6 Existing Environmental Conditions in the Study Area

6.1 Study Area

The Project is located in Northwestern Ontario, with the northern end of the road approximately 525 km northeast of Thunder Bay (refer to **Figure 1.1)**. The Project is located on provincial Crown land, Webequie First Nation Reserve land under federal jurisdiction), and the traditional territories of Indigenous communities (refer also to Section 6.4.6 Land and Resource Use). **Figure 6.1** illustrates the location of the alternative routes in relation to project area features and sensitivities. Due to confidentiality constraints (including those imposed by Webequie First Nation and Government of Ontario ministries), and the need to respect the wishes of potentially affected Indigenous communities with respect to divulging certain information on the use of lands in the project area, it is not possible to illustrate the location or bounds of a number of features and sensitivities, including First Nations' traditional territories, individual camps/cabins, species at risk (e.g., caribou ranges), and government-regulated hunting areas (e.g., trapline licences). However, sensitive features and resources are described in general terms in this section of the ToR.

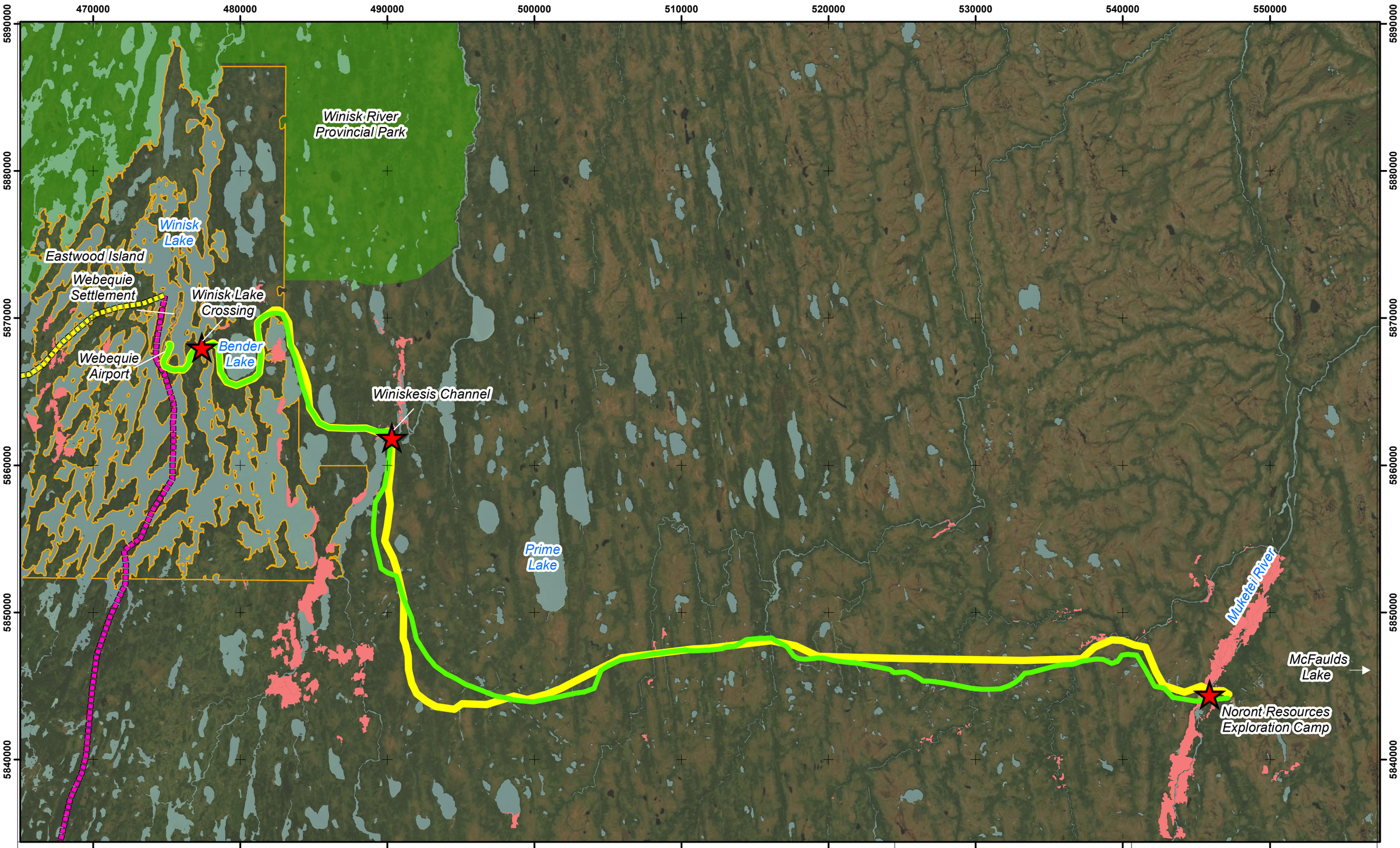
The EA will summarize past investigations and analyses of alternative road alignments between Webequie and the mineral deposit area near McFaulds Lake, and will assess the potential impacts of alternative alignments in the preferred corridor for the Webequie Supply Road. The significance of an environmental impact partially depends on the geographic extent. As such, the impact assessment will be conducted on the basis of specific study areas related to the project development, adopting a multi-scale approach for describing baseline conditions (existing environment) and predicting effects from the Project. More specifically, the Study Area will generally be broken up into the following three components to capture the potential direct and indirect effects of the Project.

Project footprint: established to identify areas of direct disturbance (i.e., the physical area required for construction and operation of the Project). The project footprint is the preferred corridor (35 m Right-of-Way width) and temporary or permanent areas needed to support the Project that include laydown yards, storage yards, construction camps, access roads and aggregate extraction sites.

Local Study Area (LSA): established to assess the potential, largely direct, and immediate indirect effects of the Project on the local environment. The boundaries of each LSA will extend a specified distance from the project footprint boundary to specifically capture the direct and nearby indirect effects on an environmental component/criterion (refer to Section 8.1.1 for the preliminary identification of evaluation criteria).

Regional Study Area (RSA): established to assess the potential, largely indirect and cumulative, effects of the Project in the broader, regional context. The RSA extends beyond the LSA to include the maximum geographical extent to which impacts from the Project may be expected.

The EA will define and describe the specific study areas for each of the environmental components (e.g., natural, socio-economic, cultural) in greater detail. Each component will be assessed within the context of LSA and RSA. The size and extent of each study area may differ for each environmental study component.



Legend

- Proposed Major Water Crossings
- Alternative Route
- Route Preferred by Webequie Community
- Existing Winter Road
- Old Winter Road
- Potential Aggregate Sources
- Webequie First Nation Reserve Limits
- Waterbody
- Winisk River Provincial Park

WSR WEBEQUIE SUPPLY ROAD

0 5 10 Km

N

NAD 83
UTM Zone 16N

Webequie Supply Road

Alternative Routes and Project Area Features / Sensitivities

Date: 2019/09/05	File Number: 649920	Sub Code: 0000
Figure Number: 6.1		Rev. 0

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For example, the study area for assessing terrestrial biological effects (e.g., caribou migration) will likely be more extensive than the hydrological study areas. Watershed boundaries will be utilized, where applicable, to ensure that potential impacts on an entire watershed are considered.

CARIBOU STUDY AREA

The LSAs and RSAs will incorporate the potentially affected caribou range or ranges. Cumulative effects of the Project, as well as other developments in the Ring of Fire on caribou, will be assessed as directed by the Ontario Caribou Conservation Policy under the ESA (2007). WFN and other Indigenous communities have provided input to the Ministry of Natural Resources and Forestry (MNRF) on the Ontario Woodland Caribou Recovery Strategy and the Ontario Woodland Caribou Conservation Plan, and will continue to work collaboratively with the MNRF to define caribou population ranges and, therefore, the necessary study area for consideration in the environmental effects analysis.

6.2 Data Collection Methodology

This section describes overarching data collection methodology goals and the approach to develop a fulsome understanding of the existing (or baseline) natural, socio-economic and cultural conditions in the Study Area for the Project.

Desktop studies will be utilized to collect data and pertinent knowledge for the environmental factors to be considered in the EA. This knowledge will serve to inform preliminary project design and direct efforts for further assessment of the effects to the environment. Information used for the purpose of documenting existing natural, socio-economic and cultural conditions will be gathered from background information provided by government agencies and other stakeholders, as well as published and unpublished data sources. An important information source will be Indigenous Knowledge from WFN and other Indigenous communities that will be incorporated into aspects of the EA, subject to consultation with and willingness of traditional knowledge holders and communities.

Information to characterize existing environmental conditions and features in the Study Area will draw upon the following secondary sources:

- Previously conducted environmental studies, including Indigenous Knowledge information obtained through consultation with Indigenous communities;
- Regulatory databases;
- Aerial photography;
- Geographic Information System (GIS) databases;
- Academic literature; and
- Information obtained from agencies and other stakeholders.

In addition, primary sources of information such as field investigations and first-hand consultation with Indigenous communities and stakeholders will be used to supplement the data gathering effort from secondary sources. Field work studies will focus on the identified preliminary preferred corridor. The scope and intensity of the field studies and the associated data collection methodologies will be further refined during the EA process through consultation with Indigenous communities, federal/provincial agencies and stakeholders.

The specific objectives of the baseline studies are to:

- Describe the existing natural, socio-economic and cultural environments in the Study Area for the Project;
- Facilitate the assessment of potential environmental effects for all phases of the Project;
- Provide the basis for the identification and development of appropriate impact management measures (i.e., mitigation) to avoid or reduce the identified potential environmental effects;
- Identify and evaluate project alternatives to minimize potential environmental effects;
- Establish benchmarks for environmental effects and compliance monitoring that will be implemented during the construction, operation and maintenance of the Project, as required.

Interact with potentially affected Indigenous communities and/or other interested groups during the baseline data collection period to facilitate the two-way exchange of information (i.e., Indigenous Knowledge) and opportunities to express their concerns and preferences with regard to project development.

The description and characterization of the existing environmental conditions provided in the ToR (Sections 6.3, 6.4 and 6.5) will be presented in greater detail in the EAR/IS and will include the method and the results of the baseline field programs that were completed to support the EA.

6.2.1 Biological Environment

The primary field methods for collection of data for the biological environment will include, but are not limited to, the following:

Winter Aerial Caribou Survey

In winter 2019, an aerial Woodland Caribou survey was conducted in accordance with the survey methodology for identifying and delineating woodland caribou winter habitat provided by the MNRF in their publication titled *Selected Wildlife and Habitat Features: Inventory Manual* (Ranta, 1998). This survey consisted of flying a grid of parallel transects, spaced 2 km apart and oriented perpendicular to the preferred corridor, using a Bell 206 Long Ranger helicopter. In total, 40 transects, were surveyed, for an approximate total survey length of 2,400 km. The survey was conducted on consecutive days between February 9-14, 2019 to ensure deep snow conditions (>30 cm). All wildlife observations made during the survey were recorded on a data sheet and included date, time, transect number, Universal Transverse Mercator (UTM) coordinates, species name, number of individuals, and habitat type. Results of this survey will be documented in an environmental baseline condition report to support the EA.

Summer Caribou Calving Survey

Woodland Caribou calving and nursery habitat will be surveyed in accordance with the methodology provided by MNRF and outlined in (Ranta, 1998) for identifying and delineating woodland caribou calving and nursery habitat. Suitable landscape features within the project footprint and LSA (i.e., within 1-2 km of the alternative corridors under consideration), such as islands, peninsulas, and bog/fen complexes, will be identified using aerial photographs and assessment of caribou refuge habitat using the Boreal Landscape Tool to establish candidate areas for the survey.

Field surveys within candidate habitat areas will occur during the calving season (June 15 to August 15) and will consist of ground transects serving to locate signs of caribou occurrence (e.g., tracks, pellets, beds, hair). Candidate habitat will be accessed using a Bell 206 Long Ranger helicopter. In instances where the

helicopter cannot safety land, a low-level survey will be conducted from the helicopter. Results of this survey will be documented in an environmental baseline condition report to support the EA.

Bat Hibernaculum Screening

A review of secondary source information will be undertaken to identify natural and man-made features along the corridors under consideration that may provide bat hibernaculum habitat. In the event that habitat suitable for use by bats as a hibernaculum is located within the project footprint or LSA, it is recommended that acoustic surveys be conducted in proximity to any entry points in late August or September. This is recommended to determine whether swarming is occurring at that site, indicating use of the feature as a hibernaculum.

Bat Maternity Roost Habitat

Maternity roost habitat assessments will be conducted in accordance with the MNRF *Bat Survey Protocol for Treed Habitats* (2017) and/or other protocols to identify forest habitat capable of hosting bat maternity roosts. Forest Resource Inventory vegetation community metadata across the Study Area will be screened using ArcGIS software for the presence of older, more mature tracts of deciduous forest or mixed forest greater than 80 years old which the alternative corridors would cross. This is the age at which trembling aspen, a common, large diameter deciduous tree in the boreal region, attains a diameter at breast height (DBH) of 20 cm. Once more mature forest areas are identified; snag density survey plot locations will be distributed as evenly as possible across accessible areas. Snag density surveys will be conducted across these plots, with the primary objective of generating a quantitative index of habitat suitability across mature treed areas across the Study Area. Snag density will be calculated as the total number of snags recorded for all plots within a contiguous candidate habitat site, divided by the total area surveyed. All snags >10cm DBH will be recorded and given a snag classification according to applicable MNRF protocols.

Bat Acoustic Surveys

Acoustic surveys will be conducted with the primary objective of determining the presence or absence of bats along the LSA as well as the species diversity thereabouts. Acoustic recordings will be collected concurrently at multiple locations at a time, using Song Meter SM3BAT (Wildlife Acoustics Inc.) full-spectrum, ultrasonic recording devices. Each detector will be paired with a Wildlife Acoustics SM3-U1 ultrasonic, omnidirectional microphone using a 3 m microphone cord. Detectors will be located in open areas along linear habitat features, such as watercourse and clearing edges, in proximity to deciduous ecosites with trees of large DBH. Microphones will be positioned approximately 10 m from the forest edge in an attempt to make recordings in a low-clutter environment; thus, maximizing the clarity and quality of recorded echolocation calls for more accurate species identification.

Bat recordings will be analyzed using the acoustic analysis program Kaleidoscope Pro (Wildlife Acoustics), which auto-identifies each recording by comparing the acoustic pulses to a known reference library and by identifying species-specific characteristics of each pulse (i.e., frequency, slope, duration). Recordings will be identified to species, where possible. In instances where identification cannot be assigned definitively to one species, the recording will be assigned a grouping that best encompasses the identifying characteristics of the pulses therein.

Breeding Birds

Inventories for migratory and year-round resident bird species that are expected to nest within the project Study Area will be conducted using principles of the *Forest Bird Monitoring Program* as well as the *Ontario Breeding Bird Atlas* survey protocols. These protocols are described in the MNRF's publication *Wildlife Monitoring Programs and Inventory Techniques* (Konze and McLaren, 1997) and the *Ontario Breeding Bird Atlas Participants Guide* (OBBA 2001). Breeding bird point counts will be conducted at pre-determined stations, positioned in distinct habitat types, such as coniferous forest, mixed forest, deciduous forest, open country, and thicket. These surveys will be completed during the bird nesting period, between May 24 and July 10th in the morning, between one half hour before sunrise and 5 hours after sunrise. Each count station will have a point-count duration of ten minutes and will be surveyed twice during the bird nesting period at least ten days apart.

Data collected during point count surveys will be summarized to calculate the total diversity present within the study area, total diversity at each count station, relative abundance at each station, species densities per habitat type, the number of Partners in Flight (PIF) species observed, and the locations of observed species.

Marsh Birds

Marsh birds will be noted opportunistically during morning breeding bird surveys. Data collected during point count surveys will be summarized to identify wetland bird species using the Study Area and the identification of the Significant Wildlife Habitat (SWH) waterfowl nesting areas type.

Reptiles and Amphibians

Reptile and amphibian observations will be noted opportunistically during breeding bird surveys and other ground surveys within accessible amphibian habitat breeding features, such as marshes, fens, bogs, thicket swamps, and treed swamps identified during the background data review.

Data collected with regards to incidental reptile and amphibian observations will include, date, time started, weather conditions (wind, temperature, cloud cover, and precipitation), UTM location, species observed, call level, number of individuals, and distance from observer. In the event that frogs are heard calling, call level will be recorded. Call levels will include: "0 – None heard; 1 – Individuals can be counted, calls not overlapping"; "2 – Numbers of some individuals can be estimated or counted, others overlapping"; and "3 – Full chorus, calls continuous and overlapping, individuals not distinguishable."

Aquatic Habitat Surveys

Aquatic habitat surveys will be conducted in reaches at or near the proposed crossings. The methodology will be generally based on the *Ontario Stream Assessment Protocol* (Stanfield 2017) and other applicable protocols.

For each waterbody, habitat variables such as location, waterbody name, watershed name, flow regime (ephemeral, intermittent, or permanent), waterbody type (watercourse, or lake/pond), and thermal regime (cold, cool, or warm) will be documented, where available. Stream morphology habitat types, such as riffle, rapids, run, flat, pool, impoundment, and backwater, will be visually assessed in the survey reach (O'Neil and Hildebrand, 1986). Other habitat variables, such as bank-full width, wetted width, water depth, in-situ water quality/chemistry measurements (temperature, pH, conductivity, total dissolved solids, and dissolved

oxygen), turbidity, water quality samples, instream cover, substrate type and fish passage barriers will be recorded. Fish community sampling will be conducted in watercourses that are wadable. Based on the habitat features observed, the overall aquatic habitat value in each waterbody will be rated as either Nil, Low, Moderate, High, or Unknown.

The habitat will also be described in terms of potential fish use and the sensitivity of the habitat at or near the proposed crossing. The habitat sensitivity will be rated based on the available spawning, migration, rearing and overwintering habitat potential and will be evaluated and assigned a fish habitat sensitivity value of Low, Moderate, or High.

VEGETATION SURVEYS

Sample locations will focus on deriving representative vegetation classifications within the Study Area as a whole.

Plots will be assessed following the Ontario Parks datasheets for Vegetation Plot Layers, and Groundcover/Substrate Plot Information (See sample datasheets attached). Key vegetation information collected for each layer (canopy, sub-canopy, understorey tree/shrubs, dwarf shrubs, herbaceous, moss/lichen, etc.) will include: percent cover, species composition, species percent cover, and any other comments. For those plots where tree height exceeds 10 m, a diameter at breast height (DbH) measurement will be taken for a representative tree of each dominant or codominant species. No ages of trees will be recorded.

At each sampling point, a soil sample will be taken using a hand auger to establish whether soils are organic, or mineral, as well as the texture of any mineral soils. Mottling of soils, or presence of gley will be noted along with depth to bedrock and water table where applicable. Soil cores will be taken to a depth of 30 cm (unless prevented by bedrock or stone cover). Where depth exceeds 30 cm, the depth of soils will be assumed to be moderately deep (30-60 cm) for purposes of determination of moisture regime and drainage class. Groundcover, including woody debris, will also be recorded.

Based on the field data, each site will be assigned a V-type (or W-Type) and ecosite based on the appropriate regional Ecosystem Classification (Sims et al., 1997; Racey et al., 1996; Chambers et al., 1997; Taylor et al., 2000). These will be translated to the appropriate provincial ecosites based on *Ecosites of Ontario: Boreal Range* (Banton et al., 2009) for each plot and extrapolated to similar un-sampled areas within the Study Area to develop the final study area wide vegetation classifications used to determine impacts. Based on the potential for variable mapping information, this will give flexibility in terms of finding best fits and common terminology between the field generated data and mapping.

6.2.2 Physical Environment

In addition to the review of secondary source information available for the project area, the primary field methods for collection of data for the physical environment will include, but are not limited to, the following:

- Ground Penetrating Radar (GPR) Survey;
- LiDAR survey to assess terrain/topography;
- Geotechnical drilling to characterize soil and groundwater conditions; and
- Surface water sampling.

6.2.3 Socio-Economic Environment

Methods to characterize and describe the existing socio-economic environment in the Study Area for the Project will be achieved through a literature review and direct consultation and engagement with Indigenous communities, including use of Indigenous Knowledge. This will include data from Statistics Canada, Indigenous Services Canada, websites of Indigenous communities, municipalities and provincial agencies, and background reports available from governmental agencies. Information will also be drawn from other studies in the area including, but not limited to, the *All-season Community Road Pre-feasibility Study* (Eabametoong, Webequie, Neskantaga and Nibinamik First Nations, 2016), *All-season Community Road Study – Phase 2* (Webequie and Nibinamik, 2017) and Noront's *Eagle's Nest Environmental Impact Statement/Environmental Assessment Report* (Noront, 2013).

6.2.4 Cultural Environment

Consultation and engagement with Indigenous communities, including receiving Indigenous Knowledge information where available, will be used to characterize and describe the existing cultural environment. This will include, but not limited to, key aspects, such as Aboriginal Rights, Treaty Rights, and interests and current use of lands and resources for cultural purposes (e.g., hunting, trapping, fishing, gathering) of importance to Indigenous communities.

In accordance with requirements under the under the *Ontario Heritage Act,* a Stage 1 Archaeological Assessment will be undertaken to describe existing archaeology potential in the Study Area for the Project. The assessment will be completed by a licensed archaeologist in accordance with the Ministry of Tourism, Culture and Sport *Standards and Guidelines for Consultant Archaeologists* (2011). The methodology for the assessment will involve review and research of geographic and historical features and land use history of the preferred corridor and its surroundings. A key data source will be WFN and other Indigenous communities for information on traditional land use areas, sacred sites and other cultural aspects. The purpose of the Stage 1 Archaeological Assessment will be to evaluate in detail the preferred corridor's archaeological potential (i.e., the likelihood that the area contains archaeological resources). In addition, the Study Area will be reviewed to determine if there are any known and/or potential built heritage resources and cultural heritage landscapes of value.

6.2.5 Published Sources of Information

Table 6-1 presents a list of the preliminary published sources of information to be used to determine the existing environmental conditions.

Table 6-1: Published Sources of Information for Existing Conditions

Source of Information	Document
Banton et al.	Ecosites of Ontario: Boreal Range (2009)
Birds Ontario (Bird Studies Canada, OFO, ECCC, Ontario Nature, MNRF)	Ontario Breeding Bird Atlas (OBBA) (2007)
Committee on the Status of Endangered Wildlife in Canada (COSEWIC)	Wildlife Species Assessments

Source of Information	Document
Committee on the Status of Species at Risk in Ontario (COSSARO)	Ontario Species at Risk (May 2000)
Committee on the Status of Species at Risk in Ontario (COSSARO)	Species at Risk in Ontario (SARO) List
Environment and Climate Change Canada	Species at Risk in Canada (SARA) List
Federation of Ontario Naturalists	Ontario Mammal Atlas (1994)
Noront Resources Ltd.	Eagle's Nest Project - Federal/Provincial Environmental Impact Statement/Environmental Assessment Report (2013)
Webequie and Nibinamik First Nations	Baseline Environmental and Geotechnical Studies Report - Webequie Community Supply Road (TPA1B) and Nibinamik-Webequie Community Road (TPA1A) (2018)
Eabametoong, Webequie, Neskantaga and Nibinamik First Nations	All-season Community Road Study (2016)
Ministry of Environment, Conservation and Parks	Environmental assessments, registry and approvals database
Ministry of the Environment, Conservation and Parks	Model Municipal Noise Control By-Law Noise Pollution Control Guideline (NPC) Construction Equipment, Publication NPC-115 (NPC-115) (1978)
Ministry of the Environment, Conservation and Parks	Environmental Noise Guideline Stationary and Transportation Sources – Approval and Planning, Publication NPC-300 (NPC-300) (2013)
Ministry of Transportation (MTO), Fisheries and Oceans Canada (DFO), MNRF	Protocol for Protecting Fish and Fish Habitat on Provincial Transportation Undertakings (2013)
Ministry of Natural Resources and Forestry	Significant Wildlife Habitat Technical Guide (2000)
Ministry of Natural Resources and Forestry	Significant Wildlife Habitat Ecoregion Criteria Schedules (2012)
Ministry of Natural Resources and Forestry	Ontario's Woodland Caribou Conservation Plan (2009)
Ministry of Natural Resources and Forestry	Bat Survey Protocol for Treed Habitats (2017)

Source of Information	Document
Ministry of Natural Resources and Forestry	Wildlife Monitoring Programs and Inventory Techniques for Ontario (1997)
Ministry of Natural Resources and Forestry	Land Information Ontario (LIO) (2016)
Ministry of Natural Resources and Forestry	Survey Protocol for Eastern Whip-poor-will in Ontario (2014)
Natural Heritage Information Centre	Biodiversity Explorer Database
Natural Heritage Information Centre (NHIC)	Rare Vascular Plants (1999)
NHIC, MNRF	Ontario Herpetofaunal Summary Atlas (2000)
Ontario Nature	Ontario Nature Reptile and Amphibian Atlas
Phair, C., Henson, B.L., and Brodribb, K.E.	Great Lakes Conservation Blueprint for Aquatic Biodiversity. Volume 2: Tertiary Watershed Summaries (2005)
Royal Ontario Museum (ROM)	Field Guide to Freshwater Fishes of Ontario (2008)
Statistics Canada	Census Profile and National Household Survey (2016)

6.3 Natural Environment

The following sections document the existing natural environment (biological and physical components) conditions in the Study Area for the Project. All information collected as part of the natural environment field program and obtained through Indigenous Knowledge transfer from WFN and other Indigenous communities will be used in the EA to determine the preferred corridor and to identify potential effects and proposed mitigation measures for the Project. Information collected for the EA may also be used by WFN to obtain other permits, approvals and/or licences that may be required to proceed to construction.

General Environmental Setting

The Study Area for the Project lies within the Ontario Shield Ecozone Region of Northern Ontario. This ecozone is known for the Precambrian bedrock, as well as many wetlands and large rivers and streams, which flow to Hudson Bay (Crins et al, 2009). Bogs and fens also dominate the region, with forest stands on higher ground formed on glacial materials, such as eskers or next to rivers. The Study Area is within the Big Trout Lake Ecoregion.

Hydrologically, the project area is situated within the primary Southwestern Hudson Bay watershed (refer to **Figure 6.2** information extracted from the 2017 All-Season Community Road Study). The area includes parts of the Winisk-Coast, Ekwan-Coast and Attawapiskat-Coast secondary watersheds, and falls within the following three (3) tertiary watersheds:

- Attawapiskat – Pineimuta River, Muketei River, Attawapiskat River;
- Winisk – Fishbasket River, Wapitotem River; and
- Ekwan – Ekwan River.

The Attawapiskat River flows in a generally easterly direction to James Bay and the Winisk and Ekwan River systems flow north to Hudson Bay.

Portions of the preferred corridor for the all-season road traverse intact boreal forest (including bogs and fens). The terrain is generally low gradient with large wetland areas, several lakes and ponds, and slow flowing, often meandering streams and rivers. Upland areas are common along river banks and associated with glacial till deposits. These areas, with contrasting vegetation due to much better drained soils, constitute a relatively low percentage of the landscape in the area. Poplar trees dominate upland glacial till deposits, while dense spruce trees typically dominate the stream and river banks.

6.3.1 Geology, Terrain and Soils

Surficial geology consists of exposed bedrock as well as large moraines. Much of the surficial deposit is dominated by silt, and silt clay deposits as a result of glaciolacustrine deposition from post-glacial Lake Agassiz. The landscape is weakly broken, with low lying ridges of clay and sand, and extensive peatlands in low lying areas (Crins et al., 2009).

Terrain and topography are generally flat, with some localized relief. Large stretches of the preferred corridor pass through water logged areas/marshes exhibiting poor ground condition with deeper peat and organics and poor drainage.

The Study Area is characterized by predominantly flat, poorly drained soils with slow rates of plant decay. As a result, the development of organic soils and peat is common throughout much of the area. The organic surface layer typically ranges from 1 to 2 metres in thickness. It is underlain by a clay/silt till layer of up to 2 m thick, and a Quaternary till layer up to 5 m thick. Depth to bedrock ranges from 5 to 12 m below the surface.

Surficial material in the region consists of unstratified post-glacial till interspersed with bedrock outcrops and stratified till. The surficial material in the Study Area is predominantly silty clay to silt matrix, commonly clast poor with high carbonate content. Soil development in the region varies depending on drainage. Low lying areas consist of organic soils, while better drained soils are regosolic.

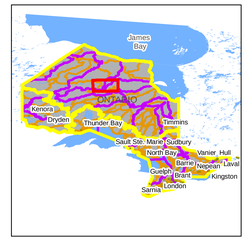
Glaciofluvial esker deposits are common in the project area. Eskers are ridges that typically consist of a core of stratified sands and gravels. In esker deposits, the soils are much better drained, there is little surface organic material, and the groundwater table is further below the surface. Eskers are of particular interest for the caribou habitat values analysis at the sub-range and range scales. Being a small proportion of the landscape, eskers may have functions proportionally greater than their area alone might suggest.

Webequie Supply Road

Figure 6.2

Watersheds and Subwatersheds

Watershed Context Map



Legend

- Preliminary Webequie Supply Road
- Primary Watersheds
- Secondary Watersheds
- Tertiary Watersheds
- Watercourses
- Waterbodies

N
W E
S

0 3.5 7 10.5 14 km

Coordinate System: NAD 1983 Ontario MNR Lambert
Projection: Lambert Conformal Conic
Datum: North American 1983

WSR
WEBEQUIE
SUPPLY ROAD

6.3.2 Groundwater and Surface Water

From data available near McFaulds Lake area (Noront, 2013) groundwater is present in the saturated organic material and in unstratified and stratified glacial till (composed of sand, silt and clay). There is also groundwater present in the near surface and deep bedrock. Hydraulic conductivities (K) are on the order of 10^{-4} m/s in the coarser overburden soils, 10^{-6} m/s for the organic soils, and as low as 10^{-7} m/s in the finer soils and bedrock. In general, the hydraulic conductivity of bedrock generally decreases with depth. The groundwater levels in region are thought to range from 0 to 4.9 m below ground surface, with seasonal fluctuations between 0.5 and 1.5 m.

Stream systems are cut minimally into the landscape, and have low slope and slow flows. Due to low relief and low permeability soils, the streams are connected to the overburden aquifer and are not typically connected to deeper bedrock aquifers. The groundwater table in the overburden is typically at or near the surface due to the flat terrain and underlying low permeability silts and clays. Where the low permeability overburden material exists, the shallow overburden aquifer is isolated from groundwater in the deeper bedrock. The permeability of the bedrock is expected to decrease with depth so, in general, the most permeable bedrock aquifer will occur along the bedrock/overburden interface.

The Study Area has many different types of waterbodies, including streams, rivers, lakes, ponds and wetlands (over 50% of the ecoregion is covered by wetlands). There are several larger rivers in the area, including the Winisk, Ekwan, Attawapiskat, Fishbasket and the Pineimuta Rivers. There are also some very large lakes, such as Winisk Lake in the northeast part of the Study Area. There is also a vast network of smaller connected headwater streams, ponds and lakes. Many of these smaller streams are part of open fens. Streams in the region are low gradient and have low velocity flow throughout most of the year. The stream banks are typical of low gradient streams and are well defined by earth, boulders, bedrock outcrops and natural levees. Beaver dams are common features on small to medium sized streams. Stream flow peaks in the spring as a result of snowmelt runoff and rainfall runoff from saturated soils. Flows recede through the summer and increase in the fall due to an increase in rainfall and a decrease in evaporation. Flows are normally lowest in winter, and some small streams freeze completely to the stream channel bed. Snowfall is an important component of the hydrologic cycle in the region, as accumulated snow represents a significant stored water component.

6.3.3 Terrestrial Wildlife and Habitat

MAMMALS

A background data review for mammal occurrence in proximity to the Project indicated that 41 mammal species may occur in the region. This total is largely based on data presented in the *Atlas of the Mammals of Ontario* (AMO) (Dobbyn, 1994).

During the Noront Eagle's Nest Mine EA, winter tracking surveys were conducted in 2011 and 2012 at three general locations along the proposed all-season road and one location around the Eagle's Nest Mine site. The EA surveys detected a total of 16 mammal species, the most abundant of which included American Marten, Snowshoe Hare, Fisher, Moose, Gray Wolf, and Red Fox (Noront, 2013). Wolverine was also recorded during the surveys. Three of the four tracking study areas occurred along the preferred corridor for WSR, and between 11 and 13 species were recorded at each area.

Wildlife surveys were conducted by SNC-Lavalin in 2017, as reported in the *Baseline Environmental and Geotechnical Studies Report - Webequie Community Supply Road (TPA1B)* and *Nibinamik-Webequie*

Community Road (TPA1A) (2018). The results of the 2017 survey produced records of 10 mammal species, of which 4 were seen or heard and 6 were recorded based only on the presence of sign, such as tracks, scat, gnaw marks, and houses. A list of these recorded species is presented in **Table 6-2.** A total of 9 mammal species were recorded across TPA1A route, while 3 species were recorded across TPA1B route. All recorded species recorded have been reported by the AMO and, with the exception of Woodland Caribou, were accounted for through winter tracking surveys.

A group of 7 caribou and a single caribou were recorded. Woodland Caribou is a Species at Risk (SAR) listed as *Threatened* and is protected under the *Species at Risk Act, 2002* (SARA). The forest-dwelling population of Woodland Caribou is also listed as *Threatened* and is protected under Ontario's *Endangered Species Act, 2007* (ESA). An estimated 5,000 to 7,000 forest-dwelling Woodland Caribou remain in Ontario. Within the RSA, the area of highest Caribou occupancy forms a broad band, averaging 110 km wide, straddling the ecotone between the boreal shield and the Hudson Bay lowlands. The WSR preferred corridor is situated within this high-occupancy band. Further discussion of SAR and the likelihood of occurrence in the Study Area is presented in Section 6.3.6.

Table 6-2: Mammals Recorded During 2017 Wildlife Surveys

Common Name	Latin Name	SARA (federal)	ESA (provincial)	Route Observed
American Marten	*Martes americana*	-	-	TPA1A
American Mink	*Mustela vison*	-	-	TPA1A/ TPA1B
Beaver	*Castor canadensis*	-	-	TPA1A
Moose	*Alces americanus*	-	-	TPA1A
Gray Wolf	*Canis lupus occidentalis*	-	-	TPA1A
Red Fox	*Vulpes*	-	-	TPA1A
Red Squirrel	*Tamiasciurus hudsonicus*	-	-	TPA1A/ TPA1B
Snowshoe Hare	*Lepus americanus*	-	-	TPA1A
Weasel Sp.	*Mustela sp.*	-	-	TPA1A
Woodland Caribou	*Rangifer tarandus caribou*	Threatened	Threatened	TPA1B

BAT AND BAT HABITAT

A review of range maps from Bat Conservation International (2017) indicate that five bat species may occur along preferred corridor for the Project. These species include Big Brown Bat (*Eptesicus fuscus*) Silver-haired Bat (*Lasionycteris noctivagans*), Hoary Bat (*Aeorestes cinereus*), Little Brown Myotis (*Myotis lucifugus*), and Northern Myotis (*Myotis septentrionalis*). Of these species, Little Brown Myotis, Northern Myotis, Big Brown Bat, and Silver-haired Bat are cavity roosting bats, while Hoary Bat is a foliage-roosting

bat. Wildlife habitat survey conducted in October 2017, as part of the baseline studies for Webequie Community Supply Road was not conducted during the active season for bats, thus no attempts to record bats were made. Nonetheless, searches for candidate bat SWH types, including hibernacula and maternity colony habitat were conducted at survey sites.

Two bat Significant Wildlife Habitat (SWH) types are recognized for Ecoregion 3W, which include maternity colonies or maternity roosting habitat and hibernacula (MNR, 2017b). During the spring and early summer, most Ontario bat species rely on forest habitat that supports a healthy density of large-diameter cavity trees. Females form maternity colonies in tree cavities that provide a warm, humid microclimate that optimizes gestation and postnatal growth of offspring (Kunz and Anthony, 1982). Trembling Aspen is a tree species commonly found within the Study Area for the Project and may provide suitable maternity roosting habitat by way of woodpecker holes in old trees suffering from heart-rot (Parsons et al., 2003; Psyllakis and Brigham, 2006).

In northern Ontario, bats typically hibernate in caves or abandoned mine shafts or adits, as well as underground foundations. Caves and mine shafts are the important features. Hibernacula are often associated as components of either cliff or rock barren ecosites (MNRF 2017b). Suitable hibernacula maintain winter temperatures slightly above freezing, have little air circulation and relative humidity is high. From the 2017 surveys, no habitat features indicative of bat hibernacula, such as caves, karst, old mine shafts, or otherwise were observed during field surveys – either by air, or on foot. Mid-age aspen-dominated deciduous forest was present at one waterbody crossing; however, no cavity trees or snags were observed in this forest patch.

Further surveys for occurrence of bats and bat habitat will be conducted as part of the EA.

BIRDS

A review of secondary sources indicates that at least 130 bird species occur in proximity to the preferred corridor for the Project. In 2009, AECOM (2010) conducted a baseline bird survey in the area of the proposed Eagle's Nest mine site recording 31 species. As a result of field studies conducted in 2010, the MNRF (Phoenix, 2010; 2013) also compiled a list of 96 breeding bird species for the Ring of Fire region. In 2011 and 2012 field studies, point count surveys were conducted at 176 sample plots, distributed among five infrastructure locations and six major habitat types in proximity to the proposed all-season road corridor (Noront, 2013). This study resulted in the detection of 82 bird species (Noront, 2013).

A total of 42 bird species were observed during the 2017 survey, as reported in the *Baseline Environmental and Geotechnical Studies Report - Webequie Community Supply Road (TPA1B) and Nibinamik-Webequie Community Road (TPA1A)* (2018). Of these, six had never been previously recorded in the aforementioned studies, including Great Gray Owl, Rough-legged Hawk, Snow Bunting, Lesser Scaup, Tundra Swan, and American Tree Sparrow. With the exception of Great Gray Owl and Lesser Scaup, it is expected that these species were non-breeding migrants that were passing through the area on route to their wintering grounds.

The six most frequently occurring breeding bird species for the regional study area in decreasing order, were Swainson's Thrush, White-throated Sparrow, Yellow-rumped Warbler, Ruby-crowned Kinglet, Hermit Thrush and White-winged Crossbill (Noront, 2013).

Waterfowl Stopover and Staging (Aquatic)

Waterfowl stopover and staging SWH consists of water bodies used for migration including ponds, marshes, lakes, bays, and coastal inlets (MNRF 2017b). This includes reservoirs managed as large wetlands or a pond/lake but excludes sewage treatment ponds and storm water ponds used by waterfowl. Areas that host annual staging of Ruddy Ducks, Canvasbacks, Trumpeter Swans or Tundra Swans are considered significant.

The preliminary 2017 baseline survey of waterfowl stopover and staging areas along the preferred corridor for the Project was flown in October, during the later peak of waterfowl migration in Ontario. While a total of over 1000 waterfowl are known to occur in the Study Area only 11 species were recorded during the 2017 survey. Many lakes and wetlands surveyed did not have any waterfowl present. Species recorded included Canada Goose, Tundra Swan, Mallard, Green-winged Teal, Lesser Scaup, Ring-necked Duck, Bufflehead, Common Goldeneye, Common Merganser, Red-breasted Merganser, and Hooded Merganser. Bufflehead was the most widely observed and numerous waterfowl species along the preferred corridor.

Eagle and Osprey Concentration Area and Nesting Habitat

Eagle and Osprey concentration area SWH consists of large river systems and merging lakes that are used by these species as hunting locations in spring, fall, or winter for several years (MNRF 2017b). Trees regularly used for perching and areas that are used for feeding or as winter/nocturnal roosting sites are considered SWH.

Eagle and Osprey nesting habitat SWH are associated with lakes, ponds, rivers or wetlands along treed shorelines, islands, or on structures over water (MNRF 2017). Osprey nests are usually at the top of a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy.

Bald Eagle was recorded at two locations along the preferred corridor from the 2017 bird surveys for WSR. No habitat features were observed that might provide suitable nesting habitat. However, it is expected that suitable perching and foraging habitat for Bald Eagles is not limiting in proximity to the corridor due to the abundance of lakes and watercourses in the area.

No Osprey or Osprey nests were observed along the preferred corridor during the 2017 survey.

Woodland Raptor Nesting Habitat

A review of existing information revealed that 11 woodland-nesting raptor species have been recorded in proximity to the Study Area for the Project, including Sharp-shinned Hawk, Cooper's Hawk, Northern Goshawk, Broad-winged Hawk, Red-tailed Hawk, Merlin, Barred Owl, Boreal Owl, Great Horned Owl, Long-eared Owl, and Northern Hawk-Owl. Based on the Noront Baseline Terrestrial Studies: Birds report (Noront, 2013), coniferous forest, mixed forest, and deciduous forest covered a combined 33% (542,791 ha) of their regional study area. Deciduous and mixed forests are most likely to provide large diameter trees (typically *Populus sp*.) suitable for supporting stick-nests or large cavities for cavity- nesting species comprised 8% (126,937ha).

From the 2017 baseline survey for the WSR, at least three hawk species, including Red-tailed Hawk, Rough-legged Hawk, Northern Harrier, were recorded, as well as a single Great Gray Owl. Of these, only Red-tailed Hawk and Great Gray Owl use woodland raptor nesting habitat. Common Raven was also

recorded. Two stick nests that were likely used by either hawk or large owl species or Common Raven were observed from the helicopter.

REPTILES AND AMPHIBIANS

A review of background information available, including the Ontario Reptile and Amphibians Atlas, indicates that five amphibians and two reptiles may occur within the Study Area for the Project. During studies conducted in support of the proposed Noront Eagle's Nest Mine, five frog species, including American Toad, Boreal Chorus Frog, Northern Leopard Frog, a Spring Peeper, and Wood Frog were recorded (Noront 2013). Eastern Garter Snake was also recorded along each study section across of the transportation corridor (Noront, 2013).

According to the Ontario Reptile and Amphibian Atlas, Ontario's most northerly turtle species, Western Painted Turtle and Snapping Turtle (*Chelydra serpentine*) do not occur further north than Woodland Caribou Provincial Park, which has a similar altitude to Pickle Lake. The Midland Painted Turtle does not occur further north than Pukaskwa National Park, on the eastern shoreline of Lake Superior. As a result, it is unlikely that turtles and turtle SWH, such as Turtle Wintering Areas and Turtle Nesting Areas, occur within the Study Area for the Project.

6.3.4 Vegetation and Wetlands

The Study Area is located within the Big Trout Lake Ecoregion (Ecoregion 2W), a large ecoregion stretching from the Manitoba border to the Hudson Bay Lowlands.

Forest dominates the ecoregion's landscape, covering approximately 50% of the ecoregion. The majority of this is coniferous forest, with a smaller component of mixed forest, and deciduous forest pockets growing along river valleys (Crins et al. 2009). Wetland (30%), open water (12%) and burns occupy the rest of the ecoregion. The burn area in this ecoregion is the highest percentage of any in Ontario. Black Spruce dominates both upland and lowland sites with Jack Pine and White Birch and Poplar species as associates. The shrub layers tend to be dominated by ericaceous shrubs, willow, and alder. The ground cover primarily consists of mosses and lichens, low ericaceous shrubs, and some herbs. Bedrock exposures have fewer trees and greater lichen cover lichens. Closed to open stands of stunted black spruce with ericaceous shrubs and a ground cover of sphagnum moss dominate poorly drained peat-filled depressions.

VEGETATION COMMUNITIES

From the review of available information sources and the 2017 field surveys of the preliminary corridor for WSR, the following is a description of the vegetation communities in the Study Area. Further vegetation assessments in accordance with established regional and provincial protocols along the preferred corridor will be undertaken as part of the EA, including conduct additional seasonal (spring/fall) surveys to capture early and late flowering species and develop a comprehensive three season species list for Study Area.

In summary, from the 2017 baseline vegetation survey for WSR the majority of the forest sites (68%) were dominated by coniferous trees, usually either Black Spruce (*Picea mariana*), or Jack Pine (*Pinus banksiana*). As well, approximately16% of the sites surveyed were classified as mixed treed and 16% as deciduous treed. Deciduous trees were typically Balsam Poplar (*Populus balsamifera*), Trembling Aspen (*Populus tremuloides*), and White Birch (*Betula papyrifera*). Wetland sites were mainly coniferous swamps with the majority falling into this Land Cover type (68%), typically dominated by Black Spruce. The

remainder of the sites of the sites surveyed were classified as Sparse Treed Fen, Open Fen and Thicket Swamp.

Vegetation has been grouped according the Far North Land Cover Classification system and is briefly described as follows.

Coniferous Treed

The coniferous treed Land Cover type was the most commonly found community type in the Study Area and one which contains the most variability. Eight different boreal ecosites were recorded in this community type. Canopy height varied, but was typically greater than 10 m with tree cover of greater than 60%. The dominant canopy species was Black Spruce, or Jack Pine. Jack Pine dominated sites often had strong regeneration of Black Spruce in the understorey, likely reflective of previous fire events. Balsam Poplar and Trembling Aspen were also present at some sites as smaller components of the canopy. Tall shrub growth was typically sparse consisting of Alder species when present. Low shrub growth was variable, dominated commonly by Labrador Tea (*Ledum groenlandicum*) with other common species including Leatherleaf (*Chamaedaphne calyculata*), and Bunchberry (*Cornus canadensis*). Moss cover was variable, though generally more prevalent at Black Spruce sites. Feathermoss species were the most common component, frequently dominating sites. Sphagnum species were occasionally found in depressions at wetter sites. Lichens were present at most sites, principally Reindeer Lichen (*Cladina rangiferina*) and Coral Lichen (*Cladina stellaris*).

Mixed Treed

The mixed treed Land Cover category found in the Study Area displayed three different boreal ecosites. Canopy height was greater than 10m with tree cover of more than 60%. Tree species were Black Spruce, Jack Pine, Trembling Aspen, Balsam Poplar, White Birch, and Tamarack (*Larix laricina*). Tall shrubs were present, usually mixed with sub-canopy trees, and consisted mainly of Green Alder (*Alnus viridis*), and Speckled Alder (*Alnus incana*) with occasional willow species (*Salix sp.*). Low shrub growth was fairly sparse with Labrador Tea, Prickly Rose (*Rosa acicularis*), Bunchberry, and Velvet Leaf Blueberry (*Vaccinum myrtilloides*) being the most common species. Moss cover was sparse at most sites with Feathermosses the most consistently present, other moss species including Ground Cedar (*Lycopodium complanatum*) and Ground Pine (*Lycopodium obscurum*) were present in lower abundances.

Deciduous Treed

This Land Cover category contained 4 sites consisting of three boreal ecosites. Canopy height was greater than 10 m, and greater than 20 m at most sites. Dominant canopy species were Balsam Poplar and Trembling Aspen with Jack Pine also present at some sites. Subcanopy growth was variable consisting mainly of poplar species along with White Birch. Black Spruce was also present in subcanopy. Tall shrub growth was variable consisting of mostly alder with some willow. Common low shrubs included Prickly Rose, Velvet Leaf Blueberry, and Bunchberry with Labrador Tea also present. Moss cover was sparse at most sites, although one site had significant feathermoss coverage. Other moss species included Ground Pine, Ground Cedar as well as Club Moss species.

Coniferous Swamp

The coniferous swamp Land Cover type was the most common wetland type. Three boreal ecosites were associated with this category, two of which are differentiated by organic versus mineral soils. Canopy height

was variable with some sites under 10 m and some over 20 m, but the majority of sites had canopies between 10-20 m. Black Spruce was the dominant canopy species at all sites, and usually dominated subcanopy layers as well. Tamarack was present as a canopy species at some sites. Tall shrub growth was sparse and typically restricted to Speckled Alder. Low shrub growth was variable, but quite dense at some sites. Labrador Tea was the most common species, occurring at almost all sites and often dominant. Leatherleaf and Dwarf Birch (*Betula nana*) were also present at wetter sites. Moss coverage was near complete at all sites. Sphagnum species were generally dominant, with Feathermosses also present and, in some cases, codominant.

Sparse Treed Fen

The sparse treed fen Land Cover type surveyed had one boreal ecosite associated with this category. Canopy height was generally less than 10 m and sparse. Tamarack was the primary tree species with Black Spruce also present. Tall shrubs were also sparse typically consisting of willow species where present. Low shrubs included Dwarf Birch, Leatherleaf, Bog Rosemary (*Andromeda polifolia*), and occasionally Red Osier Dogwood (*Cornus stolonifera*). Ground cover was a combination of Sphagnum mosses and herbaceous growth consisting of grass and sedge species with most sites having primarily herbaceous cover.

Open Fen

Two of the survey sites in 2017 were open fen with two boreal ecosites included in this Land Cover type. Trees were rare consisting of Tamarack or more rarely Black Spruce usually less than 2 m tall. Tall shrubs, where present, consisted of Speckled Alder and willow species. Low shrubs present include Leatherleaf, Dwarf Birch, and Bog Rosemary. Ground cover is dominated by grass and sedge species.

Rare Plant Species and Communities

Based on previous work conducted by Noront (2013) a list of rare plant species and plant communities was generated for the region from their contact with the MNRF, which covers the Study Area for the Project. During the 2017 field surveys for the WSR none of the plants identified in the list were observed. However, based on the timing of the surveys the presence of these species will be reassessed as part of the further field surveys to be completed to support the EA.

6.3.5 Fish Habitat and Aquatic Ecosystems

The Study Area for the Project has many different waterbodies including streams, rivers, lakes, ponds and wetlands that provide direct habitat and support many different fish species. There are several larger rivers in the area including the Winisk, Ekwan, Attawapiskat, Fishbasket and the Pineimutei River. There are also some very large lakes such as Winisk Lake in the northeast part of the Study Area. There is also a vast network of smaller connected headwater streams, ponds and lakes. Many of these smaller streams are part of open fens. The larger lakes and watercourses provide year-round fish habitat, the smaller, shallower lakes and wetlands often do not, as oxygen levels can drop to hypoxic conditions. The smaller watercourses and lakes can also provide suitable habitat for rearing and feeding for some parts of the year, usually early spring.

There are a vast number of streams in region that connect to many shallow lakes and wetlands in the area. Water bodies in the Study Area in general are considered to support a variety of cool and cold-water fish. Large rivers including the Ekwan, Muketei, Attawapiskat and Ogoki support populations of Walleye (*Sander*

vitreus), Lake Sturgeon (*Acipenser fulvescens*), Brook Trout (*Salvelinus fontinalis*), Lake Whitefish (*Coregonus clupeaformis*) and other fish species. A number of lower energy watercourses connected to these rivers provide habitat for Walleye and Northern Pike (*Esox lucius*). Typically, Yellow Perch (*Perca flavescens*), White Sucker (*Catostomus commersonii*) and other small foraging fish species are present with these larger bodied fish. Smaller streams and lakes in the area also support a variety of smaller-bodied fish including cyprinid species, Brook Stickleback (*Culaea inconstans*) and Mottled Sculpin (*Cottus bairdii*).

There are 39 fish species that have been identified as potentially present within the Study Area for the Project through the review of various sources and are presented in **Table 6-3.**

Table 6-3: Fish Species Potentially Within Study Area

Family	Systematic Name	Common Name
Acipenseridae	*Acipenser fulvescens*	Lake Sturgeon
Cyprinidae	*Couesius plumbeus*	Lake Chub
	Margariscus margarita	Pearl Dace
	Luxilus cornutus	Common Shiner
	Notropis atherinoides	Emerald Shiner
	N. heterolepis	Blacknose Shiner
	N. hudsonius	Spottail Shiner
	N. volucellus	Mimic Shiner
	Notemigonus crysoleucas	Golden Shiner
	Margariscus nachtriebi	Northern Pearl Dace
	Chrosomus eos	Northern Redbelly Dace
	Chrosomus neogaeus	Finescale Dace
	Pimephales notatus	Bluntnose Minnow
	Pimephales promelas	Fathead Minnow
	Rhinichthys cataractae	Longnose Dace
Catostomidae	*Catostomus catostomus*	Longnose Sucker
	Catostomus commersonii	White Sucker
	Moxostoma anisurum	Silver Redhorse
	Maxostoma macrolepidotum	Shorthead Redhorse
Esocidae	*Esox lucius*	Northern Pike
Salmonidae	*Coregonus artedi*	Cisco
	Coregonus clupeaformis	Lake Whitefish
	Salvelinus fontinalis	Brook Trout
	Salvelinus namaycush	Lake Trout
	Prosopium cylindraceum	Round Whitefish
Percopsidae	*Percopsis omiscomaycus*	Trout-Perch
Gadidae	*Lota lota*	Burbot
Gasterosteidae	*Culaea inconstans*	Brook Stickleback
	Pungitius pungitius	Ninespine Stickleback
Cottidae	*Cottus bairdi*	Mottled Sculpin

Family	Systematic Name	Common Name
	Cottus cognatus	Slimy Sculpin
	Cottus ricei	Spoonhead Sculpin
Percidae	*Etheostoma exile*	Iowa Darter
	Etheostoma nigrum	Johnny Darter
	Perca flavescens	Yellow Perch
	Percina caprodes	Logperch
	Percina shumardi	River Darter
	Sander canadensis	Sauger
	Sander vitreus	Walleye
Sciaenidae	*Percina caprodes*	Logperch

*list of fish species present in the area was generated using MNR and Royal Ontario Museum (ROM) species distribution data (Holm et al., 2010).

FISH HABITAT

From review of background information sources and 2017 aquatic surveys for WSR, as documented in the *Baseline Environmental and Geotechnical Studies Report - Webequie Community Supply Road (TPA1B) and Nibinamik-Webequie Community Road (TPA1A)* (2018) surface waters in the Study Area flow in a general west-to-east direction, towards James Bay and also a northerly direction to Hudson Bay. Through much of the area, surface waters move as diffuse flow through broad, densely vegetated fens, with occasional consolidation in defined channels. Many of these channels appear as pools of open water (usually created by beaver dams) that are connected to larger watercourses by narrow, poorly defined channels, or by fens without recognizable channels. Frequent ponding, flooding of treed areas and diversion of flows occur due to beaver activity, and many of the pools of open water visible on topographic maps and satellite imagery are the result of old, stable beaver dams. An abundance of fen and beaver-pond habitats exist along the preferred corridor. The abundant beaver dams pose barriers to fish passage and potential for stranding. The poor water quality (specifically, low dissolved oxygen) in these small watercourses can also pose a severe limitation to their overall productivity and suitability to most species.

Due to a lack of coarse substrate in the smaller streams, fish that require rapids or riffle habitats for during the spring period spawning likely spawn in the larger rivers (e.g. Pineimuta River and Fishbasket River), possibly on bedrock and boulder shoals due to a lack of gravel substrate.

Burbot is the only winter-spawning fish in the Study Area, and it is generally found in lake and large-river habitats. Burbot spawn in a fairly broad range of habitats, and specific spawning habitats in the Study Area have not been identified.

The fall-spawning species in Study Area include Lake Whitefish and Cisco, which are predominantly lake dwelling species. These species occasionally ascend rivers and the lower reaches of large streams (Scott and Crossman, 1973). Of the watercourses within the Study Area, the potential for presence of these species is likely limited to the larger rivers and lakes (e.g. the Pineimuta and Fishbasket Rivers, Winisk Lake) Lake Whitefish and Cisco are likely absent in the many smaller streams within the Study Area.

As part of the EA for the project aquatic investigations will be conducted to collect data on biophysical habitat conditions and sensitivity, spawning habitat, species at risk, surface water quality and fish community present in the Study Area.

6.3.6 Species at Risk

The designation of species of national significance is given by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The designation of species of Provincial significance is made by the MNRF and is based on recommendations made by the Committee on the Status of Species at Risk in Ontario (COSSARO).

A preliminary list of Species at Risk potentially present in the Study Area is presented in **Table 6-4.**

The EA will assess and document the general locations of known incidences of Species at Risk, endangered and threatened species, and species of special concern in the Study Area. This information will be based on targeted field surveys in 2019, MNRF's "Species at Risk in Ontario List", the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) list, Environment Canada species at risk search tool (http://www.registrelep-sararegistry.gc.ca/), NHIC databases, as well as known locations based on personal communications, published and unpublished information, such as Indigenous Knowledge gathered through Indigenous consultation.

Table 6-4: Species at Risk Status, Habitat Characteristics, and Preliminary Presence/Absence Determination

Species		SARA[1]	ESA[2]	S-RANK[3]	Information Source[4]	Observed During Field Studies	Habitat Requirements[5]	Potential Habitat in Local Study Area
Scientific Name	Common Name							
MAMMALS								
Puma concolor	Mountain lion (Cougar)	No Status	Endangered	SU	Atlas of the Mammals of Ontario	No	The Cougar or Mountain Lion lives in northern remote undisturbed forests where there is little human activity. However, few cougar sightings have been confirmed in recent decades. Forested habitats must support plenty of White-tailed Deer (*Odocoileus virginianus*) and other prey species for cougars.	No
Myotis lucifugus	Little Brown Myotis	Endangered	Endangered	S3	Layng et al., 2019		Caves, quarries, tunnels, hollow trees, buildings, attics, barns, wetlands, forest edges	Yes
Gulo gulo	Wolverine	Special Concern	Threatened	S2S3	Atlas of the Mammals of Ontario	Yes	Wolverine occupy many habitat types in the far north of Ontario. Individuals can have ranges of up to 3500 km^2 and dens are built in snow drifts, under logs and boulders (Ontario Wolverine Recovery Team, 2013).	Yes

Species		SARA[1]	ESA[2]	S-RANK[3]	Information Source[4]	Observed During Field Studies	Habitat Requirements[5]	Potential Habitat in Local Study Area
Scientific Name	Common Name							
Rangifer tarandus	Woodland Caribou	Threatened	Threatened	S4	Atlas of the Mammals of Ontario	Yes	Caribou require large undisturbed areas of old and mature conifer upland forest and lowlands dominated by jack pine and/or black spruce. They are also found in bogs and fens. Only the boreal population of caribou is listed as a species at risk in Ontario.	Yes
				BIRDS				
Haliaeetus leucocephalus	Bald Eagle	No Status	Special Concern	S2N, S4B	OBBA		Prefer to nest in large trees almost always near a major lake or river where they do most of their hunting.	Yes
Hirundo rustica	Barn Swallow	Threatened	Threatened	S4B	iNaturalist, eBird		Prefer open habitat for foraging: grassy fields, pastures, ROWs, agriculture crops, and wetlands. Post-European settlement: Nest in human structures including barns, garages, houses, bridges, and culverts. Barn swallows generally reuse nests from year to year and are	Yes

Species		SARA[1]	ESA[2]	S-RANK[3]	Information Source[4]	Observed During Field Studies	Habitat Requirements[5]	Potential Habitat in Local Study Area
Scientific Name	Common Name							
							therefore sensitive to the removal of nesting structures.	
Chliodonias niger	Black Tern	No Status	Special Concern	S3B	Noront		Shallow freshwater marshes (> 20 ha.) with cattails and emergent vegetation interspersed with open water. Smaller wetlands with the same features are also used.	No
Chordeiles minor	Common Nighthawk	Threatened	Special Concern	S4B	OBBA		Open ground; clearings in dense forests; peat bogs; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs.	Yes
Contopus virens	Eastern Wood-pewee	Special Concern	Special Concern	S4B	Noront		Mostly associated with the mid-canopy layer of forest clearings and edges of deciduous and mixed forests; preferred habitats are intermediate-age forest stands and mature stands with little understory vegetation.	No
Contopus cooperi	Olive-sided Flycatcher	Threatened	Special Concern	S4B	OBBA		Semi-open, conifer forest, prefers spruce, Jack Pine, and Balsam Fir; near pond, lake, or river; treed wetlands for nesting;	Yes

Species		SARA[1]	ESA[2]	S-RANK[3]	Information Source[4]	Observed During Field Studies	Habitat Requirements[5]	Potential Habitat in Local Study Area
Scientific Name	Common Name							
							burns with dead trees for perching.	
Falco peregrinus anatum/ tundrius	Peregrine Falcon	Special Concern	Special Concern	S3B	OBBA		Nests on cliff ledges or crevices, preferably 50 to 200 m in height, but sometimes on the ledges of tall buildings or bridges, always near good foraging areas.	No
Euphagus carolinus	Rusty Blackbird	Special Concern	Special Concern	S4B	OBBA		Nests in the boreal forest; prefers shores of wetlands, peat bogs, swamps, and beaver ponds.	Yes
Asio flammeus	Short-eared Owl	Special Concern	Special Concern	S2N, S4B	OBBA		Resides in open habitats including arctic tundra, grasslands, peat bogs, marshes, sand-sage concentrations and old pastures. Preferred nesting sites are dense grasslands, as well as tundra with areas of small willows.	No
				FISH				
Acipenser fulvescens	Lake Sturgeon (Southern Hudson Bay -	No Status	Special Concern	S3	DFO Species at Risk		Resides almost exclusively in lakes and rivers with soft bottoms of mud, sand or gravel. They are usually found at depths	No

Species		SARA[1]	ESA[2]	S-RANK[3]	Information Source[4]	Observed During Field Studies	Habitat Requirements[5]	Potential Habitat in Local Study Area
Scientific Name	Common Name							
	James Bay population)				Mapping, NHIC		of 5 to 20 metres. They spawn in relatively shallow, fast-flowing water (usually below waterfalls, rapids, or dams) with gravel and boulders at the bottom	

[1] Federal Species at Risk Act

[2] Species at Risk in Ontario List. (2014, August 11). Ministry of Natural Resources and Forestry. Retrieved September 12, 2014, from http://www.ontario.ca/environment-and-energy/species-risk-ontario-list

[3] Conservation Ranking

[4] Various sources

[5] MNRF Significant Wildlife Habitat Technical Guide Appendix G (MNRF, 2000) Ontario Ministry of Natural Resources.
Significant Wildlife Habitat Technical Guide. 151p.

Status

No Status: Species has not been assessed under the Species at Risk Act.

Special Concern: Species that may become threatened or an endangered species because of a combination of biological characteristics and identified threats.

Threatened: Species that is likely to become an endangered species if nothing is done to reverse the factors leading to its extirpation or extinction.

Endangered: Species that is facing imminent extirpation or extinction.

6.3.7 Climate

The James Bay Lowlands region of northern Ontario has a humid continental climate with cool short summers and cold long winters. The local climate is affected by the proximity to Hudson Bay and James Bay. Fog is common in the early morning and may last all day during the summer months. There is usually one or two days of dense fog in the summer that restrict the use of aircraft. There are typically two or three days during the winter months when snow storms restrict activity in the region. Summer temperatures typically range between 10-20 degrees C, with winter temperatures usually between -10 degrees C and -30 degrees C. Winter winds are typically from the west to northwest, with the summer winds usually from the west to southwest. Lakes typically begin to freeze in mid-October, with spring thaws typically initiating in mid-April. Precipitation levels in the area tend to exceed 700 mm on yearly basis.

6.3.8 Air Quality

The Project is located in a remote region of Ontario away from any significant sources of human induced air emissions. Air quality data from several monitoring stations in northern Ontario (e.g. Thunder Bay) and other remote locations in Canada will be used to estimate concentrations of background air quality parameters for the Project. All of the background air quality values reviewed in the region are well below the applicable Ontario Ambient Air Quality Criteria (AAQC) and lower than the Canadian Ambient Air Quality Standards (CAAQS). The EA will evaluate existing studies of air quality, potential project emission sources, and review Indigenous Knowledge gathered through Indigenous consultation and information from stakeholders. Potential project emission sources will be evaluated against regulatory standards in the EA.

6.3.9 Acoustic Environment

Background noise levels are consistent with rural and remote areas dominated by natural sounds (Ministry of the Environment Class 3 Area). In the absence of the sounds of wind and local animals, such areas would typically have a background noise level of 20 to 30 dBA. Noise surveys conducted by Noront for the Eagle's Nest Mine confirmed ambient noise levels of 25 to 37 dBA, which are expected to be indicative of the noise levels in the Study Area.

6.4 Socio-Economic Environment

The following sections document the existing socio-economic environment in the Study Area for the Project. Information collected for the EA may also be used by WFN to obtain other permits, approvals and/or licences that may be required to proceed to construction.

6.4.1 Regional Planning/Policy Initiatives

The Project is subject to both federal and provincial planning policy initiatives that dictate how projects will be undertaken. The principal planning and policy documents related to the rationale for the Project are cited in Section 1.4.2 and summarized in **Appendix A**. Two other important provincial regional planning/policy initiatives that will influence how the ToR and the EA are undertaken are the *Far North Act*, and the *Planning Act*.

The *Far North Act* governs land use planning decisions in the Far North by working with First Nation communities to identify areas where development can occur, and areas that should be protected. The main purpose of the Act is to establish land use planning that:

- Establishes a joint planning process between First Nation communities and the Government of Ontario;
- Supports environmental, social and economic objectives for land use planning in Ontario; and
- Is conducted in a manner consistent with the recognition and affirmation of existing Aboriginal and treat rights enshrined in section 35 of the *Constitution Act*, 1982, including the duty to consult.

The Far North is defined in the Act as:

(a) the portion of Ontario that lies north of the land consisting of,
  (i) Woodland Caribou Provincial Park,
  (ii) the following management units designated under Section 7 of the Crown Forest Sustainability Act, 1994 as of May 1, 2009: Red Lake Forest, Trout Lake Forest, Lac Seul Forest and Caribou Forest,
  (iii) Wabakimi Provincial Park, and
  (iv) the following management units designated under Section 7 of the Crown Forest Sustainability Act, 1994 as of May 1, 2009: Ogoki Forest, Kenogami Forest, Hearst Forest, Gordon Cosens Forest and Cochrane-Moose River, or

(b) the area, if any, that is set out in the regulations made under this Act and that describes the area described in clause (a) more specifically ("Grand Nord").

Section 12(1) of the *Far North Act* stipulates that constructing or expanding all-weather transportation infrastructure and any other infrastructure that is associated with it cannot occur without a community-based land use plan (CBLUP) in place. However, s. 12(2) of the Act includes provisions for exemption from this stipulation through the issuance of an exception order by the Minister of Natural Resources and Forestry. Section 12(4) of the Act allows the activity granted an exception to occur if the Lieutenant Governor in Council determines that the development is in the social and economic interests of Ontario. Preparation of the Webequie CBLUP is in progress, and WFN applied to MNRF for an exception order for the Supply Road Project on January 29, 2018. The application was accepted by the Minister on March 2, 2018.[3]

The *Planning Act* establishes guidelines for land use planning decisions in Ontario. The purpose of the Act is to

- Promote sustainable economic development in a healthy natural environment within a provincial policy framework;
- Provide for a land use planning system led by provincial policy;
- Integrate matters of provincial interest into provincial and municipal planning decisions by requiring that all decisions be consistent with the Provincial Policy Statement and conform/not conflict with provincial plans;
- Provide for planning processes that are fair, by making them open, accessible, timely and efficient;
- Encourage co-operation and coordination among various interests; and
- Recognize the decision-making authority and accountability of municipal councils in planning.

[3] It should be noted that the Province is proposing to repeal the *Far North Act*, amend the *Public Lands Act* to continue approved community based land use plans, and, for a time-limited period, enable completion of the planning process for communities that are at an advanced planning stage. The proposal is intended to "(reduce) red tape and restrictions on important economic development projects in the Far North including the Ring of Fire, all-season roads and electrical transmission projects for communities."

Under the Act, the Minister of Municipal Affairs and Housing may issue Provincial Policy Statements (PPS), which are province wide policy directions related to land use planning and development.

Of particular importance for this project is the 'Places to Grow, Growth Plan for Northern Ontario" published by the Municipal Affairs and Housing, which documents the growth plan for Northern Ontario for the next 25 years. The plan has a goal of strengthening Northern Ontario's economy through the following (MMA, 2011):

- Diversifying the region's traditional resource-based industries;
- Stimulating new investment and entrepreneurship; and
- Nurturing new and emerging sectors with high growth potential

These two pieces of regional planning/policy initiatives will be important in guiding the planning process for the Webequie Supply Road Project.

6.4.2 Economy, Resource, Commercial and Industrial Activities

The economy of Northern Ontario relies heavily on resource extraction, with the forestry and mining industries acting as large industrial employers.

Northern Ontario communities and outfitters also provide recreation and tourism opportunities for hunting, fishing and camping, playing an important aspect of the Northern Ontario experience.

The EA document will describe and assess existing commercial, recreational, and industrial activities in the region and address potential effects on these sectors. Leaseholders, claim owners, Indigenous communities and other stakeholders will be consulted as part of the EA process. Indicators used to describe the economy and employment will be detailed (employment, income, etc.). The EA will also address economic development and economic sectors, businesses, governmental finances, and housing characteristics.

Consultation with Indigenous communities and potential employment economic benefits for Indigenous communities which may result from the Project will be an important component of the Webequie Supply Road Project.

6.4.3 Population, Demographics and Community Profile

The Webequie First Nation has experienced increases in both their employment rates and their population rates since 2006. This has not been the same for much of Northern Ontario, or other Indigenous communities who may have an interest in the Project. The population of Northern Ontario has in general declined in recent years with many resource-based industries shutting down production or relocating. However, the Indigenous population is growing at a faster rate than that of Northern Ontario or Canada. According to the 2016 census the Indigenous population comprised of 2.8% of Ontario's population, an increase from 2.4% in 2011. The Indigenous population is a younger demographic than the non-Indigenous population. This is due to a higher fertility rate and increased life expectancy.

The 2011 Census shows that the employment rate of Webequie First Nation was 39.6% with an average income of $20,680. Remote Indigenous communities experience challenges due to their lower employment rates and average incomes when compared to averages to Ontario as a whole. This trend is not uncommon for many Northern Indigenous communities. This is due in part because of communities transitioning away from traditional manufacturing, agricultural based industries and resource development creating economic

pressures. In addition, many youth are out-migrating or living off-reserve to find other employment opportunities. This has led to impacts to employment prospects in the area. Projects such as the Webequie Supply Road may provide both skilled and unskilled workers with the opportunity to access employment opportunities in the McFaulds mining area.

The EA document will detail the existing state of communities and potential effects on the population and demographics, education, employment and housing in relation to the Project. This will include community profiles on the Indigenous Communities surrounding Webequie First Nation, including:

- Attawapiskat First Nation,
- Eabametoong First Nation;
- Kasabonika Lake First Nation,
- Marten Falls First Nation,
- Neskantaga First Nation,
- Nibinamik First Nation, and
- Weenusk (Peawanuck) First Nation.

This information will be documented through government statistics, plans, stakeholder engagement, and other sources.

6.4.4 Human Health

Human Health and well-being concerns will be addressed in the EA. Northern and remote Indigenous communities face many healthy and well-being issues due to their isolation. Mental health, substance abuse, suicide, food insecurity, and other health stressors are more prevalent among remote Indigenous communities. In addressing potential health issues, the Webequie Supply Road Project will examine human health and well-being by assessing potential changes in surface water, air quality, noise, and public safety (including social issues such as drugs and alcohol abuse in the community) likely to result due to project activities. These changes can act as pathways to potential effects on human health. These criteria will be drawn upon to inform human health and well-being assessments in the EA.

6.4.5 Infrastructure and Services

The proposed all-season road corridor will cross communities that may be able to provide waste management, municipal and community services, emergency services, police, and many other ancillary services. The construction portion of the Project will generate waste materials and access to disposal areas will be required.

In 2016, there were a total of 155 dwellings in Webequie First Nation. Remote Indigenous communities in Northern Ontario face challenges with their housing. Census data has shown that Indigenous people were much more likely to live in dwellings that were in need of major repairs. Families are also living in crowded with more than one person per room, compared to the average household in Ontario. Having safe and adequate housing is a major concern for Northern Indigenous communities as the quality and housing stock worsen. The EA document will describe available housing and infrastructure and services such as nearby road connections which have the potential to interact with or connect to the proposed project. In addition to this, the Project may also have the potential to interact with communities and services such as police and fire stations, hospitals, schools, churches and other religious buildings, local businesses, and residential areas.

The EA document will describe housing and infrastructure and services such as nearby road connections which have the potential to interact with or connect to the proposed project. In addition to this, the Project may also have the potential to interact with communities and services such as police and fire stations, hospitals, schools, churches and other religious buildings, local businesses, and residential areas.

6.4.6 Land and Resource Use

The project area is located on unsurveyed Ontario Crown lands and Webequie Frist Nation Reserve lands. Although Webequie First Nation holds the position that provincially registered traplines do not represent spatial limits of traditional use by their members, for reference purposes, it can be stated that the project area intersects traplines registered to Webequie First Nation and Marten Falls First Nation community members. A total of 17 km of the project corridor sits on federal land comprising the Webequie First Nation Reserve, as shown in Figures 1.1 and 6.1.

Webequie First Nation is in the process of preparing a Community Based Land Use Plan (CBLUP) in accordance with the Ontario Far North Act, which provides the authority, purpose, and process for community-based land use planning. Webequie First Nation started the CBLUP process in 2011 and expects to complete the process by December 2020. The location of the proposed Webequie Supply Road corridor is consistent with the recommended land use areas and designations in the Webequie Draft CBLUP. Specifically, the alternative concepts are located primarily in the designated areas of "General Use Area" (GUA) and "Other Areas", with a minor segment located within an "Enhanced Management Area" (EMA).

The Project will require access to, and the use, occupation, exploration, and development of lands and resources currently used for traditional purposes by Indigenous communities. The current Draft Webequie First Nation CBLUP (March 2019) recognizes that there is shared territory with other First Nations within the lands that Webequie has identified as its proposed planning area, including areas shared with Neskantaga and Marten Falls that would be occupied by the Webequie Supply Road corridor. In addition to Marten Falls and Neskantaga, to date, Attawapiskat First Nation, Weenusk (Peawanuck) First Nation and Kasabonika Lake First Nation have asserted that they have shared traditional territory with Webequie First Nation, but have not specified as to whether these areas coincide with the project area (refer also to acknowledged shared areas within the Webequie Draft Community Based Land Use Plan area below). Due to the draft status of the CBLUP, and the fact that Plan development discussions between Webequie, Neskantaga and Marten Falls are ongoing, the shared areas cannot be shown at this time. No mapping of traditional territory can be provided for confidentiality reasons.

According to the Ontario Ministry of Energy, Northern Development and Mines' Strategic, Network and Policy Division (J. Paetz correspondence to SLI dated April 1, 2019), there are 56 active, unpatented mining claims and one mining lease nearby or overlapping the proposed WSR corridor. The crown land tenure and claim holders within the mineralized zone in the McFaulds Lake area includes the following entities, as identified by ENDM:

- Noront Resources Ltd.
- Macdonald Mines Exploration Ltd.
- Canada Chrome Corporation
- Abitibi Royalties Inc.
- Metalex Ventures Ltd.
- Aurcrest Gold Inc.
- De Beers Canada Inc.

- Fancamp Exploration Ltd.
- Superior Exploration Ltd.
- Debut Diamonds Inc.
- Platinex Inc.
- Perry Vern English
- Michael Albert Haveman
- Clark Exploration and Consulting Inc.

Other information regarding land and resource use along the proposed road corridor will be collected through engagement and consultation activities, and review of various published and unpublished sources and Indigenous Knowledge information made available by First Nations communities, and will be documented in the EA.

6.5 Cultural Environment

From the perspective of the WFN and other Indigenous communities the cultural environment encompasses a broad series of aspects for consideration and evaluation in the EA. Specifically, this includes, but not limited to:

- Aboriginal and Treaty rights;
- Current land resource uses such as hunting, gathering, fishing and trapping within their traditional territories for cultural and socio-economic purposes;
- Socio-cultural character of remote communities (i.e., language, traditions, etc.) and potential for outside influences of non-indigenous peoples;
- Built heritage resources (e.g., hunting or trapping camps, etc.,) and/or cultural landscapes (e.g., natural feature – river or hill) that may have spiritual and symbolic meaning to Indigenous communities; and
- Known burial or scared sites of cultural importance to communities.

A description of the existing cultural environment from an Indigenous perspective will be gathered from Indigenous Knowledge information received from communities and will be documented in the EAR/IS.

6.5.1 Cultural Heritage Resources

A Stage 1 Archaeological Assessment will be conducted in 2019 to identify and confirm areas of archeological potential. The findings from this assessment will be documented in the EA and a stand-alone report that will be submitted for approval to the Ministry of Tourism, Culture and Sport. To assess potential effects to archaeological resources, the Stage 1 Archaeological Assessment will involve consultation with Indigenous communities, review of existing published data sources and information obtained from other stakeholders and agencies. Archaeological research to date for the region suggests that the area was occupied by humans as early as 7,000 years before present. These early humans, known as the Shield Archaic Culture, tended to locate themselves near caribou river crossings. Previous archaeological research has also shown that ungulates and fish were exploited by Aboriginal peoples from circa 1000 A.D. to contact with Europeans (Noront, 2013).

Evidence also suggests that the region was intensively used during the historic fur trade. Previous research has indicated that the area is located within a region that was explored by the mid-to-late 18th century. Additionally, there is a history of mining in the region spanning from the early 20th century until the present (Noront 2013).

The preferred corridor is also situated approximately 15 km south of Winisk River Provincial Park that is a cultural heritage landscape feature of interest. Landforms in the park include a large moraine and drumlin field. Geological features include the Sachigo Subprovince, Big Beaverhouse Moraine, Winisk Drumlin Field, and Cochrane Advance.

7 Potential Environmental Effects

The Project will likely result in a number of potential environmental effects, which will be identified and assessed as part of the EA. Potential environmental effects as result of the Project can be positive or negative, direct or indirect, short-term or long-term, and can occur throughout all of the project phases (construction, operation and maintenance, and retirement). The environmental effects will be evaluated on the basis of their direction (positive, negative or neutral), magnitude, geographic extent, duration, frequency and reversibility, using applicable criteria and indicators to be developed during the EA.

The assessment will incorporate input from potentially affected and/or interested Indigenous communities, government agencies, the public and stakeholders. It is expected that a broader and more detailed range of potential effects will be identified once the final baseline studies are completed and the results of the consultation and engagement program have been considered. It is possible that some of the potential effects, such as impacts to wildlife movement from the development of a linear road corridor, and increased human access to remote areas, may require more detailed field investigations or surveys to determine their full extent/scope. As part of the assessment, consideration will also be given to confirming whether environmental effects of the Project could combine with effects of other past, present and proposed future developments (cumulative effects).

Additionally, as part of the effects assessment process, WFN will document existing Aboriginal and Treaty rights, including traditional and current land uses and other socio-economic aspects. This process will include seeking Indigenous Knowledge information from Indigenous communities during the consultation/engagement program for the Project. Indigenous Knowledge information, where provided, will be integrated into all relevant aspects of the EA, but the data will remain proprietary property of the communities that provide it. The EAR/IS will describe Indigenous communities, their traditional uses of the land and their established and asserted claims, including accommodation as necessary to address potential effects to Aboriginal and Treaty rights. Section 10 of the ToR details the consultation process in greater detail. Design considerations and mitigation/remedial measures recommended to reduce or eliminate potential environmental effects will be described in the EAR/IS. Mitigation measures will be developed in consultation with Indigenous communities, government agencies, stakeholders and other interested parties.

The EA will also include an Environmental Protection Plan (EPP) specific to the construction and operation phases of the Project. The EPP will specify procedures and mitigation measures to be implemented to reduce or eliminate potential negative effects of the Project and will utilize standard industry guidelines and BMPs, with input from Indigenous communities. It is also anticipated that the EPP will include a series of contingency plans and management plans, such as a spill prevention and response plan, a waste management plan, an environmental contingency and emergency preparedness plan, and a blast management plan, should blasting be required.

The following sections provide a preliminary list of the potential environmental effects and mitigation associated with the Project. The list of potential environmental effects is initially based on the project components and activities described in Section 4.0 – Description of the Undertaking (the Project).

7.1 Natural Environment

Potential effects of the Project on the natural environment, such as soils, surface water and groundwater resources, vegetation, wildlife, fisheries, Species at Risk, noise and air quality, will be assessed.

A preliminary list of potential project effects on the natural environment, including mitigation measures, is presented in **Table 7-1.**

Table 7-1: Project Activities and Potential Effects on the Natural Environment

Project Component or Activity	Potential Effects	Mitigation Measures
• **Field surveys, staking and layout**	• Soil compaction and increased rates of erosion and sedimentation from equipment use and exposed soils	• Implement and monitor erosion and sediment control measures and BMPs, such as erosion control blankets, seed and cover/mulch to prevent erosion and/or control sediment from entering waterways
• **Vegetation Clearing and grubbing**	• Loss of wildlife habitat and/or direct impact to species from removal/clearing of vegetation	• Implement BMPs and procedures for clearing and grubbing. Manage slash and root waste and excess timber, using such techniques as chipping, leaving in place and small wood scattering • Avoid clearing of vegetation during migratory bird nesting season
• **Construction of supportive infrastructure that includes storage and laydown yards, access/haul roads, construction camps and aggregate extraction areas**	• Wildlife habitat alteration, fragmentation, displacement, migration or disturbance (e.g., migratory birds, species at risk) • Degradation of environmentally significant or sensitive areas • Increased rates of erosion and sedimentation from exposed land surface	• Avoid vegetation clearing during migratory bird nesting period and/or sensitive life cycle periods for Species at Risk (e.g., caribou, bats, etc.) • Restore and rehabilitate disturbed areas related to temporary infrastructure (e.g., access road, construction camp)
• **Construction of the road, including earthworks (cut/fill) and permanent and temporary waterbody crossings**	• Degradation of/alteration to surface water quality and flow, and/or fish habitat	• At waterbody crossings: ○ adhere to in-water work fisheries timing window during the spawning and rearing period ○ Install erosion and sediment control measures and use BMPs

Project Component or Activity	Potential Effects	Mitigation Measures
		○ Isolate and temporarily diverting flow away from work zone ○ Use appropriate capture, handling and release techniques to avoid harm to fish
Aggregate source extraction and production	• Impact to groundwater level, quality, and/or functional contribution to waterbodies or wetlands	• Monitor groundwater conditions for adverse effects
• **Emissions, discharges and waste**		
○ **Transport, handling and storage of fuel for equipment and vehicles**	• Release of contaminants from incidental spills of oil, gasoline and other chemicals that contaminate soil, groundwater or waterbodies	• Store, handle and dispose of all excess materials in a manner that prevents release to the environment (e.g., waterbodies, wetlands) • Operate, maintain and store (e.g., fuel, lubricates, waste oils) all equipment and materials using BMPs
○ **Handling and disposal of waste oil, lubricants and other fluid products from the maintenance of equipment and vehicles**	• Accidental spill/discharge of contaminants to sensitive areas, including aquatic and terrestrial habitat	• Develop Spill Prevention and Response Plan and procedures, including containment systems and spill kits on site for deployment
○ **Storage, handing and disposal of solid waste**		• Manage waste products generated from camps for disposal at licenced waste facility
○ **Management and/or disposal of wastewater and sewage, including hazardous and non-hazardous,**		• Wastewater and sewage to be treated on-site using portable facilities or transported off-site by tanker truck for treatment and disposal off-site

Project Component or Activity	Potential Effects	Mitigation Measures
generated at camp sites		
○ **Air emissions from movement and exhaust of equipment and vehicles**	• Degradation to localized air quality from equipment and vehicles (e.g., fugitive dust, exhaust emissions)	• Exhaust emission systems from construction and maintenance vehicles and equipment will be kept in good working conditions to ensure they conform to normal operational parameters for emissions • Implement dust control management practices (e.g., wetting surfaces with water) to minimize/reduce air quality effects
○ **Greenhouse (GHG) gas emissions**	• Greenhouse gas emissions will occur as result of the construction and operation of the Project. GHG, as expressed in carbon dioxide equivalent units ($ktCO_2eq$), contribute to climate change and are a concern to federal and provincial agencies and the public.	• GHG emissions from the Project are expected to be negligible because the emissions, although detectable, would be very small with respect to contributions to provincial, national and global emissions and would not be reportable when taking into account the implementation of mitigation measures. The preliminary estimate of GHG emissions attributable to the Project during construction is 73.2 kilotons of CO_2eq, and during the operations phase the annual contribution would be 11.8 kilotons of CO_2eq. These contributions in relation to Ontario and Canada-wide totals and future targets are below 0.05%.
○ **Noise emissions from equipment and vehicles**	• Increase in background noise levels during construction and operation phases with potential impact	

Project Component or Activity	Potential Effects	Mitigation Measures
	to sensitive receptors or wildlife • Blasting that could disrupt wildlife movement or harm fish/fish habitat where near a waterbody	
• **Operations and maintenance, such as road repairs, vegetation clearing**	• Wildlife mortality due to vehicle collisions during operations • Disturbance of roadside species and habitat and disruption of breeding/nesting behaviour	• Adapt/install wildlife barrier system. Increase awareness through worker training and roadside signage for drivers • Adapt/manage maintenance schedules and practices to avoid sensitive breeding/nesting periods

7.2 Socio-Economic Environment

Socio-economic impacts can be positive or negative; and can occur at various units of social order: individuals, businesses, communities and economic sectors. Both potential positive and negative socio-economic effects of all phases of the Project will be assessed as part of the EA process, including identifying appropriate mitigation/remedial measures to reduce or eliminate any significant negative effects.

Effects assessment linkages with other environmental disciplines will be determined, if applicable (e.g., links between socio-economic environment and visual aesthetics, noise, terrestrial and aquatic environments, and human health).

A preliminary list of potential socio-economic effects is presented in **Table 7-2.**

Table 7-2: Potential Effects to Socio-economic Environment

Potential Effects
Positive Effects/Benefits
Economic • Employment and economic benefits to community members and businesses of neighbouring Indigenous communities during construction and operation/maintenance • Emergence of economic opportunities along the road • Opportunity for WFN and other First Nations to own and/or construct and operate the road, including opportunity for revenue generation and potential for subsequent investment in economic development opportunities

Potential Effects
Education/Training • Opportunities for capacity building and business training • Opportunities for youth-employment and training • Possible higher overall educational levels and capacity **Social** • Higher household incomes from increased economic activity, allowing for Improved standard of living
Negative Effects
Social/Health • May result in easier access to undesirable substances, possibly causing more health and social issues in community • More outsiders coming into area, causing possible social issues **Economic** • Possible loss of government transfer payments currently paid to community due to change in remote isolation status • May facilitate more outsiders coming into community, such as resource users, that put strain on traditional territories for hunting, fishing, mineral resource exploration, as well as pressure on wildlife populations and movements

7.2.1 Effects on Traditional/Indigenous Land Use

The EA will specifically and directly consider potential project effects on Aboriginal and Treaty rights. Through WFN discussions and engagement/consultation with other Indigenous communities, the assessment will evaluate and take into account potential changes of patterns or resources use and the ability of communities to exercise their Aboriginal and Treaty rights.

The MECP has provided a list of twenty-two (22) Indigenous communities where WFN should undertake consultation and engagement activities. The list is MECP's current understanding of those communities whose Aboriginal and Treaty rights may be potentially affected by, and/or may have interests in the Project. At present, sixteen (16) of these Indigenous communities may be affected by the Project, whereas the other six (6) Indigenous communities are considered to have potential interest in the Project. A Consultation Plan to engage communities during the EA, including WFN's overall approach, is detailed in Section 10 of the ToR. The Consultation Plan outlines the degree and manner in which the identified Indigenous communities will be engaged and consulted.

7.3 Cultural Environment

The Project may have the potential to affect the cultural environment, including, but not limited to, the following areas of interest to Indigenous communities:

- Aboriginal and Treaty rights, which are the collective rights of Indigenous communities flowing from their status as the original peoples of Canada. These rights are recognized and affirmed by Section 35 of the *Constitution Act* (refer to above Section 7.2.1);
- Effects to land resource uses, such as hunting, gathering, fishing and trapping, within their traditional territories;
- Effects to the socio-cultural character of remote Indigenous communities (e.g., language, traditions, etc.) from potential outside influences of non-indigenous peoples;
- Loss of or adverse effects to archaeological sites and areas of archaeological potential, including those known cultural, spiritual or sacred sites; and
- Effects to built heritage resources (e.g., old hunting or trapping camps) and/or cultural/visual landscapes that may be of value or interest from a historic, spiritual and symbolic perspective.

To assess potential effects on the above noted cultural environment aspects, the EA will draw upon Indigenous Knowledge information gathered through consultation with Webequie community members, Elders and neighbouring First Nations.

To assess the potential effects of the Project on cultural heritage resources, as defined under the *Ontario Heritage Act*, a Stage 1 Archaeological Assessment will be undertaken as part of the EA to identify potential effects during all phases of the Project, including historical, archaeological and cultural sites. The requirements for Stage 1 Archaeological Assessment include Aboriginal consultation and engagement, and establishing protocols to be implemented in the event that unexpected archaeological finds are encountered during construction of the Project.

Should potential effects to historical, archaeological or cultural sites by the Project be identified during EA process, WFN will engage with potentially affected Indigenous communities and the Ontario Ministry of Tourism, Culture and Sport to review avoidance and other mitigation measure options.

As part of the EAR/IS, WFN will also develop an Archaeological Management Plan (AMP) in the event that the need for additional archaeological assessment is identified in the Stage 1 assessment, or previously unidentified heritage or archaeological resources (e.g., arrow heads, modified bone, pottery fragments, fossils) are suspected or encountered unexpectedly during construction.

In the case where additional archaeological assessment is recommended, the AMP will specify the assessment locations, the scope of the assessment (e.g., Stage 2 investigations), and how the work will be conducted.

With respect to encountering unknown archaeological resources during construction, typical contingency measures to be implemented by the construction contractor in such an event would include:

- Immediately stop work in the vicinity of newly discovered feature and notify Owner (assumed to be WFN);
- Work at that location will not resume until permission is received from the Owner, who will consult with a licensed archaeologist, Indigenous community(ies) if applicable, and/or MTCS for further direction; and
- Installation of temporarily flagging or fencing to create a 5 m buffer zone around the resource to protect the feature and wait for further direction from the Owner on the measures to follow.