercourse into another watercourse, cleaning and disinfecting freshwater dewatering/ water management equipment before arriving to site, avoiding emptying non-regional ballast water from barges and ships, and having ship/barge hauls free of shellfish/marine invertebrates before arrival.

12. Need for further characterization of fish and fish habitat for watercourses and bodies of water likely to be affected by the Project to address uncertainties regarding the description of potential impacts on fish and fish habitat.

Response:

Fish and fish habitat (FAFH) has been assessed using desktop and field assessment methods and is presented within a baseline biophysical environment section of the DPD. A selection of tables from the DPD providing various information on present watercourse crossings and freshwater FAFH within the LSA are presented below in Tables 1 to 4. Marine fish and fish habitat was assessed using desktop methods and is presented in the baseline biophysical environment section of the DPD.

Table 1: Major Watercourses intersecting the Project Area

Water-crossing Number	Stream Name	Channel Width	Sub-catchment area (ha)	Crossing Type	Description
WC-01	Nain Brook	5 m	562.3	Existing Bridge	• Second order stream, irregularly sinuous, stream gradient < 1% at crossing location • Streambed materials size range: sand to boulders. • Small pond present immediately upstream from the road crossing. Some silt and sand expected to be accumulating in that area. • At approximately 1.3 km upstream, there is a small dam and lake reservoir. • Floodplain is 3 m below the existing road surface at the proposed road crossing. • Sub-catchment area approximately 5.6 km^2.
WC-02	Annainak Brook	3.6 m	170.2	Existing Culvert	• Second order stream, irregularly sinuous channel, poorly defined floodplain, stream gradient < 1% at crossing location • Drains Annainak Brook – former community freshwater water source. • Bordered by bedrock on the northern side of the valley and a thin cohesive layer of till underlain with bedrock on the southern side of the valley. • The streambed material type is currently unknown. • Sub-catchment area approximately 1.7 km2.
WC-12	Kauk Brook	22 m	4,703.7	Bridge to be constructed as component of proposed Project	• Second order stream, meandering profile and perennial flow, stream gradient < 2% at crossing location. • The channel varies in width from approximately 15 to 25 m. The channel width at the proposed road crossing location is approximately 22 m. • The flood plain at proposed road crossing approximately 140 m wide, flows within a channel cut 2-3 m into the floodplain, includes both confined and unconfined segments. • Evidence of slope failures and erosion at the proposed road crossing, considered susceptible to fluvial erosion.

Table 2: Assessment of Watercourses and Waterbodies (Blowhole Pond) in the LSA, Presented in Order of Occurrence From East to West

Feature ID	Assessment Type	Rationale Not to Conduct Detailed Assessment	Collected Data
WC-01 (Nain Brook)	Visual	Existing road with existing crossing structure.	-
WC-02 (Annainak Brook)	Visual	Existing road with existing crossing structure.	-
WC-03 (Annainak Brook Tributary)	Abbreviated (no electrofishing)	Likely seasonal flow. Fish barrier documented downstream of crossing (waterfall > 1 m)	Flow data
WC-04	Visual	Draining to Blowhole Pond. Gradient > 30%	-
Blowhole Pond	Baited minnow traps	Understood to be non-fish bearing (TEK) but Project avoidance and mitigation measures will ensure no project impacts to waterbody.	Fishing effort
WC-01-new	Visual	Flooded fen feeding to WC-05 or Blowhole Pond.	-
WC-05 (Blowhole Pond Outlet)	Detailed	-	Habitat info, surface water chemistry, benthic invertebrate community, fishing effort
WC-06	Abbreviated	Began detailed survey. Assessed for downstream barrier and found gradient >30%. No further assessment.	Habitat info, flow data, fishing effort
WC-new-02	Visual	Small channel/poor channel definition or intermittent channel, drains into wetland.	-
WC-new-03	Visual	Small channel/poor channel definition or intermittent channel, drains into wetland.	-
WC-new-04	Visual	Small channel/poor channel definition or intermittent channel, drains into wetland.	-
WC-new-05	Visual	Small channel/poor channel definition or intermittent channel, drains into wetland.	-
WC-07	Visual	Waterfall over bedrock, possible fish barrier.	-
WC-new-06	Visual	Small channel/poor channel definition or intermittent channel, gradient ~20%.	-
WC-new-07	Visual	Small channel/poor channel definition or intermittent channel.	-
WC-08	Abbreviated (combined with WC-08b)	Small channel, potentially predominantly groundwater fed stream (cold), no fish captured.	Flow data, surface water chemistry, fishing effort
WC-08b	Abbreviated (combined with WC-08)	-	-
WC-10 (Kauk Brook Tributary)	Detailed	-	Habitat info, flow data, surface water chemistry, benthic invertebrate community, fishing effort, fish age
WC-11 (Kauk Brook Tributary)	Visual	Small channel/poor channel definition or intermittent channel, draining into wetland complex.	-
WC-12 (Kauk Brook Mainstem)	Detailed	-	Habitat info, flow data, surface water chemistry, benthic invertebrate community, fish capture, fish age

Feature ID	Assessment Type	Rationale Not to Conduct Detailed Assessment	Collected Data
WC-13	Visual	Small channel/poor channel definition/intermittent channel, drains into wetland	-
WC-14	Visual	Wet seep going through fen	-
WC-14b	Visual	Wet seep going through fen	-
WC-15	Visual	Wet seep going through fen	-
WC-new-08	Visual	Small channel/poor channel definition/intermittent channel	-
WC-new-09	Visual	Small channel/poor channel definition/intermittent channel	-
WC-16	Visual	Intermittent watercourse	-
WC-new-10	Visual	Small channel/poor channel definition/intermittent channel. Drains to wetland.	-
WC-new-11	Abbreviated (no electrofishing)	Approx. 400 m from ocean. Drains to wetland complex, close to watercourse that drains to ocean. Channelized but shallow in places.	Flow data
WC-new-12	Visual	Small channel.	-
WC-new-13	Visual	Fen	-
WC-new-14	Visual	Small channel/poor channel definition/intermittent channel	-
WC-new-15a	Visual	Small channel/poor channel definition/intermittent channel.	-
WC-new-15b	Visual	Small channel/poor channel definition/intermittent channel.	-
WC-19	Visual	Fen	-
WC-new-17	Abbreviated (no electrofishing)	Small channel/poor channel definition/intermittent channel.	Flow data
WC-17	Abbreviated (no electrofishing)	Small channel/poor channel definition/intermittent channel.	Flow data
WC-18	Abbreviated (no electrofishing)	Small channel/poor channel definition/intermittent channel.	Flow data
WC-18b	Abbreviated (no electrofishing)	Small channel/poor channel definition/intermittent channel.	Flow data
WC-20	Visual	Fen	-
Wetland Survey Observations for FAFH			
WS-03 through 05, WS-07 through 20	Visual	Poor channel definition/intermittent channel.	-

Note: WC = collected during FAFH field program; WC-new = collected during wildlife field program; WS = collected during wetland survey field program.

Watercourses that were indeterminant of being unique or part of another nearby watercourse were denoted as 'a' and 'b' of that watercourse ID.

Table 3: FAFH Field Survey Summarized Fish Data

Watercourse Crossing	Capture Method	Effort	Species	Number Caught	Fork Length Range (mm)	Weight Range (g)	Age (yrs)*	Maturity
Blowhole Pond	Minnow trapping	1 day	No fish captured	-	-	-	-	-
WC-05	Electrofishing	487 sec	No fish captured	-	-	-	-	-
WC-06	Electrofishing	421 sec	No fish captured	-	-	-	-	-
WC-08	Electrofishing	576 sec	No fish captured	-	-	-	-	-
WC-10	Electrofishing	1,540 sec	Brook trout	15	39-140	2-28	0-1+	Juvenile
WC-12	Electrofishing	1,020 sec	Brook trout	33	32-144	<1-35	0-1+	Juvenile
			Three-spine stickleback	2	52-58	<1-1	Unknown	Unknown

* Ageing determined by laboratory analysis of scales.

Table 4: Field Fish Habitat Characteristics Data

WC ID	Section Length (m)	Bankfull Width (cm)	Max. Depth (cm)	Flow (m/s)	% Cover Type	% Substrate Type	% Habitat Type1	Vegetative Cover
WC-03	NA	NA	NA	0.031-0.361	NA	NA	NA	NA
WC-05	98	190	30	0.013-0.098	60% Overhanging 5% Instream 4% Instream vegetation 7% Canopy	70% Boulder 10% Rubble 15% Cobble 5% Sand	30% Pool 30% Run 35% Riffle 5% Mini-falls	Overhanging: *Myrica gale*, graminoid spp., glandular birch (*Betula glandulosa*) Canopy: eastern larch (*Larix laricina*), green alder (*Alnus alnobetula*) Instream: aquatic moss spp.
WC-06	43	80	6	0.097-0.278	70% Overhanging 90% Canopy	10% Boulder 25% Gravel 65% Clay/Silt	25% Pool 70% Run 5% Riffle	Overhanging and canopy species
WC-08	NA	NA	NA	0.062-0.540	NA	NA	NA	NA
WC-10	NA	NA	NA	0.001-0.668	98% Canopy	80% Boulder 15% Cobble 5% Sand	10% Pool 75% Rapids 15% Falls	Canopy: green alder
WC-11-new	NA	NA	NA	0.042-0.086	NA	NA	NA	NA
WC-12	54	880	62	0.009-0.309	70% Overhanging 2% Instream vegetation 10% Canopy	2% Boulder 15% Cobble 3% Gravel 77% Sand 3% Clay/Silt	10% Riffle 90% Steady	Overhanging: *Myrica gale*, willow (*Salix*) spp. Canopy: eastern larch, black spruce (*Picea mariana*) Instream: aquatic moss spp.
WC-17-new	NA	NA	NA	0.060-0.326	NA	NA	NA	NA
WC-17*	NA	NA	NA	0.062-0.163	NA	NA	NA	NA
WC-18a*	NA	NA	NA	0.009-0.145	NA	NA	NA	NA
WC-18b*	NA	NA	NA	0.021-0.120	NA	NA	NA	NA

13. Need further details on potential impacts to fish and fish habitat (including from accidents and malfunctions), and associated mitigation measures (including avoidance such as strategic siting), from the construction and operation of the potable water supply system, water treatment plant, sedimentation pond(s), stormwater management system, and the access road, including the use of culverts/bridges.

Response:

Potential Project effects and proposed mitigation measures related to FAFH is presented in Table 5. Impacts to FAFH are currently not anticipated from the potable water treatment plant, as no water from the plant is anticipated to enter FAFH. Sedimentation ponds may be used during construction to treat stormwater before discharge into an adjacent waterbody; water will meet applicable water quality guidelines for turbidity prior to discharge. Stormwater management systems conveying water away from Project infrastructure (airport terminal area and access road) will be designed in a manner to prevent impacts to fish and fish habitat caused by erosion and sedimentation.

Table 5: Potential Project Effects on Fish and Fish Habitat

Project Activity	Project Effect	Mitigation Measures
Construction: Site preparation (e.g., vegetation clearing, soil stripping, excavation, rock blasting). Construction of infrastructure, including temporary and permanent facilities.	• Site preparation and construction of the access road and airport infrastructure (non in-water works) can indirectly impact fish and fish habitat through: o Runoff of sediment-laden water or other deleterious substances (e.g., spills) during construction. o Clearing of riparian areas for access road watercourse crossings. • Initial barge landings to deliver equipment and materials to site, site preparation of the marine area above the natural boundary for and construction of the temporary barge landing can disturb the aquatic marine environment through: o Grounding of barges and propeller wash disturbance of the substrate. o Riparian area clearing. o Runoff of sediment-laden water or release of other deleterious substances (e.g., spills).	• Direct contact with aquatic areas will be avoided (e.g., barges will conduct deliveries during high tide to avoid grounding below the natural boundary and propeller wash disturbance) on site. • Vessel beach/anchor locations will be planned and re-positioning events will be minimized. • Vessels will be operated at low speeds. • BMPs for fueling vessels will be used on or near water. • BMPs will be used for operating motorized/non-motorized marine vessels. • Marine mammal monitoring will be implemented during barge trips to observe for and avoid marine mammals. • Federal Marine Mammal Regulations will be adhered to for operation of vessels near marine mammals. • Any work within 50 m of freshwater sources will utilize appropriate mitigation (e.g., monitoring, sedimentation, and erosion control). This setback will be adapted to be 50-100 m for quarries and borrow pits. • An aquatics monitoring program will be developed to identify and respond to direct releases to the water.
Construction: Construction of infrastructure, including temporary and permanent facilities.	• In-water works for constructing watercourse crossing infrastructure can directly impact fish and fish habitat, including HADD of fish habitat, restriction of fish movement, or death of fish or indirectly impact fish and fish habitat through: o Runoff of sediment-laden water or other deleterious substances (e.g., spills) during construction. • Barge landings to deliver equipment and materials to site via the temporary barge landing can disturb the aquatic marine environment through: o Grounding of barges and propeller wash disturbance of the substrate. o Runoff of sediment-laden water or release of other deleterious substances (e.g., spills).	• On-site personnel will be informed about avoiding and minimizing impacts to the aquatic areas of work sites. • If required, erosion and sediment control (ESC) measures (i.e., sediment fence) will be implemented between the edge of disturbance and any watercourses. The ESC measures will be maintained and inspected during the construction activities to check they are working properly. • Appropriate regulations, guidelines, and BMPs will be followed, including applicable water quality guidelines. All appropriate in-water work permits will be obtained and works will adhere to their conditions. • Fuel storage and handling guidelines and best practices will be complied with, including personnel training, storage setbacks, secondary containment, and regular storage inspection. • All fuelling, servicing and staging of machines will be restricted to designated areas.

Project Activity	Project Effect	Mitigation Measures
Construction: Vehicle and heavy machinery transportation, use and maintenance of equipment. **Operation:** Operation of the airport and runway. Use and maintenance of the access road.	• Vehicle, aircraft, and heavy machinery transportation, use, refuelling, and maintenance during construction could cause the release of deleterious substances (e.g., spills). • Exposed soil could cause the generation and release of sediment-laden water. • Vehicle and road use could cause the release of deleterious substances (e.g., spills, sediment-laden water).	• Regular inspections of all machinery will be performed to reduce the risk of a spill by identifying and correcting potential equipment failures. • Aircraft re-fueling and de-icing areas will be concrete pads with a subsurface geosynthetic membrane to prevent infiltration of potential spills. These areas will have drains and sumps to contain spilled fuel and glycol for collection and disposal offsite. • A spill contingency plan will be developed and implemented as part of the Emergency Response Plan, in accordance with the Canadian Aviation Regulations (Section 2.3.2). • Spill kits will be available in key areas on site. • Domestic effluent will be treated to acceptable standards prior to release to the environment (construction camp, septic tank and field). • Preventive inspections will be conducted for fuel storage areas and supply vehicles, machinery, and worksite facilities with emergency kits for recovery of petroleum products and hazardous materials. • Environmental compliance monitoring will be conducted for construction works. • The FAFH Restricted Activity Period for any in-water work will be respected. Restricted Activity Periods refer to windows of time where certain species groups are more vulnerable due to seasonal behaviours, and in which mitigation measures should be implemented to ensure these groups are not adversely impacted by Project-related activities. Restricted Activity Periods, include: • Estuaries and main stems of scheduled salmon rivers (migrating period): May 1 to September 30. • Tributaries and headwaters of scheduled salmon rivers in Labrador (spawning, incubating, hatching period): September 15 to June 15. • Freshwater aquatic habitat offsetting will be conducted for impacts caused by construction of access road watercourse crossings, as required. • Fisheries and Oceans Canada's Interim Code of Practice: End-of-Pipe Fish Protection Screens for Small Water Intakes in Freshwater (2020) notes that water withdrawal should be planned with consideration for maintenance of downstream flows and intakes will be equipped with fish screens (screening, netting or mesh) designed and installed in such a manner as to prevent potential losses of fish due to entrainment or impingement.
Operation: Potable water withdrawal	• Surface water withdrawal from Kauk Brook could lead to obstruction of fish passage, reduced flow that may be harmful to aquatic life, and entrainment or impingement of fish on fish screens.	
Operation: Water and waste management and treatment	• Release of untreated wastewater or improper management of wastes could reduce surface water quality and impact freshwater fish populations and/or marine aquatic life.	

14. With anticipated harmful alteration, disruption, or destruction of fish and/or fish habitat, the importance of considering suitable offsetting options as early as possible.

Response:

Construction of fish habitat to offset anticipated Harmful Alteration, Disruption and Destruction (HADD) from infrastructure construction will be considered a sufficient length of time before implementation to enable appropriate review and input by

interested parties. NG Infrastructure understands the importance of early engagement on this item, as it can be a lengthy process to identify, decide on, design, and construct fish habitat offsets.

15. Need for information on potential monitoring and reporting requirements during construction and operation for impacted fish and fish habitat.

Response:

Environmental monitoring and reporting requirements will meet those required by applicable permits, authorizations, approvals, and as agreed to by the proponent. Instream construction works, such as for culvert installations, will receive full-time environmental monitoring. Long-term monitoring plans (e.g., approximately for 5 years) will likely be required if fish habitat offsets are needed.

16. Clarify the composition of the proposed alternative fluorine-free firefighting foam to better understand any potential residual effects to fish and fish habitat from using this alternative substance.

Response:

Fire suppression for the airport terminal will use water only. Firefighting foam used in the event of an aircraft fire will be a product certified by the Aircraft Fire Fighting at Airport and Aerodromes Standards under Canadian Aviation Regulations. These standards include maximum thresholds for toxicity, chemical oxygen demand, and biodegradability.

Migratory Birds

17. Need for more information on migratory birds and their habitat[2,3,4], including:
    • Baseline information and methodologies for understanding migratory birds that are known or have the potential to occur in the Project Area, including annual variation, distribution and habitat use;
    • Potential impacts of the Project during all phases of the Project, particularly the impacts of light attraction, on migratory birds (including avian species at risk and species of conservation concern);
    • Mitigation measures and monitoring programs for potential effects, such as measures to avoid, reduce and monitor potential light attraction; and
    • A description of any potential residual effects after mitigations have been applied.

Response:

Presence and habitat use by migratory birds in the local and regional study areas was established through desktop review and field work completed in 2022 and 2023. The desktop assessment included review of the following:

- Provincial or federal data sources (e.g., provincial wetland and forest inventories)
- Available aerial imagery
- Canadian Wildlife Service databases
- Atlantic Canada Conservation Data Centre (ACCDC)
- Newfoundland and Labrador Wildlife Division databases
- Online data obtained from Birds Canada NatureCounts
- Previous environmental assessments in the region and supporting documents
- Cornell University/Audubon Society databases
- Applicable regulatory guidance.

The desktop information combined with the land cover classification mapping was used to identify the variety of habitats for wildlife, including migratory birds, and any potential habitats for species important to the Inuit, SAR, and SOCC that may

potentially occur in the area. This information was incorporated into the baseline conditions and will be used to inform the effects assessment.

Field surveys for migratory birds in 2022 and 2023 included:

- Spring and fall bird migration surveys in early June and late September, 2023
- Summer avian/SAR/terrestrial wildlife survey in early July, 2023
- Avian autonomous recording unit (ARU) survey in spring/summer 2022

Bird Migration Surveys

The spring and fall bird migration surveys were designed to determine if the Local Study Area (LSA) is within an important flyway or staging area for migrating birds including waterfowl, shorebirds, other water birds and raptors. The surveys incorporated methods and guidelines adapted from the Alberta Bird Migration Survey Protocol (GoA 2020) as the methods are applicable to the objectives of this assessment and there are no specific protocols for bird migration surveys from the federal or provincial government. The method consisted of 20-minute point counts distributed across the LSA at locations with a wide view for visual scanning and areas with potential key stopover habitats. The survey period was based on professional experience of biologists working on the project and from information provided by Nunatsiavut Government biologists for another project in northern Labrador. Indigenous information on timing of surveys was not available in 2023 when surveys were conducted. In addition to the bird migration surveys, incidental wildlife observations were recorded during helicopter flights between survey points and between Nain and the LSA and Regional Study Area (RSA) during all wildlife and vegetation surveys.

The Project is situated within the Atlantic Migratory Bird Flyway (Environment Canada 2014; Notzl, Greene, & Riley 2013). Migration pathways vary by bird guild and species, and they are affected by the presence of important habitat for each species. Two Important Bird Areas (IBA) are located over 15 km east of the Project (IBA Canada 2024). These IBA's provide habitat for large numbers of waterfowl and seabirds. Although these IBAs are not near the Project, migratory birds using these IBAs may pass through the wildlife RSA during spring and fall migration.

During the bird migration surveys, six bird guilds, birds of prey, grouse and allies, passerines, shorebirds/waterbirds, waterfowl and others (e.g., jays) were observed. Spring migration had greater species richness (24 species) compared to fall migration (17 species), but fall migration had higher species abundance (294 individuals) compared to spring migration (179 individuals). Passerines had the highest number of observations per minute during spring and fall migration (0.4611 and 0.4306). The others guild (Canada jay and common raven) had the second highest observations per minute during spring migration (0.25) and shorebirds had the second highest observations per minute during fall migration (0.2556). Maximum flock size during spring and fall were 6 and 50. Overall, the detection rate during spring and fall migration was quite low compared to other areas as detection rates, total numbers of birds and flock sizes were low. A large number of male songbirds observed were singing during spring migration surveys which may indicate these species had initiated breeding territorial displays in the LSA and RSA.

With the lack of large open water bodies and more diverse habitat types, the LSA and RSA are likely not an important stopover area for migratory birds.

Summer Avian/SAR/Terrestrial Wildlife Survey

The summer avian/SAR/terrestrial wildlife survey was designed to obtain information primarily on songbirds during the breeding season and to collect incidental information on SAR and other wildlife. The summer avian survey was conducted from July 2 to July 7, 2023, which is within the optimal survey period for songbirds in this region (June 15 to July 15) based on professional experience and feedback from the Canadian Wildlife Service. The survey employed a combination of point counts and transects. A transect was established along the centreline of the entire proposed access road alternatives and through the centre of the airport infrastructure footprint. A total of 41 breeding bird point counts were established every 400 m along the transects. The transects and points covered a broad representation of habitat of both the airport footprint and access road. The transect was walked at a steady pace and point counts consisted of a 5-minute survey period preceded by a 2-minute quiet period to allow for the observer's disturbance to subside. The methods employed are adapted from various Tailored Impact Statement Guidelines and other EIS baseline assessments and are specific to this assessment. ECCC recommends completing two years of breeding bird surveys; however, the survey covered the entire proposed footprint, and the data provides adequate information to characterize baseline breeding bird conditions within the study areas. This is

supported by professional experience and historical assessments completed for federally and provincially regulated impact assessments. The data obtained provides sufficient information to inform mitigation strategies and the impact statement. An additional year of bird surveys is not likely to significantly increase the number of species observed and importantly, any additional species observed is unlikely to change the mitigation to be implemented or change the conclusions of the EIS. The breeding bird survey data is supplemented by ARU data obtained in 2022 and data obtained from Birds Canada NatureCounts.

A total of 227 individual birds (species abundance) of 26 species (species richness) was observed during the breeding bird survey. The yellow-rumped warbler had the highest breeding density followed by ruby-crowned kinglet, dark-eyed junco and fox sparrow. The Shannon-Weiner Diversity Index was 2.54. Three avian valued components (VCs) were observed during breeding bird surveys: the gray-cheeked thrush (*Catharus minimus aliciae,* not at risk provincially and federally), the rusty blackbird (federally Special Concern and Vulnerable provincially) and spruce grouse (not at risk). The gray cheeked thrush was observed at one location in open coniferous habitat, the rusty blackbird was observed at three sites in marsh/fen type habitat and several spruce grouse were observed in coniferous forest habitat. These species are also included in species observations from Birds Canada NatureCounts databases.

Avian Autonomous Recording Unit (ARU) Survey

An ARU survey was completed during spring/summer of 2022 to obtain preliminary information on bird presence in the LSA. Two ARUs were deployed in the LSA, one at the north end of the proposed access road and a second near the proposed airport site. However, the northern one malfunctioned and no data was obtained. ARUs were Wildlife Acoustics Songmeters that recorded from 20 June, 2022 until 16 July, 2022 including daytime and nighttime recording. Data was analyzed using Kaleidoscope Pro Analysis Software by Wildlife Acoustics (Maynard, Massachusetts). An advanced classifier for the common nighthawk was developed from existing data from another project and was used to search recordings for common nighthawk vocalizations.

A total of 27 bird species were detected at ARU 3C during June and July, 2022. The most common vocalizations from the Kaleidoscope cluster analysis were of the American robin followed by the common redpoll. Two VC's were detected including the gray-cheeked thrush and spruce grouse. The gray-cheeked thrush was detected frequently at ARU 3C and a single spruce grouse was detected . The ARU is within a black spruce/moss/lichen forest with a water body located 250 m to the southeast and bordered by an open tamarack/lichen forest to the north. The proximity of open, shrubland and aquatic habitat results in a wide range of species detected. Species detected by the ARU that were not detected during the breeding bird survey or bird migration survey included the bohemian waxwing, brown-headed cowbird, chipping sparrow, and pine siskin.

Concerns were raised by Environment and Climate Change Canada that surveys for the common nighthawk were not completed for the Project. The Project is in a remote location with no ground access (e.g., cutlines, trails) and with no access, nighttime surveys are not safe to conduct. Common nighthawks are known to occur in Labrador, but current range maps show the occurrence primarily within the southwestern portion of Labrador. There are no data records for the region of common nighthawk in the Birds Canada NatureCounts databases. No common nighthawk vocalizations were detected on the ARU despite potential open nesting habitat and open foraging habitat in the vicinity of the ARU.

Birds Canada NatureCounts

Baseline avian data was augmented with presence information obtained from a Birds Canada NatureCounts query. Avian observation and collection data was obtained from a search area extending approximately 10 to 15 km from the Project. This area encompasses a wide range of habitat types and coastal areas and includes a search query from 1800 to 2024. Data included in the search came from a wide variety of sources including, for example, long-term museum collections, iNaturalist and EBird Canada.

The search resulted in observations of 90 bird species including 49 additional species not recorded during fieldwork for the Project. However, the search area covers a much larger area with a higher diversity of habitat types including marine habitat types. There were 11 species detected during Project surveys that are not included in the online databases. Many of the species in the online databases are coastal birds that are not expected to occur in the LSA (e.g., thick-billed murre), some species are accidental or sporadic breeders (e.g., great grey shrike, short-eared owl), or seasonal migrants (e.g., gyrfalcon, Lapland longspur). Given the habitat types available in the LSA, the species detected during various surveys conducted for the Project is fairly consistent with long term data records.

Potential Effects and Mitigation

Project activities have the potential to affect wildlife and migratory birds both directly and indirectly. Project effects may be temporary or permanent in nature as there are no plans to decommission the airport. This discussion is focussed on VCs selected to be representative of broader groups of wildlife. VCs are identified with consideration from Indigenous communities, federal, provincial, territorial, or municipal authorities or entities, and the public. The preliminary list of VCs for wildlife include:

- Red-necked phalarope
- Peregrine falcon
- Short-eared owl
- Spruce grouse
- Rusty blackbird
- Gray-cheeked thrush
- Little brown myotis
- Northern myotis
- Polar bear
- Eastern migratory caribou

Potential effects on wildlife VCs may occur during Project construction and operations. Project-related effects to migratory birds are possible via several pathways, including:

- Reduction in the type and extent of habitats and habitat fragmentation;
- Bird strikes, vehicle collisions, incidental take, increased hunting; and
- Disturbance from human activity, noise and light pollution

Habitat loss occurs when infrastructure is constructed within previously undisturbed areas, destroying, fragmenting or degrading the habitat of flora and fauna. Habitat fragmentation occurs when a larger area of habitat is divided by roads, fencing or other infrastructure, creating barriers to foraging and migration. Habitat degradation reduces the attractiveness of the habitat for migratory birds and may result from the removal of wetlands or vegetation, the introduction of invasive species, or contamination of surface water, sediment or soil. Habitat loss and fragmentation cannot be fully mitigated as the airport and access road will be permanent. To reduce effects of habitat loss, the airport footprint will be minimized to the extent possible (Table 6). Temporary footprint areas (e.g., camps and quarries), will be reclaimed as soon as possible once construction is complete. The Project is in a remote location with no other disturbances currently on the landscape. Habitat availability is not a limiting factor for most species of wildlife in the area, including the VCs selected for the assessment. Based on a preliminary review of habitat availability and Project details, impacts on wildlife due to habitat loss and fragmentation are anticipated to be negligible.

Project-related noise may result in reduced habitat effectiveness for migratory birds adjacent to the airport and during construction. Studies indicate negative responses by some songbirds to anthropogenic noise (Bayne et al. 2008; Brumm 2004; Habib et al. 2007; Slabbekoorn and Peet 2003; Swaddle and Page 2007). The specific intensity threshold at which noise affects songbirds is unknown, although a study by Bayne et al. (2008) indicated that one third of species were significantly affected at noise levels averaging 48 dBA near a source of chronic noise. Infrequent or periodic noise may have lesser effects. Another study suggested that sound levels above 50 dBA may impact songbirds (Kaseloo 2005) and Environment and Climate Change Canada (2023) indicates that noise levels greater than 50 dBA or 10 dBA above ambient levels can negatively affect birds. During construction, localized noise levels may exceed 50 dBA in the medium term and it's possible that some bird species may avoid areas adjacent to high levels of noise. However, this effect is medium term (e.g., occurs during construction) and will not affect all migratory birds to the same extent. Similarly, the low frequency of flights arriving at the airport and operations of the airport are not anticipated to alter use of adjacent habitat by most species of migratory birds. Once construction is complete, it is expected that migratory birds will continue to use habitat adjacent to the airport and access road and residual effects are predicted to be negligible. Mitigation measures to reduce potential effects of noise are provided in Table 6.

Increased light levels due to the Project may result in reduced habitat effectiveness adjacent to facilities for migratory birds and may also affect birds during migration as they may be disoriented by lights (Longcore and Rich 2004; Navara and Nelson

2007; Poot et al. 2008). Lighting will be required for construction purposes; it will be directed away from the sky and activated only during working hours when there is insufficient daylight (early morning and evening). Airport operations must involve a minimum amount of lighting to adhere to Transport Canada regulations. Approach and runway lighting will only be activated when an aircraft is approaching and departing. Buildings and other obstructions will have red lights as per aviation standards. All operational lighting will be directed downwards in compliance with regulations which will reduce potential effects on migratory birds. Additional mitigation measures for light effects are provided in Table 6. With the mitigation measures implemented, residual effects as a result of light on migratory birds are expected to be minimized and negligible.

Aircraft operation may result in bird strikes during take-off and landing and collisions with construction and operations traffic on the access road may occur. Approximately 85% of bird strikes involve aircraft below 800 ft and up to 40% of bird strikes take place beyond the airport perimeter (CAA 2001). Collisions with vehicles may occur; however, collisions tend to occur on roads with high levels of traffic. The airport will be required to develop a Wildlife Management Plan as per Transport Canada regulations (GoC 2024a). The airport will also consider mitigation and guidelines documented in the *Sharing the Skies - Guide to Management of Wildlife Hazards – TP 13549* (GoC 2024b). The access road will have posted speed limits during construction and operations and traffic is expected to be low during operations (e.g., 100 vehicles per day) reducing the potential for collisions with vehicles. With the recommended airport guidelines implemented, low frequency of aircraft landing at the airport, low vehicle traffic and speed limits on the access road, impacts from aircraft and vehicle collisions are expected to be negligible.

Of the VCs, red-necked phalarope, peregrine falcon and short-eared owl were not observed nesting in the LSA and RSA. Polar bears appear to occur infrequently in the area and based on discussions with a local hunter, are typically found further north. Eastern migratory caribou are also infrequently observed in the area around Nain and are typically found further north. Potential effects on these species, therefore, are anticipated to be negligible. Potential effects on the remaining VCs (spruce grouse, rusty blackbird, gray-cheeked thrush, little brown myotis and northern myotis) are also anticipated to be negligible as the loss of habitat is expected to be low relative to habitat available for these species in the RSA and potential effects of mortality and sensory disturbance are also predicted to be negligible.

Table 6: Potential Project Effects on Wildlife and Migratory Birds

Project Activity	Project Effect	Mitigation Measures
Construction: Site preparation (e.g., vegetation clearing, soil stripping, excavation, rock blasting)	• Tree and vegetation clearing can lead to: o Reduction in wildlife habitat availability resulting from habitat loss and fragmentation, o Less habitat connectivity caused by barriers to wildlife movements; o Decreased wildlife populations resulting from increased levels of direct and indirect mortality risks; o Less wildlife diversity resulting from changes in wildlife habitat availability, reduced habitat patch size (e.g., effects of fragmentation), and changes in rare species occurrence.	• Project footprint will be minimized to the extent possible to reduce effects on habitat. • Vegetation disturbance will be minimized, as maintaining terrestrial, riparian and wetland ecosystems plays a role in supporting biodiversity, hydrology, wildlife habitats and traditional use of resources. • Activities will be suspended if caribou are observed within 500 m of work areas. Activity will resume once caribou have left the area. • Construction activities will be scheduled to avoid the ECCC D6 bird nesting period from 1 May to 15 August (GoC 2024c). • If clearing is required during the nesting period, non-intrusive pre-clearing nest surveys will occur within seven days of the clearing and no activity buffers will be established around each nest. • Speed limit will be imposed on the access road to reduce potential for wildlife collisions.
Construction: Construction of infrastructure including temporary and permanent facilities	• Construction of the access road will allow for public all-weather access to previously inaccessible areas; this may increase hunting pressures on wildlife and decrease populations	
Construction: Vehicle and heavy machinery transportation, use and maintenance of equipment	• Noise from vehicles and equipment can reduce habitat effectiveness in areas around the Project. • Construction-related light sources may reduce habitat effectiveness adjacent to facilities for migratory birds.	

Project Activity	Project Effect	Mitigation Measures
Operations: Operation of the airport and runway	• Noise from aircraft, vehicles, and equipment can reduce habitat effectiveness in areas around the airport and runway. • Use of facility lights and runway approach lighting can also lead to reduce habitat effectiveness in areas around the airport and runway. • Both of these effects can also lead to less wildlife diversity resulting from changes in wildlife habitat availability and changes in rare species occurrence.	• Develop and implement an Airport Wildlife Management Plan with consideration of guidelines provided by Transport Canada. • Bear management plan and garbage management plan will be implemented to minimize bear / human interactions. • Cross-road movements will be maintained during access road construction (e.g., provide breaks in any soil berms or slash pile rows). • Leave natural areas adjacent to Project development to reduce sensory disturbance effects to wildlife from light and allow passage of wildlife around the development. • Restrict construction traffic to designated areas. • Equipment will be fitted with factory-installed noise-reducing components, where feasible, and will be maintained. • Forest buffers will be retained around quarries to reduce noise, where feasible. • Multi-passenger vehicles (e.g., buses) will be used to transport workers to site when practicable. • Use fully shielded lights to illuminate required areas only. • Lower mast heights to reduce light emissions off site or away from target areas. • When using directional lights, ensure they are aimed at a target requiring this type of light and that they are fully shielded to prevent spill light. • Lighting required for construction and operations, including direction and timing will be controlled to avoid effects on migratory birds while meeting operational health and safety requirements.
Operations: Use and maintenance of the access road	• Reduction in wildlife habitat availability resulting from reduced habitat effectiveness (e.g., from noise, human presence); • Vehicles travelling the access road Less habitat connectivity caused by barriers to wildlife movements; • Potential for aircraft and vehicle collisions along the access can increase mortality risk and decrease wildlife populations	

18. Need for information on baseline conditions for terrestrial species at risk (birds, caribou, bats), such as species distribution, habitat availability and use, and annual/seasonal variation of species that are known or have the potential to occur in the project area. Also require information on the survey methodologies used to support the description of baseline conditions[5,6,7].

Response:

Methods for bird surveys are provided in Summary of Issues response #17.

In addition to surveys conducted for migratory birds, a bat acoustic survey was completed in 2022 and 2023. Information on other wildlife groups (e.g., caribou) were collected incidentally during other surveys. Anabat Swift Passive Detectors (Titley Scientific, Queensland, Australia) and omni-directional ultrasonic microphones (Model US-O V3) were used for bat acoustic surveys. Two bat detectors were deployed in foraging habitats (i.e., adjacent to wetlands, open water bodies) in the LSA in 2022 and six bat detectors were deployed in the LSA on June 4, 2023, near one potential maternity roost site, near four potential foraging areas, and near one travel and movement corridor.

The Québec standardized protocol (MELCCFP 2023) was used as a reference as the methods are applicable to the objectives of this Project. There are no specific protocols for bats from the federal or provincial government. Following the Québec standardized protocol (MELCCFP 2023), bat detectors were programmed to begin recording 30 minutes after sunset and record until 30 minutes before sunrise during the breeding period between June 15 and August 14, 2023 and during fall migration between August 15 and September 25, 2023 (MELCCFP 2023).

Bat acoustic data was recorded over 166 total detectors nights in 2022 and 504 total detectors nights in 2023: 104 and 312 detector nights during the breeding season and 62 and 192 detector nights during fall migration in 2022 and 2023. Four bat species were detected including the little brown myotis and northern myotis, which are provincially and federally Endangered, and eastern red bat and hoary bat. The eastern red bat is under consideration for Endangered status federally (GoC 2024d). The little brown myotis had the highest number of detections during the breeding season (1,707 passes) and fall migration (133 passes) followed by a myotis species. There was a relatively small number of detections of the northern myotis during the breeding season (18 passes) and fall migration (10 passes) and only a single detection of the hoary bat during fall migration. There was a relatively small number of detections of the eastern red bat during the breeding season (2 passes) and fall migration (3 passes) at both detectors.

Two avian species at risk (SAR) were observed during surveys completed in 2022 and 2023. One peregrine falcon (*anatum* subspecies - provincially Vulnerable, federally not at risk), was observed during bird migration surveys in 2023. There were no peregrine falcons observed during the summer avian survey and during helicopter flights near potential breeding sites on cliff faces suggesting that the species is not breeding in the LSA or RSA.

The rusty blackbird (Special Concern federally and Vulnerable provincially) was observed once during the breeding bird survey and incidentally at two locations. All three were observed in marsh/fen type habitat, typical for the rusty blackbird.

Eastern migratory caribou (provincially Threatened) tracks were detected at six locations, primarily at the west end of the access road and proposed airport location. Most of the tracks are in close proximity and may represent fewer than six animals. Consultation with Inuit has confirmed that caribou are rarely observed in the area over the past decade.

19. Need for a greater description of potential direct and indirect effects, mitigation measures, and potential residual effects on terrestrial species at risk known to or that have the potential to occur in the project area during all phases of the Project[5,6,7].

Response:

Five provincially or federally listed SAR were detected during various surveys conducted for the Project including the peregrine falcon, rusty blackbird, little brown myotis, northern myotis and eastern migratory caribou. The eastern red bat was detected in 2022. This species is currently under consideration for federal listing as Endangered. This is one of the first recorded observations of the eastern red bat in Newfoundland and Labrador.

The peregrine falcon was observed during the bird migration survey and no evidence of nesting was observed on potential cliff nesting habitat within or adjacent to the LSA during surveys completed during the breeding season. Potential effects of

noise and light on migratory birds and mitigation measures to reduce or eliminate potential effects is described in Summary of Issues response #17. Impacts on the peregrine falcon, including potential effects of noise and light, are expected to be negligible.

The rusty blackbird was observed at three locations during the summer avian survey in July 2023. All observations were within marsh/fen habitat. The most effective mitigation to reduce impacts to the rusty blackbird and other migratory birds is through timing restrictions on clearing activities (Table 6, Response #17). Clearing activities will be completed outside the breeding season for migratory birds between August 15 and May 1 (GoC 2024c) to the extent possible. Mitigation measures to reduce effects on wetlands, that will subsequently reduce effects on the rusty blackbird, are provided in response to #54 and Table 6 (Response #17). An example list of mitigation measures, including mitigation for light and noise, to reduce or eliminate effects on the rusty blackbird are provided in Table 6 (Response #17).

The little brown myotis and northern myotis were detected on bat detectors in 2022 and 2023. Important habitat for these species include maternity roost sites and winter hibernacula. Maternity sites typically consist of decayed trees with small cavities or peeling bark in trees usually found in large old-structured forests, but other habitats are used provided these trees are available. Hibernacula sites include features such as caves, abandoned mines, wells, cellars, and tunnels and is deemed critical habitat under the Recovery Strategy in Canada. There were no caves found during various fieldwork conducted for the Project. The entire access road alignment was walked during the summer avian survey and no caves were found indicating that winter hibernacula are likely not present. With mitigation measures, including mitigation for light and noise and clearing outside the bird nesting period, when bats will be present in the LSA, residual impacts on the little brown and northern myotis are expected to be negligible.

Few eastern migratory caribou were observed in the LSA during surveys conducted for the project and comments received to date from residents of Nain indicate that caribou are infrequently observed in the area. Caribou are more frequently observed north of Nain. With mitigation measures identified in Table 6, effects on eastern migratory caribou are anticipated to be negligible.

20. Importance of including Species at Risk Act (SARA) permitting to the list of potentially applicable federal legislation.

Response:

The Project is planned to be constructed in the Labrador Inuit Settlement Area (LISA) and on Labrador Inuit Lands (LIL) established by the Labrador Inuit Land Claims Agreement (LILCA). As the Project is not on federal land, the conditions of the *Species at Risk Act* (SARA) do not apply unless there is an emergency order for a species at risk. Currently, there are no emergency orders that would affect the Project. Aspects of SARA may apply if the Project is subject to a federally regulated environmental assessment under the IAA.

If permits are required, as stated under Section 73 of SARA, they will be applied for as needed. Currently, permits would be required if the Project has the potential to affect a listed species at risk. Federally listed species at risk observed in the LSA or which have the potential to occur in the LSA include the following:

- Barrow's goldeneye - Not detected in 2022 or 2023
- Harlequin duck – Not detected in 2022 or 2023
- Red-necked phalarope – Not detected in 2022 or 2023
- Rusty blackbird – Detected at three sites in 2023
- Short-eared owl – Not detected in 2022 or 2023
- Little brown myotis – Detected in the LSA in 2022 and 2023
- Northern myotis – Detected in the LSA in 2023
- Polar bear – Not detected in 2022 or 2023
- Eastern Migratory caribou – Detected at six locations in 2023

21. Concerns about the requirement for a “wildlife control agent” at an airport to hold a firearm permit. Request that wildlife management be done in a humane, cruelty-free no-kill manner, by an animal protection organization rather than a trapper, hunter, or exterminator.

Response:

As per the Canadian Aviation Regulations (Section 302.305), a wildlife management plan is required for all airports in Canada, which must be approved by Transport Canada as part of the airport certification process. These plans are unique to individual airports and can include a variety of passive measures (such as fencing, vegetation and habitat management or control) and active measures (such as scare devices, chemical usage, firearms). Firearm use may be included in the wildlife management plan for removal of or protection from wildlife such as bears, or as a last option for bird deterrents as per direction in Sharing the Skies: Guide to the Management of Wildlife Hazards (GoC 2024a). A Danger and Damage Permit under the *Migratory Birds Convention Act* will be obtained if firearms will be used to scare migratory birds potentially disrupting aircraft traffic and posing a risk to public safety.

If firearms are determined to be necessary as part of the plan, the use of firearms are heavily restricted and special permits are required. Special training is also required before firearms are used in or around an airport. In the event wildlife management needs to occur (i.e., removal), it will be conducted by trained staff in accordance with the wildlife management plan and applicable legislation. . Due to the remote location of the airport, and the potential need to quickly deal with wildlife situations to protect both the public and wildlife, it is not feasible to engage animal protection organizations for wildlife management at the new airport.

Engagement with Indigenous Peoples

22. Importance of ensuring engagement with Innu First Nation includes identification of potential impacts

Response:

Ensuring engagement with the Innu First Nation is paramount, given their proximity to the Project area and potential impacts. On May 1st, 2024, an email was sent to the Innu Nation inquiring about whether they would like to be engaged on the project. The Innu Nation confirmed receipt of the email; a response regarding preferred involvement on the project has yet to be confirmed.

Of particular significance is the location of Natuashish Innu First Nation, situated between Nain and Hopedale, making it the closest potentially affected community. As a community directly on the air flight path from Happy Valley Goose Bay to Nain, air travel between these communities is common, emphasizing the importance of understanding and addressing any potential impacts on flight reliability and frequency. Additionally, Sheshatshiu Innu First Nation, located near Lake Melville, also warrants engagement due to its proximity to Nain and its close proximity to Happy Valley-Goose Bay. Engaging with both Natuashish and Sheshatshiu Innu First Nations will be essential in that their perspectives are considered, and their concerns are addressed throughout the Project's development and implementation.

Indigenous Peoples’ Physical and Cultural Heritage and Sites of Historical or Archaeological Importance

23. Importance of implementing plans to protect identified archaeological sites.

Response:

As part of the Stage 2 archaeological assessment completed in support of the project, one site (HdCk-47) was identified within the access road footprint. To mitigate impacts to this site, the road route was diverted around the archaeological site. A 30 m buffer will be kept between the road and the archaeological site, and the site will be marked with flagging to prevent encroachment during construction. Similar mitigation will be implemented if any additional sites are identified during future field work.

Indigenous Peoples' Current Use of Lands and Resources for Traditional Purposes, and Exercise of Aboriginal and/or Treaty Rights

24. Need for further information about the location of lands and resources used for traditional purposes (e.g., hunting, trapping, country foods). Include the location of temporary/permanent/seasonal residences potentially impacted by the Project.

Response:

NG Infrastructure has received community feedback on land and resource use through a variety of means to date: conversations with local bear guards during field data collection programs, interviews with community members, and comments made during public information sessions. Concerns raised during consultations, such as disturbances to wildlife and plant life, shows the significance of implementing design and mitigation features to minimize adverse effects. Participants highlighted the importance of understanding how the airport location may affect traditional activities like fishing and hunting, particularly in areas frequented by wildlife such as ptarmigan. It was noted that the new airport location is primarily used as a transportation corridor i.e. the area is passed through during travel rather than being a destination for hunting, trapping, or country foods. Figure 4 provides the current understanding of residences in proximity to project infrastructure. Continued consultation with fishers and harvesters in the region will be integral to gaining insights into the potential impacts of the Project and ensuring that the concerns of the community are adequately addressed.

Understanding the importance of further information regarding the location of lands and resources used for traditional purposes, ongoing consultation efforts will be supplemented by the Nunatsiavut Government's detailed Regional Land Use Study. This study is focused on establishing community land use for a broad region around Nain. However, the results of the study, when available, are expected to be used to inform project planning. Through these efforts, we are committed to preserving and respecting the traditional practices and resources essential to the well-being of the community.

25. Concerns about Arctic char and partridge not being observed during field studies. Importance of using Indigenous knowledge of lands and resources for traditional purposes to determine the appropriate months to collect baseline data for fish and fish habitat, country foods (e.g., berries), and wildlife.

Response:

A discussion of baseline data collected for fish and fish habitat and wildlife is provided in Summary of Issues responses #12 and #18, respectively. Arctic char and partridge were not observed during field surveys; however, based on reviewed desktop information and community feedback they are understood to occur within the study areas. During field programs conducted in support of the project, Arctic char habitat was observed. Therefore, these species are considered in the development of project mitigation measures.

Information obtained through communication with the community has been incorporated into project field programs where possible:

- The field program for fish and fish habitat was planned based on desktop information indicating Arctic char presence from the beginning of July to late September. Feedback from local field assistants during spring surveys indicated that Arctic char are not usually present for fishing past the first week of August. The fish and fish habitat field program was completed from July 26th to 30th, which aligns with the local feedback.
- Berries were collected to support the country foods program in late September.
- Work plans describing baseline data collection methods were provided to NG Environment in 2023; feedback received indicated the timing of fall migratory bird surveys should be later in fall. As a result, this survey was postponed to late September.

26. Identification of any harvesting exclusion areas surrounding the airport.
    Comments on whether there would be potential compensation for two harvesters who use their cabins, in proximity to the airport, on a regular basis.

Response:

The public, including local harvesters, will be excluded from the fenced airport area for safety purposes. Compensation for local harvesters will be determined as part of the Nunatsiavut Government's Assembly decision with respect to the Project.

27. Importance of considering all drinking water sources in the local project area and near the access road, through community engagement.

Response:

Trouser Lake is the main water supply for Nain; this lake is over 2 km from the Project access road and over 4 km from the airport; no impacts to the water source are expected. It is also understood that some community members use Annainak Brook as a drinking water source. The existing road that crosses Annainak Brook to the south of Nain will be used for the Project. No construction activities will occur at this creek crossing location, and impacts to the water source are not expected.

Indigenous Peoples' Health and Well-Being

28. Need for information on human health risks in areas used for traditional purposes by describing the potential pathways of effects between project activities and humans.

Response:

The land around the proposed airport site may be used for the procurement of country foods and drinking water. A detailed regional land use study will be conducted by NG Lands and Natural Resources to determine any additional insights about traditional uses in the area. During preliminary interviews with the community, it was noted that the proposed Project site was primarily used as an area that is travelled through, rather than used for the procurement of country foods. One community member noted that there may be partridge hunting in the area. Additional information related to the frequency and duration of land use for each purpose and if there is any seasonality associated with each use will be used as data inputs for development of human exposure estimates. Potential pathways of effects are summarized below:

Air quality: Proposed site location is currently undisturbed. Dust and other emissions during construction activities and operation of the airport have the potential to affect air quality. Deposition of airborne particles can impact vegetation, soil and surface water quality which in turn can impact country foods. As the new airport location is located outside of the community, air quality impacts from airport operation in the town of Nain may be reduced.

Drinking and Recreational Water Quality: Surface water quality is important for recreational purposes, as well as the fishing industry and for the procurement of country foods. Impacts from deposition of particles associated with air quality as well as impacts from spills or leaks directly into the surface water environment can impact surface water quality which in turn could impact country foods.

Noise, Vibration, and Light: the proposed airport location is currently undisturbed. The addition of noise, vibration and/or light effects to the environment may have effects on wildlife behaviour, which could impact country food accessibility. Noise and vibration concerns associated with the current airstrip are closer to the community of Nain and are expected to have greater impact on humans in the area.

29. Importance of including a discussion on gender-based violence (GBV) risks as it relates to transient workers and potential effects to the local community.

Response:

The potential impacts of construction on a remote Indigenous community, particularly regarding transient workers, are complex and require careful consideration. One major concern is the risk of gender-based violence, which disproportionately affects women and girls in such communities. For the first stage of construction, the majority of the construction workforce will be staying in the construction camp located at the new airport and isolated from Nain due to the lack of access. However, following completion of the access road, project workers staying in camp will be prohibited from visiting Nain as a condition in their employment contract (with exception of travelling in and out) to minimize interaction between transient workers and the

local population. This approach seeks to create a safer environment for community members, reducing the likelihood of incidents.

It is acknowledged that a portion of the construction workforce will stay in Nain, which is beneficial for the local economy. Cultural awareness and sensitivity training will be a component in the construction contractor procurement process, to help ensure that interactions between workers and the community are respectful and harmonious. Additionally, imposing restrictions on alcohol and other substances at camp can further minimize the potential for escalated situations.

30. Need for information on airport accessibility from the hospital, especially during inclement weather.

Response:

Airport accessibility, especially during inclement weather, is a critical concern, particularly considering the relocation of the airport in Nain. While the project will provide improved reliability and operational hours, the increased distance from the community raises valid concerns about transportation access to the hospital. To address the access challenges, several measures have been put in place. Firstly, a dedicated shuttle service will operate between the town of Nain and the airport, ensuring reliable transportation even in adverse weather conditions. Additionally, the access road route has been designed to avoid steep slopes and narrow passes, with careful consideration given to avoiding known avalanche locations. Ongoing road maintenance will also be provided to facilitate clear and safe passage to and from the airport. Importantly, the relocation of the airport is expected to significantly enhance flight reliability, especially during inclement weather, as the new airport will operate 24/7. This may positively impact residents' ability to access the hospital via air travel. While there can be no guarantee that flights will always be able to land or takeoff in adverse weather conditions, the improved location and operational capabilities of the new airport should lead to enhanced reliability overall and therefore, improved access to hospitals.

31. Need further details on project activities/sources that may result in the release of dust and potential contaminants of concern during all phases of the Project and the associated risk of impacts to human health. Include an inventory of those potential project pollutants, a description of potential effects on key valued components (e.g., fish), and measures to mitigate dust and accidental release of pollutants with potential impacts to human health.

Response:

During the construction of the airport and access road, an increase in dust is expected. Throughout the operation of the airport, dust is expected to be generated through landing and take-off, and while using the access road. To mitigate some of these concerns, EK35®, a nontoxic synthetic fluid, will be used to stabilize the gravel and reduce dust.

Dust and other emissions during construction activities and operation of the airport have the potential to affect air quality and the community members living in Nain. Dust particles can lead to human health concerns. The dust ingestion and inhalation pathway will be considered in human health risk assessment, with data provided from air quality modelling and monitoring.

Combustion of aviation fuel, gasoline, and diesel produces NOx, CO, SOx, hydrocarbons, and particulates. A summary of potential health effects of these pollutants are as follows:

- According to ECCC, in sufficiently high concentrations, SO_2 and NO_2 can irritate the lungs, reduce lung function, and aggravate respiratory conditions especially in people with asthma. Long-term exposure to NO_2 may lead to the development of allergies and asthma and can cause adverse health effects at low concentrations. Both SO_2 and NO_2 can contribute to odours.
- The most common effects of CO exposure are fatigue, headaches, confusion, and dizziness due to inadequate oxygen delivery to the brain.
- Exposure to $PM_{2.5}$ can lead to onset or development of respiratory and cardiovascular adverse effects, such as asthma attacks, chronic bronchitis, heart attacks and may lead to the development of lung cancer. PM2.5 is largely emitted by vehicle exhaust.
- PM_{10} and TSP are largely the result of mechanical dust generation during construction or travel on the access road. $PM_{2.5}$ is a better indicator of health effects than PM_{10}. TSP is largely an indicator of nuisance dusting on nearby surfaces.

- Benzene and benzo(a)pyrene are components of diesel exhaust. According to the CDC, people who breathe in high levels of benzene may develop the following signs and symptoms within minutes to several hours: drowsiness, dizziness, rapid or irregular heartbeat, headaches, tremors, confusion, unconsciousness or even death (at very high levels). Long-term exposure (years) to high concentrations of benzene can lead to cancer. Benzo(a)pyrene is a probable cancer-causing agent in humans

As the airport location is more remote from the community, human health impacts due to release of pollutants from airport operation are potentially reduced.

Deposition of airborne particles can impact vegetation, soil, and surface water quality which in turn can impact country foods. This could lead to impacts for fish and other wildlife in the surrounding area. A detailed Land Use study will provide additional information on potential impacts to country foods in the area.

32. Importance of including health and medical practitioners and/or health administrators in the Engagement Plan to better understand the current baseline information on medical emergency flights and primary health care services at the existing airport, and how the Project may positively affect the number of medical emergency flights and access to health care.

Response:

To capture healthcare perspectives from engagement to date, an interview was conducted with a member of Nain Safe House, a domestic violence shelter in Nain. As part of ongoing consultation, it will be a top priority to engage directly with Nain clinic staff to understand how the airport will facilitate healthcare access for residents and healthcare staff access to Nain. Instances of prolonged wait times for medical evacuation due to flight limitations and the airport's unreliability have been communicated by residents. Additionally, understanding the airport's role in transporting medical personnel may improve understanding of how the airport enables health care access. We are committed to continuing consultations with Nain clinic staff, whose insights will be invaluable in understanding current healthcare challenges and formulating strategies to enhance medical emergency services. These consultations not only enrich our understanding of baseline healthcare services but also contribute to tailoring Project initiatives to better meet community healthcare needs.

33. Importance of considering the long-term impacts of the Project (both positive and negative) to the health of Indigenous peoples.

Response:

The existing airstrip is located within the community of Nain. Airport activities can impact air quality, water quality, noise, and vibration, as described in Summary of Issues response #31 and the DPD. By relocating the airport outside of the community, there may be positive health impacts for Indigenous peoples and residents in the long-term. The proposed location of the New Nain Airport may also lead to improved landing conditions, reducing the likelihood of aviation incidents and any associated health impacts.

Improved flight reliability may result in faster evacuations during medical emergencies which may lead to better health outcomes.

The Project may impact traditional land uses. Construction will result in disturbance to natural areas, leading to the loss of available resources related to land use activities, such as hunting, trapping and traditional plant gathering. Airport operation may also displace wildlife and further affect hunting and trapping in the area. The ability of Inuit communities to maintain their health, encompassing physical, mental, and cultural aspects, is tied to their connection with their environment. The Project may impact health as it relates to traditional land use in the area.

34. Consider expanding on the positive impacts the Project will have on food security (e.g., less cancelled/delayed inbound flights, cold storage and freezer building) within the community and region.

Response:

The existing airport infrastructure plays a crucial role in facilitating food security in Nain. Community members emphasize that virtually all perishable food items, such as fruits, vegetables, dairy, and eggs, are imported by air throughout the year.

Community members also noted that shipment delays at the existing airport often lead to spoiled foods arriving in the community. Sustaining connectivity through the airport is crucial for ensuring that grocery stores have enough supplies to meet the nutritional needs of the population. However, the reliability of air travel leads to uncertainties regarding the timely delivery of food supplies. Frequent instances of planes being unable to land exacerbate food security concerns, resulting in spoilage of perishable goods before reaching the community.

Community members noted several potential benefits of the Project:

- Possibility that the grocery store availability improves, in quality, diversity, and quantity, by increasing the reliability of flights into the community, and potentially flying larger aircrafts with additional capacity.
- Flight reliability at the existing airport creates additional food waste due to extended travel delays. Often expired food is sold at a discount in the community, though it is not preferred. Improved reliability could lead to less food waste and improved food quality.
- Community members indicated a desire for improved cold and dry food storage to improve food security, which has been integrated into the project plan. By expanding food storage, the community may be better positioned to withstand flight disruptions during extreme weather.

Indigenous Peoples' Social and Economic Conditions

35. Importance of considering all users and potential transportation methods in Project design (e.g., space for snowmobile traffic, pull-offs prior to high-risk avalanche zones, parking for snowmobiles and qamutiik/sleds).

Response:

Several key factors have been incorporated into the Project design to consider all users and potential transportation methods. The proposed access road traverses Blowhole Pass, a known avalanche risk zone, has been strategically designed to mitigate the potential risk of avalanches that historically occurred in this area. risk. By situating the road on a flatter plateau area approximately 70 m east and 45 m higher from the snowmobile route through Blowhole Pass, the potential for avalanche incidents is minimized. To further facilitate safe travel, road construction will involve grading a flat surface in steep areas to meet authorized slope levels (Figure 5). The access road will also be widened at various points to facilitate safe stopping and navigation, particularly around curves and sharp turns. Incorporating these measures will help facilitate the safety of travelers utilizing various transportation methods. Additionally, designated parking areas, including space for vehicles such as snowmobiles, will be available at the airport. the Nunatsiavut Government Infrastructure is committed to prioritize the safety and accessibility of transportation infrastructure for the community of Nain.

36. Importance of including a description of the construction workforce, and employment and procurement opportunities in Nain and Nunatsiavut.

Response:

At this stage of project planning, the construction workforce is expected to peak at approximately 50 people. While specific details regarding the construction workforce and employment and procurement opportunities have not yet been finalized, they will be further understood and articulated as the project plan progresses. Selection criteria for construction contractor procurement will include consideration to hiring from the local community.

This process will be informed through engagement with stakeholders, including local communities, businesses, and Indigenous organizations, to identify potential opportunities for employment, skills development, and economic growth.

43. Importance of applying gender-based analysis plus (GBA+) and consider subpopulations in the local community (i.e., men vs. women, Indigenous vs. non-Indigenous, youth vs. elderly) to better understand how they may be differently impacted by the Project.

Response:

Ongoing consultation efforts aim to engage a diverse range of stakeholders, including government employees, business owners, community service workers, elders, youth, and current airport/road maintenance employees. These consultations are

crucial for gaining insights into potential project impacts from various perspectives, including stakeholders across different age ranges, gender, and income brackets. By incorporating GBA+ principles, we recognize the importance of understanding how different subpopulations may be differently impacted by the Project.

Initial findings highlight potential impacts on women during the construction phase, particularly concerning gender-based violence risks associated with transient worker populations. To address this concern, specific mitigations have been proposed, such as the implementation of a construction camp and employment conditions minimizing the time employees can spend in the community, with the goal of limiting interaction between transient workers and the community. However, further consultation with the community is essential to fully understand the impacts across different subpopulations in Nain and to define appropriate mitigations and accommodations that address the specific needs of individuals within these groups. Through ongoing engagement and consideration of GBA+ principles, we are committed to ensuring that the Project's impacts are thoroughly understood and addressed in a manner that respects the diversity of experiences and perspectives within the community.

44. Importance of including a cost estimate for the construction and operation of the project, including the source of funds and consideration of any potential increases in future costs.

Detailed information on Project capital and operating costs, funding, employment and procurement are still being determined as part of ongoing feasibility studies.

Social and Economic Conditions (Non-Indigenous)

39. Importance of considering GBA+ and equality, diversity, and inclusion (EDI) proactively as a part of early workforce planning and mitigation measure development.

Response:

NG Infrastructure acknowledges the importance of considering gender-based analysis plus (GBA+) and equality, diversity, and inclusion (EDI) proactively in early workforce planning. These concepts will be included in selection criteria during the procurement process for the construction contractor.

40. Comments on how the self-sufficient working conditions during the construction phase will be implemented and the plans for dealing with workplace accidents in a remote setting.

Response:

A robust emergency response plan will be developed for construction following completion of feasibility studies, when the ownership/operation structure of the Project is determined, and procurement of construction contractors occurs. The ERP will include contingency planning for administering medical aid on site and for transporting workers to medical facilities for care.

41. Importance of outlining a human resources plan to operate the airport (and facilities) once the Project is completed.

Response:

An overall operational plan will be developed by the airport owner. Ownership of the airport will be determined once the proposed airport site is deemed feasible and project funding is secured. The operational plan will include human resources elements such as staffing requirements, training programs, recruitment strategies, and community engagement initiatives.

42. Need for information on the availability of the local workforce for construction in the short-, medium-, and long-term and how labour/skills shortages will be addressed.

Response:

At this stage of Project planning, the construction workforce is expected to peak at approximately 50 people. While specific details regarding the construction workforce and employment and procurement opportunities have not yet been finalized,

they will be further understood and articulated as the project plan progresses. Selection criteria for construction contractor procurement will include consideration to hiring and providing training opportunities from the local community.

Atmospheric Environment (e.g., air quality, light, etc.)

Response:

Air monitoring requirements will be based on results of further air quality assessment following more detailed Project design, where predicted air quality will be compared to provincial and federal ambient air quality standards. Based on a preliminary understanding of aircraft types, vehicle usage, and electricity generation requirements, impacts from emissions from Project operations are expected to be less than the Canadian Ambient Air Quality Standards (CAAQS). Impacts are also expected to be less than Newfoundland and Labrador Air Quality Standards, and according to the Government of Newfoundland and Labrador 2012 guidance document "Determination of Compliance with Ambient Air Quality Standards", monitoring during airport operations would not be required. Emissions of dust during construction of the airport and access road may exceed standards for short periods of time. Mitigation measures related to controlling dust are provided in Summary of Issues response #31.

43. Need for information on the amount of light pollution expected during all phases of the Project and for all Project infrastructure. Where feasible, consider alternative lighting options to mitigate light emissions from the Project.

Response:

Lighting will be required for construction purposes; it will be directed away from the sky and activated only during working hours when there is insufficient daylight (early morning and evening). Airport operations must involve a minimum amount of lighting to adhere to Transport Canada regulations. Approach and runway lighting will only be activated when an aircraft is approaching and departing. Buildings and other obstructions will have red lights as per aviation standards.
All operational lighting will be directed downwards in compliance with regulations to prevent potential blinding of pilots and ground crews.

44. Request to use new 1991-2020 climate normals for Nain which are currently available (except for rainfall or snowfall), to complement the 1981-2010 climate normals for Nain

Response:

The description of current air quality conditions in the DPD summarizes 1991-2020 climate normals for temperature and visibility. Climate normals from 1981-2010 are used for precipitation.

45. Importance of using the Nunatsiavut Government's climate change projection models for the community of Nain.

Response:

Climate change projections used for the Project and discussed in the DPD references Barrette et al. (2020), which is a recent and comprehensive summary of regional climate projections averaged over the entire Nunavik and Nunatsiavut region. These projections are presented specifically for the climate model grid point nearest Nain.

46. Comments on whether the Nain weather station would remain in Nain or be moved to the new airport location.

Response:

A new weather station was installed at the new airport for collecting baseline data; this station will continue to be used for the Project. The need for the continued operation of the existing weather station will be determined at a future date.

Water (Surface and Ground)

47. Request for information on potential groundwater-surface water interactions and expected impacts where groundwater may interact with surface water (e.g., at Kauk Brook and Blow Hole Creek). Concern that groundwater use for potable water supply and construction activities may impact other groundwater users, and/or aquatic/wetland habitat.

Response:

Potential impacts to both surface water and groundwater are discussed in the DPD. Groundwater is no longer being considered as potential potable water source. The primary option for water supply being considered is Kauk Brook, based on a comparison between the estimated Project water demand and calculated mean annual discharges for watercourses within 3 km of the airport. The analysis of Kauk Brook indicates that the Project peak hour potable demand (0.22 L/s) is 0.1% of the calculated discharge at low flow periods (0.25 mean annual discharge). This small fraction is not expected to impact surface water flows, and subsequently would not impact groundwater recharge.

NG Infrastructure will obtain a water use licence under the *Water Resources Act* before withdrawing water for the Project. The licence application will include an evaluation that demonstrates the sustainability of the proposed surface withdrawal.

Potential impacts to watercourses e.g., Kauk Brook and Blowhole pond due to the access road crossings, are related to water quality due to erosion and sedimentation and spills. Mitigation measures to prevent against sediment deposition and spills into watercourses include:

- Avoidance of direct contact with aquatic areas onsite, where possible. Minimize disturbance, where avoidance is not possible.
- Erosion and sediment control measures (i.e., silt fences) will be implemented between the edge of disturbance and any water bodies, as required. These measures will be maintained and inspected daily during the construction activities to make sure they are working properly.
- Development of a spill response plan, and implementation of spill prevention and response protocols.
- Emergency spill kits will be kept with all working machinery during all proposed Project phases.

48. Need for more information on the characterization of the marine environment that was collected for other initiatives to determine its adequacy for baseline. Include how the baseline data was gathered, including but not limited to, sampling locations, methods and effort; media sampled (e.g., water, sediment, fish); guidelines to which sampling was compared (e.g., water quality guidelines, sediment quality guidelines, fish toxicity); sample timing (e.g., seasonal and/or yearly) and duration (e.g., multi-year sampling plan).

Response:

A desktop review was undertaken to assess and summarize the fish species and fish habitats potentially occurring within the study area. The review included the identification of fish (including marine mammal and invertebrate) species, including SAR and habitat features that have the potential to overlap the study area. The following key information sources were reviewed:

- *Nain Airport Project R3 Report: Environmental Review - Desktop Assessment* (Aivek Stantec, 2022)
- *Nain Airport Project R6 Report: Hydrological Study* (Aivek Stantec, 2023)
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC) Assessment and Status Reports
- Government of Canada *Species at Risk Public Registry*
- Published literature on general ecology and population dynamics of relevant species and habitat
- Newfoundland and Labrador Fisheries, Forestry and Agriculture *Species at Risk* (Government of Newfoundland and Labrador, 2024)

- Newfoundland Labrador Fisheries, Forestry and Agriculture *Inland Fish* (Government of Newfoundland and Labrador, 2024)
- Nain Wind Power Micro-Grid Registration Document (Natural Forces, 2021)
- Identification of Additional Ecologically and Biologically Significant Areas (EBSAs) Within the Newfoundland and Labrador Shelves Bioregion (DFO 2013).
- DFO *Aquatic Species* collection (DFO 2020)
- DFO *Aquatic Species at Risk Map* (DFO 2022)

The desktop information reviewed and presented is considered sufficient to understand the current environmental conditions that may interact with the Project at this stage. Project activity in the marine environment (barge traffic transporting equipment and materials from Nain), will be limited spatially to single marine vessel route and relatively small offloading area on the shore.

49. Need for more information on the proposed methodology to assess potential impacts on water quality at stream crossings along the airport access road.

Response:

Potential impacts to water quality are assessed through identifying potential interactions between the Project activities and the watercourse crossings. Expected interactions are sediment deposition from construction activity and erosion, as well as accidental releases of chemicals/fuel from equipment or vehicles. Mitigation measures related to preventing releases to watercourses are presented in Summary of Issues response #48. Construction activities within and near watercourses will be monitored, and in the event of a release it will be assessed and cleaned up as part of a spill contingency plan.

50. Need for additional details on the proposed de-icing activities and potential impacts to the surrounding freshwater environment. Provide more information on mitigation measures that will be utilized to manage potential impacts to surface water quality.

Response:

A concrete de-icing pad with an HDPE membrane/liner will be constructed in the centre of the airport apron. The de-icing pad will include a drain and sump where it will be collected and then transported to Nain for disposal. Glycol contaminated water will not be discharged to surrounding area, and therefore impacts to surface water quality are not expected. During the summer season, runoff from the de-icing pad will be directed to the overall stormwater collection and conveyance system.

De-icing glycol will be stored in secure containers within the maintenance garage.

Soils and Geology

51. Need for information on field methodologies and data for determining potential (or known) permafrost areas, with a map of said areas, which will help assess where permafrost bodies could impact the Project activities. Areas of ice-rich permafrost should also be considered in the mapping.

Response:

Potential permafrost areas were established from preliminary terrain mapping in support of the project geotechnical investigations. Background data relevant to the local geomorphic and geologic conditions was compiled and reviewed. This review included preliminary identification and geomorphological mapping of key physiographic conditions (soil and bedrock), surficial deposit units, and periglacial features. Areas identified to be developed through thermokarst geomorphological processes were designated as potential permafrost areas; these were considered during access road planning and avoided where possible.

A geotechnical investigation was completed in summer/fall 2022. During this investigation 48 mechanically excavated test pits and fifty-seven 57 boreholes were completed at the 90 test locations. No permafrost was encountered at these locations, Additionally, thermistor cables (temperature probes) were installed at five of the borehole sites. These thermistors were used

to monitor subsurface temperatures to further understand the potential presence of permafrost . Temperatures recorded were above 0ºC during the summer months at all five locations.

The potential for permafrost will continue to be evaluated during future site investigations before construction.

52. Need for information on baseline permafrost characteristics (active layer and permafrost thicknesses) and ground thermal regime which are essential to assess the climate change impacts on infrastructure and projected changes to permafrost conditions.

Response:

As described in Summary of Issues response #52, permafrost have been observed in areas planned for project development. The current project design involves avoiding areas with permafrost potential, and this information will be supplemented with future site investigations. If encountered during construction of the runway, taxiways, apron, and/or parking area, it will be excavated to prepare the appropriate subgrade and avoid impacts from climate change. If the permafrost area is extensive, slight modifications to the access road will also be considered to avoid impacts.

53. Need to include proposed alternative mitigation measures and techniques for embankment and pavement approaches over permafrost in cases where it would not be possible to avoid permafrost areas.

Response:

Project planning and infrastructure siting considered potential permafrost and other poor quality soil locations, as these areas have been avoided to the extent practical. If permafrost is encountered through further site investigation or during construction, additional construction techniques will be considered including: removing permafrost and replacing the material with rock fill, using geosynthetic materials such as geogrids and geotextiles, and/or using rock fill in the embankment construction to assist in the bridging/arching effect to reduce localized settlement. If the permafrost area is extensive, slight modifications to the access road will also be considered to avoid impacts.

Wetlands

54. Need for a description of any potential direct or indirect effects of the Project activities on wetlands and wetland functions during all Project phases as it relates to migratory birds, species at risk, and species of conservation concern. Include information regarding the amount of wetland loss, and any measures that will be implemented to avoid, mitigate or offset potential effects[7].

Response:

Potential direct or indirect effects of the Project activities (i.e., clearing and construction activities) on wetlands and wetland function and the proposed mitigation measures that will be implemented to avoid, mitigate, or offset potential effects are outlined in Table 7 below.

Table 7: Wetland Interactions with the Proposed Project and Mitigation Measures

Potential Project Effect	Mitigation Measures
• Loss or disturbance of portions of the wetlands. • Changes to wetland community diversity, including wildlife use (i.e., migratory birds, species of conservation concern, and species at risk), traditional use plants and species at risk. • Changes to local hydrology/alteration of surface water flow patterns, resulting in wetting or drying of wetlands, such as inadvertent drainage or impoundment and groundwater drawdown associated with water withdrawal. • The spread or introduction of invasive species into upland habitats and wetlands through construction equipment, vehicles or runoff from. Increased traffic during the construction and operations phases can elevate this risk. • Potential sedimentation within wetlands due to up-gradient activities (e.g., earth moving, removal of vegetation, soil stockpiling). Depending on the degree, a sedimentation event may suffocate wetland vegetation and increase nutrient levels. • Dust deposition, which can, similarly to sediment, also introduce minerals and nutrients into wetlands and stress wetland vegetation (particularly non-vascular species). • Changes to wetland microclimate and habitat functions because of proximity to Project infrastructure and edge effects. • Accidental release or spill of contaminants.	• Restrict construction activities, equipment and vehicles to construction footprint. Minimize vegetation disturbance, as maintaining terrestrial, riparian and wetland ecosystems plays a role in supporting biodiversity, hydrology, wildlife habitats and traditional use of resources. • Implement construction methods that reduce the potential to drain or flood surrounding wetlands (e.g., appropriately sized / spaced culverts, no unpermitted pilling of soil / grubbing, no unnecessary ditching / artificial channelization). • Minimize erosion of wetland soils by limiting flow velocities using hydraulic dissipation techniques and directing runoff through natural upland vegetation, wherever practical. • Install temporary erosion and sediment control measures (e.g., rig matting, geotextiles, vegetated buffer zones, berms, fibre rolls or silt fencing) in appropriate locations to reduce or contain erosion or sedimentation. The type of control (if applicable) is dependent on topography. Inspect erosion and sediment controls on a regular basis and correct deficiencies (e.g., inadequate control, damage, ineffectiveness) in a timely manner. • Employ measures to reduce the spread of invasive species (particularly by vehicles) into the surrounding landscape including wetlands and retain habitat integrity. Equipment and vehicles will arrive to site clean and free of soil or vegetation debris. Inspect vehicles regularly, particularly vehicles arriving from outside the Nain area. • Maintain equipment and ensure equipment and vehicles are free of leaks. • Proper installation and proper placements of culverts or other measures to allow flow under the airport access road. • Do not wash equipment or machinery in any water body (e.g., watercourse, drainage, wetland). It is recommended to wash equipment or machinery at least 100 m from any water body. Control wastewater from construction activities such as equipment washing to avoid discharge directly into any water body (e.g., watercourse, drainage, wetland). • Prohibit fuel storage, refuelling, or servicing of equipment within 100 m of any water body (e.g., watercourse, drainage, wetland), except where secondary containment and/or tertiary containment is provided. • Ensure no fuel, lubricating fluids, hydraulic fluids, methanol, antifreeze, herbicides, biocides, or other chemicals are release on the ground or into any water body (e.g., watercourse, drainage, wetland). • Maintain drainage across any temporary workspace during construction. Ensure construction does not cause ponding of water or unintentional channelization of surface water flow. • Stake/flag boundaries of the construction footprint, access roads, and wetlands. Do not allow disturbance beyond the stakes or flagging. Restake/flag the boundaries where warranted following clearing and prior to the commencement of subsequent construction activities. • Construction equipment must be clean and free of soil or vegetative debris before its arrival on the Project to reduce the risk of weed introduction. Any equipment that arrives dirty, will not be permitted on the construction footprint. • For areas that will only be partially disturbed, efforts will be undertaken to minimize grading related effects to the remaining wetland areas (e.g. increases or decreases in hydrological inputs resulting in the subsequent flooding or drying of the wetland). Grading effects will be minimized by maintaining the pre-construction topography where possible. • Timely restoration and re-vegetation of the temporary disturbed portions of the wetlands.

Table 8 presents the potential direct disturbance to the wetlands from the development of the different of the Project.

Table 8: Wetland and Project Infrastructure Impacts

Project Footprint	Direct Disturbance to Wetlands (ha)	Percentage of the Project Footprint (%)
Runway (including approach lighting and fenced area	23.09	12
Airport (including taxiways, apron, terminal and support buildings, parking area, and associated infrastructure)	4.81	2
Access Road (including construction limit)	3.16	2
Construction Staging Area and Temporary Access	0.38	<1
Rock Borrow Areas	4.35	2
Total	**35.79**	**18**

56. Need more information on the development and implementation of spill prevention, preparedness, and response measures and systems to minimize the risk of accidents and malfunctions arising from construction and operation activities[23,24]

Response:

The *Canadian Aviation Regulations* have extensive requirements for emergency response planning. An emergency response plan will be prepared that before construction that aligns with the regulations. The plan must address:

- aircraft accident or incident within the airport boundaries, and within a critical rescue and fire-fighting access area that extends 1,000 m beyond the ends of a runway and 150 m at 90° outwards from the centreline of the runway, including any part of that area outside the airport boundaries
- an aircraft emergency declared by either air traffic services or a pilot
- a fuel spill that spreads at least 1.5 m in any direction or exceeds 12 mm in depth
- a medical emergency
- a fire in which airport operations or passenger safety is threatened
- an emergency that is related to a special aviation event and that might have an impact on airport operations,
- a natural disaster
- any other emergency that is a threat or is likely to be a threat to the safety of persons or to the operation of the airport

The plan will include:

- identification of organizations and resources capable of providing emergency assistance, including contact information
- identification of roles and responsibilities for airport and aircraft service personnel,
- establishment of emergency response training requirements for on-site personnel
- description of potential emergency situations and outline of procedures for each

All tanks will be double-walled, and will undergo routine integrity inspections. Fuel storage areas will be established greater than 30 m for any water body or watercourse. Emergency spill kits will be kept with all working machinery and fuel storage areas during all proposed Project phases.

57. Importance of including other topics in the Emergency Response Plan (e.g., fire, extreme weather events, emergency evacuation, power failure, injury and illness, workplace violence).

Response:

The emergency response plan described in Summary of Issues response #56 will be developed to address all topics requiring emergency response, including fires, extreme weather events, emergency evacuation, power failure, injury and illness, and workplace violence. This plan will be developed following the completion of project feasibility studies, securing project funding, and establishment of project ownership / operation.

58. Importance of developing a Communication Plan to communicate information on driving and road conditions for the access road.

Response:

NG Infrastructure understands the importance of maintaining safe and reliable transportation between the airport and Nain. A plan to communicate information on driving and road conditions for the access road will be developed following the completion of project feasibility studies, securing Project funding, and establishment of project ownership / operation.

59. Need a description of the potential impacts of accidents and malfunctions on migratory birds4 and species at risk, and mitigations and response plans to address these potential impacts, including information related to the development of a Wildlife Response Plan.

Response:

Potential accidents and malfunctions associated with the Project include:

- Aircraft crash and/or fire
- Marine craft fuel spill
- Spills to land or water from diesel or aviation fuel, de-icing glycol, domestic effluent

Construction and operation of airports in Canada is guided by Transport Canada through its construction and certification standards. Each airport is required to have an Airport Operations Manual, which identifies the airport, dimensions of runways, buildings, lighting, training requirements, quality assurance system and procedures with references to detailed manuals as applicable. Management plans based on best management practices will be developed based to address potential accidents or malfunctions, including a spill contingency plan; these will help to protect wildlife in and adjacent to the Project Area. As per the Canadian Aviation Regulations, a wildlife management plan is required for all airports in Canada. These plans are unique to individual airports and will be developed for this Project.

Potential effects on migratory birds and species at risk occurring or potentially occurring in the LSA and RSA would be short term effects that could impact habitat availability and quality. Potential mortality risk from contact with contaminants could also occur. The potential effects are unlikely to occur and, with mitigation, would be short term in duration and primarily localized in extent (i.e., mostly within the airport footprint). Potential effects on habitat could occur through spills along the access road or from tankers in marine habitat. With a spill contingency plan, the potential effects are anticipated to be short-term and low in magnitude.

Climate Change and Greenhouse Gas Emissions

60. Need for further information on how it was determined that GHG emissions from decommissioning would be half of the construction emissions

Response:

The Project is expected to be in operation for greater than 50 years. Due to the uncertainty in timing regarding project decommissioning, GHG emissions for that project activity are a rough estimate. The “half” factor was based on AECOM’s experience in estimating decommissioning and reclamation emissions from other industrial facilities, and the assumption that

the access road would remain in place following closure of the airport. An updated GHG emissions report has been prepared for the DPD which includes the assumption that decommissioning emissions are equivalent to construction.

61. Need to clarify annual GHG emissions estimates, in addition to total emission estimates from each phase of the Project. Include any new information on GHG estimates, such as emissions related to the temporary construction camp.

Response:

Annual GHG emissions estimates are provided in the DPD, and a summary is provided in Table 9. Information on new sources associated with the Project is not available at the current level of design. Emissions from the temporary construction camp are expected to be small compared to overall construction emissions.

Table 9: New Nain Airport Emissions (tCO_2-eq) for Construction, Operation for 50 years, and Decommissioning

Year	Source	tCO_2-eq
1	Construction of Airport and Access Road – Deforestation and Sequestration	7,356
2	Construction of Airport and Access Road	5,390
3-52	Operation of Airport (each year)	20,282
53	Decommissioning of Airport	6,373

Effects of the Environment on the Project

62. Importance of including a discussion on the potential impacts of climate change projections on groundwater availability as it relates to the supply of potable water[20].

Response:

Groundwater is no longer being considered as source for Project potable water. An assessment of Project water withdrawal on the primary source option, Kauk Brook, was completed in the DPD. The results indicate that the peak hour potable demand (0.22 L/s) is 0.1% of the calculated discharge at low flow periods (0.25 mean annual discharge). This analysis shows that much lower estimates could be used for Kauk Brook mean annual discharge to account for climate change, and Project water withdrawal would still be within the DFO recommendations for preserving ecological flows (10% of the instantaneous flow and cumulative flow 0.25 mean annual discharge).

NG Infrastructure will obtain a water use licence under the *Water Resources Act* before withdrawing water for the Project. The licence application will include an evaluation that demonstrates the sustainability of the proposed surface withdrawal.

63. Concerns about how the location and design of the new airport will account for increased visibility and fog challenges in the future, due to a changing climate.

Response:

A pre-feasibility was conducted to evaluate potential airport location options, as described in the DPD. The study determined that the selected location was the most favourable due to its alignment with prevailing winds. Further, an important consideration for mitigating visibility issues and fog is instrumentation-based approaches, and the selected location is the only option that provides that capability. Lastly, the fog at the existing airstrip is primarily due to low-lying clouds. The new airport, which opens to the south, is expected to have favourable microclimate differences compared to the existing site. NG Infrastructure acknowledges climate change can alter conditions in the region over time which poses a challenge for site selection; however, the selected airport location represents the best option for ensuring consistent air travel into Nain, given the current information available.

64. Importance of including a terrain stability assessment to help understand landslide and avalanche hazards and the potential impacts to the Project.

Response:

Selection of the access road route considered many different factors, including avoidance of potential permafrost areas and wetlands. In avoiding these areas, the route overlaps other areas of exposed bedrock, which is advantageous since it provides a stable base for road construction. However, development of the access road will require cutting in to steep slopes of exposed bedrock to create the desired surface grade, which in turn will create rock faces adjacent to the access road. NG Infrastructure understands creation of the rock faces will increase the risk of landslide and avalanche risks. Further evaluation of the road route at each of these areas will be conducted before construction, and protective measures such as energy barriers and rockfall netting will be considered for installation to reduce safety hazards.

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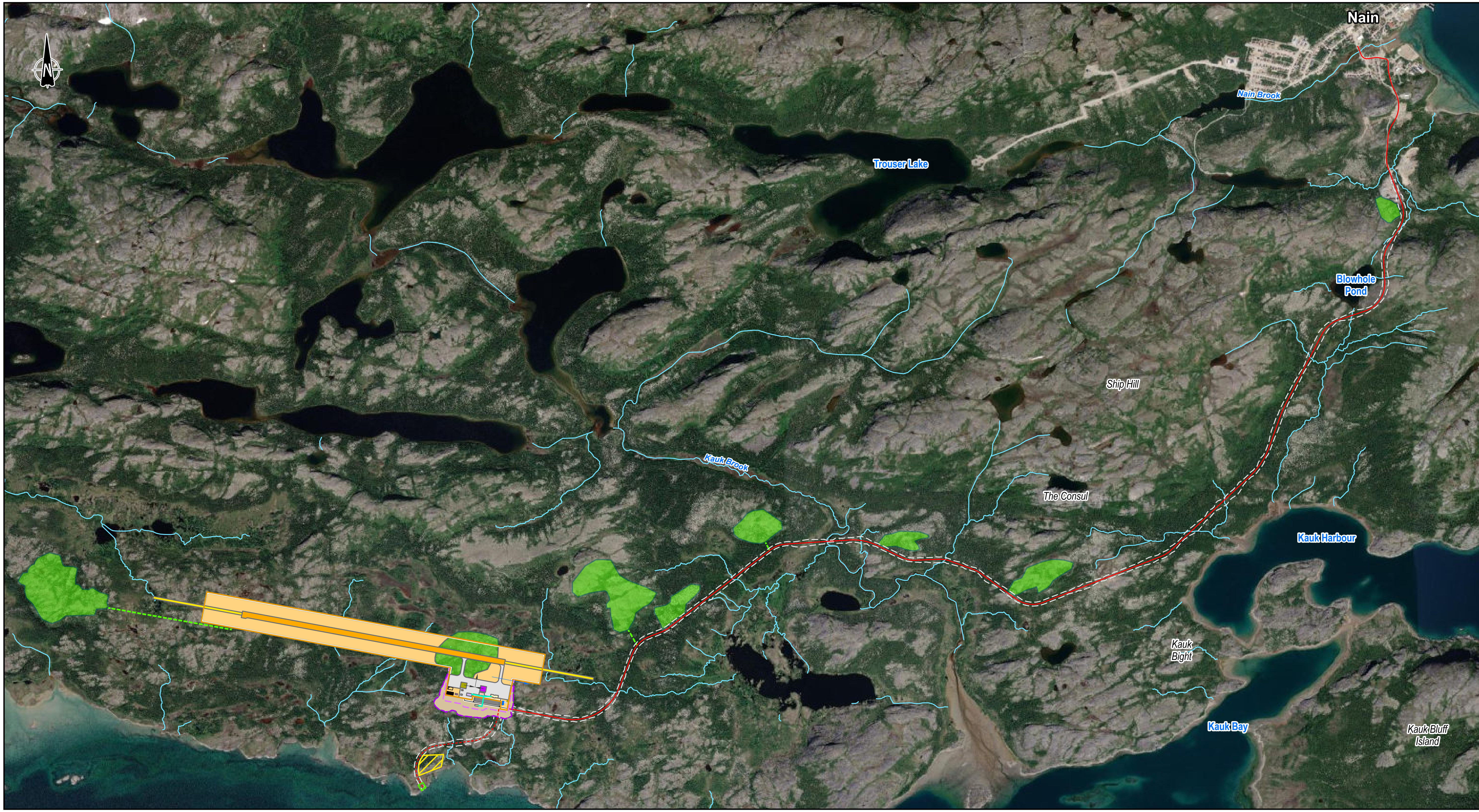
Attachments



Project Component

- Access road
- Temporary access road
- Construction limit
- Temporary road to rock borrow
- Rock borrow
- Potential construction laydown and equipment storage area
- Proposed barge landing site
- Fence
- Sewer pipe
- Top of embankment
- Bottom of embankment
- Culvert drainage
- Fuelling and de-icing pad drainage system
- Fencing and vegetation control
- Parking area and embankment
- Airport access and service road
- Aviation fuel
- Cargo warehouse
- Central power station
- De-icing pad
- Diesel fuel
- Diesel tank
- FEC
- Fueling pad
- Gravel storage
- Lights
- Maintenance garage
- Oil/water separator
- Parking and construction camp
- Potable water supply
- Runway
- Septic field
- Septic tank
- Taxiway
- Terminal
- Water tank
- Weather station

1:30 000

0 250 500 m

NAD 1983 UTM Zone 20N

Figure 1

Project Components

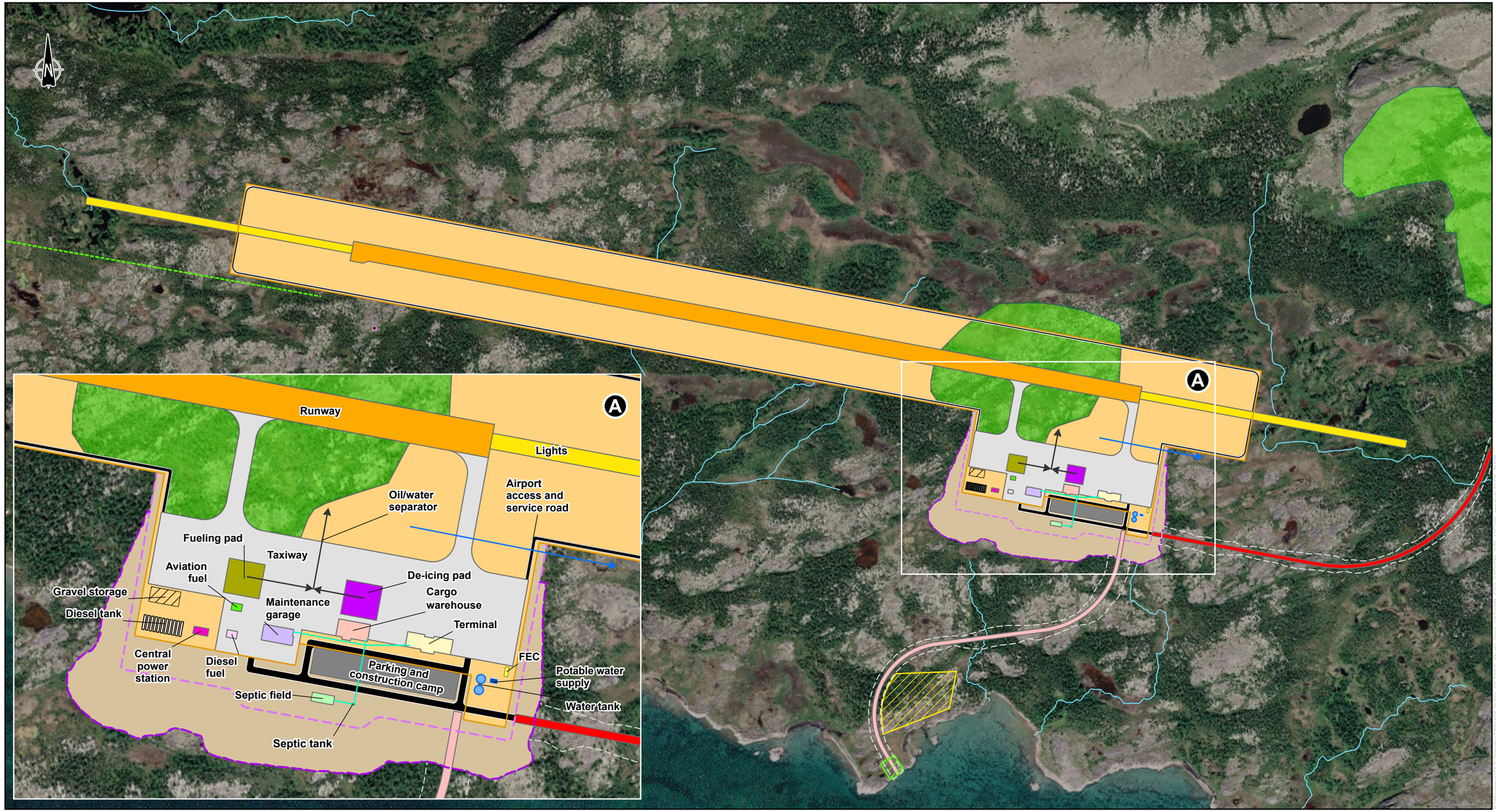
OCTANT

EXPERTS EN SOLUTIONS POUR L'AVIATION

AECOM

NUNATSIAVUT
kavamanga government

NEW NAIN AIRPORT
DETAILED PROJECT DESCRIPTION



OCTANT
EXPERTS EN SOLUTIONS POUR L'AVIATION

Project Component

- Access road
- Temporary access road
- Construction limit
- Temporary road to rock borrow
- Rock borrow
- Potential construction laydown and equipment storage area
- Proposed barge landing site
- Fence
- Sewer pipe
- Top of embankment
- Bottom of embankment
- Culvert drainage
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- Diesel tank
- FEC
- Fueling pad
- Gravel storage
- Lights
- Maintenance garage
- Oil/water separator
- Parking and construction camp
- Potable water supply
- Runway
- Septic field
- Septic tank
- Taxiway
- Terminal
- Water tank
- Weather station

1:10 000
0 100 200 m
NAD 1983 UTM Zone 20N

Figure 2
Airstrip and Airport Apron

AECOM

NUNATSIAVUT
kavamanga government

NEW NAIN AIRPORT
DETAILED PROJECT DESCRIPTION

Project Component

- Temporary access road
- Construction limit
- Potential construction laydown and equipment storage area
- Proposed barge landing site

1:2 000

0 20 40 m

NAD 1983 UTM Zone 20N

Figure 3

Construction Landing and Staging Area

OCTANT
EXPERTS EN SOLUTIONS POUR L'AVIATION

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OCTANT
EXPERTS EN SOLUTIONS POUR L'AVIATION

Project Component
- Access road
- Temporary access road
- Airport footprint
- Runway

Study Area
- Land use study area

Hydrography
- Watercourse

Labrador Inuit Lands
- Parcel number
- Nain Inuit Community Government

Human Feature
- Country food
- Potential fishing area
- Cabin
- Snowmobile trail
- Trouser Lake protected public water supplies

1. Lynx and ptarmigan are trapped/ hunted here
2. Geese are hunted in the Bay
3. Salt Water Pond: A significant area for hunting in the region. Geese are hunted in this area.
4. Firewood is gathered in this area
5. Firewood is gathered in this area. Ptarmigan are hunted in this area
6. Mussels are gathered in this area
7. A fox trap is present here
8. This area is a significant location for hunting

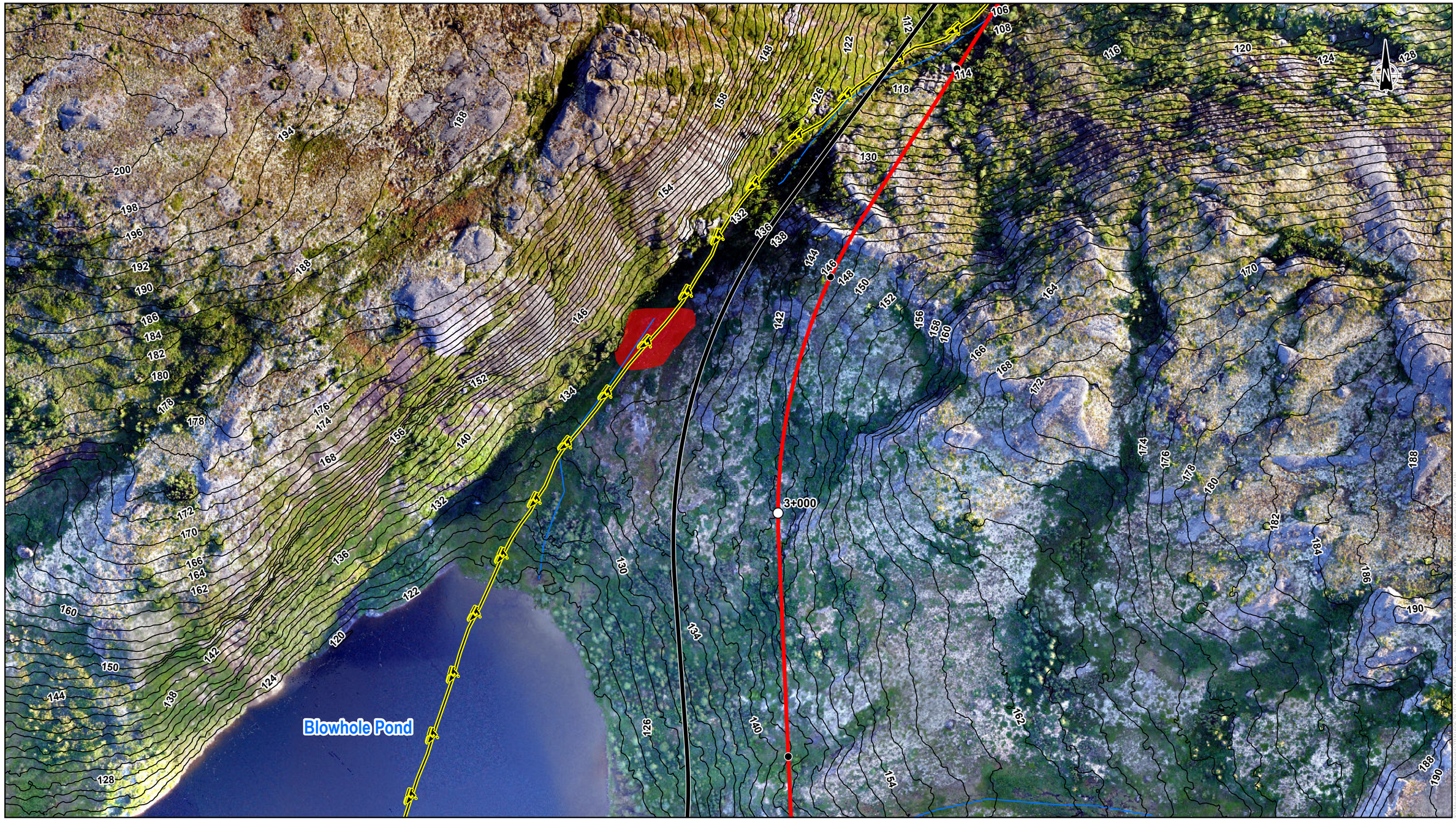
1:44 000
0 250 500 m
NAD 1983 UTM Zone 20N
2024-06-25 09:14

Figure 4
Preliminary Land Use Information related to Human Health

AECOM

NUNATSIAVUT
kavamanga government

NEW NAIN AIRPORT
DETAILED PROJECT DESCRIPTION



Project Component
- 2023 Access road alignment
- *2024 Access road alignment*
- Kilometer point
- Access road

Land use
- Snowmobile trail

Hydrography
- Watercourse

Other
- Potential avalanche area

1:1 500
0 20 40 m
NAD 1983 UTM Zone 20N
2024-05-06 15:56

Figure 5
Access Road Route Through Blowhole Pass

OCTANT
EXPERTS EN SOLUTIONS POUR L'AVIATION

AECOM

Jim Oswell Ph.D., P.Eng

Senior Geotechnical Engineer
36 years of experience · Calgary, Alberta

Dr. Oswell has worked on numerous geotechnical projects in western and northern Canada, and internationally for over 30 years. Many of these projects involved site investigations, laboratory testing, extensive analysis and evaluation. He has undertaken numerous forensic investigations for a variety of projects including pipelines, slope stability, building foundations and excavations. He has supervised technical and junior engineering personnel in the field, laboratory and office. He has experience in deep foundations and excavations for high-rise office structures, large industrial foundations, pipelines, permafrost, and slope stability. He has provided expert witness testimony in public hearings, NEB and environmental joint review panel hearings and in civil litigation.

Dr. Oswell has wide experience in many aspects of pipeline design, construction and operations. He is an expert on geotechnical issues related to pipelines in permafrost and an expert in geotechnical input to pipeline stress analyses. He was involved in assessing the geotechnical performance of the Enbridge Pipelines (NW) Inc. Norman Wells oil pipeline for over 15 years. In addition, he provided senior and expert-level engineering on the Mackenzie Gas project, the Alaska Pipeline Project, the Alaska North Slope Gas Project and the Denali Gas Pipeline Project. In western Canada, Dr. Oswell provided geotechnical support and input to the Prince Rupert Gas Transmission project (B.C.), Pacific Trails Pipelines project (B.C.), Grand Rapids pipeline project (Alberta), Coastal Gas Link pipeline project (B.C.) and others. He has consulted to pipeline companies in China, Ecuador, Colombia and Alaska.

EDUCATION

B.Eng, Civil Engineering, Lakehead University, Thunder Bay, Ontario, 1982

Master of Science in Geotechnical Engineering, University of Manitoba, Winnipeg, Manitoba, 1984

Ph.D., Geotechnical Engineering, University of Manitoba, Winnipeg, Manitoba, 1991

MEMBERSHIPS

Member, Association of Professional Engineers and Geoscientists of Alberta

Member, Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists

Member, Canadian Geotechnical Society

PROJECT EXPERIENCE

GEOTECHNICAL ENGINEERING

Pacific Trails Pipeline System | Chevron Canada | British Columbia | Senior Geotechnical Advisor & Technical Reviewer

Senior geotechnical advisor and technical reviewer for the design of a NPS 42 high pressure gas pipeline of approximately 650 km length. Geotechnical and geological issues include avalanche, debris flow, liquefaction and lateral spreading, glaciomarine clays and other issues. Participated in route reconnaissance and selection. Responsible for providing technical input to field studies and technical review of consultant reports.

Pembina Pipelines Fox Creek to Namao Liquid Pipelines | Pembina Pipelines | Alberta | Senior Geotechnical Engineer

Senior geotechnical engineer responsible for assessing in-situ soil strength at selected horizontal bends and HDD over bends as part of a soil-pipeline interaction study. Soil strengths were used in pipeline stress models to assess thermal expansion effects arising from a proposed increase in operating temperature. Also responsible for assessing in-situ soil strength of trench backfill to facilitate use of heavy tracked equipment for RoW clean up and reclamation. Program entailed the development of a field testing tool and novel assessment criteria to confirm the bearing capacity of the ground, including a thin frozen surface crust so that sections of the RoW could be safely accessed.

Nanisvik Naval Facility | Baffin Island, Nunavat | Review Engineer

Review engineer assisting geotechnical consultant on issues related to permafrost for the proposed redevelopment and enlargement of a decommissioned deep water port in northern Baffin Island.

Hay River Airport | Hay River, Northwest Territories | Senior Geotechnical Review Engineer

Senior geotechnical review engineer for geotechnical investigation into subsurface conditions at Hay River airport to provide foundation recommendations for a new antenna array and glide path facility structure.

** denotes projects completed with other firms*

Enbridge Pipeline Communications Tower | Enbridge | Fort Simpson, Northwest Territories | Senior Permafrost Engineer

Senior permafrost engineer for the design of a foundation to support a communications tower at a remote valve site on the Norman Wells pipeline.

Aurora Pipeline Project* | Universal Pegasus Inc. | British Columbia | Geotechnical Engineering Specialist

Geotechnical engineering specialist providing preliminary geotechnical and geological hazard assessments for proposed high pressure natural gas pipeline from northeast B.C. to Prince Rupert. Provided input to assessment of several potential routing corridors and review of potential geological hazard and geotechnical-related construction issues to selected corridors.

Grand Rapids Pipeline* | TransCanada Pipelines Ltd. | Alberta | Geotechnical Specialist Advisor

Geotechnical specialist advisor to TCPL. Provided expert geotechnical input to geotechnical field programs, consultant/contractor report review, and preparation of soil-pipeline interaction parameters for pipeline stress analysis.

Prince Rupert Gas Transmission* | TransCanada Pipelines Ltd. and Universal Pegasus Inc. | British Columbia | Senior Geotechnical Advisor and Technical Reviewer

Senior geotechnical advisor and technical reviewer for the design of a NPS 48 high pressure gas pipeline of approximately 750 km length. Geotechnical and geological issues include seismic fault rupture, volcano, debris flow, liquefaction and lateral spreading, glaciomarine clays and other issues. Responsible for providing technical input to field studies and technical review of consultant reports.

Oleoductos de Crudos Pesados (OCP) Pipeline* | Ecuador | Senor Geotechnical Engineer and Project Manager

Senior geotechnical engineer and Project Manager for a geological hazard assessment of the Oleoductos de Crudos Pesados (OCP) pipeline. Examined LiDAR imagery to identify geological hazards (landslides, earth flows, slumps, seismic fault ruptures) along the pipeline route that were presently not identified by OCP. Developed a semi-quantitative geohazard assessment to rate the identified hazards along the route to help set priorities for mitigations and interventions.

Alaska Gas Project* | Alaska, Yukon, British Columbia | Permafrost and Geotechnical Engineer

Permafrost and geotechnical engineer within the strain based design team responsible for characterization of route soils and determination of strain demand on the pipeline arising from frost heave and thaw settlement. Geotechnical coordinator for Project Management Team responsible for interaction and technical support to project engineering consultant. Responsibilities included coordination with environmental and regulator teams in Alaska and Canada, evaluation of geotechnical contractors to conduct intrusive field investigations, selection of field testing sites, documentation of permafrost disturbance and consultations with regulatory agencies.

Norman Wells Pipeline* | Norman Wells, Northwest Territories | Senior Project Engineer

Senior project engineer with over 15 years of active involvement in geotechnical issues. Responsible for ongoing review and evaluation of thermal, piezometric and slope stability instrumentation. Conducted annual field reconnaissance and inspections, and installed monitoring points. Many of the slopes are experiencing thawing of the permafrost under the pipeline, and an assessment of the stability of the pipeline is necessary. Responsible for preparation of annual stability assessments to be submitted to the NEB.

Frozen Muskeg Loading Study* | Alberta

Undertook a study to determine the permissible loading of frozen muskeg by drill rigs in northern Alberta. Organized field sampling of muskeg, ground temperature collection, laboratory testing and numerical modeling to provide estimates of required frozen muskeg thickness and development of a prototype field tool.

Mackenzie Gas Project* | Northwest Territories | Senior Permafrost Engineer, Project Manager, Expert Witness, Senior Reviewer

Responsible for the slope design of the pipeline through continuous and discontinuous permafrost. Work involves coordination of multi-disciplinary team (geothermal modeling, geotechnical engineering, GIS) to identify, catalogue slopes and develop design strategies to ensure long-term stability. Other project work included senior permafrost engineer and project manager for planning of geotechnical drilling program for pipeline section south of Norman Wells, and Senior Reviewer for permafrost aspects of EIA. Expert witness in National Energy Board and Joint Review Panel hearings.

** denotes projects completed with other firms*

Coastal Gas Link* | TransCanada Pipelines Ltd. | Alberta, British Columbia | Geotechnical Specialist Advisor

Geotechnical specialist advisor to TCPL. Provided expert geotechnical input to geotechnical field programs, routing and siting, consultant/contractor report review, and preparation of internal geotechnical engineering guidance documents. Prepared geological hazard risk assessment report for submission to the B.C. Oil and Gas Commission. Participated in technical meetings to B.C. Oil and Gas Commission, including presentations on geological hazards.

Alaska LNG Pipeline* | ExxonMobil/Worley Parsons | Alaska | Senior Geotechnical and Permafrost Engineering Advisor

Senior geotechnical and permafrost engineering advisor to Project Management Team on issues related to the design of a large diameter, high pressure pipeline to transport natural gas from Prudhoe Bay to Cook Inlet in Alaska for LNG export. Provide input relative strain-based design issues, review of field investigation program, preparation of documents regarding incorporating climate change into the pipeline design, assessment of conservatism in the pipeline design, and erosion control plans for construction and operations. Made presentations to the U.S. Federal Energy Regulatory Commission in Washington, D.C.

EcoPetrol* | Colombia | Senior Geotechnical Engineer

Senior geotechnical engineer and member of international multi-disciplinary team examining the root causes of two pipeline ruptures in mountainous regions of Colombia. In case, the rupture resulted in an explosion with over 30 fatalities. Services included site reconnaissance, preparation of a preliminary assessment report, development of scope of work and specifications for geotechnical investigations and instrumentation, supervision of the geotechnical program and assessment of data, and reporting.

Husky Energy North Saskatchewan River Pipeline Crossing | Husky Energy | Saskatchewan | Senior Geotechnical Engineer

Senior geotechnical engineer for geotechnical issues related to soil-pipeline interaction assessment, and senior review engineer for geotechnical issues related to slope instability and mitigation to address creep slopes on pipeline route.

PUBLICATIONS & WHITEPAPERS

Dr. Oswell has authored or co-authored over 30 papers published in journals and conference proceedings. He is author of the textbook "Soil mechanics for pipeline stress analysis". He a member of the International Standards Association, Technical Committee (TC) 67/SC 2 - Pipeline transportation systems; Member of Working Group (WG) 23 - Geological hazards risk management of oil and gas pipelines., 2018.

** denotes projects completed with other firms*

Lorne Boone M.Eng., P.Eng., P.Geo, FEC

Geotechnical Engineer
38 years of experience · St. John's, Newfoundland and Labrador

Mr. Lorne C. Boone, M.Eng., P.Eng., P.Geo., is a senior geotechnical engineer and Principal of the firm. His academic background and experience includes assessment of site conditions for geotechnical and hydrogeological projects. From 1995–2007 he was project manager for geotechnical investigations for INCO's Voisey's Bay mine (Ni-Co-Cu) development in Labrador and the Hydromet Facility in Argentia, NL. The project included geotechnical investigations and engineering for planning: Process Plant/Mill Site, Temporary Airstrip, Docking Facilities, Tailings Basin Site Selection Studies, and development of an Open Pit. Mr. Boone has managed geotechnical investigations for the Mile One Stadium, St. John's Convention Centre, and Riverhead Wastewater Treatment Project (St. John's Harbour Clean-up Project); all in St. John's, NL. He managed geotechnical investigations for the 27 MW St. Lawrence Wind Energy Project. He recently conducted significant project management assignments and technical support for the Lower Churchill project, including the Strait of Belle Isle Geotechnical Investigation for a proposed sub-sea tunnel for HVDC transmission lines from the LCP in Labrador, as well as Marine Geotechnical Investigations of the Shore Line Electrodes components of the HVDC line within the Province; Geotechnical Investigation for Ore Pass and Tunnel for Quinde Marble Quarry, Ecuador; rail line and mine infrastructure geotechnical investigations for new Bloom Lake Iron Mine, Western Labrador (includes concentrator, crusher, bridges, thickener and electrical sub-stations); geotechnical investigations in support of DSO proposed iron mines for Tata Steel Minerals Canada.

EDUCATION

B.Sc. (Earth Science), Memorial University of Newfoundland and Labrador, St. John's, NL, Canada, 1985

B.Sc.Eng. (Geological Engineering), University of New Brunswick, Saint John, NB, Canada, 1987

M.Eng. (Geotechnical Engineering), University of Alberta, Edmonton, AB, Canada, 1992

REGISTRATIONS

Professional Engineer #02162, Professional Engineers and Geoscientists Newfoundland and Labrador

Professional Geologist #02162, Professional Engineers and Geoscientists Newfoundland and Labrador

MEMBERSHIPS

Eastern Chapter, Past Chair, Professional Engineers and Geoscientists Newfoundland and Labrador

Member, Newfoundland Environmental Industry Association

Member, Canadian Geotechnical Society

Newfoundland and Labrador Section, Past President (2005/2006), Geological Association of Canada

PROJECT EXPERIENCE

BRIDGES

Geotechnical Investigation, Rail Underpass | Cliffs Natural Resources | Wabush, Newfoundland and Labrador | Project Manager

Geotechnical Investigation, Bridge Abutments | Consolidated Thompson C/O Rail Cantech | Bloom Lake, Newfoundland and Labrador | 2009 | Project Manager

Crabbe's River Bridge Replacement | Bridger Design | Crabbe's River, Newfoundland and Labrador | 2010 | Project Manager

CONDITION ASSESSMENT

Condition Evaluation, Wells/Pumps, Muskrat Falls, Lower Churchill Project | Newfoundland and Labrador Hydro | Muskrat Falls, Newfoundland and Labrador | 2009 | Project Manager

GEOTECHNICAL ENGINEERING FOR MARINE FACILITIES

Marine Geotechnical Investigation, Proposed Infill Project for Waste Water Treatment Plant | CBCL Limited | Corner Brook, Newfoundland and Labrador | Project Manager

NLRC Geotechnical Investigation - Marine Component | SNC Lavalin Inc. | Newfoundland and Labrador | 2009 | Project Manager

Geotechnical Investigation, Proposed Sub-Sea Tunnel | SNC Lavalin Inc. | Strait of Belle Isle, Newfoundland and Labrador | 2009 | Project Manager

Marine Geotechnical Investigations, Lower Churchill Project - Shoreline Pond Electrode Sites | Nalcor Energy | L'Anse au Diable and Dowden's Point, Newfoundland and Labrador | Project Manager

Marine Geotechnical Investigation, Cooper Cove Infill and Fleet Dock Expansion Project | Port of Argentia | Argentia, Newfoundland and Labrador | Project Manager, 2023

Marine Geotechnical Investigation, Aquaculture Facility Dock | Port of Argentia | Argentia, Newfoundland and Labrador | 2022 | Project Manager

Marine Geotechnical Investigation, Wharf Replacement and Extension Project | CBCL Limited | Port au Choix, Newfoundland and Labrador | 2022-2023 | Project Manager

Marine Geotechnical Investigation, Ro-Ro Ramp Caissons, Oceanex Expansion Project | St. John's, Newfoundland and Labrador | 2004 | Project Manager

Marine borehole investigation from floating plant for assessment of subsurface conditions and geotechnical recommendations for caisson design.

Marine Geotechnical Investigation, Wharf and Breakwater, Lark Harbour, NL | Lark Harbour, Newfoundland and Labrador | 2024 | Project Manager

Boreholes completed from floating plant for design of breakwater and wharf.

Geotechnical Investigation, Proposed Marine Terminal for Strange Lake Rare Earth Elements Deposit | Quest Rare Minerals Canada | Anaktalak Bay, Newfoundland and Labrador | Project Manager

Geotechnical Investigation, Proposed LNG Terminal | NL LNG Ltd. | Placentia Bay, Newfoundland and Labrador | Project Manager

Geotechnical Investigation, Fabrication Dock Expansion for White Rose FPSO Project | Kiewitt | Marystown, Newfoundland and Labrador | Project Manager

Offshore Marine Geotechnical Investigation, Hibernia Field | Mobil Oil Canada | Grand Banks, Newfoundland and Labrador | Project Engineer

GEOTECHNICAL ENGINEERING

Geotechnical Investigation, Johnson Geoscience Center | Johnson Family Foundation | St. John's, | Project Manager

Menihek Generating Station, Bedrock Quarry Assessment for Armour Stone and Blast Vibration Analysis on Control Structure | CFLCo. (Nalcor) | Menihek, Newfoundland and Labrador | 2018 | Technical Lead and Project Manager

Vibration Analysis for Bedrock Removal at Tank Farm | Irving Oil Limited | St. Johns, Newfoundland and Labrador | 2019 | Technical Lead and Project Manager

Exploits River Field Investigation and Testing | BAE-NewPlan Group Ltd. | Exploits, Newfoundland and Labrador | 2005 | Project Manager

Proposed Phase II Expansion, Humber Valley Resort | CBCL Ltd. | Corner Brook, Newfoundland and Labrador | 2005 | Project Management

Geotechnical Investigation, Deer Lake Runway Extension | Hatch Mott MacDonald Ltd. | Deer Lake, Newfoundland and Labrador | 2009 | Project Manager

Geotechnical Investigation, Building Flooding | John Hearn Architect Inc. | Paddy's Pond, Newfoundland and Labrador | 2009 | Project Manager

Geotechnical Investigation, Proposed Box Store Developments, Kelsey Drive | Kent Building Supplies | St. John's, Newfoundland and Labrador | 2009 | Project Manager

Geotechnical Investigation, Menihek Generating Station | AMEC Americas Limited | Schefferville, Newfoundland and Labrador | 2009 | Project Manager

Geotechnical Investigation, Ocean Sciences Center | Hatch Mott MacDonald | St. John's, Newfoundland and Labrador | 2010 | Project Manager

Geotechnical Investigation, New Mount Pearl Square Store | TDL Group | Mount Pearl, Newfoundland and Labrador | 2009 | Project Manager

Geothermal Testing / Earth Resistivity | Various Clients | Various Sites including Gander, Clarenville, and St. John's, Newfoundland and Labrador | Project Manager

Geotechnical Investigations, Various Buildings at Memorial University including Core Sciences Building, School of Pharmacy, Earth Sciences Building, Parking Garage, and Clock Tower | Memorial University of Newfoundland | St. John's, Newfoundland and Labrador | Project Manager

Geotechnical Investigation, The Rooms - NL Museum and Archives | PHB Group | St. John's, Newfoundland and Labrador | Project Engineer

Earth Resistivity Measurements Related to Existing or Proposed Power Generation at Various Sites | NL Hydro and Alstom Grid Inc. | Churchill Falls, Muskrat Falls, Wabush, Forteau Point, Shoal Cove, and Wiltondale, Newfoundland and Labrador | 2014 | Project Manager

Geotechnical Investigation, Nain Airport and Access Road | Nunatsiavut Government | Nain, Newfoundland and Labrador | 2022-Present | Project Manager

Project Manager for geotechnical site investigation of new runway, air terminal building and 12 km access road from the community of Nain, NL. Work was located at a remote site and accessed by helicopter, including movement of drill rigs.

Geotechnical Investigation, Renewstable Barbados Solar Photovoltaic Energy Facility | Renewstable Barbados | Harrow Plantation, Saint-Philip, Barbados | 2022 | Geotechnical Project Manager

MINING

Geotechnical Investigation for Return Air Raise, Shaft, Paste fill Plant and Substation, Thompson Mine Expansion Phase 1, FEL-3 Study Refresh | Vale Canada Limited | Thompson, Manitoba, Canada | 2018 - 2019 | Project Manager, Geotechnical Investigations

Geotechnical Investigation, New Pods Area Crusher, Carol Lake Project | Iron Ore Company of Canada (Rio Tinto) | Labrador City, Newfoundland and Labrador, Canada | Project Manager

Geotechnical Investigation, New Mine Maintenance Shop and Concentrate Storage Building | Canada Fluorspar Inc. | St. Lawrence, Newfoundland and Labrador, Canada | 2018 | Project Manager

Geotechnical Investigation, Quinde Limestone Quarry Project, Glory Hole Shaft and Transportation Tunnel | Lafarge Canada | Otavalo, Ecuador | Project Manager

Dam Safety Inspections for Vale 's Feta, Stobie and Frood Tailings Dams and Associated Control Structures | Vale Canada Limited | Sudbury, Ontario | 2019 | Geotechnical Engineer

Mine Reclamation and Closure Plan Updates for Vale's Voisey's Bay Mine and the Long Harbour Processing Facility | Vale Canada Limited | Newfoundland and Labrador | Project Manager

Geotechnical Investigation, DSO Iron Mine | Tata Steel Minerals Canada | Schefferville, Quebec & Newfoundland and Labrador | Project Manager

Geotechnical Investigation, Duck Pond Mine Infrastructure | SHG Group | Newfoundland and Labrador | Project Manager

Geotechnical Investigation, Mine Infrastructure | Vale Inco | Voisey's Bay, Newfoundland and Labrador | Project Manager

Geotechnical Investigation, Bloom Lake Rail Line and Mine | Consolidated Thompson Iron Mines Ltd. | Western Labrador, Newfoundland and Labrador | 2009 | Project Manager

Geotechnical Investigation, Tailings Pond, Fluorspar Mine | SNC Lavalin Inc. | St. Lawrence, Newfoundland and Labrador | 2009 | Project Manager

Geotechnical Investigation, Tailings and Waste Rock Assessment for Alderon Kami Project - Proposed Iron Ore Mine | Alderon Iron Ore Corp. | Labrador West, Newfoundland and Labrador | Project Engineer

Blast Vibration Monitoring and Analysis, Limestone Quarry | Atlantic Minerals Limited | Lower Cove, Newfoundland and Labrador | 2017 - 2019 | Technical Lead and Project Manager

Rehabilitation and Closure Plan, Limestone Quarry | Atlantic Minerals Limited | Lower Cove, Newfoundland and Labrador | 2015-Present | Project Manager

Rehabilitation and Closure Plan, Voisey's Bay Mine | Vale Canada Limited | Anaktalak Bay, NL, Canada | 2021-2022 | Project Manager

Rehabilitation and Closure Plan, Hydromet Processing Facility | Vale Canada Limited | Long Harbour, NL, Canada | 2021-2022 | Project Manager

Geotechnical Investigation, Bloom Lake Iron Mine Concentrator | Quebec Iron Ore | Fermont, QC, Canada | 2021-2022 | Project Manager

OIL & GAS

Geotechnical Investigation, Bull Arm Construction Site | PASSB | Bull Arm, Newfoundland and Labrador | Project Engineer

Various structures including Top Sides Quay, Nodeco Quay, and various fabrication and office buildings.

Hibernia Drill Cuttings Sampling/Processing and Disposal | Hibernia Management and Development Company | St. John's, Newfoundland and Labrador | 2006 | Project Manager

Hebron Bund Wall (Dry Dock) Geotechnical Investigation | ExxonMobil | Bull Arm, Newfoundland and Labrador | Project Manager

WIND POWER

St. Lawrence 27MW Wind Project, Geotechnical Investigations | Northland Contracting Inc. | St. Lawrence, Newfoundland and Labrador | 2007 | Project Manager

Geotechnical Investigation, Lamberts Wind Project | Barbados Light and Power Company Ltd. | Saint Lucy, Barbados | 2020-2021 | Project Manager

PUBLICATIONS & WHITEPAPERS

Field Performance of Thin Wall Foundations. *Boone, L.C., Sego, D.C., and Dozzi, S.P., Canadian Journal of Civil Engineering, Vol. 23, No.2*, 1996.

Packer Permeability Testing in Deep Inclined Boreholes - Feasibility Study for Subsea Tunnel, Nalcor Energy Strait of Belle Isle Program, Newfoundland and Labrador. *Parsons, S., Boone, L.C., Peddle, M., and Guðmundsson, A., Pan-Am CGS Geotechnical Conference, March, 2011*, 2011.