

# **HOPE BROOK ACCESS ROAD**

**Environmental Assessment Registration**

Pursuant to the Newfoundland and Labrador *Environmental Protection Act*

**Submitted by First Mining Gold Corporation**

**June 2018**

# Hope Brook Access Road

## Environmental Assessment Registration

Pursuant to the Newfoundland & Labrador *Environmental Protection Act* (Part X)

**Submitted by:**

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## 1.0 INTRODUCTION

**PROJECT NAME:** *Hope Brook Access Road*

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### 1.1 Nature of the Undertaking

First Mining Gold Corporation (First Mining) is proposing to construct a low profile resource access road to connect its Hope Brook mineral exploration property to the Burgeo Highway, Highway 480, and the provincial road network, Figure 1.1 and Figure 1.2.

In July 2015, First Mining acquired Coastal Gold Corporation which owned the former Hope Brook Gold mining and exploration properties near Couteau Bay in southwestern Newfoundland. These properties consist of seven mineral and exploration claims covering 26,650 hectares. Mining from both open pit and underground operations occurred at the Hope Brook property between 1987 and 1997 and produced 752,163 ounces of gold. Infrastructure on site remaining from the previous property development includes camp facilities, a power transmission line interconnection, sea and air access facilities and onsite roadways.

Coastal Gold Corporation conducted on-site exploration activity between 2010 and 2015 and First Mining undertook early phase exploration related work in 2017, including refurbishing of the camp and associated infrastructure. First Mining plans exploration activities at Hope Brook in 2018 and beyond. Existing air and sea access have allowed for early exploration and preparatory work, but ground access is required to make increased future exploration more economically feasible, enhance safety and emergency response capability, and allow advancement to pre-feasibility and feasibility level studies. A low profile resource access road connecting the Hope Brook property to the Burgeo highway, Highway 480, (Figure 1.1) is being proposed to advance exploration in 2019 and beyond. This will allow updated potential economic assessment and feasibility studies to determine the economic viability of future mining of this property.

**Figure 1.1 Location of Proposed Hope Brook Access Road**

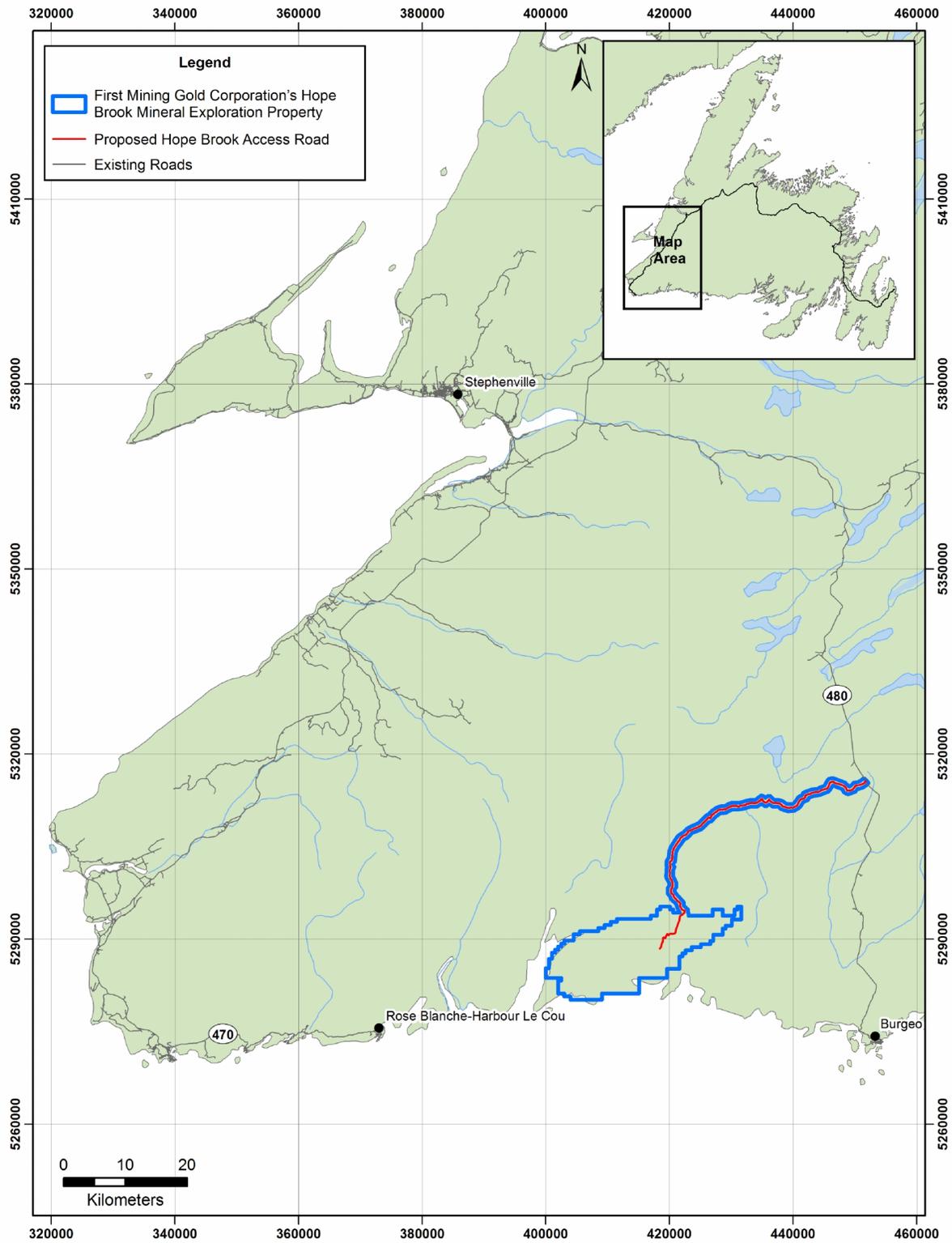
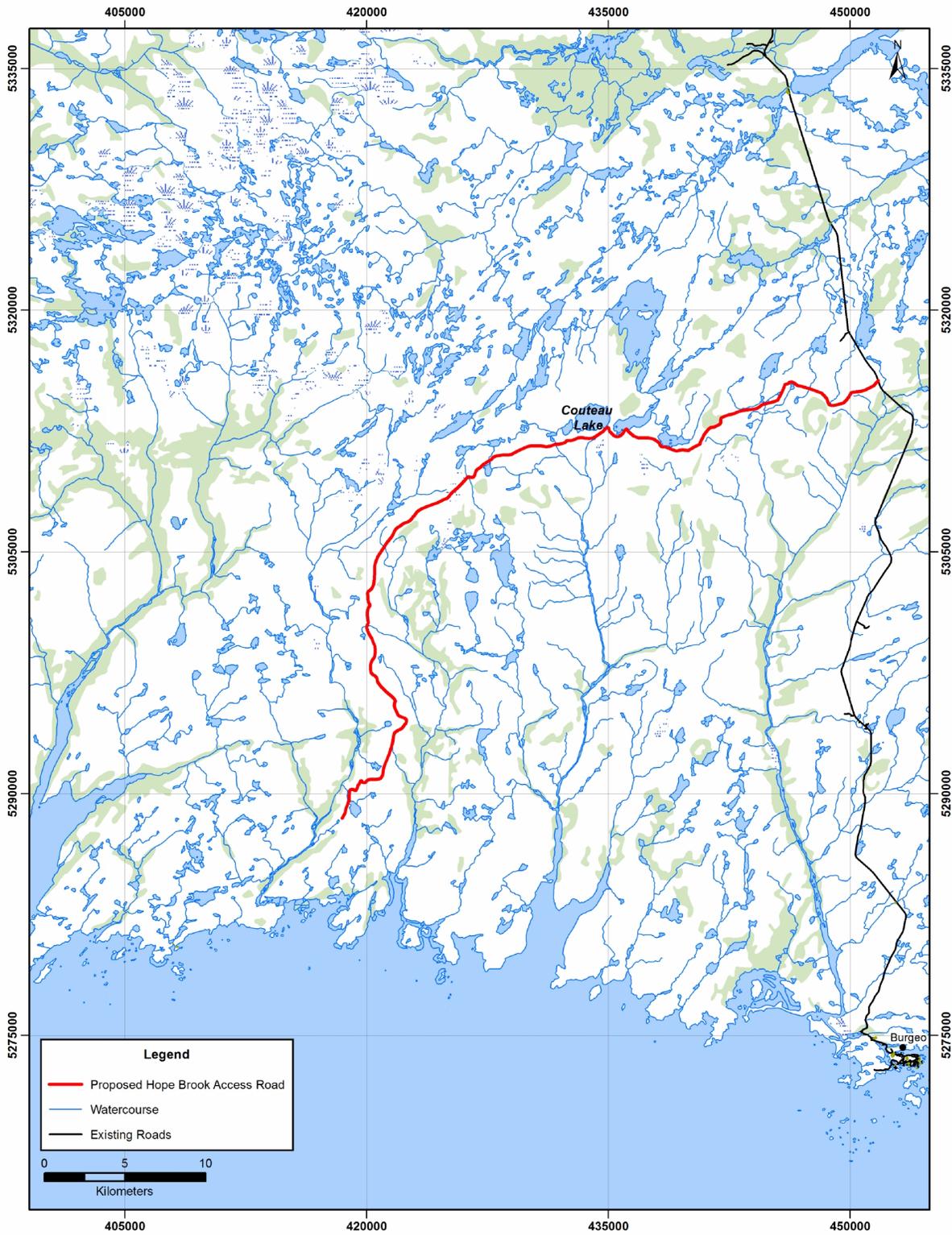


Figure 1.2 Proposed Hope Brook Access Road Route



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## 1.2 Purpose of the EA Registration

The proposed Project is subject to Part 10 of the Newfoundland and Labrador *Environmental Protection Act* and the associated *Environmental Assessment Regulations*. This document is intended to initiate the provincial environmental assessment (EA) review, and in doing so it:

- Identifies the Project’s proponent and describes its goals, core values, and environmental management approaches and procedures;
- Describes the proposed Project, including its overall purpose and rationale, as well as its key components and planned construction and operational activities; and
- Provides an overview of the existing environmental setting for the Project, some of the potential environmental considerations that have been identified to date, and First Mining’s planned approaches for addressing these in moving forward with Project planning and eventual implementation.

This *EA Registration* document has been prepared and submitted by First Mining, with assistance from Amec Foster Wheeler Environment and Infrastructure. Proposed route selection and technical design details for the proposed access road have been provided by Fracflow Consultants Inc. (Fracflow Consultants Inc., 2018).

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## 1.3 The Proponent

**Name of Corporate Body:** First Mining Gold Corporation

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Vancouver, BC  
V6C 3L2  
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### Contact Person for Environmental

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First Mining is an emerging development company with a diversified portfolio of gold projects in North America. Having assembled a large resource base of 7 million ounces of gold in the Measured and Indicated categories and 5 million ounces in the Inferred category in mining friendly jurisdictions of eastern Canada. First Mining is now focused on advancing its assets towards production.

First Mining acquired the former Hope Brook Gold mining and exploration properties in 2015 and has undertaken preliminary exploration activities on site. First Mining is proposing the Hope Brook Access Road Project (the Project) to make increased future exploration more economically feasible, enhance safety and emergency response capability, and allow advancement to pre-feasibility and feasibility level studies.

First Mining is strongly committed to conducting its business affairs with honesty and integrity and in full compliance with all laws, rules and regulations applicable to the Company's business in jurisdictions in which it operates. Each employee must at all times respect and obey such laws, rules and regulations, and should avoid any situation that could be perceived as improper, unethical or indicate a casual attitude towards compliance with such laws, rules and regulations. First Mining is committed to the protection of the environment and integration of sustainable environmental stewardship principles and best management practices at all stages of development of its projects.

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#### 1.4 Environmental Assessment Process and Requirements

The Newfoundland and Labrador *Environmental Protection Act (NL EPA)* requires anyone who plans a project that could have a significant effect on the natural, social or economic environment (an "Undertaking") to present it for examination through the provincial EA process. The definition of an "Undertaking" in the *NL EPA* includes proposed modifications, rehabilitations and extensions of such projects.

The associated *Environmental Assessment Regulations (Part 3)* list those projects (potentially including proposed modifications, rehabilitations and extensions of same) that require registration and review.

Section 35 of the *Environmental Assessment Regulations* state that:

*35. An undertaking that will be engaged in construction projects other than buildings that involve the (b) construction of roads or the relocation or realignment of existing roads where a portion of the road will be more than 500 metres from an existing right of way.*

The proposed Project will involve construction of approximately 58 km of new access road between the Burgeo road, Highway 480, and First Mining's Hope Brook mineral exploration property.

Following public and governmental review of this EA Registration, the Minister of Municipal Affairs and Environment will determine whether the Project may proceed, subject to any terms and conditions and other applicable legislation, or whether further assessment is required.

In addition to approvals under the provincial EA process, the Project may also require a number of other authorizations from relevant regulatory authorities. These are identified and discussed later in this document in Appendix A.

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## 2.0 PROJECT DESCRIPTION AND SCOPE

The proposed Project will involve construction of a low profile resource access road connecting First Mining's Hope Brook mineral exploration property to the Burgeo highway, Highway 480, Figure 1.1. The road will intersect with Highway 480 at UTM coordinates 5315631N 451739E NAD 83 Zone 21, approximately 48 km north of the Town of Burgeo. The road will be approximately 58 km in length with a 20 m cleared right of way and a 5 m wide driving surface. The road is intended to permit light to intermediate size vehicle access to the Hope Brook property to support mineral exploration activities to be conducted by First Mining, and will be maintained as needed to provide such access when required. The road is not intended to be maintained for year round, full time access.

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### 2.1 Project Purpose, Rationale and Need

First Mining has utilized existing air and sea transportation infrastructure at the Hope Brook site to complete early exploration and site preparation work in 2017 and will continue to use this infrastructure for access in 2018. These existing alternatives for access pose a significant constraint on transport of employees and materials on a regular schedule, and can pose serious health and safety risks in the event of a need to respond to a medical emergency in a timely manner. Sea conditions can pose a significant risk to sea transport at times, and any landing strip, including the existing landing strip, is subject to serious cross-winds that also pose serious risks for regular plane ferry service. The proposed road will provide connection of the Hope Brook site to Highway 480 and the provincial road network, allowing safe and timely transportation for staff and materials.

The proposed road is intended to support mineral exploration activities in 2019, and beyond, by allowing light and intermediate size vehicles to gain access to First Mining's Hope Brook property from the provincial road network. The road is not intended, or designed, to support larger sized trucks and transport vehicles that would be required for any future mining development at the Hope Brook property, but has the potential to be upgraded for that purpose if required.

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### 2.2 Project Planning and Alternatives

A guiding principle in selecting the proposed road route was to avoid crossing the three main scheduled rivers (Grandy Brook, the brooks flowing into Connoire Bay and Couteau Brook) between the Hope Brook mineral exploration property and the Burgeo Highway. Additional considerations included the cost of constructing expensive elevated bridges if a shorter direct route was followed, and avoidance of steep slopes that would be prone to erosion.

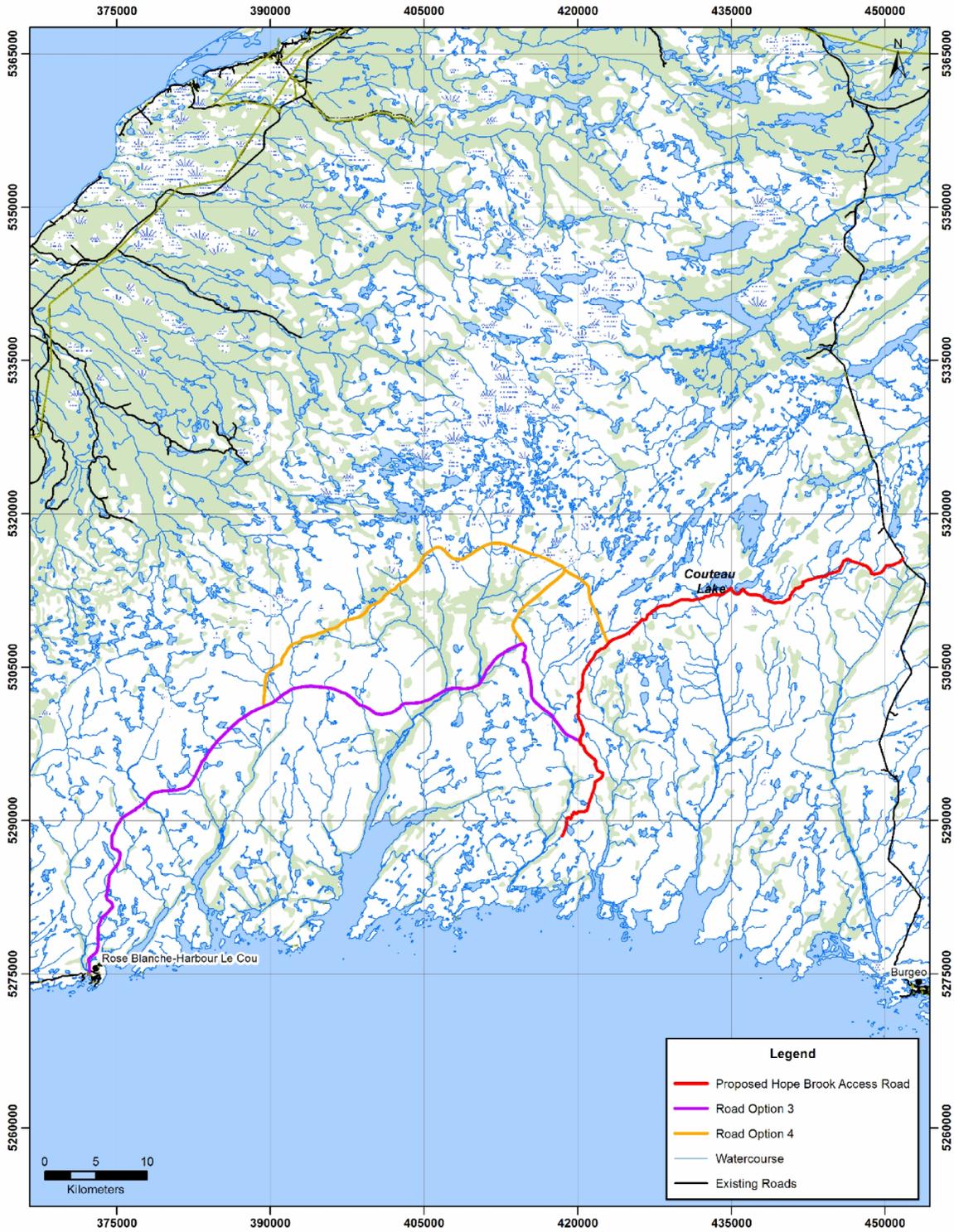
The west and south sections of the route that was selected for the proposed access road follow very close to the drainage divide between Cinq-Cerf Brook and Couteau Brook, and the drainage divide between the north flowing rivers and streams and the south flowing rivers and streams. In the northern section, to the intersection with the Burgeo Highway the route follows, where possible, the north-south

drainage divide on the high ground. The drainage divide route increases the length of the road by approximately 20 to 25 km when compared to a direct east-west trending route to the Burgeo Highway that would follow, or be close to, the existing power transmission line right-of-way. However, the potential environmental effects of the direct route, related to clearing forest cover for a right-of-way in the river valleys, and crossing scheduled salmon rivers, are considered to be much greater than the drainage divide route.

First Mining also looked at potential alternative access road routes that would connect the Hope Brook mineral exploration property to the provincial road network from Highway 470 to the east of the Hope Brook property, Figure 2.1. However, the alternative access road routes from Highway 470 were determined to be substantially longer than the proposed route and involve a greater number of water course crossings.

Overall, the proposed access road route was determined to have fewer significant water course crossings, no scheduled salmon river crossings, and greater avoidance of rough terrain. The proposed route also provides proximity to aggregate road building material sources for potential use on road construction. These factors indicate the potential for minimizing the environmental disturbance, enhancing the constructability, and reducing the potential cost of the proposed access road route versus the alternatives.

Figure 2.1 Proposed Access Road Route and Alternative Access Road Routes



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## 2.3 Project Components and Lay-out

The proposed access road is designed to accommodate light to intermediate vehicle traffic and is planned as a five metre wide gravel surface road which will be equivalent to a Class C resource access road with a maximum grade of 10 degrees. For approximately 55 km of the proposed 58 km road route this can be achieved with placement of geotextile directly onto the native vegetative and exposed gravel surfaces as a base for the road. Four sections have been identified, with a combined length of approximately two to three kilometres, where grade conditions will require using standard cut and fill road construction techniques due to the need to construct switchbacks on the steeper slopes.

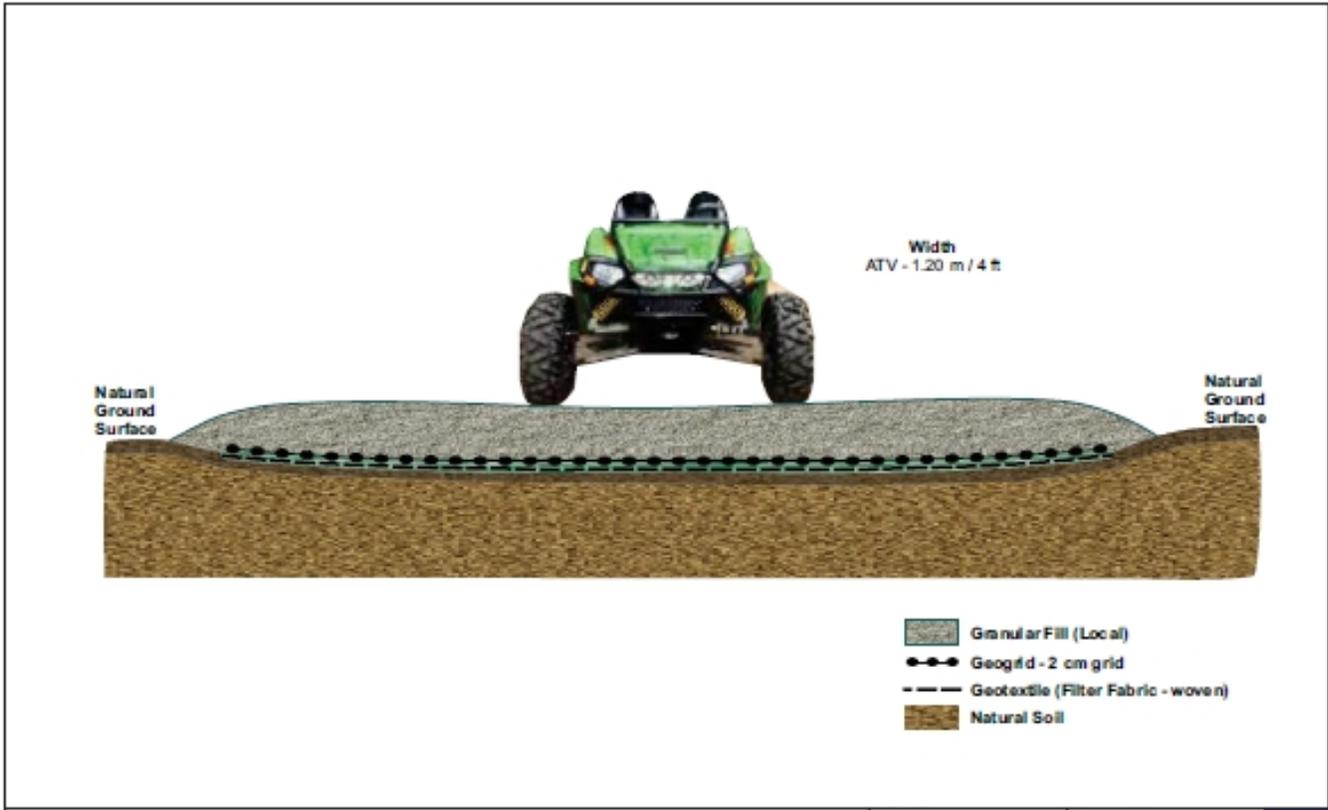
As the proposed route generally follows the drainage divide between north flowing rivers and streams and south flowing rivers and streams, most water courses that will be crossed by the proposed road will have relatively small drainage basins. Mapping of the proposed access road route at 1:25,000 scale is provided in Appendix B. Standard culvert crossings are proposed at the majority of water course crossings identified in the preliminary road design. A spanning Bailey type bridge crossing is identified for one stream crossing downstream of Couteau Lake, subject to regulatory approvals.

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### 2.3.1 Proposed Road Design

Approximately 55 km of the proposed 58 km road route will be constructed by placing a layer of permeable geotextile fabric and a layer of geogrid (with 2.5 cm grids) directly on the wet or dry grasslands and then placing a layer of fill on top of the geotextile/geogrid, Figure 2.2. Burrow material will be screened and the larger rock fragments, in the 10 cm to 20 cm size, will be used to fill the small surface depressions below the geotextile and provide a more level surface for the fill layer. The surface of the road will be sloped approximately 3 degrees to ensure drainage of surface water. Curves on the road and on the switch-backs will be sized and angled to accommodate the turning lengths of the proposed truck traffic.

**Figure 2.2 Schematic Cross-Section of Proposed Road Construction with an ATV for a Relative Scale**



Source: Fracflow Consultants Inc.

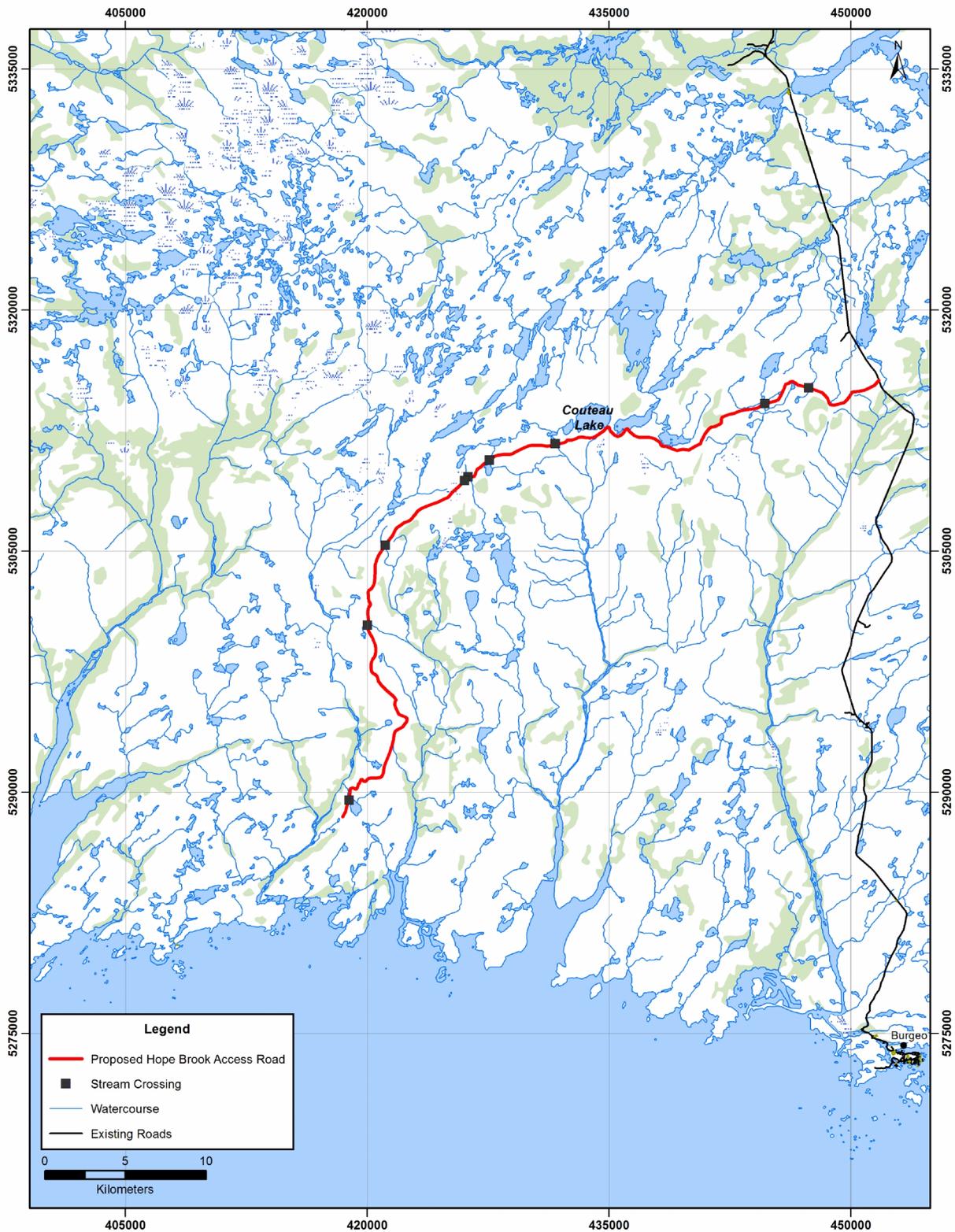
For the remaining three kilometres of road, at specific locations, grade conditions will require using standard cut and fill road construction techniques due to the need to construct switchbacks on the steeper slopes.

Drainage pipe, 10 to 20 cm in diameter, will be placed under the geotextile at all locations along the road where surface depressions or seasonal drainage indicate water movement to limit the potential for the road to impeded the movement of surface water. It is expected that drainage pipes will be placed at 50 m intervals or less.

### 2.3.2 Stream Crossings

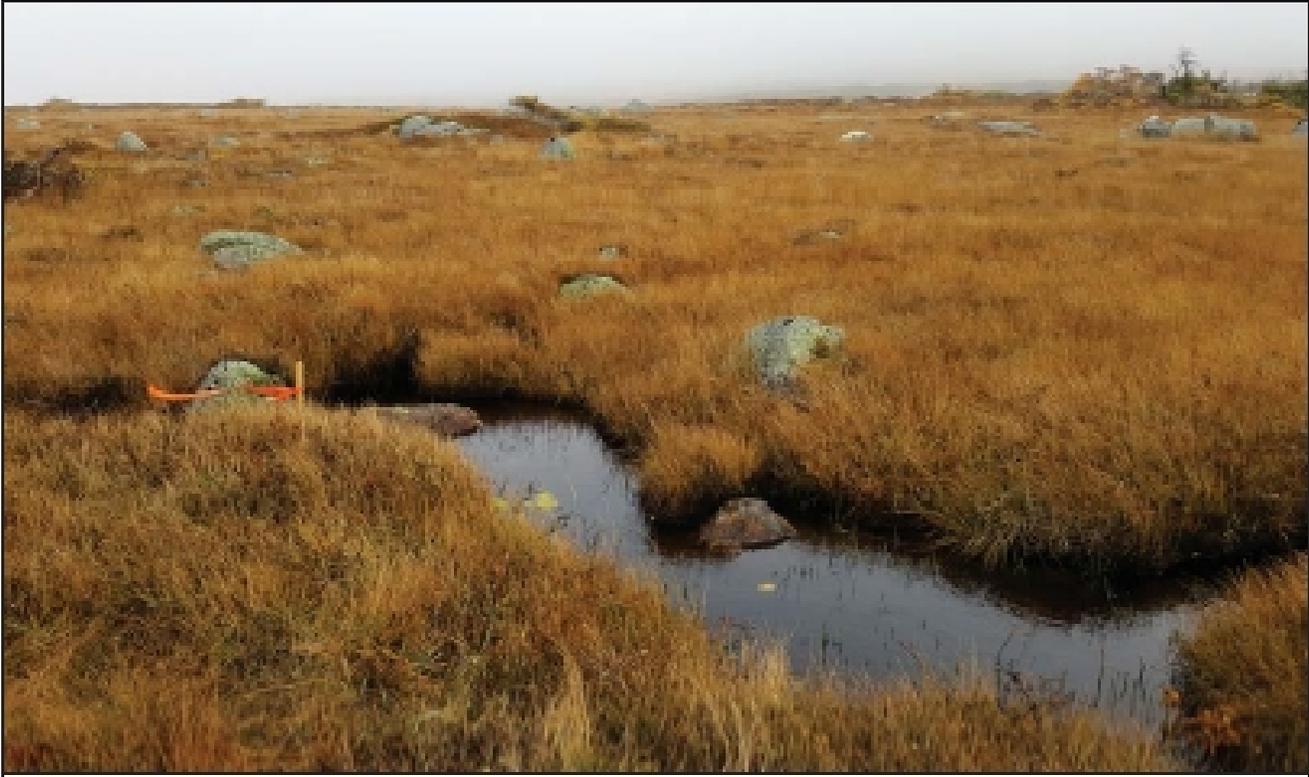
Preliminary road design has identified nine streams, appearing on 1:50,000 scale topographic maps, along the proposed access road route, Figure 2.3. The upstream catchment area, above the proposed road route, for these streams is relatively limited in most cases.

Figure 2.3 Stream Crossing Locations Identified Along Proposed Access Road Route



Typical small, intermediate and large streams along the proposed road route, based on a field assessment of the proposed road route undertaken by Fracflow Consultants Inc., are shown in Figures 2.4, 2.5 and 2.6, respectively. These will be crossed using standard single or multiple culvert installations as indicated in Figure 2.7, subject to regulatory approvals as indicated in Appendix A.

**Figure 2.4 Typical Small Stream in Grassland Area Along Proposed Road**



Source: Fracflow Consultants Inc.

**Figure 2.5 Typical Intermediate Stream Along Proposed Road Route**



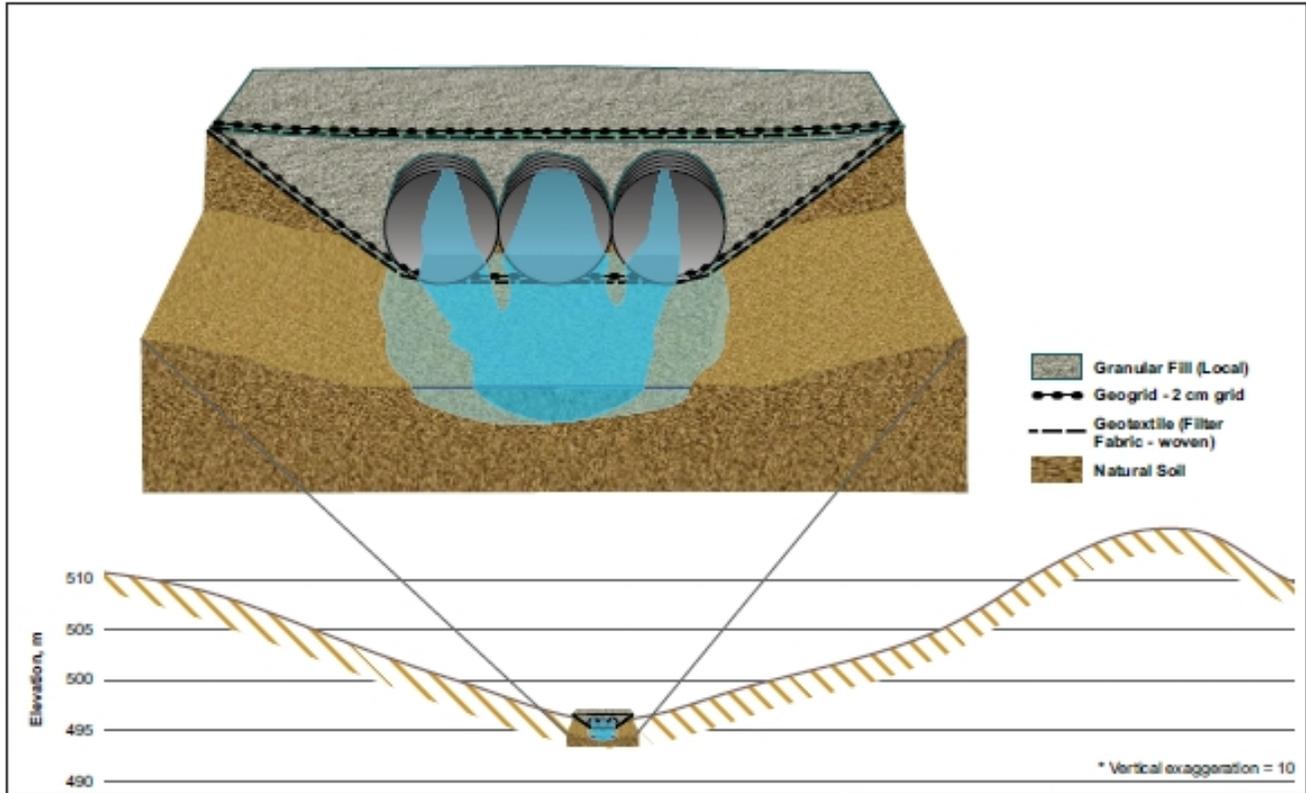
Source: Fracflow Consultant Inc.

**Figure 2.6 Typical Large Stream Along Proposed Road Route**



Source: Fracflow Consultants Inc.

**Figure 2.7 Schematic Cross-Section of a Proposed Water Crossing During Low Flow Conditions**



Source: Fracflow Consultants Inc.

It is proposed to install a spanning Bailey type bridge at one larger stream flowing from Couteau Lake. A picture of this particular stream crossing location, with a proposed Bailey bridge superimposed at the proposed crossing, is provided in Figure 2.8, subject to regulatory approvals as indicated in Appendix A.

**Figure 2.8 Larger Stream Flowing from Couteau Lake, Looking Upstream, With a Proposed Bailey Bridge Superimposed at the Proposed Crossing**



Source: Fracflow Consultants Inc.

## 2.4 Construction

A general overview of the primary activities that will be associated with the construction phase of the Project is provided in the following sections. The Project will be constructed with commonly used construction practices and in accordance with standard procedures and applicable regulatory requirements.

### 2.4.1 Construction Activities and Sequence

The proposed road is a linear development with existing access limited to Highway 480 on the east and the Hope Brook property dock and road system on the west. It is planned that construction would progress from the Highway 480 intersection and proceed to the Hope Brook mineral exploration property. Project construction will be carried out on a contractual basis with work sequencing to be planned and executed by the successful contractor subject to all contractual and permit conditions.

The road will be constructed using a geotextile and geogrid base placed directly on the ground surface. The geotextile and geogrid will be delivered in rolls that are approximately 5.0 to 5.5 metres wide and approximately 100 metres in length for ease of handling and placement. The cover material will be

obtained from the numerous moraines along the route. A linear route permit for accessing the moraines for burrow material will be sought.

A field survey of the proposed road route indicated that useable moraines will be located within 200 m of, or on, the road route. The access road to each moraine will be constructed using the same procedures that are proposed for the main access road (Fracflow Consultants Inc., 2018).

Rubber tracked mini-excavators and rubber tracked fill haulers will be the preferred equipment for extraction of burrow material and road construction. Rubber tracked Argos will be used to work ahead of the road head and select the burrow areas and flag the exact road location within the road corridor. It is expected that the final road route will be placed within 50 m of the proposed route. A minibus will be used to transport workers to the road head and materials will be delivered using lightweight trailers towed by light weight trucks.

It is expected that the work will require four to five mini-excavators and four to six fill haulers. Approximately two to three service trucks and trailers will be utilized to transport culverts, pipes, geotextile/geogrid and other materials. Refueling of equipment will take place in a spill protected location. A small excavator will be utilized in the areas that require relocating large boulders and constructing switch-backs.

Based on a five metre wide road with a 0.60 metre thick fill layer, each metre of road length will require approximately three cubic metres of burrow material. Additional material, at an estimated average of one cubic metre per metre, will be required to fill various depressions and dry holes along the road route.

The approach envisioned is to construct the road using two base camp locations. The first base camp, consisting of mobile trailers, showers, bathrooms and cooking/eating facilities plus limited office space would be established in the existing roadside gravel pit west of the Burgeo Highway at the starting point for the road. This quarry would serve to provide the lay-down area for equipment and materials.

The Burgeo Road base camp is expected to service the first 25 km of road construction with travel back and forth from the end of the road to the base camp at the start and end of the 10 to 12 hour working day. A mobile kitchen and portable toilets will be used to support the road-head staff for lunch and other breaks.

Once the first 25 km has been constructed, the base camp would be relocated to the Couteau Lake area and used to support work on 20 to 25 km of the remainder of the road. The second base camp will be located on a dry moraine. It is expected that the final section of the road will be supported from the existing base camp at the Hope Brook mineral exploration property.

All waste materials will be containerized and removed from the base camps by a local contractor on a one to two day cycle and delivered to the Burgeo municipal landfill. Each base camp will be surrounded by a snow fence to ensure that any material that is accidentally blown away by wind will be captured by the snow fence. There will be a strict prohibition on feeding or interacting with animals and the camp will be both a dry camp and a gun-free camp.

Preliminary information indicates that the proposed road route falls within, or adjacent to, a portion of the range of the La Poile caribou herd which has historically utilized this region during the biologically sensitive wintering, calving, and post-calving periods. Road construction will be staged to avoid construction activities in the middle 20 to 25 km section during the caribou calving and post-calving periods. Work on this middle section will be planned to be conducted during late August to early November.

#### 2.4.2 Construction Workforce

Project construction will be carried out on a contractual basis, with workers hired at the discretion of the Contractor and in accordance with its own hiring practices and policies. It is expected that the actual road construction will require approximately 12 to 13 operators and labourers, support staff and supervisory staff. Once construction is completed, the facility will continue to be maintained using contractual arrangements.

An initial estimate of the Project's required construction labor force, by number, occupation and National Occupational Classification (NOC) code, is provided in Table 2.1.

**Table 2.1 Occupations Likely to be Represented in the Construction Work Force**

Project Phase	Number (Approximate)	Occupation	National Occupational Classification (NOC)
Construction	2	Supervisor / Foreperson	NOC 7205
	13	Heavy Equipment Operators	NOC 7521
	3	Truck Drivers	NOC 7511
	13	Labourers	NOC 7611
	1	Environmental Monitor	NOC 2231

#### 2.5 Operation and Maintenance

The road is intended to permit light and intermediate vehicle access to the Hope Brook property to support mineral exploration activities to be conducted by First Mining and will be maintained as needed to provide such access when required. Although the road will remain open for use throughout its life, it is not intended to be maintained for year round, full time access, but will be used as needed to support planned exploration activities.

Road maintenance should normally be limited to occasional placement and grading of surface topping material to level the surface and eliminate pot holes, ruts and protruding stones. Culverts will be inspected on an annual basis and any obstructions to flows will be removed and evidence of erosion repaired. Any areas where the road surface or culverts are damaged by storm events exceeding design criteria, or for any other reason, shall be repaired as required.

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## 2.6 Project Schedule and Cost Estimate

Following detailed and on-going engineering design and planning, the current Project schedule is for road construction to commence once appropriate government and Company approvals are in place and be completed in 2018.

The estimated capital cost of the overall Project, based on the current stage of engineering design and planning, is approximately \$11,000,000.

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## 2.7 Project Documents

Apart from this EA Registration, no other EA-related documents have been produced by First Mining in relation to this Project.

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## 2.8 Environmental Management and Protection

The number and diversity of environmental challenges facing large companies and their development projects and operations require a structured and consistent management approach.

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### 2.8.1 Environmental Protection Planning

Environmental protection planning is an integral part of construction, operations and maintenance programs. An Environmental Protection Plan (EPP) is an important tool for consolidating environmental information in a format that provides sufficient detail for the implementation of environmental protection measures in the field during construction. An EPP provides concise instructions to personnel regarding protection procedures and descriptions of techniques to reduce potential environmental effects associated with any construction activity. The main objectives are to:

- Consolidate information for planning;
- Ensure that environmental standards are current and complied with;
- Provide details of corporate commitments to environmental protection and planning; and
- Provide guidelines for field activities and decision-making on environmental issues relevant to construction, operations and maintenance activities.

A project-specific EPP will be prepared and implemented by the selected Contractor(s) for this Project's construction phase. The EPP will be a field-useable document, addressing provisions that will avoid or reduce environmental effects which may be associated with construction. As appropriate, the EPP will

include items relating to work in or near water, earth work and drainage water control, contingency plans for unplanned events such as spills, rehabilitation and compliance monitoring, and others.

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### 2.8.2 Safety, Health and Environmental Emergency Response Plan

In the construction, operation and maintenance of any development project, an accidental release or other unplanned event is an unlikely, but unfortunately possible, event. Safety, Health and Environmental Emergency Response Plans (SHERPs) are intended to identify responsibilities in the event of an unplanned incident, including the accidental release of fuel or other hazardous material, on-site or during transportation, and to provide the information required for the effective response and reporting of such an incident. First Mining will conform to both provincial and federal legislation with the intent of meeting both its legal and corporate responsibilities.

The establishment and maintenance of emergency response procedures addresses the:

- Protection and maintenance of human health and safety;
- Identification of the potential for accidents and emergency situations;
- Planned response to accidents and emergency situations; and
- Prevention and mitigation of potential environmental effects associated with accidents and emergency situations.

A site/activity-specific SHERP will be prepared and implemented for the Project. The Project-specific SHERP will address: roles and responsibilities, personal protective equipment, materials storage, driving safety, working at heights, working near or over water, emergency response communications, spill response, personnel injury response, search and rescue, fire response, and vehicle / equipment accidents.

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## 2.9 Environmental Permits and Approvals

In addition to approval under the provincial EA process, the Project will also require a number of other provincial and federal permits and authorizations. First Mining is committed to obtaining, and complying with the conditions of these required permits and approvals during Project construction and operations, and will require the same of any and all contractors that are involved in this Project.

A number of key environmental permits and approvals that may be required in relation to the Project include those listed in Appendix A.

### 3.0 ENVIRONMENTAL SETTING AND CONTEXT

This Chapter provides an overview of the existing environmental setting for the proposed Project, including a description of relevant components of the natural and socioeconomic environments.

#### 3.1 Natural Environment

The proposed Project site is located in southwestern Newfoundland. The proposed access road will intersect with the Burgeo highway, Highway 480, approximately 45 km north of the community of Burgeo and proceeds in a general southwesterly direction for approximately 29 km and then southerly for approximately 29 km to intersect with the existing road network at the former Hope Brook mine property.

The following sections provide a general description of the existing natural environments in the area based on existing and available information. The objective is to present an overview summary of the environmental setting and context for the Project.

##### 3.1.1 Climate, Air Quality and Noise

The climate of southwestern coastal Newfoundland is strongly affected by proximity of the Atlantic Ocean, which exerts a moderating effect with respect to temperature extremes. However, dramatic seasonal variations occur, with winter conditions of freezing temperatures and moderate to heavy snowfall expected from late December through late March. Spring and fall seasons are cool, with frequent periods of rain and frequent heavy fog. Summer conditions typically prevail from July through early September. Inland climate conditions are similar, but with slightly lower average monthly temperatures and slightly lower rainfall and annual precipitation rates. A summary of key climatic characteristics from the coastal Isle Aux Morts Weather Station, located approximately 70 km west of the Hope Brook area, and the inland Burnt Pond Weather Station, located approximately 70 km northeast of the Hope Brook area, and 30 km east of Highway 480, are presented in Tables 3.1 and 3.2, respectively.

**Table 3.1 Climate Normals for Isle Aux Morts (1981-2010)**

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Mean Temperature (°C)	-5.0	-5.8	-3.0	1.5	5.9	10.1	14.0	15.8	12.4	7.5	2.9	-1.5	4.6
Precipitation (mm)	163.2	137.5	124.1	138.5	118.0	114.4	119.6	115.7	141.4	150.0	154.4	176.5	1,653.1
Rainfall (mm)	66.7	61.5	78.3	123.1	116.4	114.4	119.6	115.7	141.4	149.8	138.5	102.1	1327.3
Snowfall (cm)	96.6	76.0	45.9	15.3	1.6	0.0	0.0	0.0	0.0	0.2	15.8	74.4	325.8

Source: Environment Canada (2017)

**Table 3.2 Climate Normals for Burnt Pond (1981-2010)**

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Mean Temperature (°C)	-9.7	-10.5	-6.8	-0.5	5.5	10.6	14.6	14.5	10.2	4.9	-0.4	-6.1	2.2
Precipitation (mm)	153.6	121.0	118.0	101.7	99.8	100.1	102.3	116.5	111.0	125.1	146.2	139.2	1,434.4
Rainfall (mm)	67.7	49.8	51.8	74.0	96.6	99.9	102.3	116.5	111.0	122.7	121.9	74.0	1087.9
Snowfall (cm)	92.8	74.8	65.5	27.5	3.4	0.3	0.0	0.0	0.0	2.1	24.8	71.3	362.4

Source: Environment Canada (2017)

Overall, the mean monthly temperature ranges from 4.6°C on the coast to 2.2°C inland, and from a low of -10.5°C in February inland to a high of 15.8°C in August on the coast. The area receives fairly consistent precipitation throughout the year, averaging 1,653.1 mm annually on the coast and 1,434.4 mm annually inland. The total annual snowfall is 325.8 cm on the coast and 362.4 cm inland, generally occurring between November and April.

The former Hope Brook mine has been inactive since 1997 and there have been no other industrial developments with potential for air quality or noise impacts in the immediate area.

### 3.1.2 Geology and Topography

Topography of the Hope Brook property contains two distinct physiographic elevation domains that correspond to differing underlying bedrock types (Mercator Geological Services, 2015). The first is characterized by gently rolling land having predominantly tundra attributes that rise from sea level to an elevation of approximately 150 m above sea level. The second topographic domain rises abruptly from the first to reach elevations of approximately 400 m. Generally the area has a gradual increase in elevation occurring from south to north. Barren land or tundra conditions characterize much of the Hope Broke area, with irregularly developed coniferous forest cover consisting mostly of black spruce and fir being discontinuously present in river valley bottom areas and along protected side valleys and slopes. Substantial areas of boggy ground with associated peat development are also present, as are stunted growth tuckamore. Barren land expanses are characterized by lichen and moss cover interspersed with grasses and low bushes of various types. Outcropping bedrock is extensively developed in many areas, particularly at higher elevations and in barren land settings. Well developed soil profiles are present along valleys and where glacial overburden is comprised of thicker till sections, but limited development of only organic layers is also common (Mercator Geological Services, 2015).

The northern section of the proposed road route is characterized by shallow to moderate glacial deposits over bedrock with substantial areas of boggy ground and interspersed coniferous forest cover.

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### 3.1.3 Vegetation and Soils

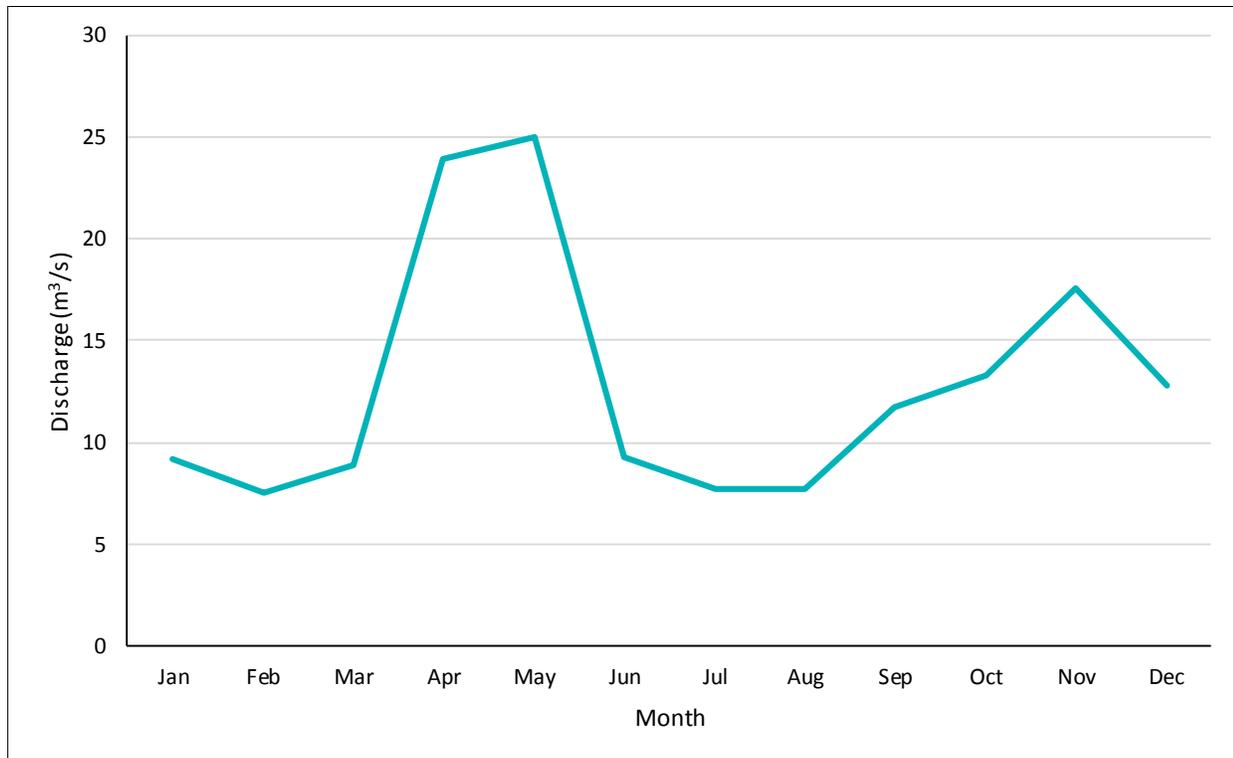
The Project Area occurs within the Southern Long Range Barrens sub-region of the more widely distributed Long Range Barrens Ecoregion (Canada Committee on Ecological Land Classification 1989). The landscape within this ecoregion is primarily windswept barrens with elevations ranging from 200 m to 650 m above sea level. The climate of this region is characterized by cool summers and cold winters with abundant snowfall. Mean annual temperature is approximately 4°C (ranging from 12°C in summer to -4°C in winter) and mean annual precipitation is 1650 mm. Winds are particularly high in this subregion (gusts >100 km/h frequently occur) and this has influenced the composition and structure of vegetation communities. Ground cover in this ecoregion is dominated by open heath (*Kalmia angustifolia*) and peat bog interspersed with patches of stunted balsam fir (*Abies balsamea*), black spruce (*Picea mariana*) and eastern larch (*Larix laricina*). Ericaceous heath species on exposed knolls and summits primarily include diapensia (*diapensia lapponica*), pink crowberry (*Empetrum eamesii*), and tundra bilberry (*Vaccinium uliginosa*) (Meades 1990). Densely stocked forests dominated by balsam fir and black spruce are limited to sheltered river valleys and also include a smaller component of white birch (*Betula papyrifera*) and other hardwoods.

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### 3.1.4 Water Resources

The Water Survey of Canada maintained a hydrometric station on Grandy Brook from 1985 to 2015. The proposed access road crosses through the bog area that makes up the headwaters of Grandy Brook. The hydrograph shows a typical flow regime with high flows associated with the Spring freshet in April and May and low flows throughout July and August, Figure 3.1. The mean annual discharge from 1985 to 2015 was approximately 13m<sup>3</sup>/s.

**Figure 3.1 Mean monthly discharge in Grandy Brook, 1985-2015 (Station# 02ZC002)**



**3.1.5 Fish and Fish Habitat**

As indicated in Section 2.2, the proposed road route avoids crossing the main river systems in the area and follows close to the drainage divide between the north flowing rivers and streams and the south flowing rivers and streams along its route. The majority of the aquatic habitat located in close proximity to the proposed access road is made up of small bog ponds. There may be isolated areas of flowing water in the construction area, however, this habitat would likely be limited to bog drainage, typically characterized by slow, deep channels with mud substrates.

Nine streams, appearing on 1:50,000 scale topographic maps, have been identified along the proposed access road route, Figure 2.3. The upstream catchment area for these streams, above the proposed road route, is relatively limited.

Throughout the immediate project area, species that are likely to be present are brook trout (*Salvelinus fontinalis*) and threespine stickleback (*Gasterosteus aculeatus*). Atlantic salmon (*Salmo salar*), American eel (*Anguilla rostrata*) and rainbow smelt (*Osmerus mordax*) are present in scheduled salmon rivers to the south of the proposed road route (Porter et al. 1974). Porter et al. (1974) also listed alewife (*Alosa pseudoharengus*) as present in Grandy River. A summary of the life histories of each key species is presented below in Table 3.3.

**Table 3.3 Fish species known to occur in proximity to proposed access road**

Common Name	Scientific Name	Biological/Habitat Details
Alewife	<i>Alosa pseudoharengus</i>	<p>Typical Habitat</p> <ul style="list-style-type: none"> <li>• Preferred temperature: 3-34°C</li> <li>• Preferred depth: 0-5m</li> <li>• Preferred substrate: gravel, sand, mud</li> </ul> <p>Biology and Ecology</p> <ul style="list-style-type: none"> <li>• Primarily a pelagic, anadromous species</li> <li>• Landlocked populations are known to occur</li> <li>• Spawning occurs in slow moving streams, where juveniles may remain for some time.</li> </ul> <p>Recreational/Commercial Value</p> <ul style="list-style-type: none"> <li>• Commercial fishery in the Maritimes</li> </ul>
American eel	<i>Anguilla rostrata</i>	<p>Typical Habitat</p> <ul style="list-style-type: none"> <li>• Preferred temperature: 0-19°C</li> <li>• Preferred depth: typically &lt;1m</li> <li>• Preferred substrate: boulder, rubble, gravel, sand, silt and mud</li> </ul> <p>Biology and Ecology</p> <ul style="list-style-type: none"> <li>• Catadromous species which spawn in the Sargasso Sea</li> <li>• Juvenile eels typically reach Canadian waters 8-12 months after hatching</li> <li>• Seaward migrations of sexually mature adults occur in the fall</li> </ul> <p>Recreational/Commercial Value</p> <ul style="list-style-type: none"> <li>• Recreational fishery</li> <li>• Commercial fishery</li> </ul>
Atlantic salmon	<i>Salmo salar</i>	<p>Typical Habitat</p> <ul style="list-style-type: none"> <li>• Preferred temperature: 8-16°C</li> <li>• Preferred depth: Variable</li> <li>• Preferred substrate: gravel, cobble, boulder</li> </ul> <p>Biology and Ecology</p> <ul style="list-style-type: none"> <li>• Distributed throughout Newfoundland and Labrador</li> <li>• Occurs as landlocked (Ouananiche) and anadromous life histories</li> <li>• Spawn in clean, well aerated, gravel bottom riffle sections of stream</li> <li>• Diet depends on the size and habitat of fish, as well as season</li> <li>• Juvenile anadromous salmon remain in natal watersheds for 2-4 years</li> <li>• Adult salmon generally remain at sea for 1-3 years before returning to their natal stream to spawn</li> </ul>

Common Name	Scientific Name	Biological/Habitat Details
		<p>Recreational/Commercial Value</p> <ul style="list-style-type: none"> <li>• Recreational fishery</li> <li>• There has not been a commercial salmon fishery in Newfoundland since 1997</li> </ul>
Brook trout	<i>Salvelinus fontinalis</i>	<p>Typical Habitat</p> <ul style="list-style-type: none"> <li>• Preferred temperature: 11-16°C</li> <li>• Preferred depth: 0.06-0.90 m</li> <li>• Preferred substrate: gravel, cobble, boulder</li> </ul> <p>Biology and Ecology</p> <ul style="list-style-type: none"> <li>• Inhabits lakes and rivers throughout Newfoundland and Labrador</li> <li>• Can be landlocked or anadromous</li> <li>• Feed mainly on aquatic and terrestrial insects and fish</li> <li>• Can hybridize with other salmonid species</li> </ul> <p>Recreational/Commercial Value</p> <ul style="list-style-type: none"> <li>• Recreational fishery</li> <li>• No commercial fishery in Newfoundland</li> </ul>
Rainbow smelt	<i>Osmerus mordax</i>	<p>Typical Habitat</p> <ul style="list-style-type: none"> <li>• Preferred temperature: 2-18°C</li> <li>• Preferred depth: 0-2m</li> <li>• Preferred substrate: cobble, gravel, sand</li> </ul> <p>Biology and Ecology</p> <ul style="list-style-type: none"> <li>• Schooling fish species found in mid water column and surface areas of estuaries and lakes</li> <li>• Anadromous species which migrate upriver during the spring to spawn</li> <li>• Not often found inhabiting riverine areas, apart from during migrations</li> </ul> <p>Recreational/Commercial Value</p> <ul style="list-style-type: none"> <li>• Recreational fishery</li> <li>• Important prey species for larger commercially and recreationally important species.</li> </ul>
Threespine stickleback	<i>Gasterosteus aculeatus</i>	<p>Typical Habitat</p> <ul style="list-style-type: none"> <li>• Preferred temperature: 9-12°C</li> <li>• Preferred depth: variable, generally &lt;1m</li> <li>• Preferred substrate: within or near vegetation</li> </ul> <p>Biology and Ecology</p> <ul style="list-style-type: none"> <li>• Common throughout Newfoundland and Labrador, in fresh, brackish and marine environments</li> <li>• Maximum lifespan is typically 2-2.5 years</li> </ul>

Common Name	Scientific Name	Biological/Habitat Details
		Recreational/Commercial Value <ul style="list-style-type: none"> <li>• Limited; may be a food source for larger recreational / commercial species</li> </ul>

Source: Grant and Lee (2004); DFO (2012)

### 3.1.5 Wildlife

Given the remoteness and inaccessibility of much of the Project Area there have been few structured wildlife surveys conducted in this region. Therefore, most inference on the assemblage of birds and mammals that occur along the proposed access road is based on their known occurrence in similar habitats at a larger spatial scale. Data sources include roadside breeding bird surveys (BBS), records from the Atlantic Canada Conservation Data Centre, species distribution maps (Newfoundland and Labrador Wildlife Division), and observations from the general public.

Long term data collected along the Burgeo Highway BBS route (Environment Canada 2014) indicates that a number of taxonomic and functional groups occur within the general region including waterfowl, shorebirds, wood warblers, birds of prey, sparrows and finches. Collectively, these species inhabit all available terrestrial and wetland habitats including dense coniferous and mixed-wood forest, open spruce woodland, upland barrens, fens, bogs, and both inland and coastal shorelines. Common species known to breed throughout the area include American Black Duck (*Anas rubripes*), Canada Goose (*Branta canadensis*), Greater Yellowlegs (*Tringa melanoleuca*), Spotted Sandpiper (*Actitis macularius*), Yellow-rumped warbler (*Dendroica coronata*), Blackpoll Warbler (*Dendroica striata*), Osprey (*Pandion haliaetus*), White-throated Sparrow (*Zonotrichia albicollis*) and Pine Grosbeak (*Pinicola enucleator*). Less common species that have been documented to occur in this region, but for which demographic information is lacking, include Gray-cheeked Thrush (*Catharus minimus*), Northern hawk-owl (*Surnia ulula*), Blackburnian Warbler (*Dendroica fusca*), and Least Sandpiper (*Calidris minutilla*). Other species that primarily utilize the study area during migration include Common Redpoll (*Acanthis flammea*), Snow Bunting (*Plectrophenax nivalis*), and American Golden Plover (*Pluvialis dominica*) and others. Overall, the assemblage of bird species found in the immediate study area is reflective of community composition that has been more extensively described for this region of Newfoundland.

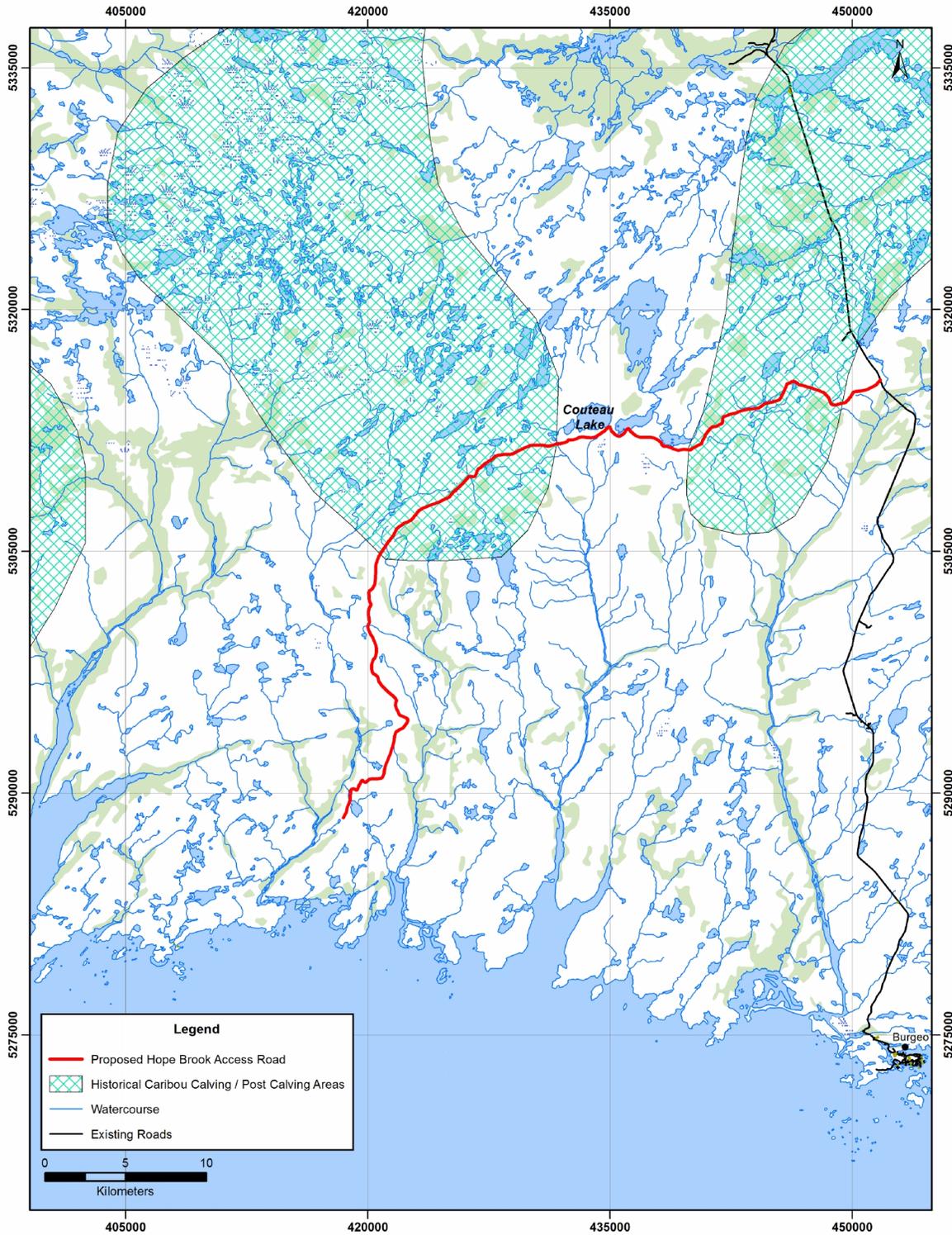
It should be noted that all species of birds in the Project area, except for those species that were introduced to North America, are protected by either the federal *Migratory Birds Convention Act* (MBCA) or the provincial *Wild Life Act*. The MBCA governs most of these species, both migratory and non-migratory. Some of these species are game birds whose harvest is regulated by this legislation (i.e., waterfowl, cranes, rails, coots, shorebirds, murre, and doves). This Act protects individuals from harm and harassment, and also protects their active nests (i.e., those containing viable eggs or nestlings). The remaining species (cormorants, pelicans, grouse, ptarmigan, hawks, owls, eagles, falcons, kingfishers, crows, jays, and blackbirds), receive the same form of protection from the provincial *Wild Life Act*. This

Act also governs the harvest of upland game birds (i.e., grouse and ptarmigan). Neither of these Acts protect habitat for these species. Additional legislation for species at risk (the federal *Species at Risk Act* (SARA) and the *Newfoundland and Labrador Endangered Species Act*; NL ESA) is described below.

Knowledge of the mammalian species that occur in the proposed Project Area is limited to an understanding of their general distribution in south-western Newfoundland and their known association with upland barrens and patchy forest cover. Common species expected to utilize the Project Area include moose (*Alces alces*), woodland caribou (*Rangifer tarandus*), black bear (*Ursus americanus*), red fox (*Vulpes vulpes*), eastern coyote (*Canis latrans*), short-tailed weasel (*Mustela erminea*), snowshoe hare (*Lepus americanus*), red squirrel (*Tamiasciurus hudsonicus*), and meadow vole (*Microtus pennsylvanicus*). Newfoundland marten (*Martes americana atrata*) designated as *Threatened* under the NL ESA are not expected to occur in this region given their strong association with extensively forested landscapes (Gosse et al. 2005, Hearn 2007). The occurrence of two federally listed bat species (little brown myotis (*Myotis lucifugus*) and northern myotis (*Myotis septentrionalis*) in the Project Area is unknown. Though many of these species may occur in the vicinity of the Project Area their densities are expected to vary both seasonally and annually depending on habitat and climatic conditions.

The proposed Project Area includes a portion of the area historically utilized during the biologically critical wintering, calving, and post-calving periods by the La Poile caribou herd (Morgan and Doucet. 2007), Figure 3.2. Woodland caribou (*Rangifer tarandus caribou*) are native to insular Newfoundland and have important ecological, cultural, and socio-economic value. As top-level herbivores, caribou influence the composition and structure of plant communities and function as prey species for multiple carnivores and scavengers. From a cultural perspective, caribou have long been utilized by aboriginals as a source of food and clothing and for ceremonial and spiritual purposes. Furthermore, caribou are an important big-game species for both residents and non-residents and provide economic benefits through the outfitting industry.

**Figure 3.2 Core Calving/Post-Calving Habitat Used by the La Poile Caribou Herd (South-West Newfoundland) Based on Satellite Data From GPS Collared Individuals (Morgan and Doucet 2007)**



Consistent with the synchronous decline in abundance that has been documented for many of the caribou populations across the island (Department of Environment and Conservation 2015), the La Poile herd experienced a decline in numbers beginning in the 1990's. Following considerable scientific research, this island-wide decline is understood to have been the consequence of density-dependent factors. That is, caribou populations began to exhibit characteristics of high population density including:

- less predictability in the use of 'traditional' space (including calving areas),
- a less selective diet and the inclusion of poorer-quality food,
- a decline in birth rates, low calf survival and recruitment into the population, and
- smaller body size (Department of Environment and Conservation 2015).

Some of these biological indicators have since improved (Schaefer and Mahoney 2013, Weir et al. 2014) though calf survival and recruitment have not yet recovered to the point where populations (including the La Poile herd) are considered stable (Morrison et al. 2012).

The effect of mining development on the La Poile caribou herd was studied during the initial construction phase of the Hope Brook Gold Mine by Weir et al. (2007). These authors evaluated the impact of mining on the distribution of caribou during three phases of activity (pre-disturbance, construction, and mining/milling operation). General findings from this research revealed an increase in caribou abundance with increasing distance from mining activity and that this impact was most apparent during the pre-calving and calving periods.

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### 3.1.7 Listed and Rare Species

There are twenty-one species of birds and mammals that are listed on Schedule 1 of the federal Species at Risk Act and/or the Newfoundland and Labrador Endangered Species Act that have the potential to occur within the immediate Project Area and surrounding landscape. However, the probability of occurrence varies depending on the species considered, their habitat requirements and their general abundance throughout this region of insular Newfoundland. For example, Piping Plovers (*Charadrius melodus melodus*) are restricted to sandy coastal beaches during the breeding season (Calvert et al. 2006) and Ivory Gulls (*Pagophila eburnea*) irregularly overwinter along coastal Newfoundland during years of heavy pack ice (Stenhouse 2004); consequently, neither species are expected to occur in the Project Area. Other species that are more likely to occur in the Project Area given the availability of suitability nesting or foraging habitat include Short-eared Owl (*Asio flammeus*), Rusty Blackbird (*Euphagus carolinus*), and Gray-cheeked Thrush (*Catharus minimus minimus*). Species for which there is insufficient data to assess their occurrence in the Project Area include little brown bats (*Myotis lucifugus*), northern bats (*Myotis septentrionalis*), Red Crossbill (*Percna curvirostra*) and Common Nighthawk (*Chordeiles minor*). Table 3.4 provides a complete list of these listed species along with their probability of occurrence in the Project Area. As described above, the lack of comprehensive and long-term survey data limits our ability to fully assess the status of the species in the Project Area.

**Table 3.4 Species at Risk That Potentially Occur Along the Proposed Access Road Route**

Species	Scientific name	Legal designation	SAR status	Expected status in the Project Area
<b>Avifauna</b>				
Harlequin duck	<i>Histrionicus histrionicus</i>	NL ESA SARA	Vulnerable Special Concern	Not expected
Barrow's goldeneye	<i>Bucephala islandica</i>	NL ESA SARA	Vulnerable Special Concern	Not expected
Eskimo curlew	<i>Numenius borealis</i>	NL ESA SARA	Endangered	Not expected
Red knot	<i>Calidris canutus rufa</i>	NL ESA SARA	Endangered	Not expected
Piping Plover	<i>Charadrius melodus melodus</i>	NL ESA SARA	Endangered	Not expected
Ivory Gull	<i>Pagophila eburnea</i>	NL ESA SARA	Endangered	Not expected
Peregrine falcon	<i>Falco peregrinus anatum</i>	NL ESA SARA	Vulnerable Special Concern	Possible
Short-eared owl	<i>Asio flammeus</i>	NL ESA SARA	Vulnerable Special Concern	Likely
Olive-sided flycatcher	<i>Contopus cooperii</i>	NL ESA SARA	Threatened	Not expected
Gray-cheeked thrush	<i>Catharus minimus minimus</i>	NL ESA	Threatened	Possible
Rusty blackbird	<i>Euphagus carolinus</i>	NL ESA SARA	Vulnerable Special Concern	Possible
Red crossbill	<i>Loxia curvirostra</i>	NL ESA	Endangered	Not expected
Common nighthawk	<i>Chordeiles minor</i>	NL ESA SARA	Threatened	Not expected
Bobolink	<i>Dolichonyx oryzivorus</i>	NL ESA SARA	Vulnerable Threatened	Not expected
Barn swallow	<i>Hirundo rustica</i>	SARA	Threatened	Possible
Bank swallow	<i>Riparia riparia</i>	SARA	Threatened	Possible
Buff-breasted sandpiper	<i>Tryngites subruficollis</i>	SARA	Special Concern	Not expected
Chimney swift	<i>Chaetura pelagica</i>	NL ESA SARA	Threatened	Not expected

Species	Scientific name	Legal designation	SAR status	Expected status in the Project Area
<b>Mammals</b>				
Newfoundland marten	<i>Martes americana atrata</i>	SARA	Threatened	Not expected
Little brown bats	<i>Myotis lucifugus</i>	SARA	Endangered	Unknown
Northern bats	<i>Myotis septentrionalis</i>	SARA	Endangered	Unknown

### 3.1.8 Special or Sensitive Areas

The proposed Project Area does not bisect or occur adjacent to any formally designated ecological reserves, wilderness reserves or Provincial/National Parks. However, all terrestrial and wetland habitats provide breeding and foraging opportunities for wildlife species during some period of the year. In particular, riparian areas that support coniferous and deciduous growth, a structurally complex shrub layer and a rich understory support a wide range of species including many warblers, ground foraging sparrows, birds of prey, and semi-aquatic mammals (e.g. American beaver (*Castor canadensis*), river otter (*Lontra canadensis*), and muskrat (*Ondatra zibethicus*)). Insect abundance is generally high in these sheltered areas and provides a food resource for aerial insectivores including flycatchers, swallows, and waxwings. Riparian environments also provide important nesting environments for waterfowl such as Red-breasted Mergansers (*Mergus serrator*), American Black Ducks and Green-winged Teal (*Anas crecca*). Maintaining the integrity of these ecological 'hot-spots,' which are found throughout the Project area, will ensure the preservation of avian diversity.

With respect to biologically critical time periods, the breeding season is the most energetically demanding time for birds as most species are vulnerable to increased predation and nest disturbance during this life history stage. Disturbance of females from nests can expose eggs to precipitation and cool temperatures and cause clutch failure. Similarly, the disturbance of parents from nestlings can result in predation of the brood by red-squirrels, American mink, and other predators. The specific dates for the breeding season vary by species group, however the period between mid-May to mid-August would encompass the courtship, egg-laying, and chick rearing phases of most migrant species in Newfoundland. Other species including Great Horned Owls (*Bubo virginianus*) and Boreal Owls (*Aegolius funereus*) initiating breeding in March or April while cone dependent finches such as Red Crossbills can nest during most of the year if food is abundant.

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## 3.2 The Human Environment

The following sections provide an overview of the existing socioeconomic environment, including a number of anthropogenic components and activities that occur near the Project area and surrounding region, and which may potentially interact with the proposed Project.

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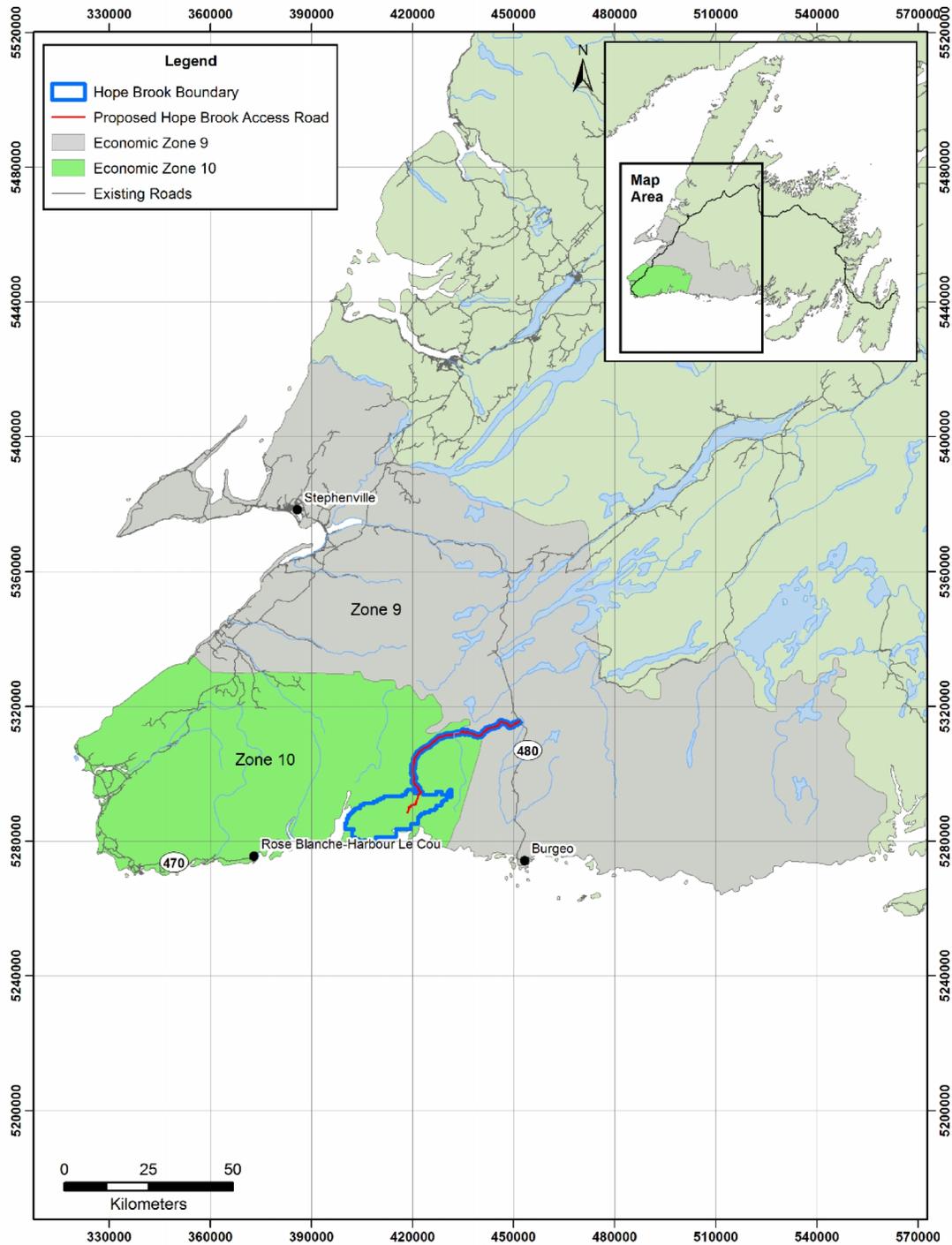
### 3.2.1 Region and Communities

The Project is located off Route 480, the Burgeo Highway, in southwestern Newfoundland. The nearest community is the Town of Burgeo, which is located at the terminus of Route 480, Figure 3.3. As Burgeo is a small community with limited service providers, it is likely that the Project would also be served through the larger Town of Stephenville, which is located near the intersection of Route 480 with the Trans Canada Highway.

The baseline information included in this section focuses on various socioeconomic components and indicators, including population, community infrastructure and services, which are described using the most current and relevant data and information available for geographic regions, including Municipalities and Regional Economic Zones, Figure 3.3, as defined below:

- *Town of Burgeo*
- *Town of Stephenville*
- *Economic Zone 9* encompasses the larger surrounding region, including Burgeo, other communities and the regional service centre of Stephenville. Although the Regional Economic Zone Boards were operationally discontinued in Newfoundland and Labrador, socioeconomic information is available based on these boundaries and they are a useful focus for the presentation and analyses of such data at the regional level.

**Figure 3.3 Municipalities and Regional Economic Zones**



**Population**

In the 2016 census, the population of Burgeo showed decline and ageing trends. The population experienced a decline of 10.7 percent since 2011, Table 3.5,. In addition, the median age was 56.4 and nearly 62 percent of the community’s population was over the age of 50 (Statistics Canada 2017).

Stephenville also experienced population decline but at a slower rate of minus 1.4 percent. The median age in Stephenville (48.6) was also lower than that of Burgeo. Many smaller communities throughout Newfoundland and Labrador are experiencing population decline, while some mid-sized towns and regional service centres are stable or growing, although by small percentages. Census data are not yet available for the economic zones. The 2011 population of Economic Zone 9 declined by -2.5 percent over the previous census period likely due to relative stability in larger centres such as Stephenville (NLSA 2017).

**Table 3.5 Population Change**

Geographic Area	Description	2006	2011	2016	% Change
Town of Burgeo	Municipality	1,607	1,464	1,307	-10.7 (2011-2016)
Town of Stephenville	Municipality	6,588	6,719	6,623	-1.4 (2011-2016)
Economic Zone 9	Includes the communities of Burgeo, Cape St. George, Gallants, Kippens, Lourdes, Port aux Port East, Port aux Port West-Aguathuna-Felix Cove, Ramea, St. George's, Stephenville, Stephenville Crossing and various unincorporated areas	21,830	21,275	na	-2.5 (2006-2011)
Source: Statistics Canada (2017); NLSA (2017)					

## Burgeo

Burgeo is made up of a group of communities including several small islands that have been connected by causeways. The area was permanently settled in the 1790s by inshore fishermen from Devon, England, at which time most people lived on Sandbanks Island. It is believed that the core of the population relocated to Burgeo as Burgeo Island offered superior shelter for fishing boats and because merchants established their businesses in the town (DTCII 2017).

Burgeo was accessible by boat only until the 146 km Route 480 was constructed in 1979 (Town of Burgeo 2016). Burgeo is the home base for a Provincial ferry service to the remote coastal communities of Ramea, Francois and Grey River (DTW 2017).

The municipality of Burgeo was incorporated in 1950. The Town provides municipal services and infrastructure to residents and businesses. This includes drinking water supply and distribution, waste water collection, a volunteer fire department and recreation facilities (Town of Burgeo 2016). The Town operates a waste disposal site that serves Burgeo, Ramea, Grey River and Francois (WRWM 2018).

Burgeo has basic services such as education and health care. Burgeo Academy All Grades School provides education, kindergarten to grade 12, a preschool program and a public library (Town of Burgeo 2016; NLSA 2017).

Burgeo is located within the Western Health Region. The Calder Health Centre in Burgeo provides primary health care and long-term care to a population of approximately 1,900 in Burgeo, Ramea, Francois and Grey River. The Centre provides emergency, acute and outpatient care as well as other services. Patients may also be referred to the Western Memorial Regional Hospital in Corner Brook for more specialized care (Western Health 2016).

Other agencies provide public services in Burgeo. An RCMP detachment is located in the community (RCMP 2018). A small craft harbour is operated by the Harbour Authority of Burgeo (DFO 2017a). A Canadian Coast Guard (CCG) vessel is based in Burgeo where it provides maritime search and rescue services (CCG 2017). The Burgeo Ground Search and Rescue Team also provides volunteer ground search and rescue services (NLSARA 2016).

## **Stephenville**

Stephenville is located on St. George's Bay on the west coast of Newfoundland near the Port aux Port Peninsula. The community was formerly known as the Acadian Village, which was named for the French-speaking people who settled in the area around 1844. The current Town of Stephenville was mainly developed along with an American Air Force Base that was constructed beginning in 1941 and closed in 1966 (Town of Stephenville 2011).

Stephenville has convenient access to transportation amenities. The Town is adjacent to the Trans Canada Highway. Stephenville airport was established as a military facility and transferred to the Stephenville Airport Corporation (SAC) in 1990. Regularly scheduled flights are offered by PAL Airlines, charter flights by Sunwing and seasonal flights by Porter and Air Saint-Pierre. The airport has a commercial fueling service (SAC 2017).

The Town of Stephenville provides various public services and infrastructure. This includes drinking water treatment and distribution, sewage collection and treatment, storm water management, a fire department and solid waste collection (Town of Stephenville 2011). Solid waste is delivered to the Bay St. George Waste Disposal Site in St. George's. The Bay St. George site also accepts construction and demolition waste (WRWM 2018).

In Stephenville, education is provided by four schools (i.e., primary, elementary, middle and high schools), an alternative program is provided for at risk individuals (PLC 2017). The Town has a public library (NLPL 2018). Post-secondary education is available through the College of the North Atlantic (CAN), which is a public college offering programs in industrial trades, business, information technology and fine arts. Programs are also available at Western College, which is a private college with courses in accounting, business, information technology, office administration, health care, social services and adult basic education. Memorial University, Marine Institute's Safety and Emergency Response Training (SERT) Centre offers fire and emergency response training and other programs (Town of Stephenville 2011). Employment services are provided by the Stephenville Service Canada Centre (SC 2017).

The Sir Thomas Roddick Hospital, a 44-bed acute care centre in Stephenville provides a range of inpatient and outpatient services to a population of approximately 24,000 in the Bay St. George area. Services

include emergency, outpatient, medical, nursing, surgery and pharmacy. Stephenville has three primary care medical clinics with clinics in other communities. Western Memorial Regional Hospital in Corner Brook is the major acute care site in the Western Region. Community-based health services and long-term care are also provided in Stephenville (Western Health 2016). Social services such as daycare facilities, family support, a women's shelter and justice services are also provided by various agencies (CEN 2018; BSGWC 2011).

Stephenville has a variety of public infrastructure. The Port of Stephenville provides year-round industrial port facilities, berthage for ships up to 385 m, pilotage, general port services, freight handling, storage, trans-shipments and a Custom Bonded Warehouse facility (POS Undated). A small craft harbour is operated by the Harbour Authority of Little Port Harmon (DFO 2017a). The Bay St. George RCMP detachment is located in Stephenville (RCMP 2018). Two Ground Search and Rescue Teams are located in the area (NLSARA Undated).

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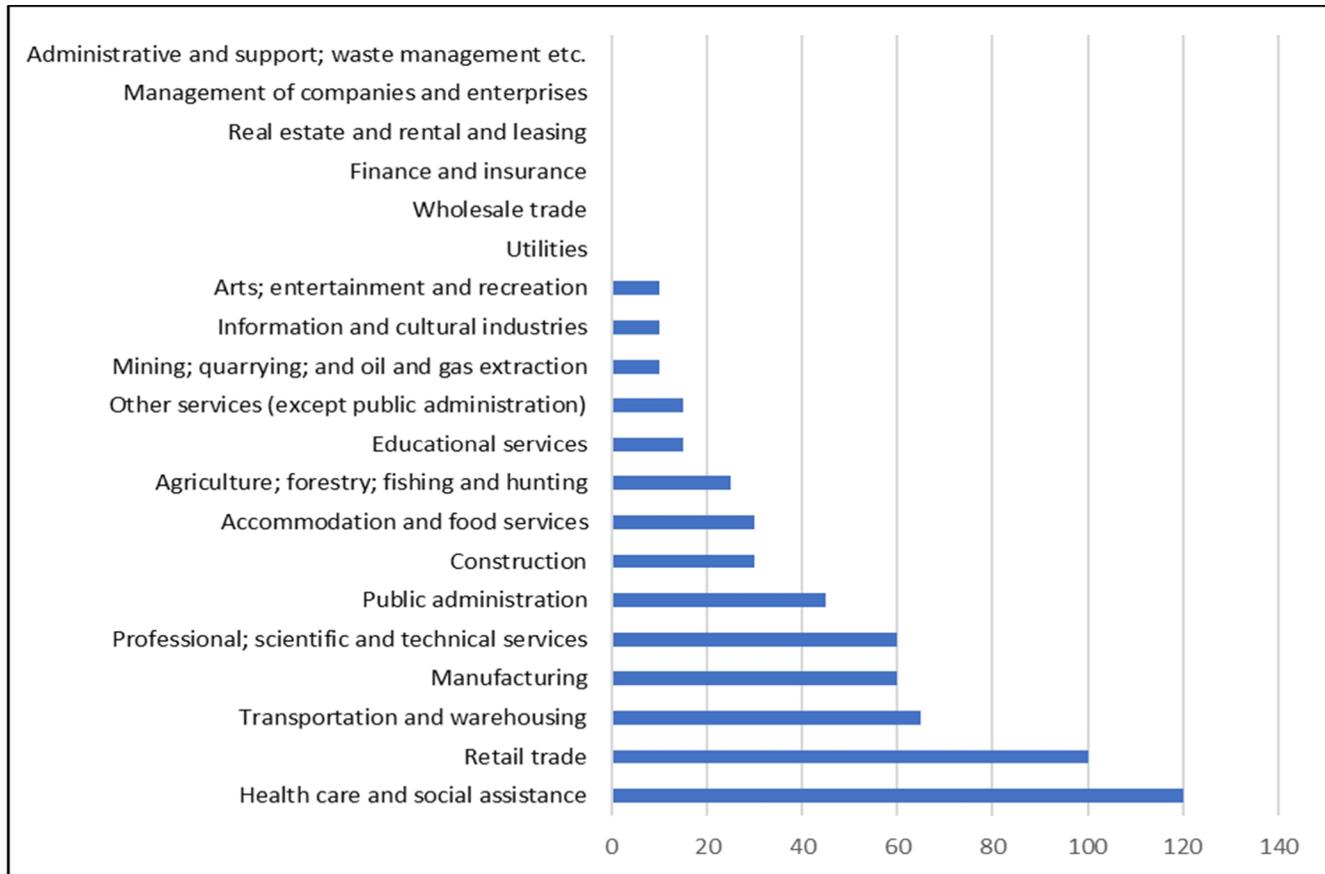
### 3.2.2 Economy, Employment and Business

Burgeo and Stephenville are located in Economic Zone 9, which encompasses an area of the west coast and the south coast of Newfoundland but excludes the southwestern tip of the Island. Currently, an estimated \$35 billion in major capital projects, valued at \$1 million or more, is planned or under construction in Newfoundland and Labrador. Of the approximately 160 initiatives, two are identified as being located in Zone 9. These include a capital investment of \$17.2M in the 2017/18 fiscal year to establish a Heavy Equipment Centre of Excellence in Teaching, Innovation and Industrial at the College of the North Atlantic in Stephenville. In addition, a portion of a planned \$19 million capital investment in Northern Harvest Sea Farms Newfoundland Ltd. aquaculture facilities will be spent in Stephenville (DOF 2017).

#### **Burgeo**

The economy of Burgeo is no longer based in the fishery, Figure 3.4. Nearly 69 percent of those employed in Burgeo in 2016 were working in health care and social assistance; retail trade; transportation and warehousing; manufacturing; and professional, scientific and technical services (Statistics Canada 2017). Burgeo's 2011 business profile shows various food stores, convenience stores, public transportation, and transportation of goods but does not reveal the nature of manufacturing businesses, which made up more than 10 percent of employment in 2016 (Town of Burgeo 2016).

**Figure 3.4 Burgeo Labour Force by Industry (2016)**



Source: Statistics Canada (2017)

Burgeo has a relatively small labour force, Table 3.5. The participation rate for males is higher than that of females. Males have a similar employment rates as females but a higher unemployment rate, which is likely indicative of seasonal employment (Statistics Canada 2017).

**Table 3.6 Burgeo Labour Force (2016)**

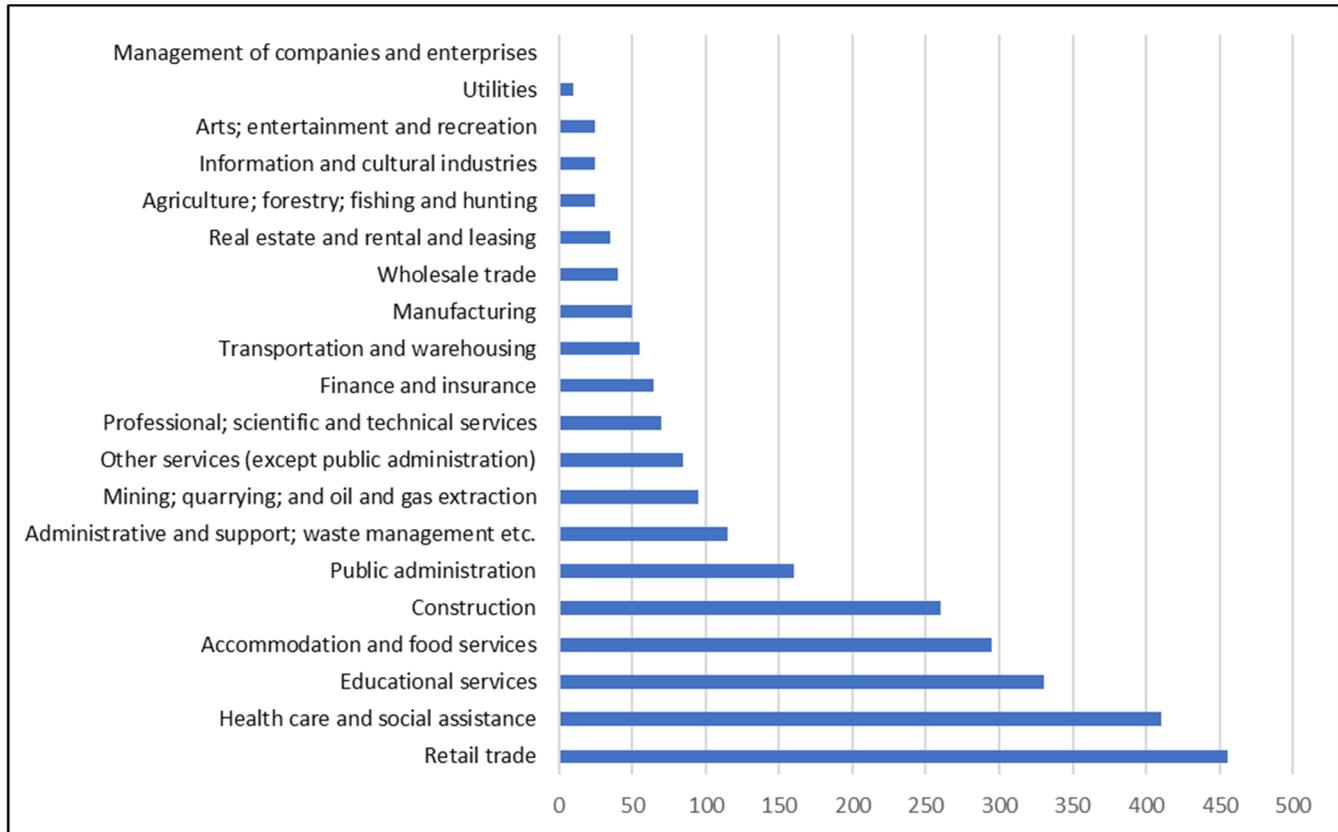
Indicator	Total	Male	Female
Total population aged 15 years of age and over	1,220	560	655
In the labour force	595	320	275
Participation rate	48.8%	57.1%	42.0%
Employment rate	29.5%	28.6%	29.8%
Unemployment rate	39.5%	50.0%	29.1%

Source: Statistics Canada (2017)

### Stephenville

Stephenville is a mid-sized Newfoundland and Labrador town and a regional government and commercial service centre for western Newfoundland. More than 67 percent of those employed in 2016 were working in the retail trade; health care and social assistance; educational services; accommodations and food services; and construction, Figure 3.5 (Statistics Canada 2017).

**Figure 3.5 Stephenville Labour Force by Industry (2016)**



Source: Statistics Canada (2017)

As a larger community, Stephenville has a larger labour force than Burgeo, Table 3.6. The participation rate in Stephenville is also higher for males than females. While females have a higher employment rate, a larger number of males were unemployed at some point in 2016 a possible indicator of seasonal work. A small number (60 or 3 percent) of employed people in Stephenville indicated that they commute to work outside of the province (Statistics Canada 2017).

**Table 3.7 Stephenville Labour Force Indicators (2016)**

Indicator	Total	Male	Female
Total population aged 15 years of age and over	5,580	2,545	3,030
In the labour force	2,765	1,345	1,425
Participation rate	49.6%	52.8%	47.0%

Indicator	Total	Male	Female
Employment rate	40.5%	40.1%	41.1%
Unemployment	18.4%	24.2%	12.6%
Source: Statistics Canada (2017)			

### 3.2.3 Land and Resource Use

The following discussion is focused on land and resource use in the area where the Project is proposed to be constructed. Various industrial, commercial, recreational and subsistence land and resource use activities are known to occur in the general area.

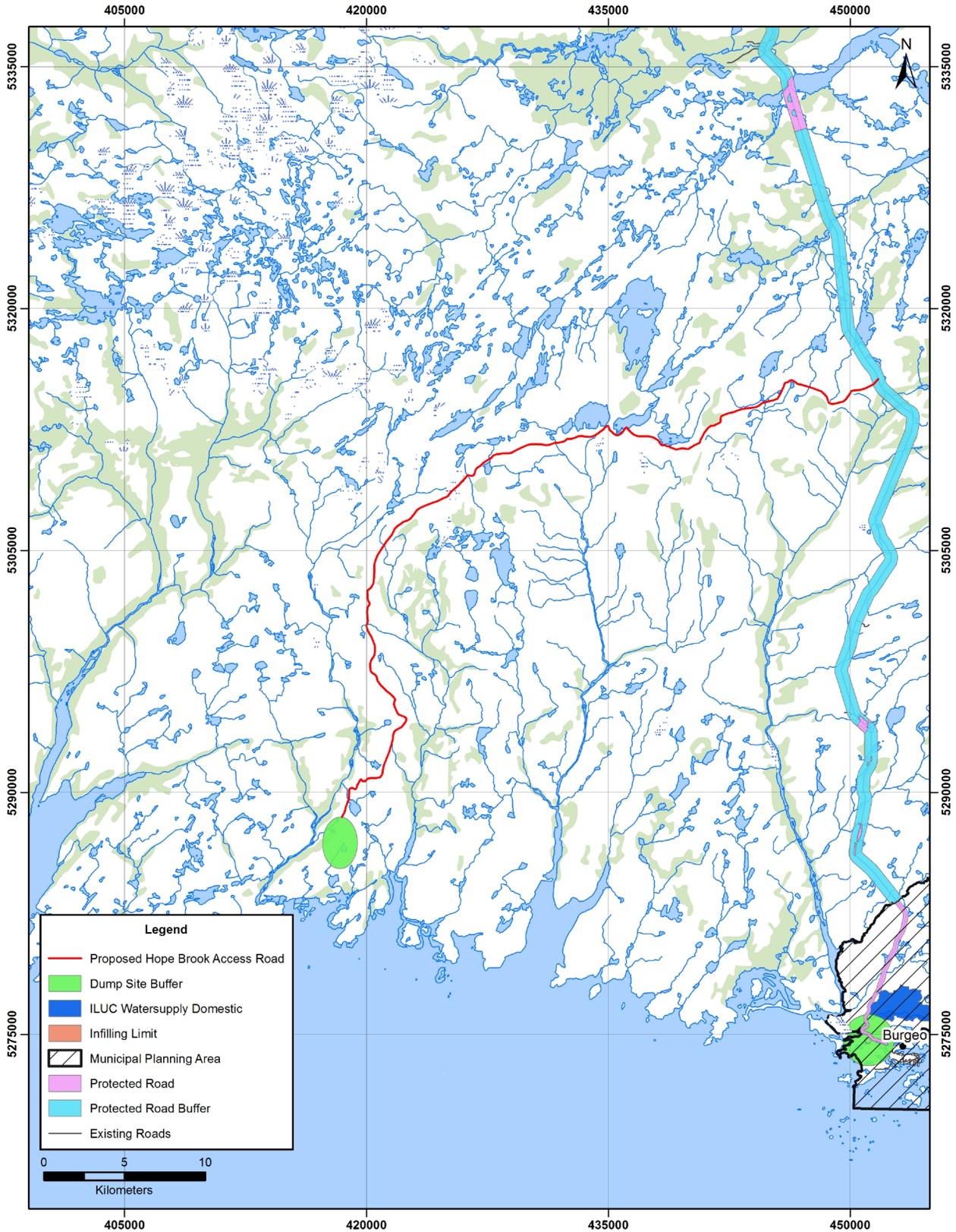
#### Urban and Rural Land Use

Route 480 is a Class II (i.e., secondary road) Protected Road under Section 61 of the Provincial *Urban and Rural Planning Act, 2000*. Burgeo Highway has three land use zones: Mixed, Rural Conservation and Summer Cottage. The area zoned as Mixed development is located 75 km from the beginning of Burgeo Highway at Peter Stride's Lake, where a number of cabins and travel trailers are located on land formerly owned by Abitibi Consolidated Ltd. The Summer Cottage Zones are located at Man Rock Pond, Beaver Pond and Wood Tilt Pond (DMPA 1990, DMPA 2010).

The Project intersects with the Protected Road in an area designated as Rural Conservation, which permits uses such as forestry, agriculture, fishing, mineral working and recreation, Figure 3.6 (ILUC 2018). This Zoning designation is intended to conserve natural resources and the rural character of the highway corridor and includes requirements for access and siting for public safety. Under the *Protected Road Zoning Regulations*, a permit is required for any development within a 400-m buffer either side of the centre line of a protected road. Development must be approved by Fisheries and Oceans Canada (DFO) if projects are located within 100 m of any waterbody, by Wildlife Division of Department of Municipal Affairs and Environment in particular areas such as Peter Stride's Lake and areas south of Dry Pond Brook, and by the Department of Fisheries and Land Resources where any proposed activities are to occur within productive forest areas. For public safety reasons, development conditions, imposed by the Department of Works, Services and Transportation, apply to access from a highway (GNL 2012; DMPA 1990, DMPA 2010). To initiate the permitting process, the proponent must submit a Preliminary Application to Develop Land to Service NL (Service NL 2018).

The Project intersects with a Dump Site Buffer identified as a possible former dump site (ILUC 2018). The waste disposal area is located at the former Hope Brook Gold Mine site. A second Dump Site Buffer, at the former mine, is located within 5 km of the Project, Figure 3.6. Service NL is responsible for approval of development within these dump site buffers.

Figure 3.6 Urban and Rural Land Use



## Natural Resources Extraction and Harvesting

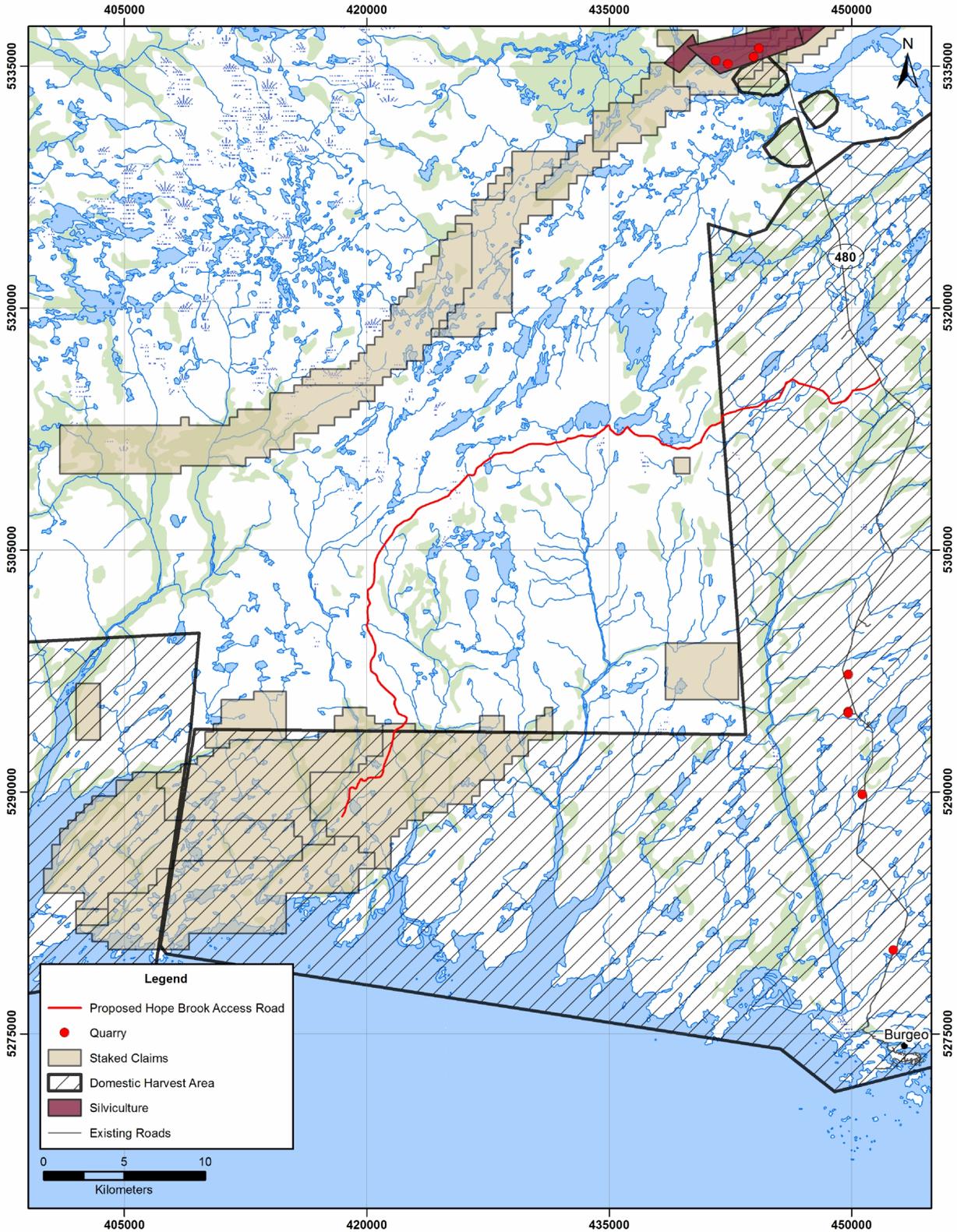
Southwestern Newfoundland has a history of natural resource activity including mining and forestry. Mines have been located at Hope Brook, Agathuna, Lower Cove and Flat Bay (DNR 2014). Currently, operating mines are located at Lower Cove (dolomite) and Coal Brook (gypsum) and a peat mine is under development at Stephenville. A number of active aggregate and quarry leases are located throughout the region (DNR 2017). The Project is located in an area where there are no active mines but there are exploration areas and gravel quarries, Figure 3.7 (DNR 2018). The Project overlaps with mineral tenure areas.

Approximately 80 to 100 farms are located in southwestern Newfoundland and these mainly located in the Humber Valley, Codroy Valley and Bay St. George areas (DNR 2014). Residents of rural areas may maintain subsistence farming plots, which are generally located near homes or cabins but sometimes by the sides of highways.

The Project is located in Forest Management District 14 where commercial forestry currently does not play a large role in the economy though the forestry industry is important in western Newfoundland. Corner Brook Pulp and Paper Limited (CBPPL), which is currently owned by Kruger Inc., operates a newsprint mill in Corner Brook. A paper mill was operated at Stephenville from 1973 to 2005, and a portion of the wood supply came from District 14. The land held by CBPPL is located on the west coast and former Abitibi Price lands are located to the north of the Project (DNR 2014).

Approximately 37 percent of the land base of FMD 14 is covered in productive forest and much of the remaining land is categorized as bog, barren or shrub. From 2009 to 2013, the total harvest was 219,366 m<sup>3</sup>, of which approximately 71 percent was allocated for domestic harvesting, 17 percent for hardwood and 11 percent for commercial use. Of the domestic and hardwood harvests, a minimum of 97 percent was used for fuel (DNR 2014). The Project intersects with domestic harvesting areas off Route 480 and along the south coast, Figure 3.7.

Figure 3.7 Natural Resources Land Use



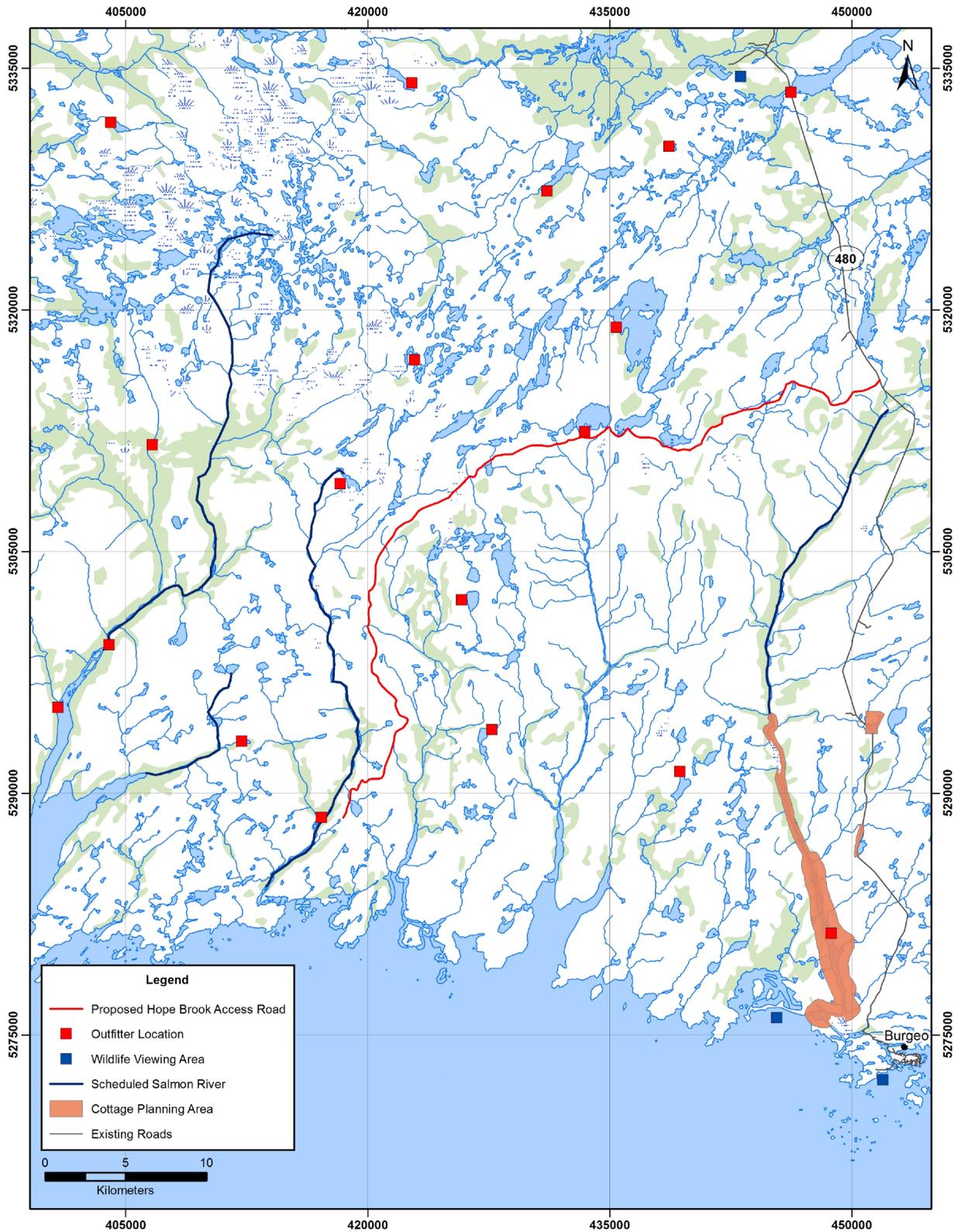
## Recreational and Subsistence Activities

The lands around Route 480 are used for outdoor recreational and subsistence activities such as hunting, fishing and outfitting. There are also a number of recreational cabins in areas near the Burgeo Highway. The following sections describe these activities and areas.

### Cabins

In Newfoundland and Labrador, recreational cottage lot grants are available, through the *Lands Act*, in rural areas that are accessible by conventional motor vehicle, in communities where land is appropriately zoned under a municipal plan, or designated Cottage Development Areas (DFLR 2017a). Cottage Development Areas have been designated off Route 480 near Burgeo and along Grandy's River (ILUC 2018). The Project does not intersect with any of the identified Cottage Development Areas, Figure 3.8.

Figure 3.8 Recreational and Subsistence Land Use



Recreational activities occur near cabins and in other areas. Identified recreational activities in southwestern Newfoundland include sea kayaking along the south coast; canoeing the Lloyd's River route from King George IV Lake to Red Indian Lake (access points on either lake and on Route 480) or Little Barachois Brook and viewing wildlife at King George IV Ecological Reserve and Big Barachois Wildlife Reserve, Figure 3.9. Hiking, camping, boating, swimming and picnicking occur in various areas including Sandbanks Provincial Park and Barachois Pond Provincial Park (Mussio Ventures 2014). The Project does not intersect with any of these areas.

## Hunting and Trapping

In Newfoundland and Labrador, hunting and trapping are regulated by the Department of Fisheries and Land Resources, under the *Wild Life Act*. The province is divided into three types of big game management areas (moose, black bear and caribou). Small game management areas and zones apply to a variety of species including waterfowl and murre, the harvesting of which is governed by the federal *Migratory Birds Regulations of the Migratory Birds Convention Act* (DFLR 2017b).

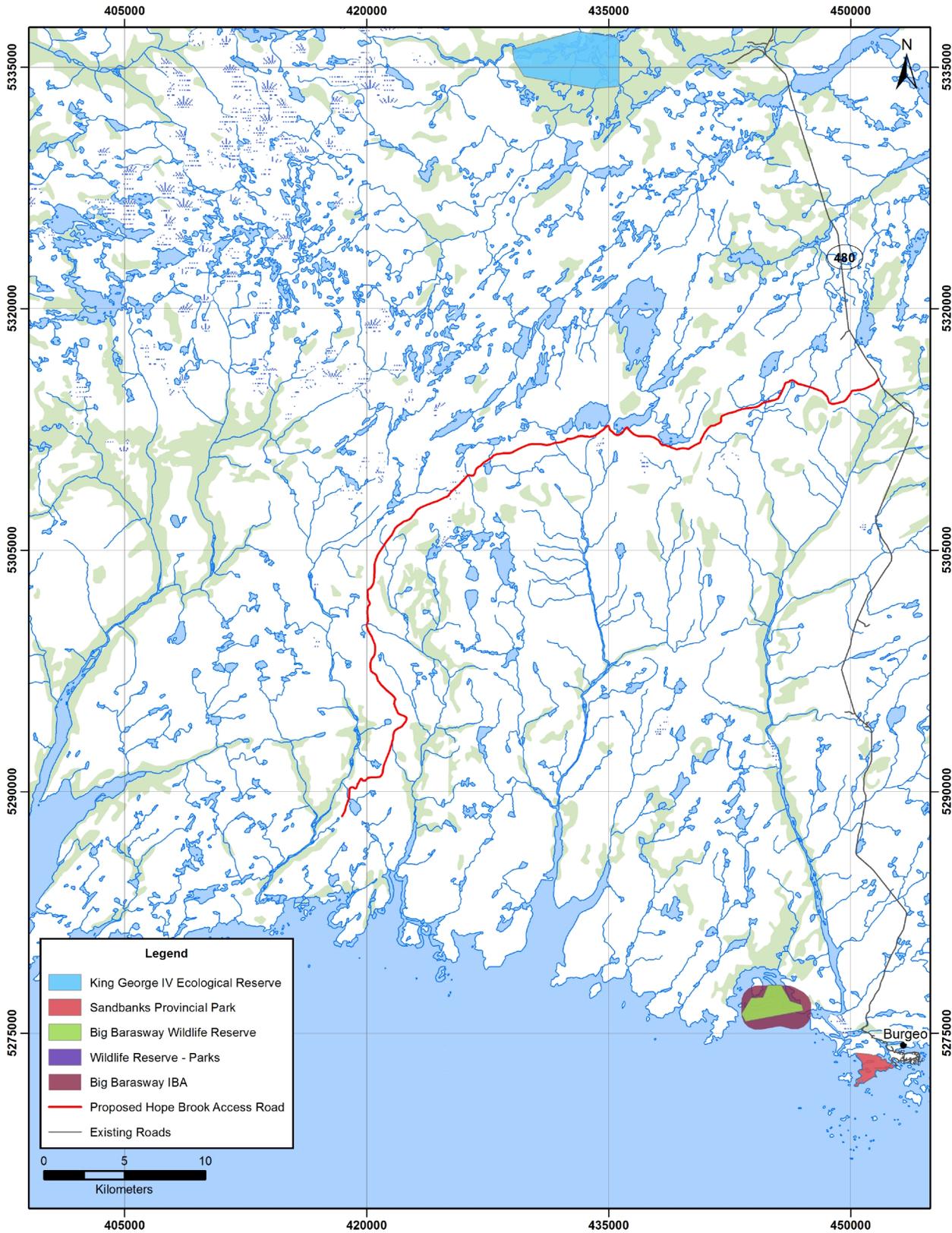
The Project overlaps with management areas for hunting moose, black bear, caribou, small game, waterfowl and snipe. Table 3.8. All species have fall and / or winter hunting seasons with the exception of black bear, which may also be harvested in a spring / summer season. A total quota of 600 moose was permitted in moose management area (MMA) 19 in the 2017-2018 season and the success rate was 72.2 percent in the previous season (2016-2017). The 2017 caribou quota was set at 70 animals in caribou management area (CMA) 61, and this area had a success rate of 88.4 percent in the previous season (2016-2017). There are no quota limits for hunting black bear and success rates are not available (DFLR 2017b).

**Table 3.8 Hunting Areas and Seasons (2017-2018)**

Species	Management Area	Spring / Summer Seasons	Fall / Winter Seasons	Quotas / Bag Limits
Big Game: Moose	19 Grey River West	No season	Sept. 9 to Dec. 31, 2017 (bow hunting open Aug. 26)	1 moose per licence
Big Game: Black Bear	19 Grey River West	May 1 to July 15, 2017 and 2018	Sept. 9 to Nov. 12, 2017	2 bears per licence
Big Game: Caribou	61 Lapoile	No season	Sept. 9 to Dec. 6, 2017 (bow hunting open Aug. 26)	1 caribou per licence
Small Game: Snowshoe Hare	Remainder of Island	No season	Shooting and Snaring: Oct. 14, 2017 to Mar. 11, 2018	40 (possession)
Small Game: Willow / Rock Ptarmigan	Remainder of Island	No season	Shooting: Sept. 16 to Dec. 3, 2017, Snaring: Oct. 14,	12 / 24

Species	Management Area	Spring / Summer Seasons	Fall / Winter Seasons	Quotas / Bag Limits
			2017 to Mar. 11, 2018	
Small Game: Ruffed and Spruce Grouse	Island of Newfoundland	No season	Shooting: Sept. 16 to Dec. 24, 2017, Snaring: Oct. 14, 2017 to Mar. 11, 2018	20 / 40
Waterfowl: Ducks including Mergansers, Geese and Snipe	Southern Inland	No season	Sept. 16 to Dec. 30, 2017	Ducks: 6 / 18; mergansers: 6 / 12; geese: 5 / 10; snipe: 10 / 20
Source: EC (2017); DFLR (2017b)				

Figure 3.9 Protected and Special Areas



Furbearing species regulated for trapping in Newfoundland include beaver, coyote, ermine (weasel), fox (coloured and white), lynx, mink, muskrat, otter and squirrel. Harvesting occurs generally in fall and winter, and during optimal periods for fur quality. Trapping seasons may vary by species but all generally occur between October and April on the island of Newfoundland (DFLR 2017b).

The Project is located in the Island of Newfoundland Trapping area and Lynx Zone: Northern Region. In these areas, trappers may harvest beaver, muskrat, otter, mink, coyote, coloured and white fox, lynx, ermine (weasel) and squirrel, Table 3.9. Marten trapping is not permitted on the Island of Newfoundland (DFLR 2017b; EC 2017).

**Table 3.9 Trapping Areas and Seasons (2017-2018)**

Species	Zone	Season
Beaver	Island of Newfoundland	Oct. 20, 2017 to April 15, 2018
Coyote		Nov. 1, 2017 to Feb. 1, 2018
Fox, Coloured		
Fox, White		
Mink		Nov. 1, 2017 to Feb. 28, 2018
Ermine (Weasel)		
Squirrel		
Muskrat		Nov. 1, 2017 to March 15, 2018
Otter		
Lynx		Zone A: Northern Region
Source: DFLR (2017b)		

### Fishing and Angling

Recreational sport and subsistence fishing occurs in both freshwater (rivers, lakes and ponds) and marine (mostly inshore) environments. Coastal and inland fisheries are regulated by DFO through the *Newfoundland and Labrador Fishery Regulations*. Four scheduled salmon rivers are located near the Project in Salmon Fishing Zones 11 and 12, which had summer (i.e., June 1-Sept. 1) fishing seasons in 2017, Table 3.10. These Rivers are all rated as Class 2, which had a 2017 daily bag limit of two fish, retention limit of four fish and a catch and release limit of four fish (DFO 2017b). Some of these rivers have high catch per unit effort (CPUE) rates as 0.25 is considered favourable and 1.0 is considered rare. The Project itself does not cross any scheduled salmon rivers but is within 5 km of Cinq Cerf River, Figure 3.8.

**Table 3.10 Salmon Fishing Success Rates (2015 preliminary)**

River	Catch Data		
	Rods	Catch	CPUE
Grandy's River	614	492	0.8
Cinq Cerf River	74	85	1.15
East Bay Brook, La Poile	No data		
La Poile River	725	198	0.27
Source: DFO (2017b)			

The Project is located in trout angling Zone 1: Insular Newfoundland, which has summer (May 15 to September 7, 2017) and winter (February 1 to April 15, 2018) angling seasons. Angling is available for speckled trout, brown trout, rainbow trout, ouananiche, Arctic char and smelt. Special conditions apply to ice fishing (DFO 2017b). Known trout-fishing areas off Route 480 include Barachois Pond and Little Barachois Brook (i.e., Barachois Pond Provincial Park), Lloyd's River and Victoria Lake (Mussio Ventures 2014).

## Outfitting

Outfitters provide camps, lodges, cabins or related facilities for sport angling / fishing, hunting or other recreational activities. The Province has a moratorium on new outfitting licences due to declining caribou populations and the potential for negatively affecting the profitability of existing operations. In addition, a buffer (eight km radius) may be identified around outfitters. This area is not regulated but used to review development applications for new land uses such as recreational cabins. Approximately 40 outfitters provide hunting and fishing opportunities through about 70 camps within Forestry Management Districts 14 and 15 where the Project is located (DNR 2014). In the 2017-2018 hunting season, 23 percent of the moose quota in MMA 19 and 56 percent of the caribou quota in CMA 61 were reserved for non-resident hunters (DFLR 2017b).

Southwestern Newfoundland has a number of outfitter camps including those in the area around the Project, Figure 3.8. A number of these outfitters are presently not accessible by road, Table 3.11. The Project itself does not intersect with any outfitters but one outfitting camp (i.e., Grand Bruit Outfitters Inc.) is located within 5 km of the Project. In addition, the Project is within an 10 km radius of seven other outfitter camps (DBTCRD 2016).

**Table 3.11 Outfitters (2016)**

Outfitting Camp	Company	Description
Deep Brook Lodge	Adventure Quest Outfitters & Tours Ltd.	Hunting (moose, black bear, woodland caribou), fishing (Atlantic salmon, brook trout) and snowmobiling. Accessibility: fly-in and road
Cinq Cerf Outfitting Inc. Cinq Cerf Lodge	Cinq Cerf Outfitting Inc.	Moose, caribou and bear hunting. Accessibility: fly-in
DADG MacDonald Outfitters Ltd.	DADG MacDonald Outfitters Ltd.	Hunting (moose, woodland caribou, black bear, small game) and fishing (Atlantic salmon, lake trout). Accessibility: fly-in and other
Princess Lake Lodge	Efford's Hunting Adventures	Hunting (moose, woodland caribou, black bear, small game) and fishing (Arctic char, northern pike, ouananiche). Accessibility: fly-in and road

<b>Outfitting Camp</b>	<b>Company</b>	<b>Description</b>
Grand Bruit Outfitters Inc.	Grand Bruit Outfitters Inc.	Moose, woodland caribou and black bear hunting. Accessibility: fly-in and other
Ironbound Outfitters	66663 Newfoundland and Labrador Inc.	Moose, black bear and woodland caribou hunting. Accessibility: fly-in
Ironbound Outfitters Jason Lake Camp		
Layden Lake Outfitters Inc.	Layden Lake Outfitters Inc.	Moose, caribou and black bear hunting. Accessibility: fly-in and other
Little Mica Pond Lodge	Mountain Top Cabin Ltd.	Hunting (moose, woodland caribou, black bear, small game) and fishing (Arctic char, Atlantic salmon, sea-run brook trout). Accessibility: fly-in and road
Dragon Den Camp	Parsons Pond Outfitters Limited	Hunting (moose, woodland caribou, black bear, small game) and fishing (Arctic char, Atlantic salmon, sea-run brook trout). Accessibility: fly-in and road
East Bay River		
Mouse Pond Camp		
Rock Camp Lodge	Rock Camp Outfitters Ltd.	Moose and caribou hunting. Accessibility: fly-in
Salmon Hole Lodge	Salmon Hole Lodge Ltd.	Arctic char, Atlantic salmon and sea-run brook trout fishing. Accessibility: boat
Salmon Hole Lodge Satellite Camp		
Sandy Pond Outfitters Peter Strides Pond Camp	Mod-U-Form Atlantic Inc.	Moose, woodland caribou, black bear and small game hunting. Accessibility: fly-in
Andrews Pond Lodge	Woodland Lodges Ltd.	Hunting (moose, woodland caribou, black bear) and fishing (Arctic char, ouananiche). Accessibility: fly-in and road
Source: DTCII (2017); CCO (2017); EHA (2011); MTO (2018); NLOA (2013); PPO (Undated); RCO (2013); SHL (2015)		

## Protected and Special Areas

A number of special areas in Newfoundland and Labrador have been designated as protected under provincial, federal and / or other legislation and processes, or have been formally identified through relevant forums and processes as being otherwise special or sensitive due to their ecological, historical and / or socio-cultural characteristics and importance. The Provincial Government establishes and manages a series of wildlife, wilderness and ecological reserves, which are created to protect and conserve wildlife, wilderness and biodiversity (DFLR 2017c; DFLR 2017d). Provincial parks are provided for recreation and also contribute to conservation objectives (DTCII 2017). Other agencies also protect or identify special areas.

Southwestern Newfoundland has a number of protected and identified special areas including those in the region surrounding the Project, Table 3.12. The Project does not intersect with any of these protected or special areas, Figure 3.9.

**Table 3.12 Provincial Protected and Special Areas**

Protected / Special Area	Description
King George IV Ecological Reserve	Established as a Provincial provisional ecological reserve in 1984, and given full designation in 1997 (through the <i>Wilderness and Ecological Reserves Act</i> ), the 18.4-km <sup>2</sup> area protects the largest undisturbed river-delta system in Newfoundland. Includes upper section of Lloyds River and a stream that enter the southwest corner of King George IV Lake. The Reserve contains several freshwater marshes, which are a rare on the Island. The Lloyds / Exploits river system is the largest on the Island. The delta's nutrient-rich alluvial soils support a rich floral and faunal community. Includes barrens, forests and several peatland types, such as basin bogs and shore fens. The habitat supports a wide range of wildlife including waterfowl. Canada geese, black ducks, green-winged teal, American goldeneyes and ring-necked ducks nest in drier areas in spring and young are raised in more open, wetter areas of the delta. The Reserve includes valuable habitat of the La Poile caribou herd (3,000 animals in 2004) some of which inhabit the River valley in winter, sheltering in the forest and feeding on tree lichens.
Sandbanks Provincial Park	Designated under the <i>Provincial Parks Act</i> in 1985. The sand dunes and beaches are unusual in Newfoundland, particularly on the Southwest Coast. The sand was produced from melting glaciers that fed Grandy's Brook about 10 thousand years ago and deposits carried by waves from numerous offshore islands. The sand dunes are fragile due to the thin vegetative cover of Dune grass ( <i>Ammophila breviligulata</i> ) and Beach Pea ( <i>Lathyrus maritimus</i> ), which binds the sand together and is easily eroded. The park environment is also unusual because animals and plants that live in the water and on the intertidal flats tolerate both fresh and salt water conditions. This is because, at high tide, salt water flows up Grepesy Brook to Heron Pond and at low tide, freshwater flows down the brook to the ocean. As a result, Heron Pond is home to various salt-tolerant plants. An important bird migration area, particularly for shore birds such as sandpipers and plovers and waterfowl such as ducks and geese. Park activities include: camping, day use, hiking and swimming. Suitable for birdwatching.
Big Barasway Wildlife Reserve	Established in 1992 under the Provincial <i>Wild Life Act</i> , the Reserve encompasses 1.4km <sup>2</sup> and provides habitat protection for the endangered Piping Plover. The Reserve is also an Important Bird Area (IBA), named so for the presence of the

Protected / Special Area	Description
	Piping Plover, a globally vulnerable and nationally endangered bird. The Reserve provides habitat protection for various other shorebirds.
Big Barasway Important Bird Area	Between 1985 and 1998, an average of 7 adult Piping Plovers (globally vulnerable and nationally endangered) were recorded at Big Barasway. This represents about 1.6% of the Atlantic Canada population. Between 1995 and 1998, Grand Barasway supported 24% of the Piping Plovers recorded in Newfoundland. Protected as Big Barasway Wildlife Reserve.
Sources: DTCII (2017); DFLR (2017c); DFLR (2017d); BSC (Undated)	

### 3.2.4 Historic and Heritage Resources

Historic and heritage resources include sites and objects of historic and archaeological, cultural, spiritual and paleontological importance. In Newfoundland and Labrador, such resources may be protected under the *Historic Resources Act (1985)* administered by the Provincial Archaeology Office (PAO) of the Department of Tourism, Culture, Industry and Innovation. The Province has a total of more than 5,000 discovered archaeological sites, which are all protected under the *Historic Resources Act (1985)* whether they are presently undisclosed to the public or undeveloped. These sites are related to various cultures: Maritime Archaic Indian, Palaeoeskimo, Intermediate Indian, Recent Indian, Beothuk, M'kmaq, Inuit, Innu and European. Other areas of high heritage resource potential have been identified throughout the Province including on land and in coastal waters (PAO 2017).

No developed archaeological sites are located in southwestern Newfoundland (PHS 2011). It is possible that known undeveloped sites and / or unknown sites exist in the area. For instance, at least 120 archeological sites, showing evidence of Maritime Archaic Indian, Palaeoeskimo, Beothuk, Mi'kmaq and European occupation, have been identified in Forestry Management Zone 6 (Districts 14 and 15) where the Project is located (DNR 2014). A multi-component historic Micmac and prehistoric Recent Indian site has been identified on King George IV Lake in the Lloyds River drainage area (Schwartz and Schwartz 1996). Beothuk sites (e.g., precontract sites, burial sites and sightings) have been identified on the southwest coast of Newfoundland including at Burgeo (Marshall 2012). A Dorset archaeological site has been identified on Sandbanks Island off Burgeo (DTCII 2017).

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## 4.0 POTENTIAL ENVIRONMENTAL INTERACTIONS AND PLANNED MITIGATION

The following sections provide an environmental effects analysis for the proposed Project, including each of its associated components and activities. The analysis focuses upon, and is organized according to, the following themes:

- 1) Atmospheric Environment;
- 2) Aquatic Environment;
- 3) Terrestrial Environment; and
- 4) Socioeconomic Environment

The analysis for each component includes a discussion and description of the likely environmental considerations (adverse and positive) that may be associated with the Project, with separate subsections for the Construction and Operations and Maintenance phases. Environmental planning and mitigation measures to avoid or reduce environmental effects are identified and considered integrally within the analyses. The assessment also includes possible accidental events and malfunctions that could potentially occur during each phase of the Project. This is followed by a summary and evaluation of the likely residual (with mitigation) environmental effects of the Project.

The environmental analysis concludes with an overview of any environmental monitoring and follow-up which may be required during one or both phases of Project implementation.

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### 4.1 Atmospheric Environment

The environmental analysis for the Atmospheric Environment includes consideration of any likely implications of the Project on air quality and noise levels within and around the Project area.

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#### 4.1.1 Construction

The main potential interactions between the Project and the Atmospheric Environment relate to the use of equipment, primarily during Project construction, and the noise, dust and engine emissions that may be associated with these activities. The atmospheric emissions from this equipment will occur within a localized area over a relatively short period. Project-related vehicles and equipment will be maintained in good repair and inspected regularly, and any associated air emissions from equipment and vehicles will conform to applicable regulations and guidelines. Any fugitive dust from construction activities will be controlled as necessary using dust control agents such as water.

Any potential emissions or interactions with the Atmospheric Environment during Project construction are therefore likely to be negligible (and within existing regulations or standards), localized and short-term (intermittent over the construction period).

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#### 4.1.2 Operations and Maintenance

During Project operations, the nature and degree of on-site activity will be considerably less than that during the construction phase, and will be characterized primarily by vehicle travel on the access road, and periodic maintenance. These operational activities are not particularly noisy, nor are they characterized by significant air emissions or other planned environmental discharges.

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#### 4.1.3 Potential Accidental Events and Malfunctions

The potential for accidental events and malfunctions for this project associated with the Atmospheric Environment are limited to the operation of construction equipment. The equipment required during road construction is limited and will be maintained in good operating condition throughout the construction period.

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#### 4.1.4 Cumulative Environmental Effects

Given the nature of the proposed project, with relatively low potential for interaction with the Atmospheric Environment, cumulative effects are not projected related to this environmental component.

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#### 4.1.5 Environmental Effects Summary and Evaluation

A summary of potential environmental interactions, identified mitigation measures, and the residual environmental effects of the Project on the Atmospheric Environment are provided in Table 4.1.

**Table 4.1 Environmental Effects Assessment Summary: Atmospheric Environment**

Environmental Component	Project Phase / Potential Interaction			Key Considerations and Environmental Mitigation
	Construction	Operations	Issues / Interactions	
Air Quality	•		<ul style="list-style-type: none"> <li>▪ Construction works (noise, dust)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Localized and short-term construction activity.</li> <li>▪ Standard construction and operational practices.</li> <li>▪ Regular inspection and maintenance of equipment.</li> <li>▪ Accidental event prevention and response.</li> </ul>
Noise Levels			<ul style="list-style-type: none"> <li>▪ Equipment use (vehicles, fuel consumption, exhausts)</li> <li>▪ Possible accidental event (fire, others)</li> </ul>	

The proposed Project is not likely to result in significant adverse environmental effects on the Atmospheric Environment.

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#### 4.2 Aquatic Environment

The Aquatic Environment includes surface water (quantity and quality) and fish and fish habitat which may interact with the Project.

The right-of-way for the proposed access road is primarily located along the highlands, and effectively reduces potential negative interactions with freshwater aquatic habitats present throughout the area. Any required watercourse crossings will be completed using appropriate culverts or bridges designed to accommodate high flow conditions without creating a restriction to water or fish movement, subject to regulatory approvals.

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##### 4.2.1 Construction

The primary potential interactions with the Aquatic Environment as a result of the proposed access road construction are increases in siltation and sedimentation, and accidental releases of deleterious substances.

The majority of the construction activities associated with the access road are localized to highlands, which reduces the interactions with the freshwater aquatic habitats within the area. However, the access road does cross several areas of bog, which may contain standing waterbodies (i.e. small bog ponds or connecting streams). Preliminary assessment indicates that nine streams will be crossed along the proposed access road route. Appropriate provincial and federal permits and approvals, section 2.9, will be obtained prior to working in these areas, and all associated regulations and mitigations will be implemented.

All construction activities will be performed in a manner that will ensure no deleterious substances enter, either directly or indirectly, the surrounding freshwater aquatic environment. Deleterious substances can include sediments and excess runoff, fuels and oils and any other substance that can have a negative impact on the aquatic environment. Standard environmental protection procedures (i.e. silt fencing, revegetation where necessary and environmental monitoring) will be in place and adhered too for the duration of this phase of the project.

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#### 4.2.2 Operations and Maintenance

During planned operations, there will be no direct effects on surrounding freshwater aquatic habitats. The road will be inspected throughout the life of the project to ensure it maintains good condition. Should inspections reveal needs for maintenance or repair, appropriate permits will be acquired and regulations followed.

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#### 4.2.3 Potential Accidental Events and Malfunctions

During construction of the access road, any accidental events or malfunctions will be handled in a safe manner while minimizing potential impacts on the surrounding Aquatic Environment. Accidental events and malfunctions would primarily be limited to accidental fuel or oil spills, or the loss of equipment into a surrounding waterbody. In either instance, proper reporting of the incident will be completed, and all necessary clean-up will be completed.

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#### 4.2.4 Cumulative Environmental Effects

The proposed road will provide a link from the Burgeo Highway to First Mining's Hope Brook mineral exploration property, an area previously inaccessible to vehicular traffic. There is potential with the increased access that increased fishing pressure may be seen in some areas.

Given the nature of the proposed project, there are relatively few cumulative effects with low potential for interactions with freshwater environment in the area.

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#### 4.2.5 Environmental Effects Summary and Evaluation

A summary of the potential environmental interactions, mitigations and potential residual environmental effects of the proposed access road on surrounding freshwater aquatic environment are presented below in Table 4.2.

**Table 4.2 Environmental Effects Summary: Freshwater Environment**

Environmental Component	Project Phase/Potential Interaction			Key Considerations and Environmental Mitigation
	Construction	Operations and Maintenance	Issue/Interactions	
Surface Water (Quality and Quantity)	•	•	<ul style="list-style-type: none"> <li>• Drainage and Sedimentation</li> <li>• Accidental Spills</li> </ul>	<ul style="list-style-type: none"> <li>• No water use is proposed for the construction of the road, water quantity should not be affected</li> <li>• Work areas will be isolated from running water as much as possible</li> <li>• When isolation is not possible, silt fencing or another barrier type will be used</li> <li>• All necessary permits will be acquired and adhered too throughout the duration of construction and for routine/non-routine maintenance</li> <li>• A response plan will be developed to address potential accidental releases</li> </ul>
Fish and Fish Habitat	•	•	<ul style="list-style-type: none"> <li>• Drainage and Sedimentation</li> <li>• Accidental Spills of deleterious substances</li> <li>• Additional access to fishing areas</li> </ul>	<ul style="list-style-type: none"> <li>• Silt fencing will be in place to reduce effects of potential increased sedimentation</li> <li>• Water samples will be collected from key areas throughout the construction period</li> <li>• Work sites will be isolated from running water, and appropriate barriers will be installed to prevent accidental released of deleterious substances</li> <li>• A response plan will be developed to address potential accidental releases of deleterious substances</li> <li>• All necessary permits will be acquired and adhered too throughout the duration of construction and for routine/non-routine maintenance</li> </ul>

The proposed Project is not likely to result in significant adverse environmental effects on the Freshwater Environment.

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### 4.3 Terrestrial Environment

The Terrestrial Environment is comprised of relevant components of the “on-land” biophysical environment which may interact with the Project, including vegetation, soils, landforms and wildlife.

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#### 4.3.1 Construction

Construction of the 58 km access road will result in the direct disturbance to landforms and soils within the 5 m wide corridor on which the road surface is placed. Vegetation will be cut within a wider 20 m right of way centered on the road centerline, but will be limited because of nature of the low growth vegetation along most of the proposed road route. Standard construction practices will limit the disturbance to these elements of the landscape to the immediate construction corridor. Additional disturbance will occur where gravel materials are quarried outside of the immediate right of way corridor. However, the extent of disturbance will again be limited to the immediate areas of excavation.

The mechanisms by which wildlife are affected by access road development include direct effects (e.g. collisions with vehicles, destruction of nesting birds) and indirect effects (e.g. habitat loss, disruption of migratory routes and foraging patterns, and increased predation). Direct effects may result in the immediate mortality of individuals while indirect effects may result in lowered reproductive rates, both of which may influence the eventual occurrence and/or density of wildlife in the Project area.

Species that may be susceptible to direct mortality includes those with limited mobility (e.g., beavers) or animals that utilize linear corridors for travel (e.g., moose, woodland caribou) or nesting opportunities (various songbird species).

Construction of the 58 km access road will result in indirect effects including some degree of habitat loss and fragmentation, the extent of which will vary depending on the ability of the affected species to tolerate disturbance or to utilize the modified habitat. Essentially all terrestrial birds and mammals that utilize the immediate corridor for denning or nesting will be excluded from using this area once vegetation and associated micro-habitats are removed. However, utilization of less affected areas adjacent to the roadside will continue to provide habitat for a variety of mammals and birds. Given the limited spatial area of the proposed access road relative to the surrounding ecoregion, disturbance from construction activity is not expected to have population level consequences for the majority of bird and mammal species. However, the potential effect on the local distribution of species at risk and woodland caribou is unknown since recent, spatially explicit information on their occurrence and distribution in the Project area is not available.

The seasonal timing in which construction activity occurs is critically important in influencing the extent of disturbance to wildlife populations. Food availability, predation risk, and weather-induced stress all

vary throughout the year and influence individual fitness. Late winter and early spring is generally the period when mammals experience the greatest degree of stress as food resources are often depleted and energy reserves are low (Adamczewski et al. 1987). Cold temperatures add to the physiological demand and the susceptibility to predation increases, particularly when deep snow limits mobility (Gese and Grothe 1995). Early spring is also the time when nesting, denning and the rearing of offspring occurs, which adds further energetic stress on adult females.

Because of the heterogeneous nature of habitats and their associated resources (food, nesting structures, protective cover etc.) some habitats support a greater diversity and density of wildlife species. For this Project area, the following habitats may be particularly sensitive to physical disturbance.

- 1) Aquatic habitats are ecologically rich and functionally important components of the boreal forest biome. In addition to supporting invertebrate, fish and bird communities, these habitats are essential for the occurrence of beavers, muskrats, and river otters on the landscape. Beavers in particular are a critically important ecosystem component as their modification of landscapes creates novel habitats (including flooded woodland and grassy meadows), which in turn are exploited by other mammals including meadow voles and southern red-backed voles. These biologically rich areas then provide foraging habitats for higher-level carnivores including red foxes and lynx. Maintaining the integrity of these aquatic habitats is essential for preserving mammalian diversity on the landscape.
- 2) Species diversity in barren, upland areas is generally less diverse compared with forest habitats. However, these environments provide foraging habitat for red foxes and breeding habitat for a range of bird species including willow ptarmigan (*Lagopus lagopus*), rock ptarmigan (*Lagopus muta*) and short-eared owls. Maintaining naturally occurring rock structures and sensitive alpine vegetation is important for ensuring the persistence of these upland specialists.
- 3) Maintaining the structural integrity and complexity of late successional forest stands is important for supporting populations of forest associated species including Canada lynx and bat species that may utilize tree cavities for roosting structures. These species extensively utilize dense, closed canopied forests for foraging, denning, and rearing young. Other species that depend on this habitat type include some birds of prey (e.g. northern goshawks (*Accipiter gentilis*), osprey), primary cavity excavators (e.g. woodpeckers), and secondary cavity nesters (e.g. boreal chickadees; *Poecile hudsonicus*).

Although some loss and fragmentation of naturally occurring habitats is unavoidable during access road construction, a number of mitigating measures will be implemented to reduce the effect of construction activity on terrestrial wildlife. These include:

- 1) Minimizing the Project footprint by confining vegetation clearing and other forms of ground disturbance to the extent possible.

- 2) Avoiding construction during the pre-calving/calving season (early May to late June) if woodland caribou are detected in the Project area.
- 3) Conducting nest searches in advance of site clearing during the breeding season (15 May to 15 August) to avoid disturbance to nesting birds.
- 4) Establishing protective buffer zones around all active nests. Buffer sizes are species-specific and are based on the perceived susceptibility of each species to anthropogenic disturbance.
- 5) Avoiding wildlife-vehicle collisions by ensuring safe driving practices, adhering to posted speed limits and yielding to wildlife. Collisions may also be reduced if the public are restricted from using the access road.
- 6) Minimizing the use of artificial lighting to reduce disturbance to nocturnal bird and bat species.
- 7) Prohibiting the hunting or harassment of wildlife species within the Project area.
- 8) Appropriately disposing of all waste to avoid the attraction of wildlife to artificial food sources.
- 9) Implementing dust control and site water treatment measures during construction.
- 10) Implementing Environmental Protection Plans to prevent forest fires and chemical spills.

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#### 4.3.2 Operations and Maintenance

During the operations phase of the Project there will be no additional soil or vegetation disturbance, and therefore, little or no potential for effects to these aspects of the terrestrial environment. Wastes, fuels and other such materials and substances will continue to be handled, used and disposed of properly throughout the life of the Project, as outlined earlier.

Potential direct and indirect effects on wildlife during operation and maintenance of the access road are similar to that described for construction but should be lessened by the lower intensity of vehicle and human activity for operation and maintenance versus construction.

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#### 4.3.3 Potential Accidental Events and Malfunctions

During construction of the access road, any accidental events or malfunctions will be handled in a safe manner while minimizing potential impacts on the surrounding terrestrial environment. Accidental events and malfunctions would primarily be limited to accidental fuel or oil spills, or fires. In either instance, proper reporting of the incident will be completed, and all necessary emergency response and clean-up will be completed.

### 4.3.4 Cumulative Environmental Effects

The proposed road will provide a link from the Burgeo Highway to First Mining’s Hope Brook mineral exploration property, an area previously inaccessible to vehicular traffic. There is potential with the increased access that increased hunting pressure may be seen in some areas

Given the nature of the proposed project, there are relatively few cumulative effects with low potential for interactions with Terrestrial Environment in the area.

### 4.3.5 Environmental Effects Summary and Evaluation

A summary of potential environmental interactions, identified mitigation measures and the residual environmental effects of the Project on the Terrestrial Environment is provided in Table 4.3.

**Table 4.3 Environmental Effects Assessment Summary: Terrestrial Environment**

Environmental Component	Project Phase / Potential Interaction			Key Considerations and Environmental Mitigation
	Construction	Operations	Issues / Interactions	
Vegetation	•	•	<ul style="list-style-type: none"> <li>• Clearing of vegetation</li> <li>• Possible fuel or chemical spills</li> </ul>	<ul style="list-style-type: none"> <li>• Localized and clearly delineated work areas</li> <li>• Compliance with applicable regulations and permits</li> <li>• Accidental event prevention and response</li> </ul>
Soils	•	•		
Wildlife	•	•	<ul style="list-style-type: none"> <li>• collisions with vehicles, disturbance of nesting birds</li> <li>• habitat loss, disruption of migratory routes and foraging patterns, and increased predation</li> <li>• Noise, human presence, vehicle and equipment use, other disturbances</li> </ul>	<ul style="list-style-type: none"> <li>• Avoiding construction during the pre-calving/calving season (early May to late June) if woodland caribou are detected in the Project area</li> <li>• Conducting nest searches in advance of site clearing during the breeding season (15 May to 15 August) to avoid disturbance to nesting birds</li> <li>• Establishing protective buffer zones around all active nests. Buffer sizes are species-specific and are based on the perceived susceptibility of each species to anthropogenic disturbance</li> <li>• Avoiding wildlife-vehicle collisions by ensuring safe driving practices</li> </ul>

Environmental Component	Project Phase / Potential Interaction			Key Considerations and Environmental Mitigation
	Construction	Operations	Issues / Interactions	
				<ul style="list-style-type: none"> <li>• Minimizing the use of artificial lighting to reduce disturbance to nocturnal bird and bat species</li> <li>• No harvesting or harassment of wildlife by Project personnel</li> <li>• Waste and other materials management (facilities and procedures)</li> <li>• Accidental event prevention and response</li> </ul>

The proposed Project will likely result in adverse environmental effects on wildlife species present in the immediate road right of way, however, the significance of this disturbance can be minimized by implementation of appropriate mitigative measures.

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#### 4.4 Socioeconomic Environment

The section discusses potential Project effects on the Socioeconomic Environment, which includes relevant components of the human and cultural environments, including region and communities; economy employment and business; land and resource use; and historic resources.

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##### 4.4.1 Construction and Operation

Project construction will be characterized by fairly standard and non-intrusive activities and practices and occur within a small and localized area over a relatively short period. The proposed Project is removed from communities and not expected to interact adversely (e.g., noise, visibility, dust, discharges, emissions) with the communities either directly or indirectly. The Project is therefore not expected to have any negative implications for existing municipal or community land use activities in the area, or on human health and well-being in local communities or elsewhere.

In some cases, development projects may result in increased demands on local, regional and provincial services and infrastructure. This may include both direct Project requirements, such as in the use of local transportation and accommodations, as well as indirect demands from Project workers and their families. Given the relatively small size and duration of the Project’s construction labour requirements, section 2.4.2, no adverse effects related to the availability or quality of community services and infrastructure are anticipated.

The Proponent will consult with the local municipalities and other stakeholders regarding Project related activities that may be disruptive to ongoing activities. These measures will include sharing schedules and requirements for activities such as the transportation of any large equipment to and through the communities or on Route 480 during Project construction and sharing environmental and emergency response plans with stakeholders.

Project construction will be carried out by a qualified and experienced contractor selected through a competitive bid process. The Project will therefore create business opportunities during its construction phase, and the requirement for labour, goods and services during Project construction may provide opportunities for local and provincial workers and businesses. These direct economic benefits will be supplemented by indirect and induced “spin-off” effects through, for example, spending by Project employees and contractors. The proponent will communicate Project-related opportunities to stakeholders (e.g., municipalities, business associations, employment agencies) in a timely fashion.

The Project does not overlap with any protected or special areas, recreational cabins or identified recreational areas. It does overlap with areas that may be used for hunting, trapping, fishing and domestic wood harvesting. The construction of the road may result in some disruption to these activities but this will be short-lived and temporary. In addition, the region is large and resource users can move to more amenable areas during construction. It is likely that the introduction of a road will increase access to and usage of the area for recreational and subsistence activities.

The Project overlaps with a Protected Road, a potential waste disposal site buffer, forestry, mineral exploration, hunting, trapping, fishing, domestic wood cutting and outfitting areas. A permit for development is required for any initiative within the building control lines of a Protected Road. To initiate the permitting process, the proponent will submit a Preliminary Application to Develop Land to Service NL. This application process may result in identification of any other communication and / or permitting requirements with other agencies such as Department of Natural Resources, Department of Forestry and Land Resources, Department of Municipal Affairs and Environment, Department of Tourism, Culture, Industry and Innovation (DTCII) and DFO. The proponent will comply with all permitting requirements related to the development.

The Project overlaps with an area used by commercial hunting and fishing outfitters. Road construction may cause disruption to outfitters’ activities but this will be short term in nature. The introduction of a seasonal road may result in increased harvesting by others but the area is already used, to some extent, by residents for hunting, trapping, fishing, domestic wood harvesting and likely other activities. Outfitters currently hold 56 percent of the caribou quota and 23 percent of the moose quota and thus dominate hunting activities in the area. It is possible that the road may result in increased illegitimate hunting. For outfitters, a road may result in some perceived, or real, diminishment of quality compared to the present exclusivity especially for fly-in only outfitting camps. It is also possible, though less likely, that a road may be welcomed by some outfitters. The proponent will correspond with outfitting industry stakeholders such as DTCII and the Newfoundland and Labrador Outfitters Association (NLOA) to identify issues and opportunities related to the development of a road in the area.

There are no known historic resources within or near the Project. Development activities and associated ground disturbance have the potential to disturb or destroy archaeological sites and other historic resources, where they exist. During Project construction, standard precautionary and reporting procedures will be implemented. Should an accidental discovery of historic resources occur, all work will cease in the immediate area of the discovery until authorization is given for the resumption of the work. Any archaeological materials encountered will be reported to the PAO, including information on the nature of the material discovered and the location and date of the find. During the operations

phase of the Project there will be no further ground disturbance, and therefore, little or no potential for effects to historic and heritage resources. The precautionary and reporting procedures implemented for construction will, however, continue to be in place throughout the life of the Project.

4.4.2 Environmental Effects Summary and Evaluation

Table 4.4 provides a summary of Projects effects, key considerations and mitigations. Most of the effects of the Project are related to construction activities, which are short-term and temporary. The Proponent will engage with stakeholders as appropriate and comply with all permitting requirements for construction and operations. The road itself may be a long term feature and may serve to increase land and resource use such as hunting, trapping, fishing and domestic wood harvesting. These activities may cause ongoing concern to remote outfitters that may experience increased human activity and competition for resources.

**Table 4.4 Environmental Effects Assessment Summary: Socioeconomic Environment**

Environmental Component	Project Phase / Potential Interactions			Key Considerations and Environmental Mitigations
	Construction	Operations	Issues / Interactions	
Regions and Communities	•		<ul style="list-style-type: none"> <li>• Potential Project-related disturbances</li> <li>• Potential Project use of, and demands for, services and infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• No anticipated interaction with distant communities</li> <li>• No construction or operational noise, discharges or emissions will disturb distant communities</li> <li>• No anticipated demand on local services and infrastructure</li> <li>• Stakeholder communications on timing and location of Project activities and accident event prevention and response plans</li> </ul>
Economy, Employment and Business	•		<ul style="list-style-type: none"> <li>• Employment and business opportunities</li> </ul>	<ul style="list-style-type: none"> <li>• Positive effects (direct and indirect)</li> <li>• Localized and short-term construction activity, small construction workforce and limited economic opportunities</li> <li>• Communication of upcoming opportunities with stakeholders</li> </ul>

Environmental Component	Project Phase / Potential Interactions			Key Considerations and Environmental Mitigations
Land and Resource Use	•	•	<ul style="list-style-type: none"> <li>• Potential direct interaction with current users and other disturbances (noise, dust, visibility, access, etc.)</li> <li>• Potential direct interaction with outfitters</li> <li>• Potential increased access resulting in additional resource harvesting</li> </ul>	<ul style="list-style-type: none"> <li>• Construction activity will be localized, routine and short-term</li> <li>• Location largely inaccessible and will Project will increase accessibility</li> <li>• Project may disturb outfitters' activities but construction activity will be localized, and short-term and the proposed road will occupy a relatively small portion of the area utilized for outfitter operations</li> <li>• Project may result in increased recreation and subsistence usage and increased access may indirectly lead to increased potential for poaching</li> <li>• Increased usage and harvesting may indirectly affect outfitters through disturbance and increased competition for natural resources</li> <li>• Communications with stakeholders such as NLOA and DTCII regarding timing and duration of activities</li> <li>• Compliance with requirements of government agencies (e.g., Service NL, DMAE, DFO) and for all permitting (e.g., Protected Roads, dump site buffer, mining, forestry, fishing)</li> </ul>
Historic Resources	•		<ul style="list-style-type: none"> <li>• Any new ground disturbance</li> </ul>	<ul style="list-style-type: none"> <li>• New Project-related ground disturbance will be localized and in clearly delineated work areas</li> <li>• No publicly identified historic resources in the area</li> <li>• Standard precautionary and reporting procedures</li> </ul>

The proposed Project is not likely to result in significant adverse residual environmental effects on the Socioeconomic Environment.

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#### 4.5 Environmental Monitoring and Follow-up

Any potential environmental issues which may be associated with the Project can be addressed and mitigated through the use of good construction and operational practices and procedures. These will be further addressed through the specific environmental permitting requirements and compliance standards and guidelines which will apply to Project activities and components.

Once operational, the Project will be subject to regular inspections and maintenance as required. The Proponent is committed to obtaining all required authorizations for the proposed Project, and to complying with all applicable regulations. No other follow-up is considered necessary in relation to the proposed Project.

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## 5.0 SUMMARY AND CONCLUSION

First Mining is proposing to construct a low profile resource access road to connect its Hope Brook mineral exploration property to the Burgeo Highway, Highway 480, and the provincial road network. The road will be approximately 58 km in length with a 20 m cleared right of way and a 5 m wide gravel driving surface. The road is intended to permit light to intermediate size vehicle access to the Hope Brook property to support mineral exploration activities to be conducted by First Mining, and will be maintained as needed to provide such access when required. Existing air and sea access have allowed for early exploration and preparatory work, but ground access is required to make increased future exploration more economically feasible, enhance safety and emergency response capability, and allow advancement to pre-feasibility and feasibility level studies. The road is not intended to be maintained for year round, full time access.

This *Environmental Assessment Registration* is intended to initiate the provincial EA process for the proposed access road, which will undergo review in accordance with applicable regulatory requirements.

The proposed route for the access road follows the drainage divide between river and stream systems in the area, avoids crossing the three main rivers between the Hope Brook mineral exploration property and Highway 480, and avoids steep slopes that would be prone to erosion. The Project is unlikely to result in adverse effects to socioeconomic, aquatic or atmospheric environmental components in the area. The proposed Project will likely result in adverse environmental effects on wildlife species present in the immediate road right-of-way, however, the significance of this disturbance can be minimized by the implementation of appropriate mitigative measures.

The Project will be planned and implemented so as to avoid or reduce any potential adverse environmental effects. The Project will be undertaken in accordance with environmental protection and regulatory compliance practices to help ensure that it is constructed and operated in a safe and environmentally-responsible manner.

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## **APPENDIX A**

List of Potentially Applicable Permits and Authorizations

**APPENDIX A List of Potentially Applicable Permits and Authorizations (Provincial, Federal, Municipal)**

Approval Potentially Required	Legislation / Regulation	Project Component / Activity Requiring Approval or Compliance	Department or Agency	Requirements
<b>Government of Newfoundland and Labrador</b>				
Licence to Occupy Crown Land Crown Land Leases/Grants/ Easements	<i>Lands Act</i>	Any development on Crown Lands	Crown Lands Division, Department of Municipal and Intergovernmental Affairs	Approval is required for project activities and infrastructure on Crown Land.
Certificate of Approval for any Alteration to a Body of Water	<i>Water Resources Act</i>	Any activities which may alter a water body	Water Resources Management Division, Department of Environment and Conservation	Permits are required for construction activities within 15 m of the high watermark of any water body. An application form is required for each alteration.
Certificates of Approval for any Instream Activity (including Culvert Installation, Bridges and Fording a Watercourse)	<i>Water Resources Act</i>	Any in-stream activity	Water Resources Management Division, Department of Environment and Conservation	Approval is required for any in-stream activity, including bridge, culvert and fording activities, before undertaking the work.
Certificate of Approval for Construction Site Drainage	<i>Water Resources Act</i>	Any run-off from the project site being discharged to receiving waters	Water Resources Management Division, Department of Environment and Conservation	Approval is required for any run-off from the project site being discharged to receiving waters.
Policy Directives	<i>Water Resources Act</i>	Project activities (as applicable)	Water Resources Management Division,	The Department has a number of potentially applicable policy

Approval Potentially Required	Legislation / Regulation	Project Component / Activity Requiring Approval or Compliance	Department or Agency	Requirements
			Department of Environment and Conservation	directives in place for particular types of in or near water work
Quarry Permit	<i>Quarry Materials Act and Regulations</i>	Extracting borrow material	Mineral Lands Division, Department of natural Resources	A permit is required to dig for, excavate, remove and dispose of any Crown quarry material.
Cutting Permit	<i>Forestry Act and Cutting of Timber Regulations</i>	Clearing land areas for laydown areas and abutment locations	Department of Natural Resources	A permit is required for the commercial or domestic cutting of timber on crown land.
Certificate of Approval for Storing and handling Gasoline and Associated Products	<i>Environmental Protection Act, Storage and Handling of Gasoline and Associated Products Regulations</i>	Storage and handling of gasoline and associated products	Engineering Services Division, Services NL	A Certificate of Approval is required for storing and handling gasoline and associated products.
Certificate of Approval for Installation of a Sewage System	<i>Sanitation Regulations, under the Health and Community Services Act</i>	Sewage disposal and treatment at construction camps	Department of Health and Community Services	Sewage disposal systems designed, constructed or installed to service a private dwelling or a commercial or other building with a daily sewage flow less than 4,546 L must be approved by an inspector before installation.
Compliance Standard	<i>Fire Prevention Act, and Fire Prevention Regulations</i>	On-site structures (temporary or permanent)	Engineering Services Division, Service NL	All structures must comply with fire prevention standards.
Compliance Standard	<i>Environmental Control Water and Sewage Regulation</i>	Any waters discharged from the Project	Pollution Prevention Division, Department of	A person discharging sewage and other materials into a body of water must comply with the

Approval Potentially Required	Legislation / Regulation	Project Component / Activity Requiring Approval or Compliance	Department or Agency	Requirements
	under the <i>Water Resources Act</i>		Environment and Conservation	standards, conditions and provisions prescribed in these regulations for the constituents, contents or description of the discharged materials.
Compliance Standard	<i>Occupational Health and Safety Act</i> and Regulations	Project-related occupations	Service NL	Outlines minimum requirements for workplace health and safety. Workers have the right to refuse dangerous work. Proponents must notify Minister of start of construction for any project greater than 30 days in duration.
Compliance Standard	<i>Workplace Hazardous Materials Information System (WHMIS) Regulations</i> , under the <i>Occupational Health and Safety Act</i>	Handling and storage of hazardous materials	Operations Division, Service NL	Outlines procedures for handling hazardous materials and provides details on various hazardous materials.
<b>Government of Canada</b>				
Letter of Notification	<i>Fisheries Act</i> and <i>Regulations</i>	Project activities in or near water	Department of Fisheries and Oceans	Where a potential for harmful effects to fish habitat can be prevented, a Letter of Notification is issued outlining appropriate mitigation procedures or conditions to be followed.

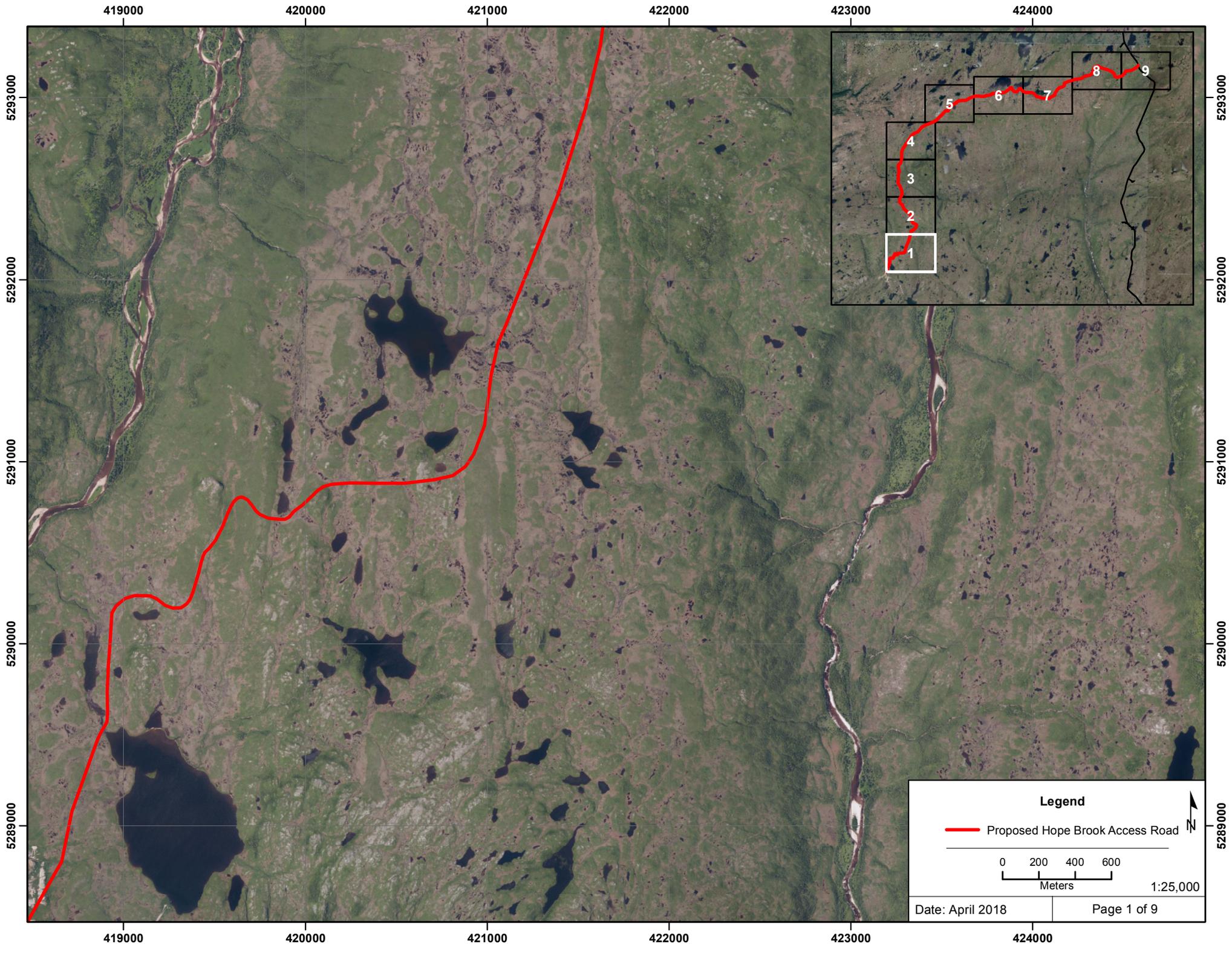
Approval Potentially Required	Legislation / Regulation	Project Component / Activity Requiring Approval or Compliance	Department or Agency	Requirements
Permit(s) for construction within Navigable Waters	<i>Navigation Protection Act Associated Regulations</i>	Project activities in or across water	Transport Canada	Permit required only within scheduled waters. There are no scheduled waters involved, however, any “non-scheduled” waters are subject to the Act if the owner wishes to opt-in.
Compliance Standard	<i>Fisheries Act, Section 36(3), Deleterious Substances</i>	Any run-off from the project site being discharged to receiving waters	Environment Canada Department of Fisheries and Oceans	Environment Canada is responsible for Section 36(3) of the <i>Fisheries Act</i> . However, DFO is responsible for matters dealing with sedimentation. Discharge must not be deleterious and must be acutely non-lethal.
Compliance Standard	<i>Migratory Birds Convention Act and Regulations</i>	Any activities which could result in the mortality of migratory birds and endangered species and any species under federal authority	Canadian Wildlife Service, Environment Canada	Prohibits disturbing, destroying or taking a nest, egg, nest shelter, eider duck shelter or duck box of a migratory bird, and possessing a live migratory bird, carcass, skin, nest or egg, except when authorized by a permit. The Canadian Wildlife Service should be notified about the mortality of any migratory bird in the project area.
Compliance standards; permits may be required.	National Fire Code	On-site structures (temporary or permanent)	Service NL	Approval is required for fire prevention systems in all approved buildings.

Approval Potentially Required	Legislation / Regulation	Project Component / Activity Requiring Approval or Compliance	Department or Agency	Requirements
Compliance standards; permits may be required.	National Building Code	On-site structures (temporary or permanent)	Service NL	Approval is required for all building plans.
<b>Municipalities</b>				
Development or Building Permit	<i>Urban and Rural Planning Act, 2000,</i> and Relevant Municipal Plan and Development Regulations	Development within municipal boundary	Community Council	A permit is required for any development or building within municipal boundaries.
Approval for Waste Disposal	<i>Urban and Rural Planning Act, 2000,</i> and Relevant Municipal Plan and Development Regulations	Waste disposal	Community Council	The use of a community waste disposal site in Newfoundland and Labrador by proponents/contractors to dispose of waste requires municipal approval. Restrictions may be in place as to what items can be disposed of a municipal disposal site.

**APPENDIX B**

Proposed Hope Brook Access Road

1:25,000 Scale Mapping



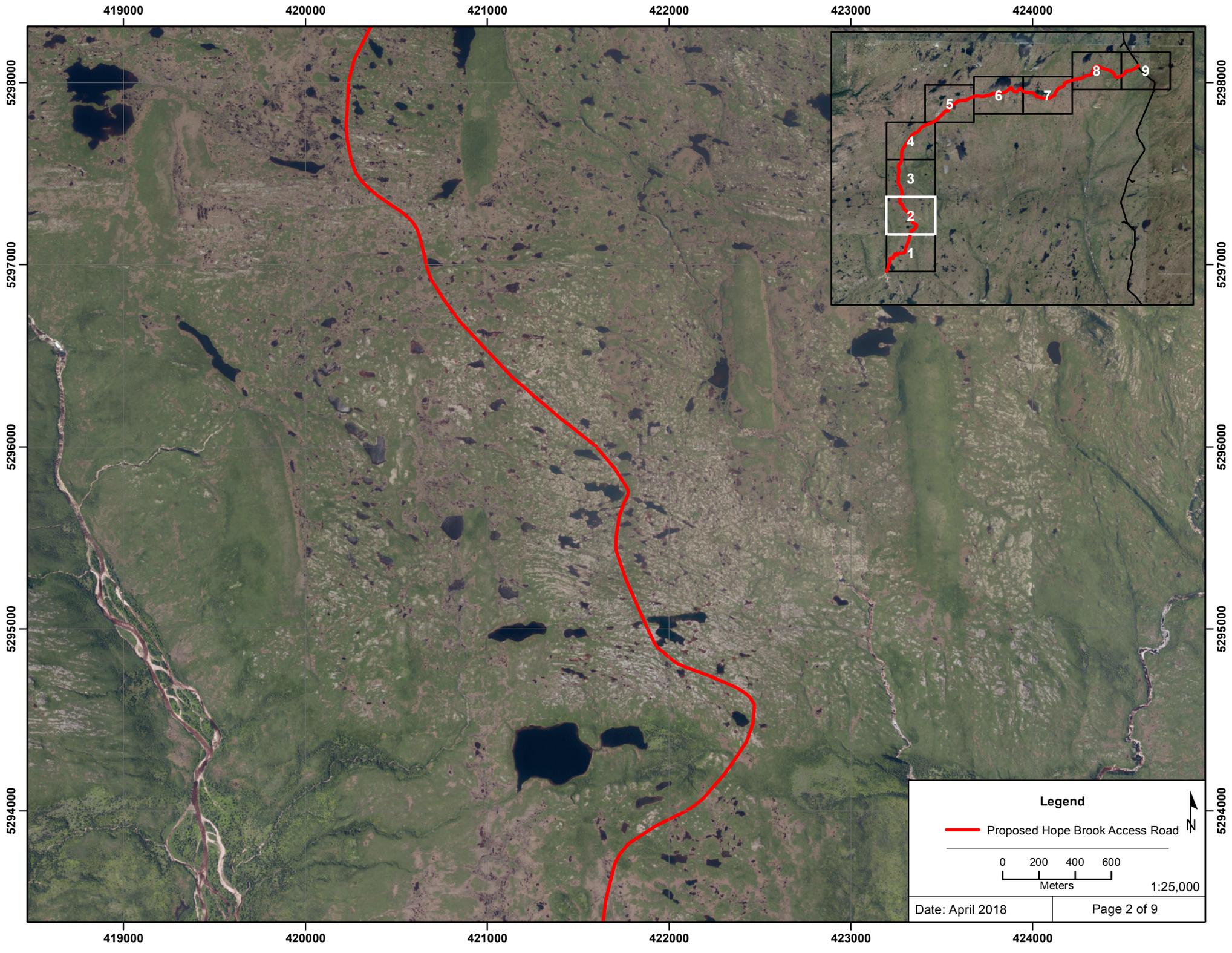
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— Proposed Hope Brook Access Road

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Date: April 2018 Page 1 of 9



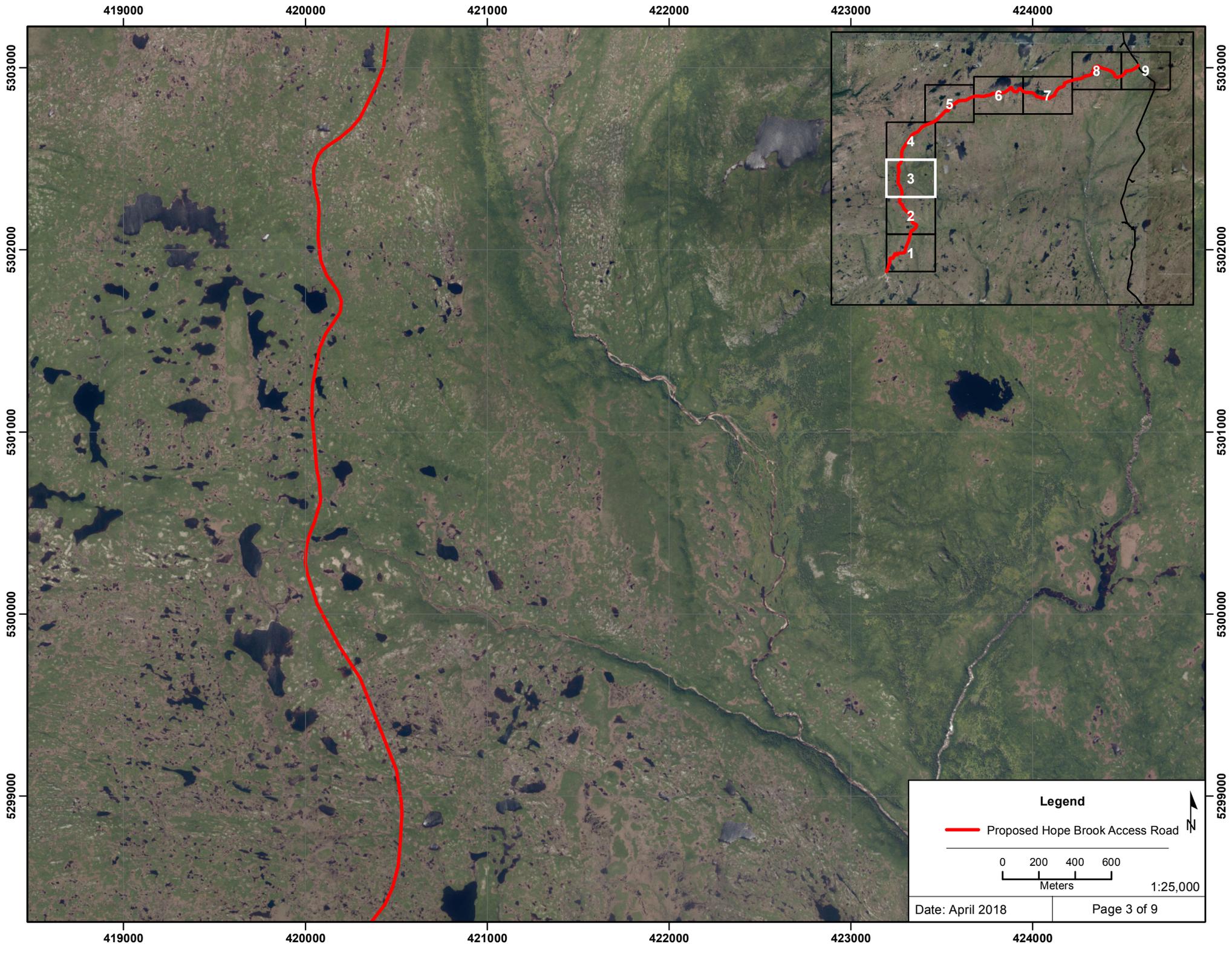
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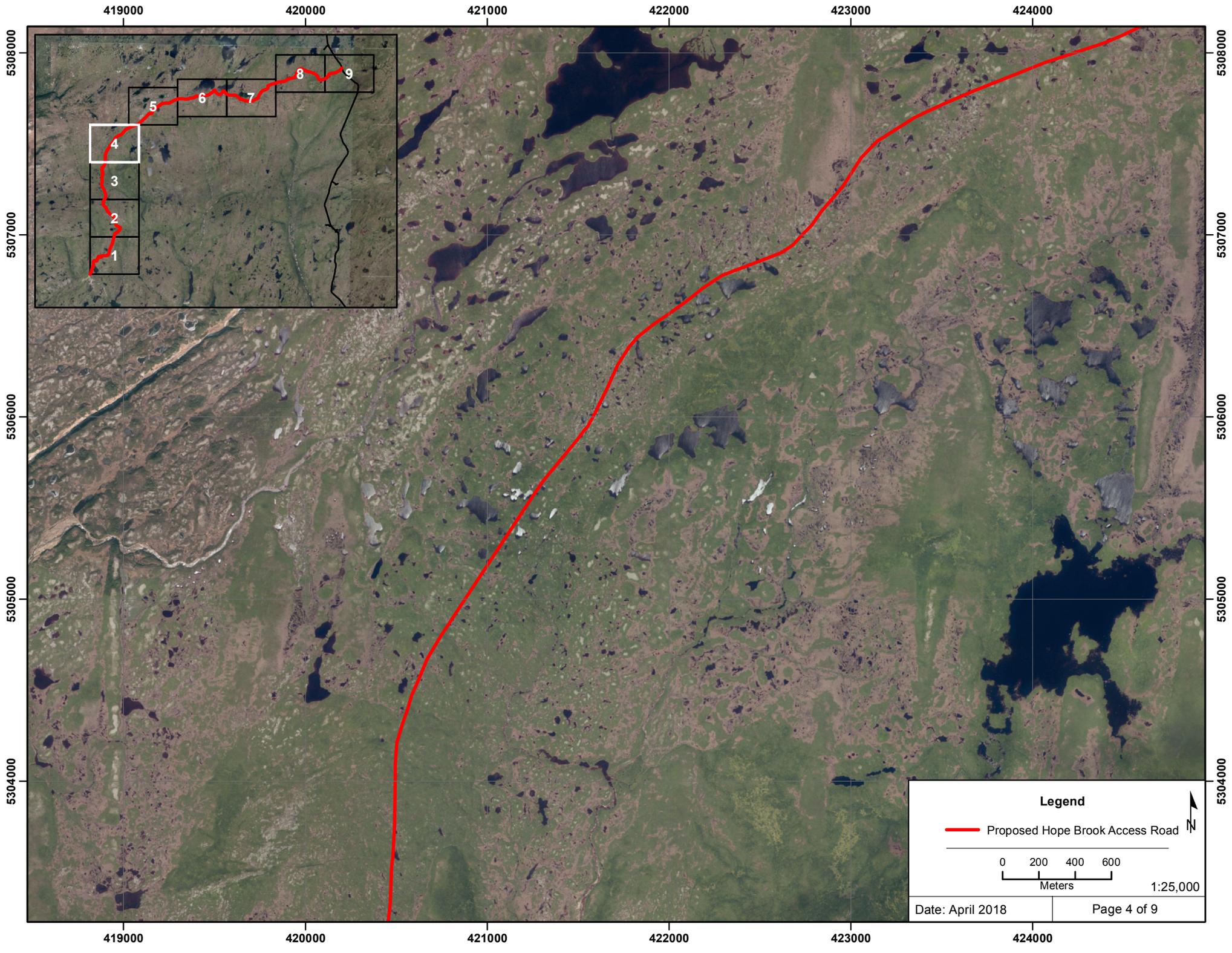
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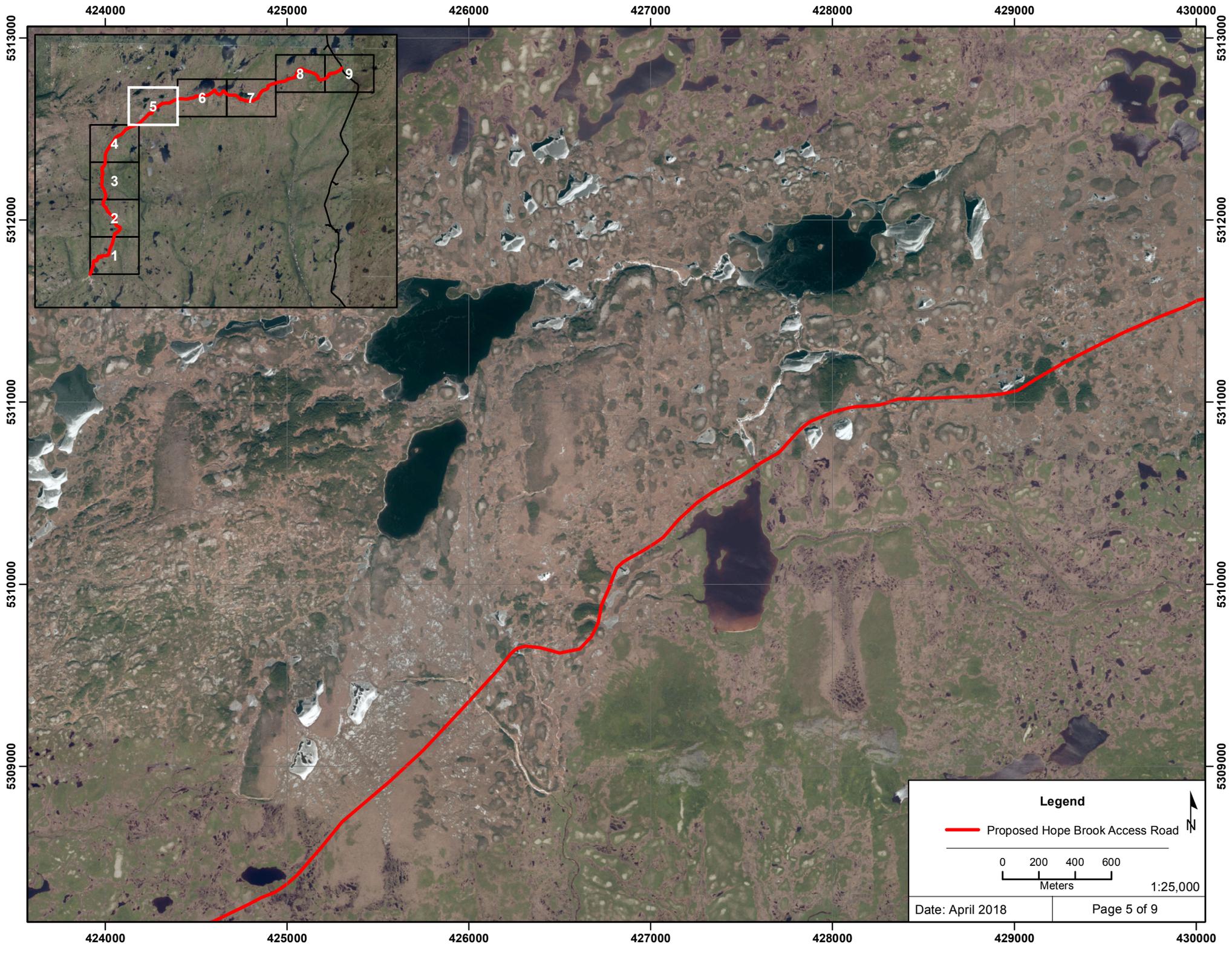
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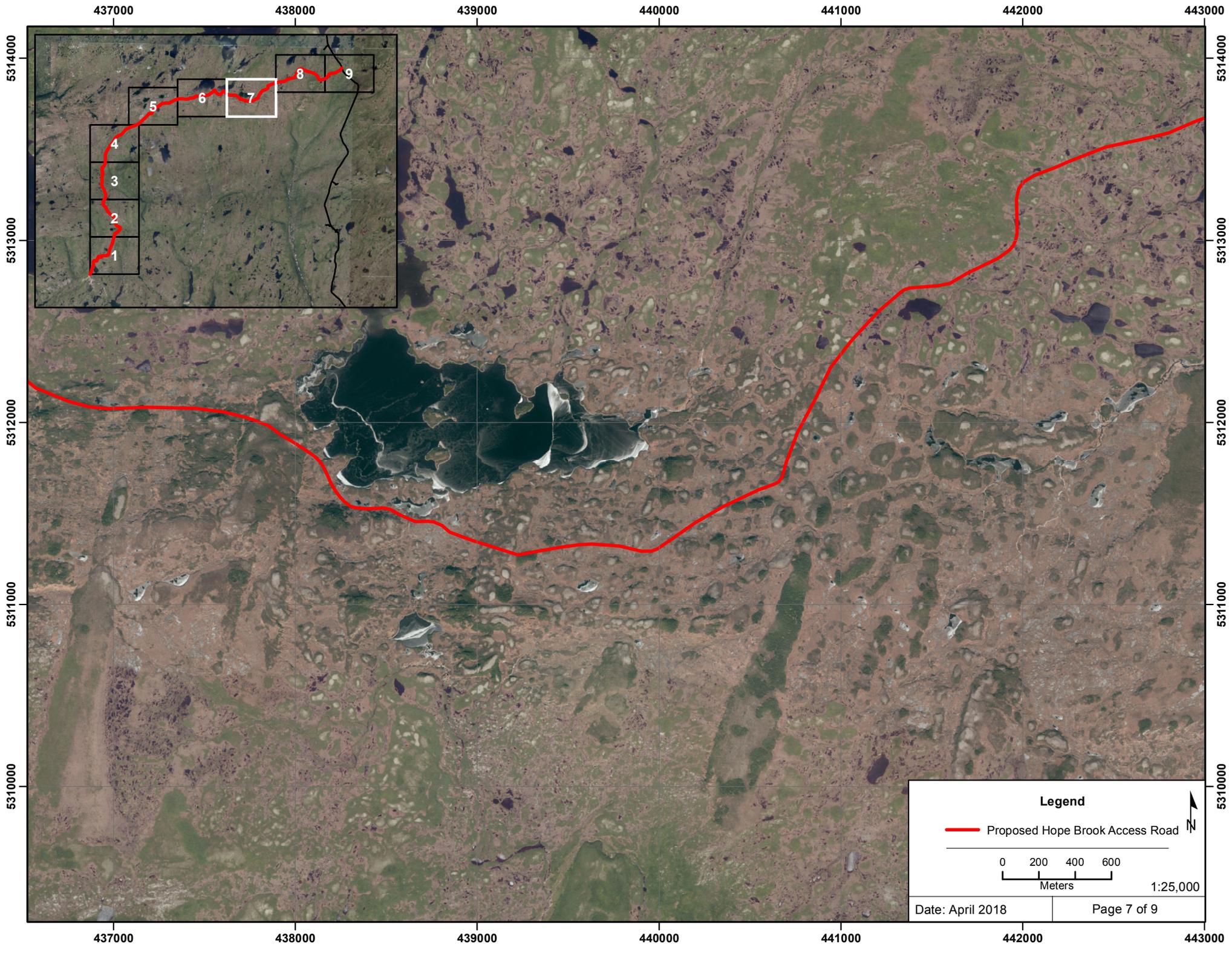
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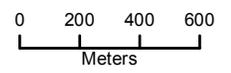
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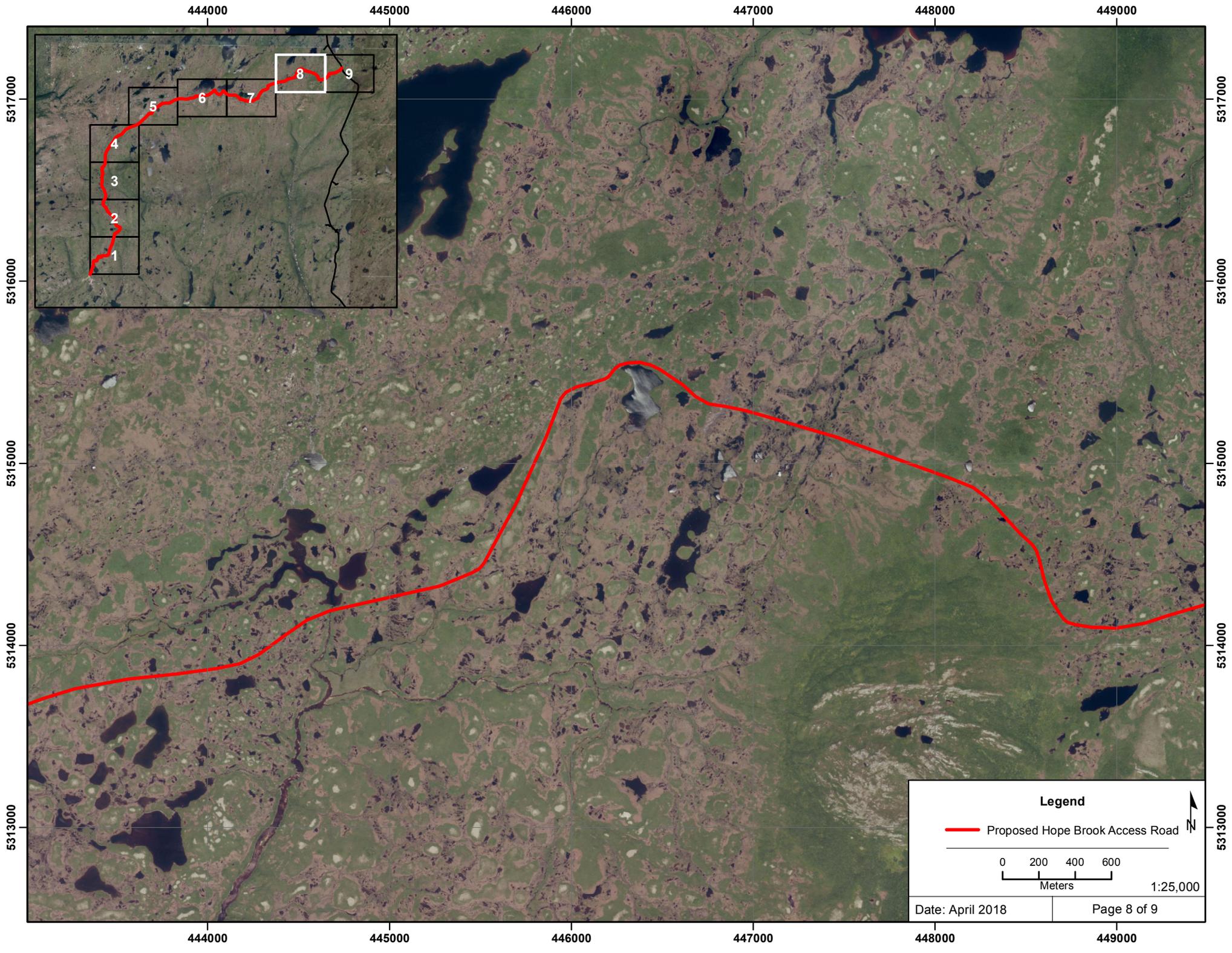
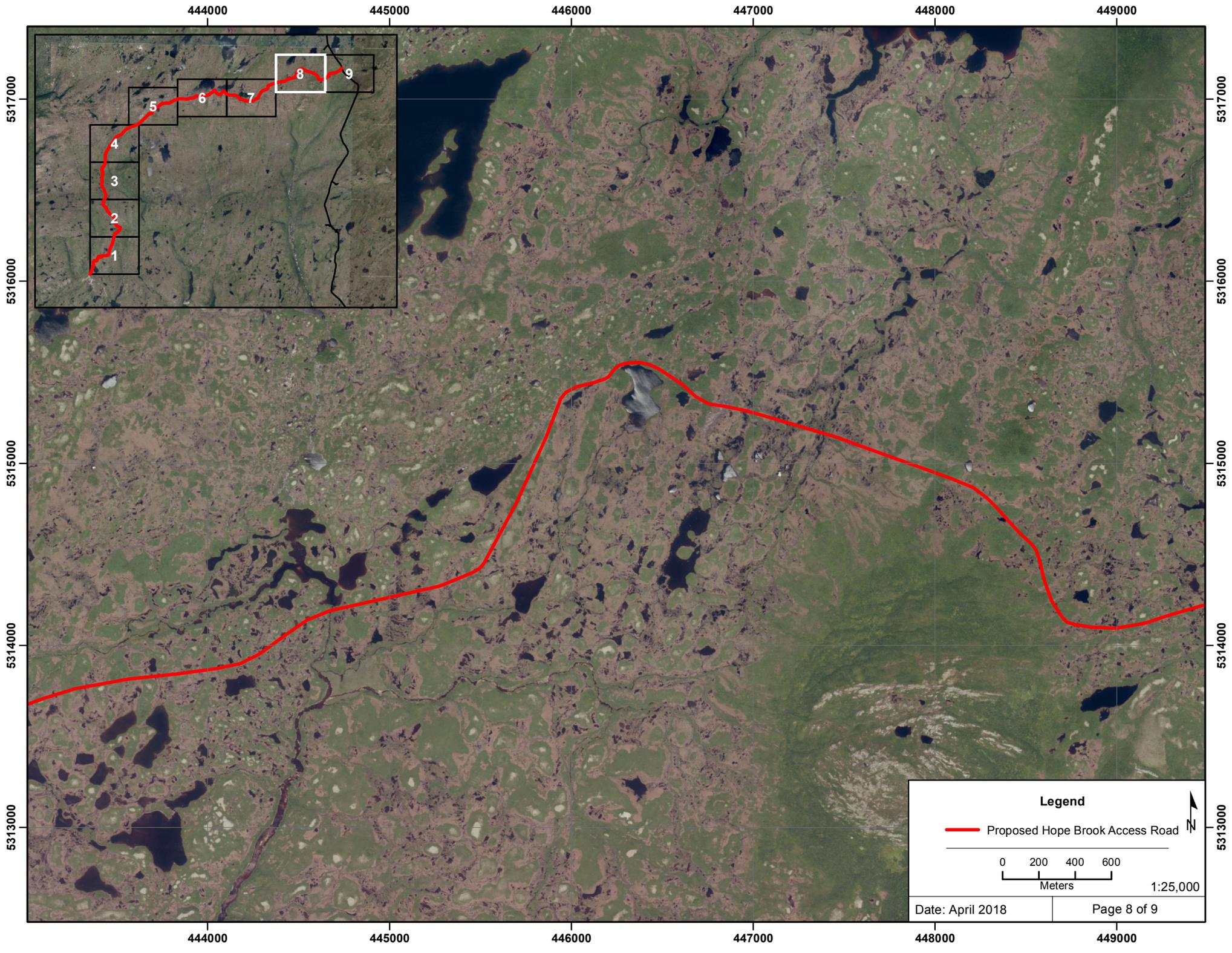
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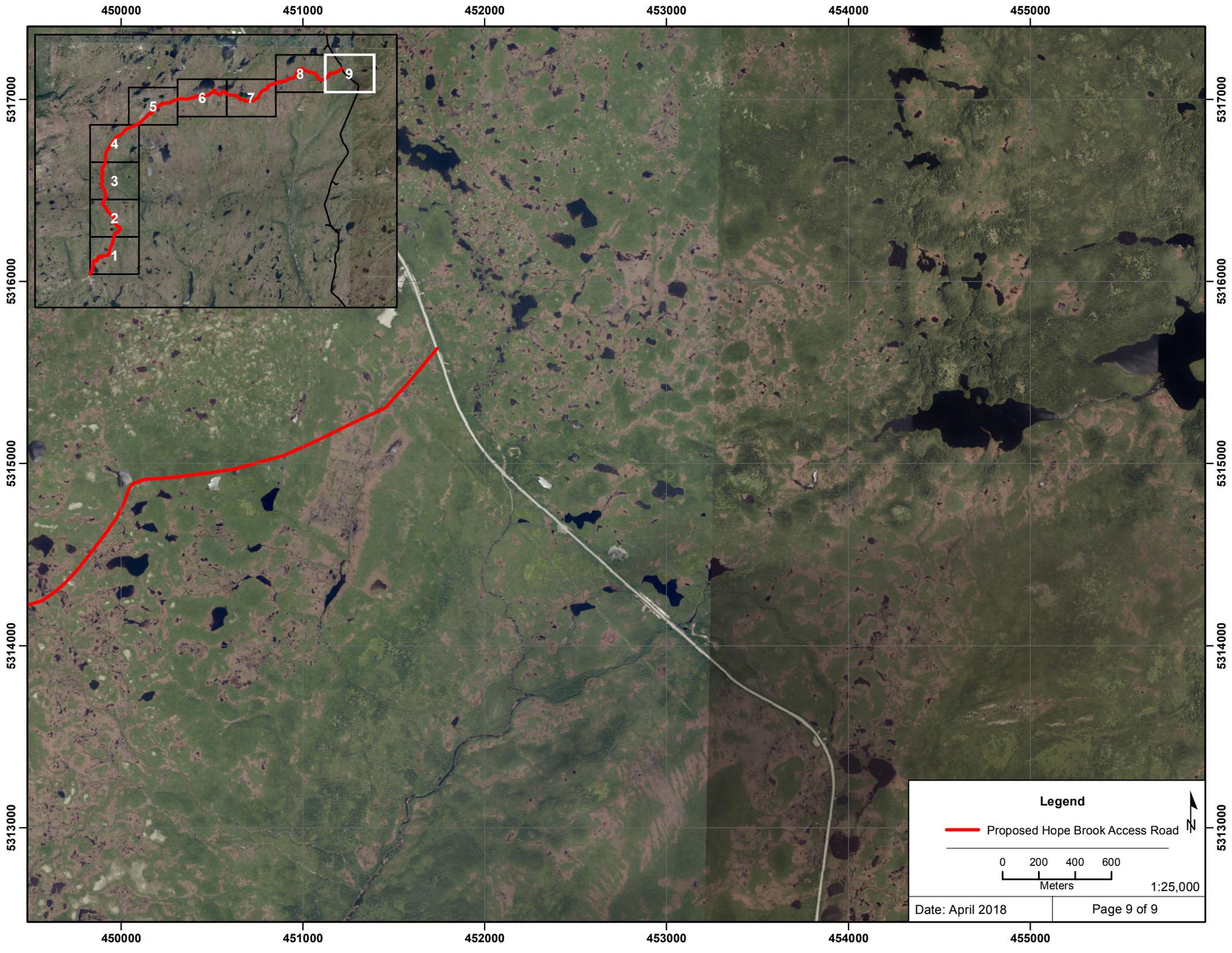
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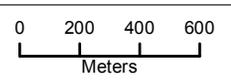
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