APPENDIX I

Surface Water Baseline Report

REPORT

2023 Surface Water Baseline Report

Kami Iron Ore Mine Project

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Distribution List

Champion Iron Mines Ltd.

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EXECUTIVE SUMMARY

The 2023 surface water study was conducted to collect information on the surface water quality and quantity to characterize the baseline conditions in the watersheds within the Project Site. The Project Site encompasses several sub-watersheds of the Churchill River, including Mills Lake, Long Lake, Riordan Lake, Waldorf River, Pike Lake, Wabush Lake, and several unnamed streams and lakes. The hydrological assessment included:

- Review of previous hydrological baseline studies and assessments;
- Climate and precipitation review (Wabush Lake Airport);
- Water column profiling (6 lakes in June and August with select stations for October 2023);
- Water level and stream flow monitoring (4 lakes and 12 watercourse stations); and
- Water and sediment quality sampling (a total of 23 samples were collected from lakes and watercourses for June, August, and October 2023).

Review of Previous Assessments

The Stantec 2011/ 2012 baseline study evaluated the surface water within the local drainage of the project. Stantec's study area excluded Molar Lake, Daviault Lake, and Duley Lake Park, which have been included as part of WSP's Project Site. The components of Stantec's study included:

- A Regional Hydrological Information Review;
- A Climate and Precipitation Assessment;
- A Water Balance Assessment;
- Hydrological Monitoring which included 7 gauging stations; and
- Empirical Hydrological Modelling.

Climate and Precipitation Review

The climate data for this site was gathered from an Environment and Climate Change Canada (ECCC) weather station at Wabush Airport and analyzed for monthly and seasonal trends. Freezing temperatures and snowfall persisted from January to mid-April at the start of the year and from the end of October through December. Flow monitors were not installed until the June field campaign, so no direct indicators of the freshet are available. However, it is expected that the freshet was driven by steadily increasing temperatures in April. Total precipitation in 2023 was 556.3 mm which is 11% below the 622.7 mm average of the preceding 5 years. During the monitoring period (i.e., June 2023 to October 2023), the monthly precipitation varied between 65.4 and 114.1 mm, with August having the most precipitation and July having the least.

Water Column Profiling

Lake Column profiles were completed at Long Lake, Pike Lake, Daviault Lake, Mills Lake, Molar Lake, and Riordan Lake. Lake column profiling was conducted at all lake basin stations in August and October 2023, as well as for select locations in June 2023.

The pH conditions at all lake basin stations in the July, August, and October of 2023 were generally near neutral throughout the water column and demonstrated minor variations over depth and season.

Temperature profiles at each station in June 2023 (spring) were characterized by slight warming zone in the upper layer of the lakes. Temperature profiles at each lake basin station in August 2023 (summer) were observed to be well stratified and included a marked thermocline through the intermediate layers. Water column profile measurements at each of the lake basin stations in October 2023 (fall) were well mixed and thermally stratified conditions were no longer present.

Water column profiles at each of the lake basin stations in June (spring) and October (fall) of 2023 showed relatively stable electrical conductivity and dissolved oxygen with depth.

Water Level and Flow Monitoring

The Project Site generally drains to the northeast through a series of wetlands, lakes and streams which are all part of the Churchill River Watershed. To evaluate seasonal lake level regimes for key surface waterbodies (lakes) in the Project Site, water level monitoring was undertaken at four lake outlet stations located on Long Lake, Mills Lake, Molar Lake, and Pike Lake.

Water levels were generally observed to gradually decrease from June to August (spring to summer) and then gradually increase from August 2023 to October 2023 (summer to fall) correlating with rain events.

The water levels, at two lake outlets (Long Lake and Mills Lake), generally reported a marked response to rain events. At Molar Lake, water level records showed unusual sudden fluctuations - similar to that of a pumped system with rapid withdrawal and release setup - coupled with a general increase of lake level trend towards the fall. At Pike Lake, water levels showed an unusual steady increase in the lake level after mid-August 2023, which is not typical of hydrologic responses to rainfall events. Two beaver dams were observed during the fall visit located upstream of the outlet at Pike Level, which likely was the cause of the increased water levels.

Twelve additional monitoring stations in the Project Site were installed to monitor for both water levels and flows. These stations were installed at watercourses and lake outlets in the Project Site. These stations were undertaken to evaluate the seasonal water level and flow regimes. Manual flows were measured three times in the 2023 campaign (June, August, and October), and, where applicable, were used to develop stage-discharge rating curves in order to generate flow hydrographs using the continuous water level records. The results of water level and flow monitoring are summarized below.

Similar to the lake outlet water levels, watercourse station water levels were generally observed to gradually decrease from June to August 2023 (spring to summer) and then gradually increase from August to October 2023 (summer to fall).

Flow and/or water level hydrographs at the watercourse and lake outlet stations were in correlation with rain events generating moderate to high flows.

The majority of the watercourse station water levels exhibited a marked, but gradual response to major rain events. Only three watercourse stations exhibited rapid and flashy hydrologic response to precipitation events characterized by higher peaks with steep rising and falling limbs.

Manual flow measurements were observed to be higher in the summer (August 2023) period compared to the spring (June 2023) and fall (October 2023). The flows ranged from 57 L/s (recorded in the spring at the inlet to Pike Lake from southwest) to 1,191 L/s (recorded in the fall at the downstream portion of Daviault Lake near the outlet).

Water and Sediment Quality

Water quality monitoring was necessary to document any potential points of environmental degradation due to existing natural or historic activities. For the purposes of assessing the in-situ and lab water quality and sediment quality results, comparison was made to the Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Aquatic Life – Freshwater (CCME 1999a) and CCME Sediment Quality Guidelines for the Protection of Aquatic Life Freshwater and Marine ISQG/PEL (CCME 1999b).

Water and sediment quality sampling was conducted at 23 watercourses and waterbodies (lakes) in the Project Site. Samples were collected during three sampling events in 2023 (June, August, and October). Samples were analyzed for several parameters including general chemistry, anions and nutrients, metals, radionuclides, and polycyclic aromatic hydrocarbons (PAHs). The results of the surface water and sediment quality aspects of the field and laboratory investigations demonstrated that, with some exceptions, the stations located in watercourses and lakes were below the relevant water and sediment quality guidelines. Only a few water quality samples reported slight exceedances of the CCME guidelines for a small group of metals and nutrients (i.e., phosphorus, aluminum, iron, manganese, lead, and copper). The sediment quality results were also noted to be below CCME guidelines, noting that the observed concentrations of some metals (i.e., arsenic, cadmium, chromium, copper, lead, mercury, and zinc) were elevated at certain locations.

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1.0 INTRODUCTION

The Kamistiatusset (Kami) Iron Ore Mine Project (the Project) is a proposed iron ore mine in Newfoundland and Labrador. The Project site is located entirely in Labrador, approximately 7 km from the Town of Wabush, 10 km south of the Town of Labrador City, and 5 km east of Ville de Fermont, Québec (Figure 1-1).

The Project was originally proposed by the Alderon Iron Ore Corporation (Alderon) and underwent a provincial and federal environmental impact assessment from 2011 to 2013, including a comprehensive baseline program that was completed in 2011 and 2012. The Project was released from the provincial and federal EA process in 2014. In 2021, Champion Iron Mines Ltd. (Champion) completed the acquisition of the Project from Alderon.

Champion is proposing several optimizations to the Project design proposed by Alderon through the previous EIS. These proposed optimizations include updates to the Project's water management strategy and modernization of the proposed ore handling, conveyance, and processing. Champion's objective for the Kami Project is to produce high purity (>67.5%) iron ore concentrate, which can be used as direct reduction pellet feed for electric arc furnaces in the green steel supply chain. Champion is planning to submit a Project Registration to the Newfoundland and Labrador Environmental Assessment Division of the Department of Environment and Climate Change in 2024.

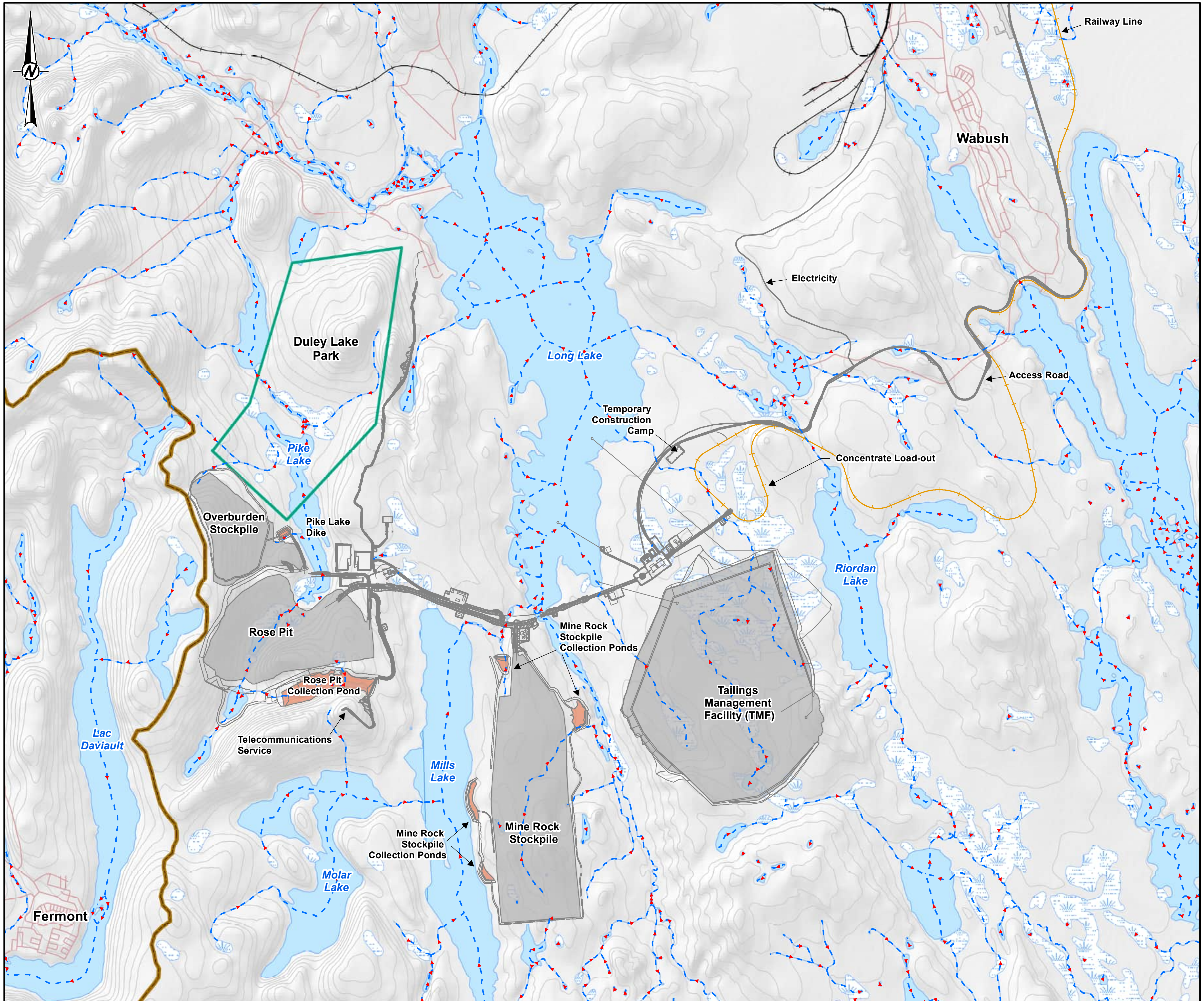
To support the Project Registration and assessment of effects from the revised Project design optimizations, Champion has commissioned the services of WSP Canada Inc. (WSP) to complete a comprehensive baseline field program that documents the existing natural and socio-economic environments in the anticipated area of the Project. The surface water baseline report represents a component of the comprehensive baseline program and was undertaken to provide context from which Project effects to surface water could be evaluated.

Figure 1-1 outlines some of the main components of the Project site including:

- Open Pit (Rose Pit);
- Mine rock stockpile;
- Ore stockpiles (operational, low-grade and emergency);
- Tailings management facility (TMF);
- Overburden stockpile;
- Processing infrastructure including crushing and concentrating;
- Ancillary infrastructure to support the mine and process plant.

1.1 Drainage

The drainage pattern within the vicinity of the Kami Project is directed north and east through a network of watercourses, lakes and wetlands that are part of the Churchill River watershed headwaters (Figure 1-1). The west portion of the proposed Project site drains into Pike Lake, which then is collected by several lakes and streams connected to the Walsh River and discharging into Long Lake from the north. The south portion of the proposed Project site follows an in-line lake pattern in the following order: Molar Lake, Mills Lake, and Long Lake. The Waldorf River and several streams from the south and southeast drain into Long Lake. One of these streams in the east connects Riordan Lake into Long Lake. Finally, Long Lake drains into Canning Lake and Harrie Lake on the northwest.



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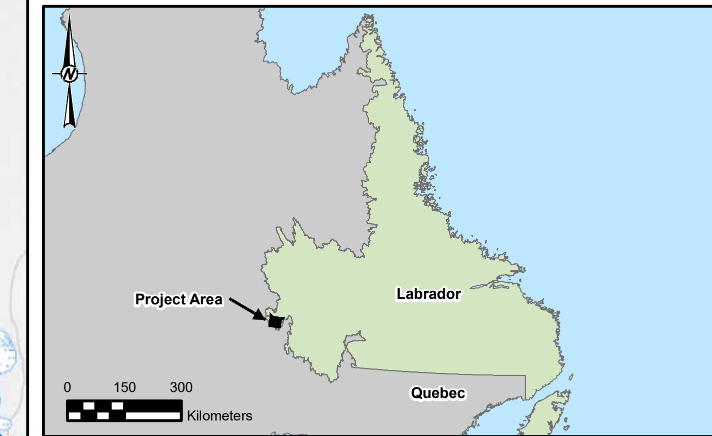

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LEGEND

PROJECT DATA

- Flow Direction Line
- Proposed Infrastructure
- Proposed Railway
- Proposed Infrastructure
- Proposed Sedimentation Pond

BASEMAP INFORMATION

- Duley Lake Park
- Existing Railway
- Existing Road
- River/Stream
- Contour
- Bog/Wetland
- Waterbody
- Labrador/Quebec Boundary
- Public Water Supply

0 625 1,250 2,500

1:60,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT
CHAMPION IRON MINES LTD.

PROJECT
KAMI IRON ORE MINE PROJECT (KAMI PROJECT)
WABUSH, NL

TITLE
SITE LOCATION MAP - FLOW DIRECTION

CONSULTANT

YYYY-MM-DD	2024-03-20
DESIGNED	----
PREPARED	####
REVIEWED	SPC
APPROVED	HJ

PROJECT NO.	CONTROL	REV.	FIGURE
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2.0 RATIONALE AND OBJECTIVES

2.1 Rationale

The 2023 surface water baseline program was carried out to gain a better understanding of the baseline hydrological and water quality conditions of waterbodies (i.e., lakes and ponds) and watercourses (i.e., rivers and streams) within the proposed Kami Project site and within downstream and upstream waterbodies and watercourses within the local watersheds. Completing the 2023 surface water baseline program will allow for the characterization of baseline and prediction of potential surface water effects arising from the proposed mining operations.

2.2 Objectives

The principal objective of the 2023 surface water baseline investigations within the vicinity of the Kami Project was to characterize the flow regime and water quality at key surface water stations in the local watershed to determine the existing physical and chemical effects on receiving surface water features. The specific study objectives were as follows:

1) Establish typical meteorology conditions within the vicinity of the Kami Project to determine the climatic controls on stream flow.
2) Develop a detailed understanding of flow rates and associated seasonal fluctuations at key surface water locations to evaluate the relative proportions of surface water flow volumes.
3) Characterize the seasonal patterns in water column profiles at Daviault Lake, Long Lake, Mills Lake, Molar Lake, Pike Lake, and Riordan Lake to evaluate the potential for lake stratification and/or turnover.
4) Assess the spatial and seasonal variability of water quality at key surface water locations.
5) Evaluate the potential influence that sources of metals and radionuclides from the surrounding watersheds have on the physical and chemical behaviour of key receiving waters.

To achieve these objectives, the baseline field program examined, implemented or assessed:

- Precipitation records;
- Regional hydrological information;
- Continuous hydrometric monitoring stations;
- Lake water column profiling; and
- In-situ and lab water quality sampling.

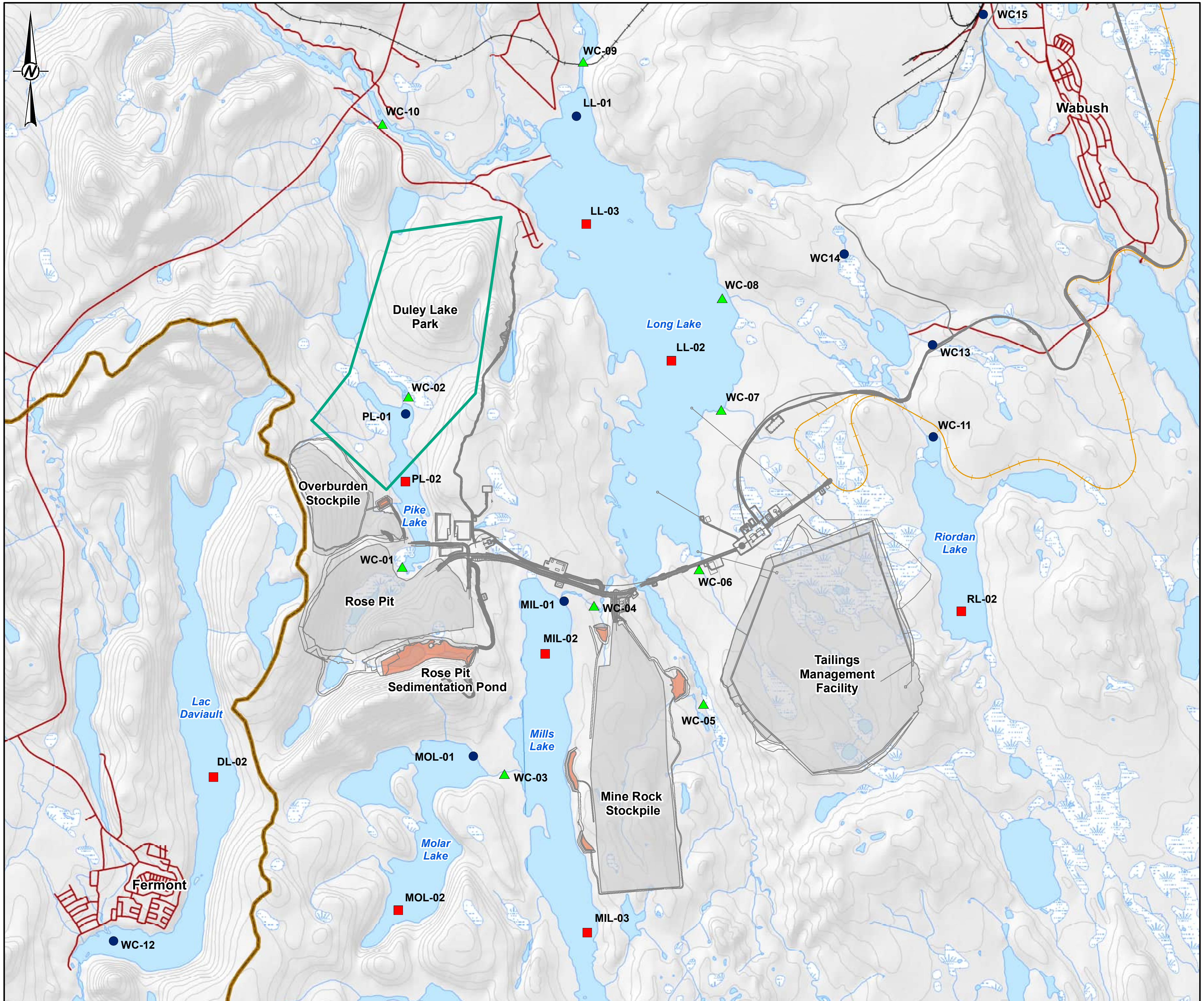
2.3 Issues

A small number of issues were encountered through completion of the 2023 surface water baseline program. The issues were as follows:

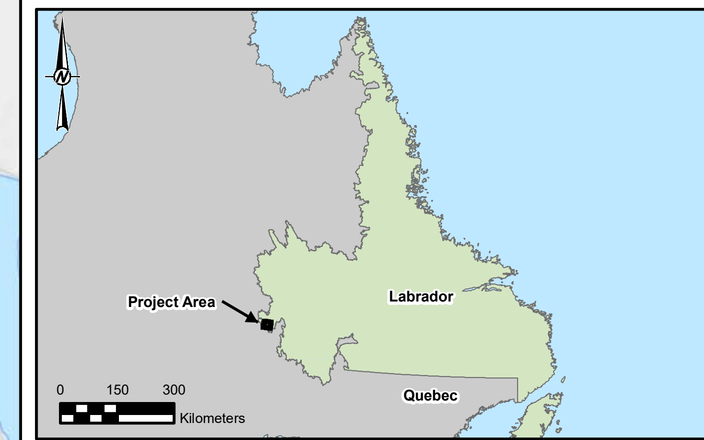
- **Environmental conditions**: High water depths and flows were observed at some watercourses, while high winds were observed at one lake, resulting in unsafe conditions to conduct activities on or near water. Additionally, beaver activity between field visits challenged stage-discharge relationships and made some watercourse not wadable. These issues were generally encountered during the summer and fall.
- **Laboratory**: A portion of the water samples collected in the fall were lost at the laboratory and complete water quality analyses of parameters could not be conducted. Regular communication with the laboratory will be stablished to ensure that all samples are received and analyzed accordingly.
- **Technical Issues:** Due to a technical issue related to data loggers, water levels at two stations could not be collected for the entire duration of monitoring. In addition, the watercourses and lake level stations could not be tied to sea level elevations due to the base station in Wabush being offline.

3.0 STUDY AREA

The study area for the 2023 surface water baseline program sampling locations encompass the waterbodies and watercourses immediately adjacent and downstream of the proposed Kami Project. Sampling locations were selected to be similar to the locations previously sampled by Stantec (Stantec 2012) in support of the previous EIS to support a comparison of existing conditions. Additional sampling stations were added in 2023 to develop a more comprehensive understanding of local and regional hydrological and water quality conditions. Sampling locations are presented in Figure 3-1.



KEY MAP



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LEGEND

SAMPLE LOCATIONS
- Watercourse Station
- Lake Level Station
- Lake Basin Station

PROJECT DATA
- Proposed Infrastructure
- Proposed Railway
- Proposed Infrastructure
- Proposed Sedimentation Pond

BASEMAP INFORMATION
- Duley Lake Park
- Existing Railway
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1:60,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - NEWFOUNDLAND
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT
CHAMPION IRON MINES

PROJECT
KAMI IRON ORE PROJECT
WABUSH, NL

TITLE
2023 SURFACE WATER SAMPLING LOCATIONS

CONSULTANT

wsp

YYYY-MM-DD	2024-03-19
DESIGNED	----
PREPARED	JA
REVIEWED	SPC
APPROVED	HJ

PROJECT NO.	CONTROL	REV.	FIGURE
TE23930010	0001	A	Figure 3-1

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4.0 METHODS

4.1 Meteorology

Historical temperature and precipitation records were obtained from the nearest Environment and Climate Change Canada (ECCC) meteorological station at Wabush Airport. These records were used to evaluate monthly climate trends for the region. The ECCC weather station is described in Table 4-1 below and was selected based on the proximity to the site (approximately 14 km northeast).

Table 4-1: ECCC Meteorological Station Information

Station Name	Climate ID	Period of Record	Elevation (masl)
WABUSH A	8504177	1960 to 2023	551.40

4.2 Water Quantity

4.2.1 Drainage Patterns and Catchment Areas

As part of the visual inspections carried out during the field campaigns, defined surface water features (i.e., channels and/or areas of diffuse flows), culvert crossings and local topography were located and documented using a hand-held GPS, field sketches and photographs.

4.2.2 Lake Water Level Stations

Water level monitoring was undertaken at lake outlet stations listed in Table 4-2 below and presented on Figure 3-1 to evaluate seasonal lake level regimes for key surface water stations within the vicinity of the Kami Project.

Table 4-2: Water Level Stations

Station ID	UTM Coordinates[(a)] Northing/Easting	Description	Period of Record
LL-01	5863619/6355536	Long Lake – downstream portion near the outlet	June 2023 to October 2023
MIL-01	5855772/635414	Mills Lake – downstream portion near the outlet	June 2023 to October 2023
PL-01	5858813/632936	Pike Lake – downstream portion near the outlet	June 2023 to October 2023
MOL-01	5853371/634007	Molar Lake – downstream portion near the outlet	August to October 2023

Notes: (a) UTM coordinates based on NAD83 Zone 19.

Water levels were recorded at each of the monitoring stations using Van Essan DIVER water level dataloggers (i.e., non-vented pressure transducers) (loggers). The water level records were compensated for atmospheric pressure (via a DIVER Barologger).

The loggers were generally installed with on steel posts (T-Posts) set into the channel bed, ideally in a pool upstream of a riffle or channel control. The typical installation of a flow monitoring station is shown in Appendix A, Photo 1. The loggers were attached to the T-Posts by carabiner and eye bolt to remain at a fixed location above the channel bed. A removable polyvinyl chloride (PVC) casing was fitted over the DIVER loggers and locked to the T-Post to prevent both water level disturbance (by turbulence and wind action) and vandalism.

In most cases, the loggers were installed during the first field campaign in June 2023. However, the monitoring stations at Molar Lake (MOL-01) were established in August 2023 as access to these locations was not available during the June visit. For the purposes of this report, water level data at the various stations are discussed through to October 24, 2023 (where possible), which corresponds with the final field campaign visit in 2023.

4.2.3 Flow Measurements

Manual flow measurements were collected during each of the 2023 surface water monitoring field visits to develop an understanding of the seasonal variation in flows within the Project site and local and regional watersheds. Measured flows were also used to develop stage-discharge rating curve relationships (see Section 4.2.5).

Manual flow measurements were estimated using the velocity-area method. Representative channel cross-sections were generally established and marked with wooden stakes at each surface water station. A typical cross section set up is shown in Appendix A, Photograph 2. A tape measure was extended the length of each cross-section during each measurement event. Stream flow velocities and corresponding water depths were collected at various intervals along the cross-section: 0.1 m to 3 m spacing depending on the width of the watercourses and lake outlets. At most stream flow locations, velocity and depth measurements were obtained by wading channels or from atop crossing features. Current velocities were recorded with a Hach Flow Meter Model 950.1 at 60% of the total water depth for water depths less than 0.75 m and at 20% and 80% for depths greater than 0.75 m.

4.2.4 Continuous Flow Monitoring

Continuous flow and/or water level monitoring was undertaken at the stations listed in Table 4-3 below and presented on Figure 3-1 to evaluate seasonal streamflow and lake level regimes for key surface water stations in the Project Site.

Table 4-3: Continuous Flow and/or Water Level Stations

Station ID	UTM Coordinates[(a)] Northing/Easting	Description	Period of Record
WC-01	5856192/632810	Unnamed stream – reporting to Pike Lake from the southwest	June 2023 to October 2023
WC-02	5858897/632920	Unnamed stream – immediately downstream of Pike Lake Outlet	June 2023 to August 2023
WC-03	5853179/634709	Unnamed stream – reporting to Mills Lake from the west	June 2023 to October 2023
WC-04	5855857/635378	Unnamed stream – reporting to Long Lake from the southwest	June 2023 to October 2023
WC-05	5854636/637507	Waldorf River – reporting to Long Lake from the south	June 2023 to October 2023
WC-06	5856351/637511	Unnamed stream – reporting	June 2023 to October 2023
WC-07	5858758/637921	Unnamed stream – reporting to Long Lake from the southeast	June 2023 to October 2023
WC-08	5860478/637962	Unnamed stream – reporting to Long Lake from the east	June 2023 to October 2023
WC-09	5863790/635635	Unnamed stream – immediately downstream of Long Lake Outlet	June 2023 to October 2023
WC-10	5863449/632468	Walsh River – reporting to Long Lake from the northwest	June 2023 to October 2023
WC-11	5858315/641017	Unnamed stream – immediately downstream of Riordan Lake	August 2023 to October 2023
WC-12	5848673/628202	Unnamed stream – immediately downstream of Daviault Lake	June 2023 to October 2023

Notes: (a) UTM coordinates based on NAD83 Zone 19.

Water levels were recorded at each of the continuous flow monitoring stations using Van Essan DIVER water level dataloggers (i.e., non-vented pressure transducers) (loggers). The water level records were compensated for atmospheric pressure (via a DIVER Barologger) and combined with theoretical stage-discharge rating curves to generate continuous flow hydrographs. Details regarding the development of the various stage-discharge rating curves are provided in Section 4.2.5.

The loggers were generally installed with on steel posts (T-Posts) set into the channel bed, ideally in a pool upstream of a riffle or channel control. The typical installation of a flow monitoring station is shown in Appendix A, Photograph 2. The loggers were attached to the T-Posts by carabiner and eye bolt to remain at a fixed location above the channel bed. A removable PVC casing was fitted over the DIVER loggers and locked to the T-Post to prevent both water level disturbance (by turbulence and wind action) and vandalism.

In most cases, the loggers were installed during the first field campaign in June 2023. However, the monitoring station at Riordan Lake (WC-11) was established in August 2023 as access to this location was not available during the June visit. For the purposes of this report, continuous flow and/or water level data at the various stations are discussed through to October 24, 2023 (where possible), which corresponds with the final field campaign visit in 2023.

Water level records at WC-02 could not be successfully downloaded in October 2023 due to instrumentation communication error. As a result, water level data at this station was unavailable from August 11 to October 24, 2023.

4.2.5 Stage-Discharge Rating Curves

Manual flows, discussed in Section 5.4, were used to develop developed stage discharge rating curves, where applicable. The stage-discharge rating curves were obtained using the following power-law rating curve equation:

$$Q = a(y)^b$$

Where:

Q = stream flow rate (m^3/s)

y = water depth (m) calculated as Y-Y_o (Y = measured water level and Y_o = water level in metres when no flow will occur (i.e., standing water level in the channel due to downstream control)

a and b = rating curve parameters (dimensionless)

As a general approach, measured flows, water levels, and channel geometry were obtained during the 2023 field campaign visits (i.e., June, August, and October) at the various continuous flow monitoring stations and tied to local benchmarks. To estimate the rating curve parameters, an optimization technique was applied with appropriate bounds on rating curve parameters. Minimization of sum-of-square-of-error between the measured manual flows and calculated flows was used as an objective function.

4.2.6 Bathymetry and Lake Depth Surveys

Bathymetric surveys were carried out at Long Lake, Mills Lake, Pike Lake, and Riordan Lake, while lake depth surveys were conducted at Daviault Lake and Molar Lake. The bathymetric and lake depth survey data at these waterbodies were used to characterize the physical configuration of the system, as well as identify where lake column profiling and water quality sampling would be conducted (refer to Sections 4.3.1 and 4.3.2).

In general, the bathymetric surveys were conducted with a 3 m zodiac boat that was fitted with a Lowrance sounder and Garmin GPS bulb. Data was collected along a series of transects based on the size of the water body at speeds of approximately 8 km/hr to 10 km/hr. The resulting water depth data were corrected for keel offset and, where possible, converted to elevation using local benchmarks (i.e., staff gauges) as an elevation reference. The data was then gridded and contoured, and bathymetric maps were prepared for each lake showing water depth. Lake depth surveys were conducted by collecting a series of depth measurements for the sole purpose of locating lake basins and did not map the entire lake, as the bathymetry did.

4.3 Water Quality

4.3.1 Water Column Profile Measurements

Lake column profiling was conducted at the various stations presented in Table 4-4 and on Figure 3-1 to characterize lake chemistry and physiology with depth at Daviault Lake, Long Lake, Mills Lake, Molar Lake, Pike Lake, and Riordan Lake. The selection of locations within the lakes for water column profiling included the deepest areas within the lake basins and/or sub-basins. Lake column profiling was conducted at all lake basin stations in the spring and fall, as well as for select locations in the summer.

Table 4-4: 2023 Lake Column Profile Stations

Lake Basin	Station ID	UTM Coordinates[a] Northing/Easting	Description	Approx. Water Depth (m)	Water Column Profile Events
Reference Lake	DL-02	5853048/629986	Daviault Lake – deepest location near the center	22	August and October
Long Lake	LL-02	5859719/637173	Long Lake – deepest location near the center	28.4	June, August and October
	LL-03	5861616/635757	Long Lake – second deepest location in the north	15	August and October
Mills Lake	MIL-02	5854958/635121	Mills Lake – deepest location near the north side	20	June, August and October
	MIL-03	5850640/635773	Mills Lake – second deepest location near the center	25	August and October
Molar Lake	MOL-02	5850987/632847	Molar Lake – near deepest location in the southwest	27	August and October
Pike Lake	PL-02	5857541/632953	Pike Lake – deepest location near the center	9	June, August and October
Riordan Lake	RL-02	5855616/641565	Riordan Lake – deepest location in the south	15	August and October

Notes: (a) UTM coordinates based on NAD83 Zone 19.

For each station, measurements of temperature, electrical conductivity (EC), pH, and dissolved oxygen (DO) were collected at 1-meter intervals throughout the water column using a Horiba Water Quality meter and YSI Multiparameter Water Quality Sonde. Water quality samples were obtained at the same time as the water column profiling measurements (Section 4.3.2).

Temperature affects physical mixing within the lake column (due to density differences of water at different temperatures). Physical mixing of a water column can occur when temperatures throughout the profile are isothermal. In comparison, thermal stratification (i.e., marked differences in near-surface and near-bed temperatures) offers resistance to lake turnover.

Electrical conductivity (EC) is a measure of the presence of ions within the water column, although the readings are non-specific (i.e., it cannot determine which ions are responsible for any observed increase). EC can affect physical mixing within the lake column since the ionic composition of water affects its density. In this assessment, the EC values are used to determine potential limitations on mixing processes within the water column, whereby chemical stratification (i.e., notable differences in near-surface and near-bed ion concentrations) provides resistance to lake turnover. EC is measured in microsiemens per centimetre (µS/cm).

Dissolved Oxygen (DO) is used as an indicator of lake turnover. Oxygen levels in the bottom waters of a lake are reduced during thermal stratification and replenished during turnover events (when oxygenated surface waters are mixed throughout the water column). Therefore, an increase in bottom water DO concentrations is an indication that turnover has occurred. DO is also used to identify potential changes in redox conditions within the lake column that accompany associated fluctuations between oxic and anoxic conditions, and, in turn, can affect metal mobility from lakebed sediments (i.e., release of metals bound to more labile sediment fractions). DO was measured in milligrams per litre (mg/L).

4.3.2 Water Quality Sampling

Water quality sampling was conducted at various watercourses and waterbodies (lake) in the Project Site. Water quality samples at the watercourse and lake basin stations were obtained by standard grab techniques using a Van Dorn discrete water sampler; at approximately 1 m below the water surface (NS = near-surface) and, where possible, approximately 1 m above the bed (NB = near-bed).

All water samples were stored in sample bottles and pre-charged (as required) with preservatives provided by the laboratory. Water quality samples were sent under chain of custody documentation to Bureau Veritas and analyzed for the following parameters:

- General parameters − pH, acidity, alkalinity, colour, electrical conductivity, hardness, dissolved organic carbon (DOC), total organic carbon, total dissolved solids (TDS), and total suspended solids;
- Anions and nutrients – ammonia, bromide, chloride, fluoride, nitrite, nitrate, phosphorus, and sulphate;
- Major cations, trace metals, and metalloids − aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, lithium, magnesium, manganese, mercury, molybdenum, nickel, potassium, selenium, silicon, silver, sodium, strontium,

tellurium, thallium, thorium, tin, titanium, tungsten, uranium, vanadium, yttrium, zinc, and zirconium;

- Radionuclides – lead-210, polonium-210, radium-226, and thorium-230 for select locations;
- Surrogate recovery parameters – D10-Anthracene, D-14-Terphenyl, D8-Acenaphthylene, and D8-Naphthalene for select locations; and
- Polyaromatic Hydrocarbons (PAHs) – Acenaphthene, Acenaphthylene, Acridine, Anthracene, Benzo(a)anthracene, Benzo(b/j)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Benzo(c)phenanthrene, Benzo(a)pyrene, Benzo(e)pyrene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, 1-Methylnaphthalene, 2-Methylnaphthalene, Naphthalene, Phenanthrene, Perylene, Pyrene, and Quinoline for select locations.

Water quality sampling was conducted at the watercourse and lake stations described in Table 4-5 and presented on Figure 3-1. Water quality sampling had previously been undertaken by at watercourses and lake stations in 2011 through to 2012 in support of the previous EA process for the Kami Project. These historical results were reviewed and, where applicable, used for comparison purposes. In most cases, the water quality data at each of the applicable stations comprised a comprehensive suite of radionuclides, metals, anions, and general parameters. The overall results of the historical sampling results are discussed in Section 5.5.

Table 4-5: 2023 Water Quality Sampling Stations

Station ID	Description	Water Sampling Event
WC-01	Unnamed stream – reporting to Pike Lake from the southwest	June, August, and October
WC-02	Unnamed stream – immediately downstream of Pike Lake Outlet	June, August, and October
WC-03	Unnamed stream – reporting to Mills Lake from the west	June, August (2) and October
WC-04	Unnamed stream – reporting to Long Lake from the southwest	June, August, and October
WC-05	Waldorf River – reporting to Long Lake from the south	June, August, and October
WC-06	Unnamed stream – reporting to Long Lake from the southeast	June, August (2) and October
WC-07	Unnamed stream – reporting to Long Lake from the southeast	June, August (2) and October
WC-08	Unnamed stream – reporting to Long Lake from the east	June, August (2) and October

Station ID	Description	Water Sampling Event
WC-09	Unnamed stream – immediately downstream of Long Lake Outlet	June, August, and October
WC-10	Walsh River - reporting to Long Lake from the northwest	June, August, and October
WC-11	Unnamed stream – immediately downstream of Riordan Lake	June, August and October
WC-12	Unnamed stream – immediately downstream of Daviault Lake	June, August and October
WC-13	Proposed railway crossing – mouth of Waldorf River reporting to Long Lake[(a)]	October
WC-14	Proposed railway crossing – unnamed stream reporting to Long Lake from the southwest[(a)]	October
WC-15	Proposed railway crossing – unnamed stream reporting to Pike Lake from the south[(a)]	October
DL-02	Daviault Lake – deepest location near the center	August and October
LL-02	Long Lake – deepest location near the center	June, August (2) and October
LL-03	Long Lake – second deepest location in the north	August and October
MIL-02	Mills Lake – deepest location near the north side	June, August (2) and October
MIL-03	Mills Lake – second deepest location near the center	August and October
MOL-02	Molar Lake – near deepest location in the southwest	August and October
PL-02	Pike Lake – deepest location near the center	June, August and October
RL-02	Riordan Lake – deepest location in the south	August and October

a) Sampling was completed at this location based on an earlier design iteration of the proposed railway; and therefore, the sampling location does not align with the proposed railway alignment presented in Figure 3-1.

4.3.3 Sediment Quality Sampling

Sediment quality sampling was used to indicate the long-term water quality conditions, potential historic contaminant releases, aquatic / benthic community potential and health and the sensitivity of aquatic sediment to environmental changes. All sediment samples were stored in sample bottles and pre-charged as required with preservatives that were provided by the laboratory. Sediment samples were sent under chain of custody documentation to Bureau Veritas and analyzed for the following parameters:

- General parameters – moisture, texture (i.e., clay, sand, and silt);
- Anions and nutrients – total Kjeldahl nitrogen (TKN), nitrite, nitrate, nitrate plus nitrite, nitrogen, and total organic carbon (TOC); and
- Metals – aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, phosphorous, potassium, selenium, silver, sodium, strontium, tin, titanium, uranium, vandium, and zinc.

With few exceptions, water quality sampling was conducted at all stations in the spring, summer (twice), and fall; while sediment quality sampling was conducted at selected stations in spring, summer, and fall. Radionuclides and surrogate recovery parameters were only sampled and analyzed in August 2023 (summer).

Sediment quality sampling was conducted at the watercourse and lake stations described in Table 4-6 and presented on Figure 3-1. Sediment quality sampling had been previously undertaken at watercourses and lake stations in 2011 through to 2012 in support of the previous EA process for the Kami Project. These historical results were reviewed and, where applicable, used for comparison purposes. In most cases, the sediment quality data at each of the applicable stations comprised a comprehensive suite of metals, anions, and general parameters. The overall results of the historical sampling results are discussed in Section 5.6.

Table 4-6: 2023 Sediment Quality Sampling Stations

Station ID	Description	Sediment Sampling Event
WC-01	Unnamed stream – reporting to Pike Lake from the southwest	June, August and October
WC-02	Unnamed stream – immediately downstream of Pike Lake Outlet	June, August and October
WC-03	Unnamed stream – reporting to Mills Lake from the west	June, August and October
WC-04	Unnamed stream – reporting to Long Lake from the southwest	June, August and October
WC-05	Waldorf River – reporting to Long Lake from the south	June, August and October
WC-06	Unnamed stream – reporting to Long Lake from the southeast	June, August and October
WC-07	Unnamed stream – reporting to Long Lake from the southeast	June, August and October
WC-08	Unnamed stream – reporting to Long Lake from the east	June, August and October
WC-09	Unnamed stream – immediately downstream of Long Lake Outlet	June, August and October
WC-10	Walsh River – reporting to Long Lake from the northwest	June, August and October

Station ID	Description	Sediment Sampling Event
WC-11	Unnamed stream – immediately downstream of Riordan Lake	October
WC-12	Unnamed stream – immediately downstream of Daviault Lake	August and October
WC-13	Proposed railway crossing – mouth of Waldorf River reporting to Long Lake	October
WC-14	Proposed railway crossing – unnamed stream reporting to Long Lake from the southwest	October
WC-15	Proposed railway crossing – unnamed stream reporting to Pike Lake from the south	October
DL-02	Daviault Lake – deepest location	Summer and fall
LL-02	Long Lake – deepest location	June, August and October
LL-03	Long Lake – second deepest location	August and October
MIL-02	Mills Lake – deepest location	June, August and October
MIL-03	Mills Lake – second deepest location	August and October
MOL-02	Molar Lake – near deepest location	August and October
PL-02	Pike Lake – deepest location	June, August and October
RL-02	Riordan Lake – deepest location	August and October

4.4 Quality Assurance / Quality Control Procedures

A Quality Assurance / Quality Control program was implemented to verify that data collection, data entry, and data analysis were conducted with a high level of confidence. Quality Assurance / Quality Control of field data and data summary calculations consisted of:

- Reviewing and verifying field data on site, at the end of each day, and at the end of each field shift to maintain data quality and consistency;
- Field work in pairs to limit observational gaps;
- Transferring and backing-up field data and field photos to online databases and laptops regularly;
- Following the appropriate water quality sampling procedures and guidelines;
- Adhering to a strict chain of custody procedures when submitting samples for analysis at the laboratory;

- Water quality data checks included verifying values outside of expected ranges for each parameter; and
- Following best practices for logger installation and flow monitoring to maintain consistency and accuracy.

5.0 RESULTS

5.1 Meteorology

Mean daily temperatures and total daily rainfall at the ECCC meteorological station Wabush A are available from November 1960 to December 2023; however, the 10-year period (2014 – 2023) is presented in Table 5-1.

Table 5-1: Monthly Temperature and Precipitation Means at ECCC Wabush A (2014 to 2023)

Wabush A	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean Annual
2023 Temp (°C)	-19.8	-19.8	-11.7	-2.4	4.4	11.8	15.5	14.3	9.2	3.6	-6.8	-12.5	-1.2
10-yr Temp (°C)	-21.8	-21.6	-14.1	-5.7	3.4	10.0	14.5	13.3	7.4	2.0	-8.4	-14.8	-3.0
5-yr Precip (mm)	13.3	15.5	25.2	36.6	58.1	89.1	92.8	107.1	66.3	57.5	34.2	42.2	638
10-yr Precip (mm)[(a)]	13.1	13.9	16.8	32.7	55.9	77.4	89.7	109.2	58.7	57.4	37.2	31.3	590

Notes: (a) Mean 10-yr precipitation excluding 2014 data due to record gap for Jan to Sep and mean annual.

Average temperatures in 2023 were 1-2 °C warmer than the 10-year mean. The mean annual temperature in 2023 reflected this trend with a value of -1.2 °C compared to the 10-year mean of -3.0 °C. A comparison of 5-year mean annual precipitation with the 10-year mean annual precipitation shows 8% increase in precipitation in the recent 5-years, indicating increasing trend in annual precipitation.

Rainfall occurred on a frequent basis during the 2023 investigation period. Four significant rainfall events (>15 mm in 24 hours) were recorded during the spring and summer of 2023, including June 28 (26 mm), August 9 and 25 (30 mm and 21 mm, respectively), and September 6 (16 mm). Monthly trends in temperature and precipitation during 2023 are shown in Table 5-2 below.

Table 5-2: 2023 Monthly Climate Trends

Month	Min Temperature (°C)	Mean Temperature (°C)	Max Temperature (°C)	Total Rain (mm)	Total Snow (mm)	Total Precipitation (mm)
January	-29.1	-21.7	-14.3	0	6.8	6.8

Month	Min Temperature (°C)	Mean Temperature (°C)	Max Temperature (°C)	Total Rain (mm)	Total Snow (mm)	Total Precipitation (mm)
February	-32.5	-24.2	-15.8	0	9	9
March	-16.8	-10.2	-3.5	1.4	22.4	23.8
April	-9.7	-2.9	3.9	6.7	12.8	19.5
May	-2.1	4.6	11.3	33.4	0.2	33.6
June	5.1	11.7	18.3	77.6	0	77.6
July	10.9	17.0	23.0	65.4	0	65.4
August	7.8	12.7	17.6	114.1	0	114.1
September	4.6	10.3	16.0	69.8	0	69.8
October	0.8	4.5	8.1	66.8	6.5	73.3
November	-13.1	-8.8	-4.5	0	21.5	21.5
December	-16.0	-11.3	-6.5	25.5	16.4	41.9
Mean / Total	**-7.4**	**-1.5**	**4.5**	**460.7**	**95.6**	**556.3**

With few exceptions, air temperature followed variations for the months and seasons monitored in 2023, noting the following key observations:

- Mean daily temperatures during spring of 2023 (June) ranged from approximately -4°C to 25°C, while corresponding mean daily temperatures in the summer of 2023 (early July to late August) varied from approximately 7°C to 22°C.
- A consistent decline in mean daily air temperatures was noted from mid-September through late October 2023 (i.e., 10°C on September 15 to 0°C on October 24).
- February was the coldest month with an average temperature of -24°C and freezing temperatures persisted from January to mid-April.

5.2 Bathymetry and Lake Depth Surveys

Bathymetric mapping for Long Lake, Mills Lake, Pike Lake, and Riordan Lake is presented on Figure 5-1 through Figure 5-4. The general findings of the bathymetry surveys are as follows and form the basis of the water column profiling data:

Long Lake is characterized by several basins with approximate depths between 20 m to 55 m (Figure 5-1). The deepest basin is situated near the middle of the lake, which is the location of water column profile station LL-02. The second deepest basin is located on the north-west side of the lake, which is the location of water column profile LL-03.

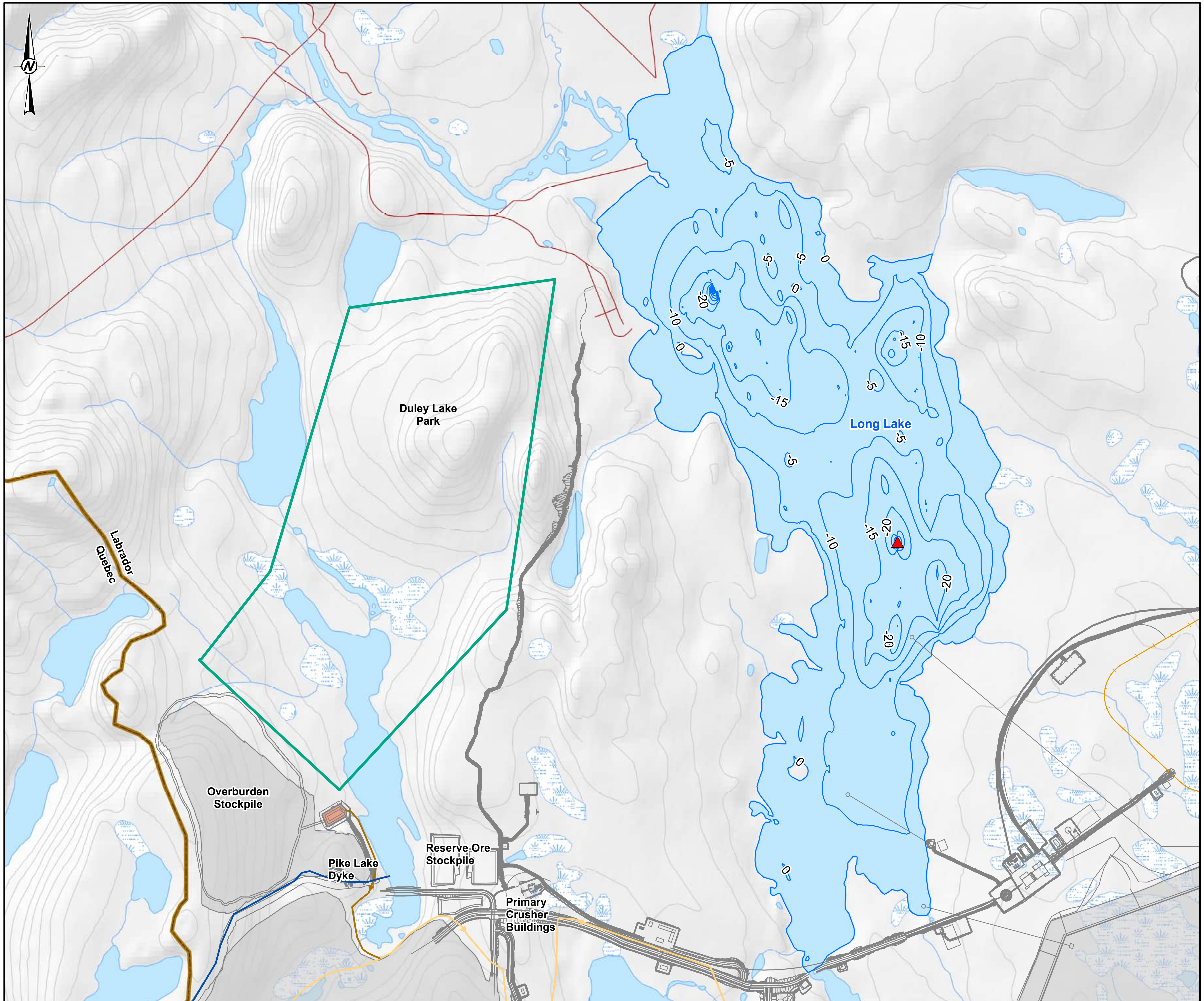
Mills Lake consists of three distinct deep basins on the respective north, central and south sides of the lake (Figure 5-2). The bathymetry of the northern and southern portions of the lake are relatively shallower depths from 9 m to 19 m, while the central portion of the lake includes several basins with an approximate maximum depth of 24 m. Water profiling stations MIL-02 and MIL-03 are located within the deepest and second deepest area of the lake.

Pike Lake is comprised of three basins on the respective north and central sides of the lake (Figure 5-3). The bathymetry of the northern portion consists of shallow depths from 1 m to 4 m, with changes in depth following relatively gradual transition from the surrounding shoreline areas to the basin. The bathymetry in the central portion of the lake includes a relatively deep basin with an approximate maximum depth of 10 m. Water profile station PL-02 is located at the deepest point of the lake.

Riordan Lake is characterized by four relatively small basins with approximate maximum depths between 6 m and 14 m (Figure 5-4). The two basins to the south are comparatively deeper and located in the upstream portion of the lake, approximately 2.8 km from the outlet area. Water column profile station RL-02 is situated in one of two southern deepest basins.

Due to time constraints, lake depth surveys were completed at Daviault Lake and Molar Lake in place of bathymetry surveys. The purpose of the lake depth surveys were to find the deepest point along the center of the lake. The results of lake depth survey are presented on Figure 5-5 and [INSERT 5-6]

Figure 5-6. The deepest point in each lake was selected as the location for the water column profile measurements. Lake column profile station DL-02 is located at the north side of the lake, with an approximate maximum depth of 23 m; while MOL-02 is located at the south portion of the lake, with an approximate maximum depth of 28 m.



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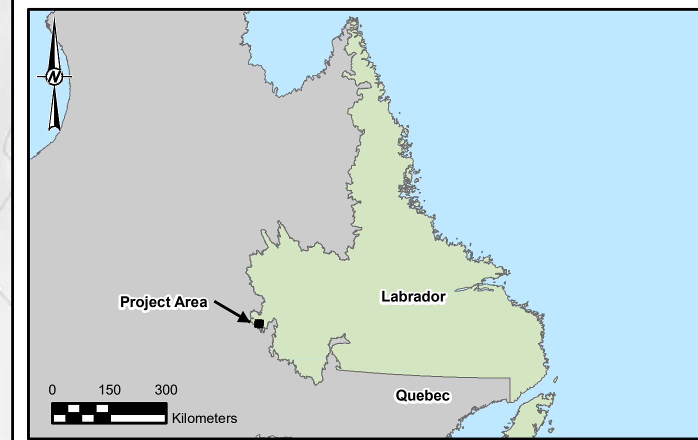

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PROJECT DATA

- Deepest Point in Lake
- Bathymetry (m)
- Contact Water
- Non-Contact Water
- Treated Water
- Proposed Infrastructure
- Proposed Railway
- Proposed Infrastructure
- Proposed Sedimentation Pond

BASEMAP INFORMATION

- Existing Railway
- River/Stream
- Existing Road
- Contour
- Bog/Wetland
- Waterbody
- Labrador/Quebec Boundary

0 335 670 1,340
1:32,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT
CHAMPION IRON MINES

PROJECT
KAMI IRON ORE PROJECT
WABUSH, NL

TITLE
2023 LONG LAKE BATHYMETRY

CONSULTANT

YYYY-MM-DD	2024-03-20
DESIGNED	----
PREPARED	JMA
REVIEWED	SPC
APPROVED	HJ

PROJECT NO.	CONTROL	REV.	FIGURE
TE23930010	0001	A	Figure 5-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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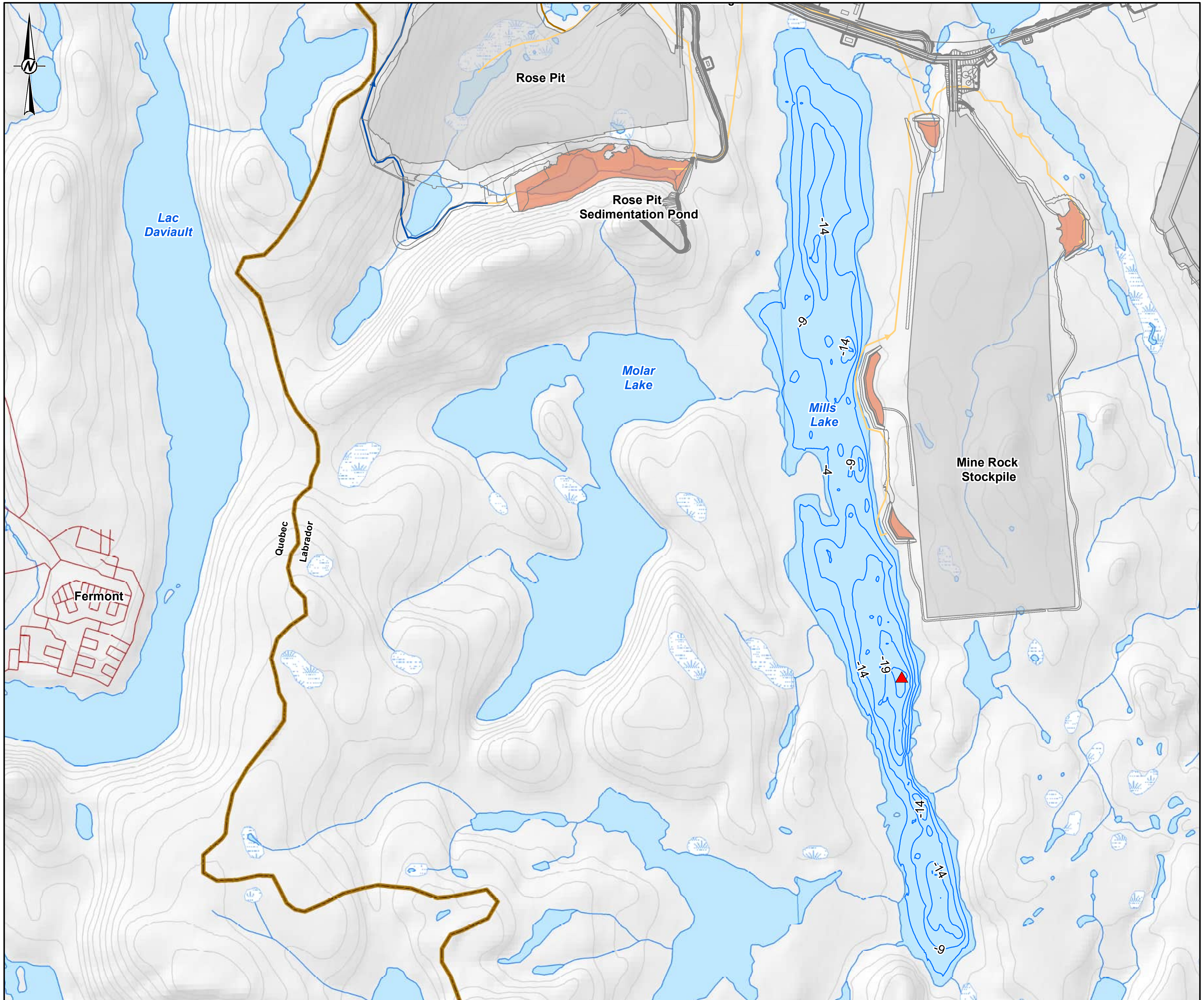

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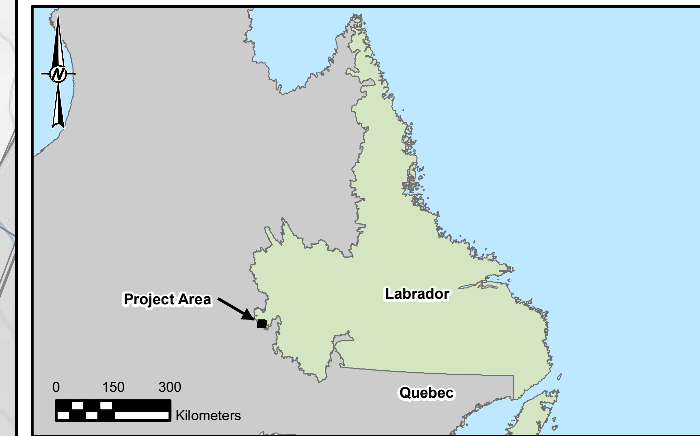

SCALE 1:20,000,000

PROJECT DATA

- Deepest Point in Lake
- Bathymetry (m)
- Contact Water
- Non-Contact Water
- Treated Water
- Proposed Infrastructure
- Proposed Railway
- Proposed Infrastructure
- Proposed Sedimentation Pond

BASEMAP INFORMATION

- Existing Railway
- River/Stream
- Existing Road
- Contour
- Bog/Wetland
- Waterbody
- Labrador/Quebec Boundary

0 335 670 1,340

1:32,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT

CHAMPION IRON MINES

PROJECT

KAMI IRON ORE PROJECT
WABUSH, NL

TITLE

2023 MILLS LAKE BATHYMETRY

CONSULTANT

YYYY-MM-DD	2024-03-20
DESIGNED	----
PREPARED	JMA
REVIEWED	SPC
APPROVED	HJ

PROJECT NO.	CONTROL	REV.	FIGURE
TE23930010	0001	A	Figure 5-2

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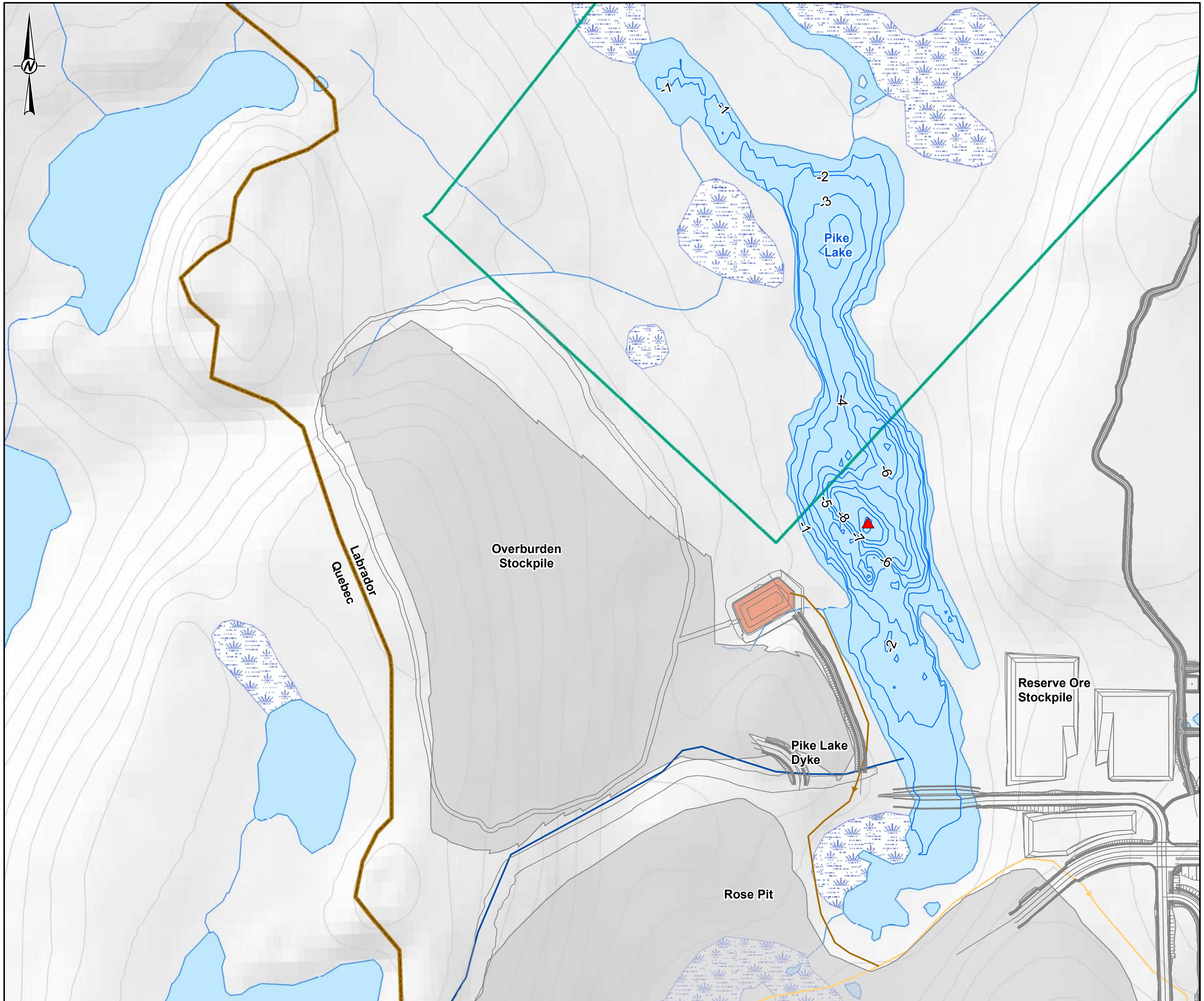

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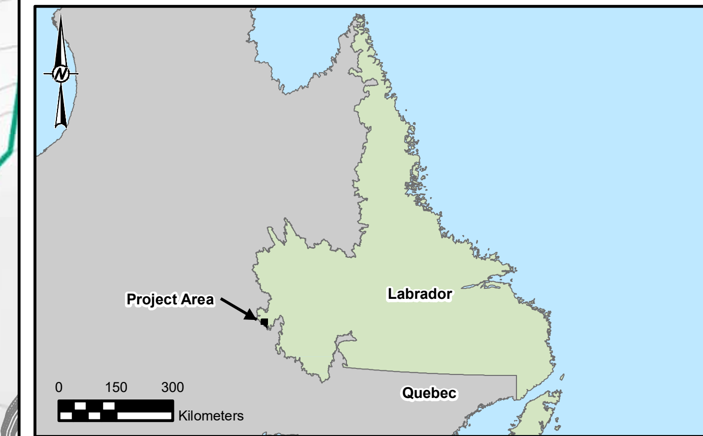

SCALE 1:20,000,000

PROJECT DATA

- Deepest Point in Lake
- Bathymetry (m)
- Contact Water
- Non-Contact Water
- Treated Water
- Proposed Infrastructure
- Proposed Railway
- Proposed Infrastructure
- Proposed Sedimentation Pond

BASEMAP INFORMATION

- Existing Railway
- River/Stream
- Existing Road
- Contour
- Bog/Wetland
- Waterbody
- Labrador/Quebec Boundary

0 137.5 275 550
1:12,753 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT
CHAMPION IRON MINES

PROJECT
KAMI IRON ORE PROJECT
WABUSH, NL

TITLE
2012 PIKE LAKE SOUTH BATHYMETRY

CONSULTANT

YYYY-MM-DD	2024-03-20
DESIGNED	----
PREPARED	JMA
REVIEWED	HJ
APPROVED	SPC

PROJECT NO.	CONTROL	REV.	FIGURE
TE23930010	0001	A	Figure 5-3

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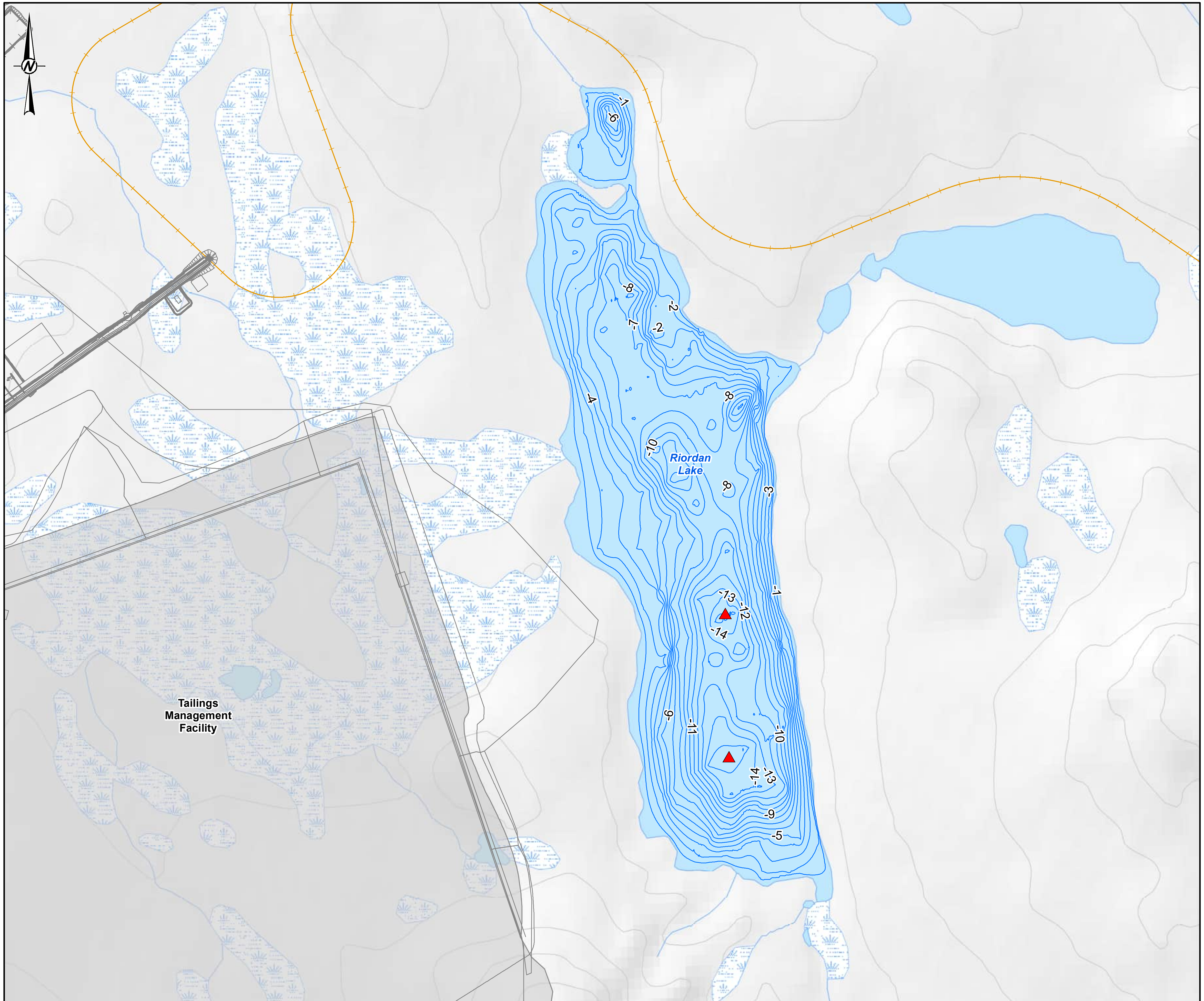

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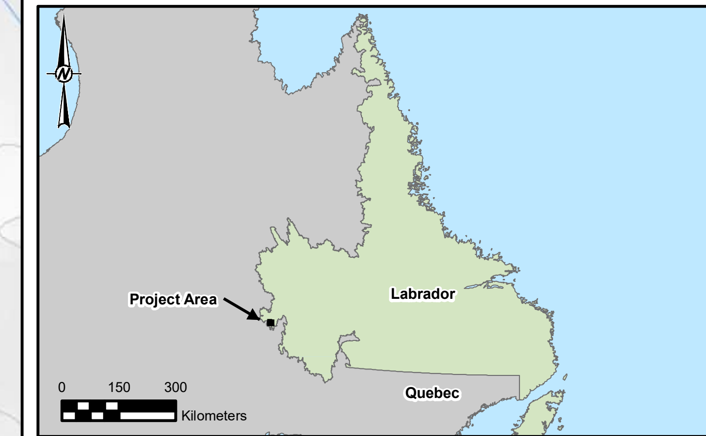


SCALE 1:20,000,000

PROJECT DATA

- Deepest Point in Lake
- Bathymetry (m)
- Contact Water
- Non-Contact Water
- Treated Water
- Proposed Infrastructure
- Proposed Railway
- Proposed Infrastructure
- Proposed Sedimentation Pond

BASEMAP INFORMATION

- Existing Railway
- River/Stream
- Existing Road
- Contour
- Bog/Wetland
- Waterbody
- Labrador/Quebec Boundary

0 165 330 660

1:15,553 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT
CHAMPION IRON MINES

PROJECT
KAMI IRON ORE PROJECT
WABUSH, NL

TITLE
2023 RIORDAN LAKE BATHYMETRY

CONSULTANT

YYYY-MM-DD	2024-03-20
DESIGNED	----
PREPARED	JMA
REVIEWED	SPC
APPROVED	HJ

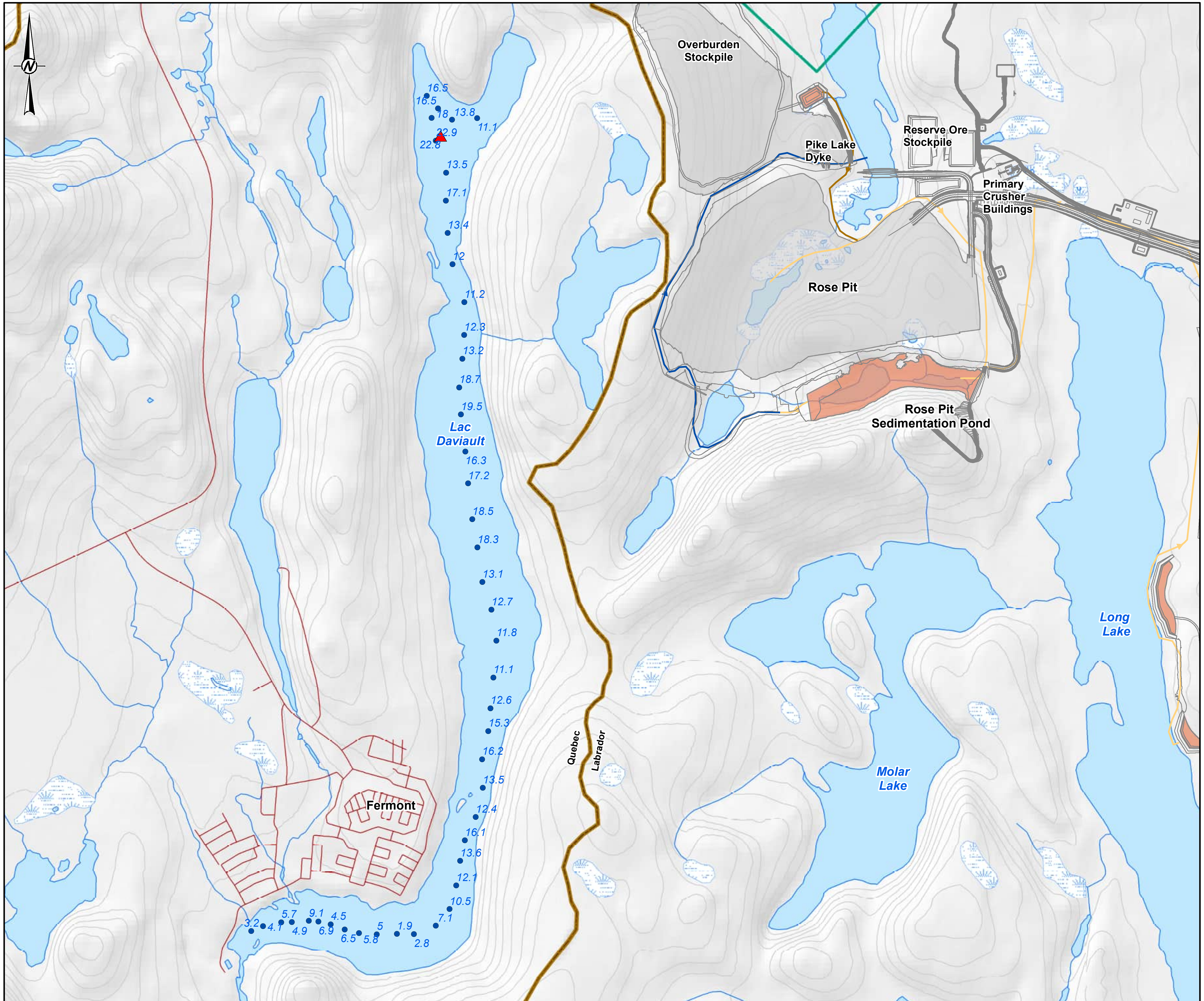
PROJECT NO.	CONTROL	REV.	FIGURE
TE23930010	0001	A	Figure 5-4

5.3 Lake Water Level Monitoring

To evaluate seasonal lake level regimes for key surface waterbodies (lakes) in the vicinity of the Kami Project, water level monitoring was undertaken at four lake outlet stations (Long Lake outlet (LL-01), Mills Lake outlet (MIL-01), Molar Lake outlet (MOL-01), and Pike Lake outlet (PL-01)). Water levels records reported herein were collected from June 2023 to October 2023, except at MOL-01 (Molar Lake outlet) where the records were available from August to October 2023 only.

Lake water level monitoring stations are listed in Table 4-2 and presented on Figure 3-1. The results of the monitoring are presented in Appendix B on the lake level hydrograph Figures B-1 to B-4. The results of water level monitoring at lake stations are as follows:

- During the period of record, the water levels fluctuated 0.374 m at LL-01, 0.128 m at MIL-01, 0.55 m at MOL-01, and 0.283 m at PL-01.
- Water levels were generally observed to gradually decrease from spring to summer and then gradually increase from summer to fall in response to rain events.
- Water level hydrographs at the lake outlet stations were in correlation with major rain events generating high water levels. Four main peaks were observed which appeared to correlate well with the prominent rain events discussed in Section 4.1.



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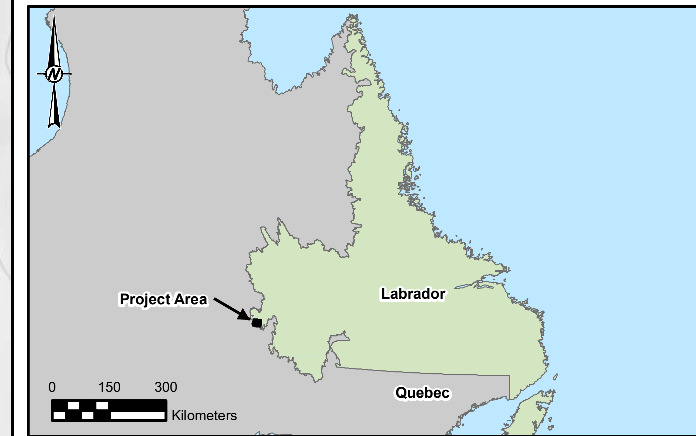


SCALE 1:20,000,000

PROJECT DATA

- Deepest Point in Lake
- Depth Location
- Proposed Infrastructure
- Proposed Railway
- Proposed Infrastructure
- Proposed Sedimentation Pond

BASEMAP INFORMATION

- Existing Railway
- River/Stream
- Existing Road
- Contour
- Bog/Wetland
- Waterbody
- Labrador/Quebec Boundary

0 335 670 1,340
1:32,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT
CHAMPION IRON MINES

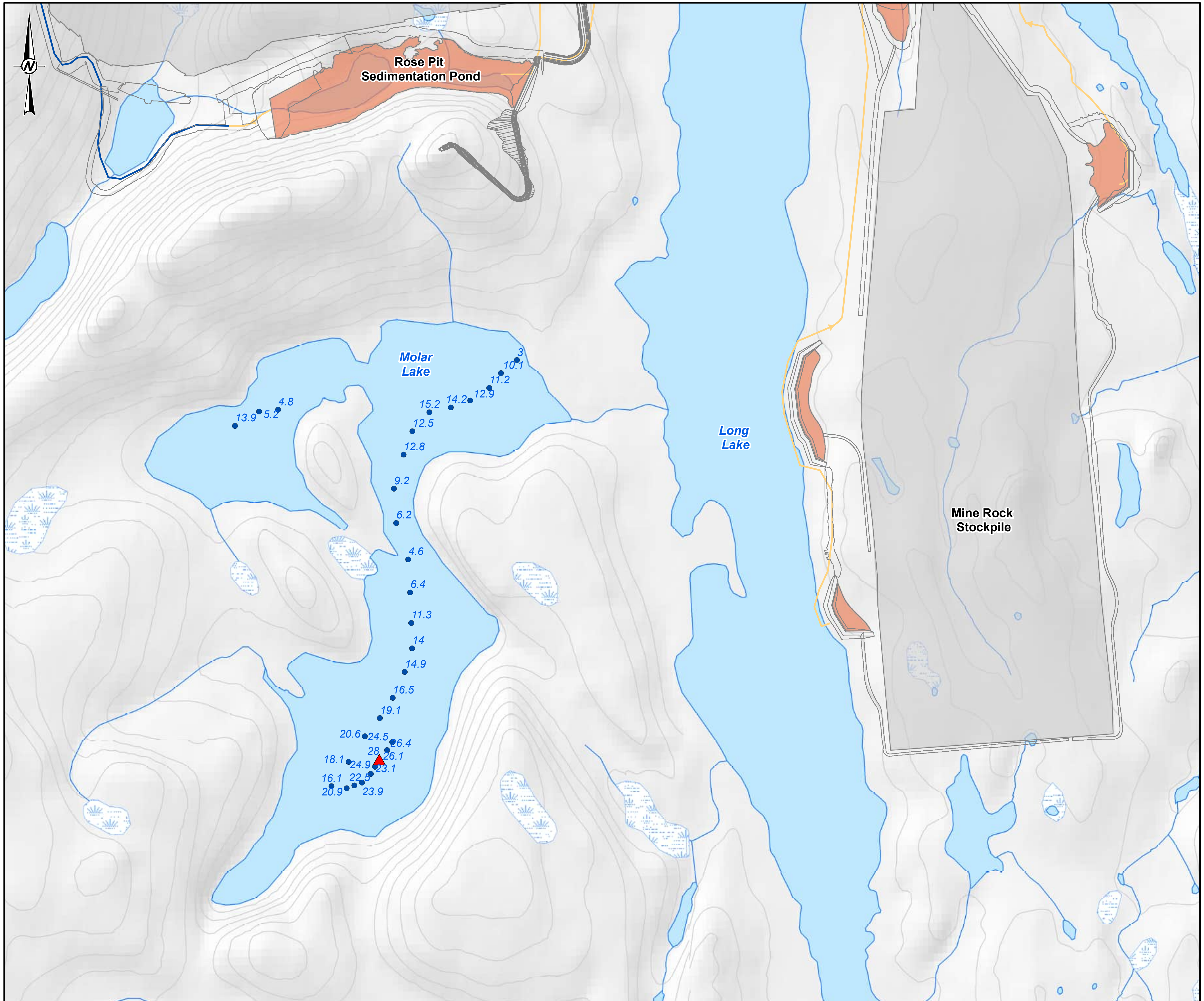
PROJECT
KAMI IRON ORE PROJECT
WABUSH, NL

TITLE
2023 LAKE DAVIAULT DEPTH SURVEY

CONSULTANT

YYYY-MM-DD	2024-03-20
DESIGNED	----
PREPARED	JMA
REVIEWED	SPC
APPROVED	HJ

PROJECT NO.	CONTROL	REV.	FIGURE
TE23930010	0001	A	Figure 5-5



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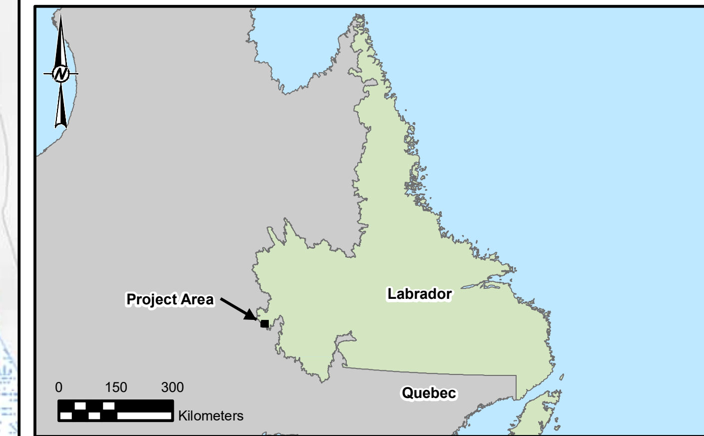

SCALE 1:20,000,000

PROJECT DATA

- Deepest Point in Lake
- Depth Location
- Contact Water
- Non-Contact Water
- Treated Water
- Proposed Infrastructure
- Proposed Railway
- Proposed Infrastructure
- Proposed Sedimentation Pond

BASEMAP INFORMATION

- Existing Railway
- River/Stream
- Existing Road
- Contour
- Bog/Wetland
- Waterbody
- Labrador/Quebec Boundary

0 225 450 900

1:21,244 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT
CHAMPION IRON MINES

PROJECT
KAMI IRON ORE PROJECT
WABUSH, NL

TITLE
2023 MOLAR LAKE DEPTH SURVEY

CONSULTANT

YYYY-MM-DD	2024-03-20
DESIGNED	----
PREPARED	JMA
REVIEWED	SPC
APPROVED	HJ

PROJECT NO.	CONTROL	REV.	FIGURE
TE23930010	0001	A	Figure 5-6

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The water levels at two lake outlets (Long Lake and Mills Lake), generally reported a marked response to rain events. At Molar Lake, water level records showed unusual sudden fluctuations, similar to that of a pumped system with rapid withdrawal and release setup and coupled with a general increase of lake level trend towards the fall. At Pike Lake, water levels showed an unusual steady increase in the lake level after mid-August 2023, which is not typical of hydrologic responses to rainfall events. Two beaver dams were observed during the fall visit located upstream of the outlet at Pike Level, which likely was the cause of the increased water levels.

The water level monitoring results indicate that the lake stations were generally in correlation with rain events. Water levels were observed to gradually decrease from June to August (spring to summer) and then gradually increase from summer to fall correlating with rain events. The water levels at two lakes (Long Lake and Mills Lake), reported a marked response to rain events. At Molar Lake, water level records showed unusual sudden fluctuations, which are comparable to a pumped system with rapid withdrawal and release responses. At Pike Lake, water levels showed an unusual steady increase in the lake level after mid-August 2023, which likely was the caused by two beaver dams that were observed during the fall visit located upstream of the outlet at Pike Lake. Water levels as high as 101.029 m and as low as 100.33 m were recorded at Long Lake and Molar Lake stations, respectively.

5.4 Flow Measurements

The manual flow measurement results are presented in Table 5-3. Manual flows were measured three times in the 2023 campaign (spring, summer, and fall).

Table 5-3: 2023 Manual Flow Measurements (L/s)

Station ID	Spring	Summer	Fall
WC-01	57	150	110
WC-02	135	532	237
WC-03	110	209	164
WC-04	629	1,013	947
WC-05	(a)	189	(a)
WC-06	41	299	71
WC-07	244	780	302
WC-08	313	621	540
WC-09	(a)	(a)	(a)
WC-10	(a)	(a)	(a)
WC-11	(b)	(b)	230
WC-12	(b)	(b)	1,191

(a) data not available due to unsafe stream conditions; (b) data not available due to limited access during the monitoring event

The results of manual flow measurement are as follows:

- Manual flows were observed higher in the summer compared to the spring and fall, noting that the summer flow measurements followed major rainfall events in August.
- The flows ranged from 57 L/s (recorded in the spring at the inlet to Pike Lake from southwest i.e., WC-01) to 1,191 L/s (recorded in the fall at the downstream portion of Daviault Lake near the outlet [WC-12]), noting that the summer flow at WC-12 could not be measured, were expected to be even higher.
- Due to unsafe conditions (high water), manual flows could not be measured at WC-09 and WC-10 during each field visit, and manual flows could not be measured at WC-05 during the spring and fall sampling visits. The flows at WC-11 and WC-12 could not be measured during the spring and summer due to access constraints.

The manual readings are based on a specific point in time; hence, it is difficult to account for hydrological lag times between stations because of storage and/or time of concentration effects. The continuous flow monitoring results provide a more comprehensive evaluation of the characteristics of flow regime for the broader investigation period. However, where applicable, the manual flow rates are referenced to support observations and inferences related to water quality trends.

Manual flow measurements were observed higher in the summer compared to the spring and fall. Manual flows at stations ranged from 57 L/s to 1,191 L/s.

5.4.1 Continuous Water Level/Flow Monitoring

Twelve additional monitoring stations in the vicinity of the Project were also established to monitor both water levels and flows. These stations were installed at watercourses and lake outlets. These stations were undertaken to evaluate the seasonal water level and flow regimes. To generate flow hydrographs using the continuous water level records, stage-discharge rating curves were developed using flow measurements, where applicable. Stage-discharge rating curves are presented in Appendix C with associated details.

Water level and/or flow hydrographs at watercourse and lake outlet stations are presented in Appendix B on Figures B-5 through B-16. The results of water level and flow monitoring are as follows:

- Water levels records reported herein were collected from June 2023 to October 2023, except at station WC-02 (located immediately downstream of Pike Lake outlet) where, due to a technical issue, the records were only available from June to August 2023 and at WC-11 (Riordan Lake outlet) where the records were only available from August to October 2023.
- Water level fluctuations at watercourse and lake outlet stations ranged from 0.106 m to 0.733 m. The lowest and the highest water level fluctuations were recorded at WC-04 and WC-06, respectively.
- Similar to the lake outlet water levels, stream water levels were generally observed to gradually decrease from spring to summer and then, gradually increase from summer to fall.

- Flows and/or water level hydrographs at the watercourse and lake outlet stations were in correlation with rain events generating moderate to high flows.
- Most watercourse water levels exhibited a marked, but gradual response to major rain events. Only three watercourse stations WC-01 (stream discharging to Pike Lake from the southwest), WC-06 and WC-07 (both located on streams discharging to Long Lake from the southeast) exhibited rapid and flashy hydrologic response to precipitation events characterized by higher peaks with steep rising and falling limbs.
- No major water level changes were observed downstream of watercourse stations (i.e., due to beaver and/or debris accumulation), with the exception of WC-03 that showed sudden minor drop in observed water level in the mid to late June 2023.
- Flow hydrographs generated using stage-discharge rating curves showed that the peak flows could range from 311 L/s (estimated at WC-05) to 1,835 L/s (estimated at WC-12).

Watercourse station water levels correlated with rain events and were observed to gradual decrease in the spring to summer and then gradual increase in water levels from summer to fall. Most stream station water levels exhibited a noticeable, but gradual, response to major rain events. Only three stream stations WC-01 (stream discharging to Pike Lake from the southwest), WC-06 and WC-07 (both located on streams discharging to Long Lake from the southeast) exhibited rapid and flashy hydrologic response to rainfall events characterized by higher peaks with steep rising and falling limbs. Water levels as high as 101.003 m and as low as 100.13 m were recorded at WC-06 and WC-07 (both located at streams discharging to Long Lake from the southeast), respectively.

5.4.2 Stage-Discharge Rating Curves

Stage-discharge rating curves for watercourse and lake outlet stations are presented in Appendix C, Table C-1 and Figures C-1 through C-4. Stage discharge rating curves were developed using manual flow measurements, where applicable, and were used to generate flow hydrographs from the water level records. Note that rating curves for stations with fewer than three manual flow measurements are also presented herein with lower level of confidence and will be updated in future, subject to the availability of new flow measurements.

The stage-discharge rating curves at each station generally matched well with the measured manual flows and associated water levels. At a few stations, minor variations between measured and calculated flows at low and medium flows (spring and fall, respectively) were observed, noting that a major rain event on August 9, 2023 occurred between these two manual flow measurements. It is suspected that the peak runoff resulting from the 30.4 mm rain event on August 9, 2023, could have flushed beaver dams and/or redistributed debris accumulated in the watercourses and thus, afterward, could have slightly changed the hydraulic response of some watercourses to the flows and associated water levels.

5.5 Water Quality

5.5.1 Previous Water Quality Results

Water quality sampling that was previously undertaken from 2011/ 2012 (Stantec 2012) were reviewed to understand the baseline conditions of that period and if there were any significant changes. The results from 2011/2012 surface water sampling are summarized below:

- The lab results indicated that pH for stream and lake stations were observed to have similar pH values (values between 7.55 and 8.06), with pH values within CCME Guidelines (Stantec 2012).
- Alkalinity values were considered to be low (values between 25 and 110 mg/L [as $CaCO_3$]) and suggested limited acid buffering potential in local lakes and streams (Stantec 2012).
- Electrical conductivity ranged from 56 µS/cm to 210 µS/cm, which falls within the range in freshwaters as indicative of the potential to support good mixed fisheries (Stantec 2012).
- Total ammonia-N ranged from below the reportable detection limit (RDL) to 0.16 mg/L and were all consistently below the Canadian Water Quality Guidelines (Stantec 2012).
- Total Dissolved Solids (TDS) concentrations were generally low for the monitoring stations, with values ranging from 27 mg/L – 110 mg/L.
- The total cadmium values ranged from below the RDL to 0.048 µg/L, with several values exceeding CWQG limits, including Pike Lake outlet, Waldorf River, and Long Lake (Stantec 2012).
- Total iron concentrations were all below the CWQG with the single exception of one sample at the outlet of Pike Lake.
- Copper, lead, nickel, arsenic, uranium and radium-226 concentrations were below CWQG thresholds (CCREM 1987; IJC 1976) (Stantec 2012).

5.5.2 Water Column Profile Measurements

Water column profile measurements from the sampling rounds in the June, August and October are presented in Appendix D on Figures D-1 through D-8 . The results of the water column profiling investigations are summarized below. Descriptions related to 'stratification' generally refer to water column profile conditions marked by an epilimnion (warm, less dense upper layer) and hypolimnion (cool, more dense lower area). The water column measurements of particular focus herein include temperature, electrical conductivity (EC), and dissolved oxygen (DO).

Temperature

Water column profile measurements at each of the lake basin stations demonstrated steady and gradual development of thermally stratified conditions from the spring to summer, followed by the decay of thermally stratified conditions from the summer to fall. The progression of thermal stratification at each of the lake profile stations was relatively consistent with observed air temperatures trends (i.e., steady increase in air temperatures from mid-May to mid-June 2023 followed by mostly stable and warm conditions through the early to mid-summer, and subsequent decrease in air temperatures from mid-August through October 2023). The results of temperature profiles are as follows:

- Spring – Temperature profiles at each station in the spring were weakly stratified and characterized by slight warming in the upper 3 to 9 m of the water column followed by mostly isostatic conditions or a steady decreasing pattern through the intermediate layers of the water column, noting:
  - Near-surface temperatures ranged from 20°C to 21°C at Long Lake (LL-02) and Mills Lake (MIL-02), however, at Pike Lake (PL-02) it was observed elevated to 25°C.
  - Near-bed temperatures ranged from 14°C to 16°C at Long Lake (LL-02) and Mills Lake (MIL-02), however at Pike Lake (PL-02) it was observed elevated to 19°C.
- Summer – Thermal conditions at each lake basin station in the summer were well stratified and included a marked thermocline through the intermediate layers of the water column (in general between 4 and 10 m below surface), noting:
  - Near-surface temperatures in the upper 3 to 4 m of the profile were relatively uniform and ranged approximately from 16°C to 17°C at Daviault Lake (DL-02), Long Lake (LL-02 and LL-03), Mills Lake (MIL-02 and MIL-03), Molar Lake (MOL-02), and Riordan Lake (RL-02), while at Pike Lake (PL-02) temperatures ranged approximately from 21°C to 24°C. This temperature difference is explained by the smaller size and shallower depth of Pike Lake compared to the rest of the lakes.
  - Near-bed temperatures at depths of generally 7 m or more, where applicable and in most cases, followed a gradual decline from approximately between 16 °C and 10 °C to roughly 6°C with relatively warmer near-bed water temperatures of between 8°C and 9°C at Long Lake (i.e., LL-02 and LL-03), Mills Lake (i.e., MIL-02 and MIL-03), and Pike Lake (i.e., PL-02).
- Fall – Observed lake column conditions at each of the sampling locations in the fall were indicative of physical mixing via partial or complete turnover and included near-vertical trends in each of the measured parameters for large portion of the respective profiles, noting:
  - Near-bed and near-surface temperatures at lake stations ranged approximately from 7°C to 9°C.
  - The extent of physical mixing at the various lake basin stations in the fall was as follows:
    - Complete turnover in the upper layers of the deepest basin of Daviault Lake (DL-02) at the time of the sampling round (Appendix D, Figure D-1). Due to unsafe conditions, only 9 m below surface were sampled at this location.
    - Complete turnover in each lake basin station of Long Lake (LL-02 and LL-03), Mills Lake (MIL-02 and MIL-03), Molar Lake (MOL-02), Pike Lake (PL-02), and Riordan Lake (RL-02) at the time of sampling round in late October 2023 (Appendix D, Figures D-2 through D-8).

Electrical conductivity

Water column profiles at lake basin stations showed increase in EC from the spring to summer followed by decrease in EC from the summer to fall. The results of EC profiles are as follows:

- Spring – EC profiles at Long Lake (LL-02), and Mills Lake (MIL-02) were relatively consistent over depth and generally ranged from 52 µS/cm to 58 µS/cm, except one near-bed EC value at Pike Lake (PL-02) that spiked to 95 µS/cm.
- Summer – Like the spring, EC profiles at all stations were relatively consistent over depth and generally ranged from 50 µS/cm to 86 µS/cm, noting that a few near-bed EC values higher than the observed range were found at Pike Lake (PL-02) and Riordan Lake (RL-02). At Pike Lake (PL-02), a few near-bed EC values were found elevated and increased from 83 µS/cm at 6 m to 119 µS/cm at 9m. Similarly, at Riordan Lake (RL-02), a few near-bed EC values were also found elevated and increased from 86 µS/cm at 12 m to 146 µS/cm at 15 m. Further, at Molar Lake (MOL-02), near-bed EC value increased from 62 µS/cm at 26 m to 70 µS/cm at 27 m (i.e., a modest increase of 8 µS/cm over a depth of 1 m).
- Fall – EC profiles at all stations were consistent over depth and generally ranged from 50 µS/cm to 84 µS/cm, noting that a few relatively higher near-bed EC values were observed at Mills Lake (MIL-03) and Molar Lake (MOL-02). At Mills Lake (MIL-03) and Molar Lake (MOL-02), near-bed EC values increased from 71.2 µS/cm at 24 m to 76.2 µS/cm at 25 m, and 59.2 µS/cm at 26 m to 71.6 µS/cm at 27m, respectively.

Dissolved Oxygen

Water column profiles at lake basin stations showed a general increase in DO values towards the fall. DO profiles in the spring and fall were relatively consistent across the depth, noting that a few low near-bed DO values were observed in some lakes. In the summer, DO profiles demonstrated vertical variations and showed marked differences between the near-surface and near-bed DO values. The results of DO profiles are as follows:

- Spring – DO profiles at Long Lake (LL-02), Mills Lake (MIL-02) and Pike Lake (PL-02) were generally consistent across depth, noting a few near-bed DO values at Pike Lake showed decline towards the bed of the lake. EC values generally ranged from 6 mg/L to 9.8 mg/L, except two near-bed DO values at Mills Lake (MIL-02) and Pike Lake (PL-02) that were found lower than the observed range. At Mills Lake (MIL-02), near-bed DO at a depth of 20 m was 4.67 mg/L. At Pike Lake (PL-02), near-bed DO values showed decreasing trend and reduced from 8.26 mg/L at 5 m to 0.22 mg/L at 9 m.
- Summer – EC profiles at all stations showed a gradual decrease in DO values towards the bed of the lakes. DO values generally ranged from 5.8 mg/L to 10 mg/L, noting that a few near-bed DO values lower than the observed range and below 5.5 mg/L were found at Long Lake (LL-03), Molar Lake (MOL-02), Pike Lake (PL-02), and Riordan Lake (RL-02). At Long Lake (LL-03), near-bed DO value at a depth of 15 m was 4.39 mg/L. At Molar Lake (MOL-02), near-bed DO value at a depth of 27 m was 1.09 mg/L. At Pike Lake (PL-02), near-bed DO values showed a decreasing trend and reduced from 7.92 mg/L at 5 m to 0.21 mg/L at 9 m. At Riordan Lake (RL-02), near-bed DO values showed decreasing trend and reduced from 6.37 mg/L at 11 m to 0.83 mg/L at 15 m.
- Fall – DO profiles at all stations were consistent over depth. DO values generally ranged from 7.14 mg/L to 13.25 mg/L, noting that two near-bed DO values at Mills Lake (MIL-02: 4.8 mg/L at 19 m and MIL-03: 1.74 mg/L at 25 m) were found lower than the observed range and were below 5.5 mg/L.

The pH conditions at all lake basin stations in the spring, summer and fall of 2023 were generally near neutral throughout the water column and demonstrated minor variations over depth and season. As such, water column measurements of pH are not discussed herein.

Overall, the water column profile results from the 2023 investigations (mid-June through late October), demonstrated that the reference and study lakes begin to be thermally stratified in mid-June with the upper thermal layer increasing in temperature and depth through the summer. In addition, the lake column profile results at these same locations demonstrated instances of a complete turnover in late October. The bottom waters at each of the lake column stations (reference and study lakes) were characterized by low DO under stratified conditions.

The thermal and chemical behaviour at all reference and study lakes were relatively similar throughout the study period (as reflected by the observed patterns in temperature, EC and DO). The lake column profiles at each of the identified locations included evidence of complete physical mixing in late October 2023.

5.5.3 Lake Water Quality Results

Water quality sampling was conducted to characterize existing water chemistry of the surface waters within the vicinity of the Kami Project site. Water quality results at waterbodies (lakes) are presented in Appendix E in Tables E-1 through E-9. The water quality results were compared to the Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Aquatic Life – Freshwater (CCME 1999a).

Daviault Lake

Near-surface (NS) and near-bed (NB) water samples were collected at DL-02 for laboratory testing in the summer and fall. At NS, the pH values ranged from 7.18 to 7.47 with average of 7.32, while at NB, the pH values ranged from 6.98 to 7.48 with an average of 7.23. Both NS and NB total alkalinity ($CaCO_3$) averaged 17 mg/L for both sampling events. Acidity concentrations were below the RDL (< 5 mg/L) in all samples. The NS and NB electrical conductivity values did not vary significantly and averaged 53 µS/cm and 52.5 µS/cm, respectively. The NS turbidity values ranged from 1.2 Nephelometric Turbidity Units (NTU) to 4.33 NTU and averaged 2.76 NTU, while NB turbidity values ranged from 0 NTU to 2 NTU and averaged 1 NTU. Note that the turbidity was recorded lower in the fall compared to the summer.

Total dissolved solids (TDS), hardness ($CaCO_3$), and DOC were measured in the summer only. The NS and NB TDS were observed to be 50 mg/L and 60 mg/L, respectively. Both hardness ($CaCO_3$) and DOC did not vary significantly. The NS and NB hardness ($CaCO_3$) were 19 mg/L and 20 mg/L, respectively, while the NS and NB DOC were 3.5 mg/L and 3.4 mg/L, respectively.

In general, the concentrations of all water quality parameters (including anions, nutrients, and metals) were below CCME guidelines.

Long Lake

Near-surface (NS) and near-bed (NB) water samples were collected at LL-02 and LL-03 for laboratory testing. At NS, the pH values ranged from 7.46 to 7.76 and with average of 7.6, while at NB, the pH values ranged from 7.2 to 7.75 with average of 7.5. Total alkalinity ($CaCO_3$) at NS and NB were comparable and ranged from 32 mg/L to 34 mg/L with average of 33.4 mg/L at NS and from 32 mg/L to 34 mg/L with average of 33.2 mg/L at NB. Acidity was below the RDL (< 5 mg/L) in all samples. Both NS and NB electrical conductivity ranged from 69 µS/cm to 73 µS/cm and averaged 71 µS/cm. Both NS and NB turbidity values were less than 1 NTU, nothing that it was measured in the summer and fall only.

Total dissolved solids (TDS), hardness, and DOC were measured in the spring and summer. While the NS TDS ranged from 60 mg/L to 95 mg/L with average of 73.3 mg/L, the NB TDS ranged from 50 mg/L to 75 mg/L with average of 60 mg/L. Note that TDS values decreased in the summer compared to the spring. The NS hardness ($CaCO_3$) ranged from 31.1 mg/L to 36 mg/L with average of 33.7 mg/L and were closer to NB values that ranged from 33 mg/L to 36 mg/L with average of 34.3 mg/L. Both NS and NB DOC values ranged from 3.2 mg/L to 3.5 mg/L with average of 3.4 mg/L and 3.3 mg/L, respectively.

Samples collected in summer at LL-02 NS and NB were also tested for radionuclides, surrogate recovery parameters and PAHs. The values of parameters were observed to be below the RDL.

In general, the concentrations of all water quality parameters (including general chemistry, anions and nutrients, metals, radionuclides, and PAHs) were below CCME guidelines, noting that the concentrations of some parameters (phosphorous, aluminum, iron, and manganese) were elevated in the spring.

Total phosphorus concentration at LL-02 NB exceeded the CCME long-term limit for mesotrophic conditions (i.e., 0.01 – 0.02 mg/L). Metals including total aluminum, iron, and manganese at LL-02 NB also exceeded the respective CCME long-term limits with concentrations of 313 µg/L, 1,480 µg/L, and 1,110 µg/L, respectively. The field notes suggested that the sample at LL-02 NB appeared to be influenced by inadvertent disturbance of bed sediment; thus, the reported total metal concentrations should be reviewed with discretion.

Mills Lake

Near-surface (NS) and near-bed (NB) water samples were collected at MIL-02 and MIL-03 for laboratory testing. At NS, the pH values ranged from 7.43 to 7.69 and with an average of 7.5, while at NB, the pH values ranged from 7.35 to 7.74 with an average of 7.5. Total alkalinity ($CaCO_3$) at NS ranged from 31 mg/L to 36 mg/L with average of 34 mg/L and at NB range from ranged from 34 mg/L to 36 mg/L with average of 35.5 mg/L. Acidity was measured in the spring and fall and values were noted below the RDL (< 5 mg/L). While the NS electrical conductivity ranged from 64 µS/cm to 74 µS/cm with average of 71 µS/cm, the NB electrical conductivity ranged from 73 µS/cm to 75 µS/cm with average of 73.7 µS/cm. The NS and NB turbidity values were less than 1 NTU, nothing that it was measured in the summer and fall only.

Both NS and NB TDS values ranged from 40 mg/L to 75 mg/L but averaged 50 mg/L at NS and 55 at NB. Note that TDS values generally decreased in the fall compared to the spring and summer. The NS hardness ($CaCO_3$) ranged from 32.9 mg/L to 38 mg/L with average of 36.8 mg/L and were closer to NB values that ranged 32.4 mg/L to 39 mg/L with average of 36.1 mg/L. At both NS and NB, DOC did not vary significantly; at NS, DOC ranged from 3 mg/L to 3.1 mg/L with average of 3.04 mg/L and at NB it ranged from 2.7 mg/L to 3.2 mg/L with average of 3.3 mg/L.

The concentrations of anions, nutrients, and metals were below CCME guidelines, noting that the concentration of dissolved copper at MIL-02 NB was equal to the CCME long-term limit (2 µg/L) in the summer.

Molar Lake

Near-surface (NS) and near-bed (NB) water samples were collected at MOL-02 for laboratory testing in the summer and fall, noting that during fall only the NB sample was tested in laboratory. At NS, the pH value in summer was measured to be 7.37, while at NB, the pH ranged from 7.20 to 7.71 with an average of 7.45. Total alkalinity ($CaCO_3$) did not vary significantly and was measured 30 mg/L at NS and averaged 29.5 mg/L at NB. Acidity was measured in fall and observed below the RDL (< 5 mg/L). Similar, both NS and NB electrical conductivity did not vary significantly. Both NS and NB electrical conductivity were observed to be 62 µS/cm in summer, while in fall it was measured at 64 µS/cm at NB. Both NS and NB turbidity values were less than 1 NTU in all samples.

Total dissolved solids (TDS), hardness ($CaCO_3$) and DOC were measured in the summer only. While the NS values were 35 mg/L, 29 mg/L, 3.2 mg/L, and the NB values were observed to be 45 mg/L, 30 mg/L and 3.1 mg/L, respectively, noting that the hardness and DOC did not vary significantly.

Concentrations of anions, nutrients, and metals were below CCME guidelines. However, the total aluminum concentration of 11 µg/L at MOL-02 NB exceeded the CCME long-term limit in the summer.

Pike Lake

Near-surface (NS) and near-bed (NB) water samples were collected at PL-02 for laboratory testing. At NS, the pH values ranged from 7.4 to 7.54 with an average of 7.47, while at NB, the pH values ranged from 7.29 to 7.53 with an average of 7.41. Total alkalinity ($CaCO_3$) was measured in spring and summer only. At NS, it ranged from 32 mg/L to 38 mg/L with average of 35 mg/L, while at NB it ranged from 32 mg/L to 41 mg/L with average of 36.5 mg/L. Acidity was below the RDL (< 5 mg/L), noting that it was measured in spring and summer only. Electrical conductivity was also measured in the spring and summer. At NS, it ranged from 71 µS/cm to 79 µS/cm with average of 75 µS/cm, while at NB, it ranged from 72 µS/cm to 85 µS/cm with average of 78.5 µS/cm. Turbidity was observed less than 1 NTU, noting that it was observed in the summer and fall only.

The NS TDS ranged from 20 mg/L to 95 mg/L and averaged 55 mg/L, while the NB TDS ranged from 20 mg/L to 75 mg/L and averaged 51.7 mg/L. Note that the TDS values decreased towards the fall. The NS hardness ($CaCO_3$) ranged from 31.5 mg/L to 41 mg/L with average of 36.8 mg/L and were closer to NB values that ranged from 33 mg/L to 39 mg/L with average of 37 mg/L. The NS DOC was slightly higher than the NB DOC and averaged 4.7 mg/L and 4.33 mg/L at NS and NB, respectively.

In general, the concentrations of all water quality parameters (including general chemistry, anions, nutrients, and metals) were below CCME guidelines. Dissolved copper and total lead concentrations were 2.2 µg/L and 3.9 µg/L, respectively at PL-02 NB – which were above the CCME long-term limit.

Riordan Lake

Near-surface (NS) and near-bed (NB) water samples were collected at RL-02 for laboratory testing in the summer and fall. At NS, the pH values ranged from 7.61 to 7.86 with average of 7.74, while at NB, the pH ranged from 7.4 to 7.87 with average of 7.63. NS total alkalinity ($CaCO_3$) was observed 45 mg/L in all samples, while the NB total alkalinity ($CaCO_3$) ranged 40 mg/L to 43 mg/L with average of 41.5 mg/L. Acidity was below the RDL (<5 mg/L) in all samples. Both NS and NB electrical conductivity did not vary significantly and averaged 88 µS/cm and 87 µS/cm, respectively. Turbidity was less than 1 NTU.

Total dissolved solids (TDS, hardness ($CaCO_3$) and DOC were measured in summer only. The NS and NB TDS values were 40 mg/L and 65 mg/L respectively, NS and NB hardness ($CaCO_3$) values were 45 mg/L and 44mg/L respectively, and NS and NB DOC values were 3.1mg/L and 2.8 mg/L respectively, noting that hardness ($CaCO_3$) and DOC did not vary significantly.

The concentrations of all water quality parameters (including anions, nutrients, and metals) were below CCME limits.

5.5.4 Watercourse Water Quality Results

Field Results

Field measurements were taken at 12 watercourse stations (WC-01 through WC-12). The results are presented in Appendix E in Table E-1.

In general, the water temperature of the watercourses showed seasonal variations and recorded higher temperatures during the spring (ranging from 9.8 ^oC to 24.3 ^oC) sampling event as opposed to lower temperatures in the summer (ranging from 11.9 ^oC to 19.5 ^oC) and fall (ranging from 5.0 ^oC to 9.5^oC) sampling events. Electrical conductivity generally increased from the spring (ranging from 22.6 µS/cm to 105.2 µS/cm) to the summer (ranging from 0.05 µS/cm to 117.2 µS/cm), and then decreased from the summer to the fall (ranging from 0.05 µS/cm to 47.7 µS/cm). Dissolved oxygen ranged from 7.83 mg/L to 11.2 mg/L in the spring, 8.62 mg/L to 9.83 mg/L in the summer and 10.3 mg/L to 14.5 mg/L during the fall sampling event and displayed similar trends to electrical conductivity. The pH values at each watercourse were consistently below CCME limits. Average turbidity was 0.45 NTU, noting that the maximum (2.97 NTU) was recorded at WC-01 in the spring, while the minimum (0 NTU) was recorded at most watercourses in the fall.

Laboratory Results

Water quality samples were also sent for laboratory analysis at the twelve (12) watercourse stations (WC-01 through WC-12). The results are presented in Appendix E in Tables E-2 through E-5.

At the watercourse stations, pH values ranged from 6.96 to 8.01 and averaged 7.55. Total alkalinity ($CaCO_3$) ranged from 10 mg/L to 67 mg/L and averaged 39.56 mg/L. Acidity was below the RDL (< 5 mg/L). Electrical conductivity ranged from 27 µS/cm to 130 µS/cm and averaged 82.4 µS/cm. TDS ranged from 20 mg/L to 115 mg/L and averaged 63.8 mg/L. Hardness ranged from 11 mg/L to 65.6 mg/L and averaged 38.2 mg/L. DOC ranged from 3 mg/L to 9.4 mg/L and averaged 4.41 mg/L. Turbidity was less than 1 NTU, except at WC-01 in the fall recorded to be 1.1 NTU.

Samples collected in summer at WC-02, WC-03, WC-09 and WC-10 were also tested for radionuclides, surrogate recovery parameters and PAHs. The values of most parameters were observed below the DRL except at WC-02 where benzo(a)pyrene, benzo(b/j)fluoranthene, benzo(g,h,i)perylene, and pyrene were observed above RDL.

In general, the concentrations of all water quality parameters (including general chemistry, anions, nutrients, metals, radionuclides, and PAHs) were below CCME guidelines, noting that the total lead concentration (2.4 µg/L) at WC-09 was above the CCME long-term limit in the summer.

5.5.5 Water Quality at Rail Crossings

Field Results

Field measurements were taken at three rail crossing watercourse stations (WC-13 through WC-15). The results are presented in Appendix E in Table E-1, noting that measurements are only available for the fall field campaign.

The water temperature at the watercourses ranged from 8.4^{o}C to 11.3^{o}C with an average of 9.6^{o}C. The field pH measurements ranged from 6.87 to 7.46 which were within CCME limits. Electrical conductivity ranged from 0.09 to 0.113 with an average of 0.1 µS/cm. Dissolved oxygen ranged from 11.0 to 13.3 mg/L. Average turbidity was 0.76 NTU, with the values being between 0 and 2.28 NTU.

Laboratory Results

Water samples were also sent for laboratory analysis at three rail crossing watercourse stations (WC-13 through WC-15). The results are presented in Appendix E in Table E-5, noting that the measurements are only available for the fall field campaign.

Total alkalinity ($CaCO_3$) ranged from 39 mg/L to 45 mg/L and averaged 41 mg/L. Acidity was below the RDL (< 5 mg/L) at all stations. Electrical conductivity ranged from 83 µS/cm to 94 µS/cm and averaged 88 µS/cm. The concentrations of all water quality parameters were below CCME guidelines.

Compared to water quality parameters reported 2011/2012 (Stantec 2012), water quality parameters at lake and watercourse (stream) stations reported herein were generally found to be in similar range and / or demonstrated a similar behavior, noting some minor deviations were observed. A brief comparison is as follows:

- Lab pH ranged from 6.96 to 8.01 compared to historic pH which ranged from 7.55 to 8.55, noting that pH values were within the CCME guidelines.
- Total alkalinity ($CaCO_3$) ranged from 10 to 67 mg/L compared to historic range of 25 to 110 mg/L.
- Electrical conductivity ranged from 27 to 130 µS/cm compared to historic range of 56 to 210 µS/cm.
- TDS ranged from 20 to 115 mg/L compared to historic range of 27 to 110 mg/L.
- Ammonia-N was observed below RDL which was noted to be similar to historic data.
- A small group of metals and nutrients (i.e., phosphorus, aluminum, iron, manganese, lead, and copper) in five samples exceeded CCME guidelines compared to reported exceedance of cadmium (several samples) and iron (one sample).

5.5.6 Water Quality Summary

Water quality sampling was conducted at 23 stations (lakes and watercourses) within the vicinity of the Kami Project site. With few exceptions, water quality sampling was conducted at all stations in the spring, summer, and fall of 2023. In addition to field measurements of basic water quality parameters, water samples were analyzed for several parameters including general chemistry, anions and nutrients, metals, radionuclides, and PAHs. The results of the surface water quality aspects of the field and laboratory investigations demonstrated the following:

- Seasonal variation in water temperatures at all stations (lakes and watercourses) was observed, noting higher temperatures in the spring and lower in the fall.
- Significant temperature differences in near-surface and near-bed were observed at waterbodies (lakes), generally in the summer which indicates thermal lake stratification.
- With some exceptions, lake and watercourse stations were below the relevant water and sediment quality guidelines (CCME 1999a and CCME 1999b).
- Only five water quality samples reported slight exceedances of the CCME guidelines for a small group of metals and nutrients (i.e., phosphorus, aluminum, iron, manganese, lead, and copper).

5.6 Sediment Quality

5.6.1 Previous Sediment Quality Results

Sediment sampling was previously conducted in 2011 to 2012 at seven (7) stations (including three lakes: Long Lake, Pike Lake, and Molar Lake) in the vicinity of the Kami Project. Metals concentrations, for the most part, were below their respective Interim Sediment Quality Guidelines (ISQG) and the Probable Effect Level (PEL). A few exceedances of the ISQG for chromium, cadmium and copper values were observed from Molar Lake. Also, samples from stream draining into Molar Lake and Long Lake exceeded chromium ISQG. However, the exceedance from Molar Lake, stream draining into Molar Lake and Long Lake sample were below the PEL values (Stantec 2012).

All benzene, toluene and three xylene isomers (BTEX) concentrations were below the detection level. All PAH parameter concentrations were below the detection limit and Canadian Sediment Quality Guideline (CSQG) threshold concentrations (Stantec 2012).

5.6.2 General Sediment Quality

All laboratory testing and analytical results for sediment quality at lakes and watercourses are presented in Appendix E in Tables E-10 through E-13.

The sediment quality results were compared to the Canadian Council of Ministers of the Environment (CCME) Sediment Quality Guidelines for the Protection of Aquatic Life Freshwater and Marine ISQG/PEL (CCME 1999b).

Daviault Lake

Sediment samples were collected from the deepest basin (DL-02) at Daviault Lake. The sediment sample collected at DL-02 in the summer was silt-dominated and the sediment texture was described as clay loam having grain sizes of 29% clay, 23% sand, 49% silt.

Total Organic Carbon (TOC) ranged from 50,000 mg/kg to 69,000 mg/kg with an average of 59,500 mg/kg. Nitrogen ranged from 0.41% to 0.72% with an average value of 0.56%. Calculated total Kjeldahl nitrogen ranged from 4,110 µg/g to 7,160 µg/g, with an average of 5,635 µg/g. Both nitrate and nitrite were observed below the detection limit.

Most metals were noted to be below CCME guidelines, noting that the observed concentrations of cadmium, chromium, copper, lead, and zinc were elevated. Specific details of elevated metals are as follows:

- Summer – concentrations of cadmium and chromium at DL-02 exceeded the CCME-ISQG limit.
- Fall – concentrations of cadmium, chromium, copper, lead, and zinc at DL-02 exceeded CCME-ISQG limits.

Long Lake

Sediment samples were collected from two stations located at the two deepest basins at Long Lake (LL-02 and LL-03). Samples in the summer were found to be dominated by sand, noting that due to variation in sand and silt contents, the sediment texture varied from loamy sand having grain sizes of 2.6% clay, 74% sand, 24% silt to loam in the spring, with average grain sizes of 11% clay, 48% sand, 40% silt. The variation in particle size distribution could be seasonal and was potentially linked to the runoff carrying sediment through watercourses and entering Long Lake.

Total Organic Carbon (TOC) ranged from 39,000 mg/kg to 68,000 mg/kg with an average of 56,800 mg/kg. Nitrogen ranged from 0.21% to 0.76% with an average of 0.56%. Calculated total Kjeldahl nitrogen ranged from 2,090 µg/g to 7,620 µg/g with average of 5,578 µg/g. Nitrate was observed below the detection limit, while nitrite was observed above detection limit only once in the fall resulting in 0.8 µg/g.

Most metals were noted to be below the CCME guidelines, noting that the observed concentrations of arsenic, cadmium, chromium, lead, and zinc were elevated. Specific details of elevated metals are as follows:

- Spring – concentrations of cadmium, chromium and zinc were observed above the CCME-ISQG limit at LL-02.
- Summer – concentrations of cadmium, chromium, and zinc were above CCME-ISQG limits at LL-02 and LL-03, in addition to concentration of lead that also exceeded the CCME-ISQG limit at LL-02.
- Fall – concentrations of arsenic, cadmium, chromium, and zinc were observed above the CCME-ISQG limit at LL-02 and LL-03.

Mills Lake

Sediment samples were collected from two stations located at the two deepest basins at Mills Lake (MIL-02 and MIL-03). The sediment sample collected in the summer was sand and silt-dominated, while the soil texture was described as loam having average grain sizes of 16% clay, 46% sand, 39% silt.

Total Organic Carbon (TOC) ranged from 81,000 mg/kg to 93,000 mg/kg with an average of 85,600 mg/kg. Nitrogen ranged from 0.67% to 0.92% with an average of 0.79%. Calculated total Kjeldahl nitrogen ranged from 6,740 µg/g to 9,210 µg/g with average of 7,874 µg/g. Both nitrate and nitrite were observed below the detection limit.

Metals were noted to be below CCME guidelines, noting that the observed concentrations of cadmium, chromium and zinc were elevated. Specific details of elevated metals are as follows:

- Spring – concentrations of cadmium and chromium were observed above CCME ISQG limits at MIL-02.
- Summer – concentrations of cadmium and chromium were observed above CCME-ISQG limits at MIL-02 and MIL-03, in addition to the concentration of lead that also exceeded the CCME-ISQG limit at MIL-03.
- Fall – concentrations of cadmium and chromium were observed above CCME-ISQG limits at MIL-02 and MIL-03, in addition to the concentration of zinc that also exceeded the CCME-ISQG limit at MIL-03.

Molar Lake

Sediment samples were collected from a station located near the deepest basin at Molar Lake (MOL-02). The sediment sample collected in the summer was silt-dominated and the sediment texture was described as silt loam having grain sizes of 19% clay, 30% sand, 51% silt.

TOC ranged from 86,000 mg/kg to 110,000 mg/kg with an average of 98,000 mg/kg. Nitrogen ranged from 0.73% to 1% with an average of 0.87%. Calculated total Kjeldahl nitrogen ranged from 7,300 µg/g to 10,300 µg/g, with average of 8,800 µg/g. Nitrate was below the detection limit, while nitrite was observed above detection limit only once in the fall resulting in 0.7 µg/g.

Most metals were noted to be below CCME guidelines, noting that the observed concentrations of chromium were found above the CCME-ISQG limit in the summer and fall at MOL-02.

Pike Lake

Sediment samples were collected from a station located at the deepest basin at Pike Lake (PL-02). Sample collected in the summer was sand dominated and the sediment texture was described as sandy loam having grain sizes of 17% clay, 69% sand, 15% silt.

Total Organic Carbon (TOC) ranged from 130,000 mg/kg to 150,000 mg/kg with an average of 143,333 mg/kg. Nitrogen ranged from 0.25% to 1.6% with an average of 1.05%. Calculated total Kjeldahl nitrogen ranged from 2,510 µg/g to 16,000 µg/g with an average of 10,503 µg/g. Both nitrate and nitrite were observed below the detection limit.

Most metals were noted to be below the CCME guidelines, noting that the observed concentrations of mercury and chromium were found to be elevated. Specific details of elevated metals are as follows:

- Spring – concentration of mercury was observed above the CCME-ISQG limit at PL-02.
- Fall – concentration of chromium was observed above the CCME-ISQG limit at PL-02.

Riordan Lake

Sediment samples were collected from the deepest lake basin at Riordan Lake (RL-02). The sediment sample collected in the summer was sand-dominated and the sediment texture was described as loamy sand having grain sizes of 5.7% clay, 87% sand, and 7.2% silt.

Total Organic Carbon (TOC) ranged from 110,000 mg/kg to 150,000 mg/kg with an average of 130,000 mg/kg. Nitrogen was 1.4% in both samples, while calculated total Kjeldahl nitrogen averaged 143,000 µg/g. Both nitrate and nitrite were observed below the detection limit.

Most metals were noted to be below CCME guidelines, noting that the observed concentration of cadmium was found above the CCME-ISQG limit in the summer.

5.6.3 Sediment Quality at Watercourses

Sediment samples were collected at twelve watercourse stations (WC-01 through WC-12). The results are presented in Appendix E in Tables E-10 through E-12. Sediment samples in the spring and summer were sand-dominated and the sediment texture at each station was described as sand, noting that variation to loamy sand texture was also observed at WC-01, WC-05, and WC-09. The grain size distribution showed that clay, sand, and silt contents ranged from <2% to 7.4%, 50% to 98%, and <2 to 42%, respectively.

Total Organic Carbon (TOC) ranged from 2,100 mg/kg to 80,000 mg/kg with an average of 14,557 mg/kg. Nitrogen ranged from <0.01 to 0.5%, while calculated total Kjeldahl nitrogen ranged from <100 to 5,020 µg/g. Both nitrate and nitrite were observed below the CCME detection limit.

Most metals were noted to be below CCME guidelines in all watercourse stations, noting that the observed concentrations of arsenic and chromium were found to be elevated. While arsenic exceeded the CCME-ISQG limit only once at WC-06, chromium exceeded the CCME-ISQG limit one time at WC-09 and three times WC-05 and WC-10. Note that all these watercourses receive flows from or discharge to Long Lake. Specific details of elevated metals are as follows:

- Spring – arsenic exceeded the CCME-ISQG limit at WC-06 (watercourse discharging to Long Lake from the southeast side); and chromium exceeded the CCME-ISQG limit at WC-05 (Waldorf River discharging to Long Lake from the south) and WC-10 (Walsh River discharging to Long Lake from the northwest).
- Summer – chromium exceeded the CCME-ISQG limit at WC-05 and WC-10.
- Fall – chromium exceeded the CCME-ISQG limit at WC-04 (watercourse discharging to Long Lake from the southwest), WC-05, WC-09 (watercourse immediately downstream of Long Lake outlet), and WC-10.

5.6.4 Sediment Quality at Rail Crossings

Sediment samples were collected at three watercourse stations near rail crossings (WC13 through WC-15). The results are presented in Appendix E in Table E-13, noting that measurements are only available for the fall field campaign.

Total Organic Carbon (TOC) ranged from 500 mg/kg to 52,000 mg/kg with an average of 23,500 mg/kg. Nitrogen ranged from <0.01 to 0.34%, while calculated total Kjeldahl nitrogen ranged from <100 to 3,360 µg/g. Both nitrate and nitrite were observed below the CCME detection limit at all sites. Metal concentrations were noted to be below the CCME guidelines at all stations.

Compared to historic sediment quality parameters reported in Stantec report (Stantec 2012), sediment quality parameters at lake and watercourse (stream) stations reported herein generally demonstrated similar characteristics, noting that sediment quality parameters in most samples were below the relevant sediment quality guidelines. A brief comparison with the parameters reported to exceed guidelines is as follows:

- Chromium and cadmium were observed above guidelines in some samples, including samples from Molar Lake and Long Lake, similar to historic reported exceedance of chromium at a watercourse draining into Molar Lake, Molar Lake and Long Lake, and cadmium at Molar Lake.
- Copper exceeded once at Daviault Lake, while in Stantec report it was reported to exceed at Molar Lake.
- In addition, some metals (arsenic, lead, mercury and zinc), that were not reported to exceed, were also observed to exceed relevant sediment quality guidelines in some samples.

5.6.5 Sediment Quality Summary

Sediment quality sampling was conducted at 23 stations (lakes and watercourses) in the Project Site. Samples were collected during three sampling events in 2023 (spring, summer, and fall). Samples were analyzed for several parameters including general chemistry, anions and nutrients, metals. The results of laboratory investigations demonstrated the following:

- Sediment samples at lakes and watercourses were generally sand-dominated, except two samples at Daviault Lake and Molar Lake, which were found to dominate with silt and clay, and showed some seasonal variations in grain sizes of clay, sand, and silt.
- Sediment samples at lakes and watercourses were below relevant sediment quality guidelines, noting that the concentrations of some metals (i.e., arsenic, cadmium, chromium, copper, lead, mercury, and zinc) were elevated at 13 locations.

6.0 KEY FINDINGS

The 2023 surface water campaign was conducted to characterize the existing surface water quality and quantity in the watersheds within the vicinity of the Kami Project. The key findings of the study are as follows:

- The climate data at Wabush Airport showed that total precipitation in 2023 was 11% below the average of the preceding 5 years and during the monitoring period (i.e., June 2023 to October 2023), August received the most precipitation and July received the least.
- Lake Column profiles investigation during 2023 showed that:
  - The pH conditions at all lake basin stations were generally near neutral.
  - Temperature profiles at each station in June 2023 (spring) were within the expected ranges.
  - Water column profiles at each of the lake basin stations in June (spring) and October (fall) of 2023 showed relatively stable electrical conductivity and dissolved oxygen with depth.
- Water level monitoring at four lake outlet stations showed that:
  - The water levels were generally observed to gradually decrease from June to August (spring to summer) and then gradually increase from August 2023 to October 2023 (summer to fall) correlating with rain events.
  - The water levels generally reported a marked response to rain events except at two lake outlets (Long Lake and Mills Lake).
- Both water level and flow monitoring at twelve (12) additional watercourses and lake outlets showed that:
  - Similar to lake outlet water levels, watercourse station water levels were generally observed to gradually decrease from June to August 2023 (spring to summer) and then gradually increase from August to October 2023 (summer to fall).
  - Flow and/or water level hydrographs at the watercourse and lake outlet stations were in correlation with rain events generating moderate to high flows.
  - Water levels at most of the watercourse stations exhibited a marked, but gradual response to major rain events, except three watercourse stations that exhibited rapid and flashy hydrologic response to precipitation events characterized by higher peaks with steep rising and falling limbs.
- Water and sediment quality investigations demonstrated that, with some exceptions, the stations located in watercourses and lakes were below the relevant water and sediment quality guidelines with few exceptions. The sediment quality results were also noted to be below CCME guidelines with few exceptions.

- Compared to historic water and sediment quality parameters reported in 2011/2012 (Stantec 2012), the parameters at lake and watercourse (stream) stations reported herein were generally in similar range and demonstrated similar characteristics. Note that the number of sampling stations and the samples collected in this study are significantly greater than the historic data reported in Stantec report (Stantec 2012); therefore, 2023 surface water campaign provides a better understanding of the baseline conditions of lakes and watercourses within the vicinity of the proposed Kami Project.

Signature Page

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https://wsponlinecan.sharepoint.com/sites/ca-kamieaca00030925894/shared documents/04_issued to client/12_project registration_final/01_appendices/appendix h_surface water baseline report/ca00030925894-r-rev0-final_surface_water_baseline_2024.docx

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APPENDIX A

Photographs

Photograph 1: unnamed stream reporting to Pike Lake; view looking south and upstream of WC-01 on August 12, 2023.

Photograph 2: WC-02 staff gauge*; view* looking *north and downstream* on *August 11*, 2023.

Photograph 3: MOL-01 staff gauge; view looking north on August 13, 2023.

Photograph 4: MOL-01 staff gauge; view looking south on August 13, 2023.

Photograph 5: Molar Lake; view looking southwest on October 22, 2023.

Photograph 6: MOL-01 staff gauge; view looking north on October 22, 2023.

Photograph 7: Daviault Lake on June 14, 2023.

Photograph 8: DL-01 water level logger on June 14, 2023.

Photograph 9: Benchmark #1 at DL-01 on June 14, 2023.

Photograph 10: Daviault Lake shore; view looking northwest on August 11, 2023.

Photograph 11: Daviault Lake Outlet; view looking north and upstream on October 14, 2023.

Photograph 12: Daviault Lake Outlet; view looking south and downstream on October 14, 2023.

Photograph 13: Long Lake; view looking south and upstream on June 8, 2023.

Photograph 14: River mouth; view looking south and downstream of Long Lake on June 8, 2023.

Photograph 15: River mouth; view looking north and upstream of Long Lake on June 8, 2023.

Photograph 16: LL-01 staff gauge facing the shore of Long Lake on June 8, 2023.

Photograph 17: Sediment sample at LL-02 on August 15, 2023.

Photograph 18: LL-01 staff gauge on October 17, 2023.

Photograph 19: MIL-01 staff gauge; view looking southwest and upstream on June 13, 2023.

Photograph 20: Shore of Mills Lake near MIL-0; view looking northwest on August 14, 2023.

Photograph 21: Mills Lake near MIL-02; view looking north on August 14, 2023.

Photograph 22: Sediment sample at MIL-02 on October 21, 2023.

Photograph 23: Mills Lake near MIL-0, view looking southeast and upstream on October 21, 2023.

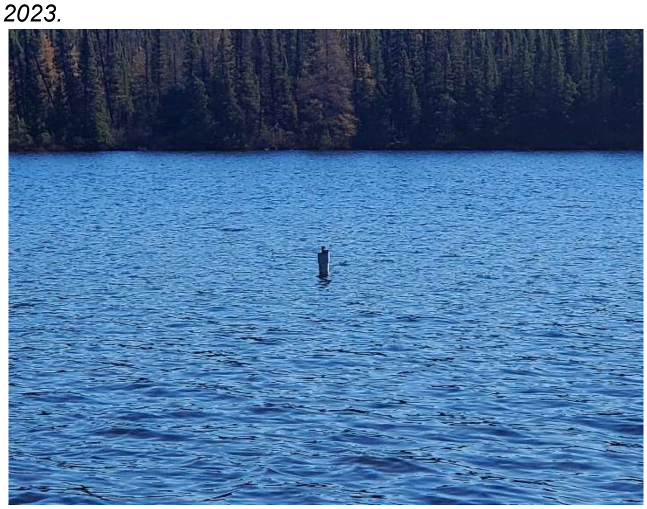
Photograph 24: Mills Lake near MIL-01; view looking northwest and downstream on October 21, 2023.

Photograph 25: PL-01 staff gauge; view looking south and upstream on June 11, 2023.

Photograph 26: Shore of Pike Lake near PL-01; view looking north and downstream on June 11, 2023.

Photograph 27: Pike Lake; view looking north on August 18, 2023.

Photograph 28: Shore of Pike Lake near PL-01; view looking west on August 18, 2023.



Photograph 29: PL-01 staff gauge; view looking upstream on October 18, 2023.

Photograph 30: Shore of Pike Lake near PL-01; view looking upstream on October 18, 2023.

Photograph 31: Shore of Riordan Lake near RL-01; view looking northwest and downstream on August 16, 2023.

Photograph 32: RL-01 staff gauge; view looking south and upstream on October 23, 2023.

Photograph 33: Riordan Lake Outlet; view looking southeast and upstream on October 23, 2023.

Photograph 34: Riordan Lake Outlet; view looking northwest and downstream on October 23, 2023.

Photograph 35: unnamed stream 25 m downstream of Riordan Lake Outlet; view looking southeast and upstream on October 23, 2023.

Photograph 36: unnamed stream 25 m downstream of Riordan Lake Outlet; view looking northwest and downstream on October 23, 2023.

Photograph 37 : unnamed stream reporting to Pike Lake; view looking north and downstream of WC-01 on June 12, 2023

Photograph 38: WC-01 staff gauge looking east on June 12, 2023.

Photograph 39: WC-01 staff gauge; view looking west on August 12, 2023.

Photograph 40: Flow survey set-up near WC-01; view looking west on October 19, 2023.

Photograph 41: unnamed stream 25 m downstream of WC-01; view looking north and downstream on October 19, 2023

Photograph 42: WC-02 staff gauge; view looking south and upstream on June 12, 2023.

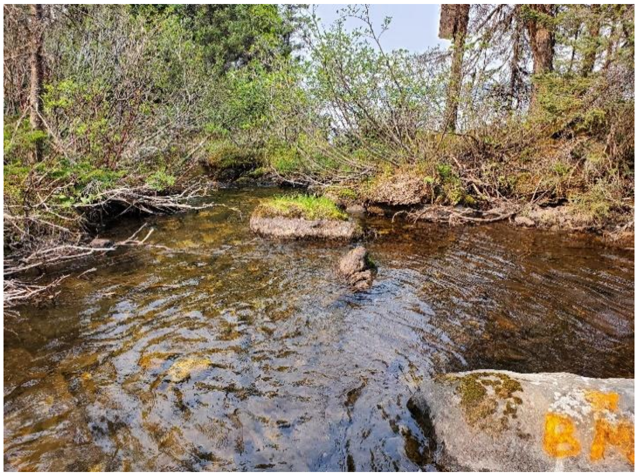
Photograph 43: unnamed stream downstream of Pike Lake Outlet; looking north and downstream of WC-02 on June 12, 2023.

Photograph 44: WC-02; view looking south and downstream of the second beaver dam, on October 18, 2023.

Photograph 45: Two beaver dams; view looking south and upstream of WC-02 on October 18, 2023.

Photograph 46: Substrate at WC-02 on October 18, 2023

Photograph 47: WC-03 staff gauge and benchmark #1; view looking west and upstream on June 13, 2023.



Photograph 48: unnamed stream and benchmark #2; view looking east and downstream of WC-03 on June 13, 2023.

Photograph 49: Cross section of unnamed stream; view looking west and upstream of WC-03 on August 14, 2023.

Photograph 50: unnamed stream 21 m downstream of WC-03; view looking south and downstream on October 20, 2023

Photograph 51: unnamed stream discharging to Mills Lake; view looking east and downstream on October 20, 2023.

Photograph 52: Cross section of unnamed stream discharging to Mills Lake; view looking south on October 20, 2023.

Photograph 53: WC-04 staff gauge, view looking southwest and upstream on June 13, 2023.

Photograph 54: unnamed stream; view looking east and downstream of WC-04 on June 13, 2023.

Photograph 55: unnamed stream and WC-04 staff gauge; view looking west on August 14, 2023.

Photograph 56: unnamed stream; view looking east and downstream of WC-04 on October 21, 2023.

Photograph 57: Left downstream bank of unnamed stream 25 m downstream of WC-04; view looking north on October 21, 2023.

Photograph 58: WC-05 staff gauge; view looking west on June 10, 2023.

Photograph 59: Waldorf River; view looking south and upstream of WC-05 on August 10, 2023.

Photograph 60: Waldorf River; view looking south and upstream on October 13, 2023.

Photograph 61: Waldorf River; view looking north and downstream of WC-05 on October 13, 2023.

Photograph 62 : Beaver dam 200 m upstream of WC-05, view looking west on October 13, 2023.

Photograph 63: Waldorf River, view looking south and upstream of WC-05 on October 13, 2023.

Photograph 64 : WC-06 staff gauge; view looking south and upstream on June 10, 2023.

Photograph 65: unnamed stream discharging to Long Lake; view looking north and downstream of WC-06 on June 10, 2023.

Photograph 66: unnamed stream discharging to Long Lake; view looking north and downstream of WC-06 on August 10, 2023.

Photograph 67: unnamed stream discharging to Long Lake; view looking south and upstream of WC-06 on October 16, 2023.

Photograph 68: WC-07 staff gauge; view looking southeast and downstream on June 9, 2023.

Photograph 69: unnamed stream discharging to Long Lake; view looking northwest and downstream of WC-07 on June 9, 2023.

Photograph 70: WC-07 staff gauge; view looking southeast and downstream on August 10, 2023.

Photograph 71: unnamed stream 25 m downstream of WC-07 discharging to Long Lake; view looking east on August 10, 2023.

Photograph 72: unnamed stream 25 m downstream of WC-07 discharging to Long Lake; view looking east on October 16, 2023.

Photograph 73: unnamed stream discharging to Long Lake; view looking northwest on October 16, 2023.

Photograph 74: unnamed stream; view looking east and upstream of WC-08 on June 9, 2023

Photograph 75: unnamed stream; view looking west and downstream of WC-08 on June 9, 2023.

Photograph 76: unnamed stream; view looking west and downstream of WC-08 on August 10, 2023.

Photograph 77: unnamed stream 20 m downstream of WC-08 and discharging to Long Lake; view looking east and upstream on October 17, 2023.

Photograph 78: unnamed stream 20 m downstream of WC-08 and discharging to Long Lake; view looking west and downstream on October 17, 2023.

Photograph 79: WC-09 staff gauge; view looking east on June 8, 2023.

Photograph 80: unnamed stream immediately downstream of Long Lake Outlet; view looking south and upstream of WC-09 on August 15, 2023.

Photograph 81: unnamed stream immediately downstream of Long Lake Outlet; view looking north and downstream of WC-09 on August 15, 2023.

Photograph 82: WC-09 staff gauge; view looking east on October 17, 2023.

Photograph 83: WC-10 staff gauge; view looking north on June 7, 2023.

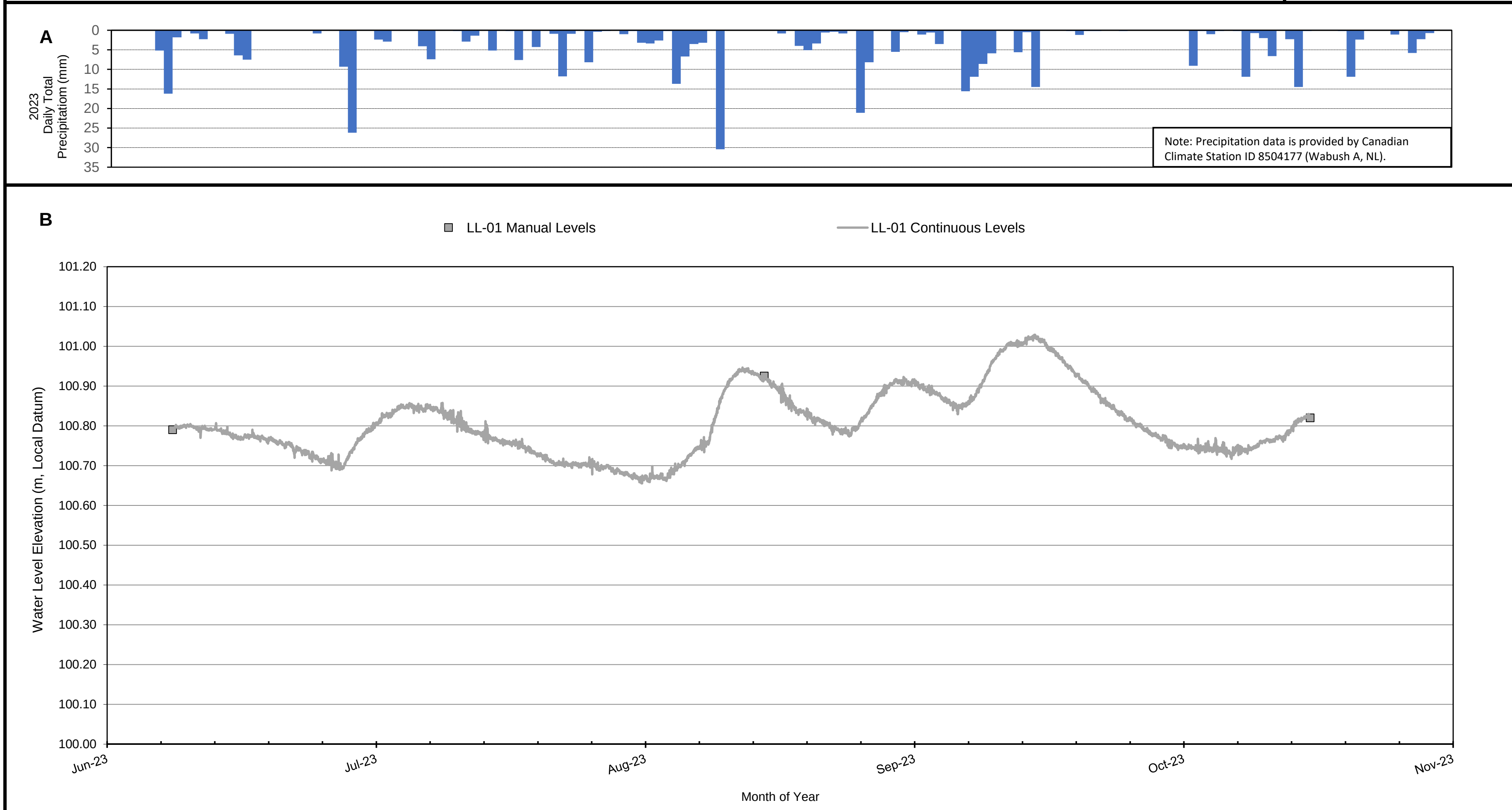
Photograph 84: Walsh River; view looking southeast and downstream of WC-10 on August 16, 2023.

APPENDIX B

Hydrographs

2023 Continuous Water Level Monitoring at LL-01

FIGURE B-1



A. Daily Rainfall **B.** Continuous Water Levels and Flows at LL-01

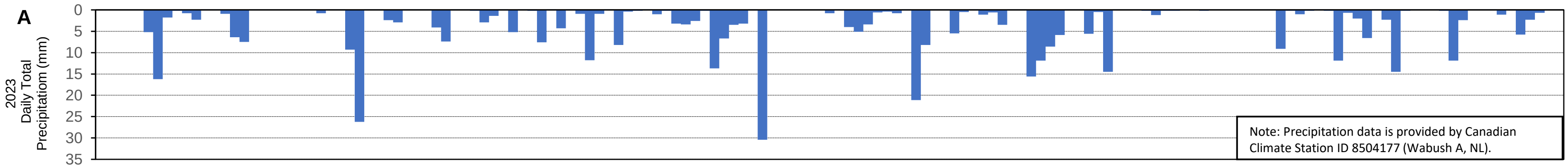
PROJECT: CA0003092.5894 (500)

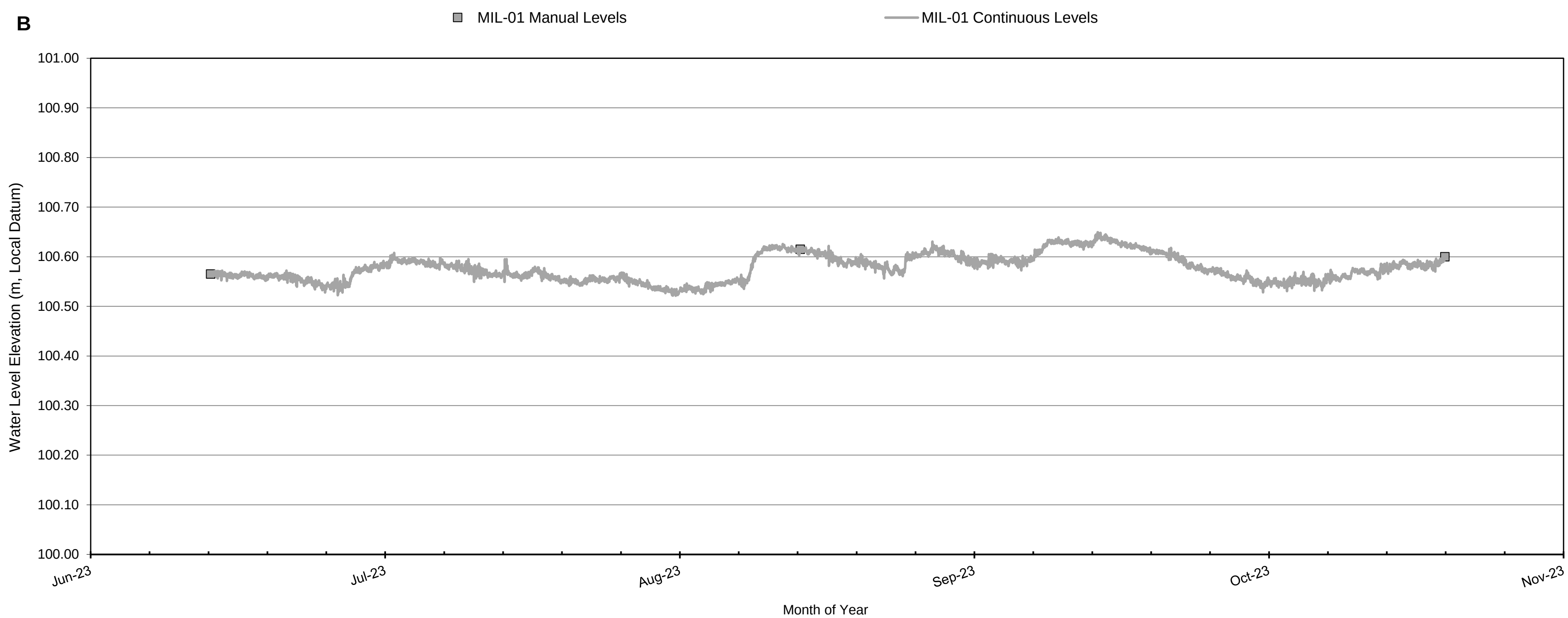
DATE: February 2024

DRAWN: SPC

CHECK: CDV

2023 Continuous Water Level Monitoring at MIL-01	FIGURE B-2



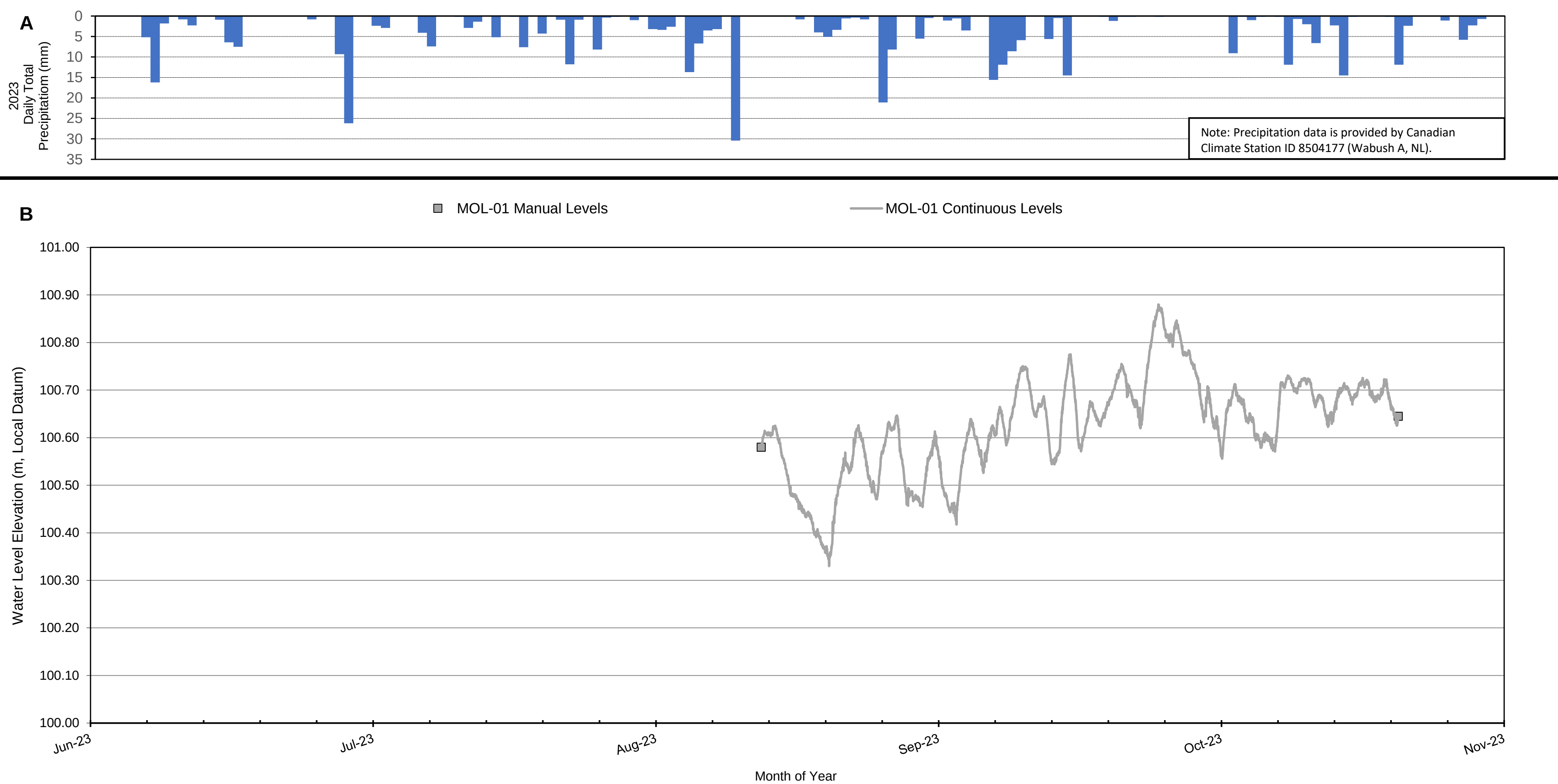


A. Daily Rainfall **B.** Continuous Water Levels and Flows at MIL-01

PROJECT: CA0003092.5894 (500)
DATE: February 2024

DRAWN: SPC
CHECK: CDV

2023 Continuous Water Level Monitoring at MOL-01	FIGURE B-3

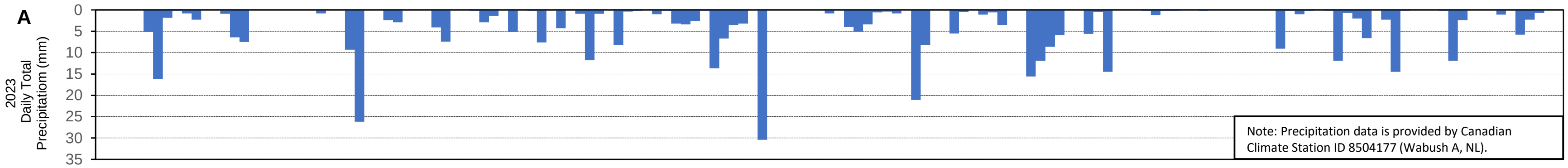


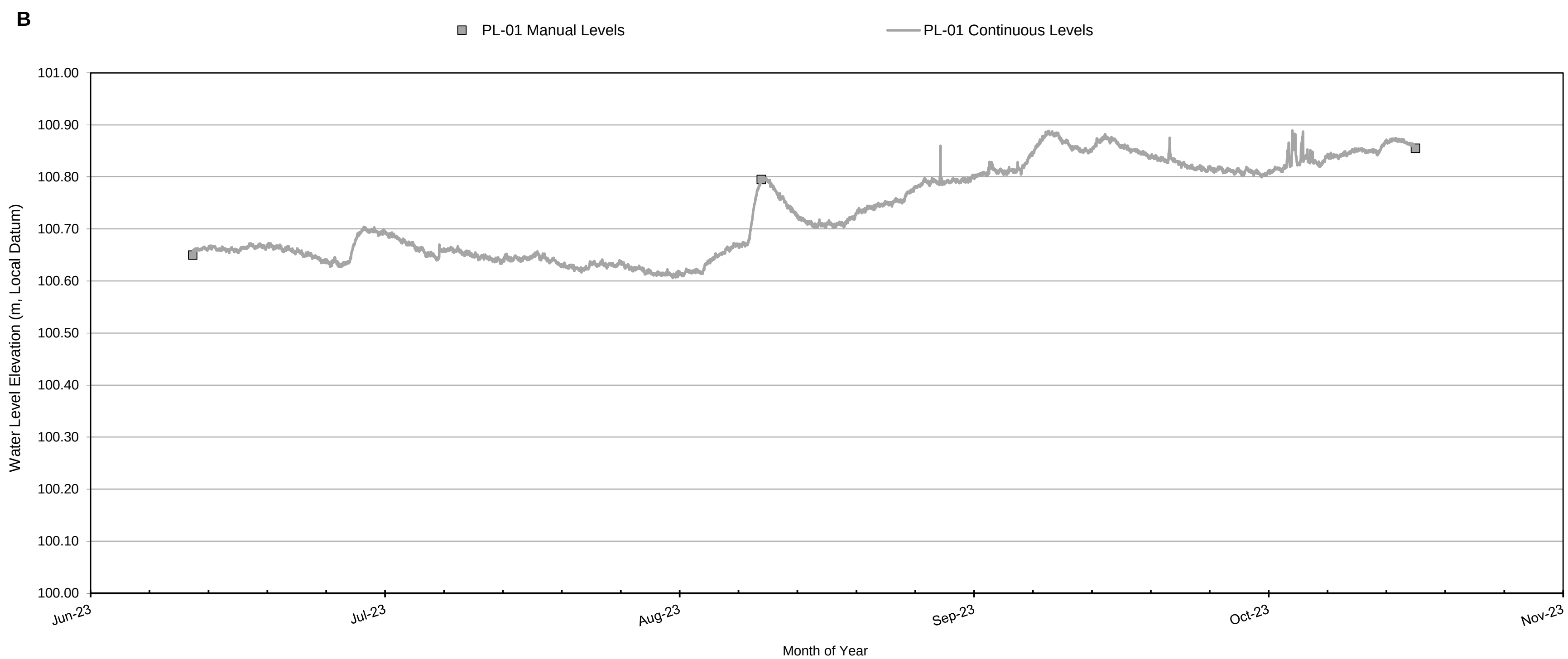
A. Daily Rainfall **B.** Continuous Water Levels and Flows at MOL-01

PROJECT: CA0003092.5894 (500)
DATE: February 2024

DRAWN: SPC
CHECK: CDV

2023 Continuous Water Level Monitoring at PL-01	FIGURE B-4





A. Daily Rainfall **B.** Continuous Water Levels and Flows at PL-01

PROJECT: CA0003092.5894 (500)

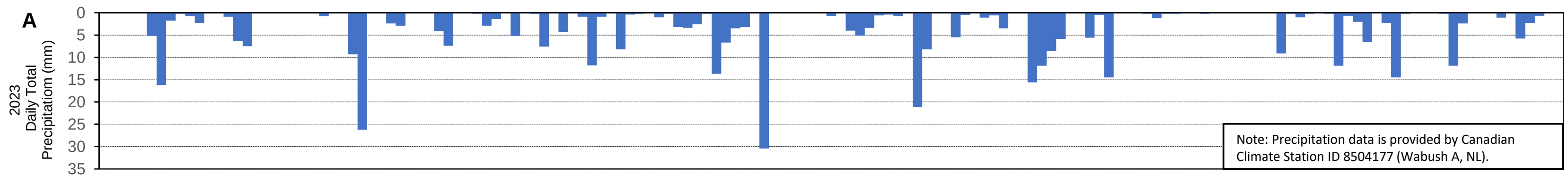
DATE: February 2024

DRAWN: SPC

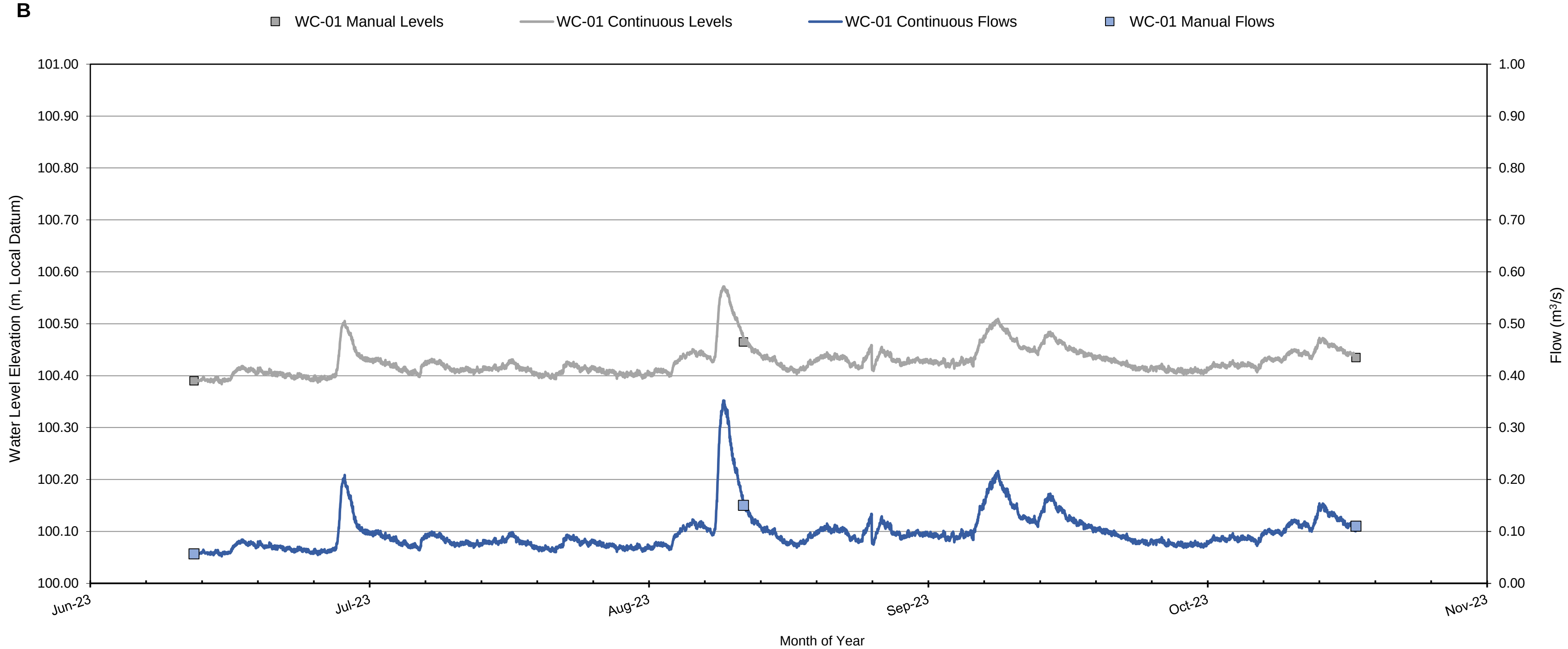
CHECK: CDV

2023 Continuous Water Level and Flow Monitoring at WC-01	FIGURE B-5

A



B

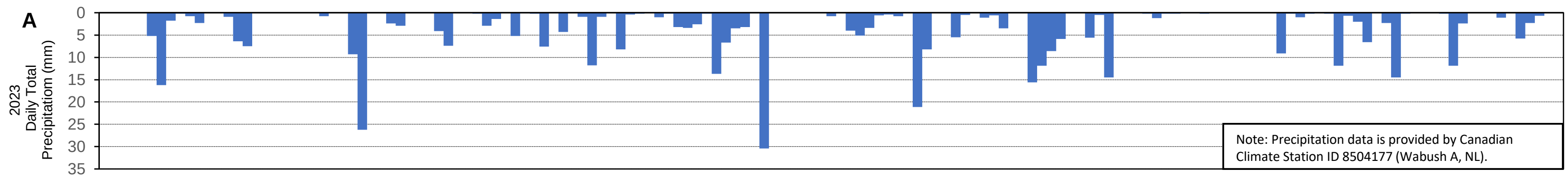


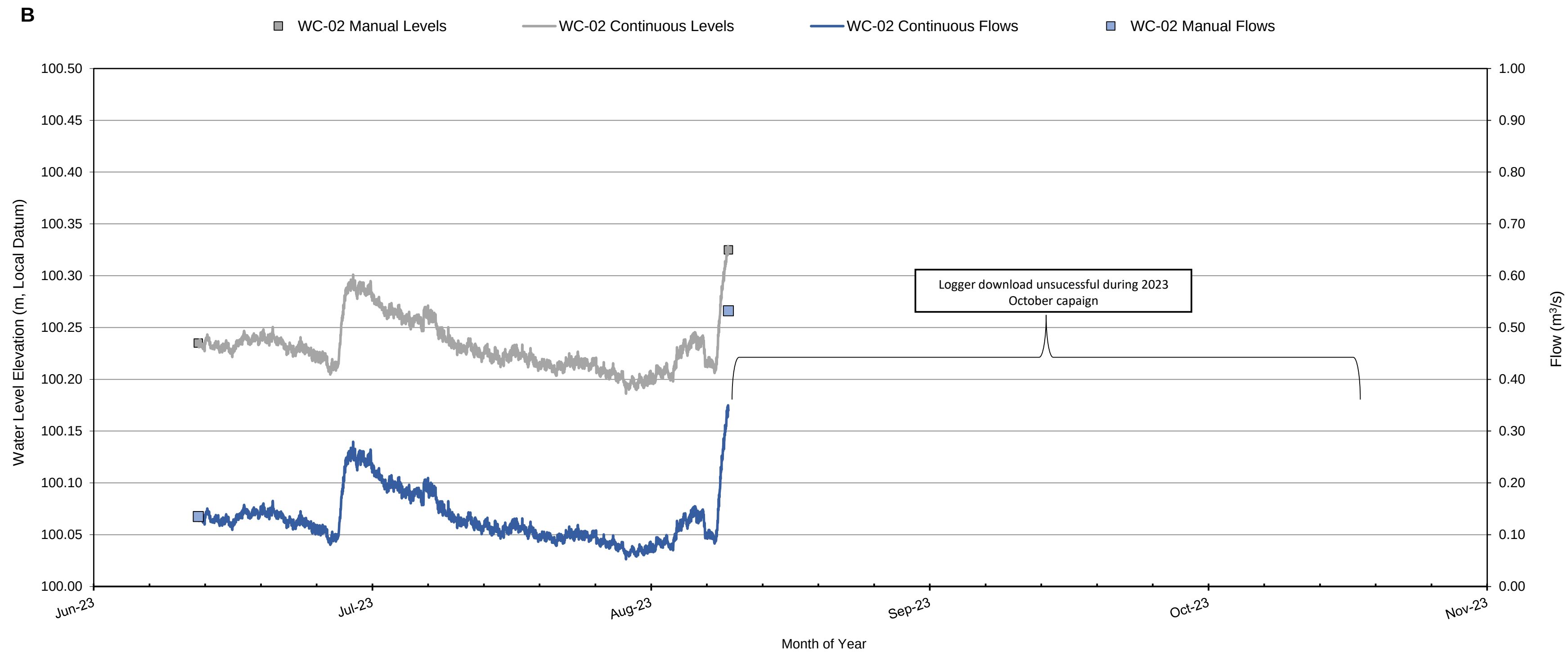
A. Daily Rainfall **B.** Continuous Water Levels and Flows at WC-01

PROJECT: CA0003092.5894 (500)
DATE: February 2024

DRAWN: SPC
CHECK: CDV

2023 Continuous Water Level and Flow Monitoring at WC-02	FIGURE B-6





A. Daily Rainfall **B.** Continuous Water Levels and Flows at WC-02

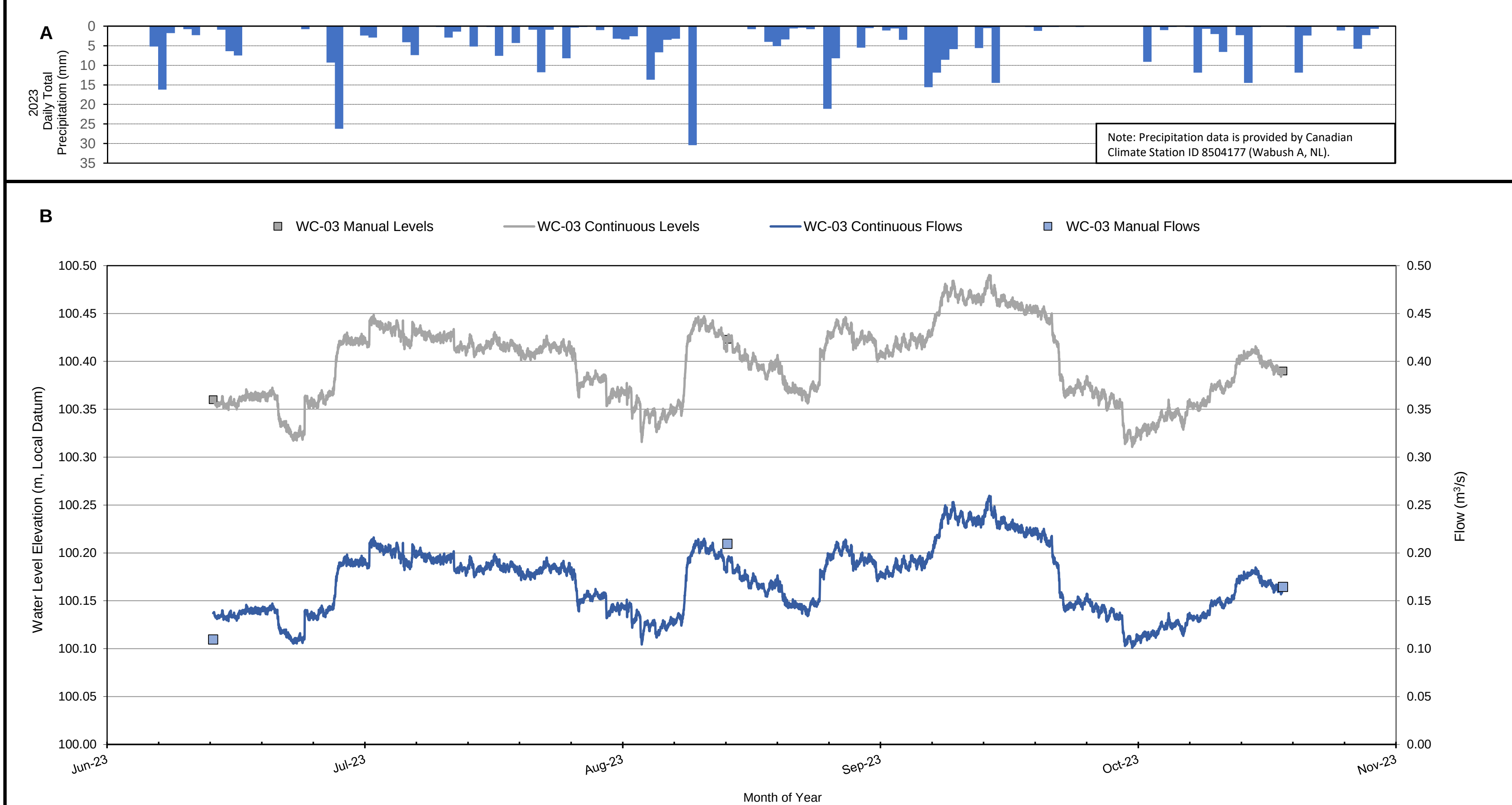
PROJECT: CA0003092.5894 (500)

DATE: February 2024

DRAWN: SPC

CHECK: CDV

2023 Continuous Water Level and Flow Monitoring at WC-03	FIGURE B-7

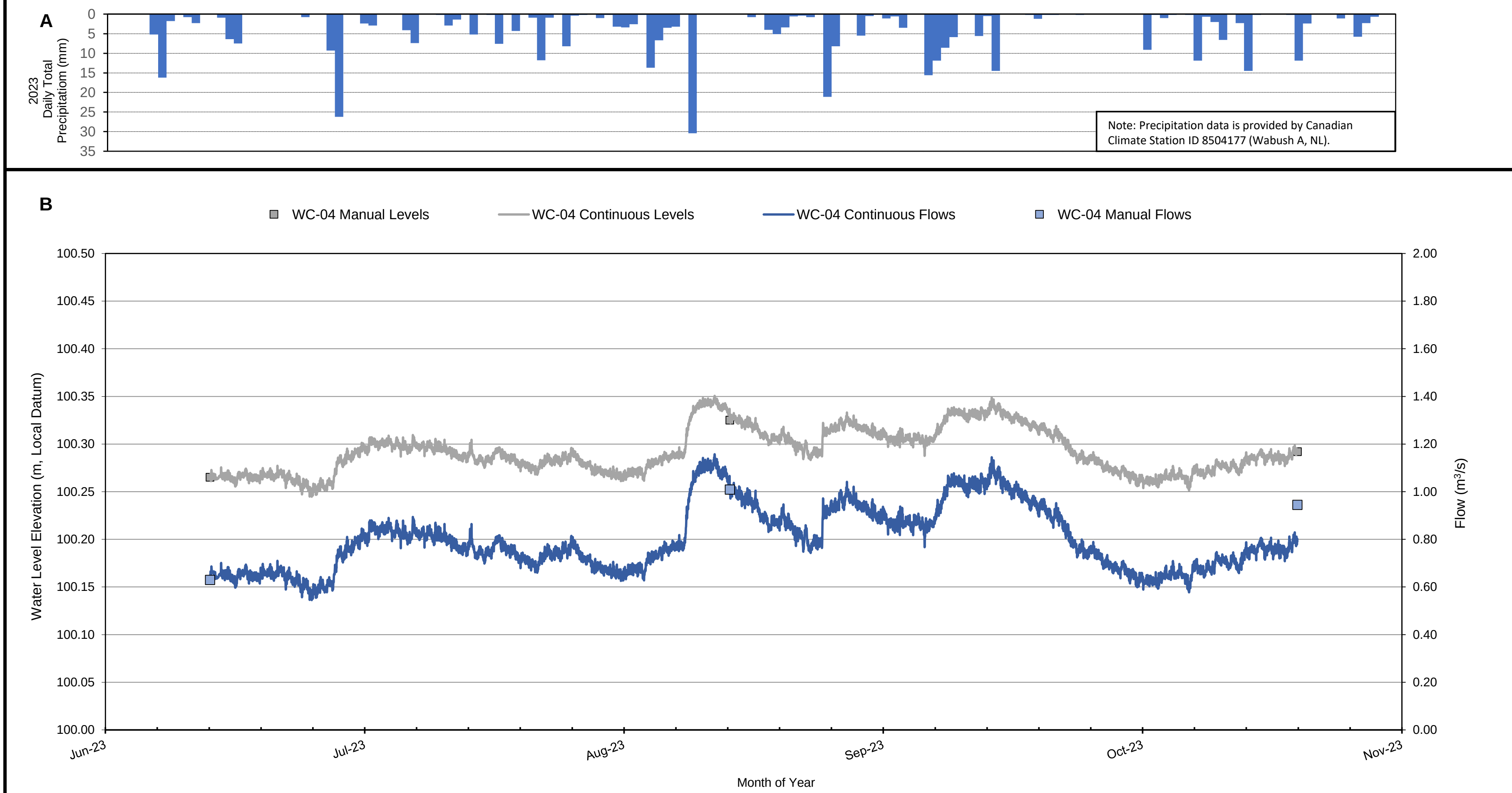


A. Daily Rainfall **B.** Continuous Water Levels and Flows at WC-03

PROJECT: CA0003092.5894 (500)
DATE: February 2024

DRAWN: SPC
CHECK: CDV

2023 Continuous Water Level and Flow Monitoring at WC-04	FIGURE B-8

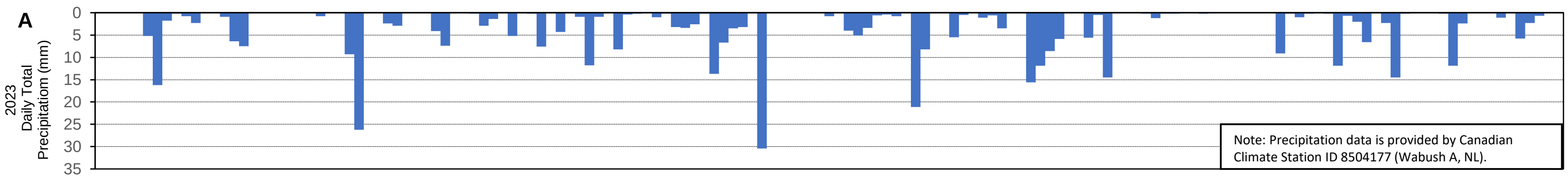


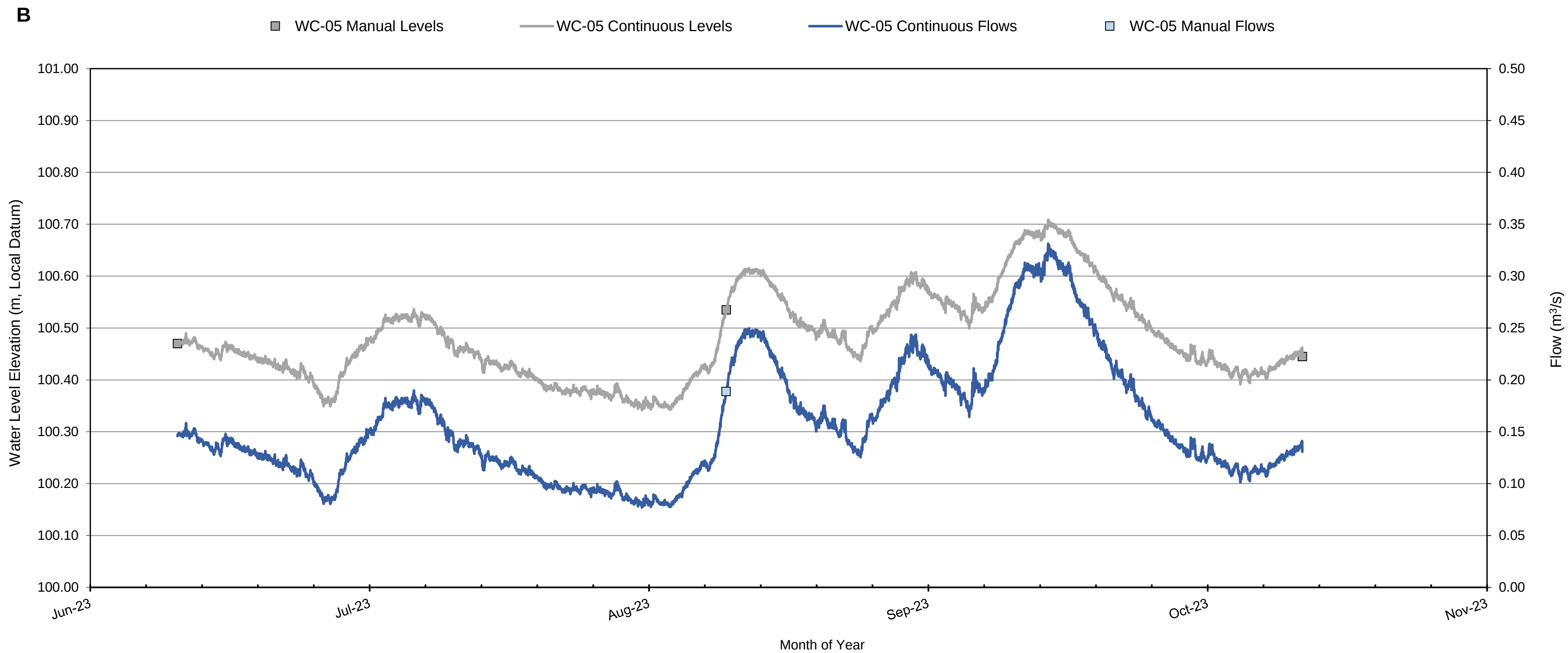
A. Daily Rainfall **B.** Continuous Water Levels and Flows at WC-04

PROJECT: CA0003092.5894 (500)
DATE: February 2024

DRAWN: SPC
CHECK: CDV

2023 Continuous Water Level and Flow Monitoring at WC-05	FIGURE B-9



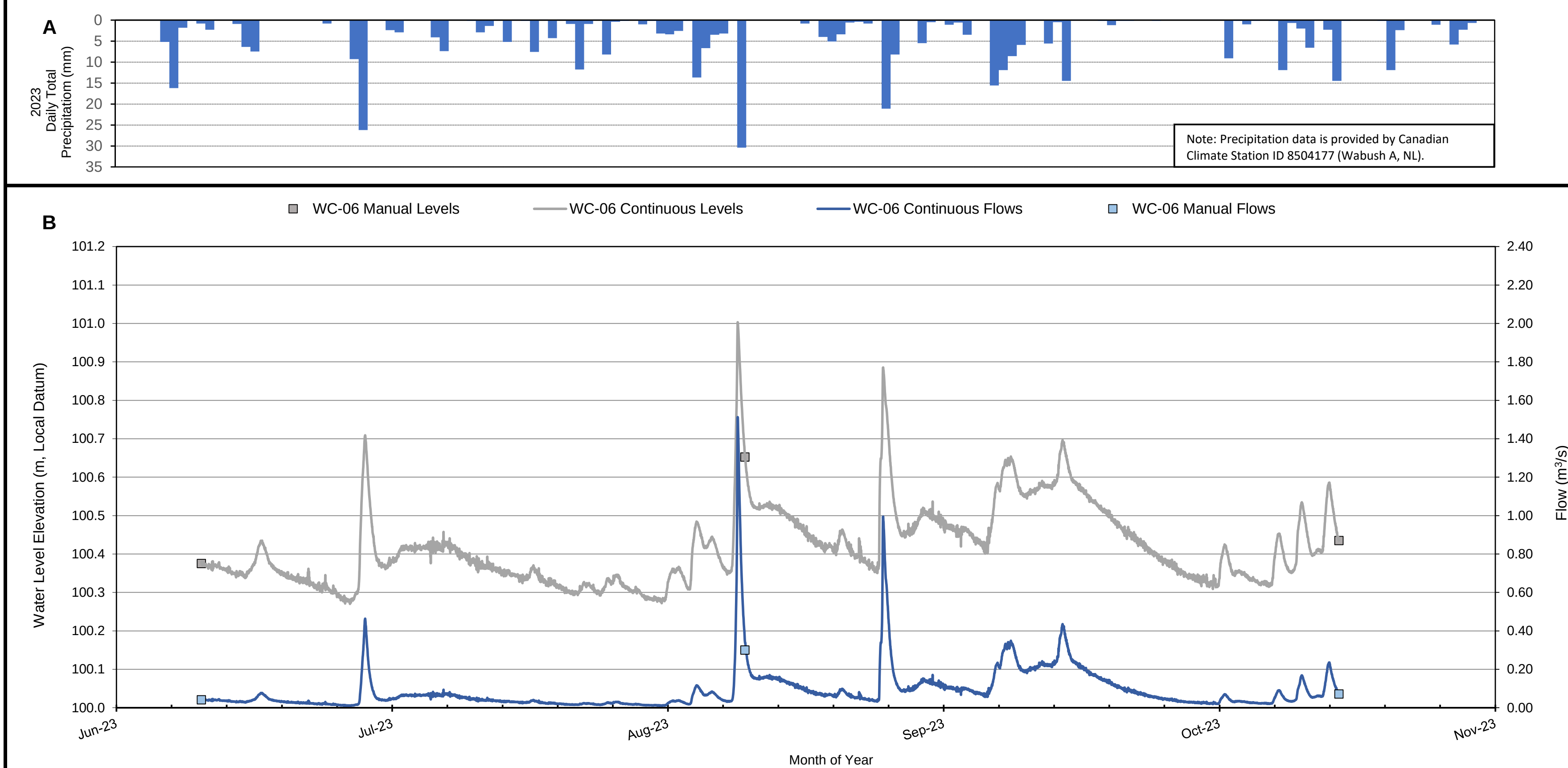


A. Daily Rainfall **B.** Continuous Water Levels and Flows at WC-05

PROJECT: CA0003092.5894 (500)
DATE: February 2024

DRAWN: SPC
CHECK: CDV

2023 Continuous Water Level and Flow Monitoring at WC-06	FIGURE B-10

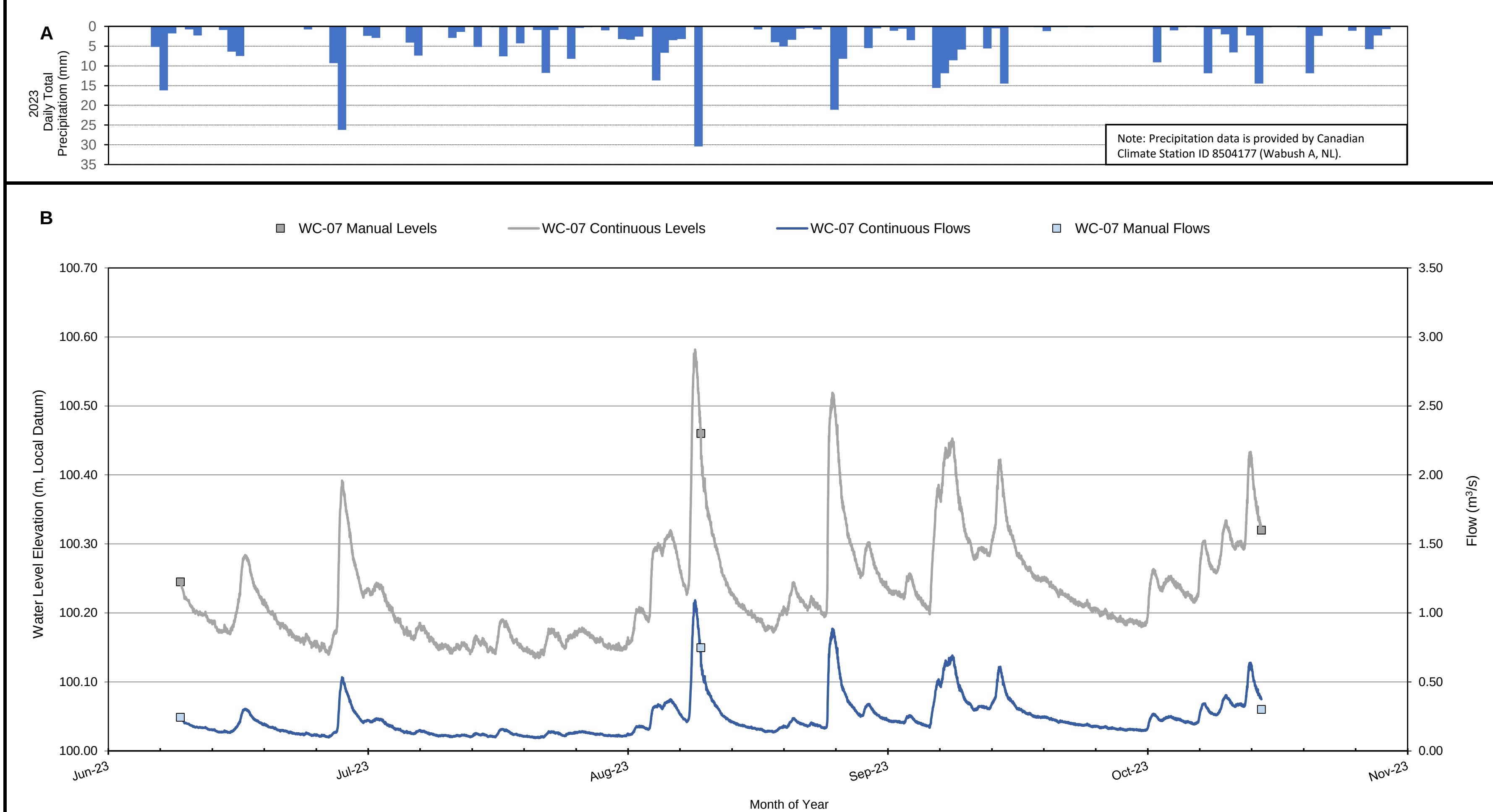


A. Daily Rainfall **B.** Continuous Water Levels and Flows at WC-06

PROJECT: CA0003092.5894 (500)
DATE: February2024

DRAWN: SPC
CHECK: CDV

2023 Continuous Water Level and Flow Monitoring at WC-07	FIGURE B-11



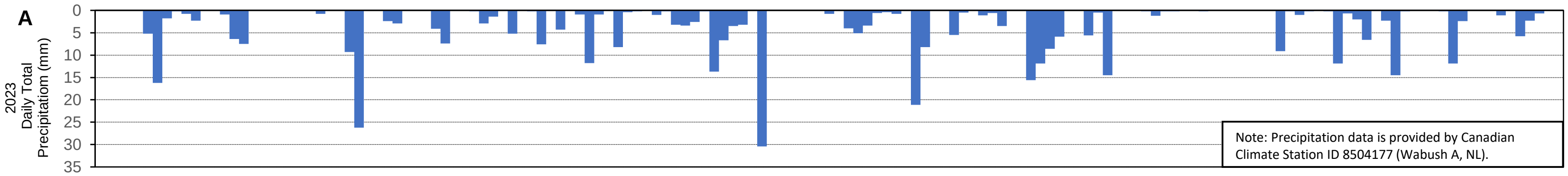
A. Daily Rainfall **B.** Continuous Water Levels and Flows at WC-07

PROJECT: CA0003092.5894 (500)
DATE: February 2024

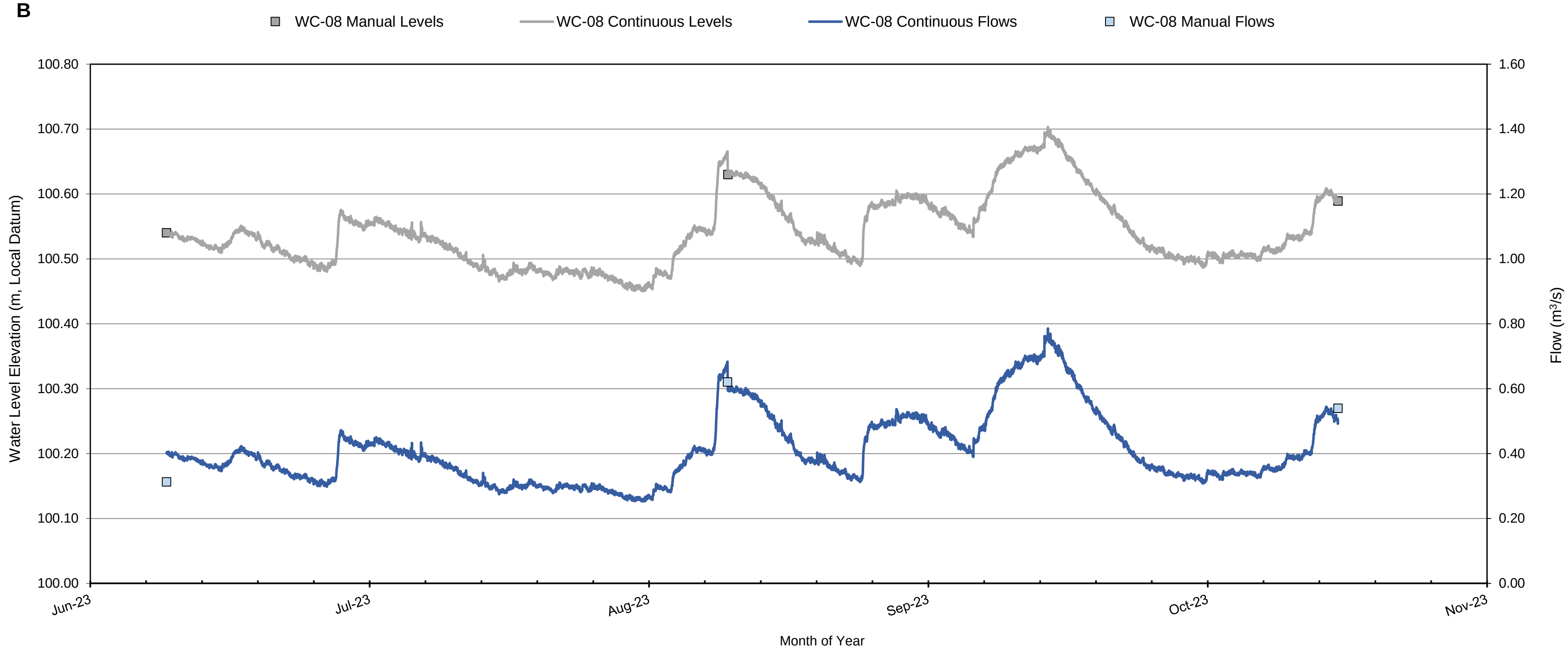
DRAWN: SPC
CHECK: CDV

2023 Continuous Water Level and Flow Monitoring at WC-08	FIGURE B-12

A



B



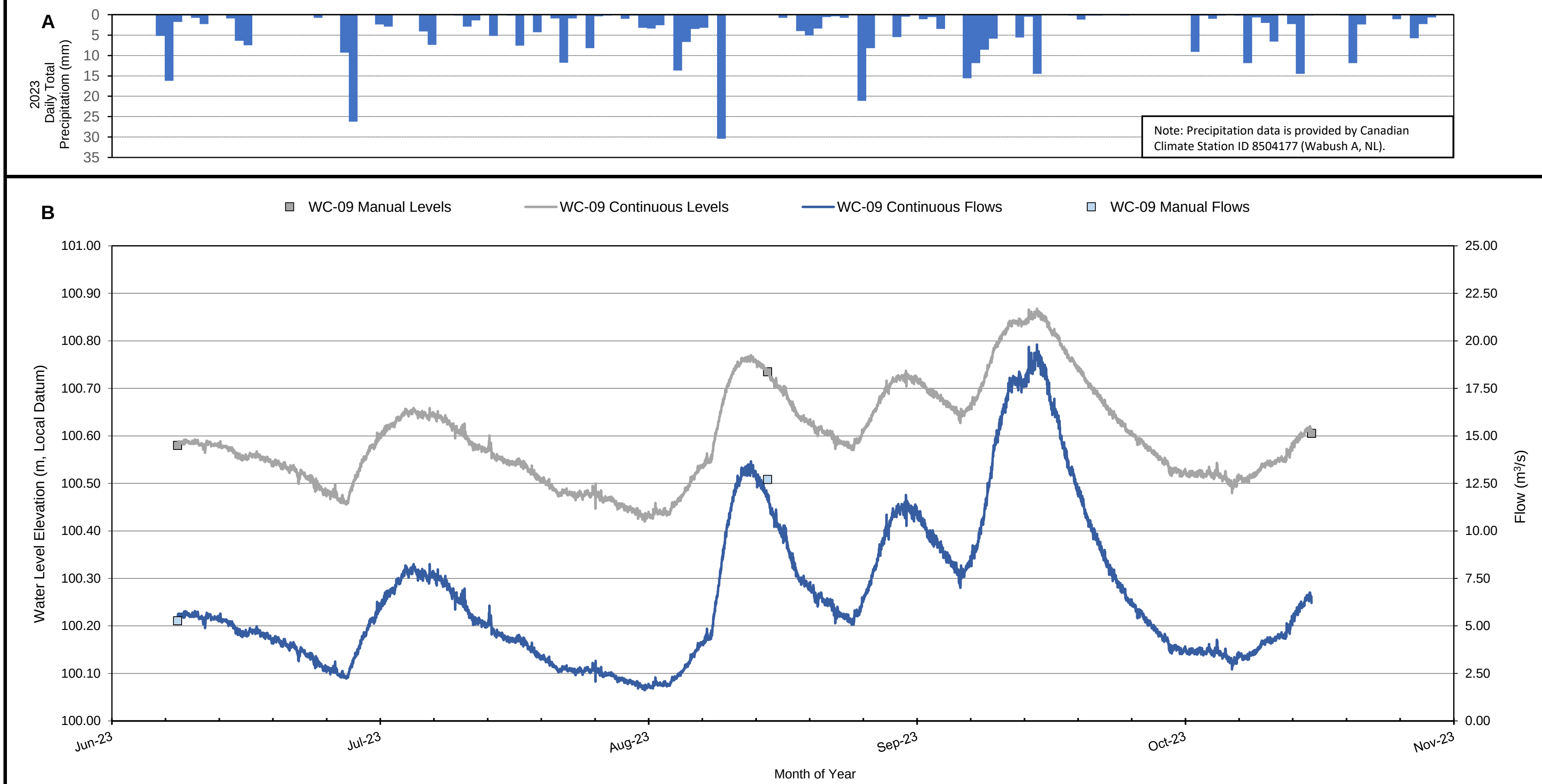
A. Daily Rainfall **B.** Continuous Water Levels and Flows at WC-08

PROJECT: CA0003092.5894 (500)
DATE: February 2024

DRAWN: SPC
CHECK: CDV

2023 Continuous Water Level and Flow Monitoring at WC-09

FIGURE B-13



A. Daily Rainfall **B.** Continuous Water Levels and Flows at WC-09

PROJECT: CA0003092.5894 (500)

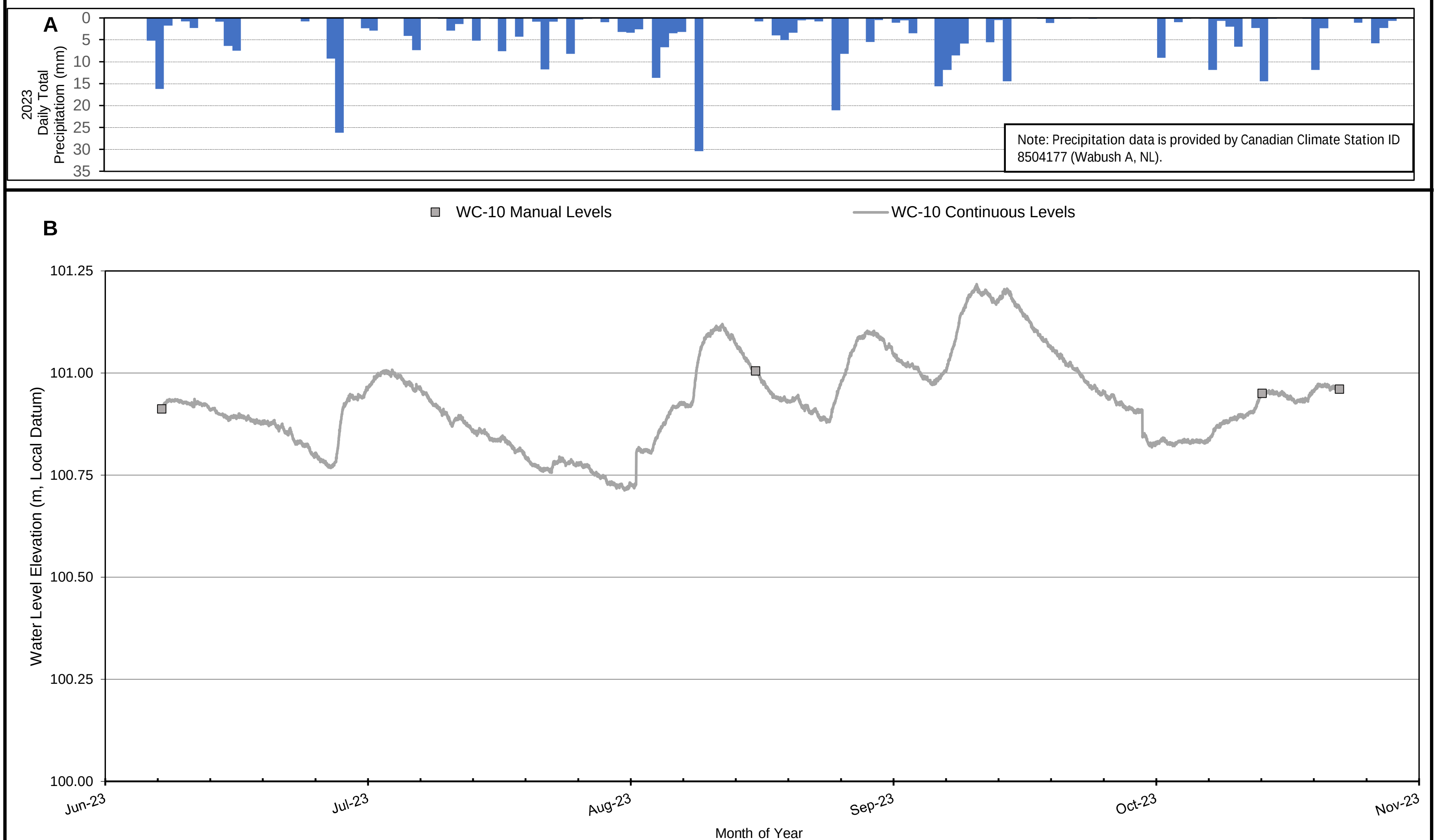
DATE: February 2024

DRAWN: SPC

CHECK: CDV

2023 Continuous Water Level Monitoring at WC-10

FIGURE B-14



A. Daily Rainfall **B.** Continuous Water Levels at WC-10

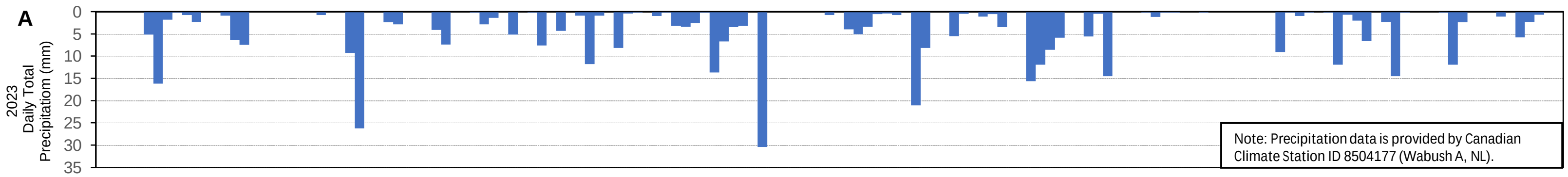
PROJECT: CA0003092.5894 (500)

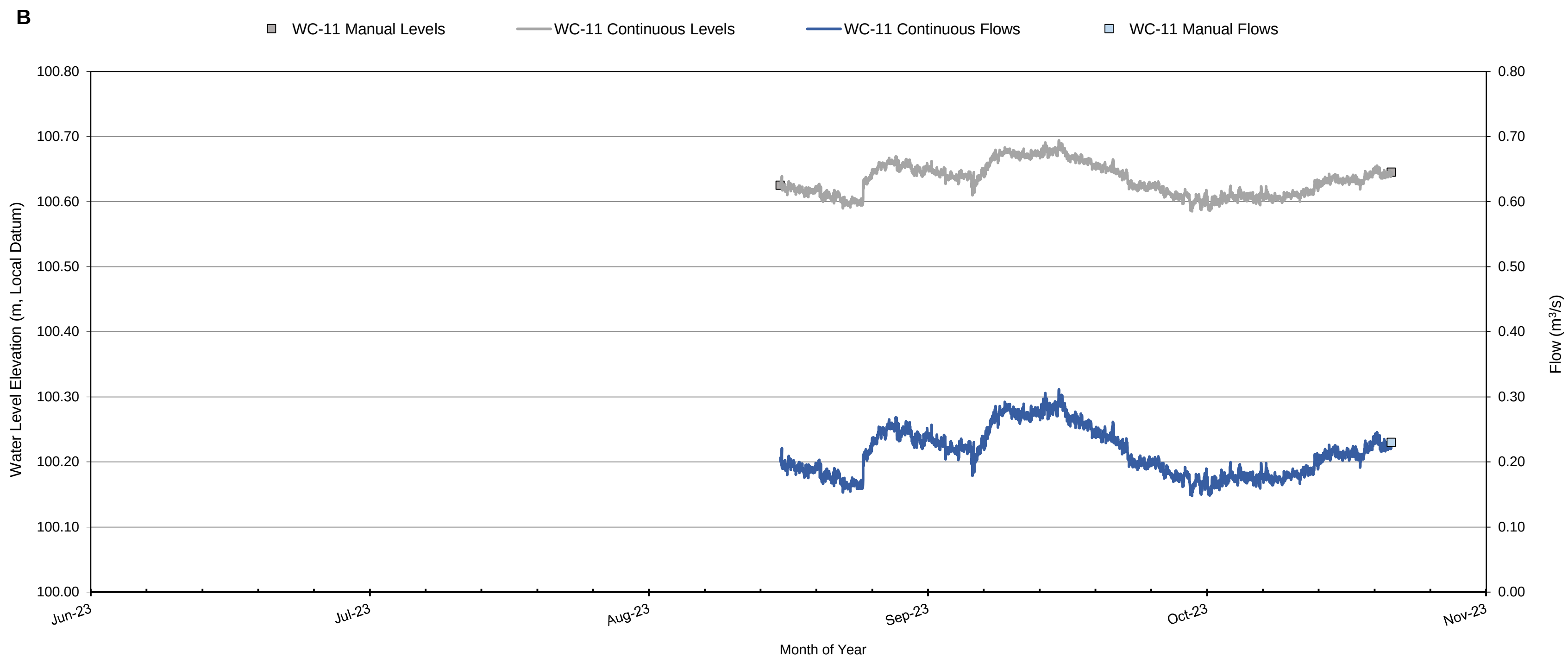
DATE: February 2024

DRAWN: SPC

CHECK: CDV

2023 Continuous Water Level and Flow Monitoring at WC-11	FIGURE B-15

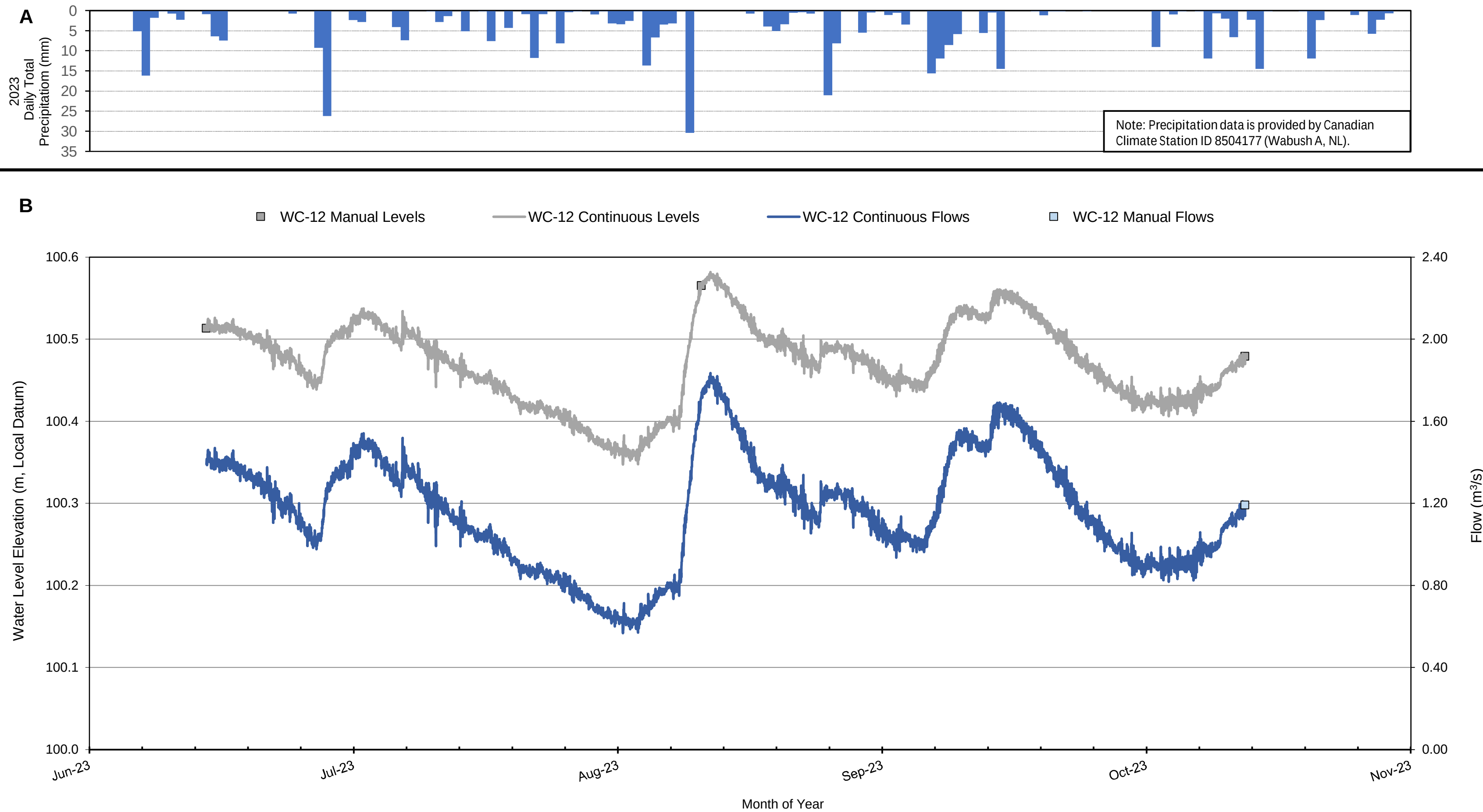




A. Daily Rainfall **B.** Continuous Water Levels and Flows at WC-11

PROJECT: CA0003092.5894 (500)		**DRAWN:** SPC
DATE: February 2024		**CHECK:** CDV

2023 Continuous Water Level and Flow Monitoring at WC-12	FIGURE B-16



A. Daily Rainfall **B.** Continuous Water Levels and Flows at WC-12

PROJECT: CA0003092.5894 (500)

DATE: February 2024

DRAWN: SPC

CHECK: CDV

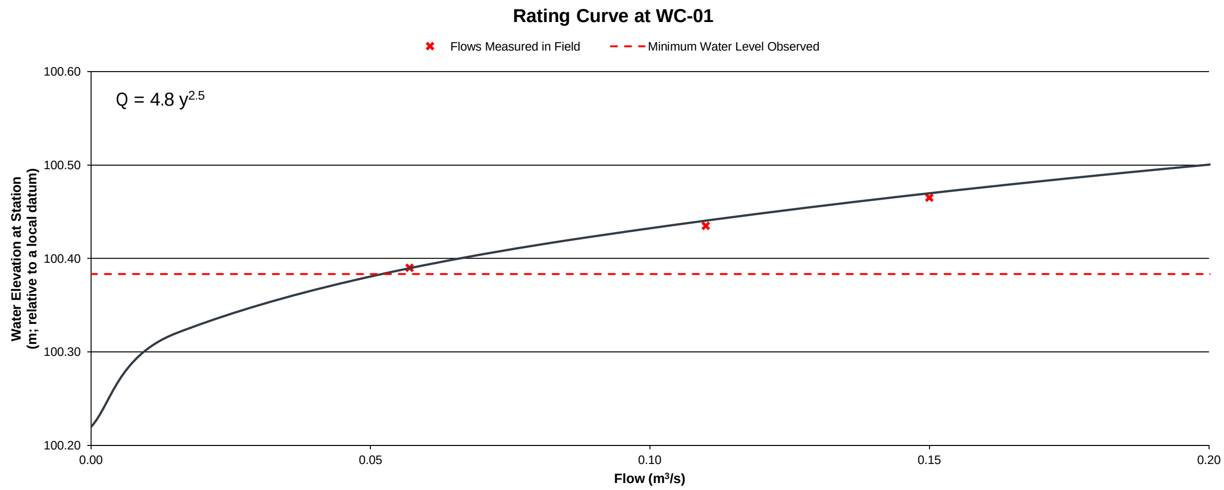
APPENDIX C

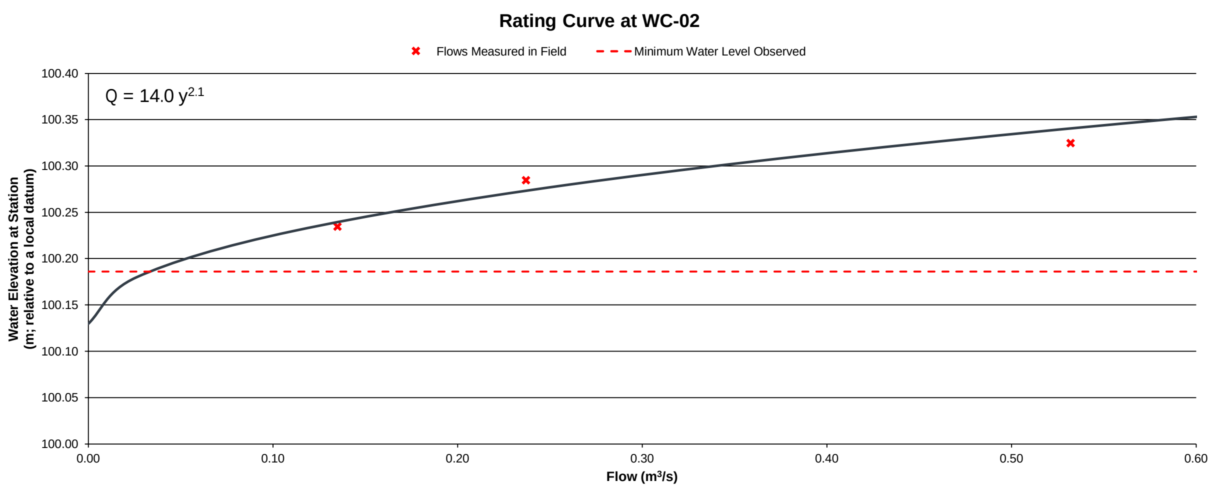
Stage-Discharge Rating Curves

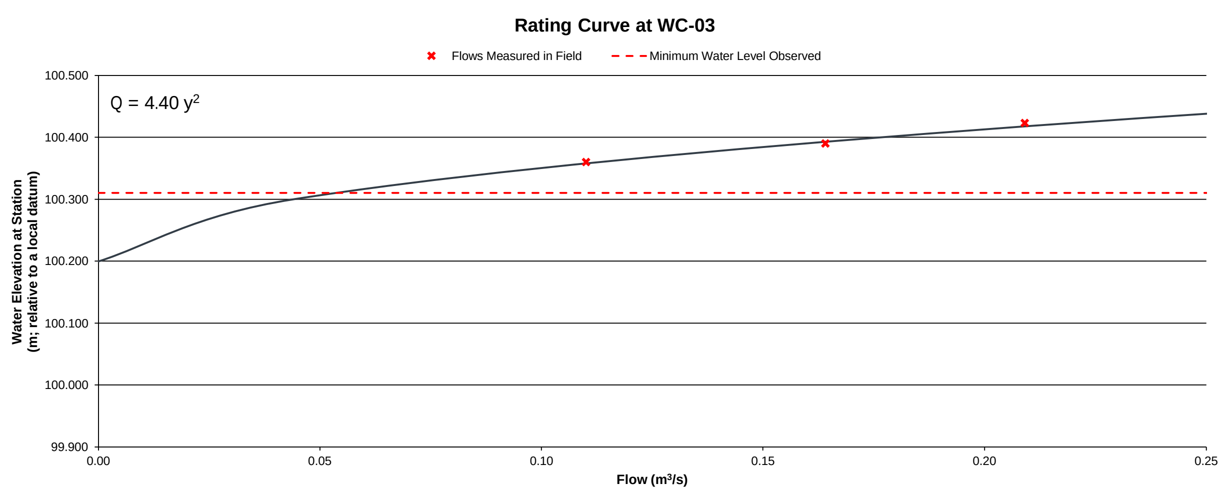
Table C-1: 2023 Stage-Discharge Rating Curve Equations

Station ID	Stage-Discharge Rating Curve Equation	Rating Curve Offset Y_o (masl)
WC-01	$Q = 4.8y^{2.5}$	100.220
WC-02	$Q = 14.0y^{2.1}$	100.130
WC-03	$Q = 4.40y^{2}$	100.200
WC-04	$Q = 17.50y^{1.9}$	100.090
WC-05	$Q = 0.660y^{2}$	100.000
WC-06	$Q = 2.053y^{3}$	100.100
WC-07	$Q = 2.735y^{2}$	99.950
WC-08	$Q = 7.50y^{2.2}$	100.300
WC-11	$Q = 2.556y^{2}$	100.345
WC-12	$Q = 6.563y^{2}$	100.053

2023 Stage-Discharge Rating Curves at WC-01, WC-02 and WC-03	FIGURE C-1





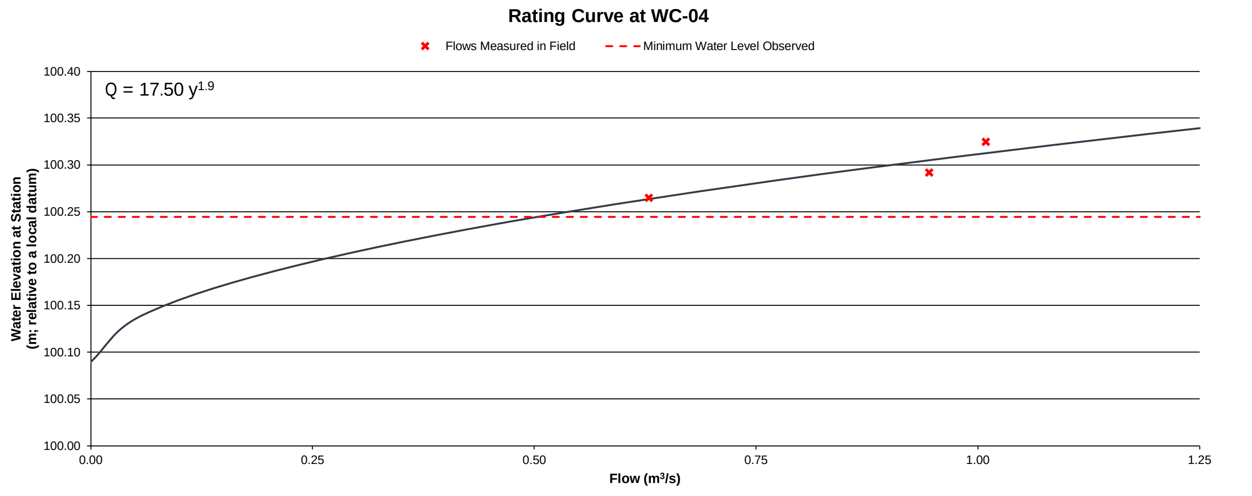


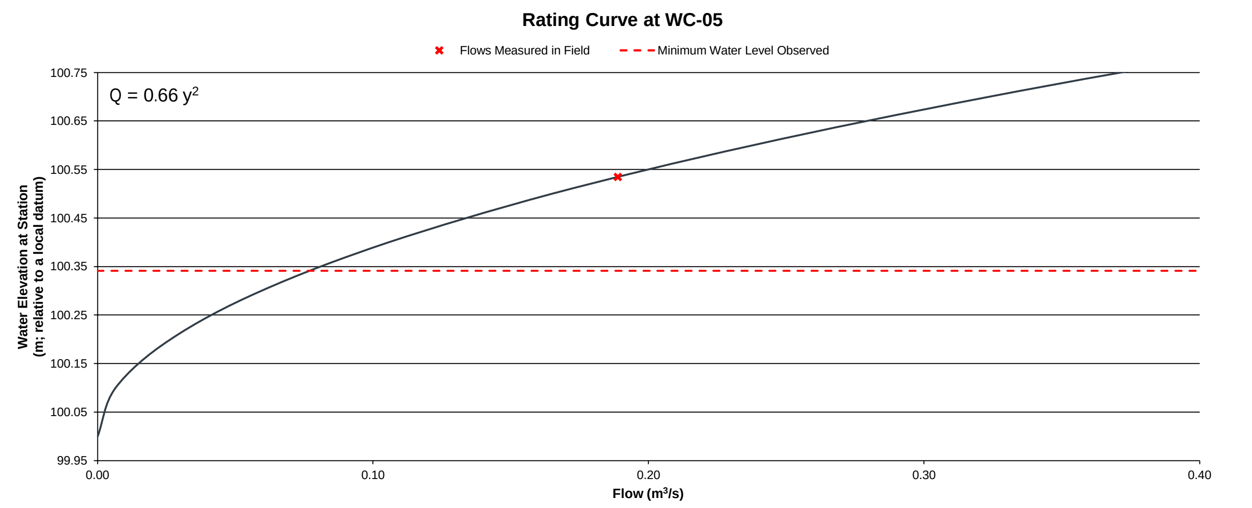
PROJECT NO: CA0003092.5894 (500)
DATE: Feburary 2024

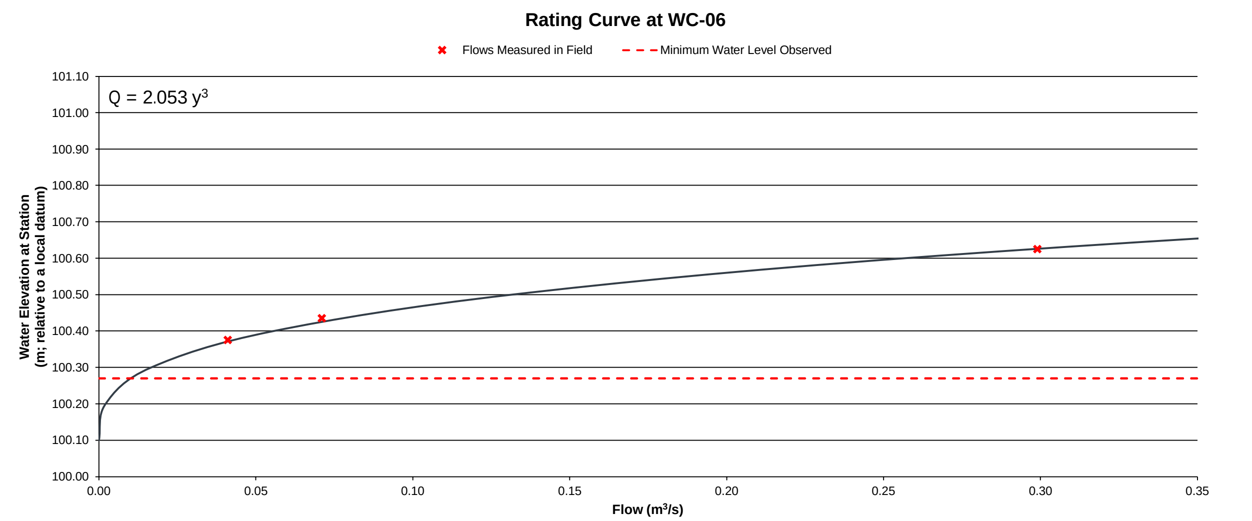
DRAWN: SPC
CHECK: CDV

Note: Rating curves with fewer than three measured points are reported with a lower confidence.

2023 Stage-Discharge Rating Curves at WC-04, WC-05 and WC-06	FIGURE C-2







PROJECT NO: CA0003092.5894 (500)

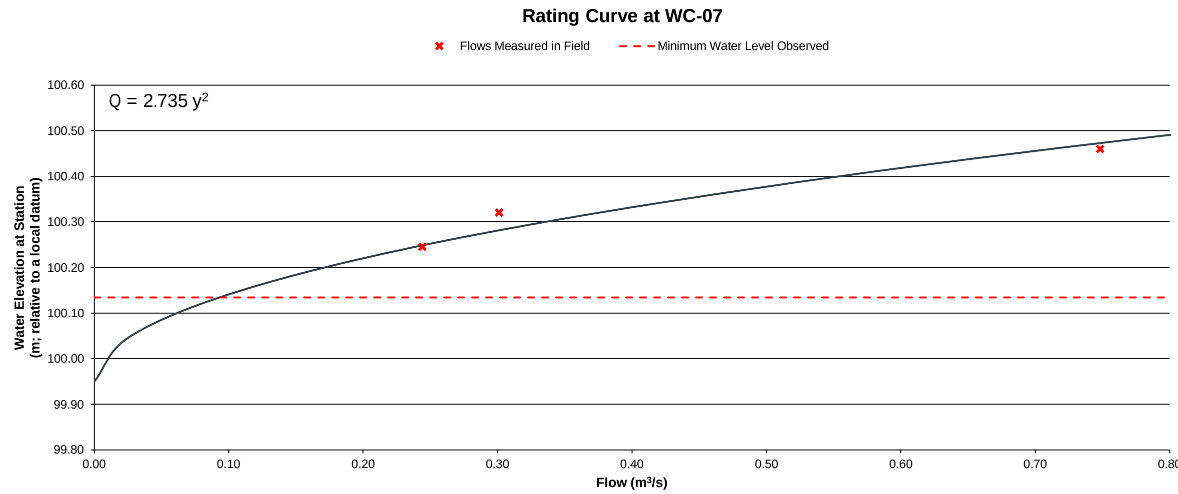
DATE: Feburary 2024

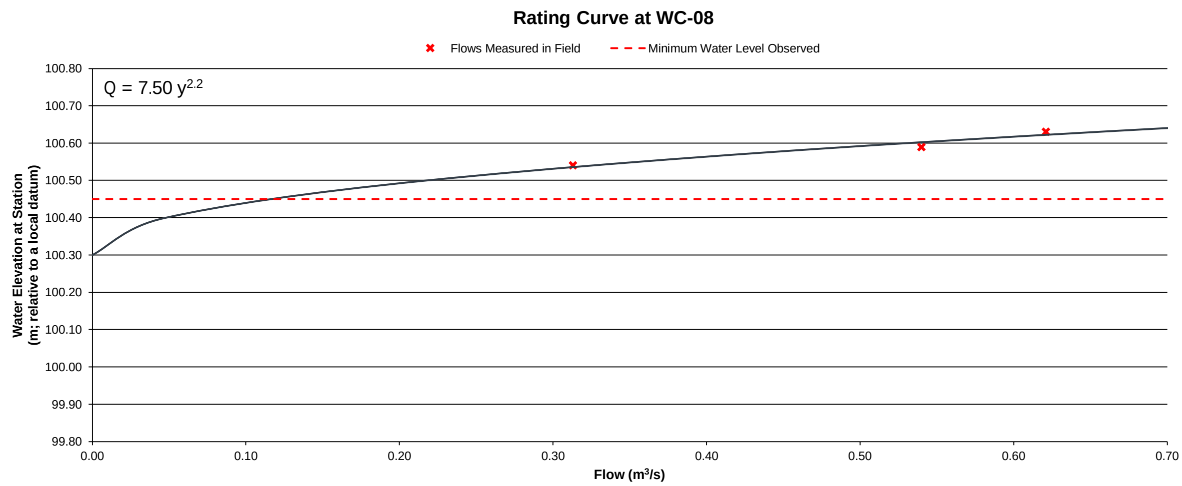
DRAWN: SPC

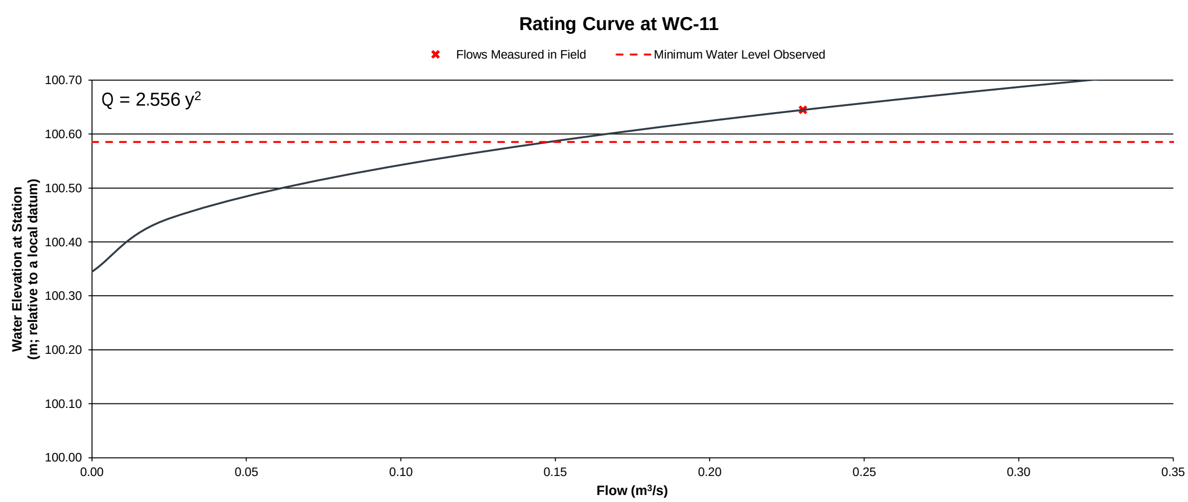
CHECK: CDV

Note: Rating curves with fewer than three measured points are reported with a lower confidence.

2023 Stage-Discharge Rating Curves at WC-07, WC-08 and WC-11	FIGURE C-3







PROJECT NO: CA0003092.5894 (500)

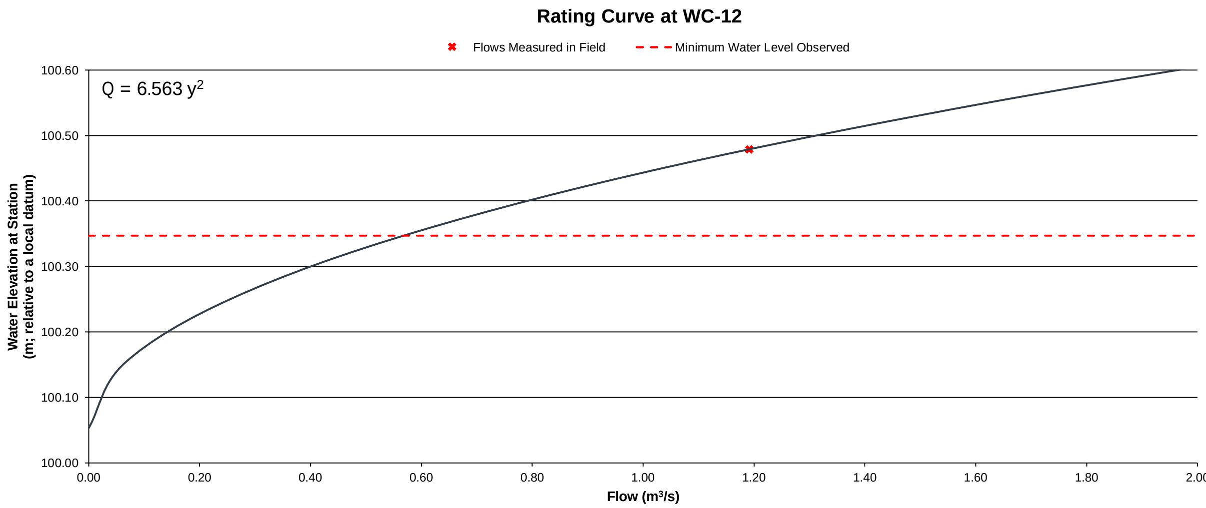
DATE: Feburary 2024

DRAWN: SPC

CHECK: CDV

Note: Rating curves with fewer than three measured points are reported with a lower confidence.

2023 Stage-Discharge Rating Curves at WC-12	FIGURE C-4



PROJECT NO: CA0003092.5894 (500)

DATE: Feburary 2024

DRAWN: SPC

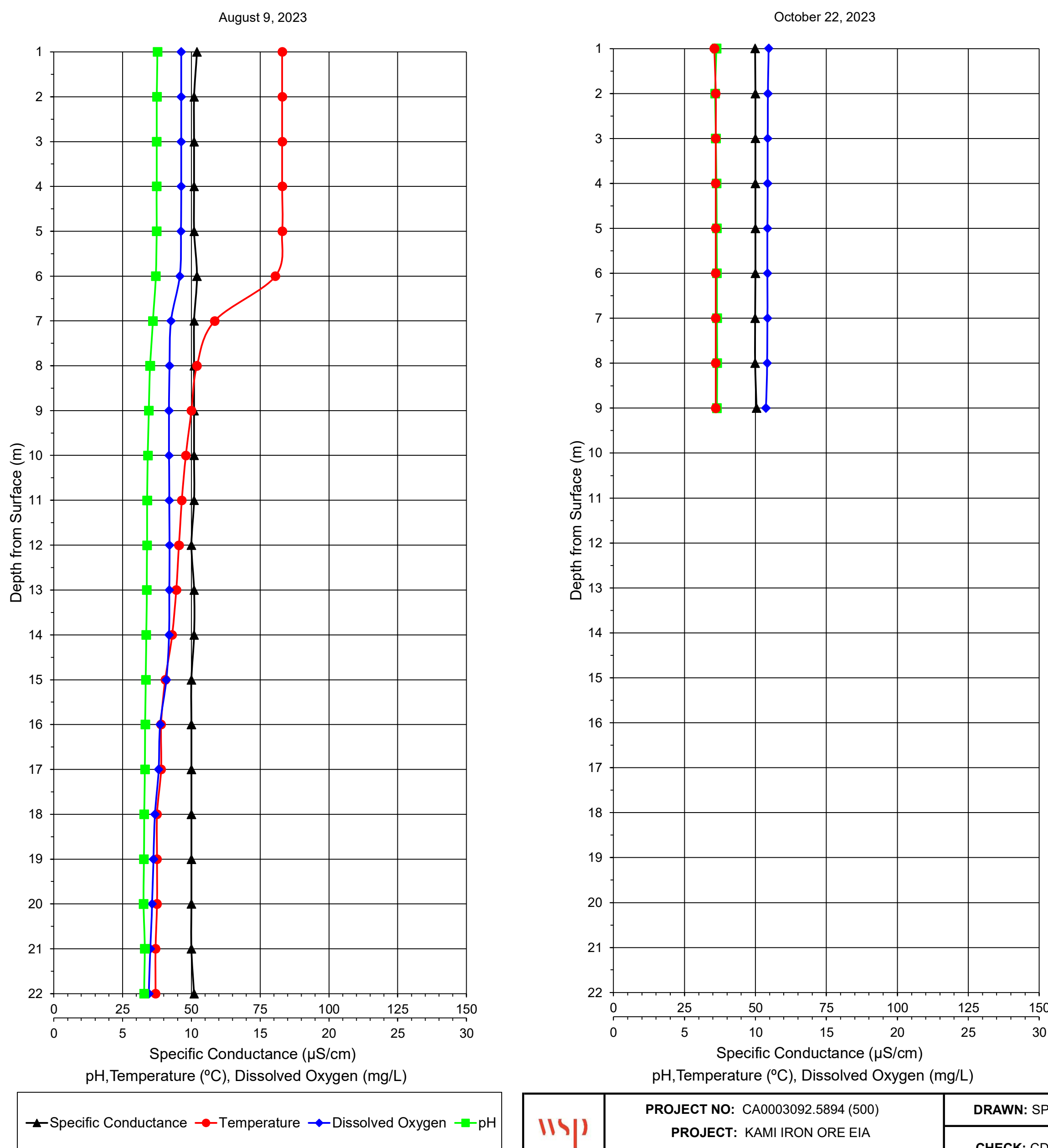
CHECK: CDV

Note: Rating curves with fewer than three measured points are reported with a lower confidence.

APPENDIX D

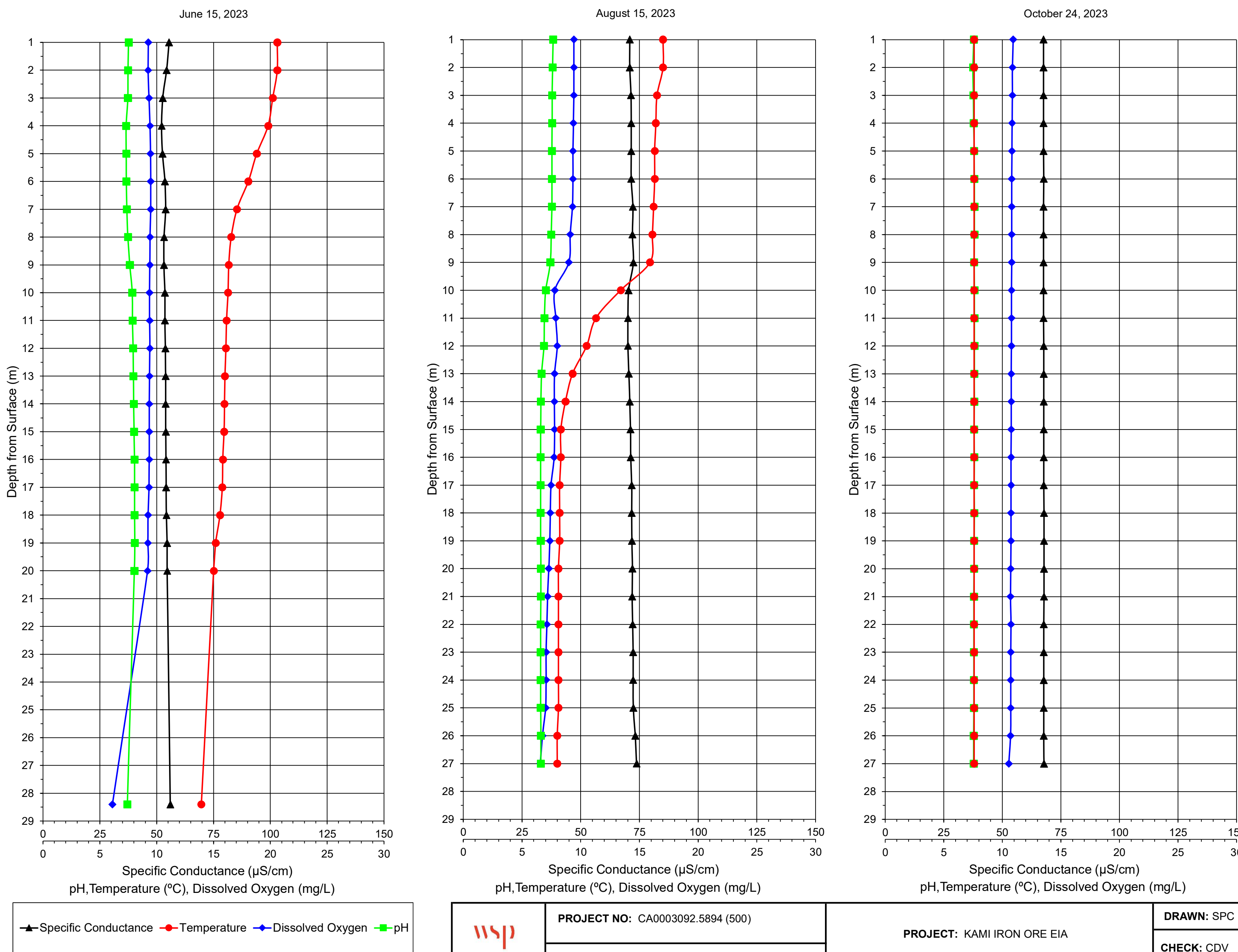
Lake Column Profile Measurements

2023 Water Column Profiles at Daviault Lake: DL-02 | **FIGURE D-1**



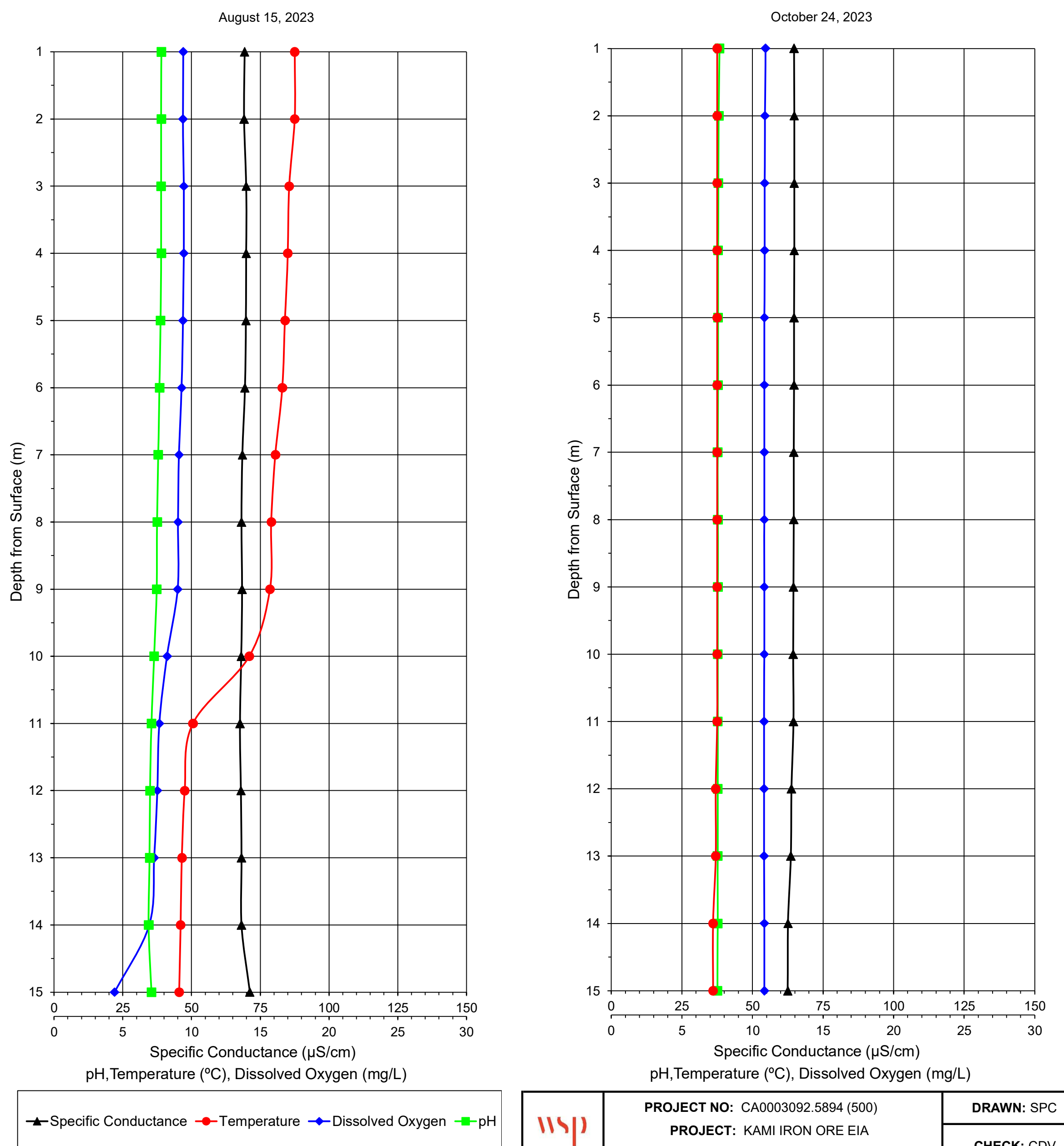
PROJECT NO: CA0003092.5894 (500)		**DRAWN:** SPC
PROJECT: KAMI IRON ORE EIA		**CHECK:** CDV
DATE: February 2024		

2023 Water Column Profiles at Long Lake: LL-02	FIGURE D-2



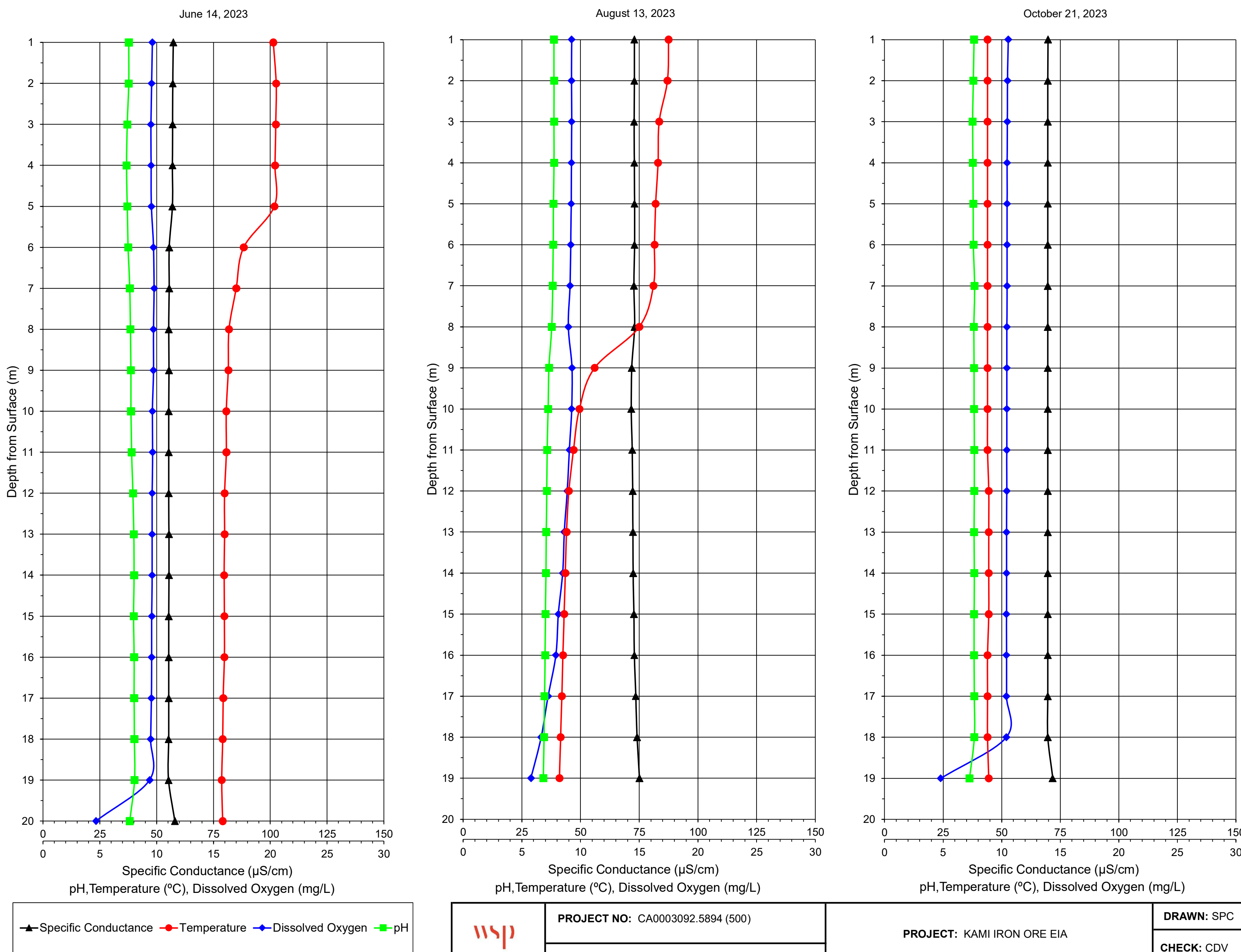
wsp	**PROJECT NO:** CA0003092.5894 (500)	**PROJECT:** KAMI IRON ORE EIA	**DRAWN:** SPC
	DATE: February 2024		**CHECK:** CDV

2023 Water Column Profiles at Long Lake: LL-03	FIGURE D-3



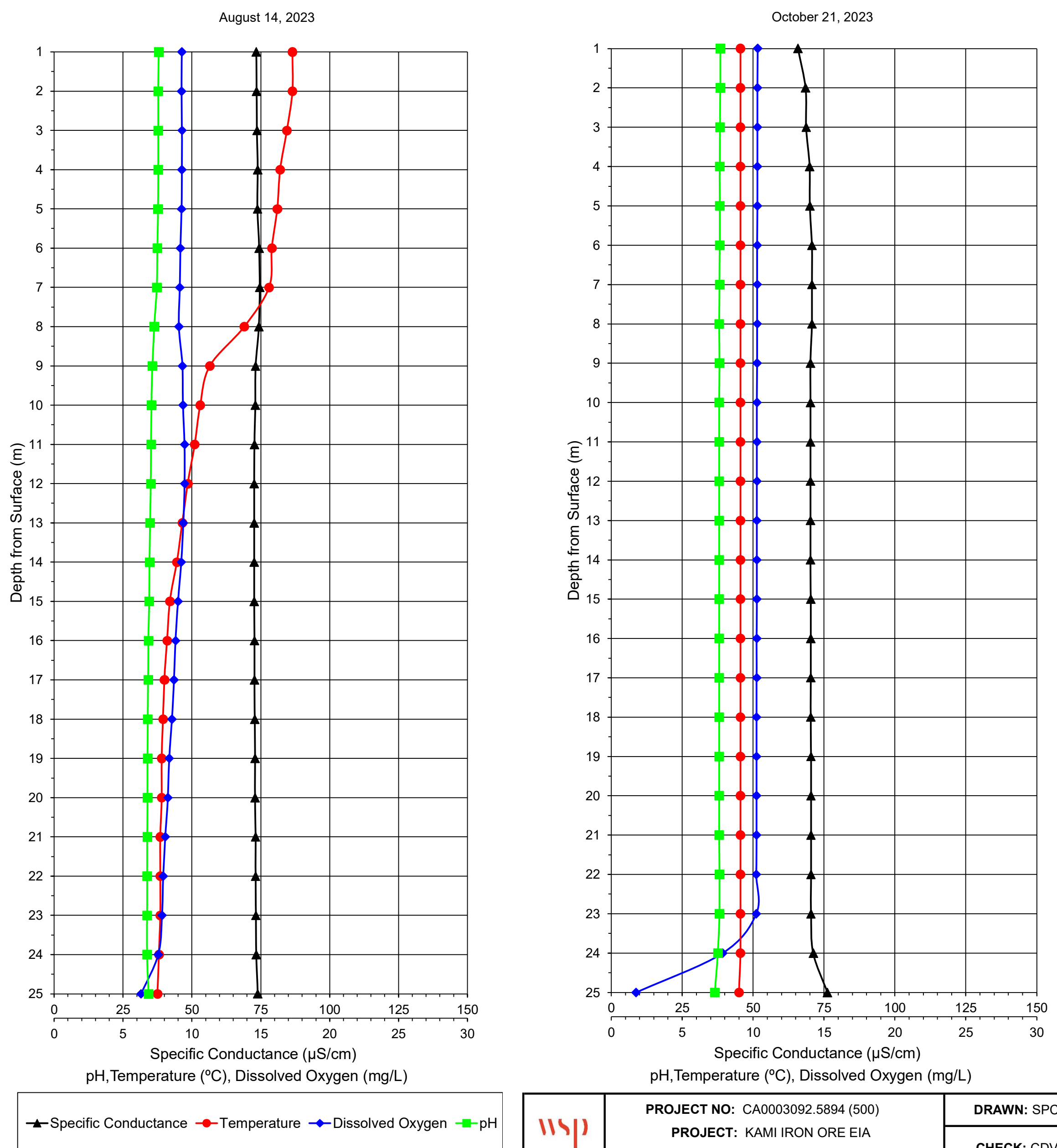
PROJECT NO: CA0003092.5894 (500)	**DRAWN:** SPC	
PROJECT: KAMI IRON ORE EIA	**CHECK:** CDV	
DATE: February 2024		

2023 Water Column Profiles at Mills Lake: MIL-02	FIGURE D-4



wsp	**PROJECT NO:** CA0003092.5894 (500) **DATE:** February 2024	**PROJECT:** KAMI IRON ORE EIA	**DRAWN:** SPC **CHECK:** CDV

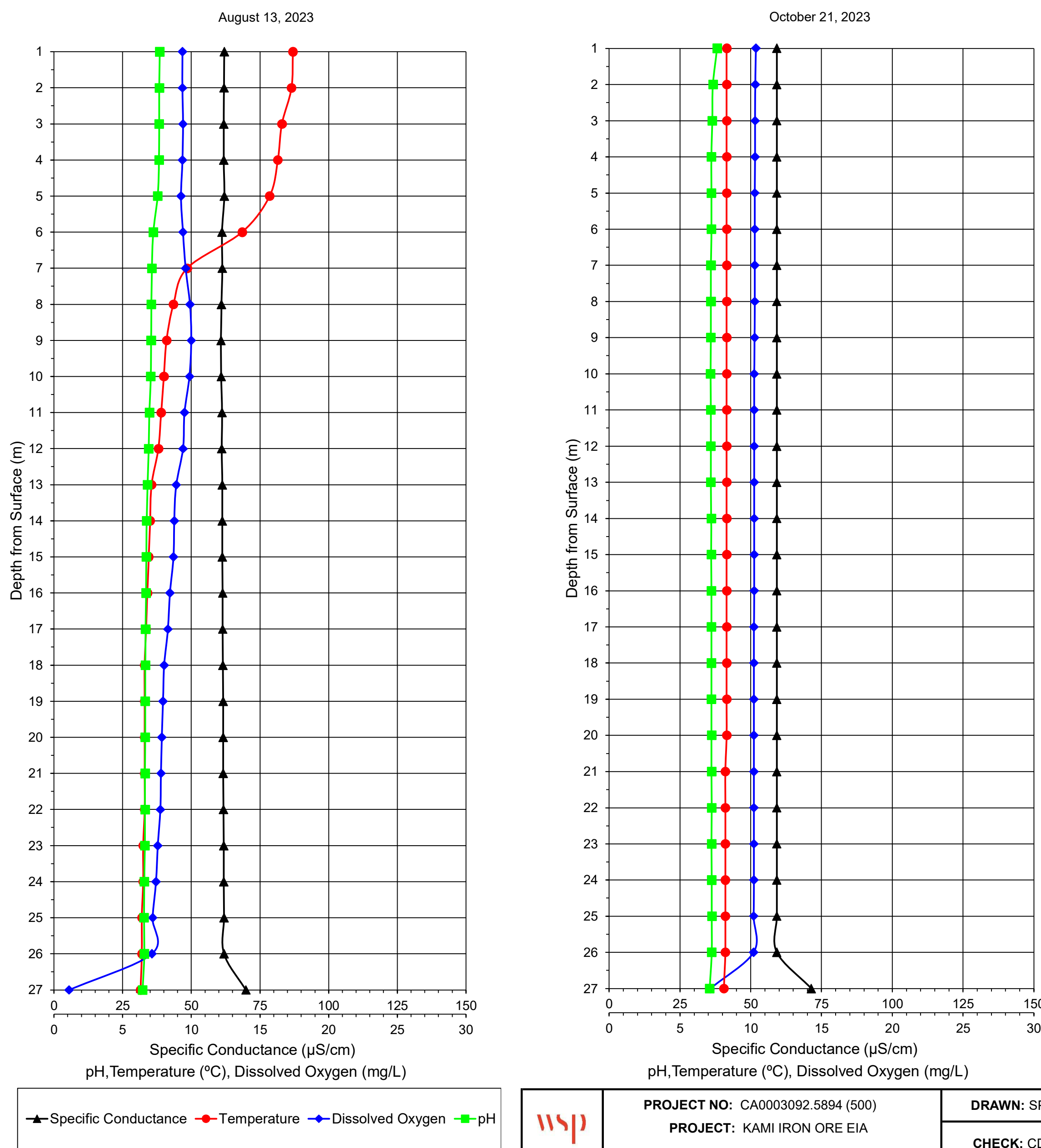
2023 Water Column Profiles at Mills Lake: MIL-03 | **FIGURE D-5**



PROJECT NO: CA0003092.5894 (500)
PROJECT: KAMI IRON ORE EIA
DATE: February 2024

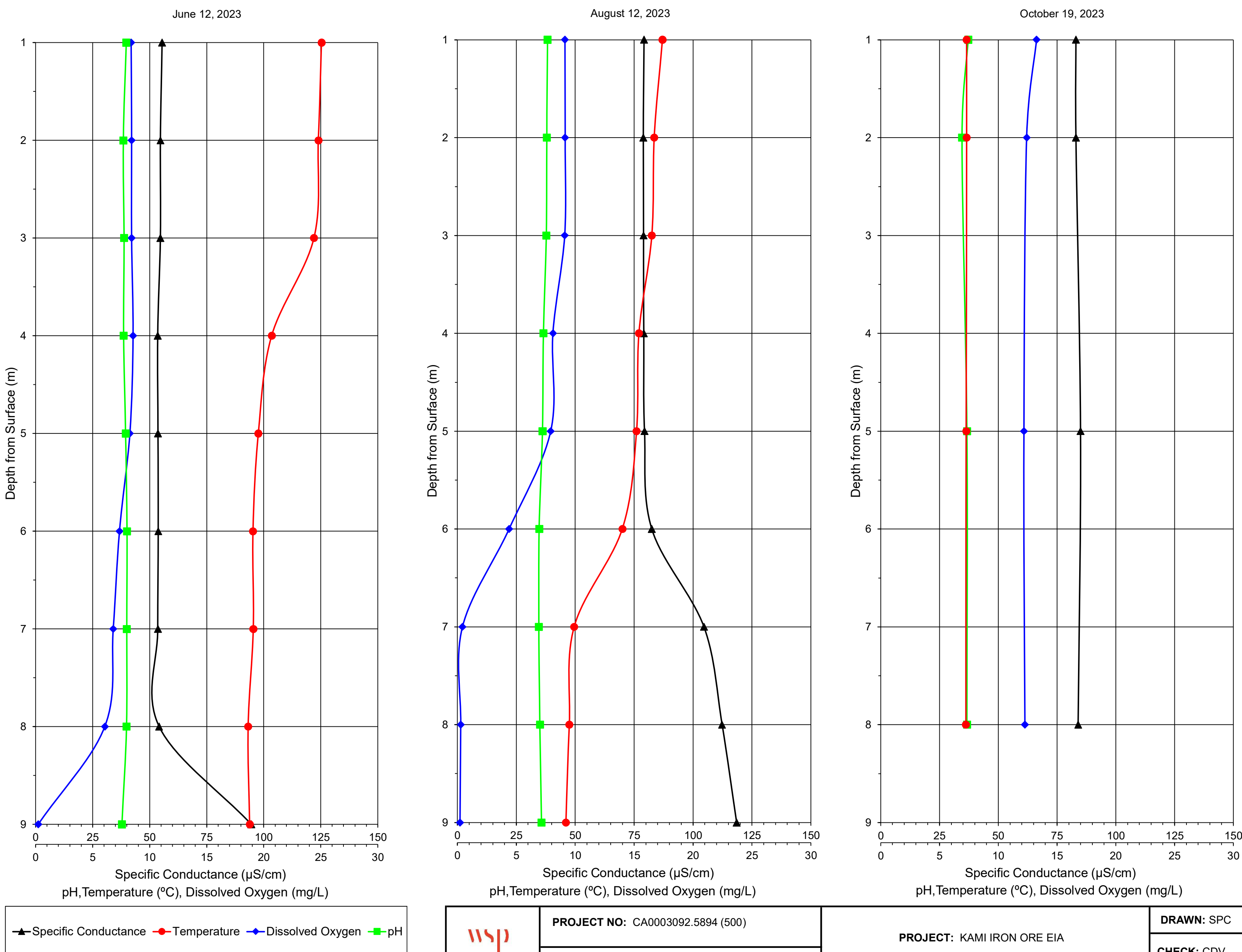
DRAWN: SPC
CHECK: CDV

2023 Water Column Profiles at Molar Lake: MOL-02 | **FIGURE D-6**



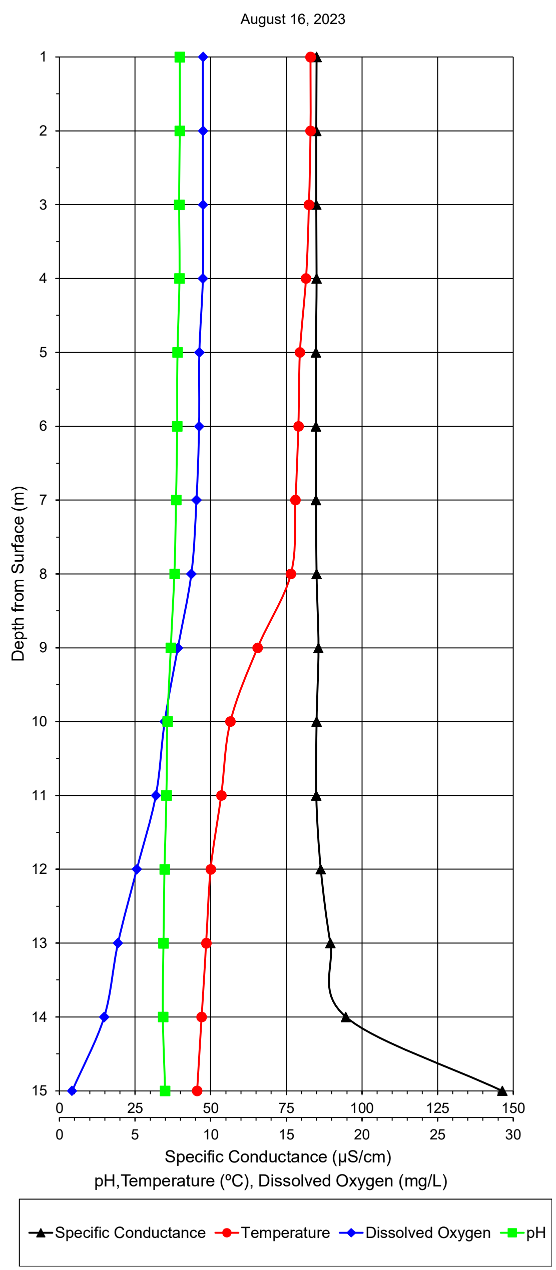
wsp	**PROJECT NO:** CA0003092.5894 (500) **PROJECT:** KAMI IRON ORE EIA **DATE:** February 2024	**DRAWN:** SPC **CHECK:** CDV

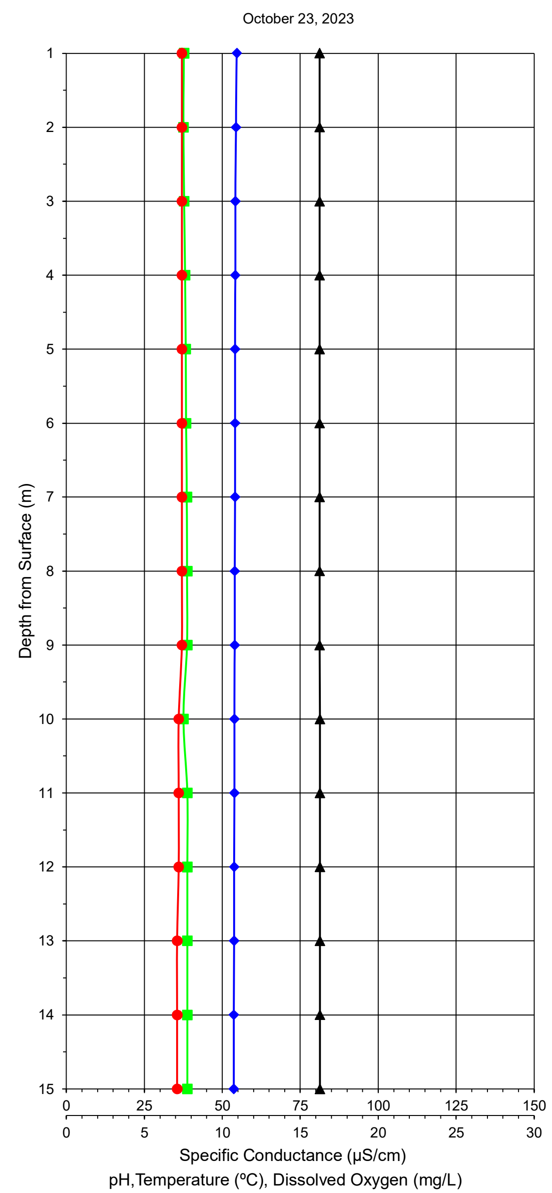
2023 Water Column Profiles at Pike Lake: PL-02 | **FIGURE D-7**



wsp	**PROJECT NO:** CA0003092.5894 (500)	**PROJECT:** KAMI IRON ORE EIA	**DRAWN:** SPC
	DATE: February 2024		**CHECK:** CDV

2023 Water Column Profiles at Riordan Lake: RL-02	FIGURE D-8





wsp	**PROJECT NO:** CA0003092.5894 (500) **PROJECT:** KAMI IRON ORE EIA **DATE:** Feburary 2024	**DRAWN:** SPC **CHECK:** CDV

APPENDIX E

Tables

PARAMETER	UNIT	CCME Guideline(1–13)		Unnamed stream reporting to Pike Lake from the southwest			Unnamed stream inmediatly downstream of Pike Lake Outlet			Unnamed stream reporting to Mills Lake from the west			Unnamed stream reporting to Long Lake from the south		
				WC-01			WC-02			WC-03			WC-04		
GENERAL PARAMETERS		Short Term	Long Term	12-Jun-23	12-Aug-23	19-Oct-23	12-Jun-23	11-Aug-23	18-Oct-23	13-Jun-23	14-Aug-23	20-Oct-23	13-Jun-23	14-Aug-23	21-Oct-23
pH		---	6.5 to 9	7.19	7.20	7.86	7.39	7.50	7.20	7.51	7.53	7.48	7.99	7.76	7.67
Temperature	Celsius	---	Narrative(2)	22.5	16.3	5.0	20.4	16.9	8.0	23.5	16.7	8.8	22.7	17.0	8.6
Specific Conductance	μS/cm	---	---	83	99	0.11	54	76	0.09	47	62	0.08	55	73	48
Turbidity	NTU	---	---	2.97	0.74	1.10	0.74	0.42	0.00	0.00	0.02	0.00	0.88	0.03	0.00
Dissolved Oxygen	mg/L	---	---	7.8	8.6	12.7	9.4	9.2	13.4	7.9	9.3	11.8	9.2	9.4	10.6
Dissolved Oxygen Saturation	%	---	---	82	88	99	97	76	113	85	96	104	96	97	91

PARAMETER	UNIT	CCME Guideline(1–13)		Walsh River reporting to Long Lake from the south			Unnamed stream reporting to Long Lake from the southeast			Unnamed stream reporting to Long Lake from the southeast			Unnamed stream reporting to Long Lake from the east		
				WC-05			WC-06			WC-07			WC-08		
GENERAL PARAMETERS		Short Term	Long Term	10-Jun-23	10-Aug-23	13-Oct-23	10-Jun-23	10-Aug-23	16-Oct-23	9-Jun-23	10-Aug-23	16-Oct-23	9-Jun-23	10-Aug-23	17-Oct-23
pH		---	6.5 to 9	8.11	7.63	7.35	7.31	7.24	7.31	7.62	7.47	7.21	8.38	7.64	7.03
Temperature	Celsius	---	Narrative(2)	24.3	14.5	9.0	14.7	11.9	6.4	18.7	13.5	5.8	12.0	16.3	6.2
Specific Conductance	μS/cm	---	---	90	117	0.13	105	117	0.13	75	77	0.09	87	94	0.10
Turbidity	NTU	---	---	1.73	0.42	0.00	0.11	0.20	0.00	1.55	0.32	0.00	0.00	0.10	0.00
Dissolved Oxygen	mg/L	---	---	8.5	9.5	10.3	9.8	8.7	12.5	9.2	9.8	14.5	10.4	9.2	12.4
Dissolved Oxygen Saturation	%	---	---	95	93	89	88	80	101	90	95	115	96	94	98

PARAMETER	UNIT	CCME Guideline(1–13)		Unnamed stream immediately downstream of Long Lake			Flows at Walsh River			Unnamed stream – immediately downstream of Riordan Lake	Unnamed stream – immediately downstream of Daviault Lake			Proposed Railway Crossings	
				WC-09			WC-10			WC-11	WC-12			WC-13	WC-14
GENERAL PARAMETERS		Short Term	Long Term	8-Jun-23	15-Aug-23	17-Oct-23	7-Jun-23	16-Aug-23	15-Oct-23	23-Oct-23	14-Jun-23	11-Aug-23	14-Oct-23	12-Oct-23	12-Oct-23
pH		---	6.5 to 9	8.18	7.43	7.05	6.72	7.21	7.31	7.65	7.49	7.73	7.31	7.03	6.87
Temperature	Celsius	---	Narrative(2)	9.8	19.5	6.7	16.3	17.5	7.4	5.3	21.7	19.1	9.5	8.4	9.2
Specific Conductance	μS/cm	---	---	61	35	0.06	23	27	0.05	85	39	0.05	0.06	0.09	0.11
Turbidity	NTU	---	---	0.00	0.18	0.00	0.06	0.21	0.00	0.05	6.56	0.74	0.02	0.00	2.28
Dissolved Oxygen	mg/L	---	---	11.2	9.5	12.7	9.7	9.3	13.0	11.5	8.7	9.3	12.8	13.3	11.0
Dissolved Oxygen Saturation	%	---	---	99	103	104	97	97	109	91	93	97	112	13	96

PARAMETER	UNIT	CCME Guideline(1–13)		Proposed Railway Crossing	Long Lake	Mills Lake	Pike Lake
				WC-15	LL-01	MIL-01	PL-01
GENERAL PARAMETERS		Short Term	Long Term	12-Oct-23	8-Jun-23	13-Jun-23	11-Jun-23
pH		---	6.5 to 9	7.46	7.84	7.73	7.75
Temperature	Celsius	---	Narrative(2)	11.3	11.1	24.3	22.0
Specific Conductance	μS/cm	---	---	0.09	68	55	56
Turbidity	NTU	---	---	0.00	0.00	0.56	1.23
Dissolved Oxygen	mg/L	---	---	12.9	11.1	9.4	9.3
Dissolved Oxygen Saturation	%	---	---	118	100	99	94

Notes:

0.1 – Shaded cell denotes a value that is greater than the Canadian Council of Ministers of the Environment (CCME) short term concentration; bold cell denotes a value that is greater than the CCME long term concentration

(1) CCME [Canadian Council of Ministers of the Environment. Water Quality Guidelines for the Protection of Aquatic Life

(2) For more information, see CCREM 1987.

PARAMETER	UNIT	CCME Guideline[1–13]		Unnamed stream reporting to Pike Lake from the southwest			Unnamed stream inmediatly downstream of Pike Lake Outlet			Unnamed stream reporting to Mills Lake from the west			
				WC-01			WC-02			WC-03			
GENERAL PARAMETERS		Short Term	Long Term	12-Jun-2023	12-Aug-2023	19-Oct-2023	12-Jun-2023	11-Aug-2023	18-Oct-2023	13-Jun-2023	31-Jul-2023	14-Aug-2023	20-Oct-2023
Field pH		---	6.5 to 9	7.19	7.20	6.86	7.39	7.50	7.20	7.51	---	7.53	7.48
Field Temperature	Celsius	---	Narrative[2]	22.5	16.3	5.0	20.4	16.9	8.0	23.5	---	16.7	8.8
Lab pH		---	---	7.49	7.44	---	7.54	7.41	---	7.51	7.44	7.34	---
Bicarb. Alkalinity	mg/L as $CaCO_3$	---	---	---	---	---	---	---	---	---	30	---	---
Carb. Alkalinity	mg/L as $CaCO_3$	---	---	---	---	---	---	---	---	---	<1.0	---	---
Total Alkalinity	mg/L as $CaCO_3$	---	---	45	48	---	32	36	---	29	30	29	---
Acidity	mg/L as $CaCO_3$	---	---	<5.0	<5.0	---	<5.0	<5.0	---	<5.0	<5.0	---	---
Conductivity	µS/cm	---	---	100	98	---	70	76	---	63	63	62	---
Salinity		---	---	---	---	---		---	---	---	<2.0	---	---
Turbidity	NTU	---	---	---	0.74	1.10	---	---	0.00	---	0.30	0.02	0.00
Calculated TDS	mg/L	---	---	---	---	---	---	---	---	---	35	---	---
TDS	mg/L	---	---	95	80	40	85	65	25	60	39	45	30
TSS	mg/L	---	---	2	<10	---	1	<10	---	<1	<1.0	<10	---
Dissolved Hardness	mg/L as $CaCO_3$	---	---	45.9	---	---	31.6	---	---	28.6	---	---	---
Total Hardness	mg/L as $CaCO_3$	---	---	46	49	56	32	37	39	27	29	30	31
DOC	mg/L	---	---	4.0	5.2	4.3	3.9	4.6	4.8	3.2	3.2	3.2	3.2
TOC	mg/L	---	---	---	---	---	---	---	---	---	4.3	---	---
Colour	TCU	---	---	13	---	---	16	---	---	11	10	---	---
ANIONS & NUTRIENTS		Short Term	Long Term										
Anion Sum	me/L	---	---	---	---	---	---	---	---	---	0.65	---	---
Cation Sum	me/L	---	---	---	---	---	---	---	---	---	0.642	---	---
Ion Balance (% Difference)	%	---	---	---	---	---	---	---	---	---	---	---	---
Langelier Index (@ 20C)		---	---	---	---	---	---	---	---	---	-1.55	---	---
Langelier Index (@ 4C)		---	---	---	---	---	---	---	---	---	-1.8	---	---
Saturation pH (@ 20C)		---	---	---	---	---	---	---	---	---	8.99	---	---
Saturation pH (@ 4C)		---	---	---	---	---	---	---	---	---	9.24	---	---
Fluoride	mg/L as F-	---	---	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dissolved Chloride	mg/L as Cl-	640	120	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dissolved Bromide	mg/L as Br-	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dissolved Sulphate	mg/L as SO_4	---	---	4.2	5.0	4.3	3.7	4.8	3.6	2.7	2.7	3.0	2.9
Total Ammonia	mg/L as NH_3	---	2.22, variable, 3.26 ug/L[3]	<0.061	<0.061	---	<0.061	<0.061	---	<0.061	---	<0.061	---
Total Ammonia	mg/L as N	---	---	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Dissolved Nitrate	mg/L as N	---	---	---	---	---	---	---	---	---	---	---	---
Dissolved Nitrate	mg/L as NO_3	---	---	---	---	---	---	---	---	---	---	---	---
Dissolved Nitrite	mg/L as NO_2	---	---	---	---	---	---	---	---	---	---	---	---
Dissolved Nitrite	mg/L as N	---	---	---	---	---	---	---	---	---	---	---	---
Nitrite	mg/L as N	---	0.06	<0.010	<0.10	<0.010	<0.010	<0.10	<0.010	<0.010	<0.10	<0.010	<0.010
Nitrate	mg/L as N	550	13	<0.10	<0.010	<0.10	<0.10	<0.010	<0.10	<0.10	<0.010	<0.010	<0.10
Total Phosphorus	mg/L	---	Guidance Framework[4]	0.008	---	---	<0.004	---	---	<0.004	---	---	---
Nitrate + Nitrite	mg/L as N	---	---	<0.050	<0.10	<0.10	<0.050	<0.10	<0.10	<0.050	<0.010	<0.010	<0.10
Dissolved Nitrate + Nitrite	mg/L as N	---	---	---	---	---	---	---	---	---	---	---	---
Total Un-ionized Ammonia	mg/L	---	19	<0.00061	<0.00061	<0.00061	<0.0006	<0.0006	<0.00061	<0.00099	---	<0.00063	<0.00061
Orthophosphate	mg/L as P	---	---	<0.010	<0.010	---	<0.010	<0.010	---	<0.010	<0.010	<0.010	---
Reactive Silica	mg/L as SiO_2	---	---	---	---	---	---	---	---	---	3.6	---	---

PARAMETER	UNIT	CCME Guideline[1–13]		WC-01 12-Jun-2023		WC-01 12-Aug-2023		WC-01 19-Oct-2023		WC-02 12-Jun-2023		WC-02 11-Aug-2023		WC-02 18-Oct-2023		WC-03 13-Jun-2023		WC-03 31-Jul-2023		WC-03 14-Aug-2023		WC-03 20-Oct-2023	
METALS		Short Term	Long Term	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
Ag	µg/L	---	0.25	<0.020	<0.020	<0.090	<0.090	---	---	<0.020	<0.020	<0.090	<0.090	---	---	<0.020	<0.020	<0.090	<0.090	<0.090	<0.090	---	---
Al	µg/L	---	5, 100[5]	14.7	5.5	15	7.4	---	---	16.9	8.8	19	7.9	---	---	16.5	11.4	27	9.7	14	9.5	---	---
As	µg/L	---	5	<0.10	<0.10	<1.0	<1.0	---	---	<0.10	<0.10	<1.0	<1.0	---	---	<0.10	<0.10	<1.0	<1.0	<1.0	<1.0	---	---
B	µg/L	29000	1500	<50	<50	<10	<10	---	---	<50	<50	<10	<10	---	---	<50	<50	<10	<10	<10	<10	---	---
Ba	µg/L	---	---	13.4	12.7	15	16	---	---	12.8	11.5	13	13	---	---	8.9	8.6	8.2	8.3	8.8	8.8	---	---
Be	µg/L	---	---	<0.10	<0.10	<0.40	<0.40	---	---	<0.10	<0.10	<0.40	<0.40	---	---	<0.10	<0.10	<0.40	<0.40	<0.40	<0.40	---	---
Bi	µg/L	---	---	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---
Ca	µg/L	---	---	11400	11500	12000	13000	---	---	8130	8030	9000	9400	---	---	6640	6890	7200	6800	7000	7200	---	---
Cd	µg/L	0.11, variable, 7.7[6]	0.04, variable, 0.37[6]	<0.010	<0.010	<0.090	<0.090	---	---	<0.010	<0.010	<0.090	<0.090	---	---	<0.010	<0.010	<0.090	<0.090	<0.090	<0.090	---	---
Co	µg/L	---	---	<0.20	<0.20	<0.50	<0.50	---	---	<0.20	<0.20	<0.50	<0.50	---	---	<0.20	<0.20	<0.50	<0.50	<0.50	<0.50	---	---
Cs	µg/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cr	µg/L	---	---	<1.0	<1.0	<5.0	<5.0	---	---	<1.0	<1.0	<5.0	<5.0	---	---	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	---	---
Cu	µg/L	---	2, variable, 4, 2[7]	<0.50	0.7	<0.90	<0.90	---	---	<0.50	0.24	<0.90	0.97	---	---	<0.50	0.23	<0.90	<0.90	<0.90	1.2	---	---
Fe	µg/L	---	300	119	46.4	100	---	---	---	67	25.9	<100	<100	---	---	---	---	---	---	<100	<100	---	---
Hg	µg/L	---	0.026	<0.01	<0.01	<0.00010	<0.10	---	---	<0.01	<0.01	<0.00010	<0.10	---	---	<0.01	<0.01	---	---	<0.00010	<0.10	---	---
K	µg/L	---	---	1810	1780	1500	1600	---	---	1330	1260	1400	1400	---	---	1040	1020	1100	1100	930	1100	---	---
Li	µg/L	---	---	<2.0	<2.0	<5.0	<5.0	---	---	<2.0	<2.0	<5.0	<5.0	---	---	<2.0	<2.0	<5.0	<5.0	<5.0	<5.0	---	---
Mg	µg/L	---	---	4140	4190	4100	4300	---	---	2720	2800	3100	3200	---	---	2560	2760	2900	2900	2700	2800	---	---
Mn	µg/L	Equation[8]	Variable[9]	67.5	33.4	36	27	---	---	42	4	45	6.3	---	---	10	1.6	4.7	<2.0	5.4	<2.0	---	---
Mo	µg/L	---	73	<1.0	<1.0	0.74	0.82	---	---	<1.0	<1.0	1	1	---	---	<1.0	<1.0	0.7	0.77	0.58	0.59	---	---
Na	µg/L	---	---	1050	1030	930	940	---	---	810	801	900	900	---	---	684	721	760	760	700	750	---	---
Ni	µg/L	---	25, variable, 150, 25[10]	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---
P	µg/L	---	4 ug/L	---	---	<0.020	<100	---	---	---	---	<0.020	<100	---	---	---	---	<0.020	<100	<0.020	<100	---	---
Pb	µg/L	---	1, variable, 7, 1[11]	<0.20	<0.20	<0.50	<0.50	---	---	<0.20	<0.20	<0.50	<0.50	---	---	<0.20	<0.20	<0.50	<0.50	<0.50	<0.50	---	---
Rb	µg/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S	mg/L	---	---	<3.0	<3.0	---	---	---	---	<3.0	<3.0	---	---	---	---	<3.0	<3.0	---	---	---	---	---	---
Sb	µg/L	---	---	<0.50	<0.50	<0.50	<0.50	---	---	<0.50	<0.50	<0.50	<0.50	---	---	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---	---
Se	µg/L	---	1	<0.10	<0.10	<2.0	<2.0	---	---	<0.10	<0.10	<2.0	<2.0	---	---	<0.10	<0.10	<2.0	<2.0	<2.0	<2.0	---	---
Si	µg/L	---	---	2420	2570	2700	2800	---	---	1870	1880	1800	1900	---	---	1790	1890	1700	1500	1500	1700	---	---
Sn	µg/L	---	---	<5.0	<5.0	<1.0	<1.0	---	---	<5.0	<5.0	<1.0	<1.0	---	---	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	---	---
Sr	µg/L	---	---	20.6	20.8	22	22	---	---	15.9	15.8	20	19	---	---	12.9	13	14	13	13	13	---	---
Te	µg/L	---	---	---	---	<1.0	<1.0	---	---	---	---	<1.0	<1.0	---	---	---	---	<1.0	<1.0	<1.0	<1.0	---	---
Th	µg/L	---	---	<1.0	<1.0	<2.0	<2.0	---	---	<1.0	<1.0	<2.0	<2.0	---	---	<1.0	<1.0	---	---	<2.0	<2.0	---	---
Ti	µg/L	---	---	<5.0	<5.0	<5.0	<5.0	---	---	<5.0	<5.0	<5.0	<5.0	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	---	---
Tl	µg/L	---	0.8	<0.010	<0.010	<0.050	<0.050	---	---	<0.010	<0.010	<0.050	<0.050	---	---	<0.010	<0.010	<0.050	<0.050	<0.050	<0.050	---	---
U	µg/L	33	15	0.12	0.1	<0.10	<0.10	---	---	<0.10	<0.10	<0.10	<0.10	---	---	<0.10	<0.10	0.1	<0.10	<0.10	<0.10	---	---
V	µg/L	---	---	<5.0	<5.0	<0.50	<0.50	---	---	<5.0	<5.0	<0.50	<0.50	---	---	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	---	---
W	µg/L	---	---	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---
Y	µg/L	---	---	<3.2	<2.0	<2.0	<2.0	---	---	<3.2	<2.0	<2.0	<2.0	---	---	<3.2	<2.0	---	---	<2.0	<2.0	---	---
Zn	µg/L	Variable[12]	Variable[13]	<5.0	<5.0	<5.0	<5.0	---	---	<5.0	<5.0	<5.0	<5.0	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	---	---
Zr	µg/L	---	---	---	---	<1.0	<1.0	---	---	---	---	<1.0	<1.0	---	---	---	---	<1.0	<1.0	<1.0	<1.0	---	---

Notes:

- For notes 1 to 13, Refer to "Notes for Tables E-2 to E-8"

0.1 − Shaded cell denotes a value that is greater than the Canadian Council of Ministers of the Environment (CCME) short term concentration; bold cell denotes a value that is greater than the CCME long term concentration

< = less than

PARAMETER	UNIT	CCME Guideline[1–13]		Unnamed stream reporting to Long Lake from the south						Flows at Waldorf River reporting to Long Lake from the south						Unnamed stream reporting to Long Lake from the southeast							
				WC-04						WC-05						WC-06							
GENERAL PARAMETERS		Short Term	Long Term	13-Jun-2023		14-Aug-2023		21-Oct-2023		10-Jun-2023		10-Aug-2023		13-Oct-2023		10-Jun-2023		3-Aug-2023		10-Aug-2023		16-Oct-2023	
Field pH		---	6.5 to 9	7.99		7.76		7.67		8.11		7.63		7.35		7.31		---		7.24		7.31	
Field Temperature	Celsius	---	Narrative[2]	22.7		17.0		8.6		24.3		14.5		9.0		14.7		---		11.9		6.4	
Lab pH		---	---	7.64		7.35		---		7.77		7.61		7.91		7.82		7.86		7.52		8.01	
Bicarb. Alkalinity	mg/L as $CaCO_3$	---	---	---		---		---		---		---		---		---		90		---		---	
Carb. Alkalinity	mg/L as $CaCO_3$	---	---	---		---		---		---		---		---		---		<1.0		---		---	
Total Alkalinity	mg/L as $CaCO_3$	---	---	34		35		---		52		57		62		64		90		62		67	
Acidity	mg/L as $CaCO_3$	---	---	<5.0		---		---		<5.0		<5.0		<5.0		<5.0		<5.0		<5.0		<5.0	
Conductivity	µS/cm	---	---	73		73		---		110		110		120		130		170		120		130	
Salinity		---	---	---		---		---		---		---		---		---		<2.0		---		---	
Turbidity	NTU	---	---	---		0.03		0.00		---		0.42		0.00		---		0.20		0.20		0.00	
Calculated TDS	mg/L	---	---	---		---		---		---		---		---		---		95		---		---	
TDS	mg/L	---	---	85		55		20		85		80		---		115		97		70		---	
TSS	mg/L	---	---	<1		<10		---		2		<10		<10		<1		<1.0		<10		<10	
Dissolved Hardness	mg/L as $CaCO_3$	---	---	33.6		---		---		54.2				---		65.8		---		---		---	
Total Hardness	mg/L as $CaCO_3$	---	---	32		36		39		53		60		---		66		97		65		---	
DOC	mg/L	---	---	3.1		3.0		3.0		3.0		4.6		---		3.9		5.0		7.3		---	
TOC	mg/L	---	---	---		---		---		---		---		---		---		6		---		---	
Colour	TCU	---	---	10		---		---		11		---		---		16		15		---		---	
ANIONS & NUTRIENTS		Short Term	Long Term																				
Anion Sum	me/L	---	---	---		---		---		---		---		---		---		1.86		---		---	
Cation Sum	me/L	---	---	---		---		---		---		---		---		---		1.98		---		---	
Ion Balance (% Difference)	%	---	---	---		---		---		---		---		---		---		---		---		---	
Langelier Index (@ 20C)		---	---	---		---		---		---		---		---		---		-0.194		---		---	
Langelier Index (@ 4C)		---	---	---		---		---		---		---		---		---		-0.445		---		---	
Saturation pH (@ 20C)		---	---	---		---		---		---		---		---		---		8.05		---		---	
Saturation pH (@ 4C)		---	---	---		---		---		---		---		---		---		8.3		---		---	
Fluoride	mg/L as F-	---	---	<0.10		<0.10		<0.10		<0.10		<0.10		---		<0.10		<0.10		<0.10		---	
Dissolved Chloride	mg/L as Cl-	640	120	<1.0		<1.0		<1.0		<1.0		<1.0		---		<1.0		<1.0		<1.0		---	
Dissolved Bromide	mg/L as Br-	---	---	<1.0		<1.0		<1.0		<1.0		<1.0		---		<1.0		<1.0		<1.0		---	
Dissolved Sulphate	mg/L as SO_4	---	---	2.7		3.0		2.8		3.8		4.5		---		3.3		2.5		2.9		---	
Total Ammonia	mg/L as NH_3	---	2.22, variable, 3.26 ug/L[3]	<0.061		<0.061		---		<0.061		<0.061		---		<0.061		---		<0.061		---	
Total Ammonia	mg/L as N	---	---	<0.050		<0.050		<0.050		<0.050		<0.050		---		<0.050		<0.050		<0.050		---	
Dissolved Nitrate	mg/L as N	---	---	---		---		---		---		---		---		---		0.014		---		---	
Dissolved Nitrate	mg/L as NO_3	---	---	---		---		---		---		---		---		---		0.063		---		---	
Dissolved Nitrite	mg/L as NO_2	---	---	---		---		---		---		---		---		---		<0.033		---		---	
Dissolved Nitrite	mg/L as N	---	---	---		---		---		---		---		---		---		<0.010		---		---	
Nitrite	mg/L as N	---	0.06	<0.010		0.01		<0.010		<0.010		<0.10		---		<0.010		---		<0.10		---	
Nitrate	mg/L as N	550	13	<0.10		<0.010		<0.10		<0.10		<0.010		---		<0.10		---		<0.010		---	
Total Phosphorus	mg/L	---	Guidance Framework[4]	<0.004		---		---		0.004		---		---		<0.004		---		---		---	
Nitrate + Nitrite	mg/L as N	---	---	<0.050		0.01		---		<0.050		<0.10		---		<0.050		---		<0.10		---	
Dissolved Nitrate + Nitrite	mg/L as N	---	---	---		---		---		---		---		---		---		0.014		---		---	
Total Un-ionized Ammonia	mg/L	---	19	<0.0028		<0.0011		<0.00061		<0.004		<0.00068		---		<0.00061		---		<0.00061		---	
Orthophosphate	mg/L as P	---	---	<0.010		<0.010		---		<0.010		<0.010		---		<0.010		<0.010		<0.010		---	
Reactive Silica	mg/L as SiO_2	---	---	---		---		---		---		---		---		---		4.3		---		---	
METALS		Short Term	Long Term	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
Ag	µg/L	---	0.25	<0.020	<0.020	<0.090	<0.090	---	---	<0.020	<0.020	<0.090	<0.090	<0.090	<0.090	<0.020	<0.020	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090
Al	µg/L	---	5, 100[5]	8.7	6.7	8.9	5.2	---	---	22	4.9	16	<4.9	12	<4.9	4.1	<3.0	5.7	<4.9	6.4	<4.9	5.4	<4.9
As	µg/L	---	5	<0.10	<0.10	<1.0	<1.0	---	---	<0.10	<0.10	<1.0	<1.0	<1.0	<1.0	<0.10	<0.10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
B	µg/L	29000	1500	<50	<50	<10	<10	---	---	<50	<50	<10	<10	<10	<10	<50	<50	14	<10	<10	<10	<10	<10
Ba	µg/L	---	---	8.5	8.4	9.1	9.6	---	---	16.6	15.7	18	17	17	17	16.7	15.6	23	23	15	14	13	13
Be	µg/L	---	---	<0.10	<0.10	<0.40	<0.40	---	---	<0.10	<0.10	<0.40	<0.40	<0.40	<0.40	<0.10	<0.10	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Bi	µg/L	---	---	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ca	µg/L	---	---	7670	7800	8600	8400	---	---	12600	12800	14000	14000	14000	15000	15000	15000	21000	21000	14000	15000	15000	15000
Cd	µg/L	0.11, variable, 7.7[6]	0.04, variable, 0.37[6]	<0.010	<0.010	<0.090	<0.090	---	---	<0.010	<0.010	<0.090	<0.090	<0.090	<0.090	<0.010	<0.010	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090
Co	µg/L	---	---	<0.20	<0.20	<0.50	<0.50	---	---	<0.20	<0.20	<0.50	<0.50	<0.50	<0.50	<0.20	<0.20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Cr	µg/L	---	---	<1.0	<1.0	<5.0	<5.0	---	---	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cs	µg/L	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	<0.20	---	---	---	---	---	---	<0.20	<0.20
Cu	µg/L	---	2, variable, 4, 2[7]	<0.50	0.91	<0.90	<0.90	---	---	<0.50	0.84	<0.90	<0.90	<0.90	<0.90	<0.50	0.64	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90
Fe	µg/L	---	300	12	10.2	<100	<100	---	---	143	53	140	<100	110	<100	60	36.5	<100	<100	<100	<100	<100	<100
Hg	µg/L	---	0.026	<0.01	<0.01	<0.00010	<0.10	---	---	<0.01	<0.01	<0.00010	<0.10	<0.00010	<0.10	<0.01	<0.01	---	---	<0.00010	<0.10	<0.00010	<0.10
K	µg/L	---	---	862	0.837	850	940	---	---	1130	1070	950	1000	1100	1100	957	905	820	880	390	430	760	760
Li	µg/L	---	---	<2.0	<2.0	<5.0	<5.0	---	---	<2.0	<2.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Mg	µg/L	---	---	3210	3430	3600	3600	---	---	5210	5400	5700	5900	5900	6600	6820	6920	9900	10000	6500	6600	7000	7200
Mn	µg/L	Equation[8]	Variable[9]	5.6	1.2	5.2	<2.0	---	---	21.4	14.8	23	17	18	18	20.2	10.2	31	4.9	28	2.5	17	6.8
Mo	µg/L	---	73	<1.0	<1.0	0.67	0.64	---	---	<1.0	<1.0	<0.50	0.55	0.52	<0.50	<1.0	<1.0	2	0.86	<0.50	<0.50	1.1	0.54
Na	µg/L	---	---	537	519	560	600	---	---	458	442	410	450	450	480	575	521	680	650	360	380	420	440
Ni	µg/L	---	25, variable, 150, 25[10]	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
P	µg/L	---	4 ug/L	---	---	<0.020	<100	---	---	---	---	<0.020	<100	<0.020	<100	---	---	<0.020	<100	<0.020	<100	<0.020	<100
Pb	µg/L	---	1, variable, 7, 1[11]	<0.20	<0.20	<0.50	<0.50	---	---	<0.20	<0.20	<0.50	<0.50	<0.50	<0.50	<0.20	<0.20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Rb	µg/L	---	---	---	---	---	---	---	---	---	---	---	---	2.4	2.5	---	---	---	---	---	---	1.6	1.5
S	mg/L	---	---	<3.0	<3.0	---	---	---	---	<3.0	<3.0			---	---	<3.0	<3.0	---	---	---	---	---	---
Sb	µg/L	---	---	<0.50	<0.50	<0.50	<0.50	---	---	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Se	µg/L	---	1	<0.10	<0.10	<2.0	<2.0	---	---	<0.10	<0.10	<2.0	<2.0	<2.0	<2.0	<0.10	<0.10	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Si	µg/L	---	---	1790	1850	1700	1800	---	---	1560	1580	1600	1700	1700	1700	2220	2330	2200	2100	1500	1700	1600	1700
Sn	µg/L	---	---	<5.0	<5.0	<1.0	<1.0	---	---	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sr	µg/L	---	---	10.8	11.1	12	12	---	---	16.4	16.6	17	17	18	17	12.8	12.7	18	18	12	12	12	12
Te	µg/L	---	---	---	---	<1.0	<1.0	---	---	---	---	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Th	µg/L	---	---	<1.0	<1.0	<2.0	<2.0	---	---	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	---	---	<2.0	<2.0	<2.0	<2.0
Ti	µg/L	---	---	<5.0	<5.0	<5.0	<5.0	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tl	µg/L	---	0.8	<0.010	<0.010	<0.050	<0.050	---	---	<0.010	<0.010	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
U	µg/L	33	15	<0.10	<0.10	<0.10	<0.10	---	---	0.23	0.21	0.18	0.2	0.24	0.24	0.2	0.19	0.36	0.33	<0.10	<0.10	<0.10	<0.10
V	µg/L	---	---	<5.0	<5.0	<0.50	<0.50	---	---	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
W	µg/L	---	---	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Y	µg/L	---	---	<3.2	<2.0	<2.0	<2.0	---	---	<3.2	<2.0	<2.0	<2.0	<2.0	<2.0	<3.2	<2.0	---	---	<2.0	<2.0	<2.0	<2.0
Zn	µg/L	Variable[12]	Variable[13]	<5.0	<5.0	<5.0	<5.0	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	6.6	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	27	13
Zr	µg/L	---	---	---	---	<1.0	<1.0	---	---	---	---	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Notes:
- For notes 1 to 13, Refer to "Notes for Tables E-2 to E-8"

0.1 – Shaded cell denotes a value that is greater than the Canadian Council of Ministers of the Environment (CCME) short term concentration; bold cell denotes a value that is greater than the CCME long term concentration

< = less than

PARAMETER	UNIT	CCME Guideline(1–13)		Unnamed stream reporting to Long Lake from the southeast								Unnamed stream reporting to Long Lake from the east								Unnamed stream immediately downstream of Long Lake					
				WC-07								WC-08								WC-09					
GENERAL PARAMETERS		Short Term	Long Term	9-Jun-2023		3-Aug-2023		10-Aug-2023		16-Oct-2023		9-Jun-2023		3-Aug-2023		10-Aug-2023		17-Oct-2023		8-Jun-2023		15-Aug-2023		17-Oct-2023	
Field pH		---	6.5 to 9	7.62		---		7.47		7.21		8.38		---		7.64		7.03		8.18		7.43		7.05	
Field Temperature	Celsius	---	Narrative(2)	18.7		---		13.5		5.8		12.0		---		16.3		6.2		9.8		19.5		6.7	
Lab pH		---	---	7.69		8.00		7.42		7.80		7.71		7.83		7.60		7.89		7.54		7.01			
Bicarb. Alkalinity	mg/L as $CaCO_3$	---	---	---		87		---		---		---		60		---		---		---		---		---	
Carb. Alkalinity	mg/L as $CaCO_3$	---	---	---		<1.0		---		---		---		<1.0		---		---		---		---		---	
Total Alkalinity	mg/L as $CaCO_3$	---	---	45		88		40		41		46		60		47		47		32		12		---	
Acidity	mg/L as $CaCO_3$	---	---	<5.0		<5.0		<5.0		<5.0		<5.0		<5.0		<5.0		<5.0		<5.0		<5.0		---	
Conductivity	µS/cm	---	---	92		160		77		82		95		120		94		95		69		34		---	
Salinity		---	---	---		<2.0		---		---		---		<2.0		---		---		---		---		---	
Turbidity	NTU	---	---	---		1.1		0.32		0		---		0.2		0.1		0		---		0.018		0	
Calculated TDS	mg/L	---	---	---		92		---		---		---		---		---		---		---		---		---	
TDS	mg/L	---	---	70		89		70		---		105		65		45		---		75		35		<10	
TSS	mg/L	---	---	<1		<1.0		<10		<10		<1		1.20		<10		<10		1		<10		---	
Dissolved Hardness	mg/L as $CaCO_3$	---	---	46		---		---		---		46		---		---		---		32		---		---	
Total Hardness	mg/L as $CaCO_3$	---	---	46		93		43		---		44		63		50		---		31		14		25	
DOC	mg/L	---	---	5.2		4.10		9.4		---		3.2		2.80		4.2		---		3.4		5.4		5.2	
TOC	mg/L	---	---	---		5.3		---		---		---		4.1		---		---		---		---		---	
Colour	TCU	---	---	24		18		---		---		9		6		---		---		15		---		---	
ANIONS & NUTRIENTS		Short Term	Long Term																						
Anion Sum	me/L	---	---	---		---		---		---		---		1.26		---		---		---		---		---	
Cation Sum	me/L	---	---	---		---		---		---		---		1.32		---		---		---		---		---	
Ion Balance (% Difference)	%	---	---	---		---		---		---		---		---		---		---		---		---		---	
Langelier Index (@ 20C)		---	---	---		---		---		---		---		-0.566		---		---		---		---		---	
Langelier Index (@ 4C)		---	---	---		---		---		---		---		-0.818		---		---		---		---		---	
Saturation pH (@ 20C)		---	---	---		---		---		---		---		8.4		---		---		---		---		---	
Saturation pH (@ 4C)		---	---	---		---		---		---		---		8.65		---		---		---		---		---	
Fluoride	mg/L as F-	---	---	<0.10		<0.10		<0.10		---		<0.10		<0.10		<0.10		---		<0.10		<0.10		<0.10	
Dissolved Chloride	mg/L as Cl-	640	120	<1.0		<1.0		<1.0		---		<1.0		<1.0		<1.0		---		<1.0		<1.0		1.1	
Dissolved Bromide	mg/L as Br-	---	---	<1.0		<1.0		<1.0		---		<1.0		<1.0		<1.0		---		<1.0		<1.0		<1.0	
Dissolved Sulphate	mg/L as SO_4	---	---	1.7		2.3		3.0		---		2.7		2.8		4.0		---		3.2		2.9		2.5	
Total Ammonia	mg/L as NH_3	---	2.22, variable, 3.26 ug/L(3)	<0.061		---		<0.061		---		<0.061		---		<0.061		---		<0.061		<0.061		---	
Total Ammonia	mg/L as N	---	---	<0.050		<0.050		<0.050		---		<0.050		<0.050		<0.050		---		<0.050		<0.050		<0.050	
Dissolved Nitrate	mg/L as N	---	---	---		---		---		---		---		---		---		---		---		---		---	
Dissolved Nitrate	mg/L as NO_3	---	---	---		---		---		---		---		---		---		---		---		---		---	
Dissolved Nitrite	mg/L as NO_2	---	---	---		---		---		---		---		---		---		---		---		---		---	
Dissolved Nitrite	mg/L as N	---	---	---		---		---		---		---		---		---		---		---		---		---	
Nitrite	mg/L as N	---	0.06	<0.010		<0.10		<0.010		---		<0.010		<0.10		<0.010		---		<0.010		<0.010		<0.010	
Nitrate	mg/L as N	550	13	<0.10		<0.010		<0.10		---		<0.10		<0.010		<0.10		---		<0.10		<0.10		0.11	
Total Phosphorus	mg/L	---	Guidance Framework(4)	<0.004		---		---		---		<0.004		---		---		---		<0.004		---		---	
Nitrate + Nitrite	mg/L as N	---	---	<0.050		<0.10		<0.10		---		<0.050		<0.10		<0.10		---		<0.050		<0.10		0.11	
Dissolved Nitrate + Nitrite	mg/L as N	---	---	---		---		---		---		---		---		---		---		---		---		---	
Total Un-ionized Ammonia	mg/L	---	19	<0.0009		---		<0.00061		---		<0.003		---		<0.00079		---		<0.0016		<0.00062		<0.00061	
Orthophosphate	mg/L as P	---	---	<0.010		<0.010		<0.010		---		<0.010		<0.010		<0.010		---		<0.010		---		---	
Reactive Silica	mg/L as SiO_2	---	---	---		3.8		---		---		---		3.5		---		---		---		---		---	
METALS		Short Term	Long Term	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
Ag	µg/L	---	0.25	<0.020	<0.020	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.020	<0.020	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.020	<0.020	<0.090	<0.090	---	---
Al	µg/L	---	5, 100(5)	6.5	3.1	5	<4.9	16	<4.9	5.2	<4.9	10	<3.0	<4.9	<4.9	12	<4.9	5.2	<4.9	35.4	17.5	55	35	---	---
As	µg/L	---	5	<0.10	<0.10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.10	<0.10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.10	<0.10	<1.0	<1.0	---	---
B	µg/L	29000	1500	<50	<50	<10	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	<50	<50	<10	<10	---	---
Ba	µg/L	---	---	11.7	11	19	20	13	12	11	11	12.4	12	15	14	14	12	13	14	9.7	8.7	7.4	7.1	---	---
Be	µg/L	---	---	<0.10	<0.10	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.10	<0.10	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.10	<0.10	<0.40	<0.40	---	---
Bi	µg/L	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---
Ca	µg/L	---	---	10200	10200	20000	21000	9500	9800	8700	9100	9940	10300	14000	14000	10000	11000	9700	10000	7360	7490	3700	3700	---	---
Cd	µg/L	0.11, variable, 7.7(6)	0.04, variable, 0.37(6)	<0.010	<0.010	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.010	<0.010	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.010	<0.010	<0.090	<0.090	---	---
Co	µg/L	---	---	<0.20	<0.20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.20	<0.20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.20	<0.20	<0.50	<0.50	---	---
Cr	µg/L	---	---	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1.0	<1.0	<5.0	<5.0	---	---
Cs	µg/L	---	---	---	---	---	---	---	---	<0.20	<0.20	---	---	---	---	---	---	<0.20	<0.20	---	---	---	---	---	---
Cu	µg/L	---	2, variable, 4, 2(7)	<0.50	0.59	<0.90	<0.90	<0.90	1.5	<0.90	1.2	<0.50	0.22	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.50	0.59	<0.90	<0.90	---	---
Fe	µg/L	---	300	117	72.8	**390**	240	120	<100	<100	<100	47	21.6	<100	<100	<100	<100	<100	<100	---	---	160	<100	---	---
Hg	µg/L	---	0.026	<0.01	<0.01	---	---	<0.00010	<0.10	<0.00010	<0.10	<0.01	<0.01	---	---	<0.00010	<0.10	<0.00010	<0.10	<0.01	<0.01	<0.00010	<0.10	---	---
K	µg/L	---	---	492	495	760	850	<200	<200	350	400	880	856	1100	1200	840	920	850	950	865	817	750	790	---	---
Li	µg/L	---	---	<2.0	<2.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<5.0	<5.0	---	---
Mg	µg/L	---	---	4900	5000	9700	10000	4300	4500	4400	4600	4690	4990	6600	6900	4900	5300	4800	5100	3020	3220	1200	1200	---	---
Mn	µg/L	Equation(8)	Variable(9)	12.7	3.1	7.4	<2.0	26	5.3	12	5	20.9	3.5	18	<2.0	44	6.9	15	2	27	5.2	24	13	---	---
Mo	µg/L	---	73	<1.0	<1.0	0.74	0.68	<0.50	<0.50	<0.50	<0.50	<1.0	<1.0	0.79	0.73	0.59	0.73	0.65	0.66	<1.0	<1.0	<0.50	<0.50	---	---
Na	µg/L	---	---	473	459	850	900	230	250	310	340	437	0.399	500	540	430	420	420	440	496	474	740	770	---	---
Ni	µg/L	---	25, variable, 150, 25(10)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---
P	µg/L	---	4 ug/L	---	---	<0.020	<100	<0.020	<100	<0.020	<100	---	---	<0.020	<100	<0.020	<100	<0.020	<100	---	---	<0.020	<100	---	---
Pb	µg/L	---	1, variable, 7, 1(11)	<0.20	<0.20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.20	<0.20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.20	<0.20	**2.4**	<0.50	---	---
Rb	µg/L	---	---	---	---	---	---	---	---	0.78	0.73	---	---	---	---	---	---	1.6	1.6	---	---	---	---	---	---
S	mg/L	---	---	<3.0	<3.0	---	---	---	---	---	---	<3.0	<3.0	---	---	---	---	---	---	<3.0	<3.0	---	---	---	---
Sb	µg/L	---	---	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---	---
Se	µg/L	---	1	<0.10	<0.10	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.10	<0.10	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.10	<0.10	<2.0	<2.0	---	---
Si	µg/L	---	---	1380	1290	2000	1900	1200	1200	1100	1100	1320	1220	1800	1700	1500	1600	1500	1600	1600	1620	910	940	---	---
Sn	µg/L	---	---	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	---	---
Sr	µg/L	---	---	9.8	9.7	20	20	9	8.5	8.0	8.2	12.0	12.2	18.0	17.0	13.0	13.0	12.0	12.0	11.6	12.0	12.0	12.0	---	---
Te	µg/L	---	---	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<2.0	<2.0	---	---
Th	µg/L	---	---	<1.0	<1.0	---	---	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	---	---	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	---	---
Ti	µg/L	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	---	---
Tl	µg/L	---	0.8	<0.010	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010	<0.050	<0.050	---	---
U	µg/L	33	15	0.12	0.11	0.5	0.49	<0.10	<0.10	<0.10	<0.10	0.15	0.15	0.25	0.25	0.15	0.15	0.12	0.13	0.1	0.1	<0.10	<0.10	---	---
V	µg/L	---	---	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	---	---
W	µg/L	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---
Y	µg/L	---	---	<3.2	<2.0	---	---	<2.0	<2.0	<2.0	<2.0	<3.2	<2.0	---	---	<2.0	<2.0	<2.0	<2.0	<3.2	<2.0	<2.0	<2.0	---	---
Zn	µg/L	Variable(12)	Variable(13)	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	5.9	<5.0	---	---
Zr	µg/L	---	---	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	---	---

Notes:

- For notes 1 to 13, Refer to "Notes for Tables E-2 to E-8"

0.1 – Shaded cell denotes a value that is greater than the Canadian Council of Ministers of the Environment (CCME) short term concentration; bold cell denotes a value that is greater than the CCME long term concentration

< = less than

Table E-5: 2023 Laboratory Water Quality Results - WC-10, DL-01, SC-12, SC-13, SC-14 and SC-15
Kami Iron Ore EIA

PARAMETER	UNIT	CCME Guideline(1–13)		Flows at Walsh River reporting to Long Lake from the northwest			Unnamed stream – immediately downstream of Daviault Lake			Proposed Railway Crossings		
				WC-10			WC-12			WC-13	WC-14	WC-15
GENERAL PARAMETERS		Short Term	Long Term	7-Jun-2023	16-Aug-2023	15-Oct-2023	14-Jun-2023	11-Aug-2023	14-Oct-2023	13-Oct-2023	13-Oct-2023	13-Oct-2023
Field pH		---	6.5 to 9	6.72	7.21	7.31	7.49	7.73	7.31	7.03	6.87	7.46
Field Temperature	Celsius	---	Narrative(2)	16.3	17.5	7.4	21.7	19.1	9.5	8.4	9.2	11.3
Lab pH		---	---	7.15	6.96	7.53	7.32	---	7.45	7.83	7.73	7.79
Bicarb. Alkalinity	mg/L as $CaCO_3$	---	---	---	---	---	---	---	---	---	---	---
Carb. Alkalinity	mg/L as $CaCO_3$	---	---	---	---	---	---	---	---	---	---	---
Total Alkalinity	mg/L as $CaCO_3$	---	---	12	10	21	17	---	20	45	39	40
Acidity	mg/L as $CaCO_3$	---	---	<5.0	<5.0	<5.0	<5.0	---	<5.0	<5.0	<5.0	<5.0
Conductivity	µS/cm	---	---	32	27	49	53	---	56	94	83	87
Salinity		---	---	---	---	---	---	---	---	---	---	---
Turbidity	NTU	---	---	---	0.21	0.00	---	0.74	0.02	0.00	2.28	0.00
Calculated TDS	mg/L	---	---	---	---	---	---	---	---	---	---	---
TDS	mg/L	---	---	70	25	---	65	---	---	---	---	---
TSS	mg/L	---	---	2	<10	<10	<1	---	<10	<10	<10	<10
Dissolved Hardness	mg/L as $CaCO_3$	---	---	13.3	---	---	19.2	---	---	---	---	---
Total Hardness	mg/L as $CaCO_3$	---	---	13.9	11	---	19	---	---	---	---	---
DOC	mg/L	---	---	5.0	5.5	---	3.9	---	---	---	---	---
TOC	mg/L	---	---	---	---	---	---	---	---	---	---	---
Colour	TCU	---	---	29	---	---	18	---	---	---	---	---
ANIONS & NUTRIENTS		Short Term	Long Term									
Anion Sum	me/L	---	---	---	---	---	---	---	---	---	---	---
Cation Sum	me/L	---	---	---	---	---	---	---	---	---	---	---
Ion Balance (% Difference)	%	---	---	---	---	---	---	---	---	---	---	---
Langelier Index (@ 20C)		---	---	---	---	---	---	---	---	---	---	---
Langelier Index (@ 4C)		---	---	---	---	---	---	---	---	---	---	---
Saturation pH (@ 20C)		---	---	---	---	---	---	---	---	---	---	---
Saturation pH (@ 4C)		---	---	---	---	---	---	---	---	---	---	---
Fluoride	mg/L as F-	---	---	---	<0.10	---	---	---	---	---	---	---
Dissolved Chloride	mg/L as Cl-	640	120	<0.10	<1.0	---	<0.10	---	---	---	---	---
Dissolved Bromide	mg/L as Br-	---	---	<1.0	<1.0	---	1.7	---	---	---	---	---
Dissolved Sulphate	mg/L as SO_4	---	---	<1.0	2.50	---	<1.0	---	---	---	---	---
Total Ammonia	mg/L as NH_3	---	2.22, variable, 3.26 ug/L(3)	1.9	<0.061	---	2	---	---	---	---	---
Total Ammonia	mg/L as N	---	---	<0.061	<0.050	---	<0.061	---	---	---	---	---
Dissolved Nitrate	mg/L as N	---	---	<0.050	---	---	<0.050	---	---	---	---	---
Dissolved Nitrate	mg/L as NO_3	---	---	---	---	---	---	---	---	---	---	---
Dissolved Nitrite	mg/L as NO_2	---	---	---	---	---	---	---	---	---	---	---
Dissolved Nitrite	mg/L as N	---	---	---	---	---	---	---	---	---	---	---
Nitrite	mg/L as N	---	0.06	---	<0.010	---	---	---	---	---	---	---
Nitrate	mg/L as N	550	13	<0.010	<0.10	---	<0.010	---	---	---	---	---
Total Phosphorus	mg/L	---	Guidance Framework(4)	<0.10	---	---	<0.10	---	---	---	---	---
Nitrate + Nitrite	mg/L as N	---	---	0.006	<0.10	---	<0.004	---	---	---	---	---
Dissolved Nitrate + Nitrite	mg/L as N	---	---	<0.050	---	---	<0.050	---	---	---	---	---
Total Un-ionized Ammonia	mg/L	---	19	---	<0.00061	---		---	---	---	---	---
Orthophosphate	mg/L as P	---	---	<0.00061	---	---	<0.00083	---	---	---	---	---
Reactive Silica	mg/L as SiO_2	---	---	<0.010	---	---	<0.010	---	---	---	---	---

METALS		Short Term	Long Term	WC-10 7-Jun-2023 Total	WC-10 7-Jun-2023 Dissolved	WC-10 16-Aug-2023 Total	WC-10 16-Aug-2023 Dissolved	WC-10 15-Oct-2023 Total	WC-10 15-Oct-2023 Dissolved	WC-12 14-Jun-2023 Total	WC-12 14-Jun-2023 Dissolved	WC-12 11-Aug-2023 Total	WC-12 11-Aug-2023 Dissolved	WC-12 14-Oct-2023 Total	WC-12 14-Oct-2023 Dissolved	WC-13 13-Oct-2023 Total	WC-13 13-Oct-2023 Dissolved	WC-14 13-Oct-2023 Total	WC-14 13-Oct-2023 Dissolved	WC-15 13-Oct-2023 Total	WC-15 13-Oct-2023 Dissolved
Ag	µg/L	---	0.25	<0.020	<0.020	<0.090	<0.090	<0.090	<0.090	<0.020	<0.020	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090
Al	µg/L	---	5, 100(5)	74	50.6	43	39	58	41	25.2	25.5	16	24	31	12	5.3	<4.9	7.3	6.1	13	<4.9
As	µg/L	---	5	<0.10	<0.10	<1.0	<1.0	<1.0	<1.0	<0.10	<0.10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
B	µg/L	29000	1500	<50	<50	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Ba	µg/L	---	---	6.7	6.1	6	6.2	8	7.9	9.3	8.5	8.7	9.4	10	9.8	11	12	12	15	12	12
Be	µg/L	---	---	<0.10	<0.10	<0.40	<0.40	<0.40	<0.40	<0.10	<0.10	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Bi	µg/L	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ca	µg/L	---	---	3380	3240	3000	2900	5100	5100	5180	5120	5500	5700	5200	5400	9800	10000	8700	9600	9200	9500
Cd	µg/L	0.11, variable, 7.7(6)	0.04, variable, 0.37(6)	<0.010	<0.010	<0.090	<0.090	<0.090	<0.090	<0.010	<0.010	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090
Co	µg/L	---	---	<0.20	<0.20	<0.50	<0.50	<0.50	<0.50	<0.20	<0.20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Cr	µg/L	---	---	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cs	µg/L	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Cu	µg/L	---	2, variable, 4, 2(7)	0.65	0.95	<0.90	<0.90	<0.20	<0.20	<0.50	1.45	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	<0.90	1	0.98	1.1
Fe	µg/L	---	300	111	59.5	<100	<100	<0.90	<0.90	52	34.8	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Hg	µg/L	---	0.026	<0.01	<0.01	<0.00010	<0.10	160	<100	<0.01	<0.01	<0.00010	<0.10	<0.00010	<0.10	<0.00010	<0.10	<0.00010	<0.10	<0.00010	<0.10
K	µg/L	---	---	647	620	620	690	<0.00010	<0.10	1110	1050	1000	1100	1000	1100	840	910	1200	1300	960	1000
Li	µg/L	---	---	<2.0	<2.0	<5.0	<5.0	760	840	<2.0	<2.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Mg	µg/L	---	---	1340	1270	930	990	<5.0	<5.0	1480	1550	1500	1600	1500	1500	4700	4900	3700	3900	3800	3800
Mn	µg/L	Equation(8)	Variable(9)	11.4	5	6.3	6.5	2100	2200	16.4	16.7	11	21	26	7.2	6.4	2	35	51	27	14
Mo	µg/L	---	73	<1.0	<1.0	<0.50	<0.50	13	5.1	<1.0	<1.0	<0.50	0.7	0.82	0.53	<0.50	0.51	<0.50	0.56	<0.50	<0.50
Na	µg/L	---	---	544	469	530	560	<0.50	<0.50	2120	2100	2000	2100	2200	2200	420	430	600	660	820	830
Ni	µg/L	---	25, variable, 150, 25(10)	<1.0	<1.0	<1.0	<1.0	580	610	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
P	µg/L	---	4 ug/L	---	---	<0.020	<100	<1.0	<1.0			---	<100	<0.020	<100	<0.020	<100	<0.020	<100	<0.020	<100
Pb	µg/L	---	1, variable, 7, 1(11)	<0.20	<0.20	<0.50	<0.50	<0.020	<100	<0.20	<0.20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Rb	µg/L	---	---	---	---	---	---	<0.50	<0.50	---	---	---	---	1.9	2.1	1.5	1.5	1.2	1.3	1.7	1.6
S	mg/L	---	---	<3.0	<3.0	---	---	1.9	1.9	<3.0	<3.0	---	---	---	---	---	---	---	---	---	---
Sb	µg/L	---	---	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Se	µg/L	---	1	<0.10	<0.10	<2.0	<2.0	<2.0	<2.0	<0.10	<0.10	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Si	µg/L	---	---	1100	964	810	860	1200	1200	2110	2200	1800	2000	2000	2000	1600	1700	2000	2100	1800	1800
Sn	µg/L	---	---	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sr	µg/L	---	---	9.9	9.4	11	11	14	14	15.6	15.2	16	16	16	16	13	13	13	13	16	16
Te	µg/L	---	---	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Th	µg/L	---	---	---	---	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ti	µg/L	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tl	µg/L	---	0.8	<0.010	<0.010	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
U	µg/L	33	15	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
V	µg/L	---	---	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
W	µg/L	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Y	µg/L	---	---	<3.2	<2.0	<2.0	<2.0	<2.0	<2.0	<3.2	<2.0	---	---	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Zn	µg/L	Variable(12)	Variable(13)	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Zr	µg/L	---	---	---	---	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Notes:
- For notes 1 to 13, Refer to "Notes for Tables E-2 to E-8"

0.1 – Shaded cell denotes a value that is greater than the Canadian Council of Ministers of the Environment (CCME) short term concentration; bold cell denotes a value that is greater than the CCME long term concentration

< = less than

PARAMETER	UNIT	CCME Guideline[1–13]		Lake Column at Daviault Lake								Lake Column at Long Lake																							
				DL-02 NS				DL-02 NB				LL-02 NS								LL-02 NB								LL-03 NS				LL-03 NB			
GENERAL PARAMETERS		Short Term	Long Term	9-Aug-2023		22-Oct-2023		9-Aug-2023		22-Oct-2023		15-Jun-2023		3-Aug-2023		15-Aug-2023		24-Oct-2023		15-Jun-2023		3-Aug-2023		15-Aug-2023		24-Oct-2023		15-Aug-2023		24-Oct-2023		15-Aug-2023		24-Oct-2023	
Field pH		---	6.5 to 9	7.53		7.25		6.56		7.28		7.53		---		7.65		7.57		7.41		---		6.60		7.56		7.80		7.67		7.08		7.52	
Field Temperature	Celsius	---	Narrative[2]	16.6		7.1		7.4		7.2		20.6		---		17.0		7.6		13.9		---		8.0		7.6		17.5		7.5		9.1		7.2	
Lab pH		---	---	7.18		7.47		6.98		7.48		7.59		7.67		7.46		7.73		7.43		7.57		7.19		7.75		7.48		7.70		7.27		7.68	
Bicarb. Alkalinity	mg/L as $CaCO_3$	---	---	---		---		---		---		---		35		---		---		---		34		---		---		---		---		---		---	
Carb. Alkalinity	mg/L as $CaCO_3$	---	---	---		---		---		---		---		<1.0		---		---		---		<1.0		---		---		---		---		---		---	
Total Alkalinity	mg/L as $CaCO_3$	---	---	17		17		17		17		32		35		34		34		32		34		34		34		33		34		33		33	
Acidity	mg/L as $CaCO_3$	---	---	<5.0		<5.0		<5.0		<5.0		<5.0		<5.0		---		<5.0		<5.0		<5.0		<5.0		<5.0		<5.0		<5.0		<5.0		<5.0	
Conductivity	µS/cm	---	---	52		54		51		54		69		72		73		73		71		71		73		73		69		70		69		70	
Salinity		---	---	---		---		---		---		---		<2.0		---		---		---		<2.0		---		---		---		---		---		---	
Turbidity	NTU	---	---	4.33		1.2		2		0		---		0.4		0		0.25		---		0.4		0		0		0.07		0.2		0		0	
Calculated TDS	mg/L	---	---	---		---		---		---		---		40		---		---		---		40		---		---		---		---		---		---	
TDS	mg/L	---	---	50		---		60		---		95		41		65		---		75		46		55		---		60		---		50		---	
TSS	mg/L	---	---	<10		<10		<10		<10		<1		<1.0		<10		<10		18		1.2		<10		<10		<10		<10		<10		<10	
Dissolved Hardness	mg/L as $CaCO_3$	---	---	---		---		---		---		31.9		---		---		---		33.0		---		---		---		---		---		---		---	
Total Hardness	mg/L as $CaCO_3$	---	---	19		---		20		---		31.1		35		36		---		33.8		36		36		---		34		---		33		---	
DOC	mg/L	---	---	3.5		---		3.4		---		3.5		3.3		3.2		---		3.5		3.4		3.2		---		3.5		---		3.3		---	
TOC	mg/L	---	---	---		---		---		---		---		4.3		---		---		---		4.2		---		---		---		---		---		---	
Colour	TCU	---	---	---		---		---		---		16		10		---		---		13		13		---		---		---		---		---		---	
ANIONS & NUTRIENTS		Short Term	Long Term																																
Anion Sum	me/L	---	---	---		---		---		---		---		0.754		---		---		---		0.737		---		---		---		---		---		---	
Cation Sum	me/L	---	---	---		---		---		---		---		0.755		---		---		---		0.765		---		---		---		---		---		---	
Ion Balance (% Difference)	%	---	---	---		---		---		---		---		---		---		---		---		---		---		---		---		---		---		---	
Langelier Index (@ 20C)		---	---	---		---		---		---		---		-1.180		---		---		---		-1.280		---		---		---		---		---		---	
Langelier Index (@ 4C)		---	---	---		---		---		---		---		-1.430		---		---		---		-1.530		---		---		---		---		---		---	
Saturation pH (@ 20C)		---	---	---		---		---		---		---		8.84		---		---		---		8.85		---		---		---		---		---		---	
Saturation pH (@ 4C)		---	---	---		---		---		---		---		9.1		---		---		---		9.1		---		---		---		---		---		---	
Fluoride	mg/L as F-	---	---	<0.10		---		<0.10		---		---		<0.10		<0.10		---		---		<0.10		<0.10		---		<0.10		---		<0.10		---	
Dissolved Chloride	mg/L as Cl-	640	120	2.3		---		1.5		---		<0.10		<1.0		<1.0		---		<0.10		<1.0		<1.0		---		<1.0		---		<1.0		---	
Dissolved Bromide	mg/L as Br-	---	---	<1.0		---		<1.0		---		<1.0		<1.0		<1.0		---		<1.0		<1.0		<1.0		---		<1.0		---		<1.0		---	
Dissolved Sulphate	mg/L as SO_4	---	---	3.7		---		3.3		---		<1.0		2.8		3.2		---		<1.0		2.7		3.8		---		3.7		---		3.6		---	
Total Ammonia	mg/L as NH_3	---	2.22, variable, 3.26 ug/L[3]	<0.061		---		<0.061		---		2.9		---		<0.061		---		2.5		---		0.098		---		<0.061		---		<0.061		---	
Total Ammonia	mg/L as N	---	---	<0.050		---		<0.050		---		<0.061		<0.050		<0.050		---		<0.061		<0.050		0.08		---		<0.050		---		<0.050		---	
Dissolved Nitrate	mg/L as N	---	---	---		---		---		---		<0.050		---		---		---		<0.050		---		---		---		---		---		---		---	
Dissolved Nitrate	mg/L as NO_3	---	---	---		---		---		---		---		---		---		---		---		---		---		---		---		---		---		---	
Dissolved Nitrite	mg/L as NO_2	---	---	---		---		---		---		---		---		---		---		---		---		---		---		---		---		---		---	
Dissolved Nitrite	mg/L as N	---	---	---		---		---		---		---		---		---		---		---		---		---		---		---		---		---		---	
Nitrite	mg/L as N	---	0.06	<0.010		---		<0.010		---		---		<0.10		<0.010		---		---		<0.10		<0.010		---		<0.010		---		<0.010		---	
Nitrate	mg/L as N	550	13	<0.10		---		<0.10		---		<0.010		<0.010		<0.010		---		<0.010		<0.010		<0.10		---		<0.10		---		<0.10		---	
Total Phosphorus	mg/L	---	Guidance Framework[4]	---		---		---		---		<0.10				---		---		<0.10				---		---		---		---		---		---	
Nitrate + Nitrite	mg/L as N	---	---	<0.10		---		<0.10		---		0.009		<0.10		<0.010		---		0.025		<0.10		<0.10		---		<0.10		---		<0.10		---	
Dissolved Nitrate + Nitrite	mg/L as N	---	---	---		---		---		---		<0.050		---		---		---		<0.050		---		---		---		---		---		---		---	
Total Un-ionized Ammonia	mg/L	---	19	<0.00063		---		<0.00061		---		---		---		<0.00085		---		---		---		<0.00061		---		<0.0012		---		<0.00061		---	
Orthophosphate	mg/L as P	---	---	---		---		---		---		<0.00084		<0.010		<0.010		---		<0.00061		<0.010		<0.010		---		<0.010		---		<0.010		---	
Reactive Silica	mg/L as SiO_2	---	---	---		---		---		---		<0.010		2.5		---		---		<0.010		2.9		---		---		---		---		---		---	
METALS		Short Term	Long Term	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total[14]	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
Ag	µg/L	---	0.25	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.020	<0.020	<0.090	<0.090	<0.090	<0.090	---	---	<0.020	<0.020	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090
Al	µg/L	---	5, 100[5]	18	**170**	28	13	19	9.7	29	12	22	17.9	15	9.5	13	7.9	---	---	**313**	11.2	17	9.4	20	6.5	17	8.2	16	9.1	20	8.1	12	13	18	9.1
As	µg/L	---	5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.10	<0.10	<1.0	<1.0	<1.0	<1.0	---	---	0.24	<0.10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
B	µg/L	29000	1500	<10	<10	<10	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	---	---	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Ba	µg/L	---	---	8.1	8.3	9.4	9.2	7.7	7.8	9.2	8.7	9.3	9.1	9.2	9.5	10	10	---	---	44.5	11.5	9.7	9.7	12	12	11	10	9.5	9.4	12	10	10	11	9.9	9.8
Be	µg/L	---	---	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.10	<0.10	<0.40	<0.40	<0.40	<0.40	---	---	<0.10	<0.10	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Bi	µg/L	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ca	µg/L	---	---	5200	5200	5200	5400	5400	5500	5100	5200	7460	7480	8500	8200	8700	8300	---	---	7940	7630	8400	8300	8500	8400	8800	8300	7500	8000	8600	7700	8000	7700	7400	7500
Cd	µg/L	0.11, variable, 7.7[6]	0.04, variable, 0.37[6]	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.010	<0.010	<0.090	<0.090	<0.090	<0.090	---	---	0.025	<0.010	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090
Co	µg/L	---	---	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.20	<0.20	<0.50	<0.50	<0.50	<0.50	---	---	0.33	<0.20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Cr	µg/L	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	---	---	1.1	<1.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cs	µg/L	---	---	---	---	<0.20	<0.20	---	---	<0.20	<0.20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	<0.20	---	---	<0.20	<0.20	---	---	<0.20	<0.20
Cu	µg/L	---	2, variable, 4, 2[7]	<0.90	1.6	<0.90	<0.90	<0.90	<0.90	<0.90	1.3	<0.50	1.66	<0.90	<0.90	<0.90	1.4	---	---	1.24	1.13	<0.90	<0.90	<0.90	1	<0.90	<0.90	<0.90	1.3	<0.90	1.1	1.6	<0.90	<0.90	1.2
Fe	µg/L	---	300	<100	<100	<100	<100	<100	<100	<100	<100	45	22.2	<100	<100	<100	<100	---	---	**1480**	26.7	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Hg	µg/L	---	0.026	<0.00010	<0.10	<0.00010	<0.10	<0.00010	<0.10	<0.00010	<0.10	<0.01	<0.01	---	---	<0.00010	<0.10	---	---	<0.01	<0.01	---	---	<0.00010	<0.10	<0.00010	<0.10	<0.00010	<0.10	<0.00010	<0.10	<0.00010	<0.10	<0.00010	<0.10
K	µg/L	---	---	990	1000	1000	1100	1100	1100	1000	1100	830	812	940	910	880	970	---	---	888	824	890	950	890	910	960	880	840	910	970	870	890	820	850	860
Li	µg/L	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<5.0	---	---	<2.0	<2.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Mg	µg/L	---	---	1500	1500	1500	1500	1600	1600	1500	1500	3020	3220	3600	3600	3600	3600	---	---	3390	3400	3600	3700	3600	3600	3500	3400	3200	3400	3400	3200	3400	3300	3200	3000
Mn	µg/L	Equation[8]	Variable[9]	6.2	2.9	22	4.7	19	4.3	23	4.8	6.8	<1.0	7	<2.0	8.7	<2.0	---	---	**1110**	47.5	13	<2.0	22	<2.0	12	<2.0	7.1	<2.0	12	<2.0	<2.0	10	10	<2.0
Mo	µg/L	---	73	0.55	0.58	<0.50	0.56	0.51	0.55	0.53	0.51	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	---	---	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Na	µg/L	---	---	1800	1700	2000	2200	1800	1800	2000	2100	496	476	570	540	600	610	---	---	497	473	540	540	590	520	550	550	550	540	600	550	540	490	560	540
Ni	µg/L	---	25, variable, 150, 25[10]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
P	µg/L	---	4 ug/L	<0.020	<100	<0.020	<100	<0.020	<100	<0.020	<100	---	---	<0.020	<100	<0.020	<100	<0.020	---	---	---	<0.020	<100	<0.020	<100	<0.020	<100	<0.020	<100	<0.020	<100	<0.020	<100	<0.020	<100
Pb	µg/L	---	1, variable, 7, 1[11]	0.56	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.20	<0.20	<0.50	<0.50	<0.50	<0.50	---	---	0.78	<0.20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Rb	µg/L	---	---	---	---	1.9	2	---	---	2	2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1.9	1.8	---	---	2	1.8	---	---	1.7	1.8
S	mg/L	---	---	---	---	---	---	---	---	---	---	<3.0	<3.0	---	---	---	---	---	---	<3.0	<3.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sb	µg/L	---	---	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---	---	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Se	µg/L	---	1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.10	<0.10	<2.0	<2.0	<2.0	<2.0	---	---	<0.10	<0.10	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Si	µg/L	---	---	1800	1700	2000	2000	2300	2400	2000	2000	1530	1560	1500	1400	1400	1500	---	---	2280	1740	1700	1600	1900	1900	1500	1500	1300	1400	1500	1400	1700	1600	1400	1400
Sn	µg/L	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	---	---	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sr	µg/L	---	---	15	15	16	16	15	14	16	16	11.5	11.6	13	13	13	13	---	---	12.4	11.6	13	13	13	13	13	13	13	13	14	13	12	12	13	13
Te	µg/L	---	---	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0			<1.0	<1.0	<2.0	<2.0	---	---	---	---	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Th	µg/L	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	---	---	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ti	µg/L	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	---	---	12.3	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tl	µg/L	---	0.8	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010	<0.050	<0.050	<0.050	<0.050	---	---	<0.010	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
U	µg/L	33	15	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.11	<0.010	0.11	0.11	0.11	0.11	---	---	0.31	<0.10	0.11	<0.10	0.1	<0.10	0.11	0.11	0.11	0.11	0.11	<0.10	<0.10	<0.10	0.1	0.11
V	µg/L	---	---	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	---	---	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
W	µg/L	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Y	µg/L	---	---	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<3.2	<2.0	---	---	<2.0	<2.0	<2.0	<2.0	<3.2	<2.0	---	---	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Zn	µg/L	Variable[12]	Variable[13]	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	---	---	5.5	<5.0	<5.0	<5.0	6.9	6	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Zr	µg/L	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	---	---	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Notes:

- For notes 1 to 13, Refer to "Notes for Tables E-2 to E-8"

0.1 − Shaded cell denotes a value that is greater than the Canadian Council of Ministers of the Environment (CCME) short term concentration; bold cell denotes a value that is greater than the CCME long term concentration

< = less than

PARAMETER	UNIT	CCME Guideline(1–13)		Lake Column at Mills Lake											
				MIL-02 NS				MIL-02 NB				MIL-03 NS		MIL-03 NB	
GENERAL PARAMETERS		Short Term	Long Term	14-Jun-2023	31-Jul-2023	13-Aug-2023	22-Oct-2023	14-Jun-2023	3-Aug-2023	13-Aug-2023	21-Oct-2023	14-Aug-2023	21-Oct-2023	14-Aug-2023	21-Oct-2023
Field pH		---	6.5 to 9	7.55	---	7.73	7.65	7.63	---	6.82	7.25	7.59	7.68	6.85	7.30
Field Temperature	Celsius	---	Narrative(2)	20.3	---	17.5	8.8	15.8	---	8.2	8.9	17.3	9.1	7.5	9.0
Lab pH		---	---	7.61	7.46	7.43	7.69	7.60	7.76	7.39	7.74	7.45	---	7.35	---
Bicarb. Alkalinity	mg/L as $CaCO_3$	---	---	---	35	---	---	---	39	---	---	---	---	---	---
Carb. Alkalinity	mg/L as $CaCO_3$	---	---	---	<1.0	---	---	---	<1.0	---	---	---	---	---	---
Total Alkalinity	mg/L as $CaCO_3$	---	---	34	35	35	31	34	36	36	36	36	---	36	---
Acidity	mg/L as $CaCO_3$	---	---	<5.0	<5.0	---	<5.0	<5.0	<5.0	---	<5.0	---	---	---	---
Conductivity	µS/cm	---	---	73	74	73	64	73	77	73	75	74	---	74	---
Salinity		---	---	---	<2.0	---	---	---	<2.0	---	---	---	---	---	---
Turbidity	NTU	---	---	---	0.30	0.21	0.19	---	0.20	0.04	0.00	0.25	0.21	0.02	0.00
Calculated TDS	mg/L	---	---	---	42	---	---	---	43	---	---	---	---	---	---
TDS	mg/L	---	---	75	41	50	40	75	42	60	---	40	45	45	40
TSS	mg/L	---	---	<1	<1.0	<10	<10	<1	<1.0	<10	<10	<10	---	<10	---
Dissolved Hardness	mg/L as $CaCO_3$	---	---	34	---	---	---	34	---	---	---	---	---	---	---
Total Hardness	mg/L as $CaCO_3$	---	---	33	38	38	---	32	38	36	---	37	38	37	39
DOC	mg/L	---	---	3.1	3.2	3.0	---	3.2	3.2	2.7	---	3.1	3.0	2.9	3.1
TOC	mg/L	---	---	---	4.3	---	---	---	4.3	---	---	---	---	---	---
Colour	TCU	---	---	9	7	---	---	9	7	---	---	---	---	---	---
ANIONS & NUTRIENTS		Short Term	Long Term												
Anion Sum	me/L	---	---	---	---	---	---	---	0.830	---	---	---	---	---	---
Cation Sum	me/L	---	---	---	---	---	---	---	0.784	---	---	---	---	---	---
Ion Balance (% Difference)	%	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Langelier Index (@ 20C)		---	---	---	---	---	---	---	-1.03	---	---	---	---	---	---
Langelier Index (@ 4C)		---	---	---	---	---	---	---	-1.28	---	---	---	---	---	---
Saturation pH (@ 20C)		---	---	---	---	---	---	---	8.79	---	---	---	---	---	---
Saturation pH (@ 4C)		---	---	---	---	---	---	---	9.04	---	---	---	---	---	---
Fluoride	mg/L as F-	---	---	---	---	<0.10	<0.10	---	<0.10	<0.10	---	<0.10	<0.10	<0.10	<0.10
Dissolved Chloride	mg/L as Cl-	640	120	<0.10	<1.0	<1.0	<1.0	<0.10	<1.0	<1.0	---	<1.0	<1.0	<1.0	<1.0
Dissolved Bromide	mg/L as Br-	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	<1.0	<1.0	<1.0	<1.0
Dissolved Sulphate	mg/L as SO_4	---	---	<1.0	2.8	3.1	2.7	<1.0	2.3	3.0	---	3.1	2.8	3.0	2.7
Total Ammonia	mg/L as NH_3	---	2.22, variable, 3.26 ug/L(3)	2.9	---	<0.061	---	2.9	---	<0.061	---	<0.061	---	<0.061	---
Total Ammonia	mg/L as N	---	---	<0.061	<0.050	<0.050	<0.050	<0.061	<0.050	<0.050	---	<0.050	<0.050	<0.050	<0.050
Dissolved Nitrate	mg/L as N	---	---	<0.050	---	---	---	<0.050	---	---	---	---	---	---	---
Dissolved Nitrate	mg/L as NO_3	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Dissolved Nitrite	mg/L as NO_2	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Dissolved Nitrite	mg/L as N	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Nitrite	mg/L as N	---	0.06	---	<0.10	<0.010	<0.010	---	<0.10	<0.010	---	<0.010	<0.010	<0.010	<0.010
Nitrate	mg/L as N	550	13	<0.010	<0.010	<0.010	<0.10	<0.010	<0.010	0.02	---	0.013	<0.10	0.038	<0.10
Total Phosphorus	mg/L	---	Guidance Framework(4)	<0.10	---	---	---	<0.10	---	---	---	---	---	---	---
Nitrate + Nitrite	mg/L as N	---	---	<0.004	<0.10	<0.010	<0.10	<0.004	<0.10	0.020	---	0.013	<0.10	0.038	<0.10
Dissolved Nitrate + Nitrite	mg/L as N	---	---	<0.050	---	---	---	<0.050	---	---	---	---	---	---	---
Total Un-ionized Ammonia	mg/L	---	19	---	---	<0.0011	<0.00061	---	---	<0.00061	---	<0.00076	<0.0005	<0.00061	<0.00061
Orthophosphate	mg/L as P	---	---	<0.00086	<0.010	---	---	<0.00075	<0.010	---	---	---	---	---	---
Reactive Silica	mg/L as SiO_2	---	---	<0.010	3.4	---	---	<0.010	3.8	---	---	---	---	---	---

PARAMETER	UNIT	CCME Guideline(1–13)		MIL-02 NS 14-Jun-2023		MIL-02 NS 31-Jul-2023		MIL-02 NS 13-Aug-2023		MIL-02 NS 22-Oct-2023		MIL-02 NB 14-Jun-2023		MIL-02 NB 3-Aug-2023		MIL-02 NB 13-Aug-2023		MIL-02 NB 21-Oct-2023		MIL-03 NS 14-Aug-2023		MIL-03 NS 21-Oct-2023		MIL-03 NB 14-Aug-2023		MIL-03 NB 21-Oct-2023	
METALS		Short Term	Long Term	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
Ag	µg/L	---	0.25	<0.020	<0.020	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.020	<0.020	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	---	---	<0.090	<0.090	---	---
Al	µg/L	---	5, 100(5)	8.3	5.8	9.4	6.6	8.8	5.3	9.4	6.9	9.3	5.5	7.8	6	7.7	<4.9	6.7	<4.9	8.1	5.5	---	---	24	<4.9	---	---
As	µg/L	---	5	<0.10	<0.10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.10	<0.10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	---	---
B	µg/L	29000	1500	<50	<50	<10	<10	<10	<10	<10	<10	<50	<50	<10	<10	<10	<10	<10	<10	<10	<10	---	---	<10	<10	---	---
Ba	µg/L	---	---	8.9	8.5	9.2	9.9	10	9.3	8	8.5	8.6	8.6	9.4	9	9.5	9	8.8	11	9.2	9.7	---	---	9.5	9.2	---	---
Be	µg/L	---	---	<0.10	<0.10	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.10	<0.10	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	---	---	<0.40	<0.40	---	---
Bi	µg/L	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	---	---
Ca	µg/L	---	---	7830	7900	8700	8700	8500	8900	6600	6900	7640	7850	8600	8300	8600	8400	7900	8500	8200	8700	---	---	8700	8500	---	---
Cd	µg/L	0.11, variable, 7.7(6)	0.04, variable, 0.37(6)	<0.010	<0.010	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.010	<0.010	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	---	---	<0.090	<0.090	---	---
Co	µg/L	---	---	<0.20	<0.20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.20	<0.20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---	---	<0.50	<0.50	---	---
Cr	µg/L	---	---	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	---	---	<5.0	<5.0	---	---
Cs	µg/L	---	---	---	---	---	---	---	---	<0.20	<0.20	---	---	---	---	---	---	<0.20	<0.20	---	---	---	---	---	---	---	---
Cu	µg/L	---	2, variable, 4, 2(7)	<0.50	0.24	<0.90	<0.90	<0.90	1.4	<0.90	0.93	<0.50	1.03	<0.90	<0.90	<0.90	2	<0.90	1.2	<0.90	1.4	---	---	<0.90	1.1	---	---
Fe	µg/L	---	300	14	5.9	<100	<100	<100	<100	<100	<100	12	8.6	<100	<100	<100	<100	<100	<100	<100	<100	---	---	<100	<100	---	---
Hg	µg/L	---	0.026	<0.01	<0.01	---	---	<0.00010	<0.10	<0.00010	<0.10	<0.01	<0.01	---	---	<0.00010	<0.10	<0.00010	<0.10	<0.00010	<0.10	---	---	<0.00010	<0.10	---	---
K	µg/L	---	---	895	854	930	1000	860	980	980	1000	880	855	920	980	870	930	840	910	790	960	---	---	820	920	---	---
Li	µg/L	---	---	<2.0	<2.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	---	---	<5.0	<5.0	---	---
Mg	µg/L	---	---	3240	3530	3800	4000	3600	3700	2700	2700	3220	3510	3800	3900	3600	3600	3500	3700	3400	3700	---	---	3500	3700	---	---
Mn	µg/L	Equation(8)	Variable(9)	4.3	1.1	3.6	<2.0	5.1	<2.0	3.2	<2.0	5.4	<1.0	3	<2.0	4.5	<2.0	4.6	<2.0	4.3	<2.0	---	---	4.7	<2.0	---	---
Mo	µg/L	---	73	<1.0	<1.0	0.66	0.66	0.62	0.75	0.62	0.66	<1.0	<1.0	0.58	0.62	0.51	0.55	0.69	0.77	0.59	0.71	---	---	0.54	0.52	---	---
Na	µg/L	---	---	568	534	590	630	550	660	670	690	538	543	590	630	580	590	520	590	530	640	---	---	550	610	---	---
Ni	µg/L	---	25, variable, 150, 25(10)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	---	---
P	µg/L	---	4 ug/L	---	---	<0.020	<100	<0.020	<100	<0.020	<100	---	---	<0.020	<100	<0.020	<100	<0.020	<100	<0.020	<100	---	---	<0.020	<100	---	---
Pb	µg/L	---	1, variable, 7, 1(11)	<0.20	<0.20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.20	<0.20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---	---	<0.50	<0.50	---	---
Rb	µg/L	---	---	---	---	---	---	---	---	1.3	1.3	---	---	---	---	---	---	1.7	1.6	---	---	---	---	---	---	---	---
S	mg/L	---	---	<3.0	<3.0	---	---	---	---	---	---	<3.0	<3.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sb	µg/L	---	---	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---	---	<0.50	<0.50	---	---
Se	µg/L	---	1	<0.10	<0.10	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.10	<0.10	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	---	---	<2.0	<2.0	---	---
Si	µg/L	---	---	1850	1850	1800	1700	1700	1900	1600	1700	1800	1880	1900	1800	1900	2000	1700	1800	1600	1800	---	---	1900	2000	---	---
Sn	µg/L	---	---	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	---	---
Sr	µg/L	---	---	11.4	11.4	12	12	12	12	13	13	11.2	11.3	13	12	12	12	12	12	12	12	---	---	12	12	---	---
Te	µg/L	---	---	---	---	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	---	---	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	---	---	<2.0	<2.0	---	---
Th	µg/L	---	---	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	---	---
Ti	µg/L	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	---	---	<5.0	<5.0	---	---
Tl	µg/L	---	0.8	<0.010	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	---	---	<0.050	<0.050	---	---
U	µg/L	33	15	<0.10	<0.10	0.15	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	---	---	<0.10	<0.10	---	---
V	µg/L	---	---	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---	---	<0.50	<0.50	---	---
W	µg/L	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	---	---
Y	µg/L	---	---	<3.2	<2.0	---	---	<2.0	<2.0	---	---	<3.2	<2.0	---	---	<2.0	<2.0	---	---	<2.0	<2.0	---	---	<2.0	<2.0	---	---
Zn	µg/L	Variable(12)	Variable(13)	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	---	---	<5.0	<5.0	---	---
Zr	µg/L	---	---	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	---	---

Notes:
- For notes 1 to 13, Refer to "Notes for Tables E-2 to E-8"

0.1 – Shaded cell denotes a value that is greater than the Canadian Council of Ministers of the Environment (CCME) short term concentration; bold cell denotes a value that is greater than the CCME long term concentration

< = less than

PARAMETER	UNIT	CCME Guideline[1–13]		Lake Column at Molar Lake				Lake Column at Pike Lake						Lake Column at Riordan Lake			
				MOL-02 NS		MOL-02 NB		PL-02 NS			PL-02 NB			RL-02 NS		RL-02 NB	
GENERAL PARAMETERS		**Short Term**	**Long Term**	13-Aug-2023	22-Oct-2023	13-Aug-2023	22-Oct-2023	12-Jun-2023	12-Aug-2023	19-Oct-2023	12-Jun-2023	12-Aug-2023	19-Oct-2023	16-Aug-2023	23-Oct-2023	16-Aug-2023	23-Oct-2023
Field pH		---	6.5 to 9	7.70	7.62	**6.45**	7.09	7.95	7.64	7.44	7.97	7.13	7.41	7.96	7.54	6.98	7.75
Field Temperature	Celsius	---	Narrative[2]	17.4	8.3	6.3	8.1	25.1	17.4	7.3	18.6	9.2	7.3	16.6	7.4	9.1	7.1
Lab pH		---	---	7.37	---	7.20	7.71	7.54	7.40	---	7.53	7.29	---	7.61	7.86	7.38	7.87
Bicarb. Alkalinity	mg/L as $CaCO_3$	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Carb. Alkalinity	mg/L as $CaCO_3$	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Total Alkalinity	mg/L as $CaCO_3$	---	---	30	---	29	30	32	38	---	32	41	---	45	45	43	40
Acidity	mg/L as $CaCO_3$	---	---	---	---	---	<5.0	<5.0	---	---	<5.0	<5.0	---	---	<5.0	---	<5.0
Conductivity	µS/cm	---	---	62	---	62	64	71	79	---	72	85	---	88	88	86	88
Salinity		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Turbidity	NTU	---	---	0.00	0.32	0.00	0.00	---	0.02	0.10	---	0.00	0.00	0.21	0.10	0.32	0.00
Calculated TDS	mg/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TDS	mg/L	---	---	35	---	45	---	95	50	20	75	60	20	40	---	65	---
TSS	mg/L	---	---	<10	---	<10	<10	1	<10	---	1	<10	---	<10	<10	<10	<10
Dissolved Hardness	mg/L as $CaCO_3$	---	---	---	---	---	---	32.5	---	---	32.6	---	---	---	---	---	---
Total Hardness	mg/L as $CaCO_3$	---	---	29	---	30	---	31.5	38	41	33.0	39	39	45	---	44	---
DOC	mg/L	---	---	3.2	---	3.1	---	4.9	4.4	4.8	3.9	4.3	4.8	3.1	---	2.8	---
TOC	mg/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Colour	TCU	---	---	---	---	---	---	16	---	---	16	---	---	---	---	---	---
ANIONS & NUTRIENTS		**Short Term**	**Long Term**														
Anion Sum	me/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cation Sum	me/L	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Ion Balance (% Difference)	%	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Langelier Index (@ 20C)		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Langelier Index (@ 4C)		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Saturation pH (@ 20C)		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Saturation pH (@ 4C)		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Fluoride	mg/L as F-	---	---	<0.10	---	<0.10	---	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	---	<0.10	---
Dissolved Chloride	mg/L as Cl-	640	120	<1.0	---	<1.0	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	<1.0	---
Dissolved Bromide	mg/L as Br-	---	---	<1.0	---	<1.0	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	<1.0	---
Dissolved Sulphate	mg/L as SO_4	---	---	3.1	---	2.9	---	3.0	3.8	4.0	3.8	4.4	3.5	3.4	---	3.8	---
Total Ammonia	mg/L as NH_3	---	2.22, variable, 3.26 ug/L[3]	<0.061	---	<0.061	---	<0.061	<0.061	---	<0.061	0.15	---	<0.061	---	<0.061	---
Total Ammonia	mg/L as N	---	---	<0.050	---	<0.050	---	<0.050	<0.050	<0.050	<0.050	0.12	<0.050	<0.050	---	<0.050	---
Dissolved Nitrate	mg/L as N	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Dissolved Nitrate	mg/L as NO_3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Dissolved Nitrite	mg/L as NO_2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Dissolved Nitrite	mg/L as N	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Nitrite	mg/L as N	---	0.06	<0.010	---	<0.010	---	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	---	<0.010	---
Nitrate	mg/L as N	550	13	<0.010	---	0.053	---	<0.10	<0.050	<0.10	<0.10	<0.10	<0.10	<0.10	---	<0.10	---
Total Phosphorus	mg/L	---	Guidance Framework[4]	---	---	---	---	<0.004	---	---	0.004	---	---	---	---	---	---
Nitrate + Nitrite	mg/L as N	---	---	<0.010	---	0.053	---	<0.050	<0.050	---	<0.050	<0.10	---	<0.10	---	<0.10	---
Dissolved Nitrate + Nitrite	mg/L as N	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Total Un-ionized Ammonia	mg/L	---	19	<0.00098	---	<0.00061	---	<0.003	<0.00086	<0.00061	<0.002	<0.00061	<0.00061	<0.0017	---	<0.00061	---
Orthophosphate	mg/L as P	---	---	<0.010	---	<0.010	---	<0.010	<0.010	---	<0.010	<0.010	---	<0.010	---	<0.010	---
Reactive Silica	mg/L as SiO_2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

PARAMETER	UNIT	CCME Guideline[1–13]		MOL-02 NS 13-Aug-2023		MOL-02 NS 22-Oct-2023		MOL-02 NB 13-Aug-2023		MOL-02 NB 22-Oct-2023		PL-02 NS 12-Jun-2023		PL-02 NS 12-Aug-2023		PL-02 NS 19-Oct-2023		PL-02 NB 12-Jun-2023		PL-02 NB 12-Aug-2023		PL-02 NB 19-Oct-2023		RL-02 NS 16-Aug-2023		RL-02 NS 23-Oct-2023		RL-02 NB 16-Aug-2023		RL-02 NB 23-Oct-2023	
METALS		**Short Term**	**Long Term**	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
Ag	µg/L	---	0.25	<0.090	<0.090	---	---	<0.090	<0.090	<0.090	<0.090	<0.020	<0.020	<0.090	<0.090	---	---	---	---	---	---	---	---	---	---	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090
Al	µg/L	---	5, 100[5]	11	8.4	---	---	**11**	8.4	9.8	6.2	11.4	8.2	12	6.2	---	---	13.4	11	11	5.5	---	---	---	---	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9
As	µg/L	---	5	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<0.10	<0.10	<1.0	<1.0	---	---	<0.10	<0.10	<1.0	<1.0	---	---	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
B	µg/L	29000	1500	<10	<10	---	---	<10	<10	<10	<10	<50	<50	<10	<10	---	---	<50	<50	<10	<10	---	---	---	---	<10	<10	<10	<10	<10	<10
Ba	µg/L	---	---	7.7	8.7	---	---	7.8	8	8	8.3	11.8	11.6	13	13	---	---	12.8	12	23	24	---	---	---	---	13	13	16	17	13	13
Be	µg/L	---	---	<0.40	<0.40	---	---	<0.40	<0.40	<0.40	<0.40	<0.10	<0.10	<0.40	<0.40	---	---	<0.10	<0.10	<0.40	<0.40	---	---	---	---	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Bi	µg/L	---	---	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	---	---	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ca	µg/L	---	---	7000	6900	---	---	7300	7200	6500	7200	8060	8220	9900	9500	---	---	8530	8200	9800	10000	---	---	---	---	9500	9400	9200	9800	8900	9300
Cd	µg/L	0.11, variable, 7.7[6]	0.04, variable, 0.37[6]	<0.090	<0.090	---	---	<0.090	<0.090	<0.090	<0.090	<0.010	<0.010	<0.090	<0.090	---	---	<0.010	<0.010	<0.090	<0.090	---	---	---	---	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090
Co	µg/L	---	---	<0.50	<0.50	---	---	<0.50	<0.50	<0.50	<0.50	<0.20	<0.20	<0.50	<0.50	---	---	<0.20	<0.20	<0.50	<0.50	---	---	---	---	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Cr	µg/L	---	---	<5.0	<5.0	---	---	<5.0	<5.0	<5.0	<5.0	<1.0	<1.0	<5.0	<5.0	---	---	<1.0	<1.0	<5.0	<5.0	---	---	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cs	µg/L	---	---	---	---	---	---	---	---	<0.20	<0.20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	<0.20	<0.20	---	---	<0.20	<0.20
Cu	µg/L	---	2, variable, 4, 2[7]	<0.90	1	---	---	<0.90	1.3	<0.90	1.6	<0.50	0.98	<0.90	1.5	---	---	<0.50	0.61	<0.90	**2.2**	---	---	---	---	<0.90	1.4	1.2	<0.90	<0.90	1.3
Fe	µg/L	---	300	<100	<100	---	---	<100	<100	<100	<100	45	21.9	<100	<100	---	---	71	25.3	<100	<100	---	---	---	---	<100	<100	---	---	<100	<100
Hg	µg/L	---	0.026	<0.00010	<0.10	---	---	<0.00010	<0.10	<0.00010	<0.10	<0.01	<0.01	---	<0.10	---	---	<0.01	<0.01	<0.00010	<0.10	---	---	---	---	<0.00010	<0.10	<0.00010	<0.10	<0.00010	<0.10
K	µg/L	---	---	980	1100	---	---	1000	1100	950	1100	1320	1260	1400	1500	---	---	1350	1280	1400	1500	---	---	---	---	770	790	750	800	720	780
Li	µg/L	---	---	<5.0	<5.0	---	---	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<5.0	<5.0	---	---	<2.0	<2.0	<5.0	<5.0	---	---	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Mg	µg/L	---	---	2800	2800	---	---	2800	2800	2700	2900	2750	2890	3300	3400	---	---	2840	2930	3200	3300	---	---	---	---	4600	4600	4500	4700	4400	4600
Mn	µg/L	Equation[8]	Variable[9]	3.4	<2.0	---	---	3.1	<2.0	4	<2.0	10.6	1	52	4.6	---	---	28.6	4.1	1400	1300	---	---	---	---	16	<2.0	150	200	15	<2.0
Mo	µg/L	---	73	0.59	0.66	---	---	0.51	<0.50	0.66	0.68	<1.0	<1.0	1.1	1	---	---	<1.0	<1.0	1.3	1.4	---	---	---	---	0.54	0.61	0.54	0.63	0.56	0.54
Na	µg/L	---	---	710	760	---	---	730	760	650	740	808	790	870	980	---	---	809	804	840	890	---	---	---	---	410	400	410	480	380	400
Ni	µg/L	---	25, variable, 150, 25[10]	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	---	---	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
P	µg/L	---	4 ug/L	<0.020	<100	---	---	<0.020	<100	<0.020	<100	---	---	0.032	<100	---	---	---	---	<0.020	<100	---	---	<0.020	---	<0.020	<100	<0.020	<100	<0.020	<100
Pb	µg/L	---	1, variable, 7, 1[11]	<0.50	<0.50	---	---	<0.50	<0.50	<0.50	<0.50	<0.20	<0.20	<0.50	<0.50	---	---	<0.20	<0.20	**3.9**	<0.50	---	---	---	---	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Rb	µg/L	---	---			---	---	---	---	1.2	1.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1.3	1.3	---	---	1.3	1.5
S	mg/L	---	---	---	---	---	---	---	---	---	---	<3.0	<0.50	---	---	---	---	<3.0	<0.50	---	---	---	---	---	---	---	---	---	---	---	---
Sb	µg/L	---	---	<0.50	<0.50	---	---	<0.50	<0.50	<0.50	<0.50	<0.50	<2.0	<0.50	<0.50	---	---	<0.50	<3.0	<0.50	<0.50	---	---	---	---	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Se	µg/L	---	1	<2.0	<2.0	---	---	<2.0	<2.0	<2.0	<2.0	<0.10	<0.10	<2.0	<2.0	---	---	<0.10	<0.10	<2.0	<2.0	---	---	---	---	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Si	µg/L	---	---	1500	1600	---	---	1900	2000	1600	1700	1910	2010	2000	2000	---	---	2070	2070	2500	2700	---	---	---	---	1400	1400	1500	1600	1300	1400
Sn	µg/L	---	---	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0	---	---	<5.0	<5.0	<1.0	<1.0	---	---	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sr	µg/L	---	---	13	13	---	---	14	13	13	13	15.5	15.6	20	20	---	---	15.9	16	20	20	---	---	---	---	11	11	11	11	11	11
Te	µg/L	---	---	<2.0	<2.0	---	---	<2.0	<2.0	<2.0	<2.0	---	---	<2.0	<2.0	---	---	---	---	<2.0	<2.0	---	---	---	---	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Th	µg/L	---	---	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	---	---	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ti	µg/L	---	---	<5.0	<5.0	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	---	---	<5.0	<5.0	<5.0	<5.0	---	---	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Tl	µg/L	---	0.8	<0.050	<0.050	---	---	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010	<0.050	<0.050	---	---	<0.010	<0.010	<0.050	<0.050	---	---	---	---	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
U	µg/L	33	15	<0.10	<0.10	---	---	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	---	---	<0.10	<0.10	0.13	0.11	---	---	---	---	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
V	µg/L	---	---	<0.50	<0.50	---	---	<0.50	<0.50	<0.50	<0.50	<5.0	<5.0	<0.50	<0.50	---	---	<5.0	<5.0	<0.50	<0.50	---	---	---	---	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
W	µg/L	---	---	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	---	---	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Y	µg/L	---	---	<2.0	<2.0	---	---	<2.0	<2.0	<2.0	<2.0	<3.2	<2.0	<2.0	<2.0	---	---	<3.2	<2.0	<2.0	<2.0	---	---	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Zn	µg/L	Variable[12]	Variable[13]	<5.0	<5.0	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	---	---	<5.0	<5.0	<5.0	<5.0	---	---	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Zr	µg/L	---	---	<1.0	<1.0	---	---	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	<1.0	---	---	---	---	<1.0	<1.0	---	---	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Notes:
- For notes 1 to 13, Refer to "Notes for Tables E-2 to E-8"

0.1 − Shaded cell denotes a value that is greater than the Canadian Council of Ministers of the Environment (CCME) short term concentration; bold cell denotes a value that is greater than the CCME long term concentration

< = less than

PARAMETER	UNIT	CCME Guideline[1]		Unnamed stream immediately downstream of Long Lake	Unnamed stream reporting to Mills Lake from the west	Unnamed stream immediately downstream of Long Lake	Flows at Walsh River	Lake Column at Long Lake	
				WC-02	WC-03	WC-09	WC-10	LL-02 NS	LL-02 NB
RADIONUCLIDES		**Short Term**	**Long Term**	11-Aug-2023	14-Aug-2023	15-Aug-2023	16-Aug-2023	15-Aug-2023	15-Aug-2023
Polonium-210	Bq/L	---	---	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Lead-210	Bq/L	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Radium-226	Bq/L	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Thorium-230	Bq/L	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
POLYAROMATIC HYDROCARBONS		**Short Term**	**Long Term**						
Benzo(a)pyrene Total Potency Equiv.	µg/L	---	---	0.012	<0.010	<0.010	<0.010	<0.010	<0.010
Acenaphthene	µg/L	---	5.8	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	µg/L	---	---	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Acridine	µg/L	---	4.4	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Anthracene	µg/L	---	0.012	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Benzo(a)anthracene	µg/L	---	0.018	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085
Benzo(b/j)fluoranthene	µg/L	---	---	0.016	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085
Benzo(k)fluoranthene	µg/L	---	---	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085
Benzo(g,h,i)perylene	µg/L	---	---	0.17	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085
Benzo(c)phenanthrene	µg/L	---	---	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(a)pyrene	µg/L	---	0.015	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Benzo(e)pyrene	µg/L	---	---	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chrysene	µg/L	---	---	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085
Dibenzo(a,h)anthracene	µg/L	---	---	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075
Fluoranthene	µg/L	---	0.04	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Fluorene	µg/L	---	3	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Indeno(1,2,3-cd)pyrene	µg/L	---	---	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085
1-Methylnaphthalene	µg/L	---	---	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
2-Methylnaphthalene	µg/L	---	---	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Naphthalene	µg/L	---	1.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenanthrene	µg/L	---	0.4	0.078	<0.050	<0.050	<0.050	<0.050	<0.050
Perylene	µg/L	---	---	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Pyrene	µg/L	---	0.025	0.022	<0.020	<0.020	<0.020	<0.020	<0.020
Quinoline	µg/L	---	3.4	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
SURROGATE RECOVERY		**Short Term**	**Long Term**						
D10-Anthracene	%	---	---	103	104	102	102	99	102
D14-Terphenyl	%	---	---	107	99	93	100	92	97
D8-Acenaphthylene	%	---	---	105	101	98	105	95	101

Notes:

0.1 – Shaded cell denotes a value that is greater than the Canadian Council of Ministers of the Environment (CCME) short term concentration; bold cell denotes a value that is greater than the CCME long term concentration

(1) CCME [Canadian Council of Ministers of the Environment. Water Quality Guidelines for the Protection of Aquatic Life Freshwater, Marine

< = less than

PARAMETER	UNIT	CCME Guideline[1]		Unnamed stream reporting to Pike Lake from the southwest			Unnamed stream inmediatly downstream of Pike Lake Outlet			Unnamed stream reporting to Mills Lake from the west			Unnamed stream reporting to Long Lake from the south			Flows at Waldorf River		
				WC-01			WC-02			WC-03			WC-04			WC-05		
PHYSICAL PARAMETERS		ISQG	PEL	12-Jun-2023	12-Aug-23	19-Oct-23	12-Jun-23	11-Aug-23	18-Oct-23	13-Jun-23	14-Aug-23	20-Oct-23	13-Jun-23	14-Aug-23	21-Oct-23	10-Jun-23	10-Aug-23	13-Oct-23
Clay	%	---	---	3.1	7.4	---	<2.0	3.3	---	<2.0	3.3	---	<2.0	3.2	---	2.4	7.4	---
Sand	%	---	---	93	88	---	97	95	---	97	95	---	97	94	---	73	50	---
Silt	%	---	---	3.9	5	---	<2.0	<2.0	---	2	<2.0	---	<2.0	3.1	---	25	42	---
Texture		---	---	Sand	Loamy sand	---	Sand	Sand	---	Sand	Sand	---	Sand	Sand	---	Loamy sand	Loam	---
Moisture	%	---	---	27	32	54	23	26	23	17	19	32	11	19	25	64	64	71
ANIONS & NUTRIENTS																		
Nitrogen (N)	%	---	---	0.068	0.055	0.22	0.028	0.031	0.013	0.17	0.022	0.036	0.024	0.023	0.018	0.027	0.38	0.5
TOC	mg/kg	---	---	19000	11000	34000	4100	5700	5300	7000	3500	7800	13000	8900	8900	37000	44000	80000
Calculated Total Kjeldahl Nitrogen	µg/g	---	---	680	551	2180	283	306	127	1730	217	362	237	231	183	272	3830	5020
Nitrite (N)	µg/g	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrate (N)	µg/g	---	---	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Nitrite + Nitrate (N)	µg/g	---	---	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
METALS																		
Ag	µg/g	---	---	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Al	µg/g	---	---	4100	3100	4100	2400	3700	4000	4400	3000	3600	6900	5900	13000	6700	7900	7200
As	µg/g	5.9	17	1.8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.2	<1.0	<1.0	<1.0	<1.0	<1.0
B	µg/g	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ba	µg/g	---	---	1100	320	210	97	25	82	79	36	37	250	92	110	58	69	82
Be	µg/g	---	---	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.26	<0.20	0.21	<0.20
Bi	µg/g	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ca	µg/g	---	---	4000	2500	3200	1400	1700	1900	2000	1700	2300	3700	2100	3800	7200	9300	5900
Cd	µg/g	0.6	3.5	0.15	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.22	<0.10	<0.10	0.15	0.18	0.18
Co	µg/g	---	---	7.6	3.8	5.3	2.1	2.3	2.8	4.8	2.8	2.7	6.3	4	9.2	6.6	6.8	7.9
Cr	µg/g	37	90	19	13	18	8.8	15	17	24	19	21	32	25	53	39	43	42
Cu	µg/g	35.7	197	5.2	3.6	5.5	1.4	1.6	1.8	2.9	2.1	2.7	13	5.9	15	10	11	11
Fe	µg/g	---	---	32000	17000	20000	6400	10000	9400	13000	11000	13000	29000	25000	35000	35000	36000	40000
Hg	µg/g	0.17	0.486	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
K	µg/g	---	---	630	420	450	380	620	760	810	560	540	3700	3400	3200	890	920	890
Mg	µg/g	---	---	2300	1700	2200	1500	2400	2600	2900	2000	2200	4900	4000	9000	6600	8000	5900
Mn	µg/g	---	---	23000	8800	5500	1900	180	980	960	360	140	4300	580	400	300	460	670
Mo	µg/g	---	---	14	2	1.8	1.7	1.4	1	2	0.77	<0.50	5.2	1.1	2.7	1.2	1.2	1.9
Na	µg/g	---	---	<50	<50	66	<50	<50	<50	57	<50	75	110	76	75	75	85	100
Ni	µg/g	---	---	19	9.8	12	6.1	7	8.2	11	7.1	7.2	21	11	24	17	19	21
P	µg/g	---	---	710	580	630	310	440	450	400	410	470	850	600	740	780	780	650
Pb	µg/g	35	91.3	2.9	1.6	2.4	1.7	1.8	8.3	2.8	2.1	2.7	7	2.7	4.8	5	7.2	8.4
Sb	µg/g	---	---	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Se	µg/g	---	---	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	1.7	1.3	1.5
Sn	µg/g	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sr	µg/g	---	---	20	12	14	10	12	12	11	9.3	13	15	13	14	11	14	15
Tl	µg/g	---	---	0.54	0.25	0.19	0.11	<0.050	0.086	0.09	<0.050	<0.050	0.44	0.2	0.27	0.084	0.088	0.1
U	µg/g	---	---	2.2	0.97	2.1	0.46	0.73	0.51	1.1	0.76	0.73	3.4	1.3	2.2	3.6	2.7	3.1
V	µg/g	---	---	16	9.1	12	5.8	11	10	16	12	13	40	27	49	23	24	25
Zn	µg/g	123	315	41	22	31	15	14	17	18	13	13	69	47	90	48	59	59

Notes:

0.1 – Shaded cell denotes a value that is greater than the Canadian Council of Ministers of the Environment (CCME) ISQG; shaded and bold cell denotes a value that is greater

(1) CCME [Canadian Council of Ministers of the Environment]. Sediment Quality Guidelines for the Protection of Aquatic Life Freshwater and Marine ISQG/PEL

Table E-11: 2023 Sediment Quality Results - WC-06, WC-07, WC-08, WC-09, and WC-10
Kami Iron Ore EIA

PARAMETER	UNIT	CCME Guideline[(1)]		Unnamed stream reporting to Long Lake from the southeast			Unnamed stream reporting to Long Lake from the southeast			Unnamed stream reporting to Long Lake from the east			Unnamed stream immediately downstream of Long Lake			Flows at Walsh River		
				WC-06			WC-07			WC-08			WC-09			WC-10		
PHYSICAL PARAMETERS		ISQG	PEL	10-Jun-23	10-Aug-23	16-Oct-23	9-Jun-23	10-Aug-23	16-Oct-23	9-Jun-23	10-Aug-23	17-Oct-23	8-Jun-23	15-Aug-23	17-Oct-23	7-Jun-23	16-Aug-23	15-Oct-23
Clay	%	---	---	<2.0	2.5	---	2.4	3.7	---	<2.0	<2.0	---	<2.0	6	---	<2.0	<2.0	---
Sand	%	---	---	97	96	---	93	93	---	98	96	---	98	68	---	91	98	---
Silt	%	---	---	<2.0	<2.0	---	4.9	3	---	<2.0	2.4	---	<2.0	26	---	7.4	<2.0	---
Texture		---	---	Sand	Sand	---	Sand	Sand	---	Sand	Sand	---	Sand	Sandy loam	---	Sand	Sand	---
Moisture	%	---	---	22	33	26	22	24	28	17	17	29	20	47	21	18	14	20
ANIONS & NUTRIENTS																		
Nitrogen (N)	%	---	---	0.1	0.043	0.022	<0.010	0.024	0.02	0.029	0.012	0.013	<0.010	0.13	0.025	0.089	<0.010	<0.010
TOC	mg/kg	---	---	21000	5400	7400	25000	19000	26000	7100	2100	5800	3300	15000	15000	7300	2600	3200
Calculated Total Kjeldahl Nitrogen	µg/g	---	---	1020	425	218	<100	241	203	290	124	132	<100	1260	247	892	<100	<100
Nitrite (N)	µg/g	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrate (N)	µg/g	---	---	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Nitrite + Nitrate (N)	µg/g	---	---	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
METALS																		
Ag	µg/g	---	---	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Al	µg/g	---	---	2000	1400	1700	2400	3000	2400	3100	3100	6300	5100	8400	8700	13000	8200	4100
As	µg/g	5.9	17	6.8	1.6	2.9	1.7	<1.0	1.3	<1.0	<1.0	1.3	1.2	<1.0	1.2	<1.0	<1.0	<1.0
B	µg/g	---	---	<25	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ba	µg/g	---	---	7000	840	2300	900	85	650	51	84	320	430	81	100	64	110	53
Be	µg/g	---	---	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.2	0.22	<0.20	<0.20
Bi	µg/g	---	---	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ca	µg/g	---	---	9900	3100	4900	34000	6900	30000	2900	2500	4900	2700	3000	3400	4400	3800	2200
Cd	µg/g	0.6	3.5	<0.50	<0.10	0.14	0.27	<0.10	0.27	<0.10	<0.10	0.11	0.11	<0.10	0.19	<0.10	0.1	<0.10
Co	µg/g	---	---	7.1	3.3	4.6	4.5	2.9	4.2	7	5.1	8.9	8.9	10	12	15	11	8.9
Cr	µg/g	37	90	10	12	12	9.8	14	10	19	16	35	22	37	41	85	63	41
Cu	µg/g	35.7	197	5	1.7	2.5	3.2	1.7	2.8	4.4	3.8	7.2	5.4	6.5	8.1	34	13	8.1
Fe	µg/g	---	---	170000	65000	99000	47000	25000	43000	84000	49000	44000	33000	44000	50000	42000	37000	53000
Hg	µg/g	0.17	0.486	<0.25	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
K	µg/g	---	---	<1000	<200	310	210	270	230	420	470	960	1400	1300	1400	3200	3600	1200
Mg	µg/g	---	---	2900	1100	1800	20000	5200	17000	2900	2900	6300	3000	4900	5500	9500	7000	3600
Mn	µg/g	---	---	66000	10000	25000	12000	1600	9500	1000	1500	4700	3000	1300	2100	510	1100	870
Mo	µg/g	---	---	73	9.4	25	5.1	1	4	0.85	0.92	2.9	5.5	3.4	3.3	1	1	0.69
Na	µg/g	---	---	<250	<50	54	<50	<50	<50	<50	<50	53	100	59	68	56	140	97
Ni	µg/g	---	---	20	5.9	9.6	11	7.7	9.3	9.6	9.2	21	18	24	29	35	32	16
P	µg/g	---	---	670	580	520	690	480	690	740	520	710	760	840	740	700	880	440
Pb	µg/g	35	91.3	<5.0	1.1	1.1	3.1	1.5	2.4	1.6	1.7	2.3	4	3.4	3.9	7.1	4.4	15
Sb	µg/g	---	---	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Se	µg/g	---	---	<2.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Sn	µg/g	---	---	<5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sr	µg/g	---	---	37	9.2	18	13	6.1	14	5.2	4.4	9.2	18	12	15	20	19	9.4
Tl	µg/g	---	---	2.1	0.24	0.67	0.2	<0.050	0.16	0.054	0.059	0.2	0.24	0.14	0.25	0.26	0.27	0.11
U	µg/g	---	---	5.8	1.2	2.3	2.2	0.66	1.7	1.2	0.83	1.7	1.2	1.1	1.1	1.6	0.67	0.49
V	µg/g	---	---	<25	11	13	11	11	11	16	12	23	17	22	26	33	31	33
Zn	µg/g	123	315	53	15	29	58	40	51	19	16	35	49	62	72	66	44	29

Notes:

0.1 – Shaded cell denotes a value that is greater than the Canadian Council of Ministers of the Environment (CCME) ISQG; shaded and bold cell denotes a value that is greater

(1) CCME [Canadian Council of Ministers of the Environment]. Sediment Quality Guidelines for the Protection of Aquatic Life Freshwater and Marine ISQG/PEL

PARAMETER	UNIT	CCME Guideline[1]		Unnamed stream – DS of Riordan	Unnamed stream – immediately downstream of Daviault Lake		Lake Column at Daviault Lake		Lake Column at Long Lake					Lake Column at Mills Lake					Lake Column at Molar Lake	
				WC-11	WC-12		DL-02		LL-02			LL-03		MIL-02			MIL-03		MOL-02	
PHYSICAL PARAMETERS		ISQG	PEL	10-Oct-23	11-Aug-23	14-Oct-23	9-Aug-23	22-Oct-23	15-Jun-23	15-Aug-23	24-Oct-23	15-Aug-23	24-Oct-23	14-Jun-23	13-Aug-23	21-Oct-23	14-Aug-23	21-Oct-23	13-Aug-23	22-Oct-23
Clay	%	---	---	---	<2.0	---	29	---	2.6	13	---	9.9	---	---[2]	15	---	17	---	19	---
Sand	%	---	---	---	98	---	23	---	74	46	---	50	---	---[2]	49	---	42	---	30	---
Silt	%	---	---	---	<2.0	---	49	---	24	40	---	40	---	---[2]	36	---	41	---	51	---
Texture		---	---	---	Sand	---	Clay loam	---	Loamy sand	Loam	---	Loam	---	---[2]	Loam	---	Loam	---	Silt loam	---
Moisture	%	---	---	46	19	23	90	83	83	89	89	90	90	90	91	91	92	89	90	90
ANIONS & NUTRIENTS																				
Nitrogen (N)	%	---	---	0.3	0.01	<0.010	0.72	0.41	0.21	0.76	0.57	0.64	0.61	0.67	0.79	0.69	0.92	0.86	0.73	1
TOC	mg/kg	---	---	18000	4200	3800	69000	50000	39000	59000	54000	64000	68000	83000	82000	81000	89000	93000	86000	110000
Calculated Total Kjeldahl Nitrogen	µg/g	---	---	2950	103	<100	7160	4110	2090	7620	5710	6390	6080	6740	7920	6940	9210	8560	7300	10300
Nitrite (N)	µg/g	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.9	<0.5	0.7
Nitrate (N)	µg/g	---	---	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Nitrite + Nitrate (N)	µg/g	---	---	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
METALS																				
Ag	µg/g	---	---	<0.20	<0.20	<0.20	0.41	0.43	<0.20	0.26	0.2	0.27	0.26	0.37	0.33	0.29	0.3	0.37	0.49	0.38
Al	µg/g	---	---	2400	3900	4700	14000	15000	30000	16000	17000	17000	15000	16000	14000	15000	12000	16000	16000	13000
As	µg/g	5.9	17	<1.0	<1.0	<1.0	2.1	1.7	2.1	4	**7.4**	4.4	**6.3**	1.2	1.6	2.4	1.6	2.3	<1.0	1.6
B	µg/g	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ba	µg/g	---	---	43	41	50	370	250	1100	400	1900	1300	1700	350	330	640	160	1000	230	160
Be	µg/g	---	---	<0.20	<0.20	<0.20	0.33	0.37	0.59	0.51	0.49	0.54	0.5	0.39	0.39	0.42	0.32	0.4	0.35	0.27
Bi	µg/g	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ca	µg/g	---	---	4900	1100	2000	5100	4200	5600	4800	5700	6200	6000	6400	7000	6400	5800	6900	8100	6900
Cd	µg/g	0.6	3.5	<0.10	<0.10	<0.10	**0.61**	**0.61**	**0.72**	**0.95**	**0.93**	**0.94**	**0.91**	**0.63**	**0.68**	**0.77**	**0.99**	**0.82**	0.31	0.59
Co	µg/g	---	---	3.5	2.9	3.9	11	18	31	15	18	18	19	9.8	10	12	5.5	9.7	6.2	5.9
Cr	µg/g	37	90	14	20	29	**44**	**70**	**70**	**63**	**56**	**58**	**56**	**64**	**55**	**50**	**49**	**57**	**61**	**48**
Cu	µg/g	35.7	197	2.7	7.2	11	27	**46**	21	28	32	30	27	27	28	23	22	29	25	21
Fe	µg/g	---	---	56000	8500	11000	30000	39000	140000	92000	170000	95000	100000	32000	40000	74000	28000	44000	16000	17000
Hg	µg/g	0.17	0.486	<0.050	<0.050	<0.050	0.15	0.14	0.1	0.16	0.07	0.13	0.13	0.093	0.092	0.1	0.16	0.13	0.073	0.15
K	µg/g	---	---	340	1400	1500	1300	3200	1400	2000	1600	2000	1800	1800	1600	1500	1200	1400	1200	900
Mg	µg/g	---	---	3000	2900	3600	3000	6700	4800	5900	4700	5600	5400	5200	4700	4300	3900	4500	3800	3000
Mn	µg/g	---	---	770	130	100	4600	1900	15000	9100	21000	35000	39000	1700	4700	12000	1300	13000	580	940
Mo	µg/g	---	---	1.1	<0.50	<0.50	12	4.8	3.1	5.8	43	5.6	9.2	5.5	5.9	3.5	4.4	11	6	5.1
Na	µg/g	---	---	<50	<50	62	140	250	92	130	85	140	140	150	140	160	120	150	120	110
Ni	µg/g	---	---	6.5	10	13	29	42	56	40	61	51	50	35	33	34	22	33	21	19
P	µg/g	---	---	690	200	510	2000	1400	1300	1200	4800	1800	2500	1400	1300	1400	1000	1700	1800	1400
Pb	µg/g	35	91.3	3.7	2.8	3.3	31	**58**	13	**39**	11	33	31	11	17	23	**57**	17	7.9	32
Sb	µg/g	---	---	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.29	<0.20	<0.20	<0.20
Se	µg/g	---	---	<0.50	<0.50	<0.50	0.91	0.58	1	1.3	2.4	1.7	1.8	0.98	1.1	1.2	1.3	1.5	1	1.2
Sn	µg/g	---	---	<1.0	<1.0	<1.0	1.1	3.2	<1.0	1.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.7	<1.0	9.6	<1.0
Sr	µg/g	---	---	7.4	7.9	13	26	29	17	17	19	21	22	22	24	21	19	24	28	22
Tl	µg/g	---	---	<0.050	0.079	0.097	0.29	0.39	0.68	0.42	0.48	0.58	0.53	0.41	0.42	0.42	0.21	0.34	0.17	0.17
U	µg/g	---	---	1	0.24	0.32	6.6	3	17	9.1	15	13	12	12	11	12	9	15	13	9.4
V	µg/g	---	---	12	11	17	31	40	38	40	39	43	41	36	34	34	27	35	25	19
Zn	µg/g	123	315	20	17	21	91	**140**	**220**	**140**	**140**	**130**	**130**	120	110	120	96	**130**	79	81

Notes:

0.1 – Shaded cell

(1) CCME [Canadian Council of Ministers of the Environment]. Sediment Quality Guidelines for the Protection of Aquatic Life Freshwater and Marine ISQG/PEL

(2) Grain size tests/results unavailable due to insufficient sample volumes

PARAMETER	UNIT	CCME Guideline(1)		Flows at Pike Lake			Lake Column at Riordan Lake		Railway Crossings		
				PL-02			RL-02		WC-13	WC-14	WC-15
PHYSICAL PARAMETERS		ISQG	PEL	12-Jun-23	12-Aug-23	19-Oct-23	16-Aug-23	23-Oct-23	13-Oct-23	13-Oct-23	13-Oct-23
Clay	%	---	---	---(2)	17	---	5.7	---	---	---	---
Sand	%	---	---	---(2)	69	---	87	---	---	---	---
Silt	%	---	---	---(2)	15	---	7.2	---	---	---	---
Texture		---	---	---(2)	Sandy loam	---	Loamy sand	---	---	---	---
Moisture	%	---	---	93	94	93	94	92	39	67	23
ANIONS & NUTRIENTS											
Nitrogen (N)	%	---	---	0.25	1.6	1.3	1.4	1.4	0.064	0.34	<0.010
TOC	mg/kg	---	---	150000	150000	130000	110000	150000	18000	52000	500
Calculated Total Kjeldahl Nitrogen	µg/g	---	---	2510	16000	13000	14400	14200	640	3360	<100
Nitrite (N)	µg/g	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nitrate (N)	µg/g	---	---	<2	<2	<2	<2	<2	<2	<2	<2
Nitrite + Nitrate (N)	µg/g	---	---	<3	<3	<3	<3	<3	<3	<3	<3
METALS											
Ag	µg/g	---	---	0.24	0.21	0.21	<0.20	<0.20	<0.20	<0.20	<0.20
Al	µg/g	---	---	11000	9900	12000	7100	5500	6600	5900	400
As	µg/g	5.9	17	2	1.8	1.6	1.2	<1.0	1.4	1.5	2
B	µg/g	---	---	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Ba	µg/g	---	---	200	260	250	200	150	1200	1300	82
Be	µg/g	---	---	0.3	0.28	0.27	0.25	<0.20	<0.20	<0.20	0.32
Bi	µg/g	---	---	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ca	µg/g	---	---	6600	5600	6300	6300	5500	5400	6600	320
Cd	µg/g	0.6	3.5	0.45	0.34	0.35	0.71	0.44	0.17	0.23	<0.10
Co	µg/g	---	---	8.8	7.9	10	6.8	6.2	7.1	5	5.3
Cr	µg/g	37	90	37	33	38	27	24	31	24	2
Cu	µg/g	35.7	197	21	17	17	25	19	6.6	6.9	2
Fe	µg/g	---	---	46000	73000	100000	38000	36000	52000	64000	64000
Hg	µg/g	0.17	0.486	0.23	0.16	0.15	0.073	<0.050	<0.050	0.056	<0.050
K	µg/g	---	---	930	740	650	1100	930	610	430	<200
Mg	µg/g	---	---	2500	1900	2200	3800	3400	4100	3200	180
Mn	µg/g	---	---	2000	2500	4700	1500	1500	21000	30000	4800
Mo	µg/g	---	---	5.3	2.2	1.9	3.7	4.2	15	22	<0.50
Na	µg/g	---	---	87	80	79	110	110	59	<50	<50
Ni	µg/g	---	---	24	20	22	21	19	25	20	1.9
P	µg/g	---	---	2000	2800	1800	1100	850	630	700	97
Pb	µg/g	35	91.3	21	13	11	17	7.7	2.7	2.6	<1.0
Sb	µg/g	---	---	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Se	µg/g	---	---	1	0.93	0.88	1.2	0.96	<0.50	<0.50	<0.50
Sn	µg/g	---	---	<1.0	<1.0	<1.0	1.1	<1.0	<1.0	<1.0	<1.0
Sr	µg/g	---	---	17	15	17	16	14	19	20	2.7
Tl	µg/g	---	---	0.3	0.2	0.23	0.18	0.16	0.22	0.22	<0.050
U	µg/g	---	---	6.1	4.7	5.7	8.3	6.6	3.7	2.7	0.095
V	µg/g	---	---	20	17	17	20	19	20	16	<5.0
Zn	µg/g	123	315	72	64	80	110	87	77	91	7.4

Notes:

0.1 – Shaded cell

(1) CCME [Canadian Council of Ministers of the Environment]. Sediment Quality Guidelines for the Protection of Aquatic Life Freshwater and Marine ISQG/PEL

(2) Grain size tests/results unavailable due to insufficient sample volumes

Water Quality Notes for Tables E-2 through E-8

(1) CCME [Canadian Council of Ministers of the Environment. Water Quality Guidelines for the Protection of Aquatic Life.

(2) For more information, see CCREM 1987.

(3) The CCME for long term Ammonia values depends on temperature and pH using a table found at https://ccme.ca/en/chemical/5#_aql_fresh_concentration

(4) Ultra-oligotrophic <4; oligotrophic 4-10; mesotrophic 10-20; meso-eutrophic 20-35; eutrophic 35-100; hyper-eutrophic >100

(5) 5 ug/L if pH<6.5; 100 ug/L if pH≥6.5

(6) CCME for Cd depends on hardness as follows: hardness 0−53 mg/L as CaCO3, CWQG= 0.11 ug/L; hardness ≥ 5.3 to ≤ 360 mg/L as CaCO3, CWQG= 10{1.016(log[hardness])-1.71} ug/L; hardness >360 mg/L, CWQG= 7.7 ug/L for short term concentration. Hardness >0 to 17 mg/L as CaCO3, CWQG= 0.04 ug/L; hardness ≥ 17 to ≤ 280 mg/L as CaCO3, CWQG= 10{0.83(log[hardness])-2.46} ug/L; hardness > 280 mg/L, CWQG= 0.3 ug/L for long term concentration

(7) CCME for Cu depends on hardness as follows: hardness 0 to <82 mg/L as CaCO3, CWQG= 2 ug/L; hardness ≥82 to ≤180 mg/L as CaCO3, CWQG= 0.2*e{0.8545[ln(hardness)]-1.465} ug/L; hardness is unknown, CWQG= 2 ug/L for long term concentration.

(8) CCME for Mn depends on hardness as follows: CCME=exp(0.878[ln(hardness)]+4.76)

(9) The CWQG for manganese (i.e. long-term guideline) is found using the CWQG calculator in Appendix B of the Scientific Criteria Document for the Development of the Canadian Water Quality Guidelines for the Protection of Aquatic Life: Manganese.

(10) CCME for Ni depends on hardness as follows: hardness 0 to ≤ 60 mg/L as CaCO3, CWQG= 25 ug/L; hardness > 60 to ≤ 180 mg/L as CaCO3, CWQG = e{0.76[ln(hardness)]+1.06} ug/L; hardness > 180, CWQG= 150 ug/L ; hardness is unknown, CWQG= 25 ug/L

(11) CCME for Pb depends on hardness as follows: hardness 0 to ≤ 60 mg/L as CaCO3, CWQG= 1 ug/L; hardness > 60 to ≤ 180 mg/L as CaCO3, CWQG = e{1.273[ln(hardness)]-4.705} ug/L; hardness > 180, CWQG= 7ug/L ; hardness is unknown, CWQG= 1 ug/L

(12) CCME for Pb is calculated using the following equation: CWQG= exp(0.833[ln(hardness mg·L-1)] + 0.240[ln(DOC mg·L-1)] + 0.526).

(13) CCME for Pb is calculated using the following equation: CWQG=exp(0.947[ln(hardness mg·L-1)] - 0.815[pH] + 0.398[ln(DOC mg·L-1)] + 4.625)

(14) The results from LL-02 NB appear to be influenced by the inadvertent disturbance of the bed sediments, and, because of this, the reported total metals concentrations should be viewed with discretion

wsp.com

APPENDIX J

Vegetation and Wetlands Baseline Report

REPORT

Vegetation and Wetland Baseline Report

Kami Iron Ore Mine Project

Submitted to:

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Submitted by:

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April 2024

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ACRONYMS AND ABBREVIATIONS

Acronyms and Abbreviations	Description
ACCDC	Atlantic Canada Conservation Data Centre
Alderon	Alderon Iron Ore Corporation
BSA	Baseline Study Area
Champion	Champion Iron Mines Ltd.
COSEWIC	Committee on the Status of Endangered Species in Canada
EA	Environmental Assessment
ECCC	Environment and Climate Change Canada
ELC	Ecological Land Classification
ESWG	Ecological Stratification Working Group
GPS	Global Positioning System
G-Rank	Global-Rank
NBDELG	New Brunswick Department of Environment and Local Government
NLESA	Newfoundland and Labrador Endangered Species Act
NovaWET	Nova Scotia Wetland Evaluation Technique
N-Rank	National-Rank
SAR	Species at Risk
SOCC	Species of Conservation Concern
SARA	Species at Risk Act
S-Rank	Subnational-Rank
SSA	Site Study Area
SSAC	Species Status Advisory Committee
USACE	United States Army Corps of Engineering
WESP-AC	Wetland Ecosystem Services Protocol – Atlantic Canada
WSP	WSP Canada Inc.

UNITS OF MEASURE

Units of Measure	Description
mm	Millimeter
cm	Centimeter
m	Meter
km^2	Square Kilometer
°C	Degrees Celsius
%	Percent
pH	Potential of Hydrogen

EXECUTIVE SUMMARY

The Kamistiatusset (Kami) Iron Ore Mine Project (the Project) is a proposed iron ore mine in Newfoundland and Labrador. The Project site is located entirely in Labrador, approximately seven kilometres from the Town of Wabush, ten kilometres from the Town of Labrador City, and five kilometres east of Ville de Fermont, Québec. Building off the previously completed baseline field program, WSP Canada Inc. (WSP) was retained by Champion Iron Mines (Champion) to complete a vegetation and wetland baseline program to provide context from which Project environmental vegetation and wetland effects could be evaluated.

Regional Vegetation Ecotypes

Previously baseline studies identified a variety of forested, previously burned/regeneration and wetland ecotypes within proximity of the Project including those outlined in the table below. Surveys completed by WSP in 2023 further verified the eco-types in the region. In addition, WSP surveys included alder thickets and jack pine stands.

Table ES-1: Ecological Land Classification Categories for the Kami Project[1]

Ecological Land Classification (ELC)	Classification Number	Area (km^2)	Percentage of ELC Area
Alpine Heath	1	1.0	0.2
Hardwood Forest	2	5.4	1.4
Mixedwood Forest	3	17.5	4.4
Black Spruce-Labrador Tea -Feathermoss	4	91.5	23.1
Black Spruce-Lichen	5	19.7	5
Black Spruce/Tamarack-Sphagnum Woodland	6	49.6	12.5
Tamarack/Black-Spruce-Feathermoss (Water Track)	7	30.1	7.6
Softwood Burn/Regeneration[2]	8	40.2	9.3
Hardwood Burn/Regeneration[2]	9	36.7	10.2
Riparian Thickett	10	0.3	0.1
Riparian Marsh (Fen)	11	0.6	0.2
Patterned Shrub Fen	12	3.1	0.8
Non-Patterened Shrub Fen	13	9.3	2.3
Graminoid Fen (Included in aerial extent of Ecotype 12 and 13).	14	Included as a sub-component in aerial extent of Ecotype 12 and 13.	

Ecological Land Classification (ELC)	Classification Number	Area (km²)	Percentage of ELC Area
Open Water	15	54.5	13.7
Shallow Water with Vegetation	16	5.0	1.3
Anthropogenic/Bare Ground	17	22.4	5.7
Non-ELC	18	9.5	2.4

Note [1] Table produced from data from Stassinu Stantec (2012 a, b).
[2] Stanissu Stantec 2012b identified a mixedwood regeneration category not identified in Stanissu Stantec 2012 a, so the aerial extent was split and applied evenly to between hardwood and softwood burn regeneration classes.
[3] Stanissu Stantec (2012b) identified a mixedwood regeneration category not identified in Stanissu Stantec 2012a, so the aerial extent was split and applied evenly between hardwood and softwood burn regeneration classes.

Regional Wetlands

Wetlands of varying types occur throughout the Project area and larger regional landscape. Previous work by Stassinu Stantec (2012b) identified a total aerial extent of wetlands of 1,763 ha over an area that generally covered the mineral licences for the Kami project at the time (approximately 161 km^2). Individual wetland size ranged from 0.05 ha to over 500 ha which fell into five general wetland classes based upon Canadian Wetland Classification System classification criteria. These were slope fens (1,285.5 ha), Atlantic ribbed fens (317.5 ha), stream fens (139.8 ha), shore fens (5.5 ha) and lacustrine marsh (15.0 ha). Wetland functions were assessed in 2012 using the NovaWET assessment protocol but currently, the Wetland Ecosystem Services Protocol – Atlantic Canada (WESP-AC) is considered the standard wetland functional assessment tool.

Targeted wetlands within proximity of the Project were assessed in 2023 using the currently accepted methods for wetland functional assessment protocol for Atlantic Canada (the WESP-AC protocol). Assessed wetlands ranged in size from 6.2 to 387.5 ha and were classified as either fen, fen bordered by a treed swamp or marsh bordered by a shrub swamp. In all cases when soil pits were excavated histosols were present that were in excess of 40 cm deep, there was a high-water table with surface water visibly present within the wetland. Wetlands were slightly basic (pH 7.30 to 7.74), suggesting they lie overtop of calcareous soils, or were mildly acidic (pH 5.24 to 5.46).

Species at Risk

The potential for species at risk (species listed under Schedule 1 of the *Species at Risk Act* or listed under the *Endangered Species List Regulations* under the *Endangered Species Act* for the Province of Newfoundland and Labrador) to be found within proximity of the Project were assessed. The assessment determined that the occurrence of any species at risk was unlikely within the Project area. Vegetation surveys conducted as part of the preliminary baseline studies for the Kami project by Stassinu Stantec or by WSP in 2023 did not identify any species at risk in the Project area. In addition, the results of an Atlantic Canada Conservation Data Centre data search did not identify the occurrence of any Federally or Provincially listed species at risk within proximity of the Project or in general region.

Species of Conservation Concern

While not protected by Federal or Provincial legislation there are also species of conservation concern (SOCC) that are considered rare which should also be assessed. An Atlantic Canada Conservation Data Center (ACCDC) data search for rare species in the region identified the following species as imperiled or critically imperiled species that may occur in the area: green spleenwort (*Asplenium viride*), beautiful sedge (*Carex concinna*), small yellow lady's-slipper (*Cypripedium parviflorum*), mountain bladder fern (*Cystopteris montana*), daisy fleabane (*Erigeron hyssopifolius*), limestone polypody (*Gymnocarpium robertianum*), running pine (*Lycopodium clavatum*), marsh muhly (*Muhlenbergia glomerata*), jack pine, Northern Valerian (*Valeriana dioica subsp*. *sylvatica*), and green false hellebore (*Veratrum viride var*. *viride*). Initial baseline studies completed by Stassinu Stantec (2012c) and/or vegetation/wetland surveys completed by WSP in 2023, located beautiful sedge, small yellow lady's-slipper, running pine, marsh muhly, jack pine, northern valerian and green false hellebore either directly within or within close proximity of the SSA.

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FIGURES

APPENDICES

1.0 INTRODUCTION

The Kamistiatusset (Kami) Iron Ore Mine Project (the Project) is a proposed iron ore mine in Newfoundland and Labrador. The Project site is located entirely in Labrador, approximately seven kilometres from the Town of Wabush, ten kilometres from the Town of Labrador City, and five kilometres east of Ville de Fermont, Québec (Figure 1-1).

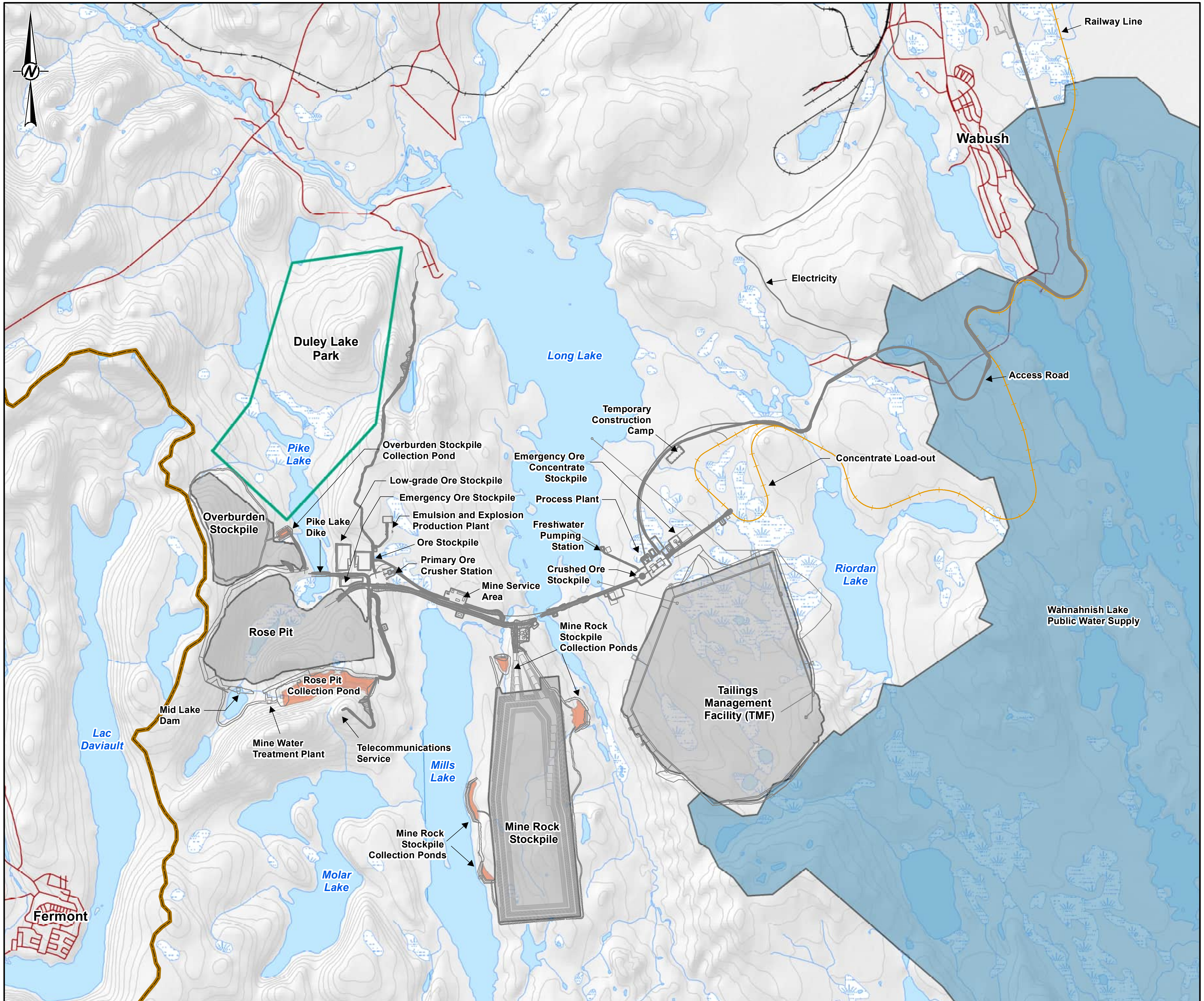
The Project was originally proposed by the Alderon Iron Ore Corporation (Alderon) and underwent a provincial and federal environmental impact assessment from 2011 to 2013, including a comprehensive baseline program that was completed in 2011 and 2012. The Project was released from the provincial and federal EA process in 2014. In 2021, Champion Iron Mines Ltd. (Champion) completed the acquisition of the Project from Alderon.

Champion is proposing several optimizations to the Project design proposed by Alderon through the previous EIS. These proposed optimizations include improvements to the Project's water management strategy and modernization of the proposed ore handling, conveyance, and processing. Champion's objective for the Kami Project is to produce high purity (>67.5%) iron ore concentrate, which can be used as direct reduction pellet feed for electric arc furnaces in the green steel supply chain. Champion is planning to submit a Project Registration to the Newfoundland and Labrador Environmental Assessment Division of the Ministry of the Environment and Climate Change in 2024.

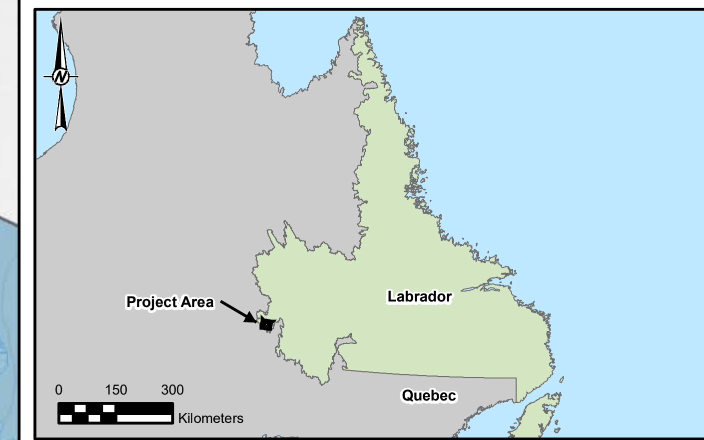
To support the Project Registration and assessment of effects from the revised Project design optimizations, Champion has commissioned the services of WSP Canada Inc. (WSP) to complete a comprehensive baseline field program that documents the existing natural and socio-economic environments in the anticipated area of the Project. The vegetation and wetland baseline program represents a component of the comprehensive baseline program and was undertaken to provide context from which Project environmental vegetation and wetland effects could be evaluated in the Project Planning and Environmental Assessment (EA) process.

Figure 1-1 outlines some of the main components of the Project site including:

- Open Pit (Rose Pit);
- Mine rock stockpile;
- Ore stockpiles (operational, low-grade and emergency);
- Tailings management facility (TMF);
- Overburden stockpile;
- Processing infrastructure including crushing and concentrating;
- Ancillary infrastructure to support the mine and process plant.



KEY MAP



SCALE 1:20,000,000

LEGEND

PROJECT DATA

- Proposed Infrastructure
- Proposed Railway
- Proposed Infrastructure
- Proposed Sedimentation Pond

BASEMAP INFORMATION

- Duley Lake Park
- Existing Railway
- Existing Road
- River/Stream
- Contour
- Bog/Wetland
- Waterbody
- Labrador/Quebec Boundary
- Public Water Supply

0 625 1,250 2,500

1:60,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT

CHAMPION IRON MINES LTD.

PROJECT

KAMI IRON ORE MINE PROJECT (KAMI PROJECT)
WABUSH, NL

TITLE

PROJECT LOCATION AND SITE LAYOUT

CONSULTANT

wsp

YYYY-MM-DD	2024-03-14
DESIGNED	----
PREPARED	####
REVIEWED	SPC
APPROVED	HJ

PROJECT NO.	CONTROL	REV.	FIGURE
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2.0 STUDY AREA

2.1 Ecological Setting

The national ecological framework for Canada presents a hierarchical approach to describe the various ecologies observed across the country. This framework is based upon the utilization of criteria that incorporates geological, soil, vegetation, climate and human activity characteristics to identify distinct regions. At its largest scale the framework breaks Canada into 15 Eco-zones which are further divided into Eco-regions and, at the lowest level Eco-districts (ESWG 1995).

The Project is within the Boreal Shield Ecozone which experiences a continental climate comprised of long cold winters (average mid-winter temperature of -15° C) and short warm summers (average mid-summer temperature 17° C) with precipitation ranging from 400-1000 mm. Due to a short growing season, frequent forest fires and acidic soils, the ecozone is primarily comprised of several adaptable tree species such as black spruce, white spruce, balsam fir, eastern larch and jack pine; but other species such a white birch and trembling aspen, white pine and red pine may occur in suitable habitats. Throughout the ecozone there are numerous wetlands (bogs, fens, swamps and marshes) that are species diverse while in areas that were scoured during glaciation a variety of lichen and low growing shrubs are common (ESWG 1995; Wiken et al. 1996).

At the Ecoregion level the Project is within the Mid Subarctic Forest. This ecoregion encompasses the flat and rolling plateaus of central and western Labrador. In general, this ecoregion is dominated by moist forests, over top of coarse textured till and glaciofluvial deposits. Evidence of glacial activity in this ecoregion is evident from the observance of an abundance of drumlins and eskers. This ecoregion experiences short cool summers and long cold winters with annual rainfall from 900 to 1100 mm and snowfall from 3.5 to 4.5 m. Mean mid-summer daily temperatures range from 11-13° C, while mean mid-winter temperatures range from -17 to -22° C. String bogs and string fens are common with black spruce the most common tree species found in the ecoregion. Black spruce can be found within poorly drained sites, within more upland lichen woodlands with a shrub understory of Labrador tea and shrub birches and in areas where the forest floor is covered by an understory of sphagnum moss. In more northern portions of the ecoregion where wetlands are less frequent, and the soils more well drained white spruce may be dominant. White spruce and balsam fir also occur on protected slopes where drainage is good. Larch and trembling aspen and jack pine may also be found growing in this ecoregion (PAANL 2008).

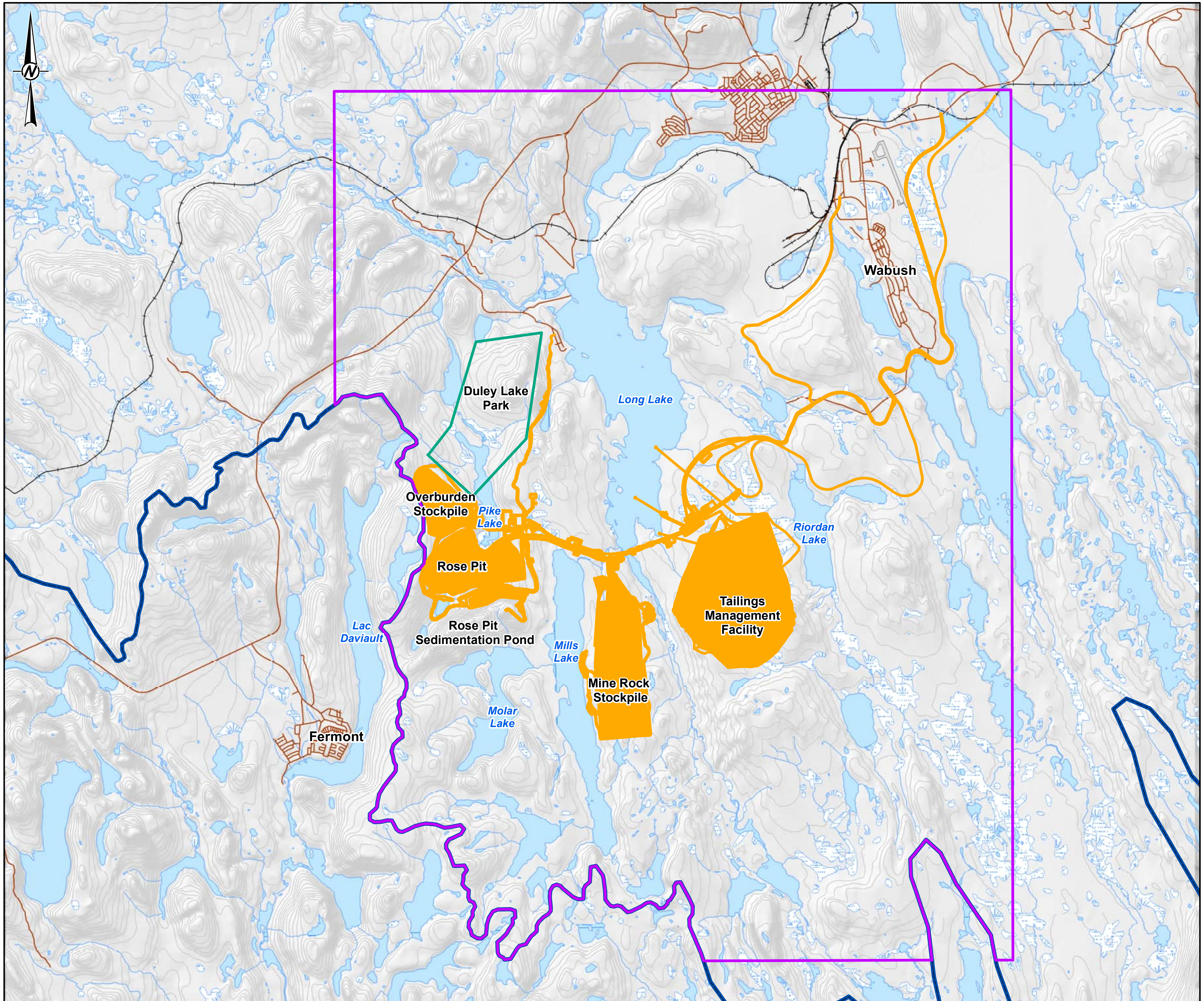
At a more local level the Project falls within the Wabush Eco-district. This eco-district covers a small portion of western Labrador (1339 km^2 or, 0.5 percent of Labradors landmass) with elevations ranging from 524-904 m (mean 631 m). The average annual temperature and precipitation are -3.1° C and 849.1 mm, respectively. The fractured bedrock terrain supports open lichen-spruce woodlands, with lakes, ponds and wetlands found in the lowlands. Lower hillslopes are dominated by closed black spruce/balsam fir stands, while upper hillslopes are dominated by open black spruce stands interspersed with white spruce and birch. Wetlands occupy a small proportion (less than one percent) of the eco-district, while 12.6 percent is occupied by open water. This eco-district has been significantly affected by forest fires with 15.7 percent of the district being previously burned (Riley et al. 2013).

2.2 Study Areas

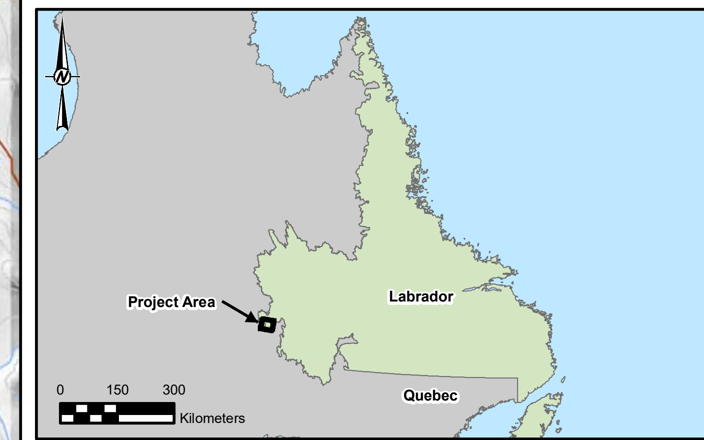
Two study areas were developed to support the characterization of baseline conditions of vegetation and wetlands within the vicinity of the Kami Project; a site study area and baseline study area (Figure 2-1).

The site study area (SSA) is defined as the area of potential direct disturbance (i.e., location of proposed infrastructure) and is the area where most of the direct effects from the proposed Project are likely to occur. It is represented by the proposed Project footprint and is approximately 2,681 hectares (ha). The SSA was based on the Project design information available at the time of planning for the field program (Figure 2-1).

The baseline study area (BSA) includes the SSA but also takes in a larger area to ensure that the local and regional variability of vegetation habitats and wetlands is captured, but also provides context for the habitats and wetlands observed within the SSA. It is possible to determine if there are unique habitats within the SSA or if they are also common within the larger BSA. Similarly, the extant of habitat types can be compared at a local and regional level (e.g., if there is an abundance of a specific habitat within the BSA then the removal of that habitat type for within the SSA will not adversely affect the habitat at a regional level). The BSA for this study has been defined as the Ecological Land Classification (ELC) study area presented in the Stassinu Stantec ELC Report (2012a). The ELC study area included a 396 square kilometer area which included locations within Labrador and Quebec. However, the BSA was restricted to the portion of the ELC area located within Labrador, which covered an area of 348 square kilometers. This approach would allow for comparison between initial baseline studies from 2012 and the 2023 baseline studies.



KEY MAP



SCALE 1:20,000,000

LEGEND:

PROJECT DATA	BASEMAP INFORMATION
Site Study Area	Duley Lake Park
Baseline Study Area	Existing Railway
	River/Stream
	Existing Road
	Contour
	Bog/Wetland
	Waterbody
	Labrador/Quebec Boundary

0 1,000 2,000 4,000

1:100,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - NEWFOUNDLAND AND LABRADOR
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT

CHAMPION IRON MINES

PROJECT

KAMI IRON ORE PROJECT

WABUSH, NL

TITLE

VEGETATION AND WETLAND BASELINE STUDY AREAS

CONSULTANT

YYYY-MM-DD	2024-03-25
DESIGNED	----
PREPARED	JA
REVIEWED	SG
APPROVED	SG

PROJECT NO.	CONTROL	REV.	FIGURE
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3.0 RATIONALE AND OBJECTIVES

The rationale for the combined vegetation and wetland program was to identify the floristic components within the preliminary Project footprint (Site Study Area) and general area (Baseline Study Area) of the Project. Floristic components include the habitat type identification, species composition, potential listed species at risk (SAR) that may be protected under Federal and/or Provincial Legislation and species of conservation concern (SOCC) that may be found within vicinity of the Project. Species of conservation concern are not protected by Federal or Provincial legislation but may be considered locally rare.

The objectives of the vegetation and wetlands baseline program were as follows:

- To identify vegetation habitat types within or in close proximity to the Project.
- To determine species composition within each habitat type.
- To identify any SAR that may occur within or in close proximity to the Project.
- To identify any SOCC that may occur within or in close proximity to the Project.
- To identify, delineate and assess selected wetlands within or in close proximity to the Project using the Wetland Ecosystem Services Protocol – Atlantic Canada (WESP-AC) non-tidal protocol.

4.0 METHODS

The identification, determination of aerial extent and species composition of habitats within proximity to a project is an integral part of evaluating the existing biological environment. Previous baseline studies (Stassinu Stantec 2012a) identified a variety of forested, previously burned/regeneration and wetland ecotypes within proximity of the Project through a process of ELC. Field surveys were completed by WSP in 2023 to further verify the ecotypes and species composition within each ELC plot. Sections 4.1 and 4.2 provide additional details regarding ecotype classification and plot survey methodologies.

Wetlands are ecologically important as they serve a variety of functions to support healthy ecosystems. Therefore, it is important that wetlands are identified, classified and functionally assessed. Wetlands in the vicinity of the Project were previously assessed, but since that time the standard wetland assessment protocol has been updated to the Wetland Ecosystem Services Protocol – Atlantic Canada (WESP-AC). WSP assessed a number of targeted wetlands using the updated protocol, as described in Section 4.3.

The identification of species at risk (SAR) and species of conservation concern (SOCC) within a project area is also integral for assessing the biological environment. The processes used to assess the potential for SAR (those that have legal protection) and/or SOCC (species which do not have legal protection but are considered rare) are outlined in Sections 4.4 and 4.5, respectively.

4.1 Habitat Type Determination

Vegetated habitats or ecotypes within the SSA and the larger BSA are variable with a variety of forest, tundra, wetland, riparian, and post fire regeneration habitats represented. Earlier work competed by Stassinu Stantec (2012a) identified a total of eighteen classifications (i.e., vegetated habitats or ecotypes) within the BSA. Included in these classes were areas that were anthropogenic/ exposed earth (e.g., developed areas which include municipal/industrial infrastructure and areas where vegetation is generally lacking), open water (e.g., lakes, ponds, gullies, and rivers), shallow open water with vegetation and non-ELC areas (i.e., areas where the imagery was obscured due to factors such as cloud cover). These four classes were not included in this assessment. The remaining fourteen ecotypes were included in the assessment. The fourteen ecotype classes, their aerial extent, and percentage of the ELC area that each class comprises are outlined in Table 4-1.

For the purposes of this study, WSP utilized the ecotypes previously identified within Stassinu Stantec (2012a) and aerial extent of each to help guide the selection of vegetation plot survey locations and the survey intensity within each ecotype. Ecotypes that comprised a larger portion of the ELC area were generally sampled more frequently than ecotypes that were smaller in aerial extent to help ensure the species composition in those areas were adequately sampled. This approach allows for comparisons to be made between the initial baseline studies in 2012 and 2023 studies.

Table 4-1: Ecological Land Classification for the Kami Project[1, 2]

Ecological Land Classification (Ecotypes or Vegetated Habitats)	Classification Number	Area (km^2)	Percentage of ELC Area
Alpine Heath	1	1.0	0.2
Hardwood Forest	2	5.4	1.4
Mixedwood Forest	3	17.5	4.4
Black Spruce-Labrador Tea -Feathermoss	4	91.5	23.1
Black Spruce-Lichen	5	19.7	5
Black Spruce/Tamarack-Sphagnum Woodland	6	49.6	12.5
Tamarack/Black-Spruce-Feathermoss (Water Track)	7	30.1	7.6
Softwood Burn/Regeneration[3]	8	40.2	9.3
Hardwood Burn/Regeneration[3]	9	36.7	10.2
Riparian Thickett	10	0.3	0.1
Riparian Marsh (Fen)	11	0.6	0.2
Patterned Shrub Fen	12	3.1	0.8
Non-Patterened Shrub Fen	13	9.3	2.3
Graminoid Fen (Included in aerial extent of Ecotype 12 and 13).	14	Included as a sub-component in aerial extent of Ecotype 12 and 13.	
Open Water	15	54.5	13.7
Shallow Water with Vegetation	16	5.0	1.3
Anthropogenic/Bare Ground	17	22.4	5.7
Non-ELC	18	9.5	2.4

[1] Table produced from data from 2012 ELC and Rare Plant Reports (Stassinu Stantec 2012a, b).

[2] Aerial extent and associated percentages includes the Stassinu Stantec ELC area identified in Stassinu Stantec 2012a (396 square kilometers with areas included within Labrador and Quebec).

[3] Stanissu Stantec (2012b) identified a mixedwood regeneration category not identified in Stanissu Stantec 2012a, so the aerial extent was split and applied evenly between hardwood and softwood burn regeneration classes.

4.2 Vegetation Plot Surveys

Vegetation plot surveys were conducted in each of the identified 14 ecotypes. In addition, surveys were conducted in jack pine stands as the species were classified as rare within the area (Ranked as S1 by Atlantic Canada Conservation Data Center). Vegetation survey plots consisted of surveying a randomly selected 250 m^2 area at each survey location within a representative area of the ecotype. The data collected include species present, percent cover of each species of the total plot area (i.e., the sum of cover for all species in the plot may exceed 100 % due to the presence of multiple vegetation strata layers), humus depth, slope, moisture regime, drainage, any indication of previous disturbance, and visible surface substrate composition. Each species was also assigned to a specific strata layer based upon height as follows tree (>10 m), tall shrub (2m to 10 m), low shrub (<2 m), herbaceous (herbaceous and low woody species typically less than 15 cm in height) and moss/lichen. Species may occur within multiple strata categories (e.g., black spruce may occur in the low shrub, tall shrub and tree strata layers within the same plot), with the percent cover presented for each species within each layer. Humus depth was determined by excavating a small pit to a level below the humus layer. The humus layer was then measured using a measuring tape.

In wetland areas, a probe was used to determine the humus depth by forcing the probe into the soil until refusal and measuring the refusal depth or a depth of one meter was reached. For moisture regime, there were nine classes that include, from driest to wettest, very xeric, xeric, subxeric, submesic, mesic, subhygric, hygric, subhydric and hydric. Soil drainage was rated based on a seven-point scale that include Very rapidly drained, rapidly drained, well drained, moderately well drained, imperfectly drained, poorly drained and very poorly drained. Representative photographs were also taken of the survey plot, species encountered, and of the excavated pit.

4.3 Wetland Delineation Surveys and Functional Assessment

Wetlands of varying types occur throughout the SSA and BSA. Previous work by Stassinu Stantec (2012c) identified a total aerial extent of wetlands of 1,763 ha over an area that generally covered the mineral licences for the Kami Project at the time (approximately 161 km^2). Individual wetland size ranged from 0.05 ha to over 500 ha within five general wetland classes based upon Canadian Wetland Classification System classification criteria. These were slope fens (1,285.5 ha), Atlantic ribbed fens (317.5 ha), stream fens (139.8 ha), shore fens (5.5 ha) and lacustrine marsh (15.0 ha) (Stassinu Stantec 2012c). In some cases, multiple wetland classes were combined to form a wetland complex (when three or more of the wetland classes occur adjacent to each other or contiguously). Wetland functions were initially assessed in 2012 using the NovaWET assessment protocol. Since that time wetland functional assessments in Atlantic Canada use the Wetland Ecosystem Services Protocol – Atlantic Canada (WESP-AC) as the standard wetland functional assessment tool.

To better understand the functionality of wetlands, WSP assessed several wetlands in 2023 that may be affected by the implementation of the proposed Project, either directly within the SSA or within a potential zone of influence, using the WESP-AC non-tidal protocol in 2023. The assessment included wetland delineation, determination of species composition and using field collected data on wetland characteristics and species composition to provide a functional assessment of each surveyed wetland using the WESP-AC protocol.

4.3.1 Wetland Delineation Surveys

The presence or absence of wetlands was evaluated in 2023 in accordance with the United States Army Corps of Engineering Wetland Delineation and the Northcentral and Northeastern Interim Regional Supplement (USACE 2012). For an area to be identified as wetland, it must show positive indicators in three areas of assessment (with some exceptions). These parameters are: hydrophytic vegetation, hydric soils, and wetland hydrology.

When a wetland is suspected, the soil, vegetation, and hydrology are evaluated at a test pit location. The wetland boundary is digitally marked using a handheld Global Positioning System (GPS) unit with an accuracy of ±5 m. If necessary, additional soil test pits were undertaken to confirm the location of the wetland boundary.

Where only partial delineations could be completed, the data collected was supplemented with high-resolution LiDAR so that the wetland boundaries could be inferred using ArcGIS Desktop 10.8.

4.3.1.1 Hydrophytic Vegetation

As defined in the United States Army Corps of Engineering Manual (2012), hydrophytic vegetation is the community of macrophytes that occur in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to exert a controlling influence on the plant species present. The vegetation is assessed based on the indicator status of the dominant plant species in each stratum (i.e., tree, shrub and herbaceous). Vegetation indicator status defines the frequency of occurrence of a specific species within upland or wetland areas and its general tolerance for habitat variability. The indicator status varies from obligate (>99 % of occurrences are in a wetland) to upland (<1 % of occurrences are in a wetland). An assessment for hydrophytic vegetation was carried out at the wetland and upland test pit locations.

4.3.1.2 Hydric Soils

Hydric soils are those formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper layers. Hydric soil indicators are formed predominantly by the accumulation of organic matter or; loss of iron, manganese, sulphur, or carbon compounds in a saturated and anaerobic environment. Examples of hydric soils include organic deposits caused by the accumulation of organic matter (lack of oxygen preventing decomposition) and mineral soils with gleyed or depleted matrices (soils stripped of iron and manganese). Soil profiles were completed in any suspected wetland, and the presence or absence of a positive indicator for hydric soils was documented.

4.3.1.3 Wetland Hydrology

A site was considered to possess a positive indicator of wetland hydrology when either one primary indicator or two secondary indicators were observed. Common primary and secondary indicators are listed below:

- Primary Indicators:
  - Surface water, high water table, saturation
  - Water marks on trees
  - Sediment deposits
  - Water-stained leaves
  - Drift deposits

- Secondary Indicators:
  - Drainage patterns
  - Stunted or stressed plants
  - Dry-season water table

4.3.2 Wetland Functional Assessment

Wetland functional assessments were completed using the WESP-AC non-tidal calculator for Newfoundland and Labrador. This method of assessment was combined with desktop review and field investigations to assess the condition and function of wetlands and was calibrated for wetlands occurring within Newfoundland and Labrador. WESP-AC generates a score (0 to 10) and ratings (Lower, Moderate, and Higher) for each of a wetland's functions and benefits, as defined in Table 4-2. All evaluations are done in a consistent and transparent manner; therefore, all scores and ratings can be used to make informed decisions about wetland avoidance, minimization, and replacement. This can help to ensure the wetland restoration balances the unavoidable loss of specific functions and benefits (NB DELG, 2018).

Table 4-2: Benefits of wetland functions scored by WESP-AC in Atlantic Canada (NB DELG, 2018)

Function	Definition	Potential Benefits
Hydrologic Functions		
Water Storage and Delay	The effectiveness for storing runoff or delaying the downslope movement of surface water for long or short periods.	Flood control, maintain ecological systems
Stream Flow Support	The effectiveness for contributing water to streams especially during the driest part of a growing season.	Support fish and other aquatic life
Water Quality Maintenance Functions		
Water Cooling	The effectiveness for maintaining or reducing temperature of downslope waters.	Support cold-water fish and other aquatic life
Sediment Retention and Stabilisation	The effectiveness for intercepting and filtering suspended inorganic sediments thus allowing their deposition, as well as reducing energy of waves and currents, resisting excessive erosion, and stabilising underlying sediments or soil.	Maintain quality of receiving waters. Protect shoreline structures from erosion.
Phosphorus Retention	The effectiveness for retaining phosphorus for long periods (>1 growing season)	Maintain quality of receiving waters.
Nitrate Removal and Retention	The effectiveness for retaining particulate nitrate and converting soluble nitrate and ammonium to nitrogen gas while generating little or no nitrous oxide (a potent greenhouse gas).	Maintain quality of receiving waters.

Function	Definition	Potential Benefits
Organic Nutrient Export	The effectiveness for producing and subsequently exporting organic nutrients (mainly carbon), either particulate or dissolved.	Support food chains in receiving waters.
Ecological (Habitat) Functions		
Fish Habitat	The capacity to support an abundance and diversity of native fish (both anadromous and resident species)	Support recreational and ecological values.
Aquatic Invertebrate Habitat	The capacity to support or contribute to an abundance or diversity of invertebrate animals which spend all or part of their life cycle underwater or in moist soil. Includes dragonflies, midges, clams, snails, water beetles, shrimp, aquatic worms, and others.	Support salmon and other aquatic life. Maintain regional biodiversity.
Amphibian and Reptile Habitat	The capacity to support or contribute to an abundance or diversity of native frogs, toads, salamanders, and turtles.	Maintain regional biodiversity.
Waterbird Feeding Habitat	The capacity to support or contribute to an abundance or diversity of waterbirds that migrate or winter but do not breed in the region.	Support hunting and ecological values. Maintain regional biodiversity.
Waterbird Nesting Habitat	The capacity to support or contribute to an abundance or diversity of waterbirds that nest in the region.	Maintain regional biodiversity.
Songbird, Raptor, and Mammal Habitat	The capacity to support or contribute to an abundance or diversity of native songbird, raptor, and mammal species and functional groups, especially those that are most dependent on wetlands or water.	Maintain regional biodiversity.
Native Plant Habitat, Pollinator Habitat	The capacity to support or contribute to a diversity of native, hydrophytic, vascular plant species, communities, and/or functional groups, as well as the pollinating insects linked to them.	Maintain regional biodiversity and food chains.
Public Use and Recognition	Prior designation of the wetland, by a natural resource or environmental agency, as some type of special protected area. Also, the potential and actual use of a wetland for low-intensity outdoor recreation, education, or research.	Commercial and social benefits of recreation. Protection of prior public investments.

4.4 Species at Risk Assessment

An integral part of this vegetation baseline study is determining whether SAR may occur within the vicinity of the Project or may be influenced by the project. Species at risk (SAR) for the purposes of this report include the species and their habitats that are protected by federal or provincial legislation. Species that are protected under Federal legislation include those under Schedule 1 of the *Species at Risk Act* (SARA) listed as endangered, threatened or special concern. Provincially protected species include those that are listed as endangered (Schedule A), threatened (Schedule B), or vulnerable (Schedule C) by the Endangered Species List Regulations under the *Newfoundland and Labrador Endangered Species Act* (NLESA).

To complete an assessment of the potential for SAR occurring within the SSA and BSA that are protected by the SARA, a review of the Species at Risk Public Registry administered by Environment and Climate Change Canada was undertaken. This included conducting a search for vascular plant, lichen and moss species that are listed under Schedule 1 of the SARA for Newfoundland and Labrador to identify potential candidate species. For each species, the corresponding Committee on the Status of Endangered Species in Canada (COSEWIC) status report was reviewed to determine potential species presence in the area and its typical habitat requirements.

Similarly, the Endangered Species List Regulations under the NLESA was reviewed to identify listed species within the province of Newfoundland and Labrador. For each species, the applicable information sheet and/or Species Status Advisory Committee (SSAC) status report was reviewed to determine if the species was likely to occur in the SSA or BSA based upon known distributions and habitat requirements.

4.5 Species of Conservation Concern Assessment

While not protected by Federal or Provincial legislation, there are also species of conservation concern (SOCC) that are considered rare due to generally low numbers of individuals, reduced distributions or habitat restrictions. Species are commonly ranked at global, national and sub-national (Provincial) scales. These rankings are generally refereed as G-Rank (Global-Rank), N-Rank (National-Rank) and S-Rank (Subnational-Rank) and generally use a ranking scale ranging from 1 to 5 with the lower the number generally indicating the rarity of the species and the sensitivity to being adversely affected through the disturbance of individuals/ populations. The Atlantic Canada Conservation Data Centre (ACCDC) provides sub-national species rarity rankings (S-Rank) for the province of Newfoundland and Labrador (Table 4-3). As part the ranking process, ACCDC maintains a searchable geo-referenced database which outlines records of rare plants throughout the province. To assess the potential presence of SOCC within the local and regional area of the Project, WSP requested a data search within BSA.

Table 4-3: Atlantic Canada Conservation Data Centre subnational ranking system (S-Rank) categories

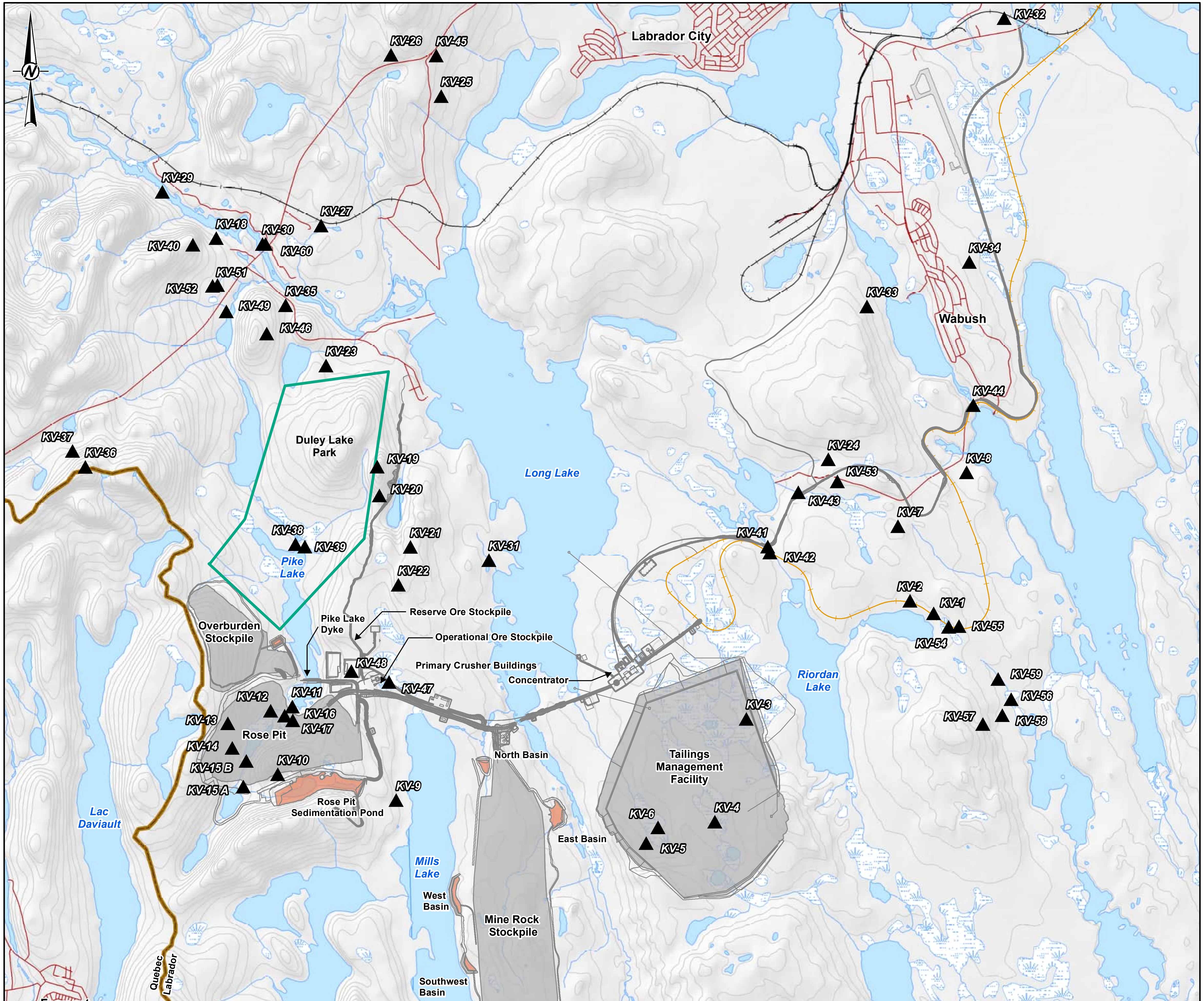
Rank	Category	Description
S1	Critically Imperiled	Critically imperiled in the jurisdiction because of extreme rarity or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the jurisdiction.
S2	Imperiled	Imperiled in the jurisdiction because of rarity due to very restricted range, very few populations, steep declines, or other factors making it very vulnerable to extirpation from jurisdiction.
S3	Vulnerable	Vulnerable in the jurisdiction due to a restricted range, relatively few populations, recent and widespread declines, or other factors making it vulnerable to extirpation.
S4	Apparently Secure	Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5	Secure	Common, widespread, and abundant in the jurisdiction.
SX	Presumably Extirpated	Species or ecosystem is believed to be extirpated from the jurisdiction (i.e., nation or state/province). Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
SH	Possibly Extirpated	Known from only historical records but still some hope of rediscovery. There is evidence that the species or ecosystem may no longer be present in the jurisdiction, but not enough to state this with certainty. Examples of such evidence include (1) that a species has not been documented in approximately 20-40 years despite some searching or some evidence of significant habitat loss or degradation; (2) that a species or ecosystem has been searched for unsuccessfully, but not thoroughly enough to presume that it is no longer present in the jurisdiction.
S#S#	Rank Range	A numeric range rank (e.g., S2S3 or S1S3) is used to indicate any range of uncertainty about the status of the species or ecosystem. Ranges cannot skip more than two ranks (e.g., SU is used rather than S1S4).
SU	Unrankable	Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNR	Unranked	National or subnational conservation status not yet assessed.
SNA	Not Applicable	A conservation status rank is not applicable because the species or ecosystem is not a suitable target for conservation activities.

5.0 STUDY RESULTS

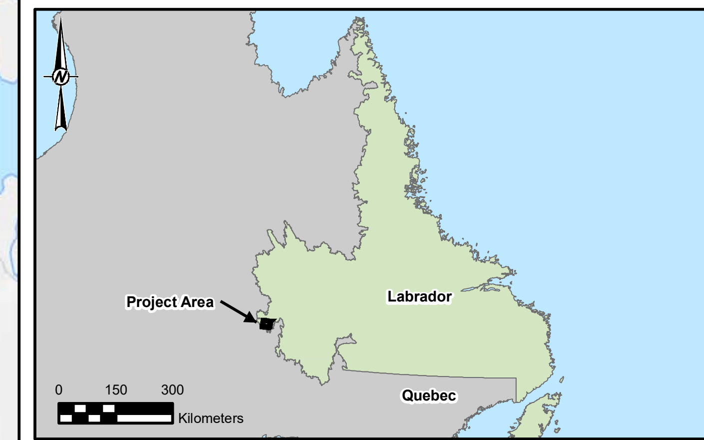
5.1 Vegetation Plot Survey Results

Vegetation survey plots were completed in each of the fourteen ecotypes (Table 4-1). Additional vegetation plots also were completed in Jack Pine Stands (2 plots) and Alder Thickett (1 plot) since they are unique from the other ecotypes. Plots were completed both within both the SSA and BSA to ensure the variability of each ecotype was captured. In total, 61 survey plots were completed from June 16th to 21st, 2023 and August 5th to 10th, 2023 (Figure 5-1). This survey timing allowed data to be collected while early flowering species were in bloom (June surveys) and the collection of data when late flowering species were in bloom or bearing seeds (August surveys).

The subsequent sections (5.1.1 to 5.1.16) provide a description of each ecotype and the species encountered within each ecotype. Each ecotype description is followed by a table which outlines the characteristics of the ecotype and other related information. The information presented includes the ecotype, the number of sample plots completed within the ecotype (including the specific plot identification codes), the range of slopes, moisture regime and drainage encountered within each ecotype, average humus thickness, and details of the dominant species from the identified strata layers. A subsequent table provides a summary of the species composition, the range of cover for each species (minimum, maximum and mean) within each strata layer (tree, tall shrub, low shrub, herbaceous and moss/lichen) and prevalence of each species (how many of the plots the species was present within the ecotype). A list of the identifiable species encountered during the vegetation plot surveys is included in Appendix A.



KEY MAP



SCALE 1:20,000,000

PROJECT DATA

- Kami Plot Coordinates
- Proposed Infrastructure
- Proposed Railway
- Proposed Infrastructure
- Proposed Sedimentation Pond

BASEMAP INFORMATION

- Duley Lake Park
- Existing Railway
- Existing Road
- River/Stream
- Contour
- Waterbody
- Bog/Wetland
- Labrador/Quebec Boundary

0 650 1,300 2,600
1:63,360 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - NEWFOUNDLAND AND LABRADOR
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT
CHAMPION IRON MINES

PROJECT
KAMI IRON ORE PROJECT
WABUSH, NL

TITLE
VEGETATION PLOT LOCATIONS

CONSULTANT

YYYY-MM-DD	2024-03-22
DESIGNED	----
PREPARED	JMA
REVIEWED	----
APPROVED	SG

PROJECT NO.	CONTROL	REV.	FIGURE
TE23930010	0001	A	Figure 5-1

5.1.1 Alpine Heath

The Alpine Heath ecotype generally occurs in higher elevation areas which are exposed and subject to harsh weather conditions (e.g., high winds and extreme cold). The humus layer is usually thin (mean of 4 cm for 2023 survey plots), with soil moisture regime dry and well drained. Soils may be thin, with exposed bedrock common. The general ecotype characteristics are outlined in Table 5-1 while Figure 5-2 outlines the general ecotype conditions.

Plant species include those adapted to the exposed conditions, with the species composition outlined in Table 5-2. Tree cover is often absent, but when present tree species are typically stunted. Eastern larch (*Larix laricina*) and black spruce are typical tree species, but their growth form is typically as a low shrub (<2 m) or tall shrub (2-<10 m), but typically on the shorter end of the tall shrub range. Shrub-form birches (e.g., *Betula glandulosa*) are common within the floral compliment, while Labrador tea may also be present. Ericaceous species such as tundra bilberry, partridgeberry and alpine bearberry are common, while black crowberry and are also common low growing vascular plant species that occupy this ecotype. Non-vascular species include a variety of lichens such as witches hair lichen, reindeer lichen (*Cladina arbuscula*), star-tipped reindeer lichen, easter lichen and crinkled snow lichen. Grasses may also be present but were uncommon (a single unidentified species occurred in one plot). Mean species richness was 7 for vascular plants and 2.7 for non-vascular plants.

Figure 5-2: Alpine Heath Ecotype

Table 5-1: Summary of the Ecological Characteristics for Alpine Heath Ecotype

Ecotype: Alpine Heath	
Number of Sample Plots:	3
Sample Plot Identification Codes:	KV-19, KV-21, KV-36
Slope % (Range):	8-12
Moisture Regime (Range):	Mesic-Xeric
Drainage (Range):	Well
Average Humus thickness (cm):	4
Dominant Tree Species[1]:	N/A[3]
Dominant Tall Shrub Species[1]:	*Picea mariana (Tall Shrub Form)*
Dominant Low Shrub Species[1]:	*Betula glandulosa*
Dominant Herb Species[1,2]:	*Empetrum nigrum*
Dominant Moss/Lichen Species[1]:	*Alectoria ochroleuca*

[1]Based upon average cover across all survey plots within this Ecotype.

[2]Includes low growing shrubs typically less than 15 cm in height.

[3]N/A – Not Applicable.

Table 5-2: Plant Species Composition for Alpine Heath Ecotype

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Alpine Bearberry	*Arctos alpina*	Herbaceous	2	10	20	15.0
Diapensia	*Diapensia lapponica*	Herbaceous	3	0.5	2.5	1.7
Black Crowberry	*Empetrum nigrum*	Herbaceous	3	20	20	20.0
Unknown Grass	Unknown Grass	Herbaceous	1	0.5	0.5	0.5
Tundra Bilberry	*Vaccinium uliginosum*	Herbaceous	3	10	20	16.7
Partridgeberry	*Vaccinium vitis-idaea*	Herbaceous	2	2	10	6.0
Tundra Dwarf Birch	*Betula glandulosa*	Low Shrub	2	3.5	3.5	3.5
Swamp Birch	*Betula pumila*	Low Shrub	1	5	5	5.0
Eastern Larch	*Larix laricina*	Low Shrub	1	0.5	0.5	0.5
Labrador Tea	*Rhododendron groenlandicum*	Low Shrub	1	2	2	2.0

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Black Spruce	*Picea mariana*	Low Shrub	1	2	2	2.0
Witches Hair Lichen	*Alectoria ochroleuca*	Moss/Lichen	2	30	45	37.5
Reindeer Lichen	*Cladina arbuscula*	Moss/Lichen	1	30	30	30.0
Star-Tipped Reindeer Lichen	*Cladina stellaris*	Moss/Lichen	2	10	15	12.5
Easter Lichen	*Stereocaulon paschale*	Moss/Lichen	2	20	20	20.0
Crinkled Snow Lichen	*Flavacetraria nivalis*	Moss/Lichen	1	25	25	25.0
Black Spruce	*Picea mariana*	Tall Shrub	1	2.5	2.5	2.5

5.1.2 Hardwood Forest

Hardwood forests typically occur on hillsides with moderate to steep slopes (8 to 32 % slopes were observed during field surveys), where the humus layer is fairly thin (mean humus layer was 9 cm). Soils are variably covered with a layer of leaf litter, with a moisture regime which is submesic to mesic and are typically well drained. The general ecotype characteristics are outlined in Table 5-3, while Figure 5-3 outlines the general ecotype conditions.

White birch is typically the dominant tree species (in prevalence and cover), while other tree species (e.g., black spruce) may be present but only as a small percent of the canopy cover. White birch occurred in all survey plots with cover ranging from 40-90 %, while black spruce occurred in 75 % of plots but cover ranged from 5-7.5 %. Shrub species such green alder as a component within the low shrub and tall shrub layers, raspberry, skunk current, squashberry and lowbush blueberry are common (occurring within 75 % or more of survey plots), but maximum cover was generally low (20 % or less). Similarly, a variety of herbaceous species may be present with interrupted clubmoss, crackerberry, twinflower, twisted stalk, and grass species (*Poaceae*) occurring regularly within the ecotype (within 75 % of survey plots). However, cover was variable for all species with interrupted clubmoss and crackerberry having the highest maximum cover (70 % and 40 %, respectively) observed within the herbaceous strata layer. A variety of moss species are represented including red-stemmed feathermoss, knights plume moss, haircap moss and forkmoss (*Dicranium spp*.), while the lichen smooth cladonia may also be found within the ecotype. Red-stemmed feathermoss was the most prevalent species occluding in 75 % of plots with a percent cover ranging from10-25 %, while other species occurred at 10 % or less cover when present. Mean species richness was 17 for vascular plants and 3 for non-vascular plants. Table 5-4 provides details on species composition within the ecotype.

Figure 5-3: Hardwood Forest Ecotype

Table 5-3: Summary of the Ecological Characteristics for Hardwood Forest

Ecotype: Hardwood Forest	
Number of Sample Plots:	4
Sample Plot Identification Codes:	KV-25, KV-26, KV-33, KV-57
Slope % (Range):	8-32
Moisture Regime (Range):	Submesic-Mesic
Drainage (Range):	Well

Ecotype: Hardwood Forest	
Average Humus thickness (cm):	9
Canopy:	*Betula papyrifera*
Understory:	*Betula papyrifera*
Dominant Tree Species[1]:	*Betula papyrifera*
Dominant Tall Shrub Species[1]:	*Betula papyrifera*
Dominant Low Shrub Species[1]:	*Viburnum edule*
Dominant Herb Species[1,2]:	*Spinulum annotinum*
Dominant Moss/Lichen Species[1]:	*Pleurozium shreberi*

[1]Based upon average cover across all survey plots within this Ecotype.

[2]Includes low growing shrubs typically less than 15 cm in height.

Table 5-4: Plant Species Composition for Hardwood Forest

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Common Yarrow	*Achillea millefolium*	Herbaceous	1	0.5	0.5	0.5
Fireweed	*Chamerion angustifolium*	Herbaceous	1	2	2	2.0
Bluebead Lilly	*Clintonia borealis*	Herbaceous	1	20	20	20.0
Crackerberry	*Cornus canadensis*	Herbaceous	3	5	40	18.3
Mountain Wood Fern	*Dryopteris campyloptera*	Herbaceous	2	5	19	12.0
Spinulose Wood Fern	*Dryopteris carthusiana*	Herbaceous	1	1	1	1.0
Woodland Horsetail	*Equisetum sylvaticum*	Herbaceous	1	2	2	2.0
Creeping Snowberry	*Gautheria hispidula*	Herbaceous	1	5	5	5.0
Northern Oak Fern	*Gymnocarpium dryopteris*	Herbaceous	1	10	10	10.0
Twinflower	*Linnaea borealis*	Herbaceous	3	0.5	3	2.2
Starflower	*Lysimachia borealis*	Herbaceous	1	0.5	0.5	0.5
Naked Bishop's Cap	*Mitella nuda*	Herbaceous	2	2	20	11.0
Arctic Butterbur	*Petasites frigidus*	Herbaceous	2	0.3	0.5	0.4
Unidentified Grass	*Poaceae*	Herbaceous	3	0.5	2	1.2
Dwarf Raspberry	*Rubus arcticus*	Herbaceous	1	15	15	15.0

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Dewberry	*Rubus pubescens*	Herbaceous	1	0.3	0.3	0.3
Bottle Brush	*Sanguisorba canadensis*	Herbaceous	1	1	1	1.0
Large-Leaf Goldenrod	*Solidago macrophylla*	Herbaceous	2	0.5	2	1.3
Bog Goldenrod	*Solidago uliginosa*	Herbaceous	1	2.5	2.5	2.5
Interrupted Clubmoss	*Spinulum annotinum*	Herbaceous	3	2	70	40.7
Twisted Stalk	*Streptopus amplexifolius*	Herbaceous	3	0.5	1	0.7
Unknown Plant	*Unknown Forb*	Herbaceous	1	0.3	0.3	0.3
Violet	*Viola sp.*	Herbaceous	1	0.3	0.3	0.3
Green Alder	*Alnus alnobetula*	Low Shrub	1	10	10	10.0
Chuckley Pear	*Amelanchier bartramiana*	Low Shrub	2	1	1	1.0
Labrador Tea	*Rhododendron groenlandicum*	Low Shrub	1	1	1	1.0
Trembling Aspen	*Populus tremuloides*	Low Shrub	1	2	2	2.0
Skunk Current	*Ribes glandulosum*	Low Shrub	4	1	15	5.5
Raspberry	*Rubus idaeus*	Low Shrub	3	2	12	8.0
Pussy Willow	*Salix dicolor*	Low Shrub	1	5	5	5.0
Willow	*Sorbus decora*	Low Shrub	1	0.5	0.5	0.5
Showy Mountain Ash	*Salix sp.*	Low Shrub	1	2	2	
Lowbush Blueberry	*Vaccinium angustifolium*	Low Shrub	3	2	5	4.0
Squashberry	*Viburnum edule*	Low Shrub	3	10	20	15.0
Smooth Cladonia	*Cladonia gracilis*	Moss/Lichen	1	0.5	0.5	0.5
Dicranium Moss	*Dicranium sp.*	Moss/Lichen	1	10	10	10.0
Feathermoss	*Feathermoss*	Moss/Lichen	1	10	10	10.0
Red-stemmed Feathermoss	*Pleurozium shreberi*	Moss/Lichen	3	10	25	15.0
Haircap Moss	*Polytrichum sp.*	Moss/Lichen	2	2	5	3.5
Knights Plume Moss	*Ptilium crista-castrensis*	Moss/Lichen	1	10	10	10.0
Green Alder	*Alnus alnobetula*	Tall Shrub	2	3	20	11.50

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
White Birch	*Betula papyrifera*	Tall Shrub	3	40	70	51.6
Black Spruce	*Picea mariana*	Tall Shrub	3	5	7.5	5.8
Unknown Tree	*Undetermined Shrub/Tree*	Tall Shrub	1	5	5	5.0
White Birch	*Betula papyrifera*	Tree	1	90	90	90

5.1.3 Mixedwood Forest

Mixedwood forests occurred over a range of slopes (4 to 20 %), with a variety of moisture regimes (submesic to hygric). Soil humus layer is generally thin with humus layer thickness ranging from 4 to 12 cm during 2023 field surveys. The general ecotype characteristics are outlined in Table 5-5 while Figure 5-4 outlines the general ecotype conditions.

Within this ecotype hardwood and softwood tree species are present and may include black spruce, balsam fir, white birch and trembling aspen which may occur in the tree and/or tall shrub strata layers but may also be found in the understory low shrub layer as saplings. Black spruce and balsam fir were found in all three strata layers. Mixedwood forest stands are usually fairly open with tree species present typically having a percent cover of 30% or less within each strata layer when present. The tall shrub layer regularly includes green alder and pussy willow both of which had a maximum observed cover of 20 % during 2023 field surveys. The low shrub layer regularly included squashberry, skunk current, Labrador tea and lowbush blueberry, with Labrador tea and lowbush blueberry each having cover ranging from 20 to 30 % when present in a plot, while squashberry and skunk current had minimal cover. Grass species, interrupted clubmoss, crackerberry, twinflower and starflower are represented regularly within the herbaceous layer of the ecotype. Cover for each herbaceous species was variable when compared between survey plots (the range between minimum and maximum cover for each is wide), and usually not extensive (interrupted clubmoss was the only species that had cover above 35 % in any plot). Within the moss/lichen layer knights plume moss and red-stemmed feathermoss were dominant (occurring in 60% and 80% of plots respectively), both with appreciable to significant cover when they occurred (10% to 50% and 10% to 90%, respectively). While star-tipped reindeer lichen and smooth cladonia lichens occurred infrequently. Mean species richness was 17.3 for vascular plants and 2.3 for non-vascular plants. Table 5-6 provides details on species composition within the ecotype.

Figure 5-4: Mixedwood Forest Ecotype

Table 5-5: Summary of the Ecological Characteristics for Mixedwood Forest

Ecotype: Mixedwood Forest	
Number of Sample Plots:	4
Sample Plot Identification Codes:	KV-40, KV-42, KV-45, KV-58
Slope % (Range):	4-20
Moisture Regime (Range):	Submesic-Hygric
Drainage (Range):	Moderate-Well
Average Humus thickness (cm):	7.3
Canopy:	*Picea mariana; Populus tremuloides*

Ecotype: Mixedwood Forest	
Understory:	*Betula papyrifera*
Dominant Tree Species[1]:	*Picea mariana; Populus tremuloides*
Dominant Tall Shrub Species[1]:	*Betula papyrifera*
Dominant Low Shrub Species[1]:	*Vaccinium angustifolium*
Dominant Herb Species[1,2]:	*Equisetum sylvaticum (1 plot); Spinulum annotinum (4 plots); Cornus canadensis (4 plots)*
Dominant Moss/Lichen Species[1]:	*Ptilium crista-castrensis*

[1]Based upon average cover across all survey plots within this Ecotype.

[2]Includes low growing shrubs typically less than 15 cm in height.

Table 5-6: Plant Species Composition for Mixedwood Forest

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Red Baneberry	*Actaea rubra*	Herbaceous	1	2	2	2.0
Fireweed	*Chamerion angustifolium*	Herbaceous	2	1	5	3.0
Bluebead Lilly	*Clintonia borealis*	Herbaceous	1	2	2	2.0
Crackerberry	*Cornus canadensis*	Herbaceous	4	5	35	27.5
Field Horsetail	*Equisetum arvense*	Herbaceous	1	1	1	1.0
Woodland Horsetail	*Equisetum sylvaticum*	Herbaceous	1	30	30	30.0
Northern Commandra	*Geocaulon lividium*	Herbaceous	2	0.5	2	1.3
Twinflower	*Linnaea borealis*	Herbaceous	3	3	25	10.3
Arctic Butterbur	*Petasites frigidus*	Herbaceous	1	1	1	1.0
Starflower	*Lysimachia borealis*	Herbaceous	3	0.5	2	1.0
Unidentifed Grass Species	*Poaceae*	Herbaceous	5	0.1	5	2.5
Dewberry	*Rubus pubescens*	Herbaceous	1	2	2	2.0
Large-Leaf Goldenrod	*Solidago macrophylla*	Herbaceous	1	0.5	0.5	0.5
Interrupted Clubmoss	*Spinulum annotinum*	Herbaceous	4	1	80	27.8
Twisted Stalk	*Streptopus amplexifolius*	Herbaceous	1	0.5	0.5	0.5
Aster (basal rosette)	*Symphonotrichum sp.*	Herbaceous	1	1	1	1.0
Unknown Plant	*Unidentified Forb*	Herbaceous	1	1	1	1.0

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Partridgeberry	*Vaccinium vitis-idaea*	Herbaceous	1	1	1	1.0
Balsam Fir	*Abies balsamea*	Low Shrub	2	0.5	1	0.8
Green Alder	*Alnus alnobetula*	Low Shrub	1	5	5	5.0
Chuckley Pear	*Amelanchier bartramiana*	Low Shrub	1	0.5	0.5	0.5
Tundra Dwarf Birch	*Betula glandulosa*	Low Shrub	1	2	2	2.0
Labrador Tea	*Rhododendron groenlandicum*	Low Shrub	2	20	30	25.0
Black Spruce	*Picea mariana*	Low Shrub	2	0.5	2	1.3
Skunk Current	*Ribes glandulosum*	Low Shrub	2	1	1	1.0
Showy Mountain Ash	*Sorbus decora*	Low Shrub	1	0.5	0.5	0.5
Lowbush Blueberry	*Vaccinium angustifolium*	Low Shrub	2	23	30	26.5
Tundra Bilberry	*Vaccinium uliginosum*	Low Shrub	1	2	2	2.0
Squashberry	*Viburnum edule*	Low Shrub	3	0.5	4	2.2
Star-Tipped Reindeer Lichen	*Cladina stellaris*	Moss/Lichen	1	5	5	5.0
Smooth Cladonia	*Cladonia gracilis*	Moss/Lichen	1	1	1	1.0
Red-stemmed Feathermoss	*Pleurozium shreberi*	Moss/Lichen	4	10	50	32.5
Knights Plume Moss	*Ptilium crista-castrensis*	Moss/Lichen	3	10	90	48.3
Balsam Fir	*Abies balsamea*	Tall Shrub	1	3	3	3.0
Green Alder	*Alnus alnobetula*	Tall Shrub	2	5	20	12.5
White Birch	*Betula papyrifera*	Tall Shrub	3	10	25	16.7
Black Spruce	*Picea mariana*	Tall Shrub	2	0.5	25	12.8
Pussy Willow	*Salix dicolor*	Tall Shrub	3	10	20	13.3
Balsam Fir	*Abies balsamea*	Tree	1	10	10	10.0
Black Spruce	*Picea mariana*	Tree	3	10	30	20.0
Trembling Aspen	*Populus tremuloides*	Tree	2	10	30	20.0

5.1.4 Black Spruce-Labrador Tea-Feathermoss

The Black Spruce-Labrador Tea-Feathermoss ecotype is found at a variety of elevations and positions along slopes and in level areas (slopes of survey plots ranged from 1 to 15 %). Typically, drainage is moderate to well, with a moisture regime ranging from mesic to subhydric. The mean depth of the humus layer was 15 cm. The general ecotype characteristics are outlined in Table 5-7 , while Figure 5-5 outlines the general ecotype conditions.

Black spruce is the dominant species (in percent cover and prevalence) in the tree and tall shrub strata layers, while eastern larch and balsam fir are also represented in each layer as sub-dominant species. Within the low shrub layer Labrador tea and lowbush blueberry were commonly found in survey plots as co-dominants (9 and 10.6 % mean cover, respectively). Shrub form birches (swamp birch and tundra dwarf birch) were also present in some plots at appreciable cover (10 and 12.5 % average cover, respectively). Other species in the low shrub layer include several willow species, shrubby cinquefoil, northern honeysuckle, bog laurel, chuckley pear, while black spruce and balsam fir are also represented. Representatives within the herbaceous layer include creeping snowberry, twinflower and interrupted clubmoss, partridgeberry, black crowberry, woodland horsetail and crackerberry. Within the moss/lichen layer red-stemmed feathermoss is dominant with knights plume moss subdominant both of which occurred in all survey plots. Other mosses which occurred in the ecotype include *Sphagnum sp.* and Stairstep moss both of which occurred infrequently within the survey plots. Lichen species included star-tipped reindeer lichen, smooth cup lichen freckled pelt lichen with only star-tipped reindeer lichen occurring regularly within the survey plots. Mean species richness was 9.1 for vascular plants and 4 for non-vascular plants. Table 5-8 provides details on species composition within the ecotype.

Figure 5-5: Black Spruce-Labrador Tea Feathermoss Ecotype

Table 5-7: Summary of the Ecological Characteristics for Black Spruce-Labrador Tea-Feathermoss Ecotype

Ecotype: Black Spruce-Labrador Tea-Feathermoss	
Number of Sample Plots:	7
Sample Plot Identification Codes:	KV-9, KV-15A, KV-20, KV-23, KV-37, KV-48, KV-55
Slope % (Range):	1-14
Moisture Regime (Range):	Mesic-Subhydric
Drainage (Range):	Moderate-Well
Average Humus thickness (cm):	15

Ecotype: Black Spruce-Labrador Tea-Feathermoss	
Canopy:	*Picea mariana*
Understory:	*Picea mariana, Rhododendron groenlandicum, Betula glandulosum, Betula pumila*
Dominant Tree Species[1]:	*Picea mariana*
Dominant Tall Shrub Species[1]:	*Picea mariana*
Dominant Low Shrub Species[1]:	*Betula glandulosa*
Dominant Herb Species[1,2]:	*Gaultheria hispidula*
Dominant Moss/Lichen Species[1]:	*Pleurozium shreberii*

[1]Based upon average cover across all survey plots within this Ecotype.

[2]Includes low growing shrubs typically less than 15 cm in height.

Table 5-8: Plant Species Composition for Black Spruce-Labrador Tea-Feathermoss Ecotype

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Crackerberry	*Cornus canadensis*	Herbaceous	5	0.5	7	2.1
Black Crowberry	*Empetrum nigrum*	Herbaceous	6	1	10	3.5
Woodland Horsetail	*Equisetum sylvaticum*	Herbaceous	1	1	1	1.0
Creeping Snowberry	*Gautheria hispidula*	Herbaceous	4	0.5	25	15.1
Twinflower	*Linnaea borealis*	Herbaceous	1	5	5	5.0
Interrupted Clubmoss	*Spinulum annotinum*	Herbaceous	3	5	10	7.5
Partridgeberry	*Vaccinium vitis-idaea*	Herbaceous	5	0.5	3	1.5
Balsam Fir	*Abies balsamea*	Low Shrub	2	3	7	5.0
Chuckley Pear	*Amelanchier bartramiana*	Low Shrub	1	0.3	0.3	0.3
Tundra Dwarf Birch	*Betula glandulosa*	Low Shrub	2	5	20	12.5
Swamp Birch	*Betula pumila*	Low Shrub	2	10	10	10.0
Shrubby Cinquefoil	*Dasiphora fruticosa*	Low Shrub	1	5	5	5.0
Bog Laurel	*Kalmia polifolia*	Low Shrub	1	0.5	0.5	0.5
Labrador Tea	*Rhododendron groenlandicum*	Low Shrub	6	2	20	9.0
Northern Honeysuckle	*Lonicera villosa*	Low Shrub	2	0.5	1	0.8

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Black Spruce	*Picea mariana*	Low Shrub	3	2	5	3.0
Bebb's Willow	*Salix bebbiana*	Low Shrub	1	1	1	1.0
Pussy Willow	*Salix discolor*	Low Shrub	1	1	1	1.0
Prairie Willow	*Salix humilis*	Low Shrub	1	5	5	5.0
Willow	*Salix sp.*	Low Shrub	1	2	2	2.0
Lowbush Blueberry	*Vaccinium angustifolium*	Low Shrub	8	5	15	10.6
Star-Tipped Reindeer Lichen	*Cladina stellaris*	Moss/Lichen	6	0.5	15	4.3
Smooth Cup Lichen	*Cladonia gracilis*	Moss/Lichen	1	0.5	0.5	0.5
Stairstep Moss	*Hylocomium splendens*	Moss/Lichen	1	5	5	5.0
Freckled Pelt Lichen	*Peltigera aphthosa*	Moss/Lichen	3	0.5	1	0.7
Red-stemmed Feathermoss	*Pleurozium shreberi*	Moss/Lichen	7	10	80	57.6
Knights Plume Moss	*Ptilium crista-castrensis*	Moss/Lichen	7	10	90	37.1
Sphagnum moss	*Sphagnum sp.*	Moss/Lichen	2	5	10	7.5
Unknown Lichen	*Unkown Lichen*	Moss/Lichen	1	3	3	3.0
Balsam Fir	*Abies balsamea*	Tall Shrub	1	4	4	4.0
Eastern Larch	*Larix laricina*	Tall Shrub	1	5	5	5.0
Black Spruce	*Picea mariana*	Tall Shrub	5	3	60	23.6
Balsam Fir	*Abies balsamea*	Tree	2	5	20	12.5
Eastern Larch	*Larix laricina*	Tree	1	7.5	7.5	7.5
Black Spruce	*Picea mariana*	Tree	6	15	40	29.2

5.1.5 Black Spruce-Lichen

The Black Spruce-Lichen ecotype is found throughout the survey area on slopes that ranged from 1 to 14 %. Typical drainage is well to rapidly drained with moisture regime ranging from subxeric to submesic. Mean humus thickness was 7 cm. The habitat typically has an open crown and frequently there is no crown overlap between adjacent trees. The general ecotype characteristics are outlined in Table 5-9, while Figure 5-6 outlines the general ecotype conditions.

Black spruce is the dominant species (in percent cover and prevalence) in the tree and tall shrub strata layers, while eastern larch and pussy willow are represented in the tall shrub layer. Within the low shrub layer lowbush blueberry was the dominant species in all survey plots of the ecotype. Labrador tea occurred in all sample plots at low density (maximum cover was 10 %), while swamp birch, dwarf tundra birch, northern honeysuckle and willow occurred in some plots at a low density (all less than 7.5 percent mean cover). Species in the herbaceous layer included partridgeberry, northern ground cedar, black crowberry and crackerberry all of which occurred at low density (2 % or less mean cover), with partridgeberry the only herbaceous species occurring in all ecotype plots. Star-tipped reindeer lichen, red-stemmed feathermoss and easter lichen were found in all survey plots, with smooth cup lichen found within a single plot. Star-tipped reindeer lichen was dominant (70 to 90 % cover), while the occurrence of the other species was 15 % or less. Mean species richness was 6 for vascular plants and 3.3 for non-vascular plants making this the ecotype with the lowest species richness. Table 5-10 provides details on species composition within the ecotype.

Figure 5-6: Black Spruce-Lichen Ecotype

Table 5-9: Summary of the Ecological Characteristics for Black Spruce-Lichen Ecotype

Ecotype: Black Spruce-Lichen	
Number of Sample Plots:	3
Sample Plot Identification Codes:	KV-18, KV-22, KV-31
Slope % (Range):	1-14
Moisture Regime (Range):	Subxeric-Submesic
Drainage (Range):	Rapidly Drained-Well Drained
Average Humus thickness (cm):	7
Canopy:	*Picea mariana*
Understory:	*Picea mariana*
Dominant Tree Species[1]:	*Picea mariana*
Dominant Tall Shrub Species[1]:	*Picea mariana*
Dominant Low Shrub Species[1]:	*Vaccinium angustifolium*
Dominant Herb Species[1,2]:	*Diphasiastrum complanatum*
Dominant Moss/Lichen Species[1]:	*Cladina stellaris*

[1]Based upon average cover across all survey plots within this Ecotype.

[2]Includes low growing shrubs typically less than 15 cm in height.

Table 5-10: Plant Species Composition for Black Spruce-Lichen Ecotype

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Crackerberry	*Cornus canadensis*	Herbaceous	1	0.5	0.5	0.5
Northern Ground Cedar	*Diphasiastrum complanatum*	Herbaceous	1	2	2	2.0
Black Crowberry	*Empetrum nigrum*	Herbaceous	1	1	1	1.0
Partridgeberry	*Vaccinium vitis-idaea*	Herbaceous	3	0.5	3	1.3
Dwarf Tundra Birch	*Betula glandulosa*	Low Shrub	1	5	5	5.0
Swamp Birch	*Betula pumila*	Low Shrub	2	5	10	7.5
Labrador Tea	*Rhododendron groenlandicum*	Low Shrub	3	0.5	10	3.5
Northern Honeysuckle	*Lonicera villosa*	Low Shrub	1	0.5	0.5	0.5
Willow	*Salix sp.*	Low Shrub	1	1	1	1.0

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Lowbush Blueberry	*Vaccinium angustifolium*	Low Shrub	3	20	25	21.7
Star-Tipped Reindeer Lichen	*Cladina stellaris*	Moss/Lichen	3	70	90	78.3
Smooth Cup Lichen	*Cladonia gracilis*	Moss/Lichen	1	3	3	3.0
Red-stemmed Feathermoss	*Pleurozium shreberi*	Moss/Lichen	3	5	15	10.0
Easter Lichen	*Stereocaulon paschale*	Moss/Lichen	3	2	15	7.3
Eastern Larch	*Larix laricina*	Tall Shrub	1	2	2	2.0
Black Spruce	*Picea mariana*	Tall Shrub	3	20	20	20.0
Pussy Willow	*Salix dicolor*	Tall Shrub	1	1	1	1.0
Black Spruce	*Picea mariana*	Tree	1	5	5	5.0

5.1.6 Black Spruce/Tamarack-Sphagnum Woodland

The Black Spruce/Tamarack-Sphagnum Woodland ecotype is typically found at lower elevations on locations with a low to no slope. The humus layer is considerable (mean of plots surveyed was 34 cm) often with a moisture regime where the soil is moist-wet throughout the year with moderate to poor drainage. The general ecotype characteristics are outlined in Table 5-11, while Figure 5-7 outlines the general ecotype conditions.

Eastern larch and black spruce are typical components of the typically open tree strata layer, while white spruce may occur infrequently. Eastern larch and black spruce also occur variably within the shrub strata layers. Pussy willow, green alder and balsam fir are also represented within the tall shrub strata layer.

The low shrub layer is comprised of numerous species including a variety of willow (*Salix*) species, Labrador tea, leatherleaf, low bush blueberry and squashberry. Herbaceous species include a variety of forbs including bottlebrush, water avens, crackerberry, woodland horsetail and naked bishop’s cap. Graminoid species are variably represented, while creeping snowberry and partridgeberry are found as low growing spreading shrubs. Red-stemmed feathermoss, knights plume moss and sphagnum mosses are regularly found within the ecotype, but sphagnum mosses are dominant. This ecotype was the most species diverse with a mean species richness of 17.3 for vascular plants and 3 for non-vascular plants. Table 5-12 provides details on species composition within the ecotype.

Figure 5-7: Black Spruce/Tamarack-Sphagnum Woodland Ecotype

Table 5-11: Summary of the Ecological Characteristics for Black Spruce/Tamarack-Sphagnum Woodland Ecotype

Ecotype: Black Spruce/Tamarack-Sphagnum Woodland	
Number of Sample Plots:	6
Sample Plot Identification Codes:	KV-12, KV-32, KV-34, KV-39, KV-50, KV-59
Slope % (Range):	0-5
Moisture Regime (Range):	Subhydric - Hydric
Drainage (Range):	Moderate-Poor
Average Humus thickness (cm):	34
Canopy:	Eastern Larch

Ecotype: Black Spruce/Tamarack-Sphagnum Woodland	
Understory:	N/A
Dominant Tree Species[1]:	*Larix laricina*
Dominant Tall Shrub Species[1]:	*Alnus alnobetula* (1 plot); *Picea mariana* (6 plots)
Dominant Low Shrub Species[1]:	*Vaccinium angustifolium*
Dominant Herb Species[1,2]:	*Trichophorum cespitosum*
Dominant Moss/Lichen Species[1]:	*Sphagnum sp.*

[1]Based upon average cover across all survey plots within this Ecotype.

[2]Includes low growing shrubs typically less than 15 cm in height.

Table 5-12: Plant Species Composition for Black Spruce/Tamarack-Sphagnum Woodland Ecotype

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Blue-Joint Reedgrass	*Calamagrostis canadensis*	Herbaceous	2	1	5	3.0
Hair-Like Sedge	*Carex capillaris*	Herbaceous	1	2	2	2.0
Star Sedge	*Carex echinata*	Herbaceous	1	N/A	N/A	N/A
Boreal Bog Sedge	*Carex magellanica*	Herbaceous	1	N/A	N/A	N/A
Three Seeded Sedge	*Carex trisperma*	Herbaceous	1	0.5	0.5	0.5
Fireweed	*Chamerion angustifolium*	Herbaceous	2	0.5	1	0.8
Goldthread	*Coptis trifolia*	Herbaceous	2	1	2	1.5
Crackerberry	*Cornus canadensis*	Herbaceous	4	0.5	5	3.9
Black Crowberry	*Empetrum nigrum*	Herbaceous	2	2	2	2.0
Field Horsetail	*Equisetum arvense*	Herbaceous	1	0.5	0.5	0.5
Water Horsetail	*Equisetum fluvitale*	Herbaceous	1	N/A	N/A	N/A
Woodland Horsetail	*Equisetum sylvaticum*	Herbaceous	5	0.1	30	8.8
Virginia Strawberry	*Fragaria virginiana*	Herbaceous	1	0.5	0.5	0.5
Creeping Snowberry	*Gautheria hispidula*	Herbaceous	6	1.5	8	5.2
Northern Commandra	*Geocaulon lividium*	Herbaceous	1	N/A	N/A	N/A
Water Avens	*Geun rivale*	Herbaceous	1	10	10	10.0
Twinflower	*Linnaea borealis*	Herbaceous	4	1	2	1.8

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Canada Mayflower	*Maianthemum canadense*	Herbaceous	1	2	2	2.0
Three Leaved False Solomon Seal	*Maianthemum trifolium*	Herbaceous	1	N/A	N/A	N/A
Naked Bishop's Cap	*Mitella nuda*	Herbaceous	2	0.5	7.5	4.0
Arctic Butterbur	*Petasites frigidus*	Herbaceous	1	0.5	0.5	0.5
Unidentified Grass Species	*Poaceae*	Herbaceous	4	3	20	10.8
Dwarf Raspberry	*Rubus arcticus*	Herbaceous	2	1	3	2.0
Bakeapple	*Rubus chamaemorus*	Herbaceous	4	0.5	5	2.2
Bottle Brush	*Sanguisorba canadensis*	Herbaceous	3	1	25	12.0
Purple Oatgrass	*Schizachne purpurescens*	Herbaceous	1	1	1	1.0
Large-Leaf Goldenrod	*Solidago macrophylla*	Herbaceous	1	3	3	3.0
Aster	*Symphonotrichum sp.*	Herbaceous	1	1	1.0	1
Swamp Aster	*Symphyotrichum puniceum*	Herbaceous	0.5	0.5	0.5	1
Deergrass	*Trichophorum cespitosum*	Herbaceous	15	15	15.0	1
Unidentified Plant	*Unidentified Forb*	Herbaceous	0.5	0.5	0.5	1
Partridgeberry	*Vaccinium vitis-idaea*	Herbaceous	0.5	2	1.0	3
Green False hellebore	*Veratrum viride var.viride*	Herbaceous	0.5	0.5	0.5	1
Labrador Violet	*Viola cf. labradorica*	Herbaceous	1	1	1.0	1
Chuckley Pear	*Amelanchier bartramiana*	Low Shrub	1	1	1	1.0
Tundra Dwarf Birch	*Betula glandulosa*	Low Shrub	2	2	5	3.5
Leatherleaf	*Chamaedaphne calyculata*	Low Shrub	2	5	5	5.0
Shrubby Cinquefoil	*Dasiphora fruticosa*	Low Shrub	2	1	1	1.0
Sheep Laurel	*Kalmia angustifolia*	Low Shrub	1	2	2	2.0
Bog Laurel	*Kalmia polifolia*	Low Shrub	3	1	1	1.0
Eastern Larch	*Larix laricina*	Low Shrub	2	1	20	10.5
Labrador Tea	*Rhododendron groenlandicum*	Low Shrub	6	2	25	12.0
Sweetgale	*Myrica gale*	Low Shrub	2	2	2	2.0

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Black Spruce	*Picea mariana*	Low Shrub	3	1	10	4.3
Labrador Willow	*Salix argyrocarpa*	Low Shrub	2	2	2	2.0
Bog Willow	*Salix pedicellaris*	Low Shrub	2	1	2	1.5
Rock Willow	*Salix vestida*	Low Shrub	1	1.5	1.5	1.5
Lowbush Blueberry	*Vaccinium angustifolium*	Low Shrub	4	2	50	18.3
Squashberry	*Viburnum edule*	Low Shrub	1	7	7	7.0
Unknown Reindeer Moss	*Cladina sp.*	Moss-Lichen	1	N/A	N/A	N/A
Red-stemmed Feathermoss	*Pleurozium shreberi*	Moss-Lichen	6	20	60	36.0
Knights Plume Moss	*Ptilium crista-castrensis*	Moss-Lichen	5	10	45	23.8
Sphagnum moss	*Sphagnum sp.*	Moss-Lichen	6	20	70	43.0
Balsam Fir	*Abies balsamea*	Tall Shrub	2	5	10	7.5
Green Alder	*Alnus alnobetula*	Tall Shrub	1	25	25	25.0
Eastern Larch	*Larix laricina*	Tall Shrub	4	1	50	13.3
Black Spruce	*Picea mariana*	Tall Shrub	6	4	50	15.7
Pussy Willow	*Salix discolor*	Tall Shrub	2	2	7.5	4.8
Eastern Larch	*Larix laricina*	Tree	3	10	30	18.3
White Spruce	*Picea glauca*	Tree	1	5	5	5.0
Black Spruce	*Picea mariana*	Tree	3	15	20	16.7

N/A = Not Applicable.

5.1.7 Tamarack/Black Spruce-Feathermoss (Water Track)

Tamarack/Black-Spruce-Feathermoss (Water Track) ecotype occurs in low lying-low slope areas (slopes observed during the 2023 field surveys ranged from 1 to 4 %) where a water track (e.g., a small stream) appears to bisect a larger wetland complex. The typical configuration of this ecotype is a strip of variably forested land that boarders both sides of a slow flowing stream which in turn are bordered by wetlands. Soils within this ecotype have variable humus depth (humus depth of 20 to 100 cm was observed during 2023 field surveys) with generally poor drainage depending upon the underlying substrate composition and surrounding water table elevation. The moisture regime is generally wet (subhydric to hydric). The general ecotype characteristics are outlined in Table 5-13, while Figure 5-8 outlines the general ecotype conditions.

The Tamarack/Black-Spruce-Feathermoss (Water Track) ecotype commonly supports a variety of tree, shrub, forb, graminoid and moss species common within moist to wet ecotypes. Tree cover in this ecotype is open and somewhat patchy with eastern larch and black spruce as the typical species, with white spruce occurring infrequently at locations where soils are more well drained and somewhat elevated above the water table. The maximum cover observed for black spruce and eastern larch within either the tall shrub or tree strata layer was 20% and 15%, respectively. White spruce occurred within a single survey plot with a cover of 5%. Shrubby cinquefoil, tundra dwarf birch, northern honeysuckle and squashberry are common shrub species within the ecotype, while eastern larch and black spruce may also be present as a low shrub form (<2 m in height). While common the maximum cover of either species is typically not extensive (maximum cover observed for either species was 35% or less). Other shrub species include willows, sweetgale, common juniper, skunk current, bog laurel and Labrador tea all of which had a maximum cover of 12 % or less. There are a wide variety of herbaceous species that may be found in this ecotype including a variety graminoids with a low rate of prevalence (does not occur consistently across sites) and the amount of cover generally low (10% or less cover). Chestnut-colored sedge (*Carex castanea*) and an unidentified graminoid species were the only species to have a percent cover which exceeded 10 % in a plot surveyed within the ecotype (50% and 40%, respectively). Similarly, a variety of forbs may occur within this ecotype including bottle brush, swamp aster, tall meadow rue, green false hellebore, Labrador violet, arctic raspberry, Mistassini primrose, water avens, virginia strawberry, woodland horsetail, goldthread and others. Bottlebrush was ubiquitous across all sample plots within the ecotype with a percent cover ranging from 3 to 35 %. Green false hellebore was found within 4 of 6 survey plots, however the percent cover was low (5% or less), while swamp aster and tall meadow rue were found in 50 % of plots at low densities (15 % or less of total cover). The other species were found infrequently at low densities (5% or less of cover). Sphagnum mosses are common while red-stemmed feathermoss and stairstep moss are also present all at variable densities. While uncommon, woods valerian occurred in a single plot at low density during the 2023 field surveys. The species is identified as a species of conservation concern (Section 4.5). Mean species richness was 16.4 for vascular plants and 1.4 for non-vascular plants. Table 5-14 provides details on species composition within the ecotype.

Figure 5-8: Tamarack/Black Spruce-Feathermoss (Water Track)

Table 5-13: Summary of the Ecological Characteristics for Tamarack/Black Spruce-Feathermoss (Water Track)

Ecotype: Tamarack/Black Spruce-Feathermoss (Water Track)	
Number of Sample Plots:	6
Sample Plot Identification Codes:	KV-4, KV-6, KV-27, KV-43, KV-52, KV-56
Slope % (Range):	1-4
Moisture Regime (Range):	Subhydric-Hydric
Drainage (Range):	Well-Poor
Average Humus thickness (cm):	57

Ecotype: Tamarack/Black Spruce-Feathermoss (Water Track)	
Canopy:	*Larix laricina; Picea mariana*
Understory:	*Larix laricina; Picea mariana; Salix discolor*
Dominant Tree Species[1]:	*Larix laricina*
Dominant Tall Shrub Species[1]:	*Picea mariana*
Dominant Low Shrub Species[1]:	*Dasiphora fruticosa*
Dominant Herb Species[1,2]:	*Carex castanea (1 plot), Graminoid sp. (1 plot), Sanguisorba canadensis (6 plots)*
Dominant Moss/Lichen Species[1]:	*Sphagnum sp.*

[1]Based upon average cover across all survey plots within this Ecotype.

[2]Includes low growing shrubs typically less than 15 cm in height.

Table 5-14: Plant Species Composition for Tamarack/Black Spruce-Feathermoss (Water Track)

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Fringed Brome	*Bromus ciliatus*	Herbaceous	1	1	1	1.0
Blue-Joint Reedgrass	*Calamagrostis canadensis*	Herbaceous	2	1	2	1.5
Water Sedge	*Carex aquatilis*	Herbaceous	1	10	10	10.0
Chestnut-Colored Sedge	*Carex castanea*	Herbaceous	1	50	50	50.0
Northern Bog Sedge	*Carex gynocrates*	Herbaceous	1	0.5	0.5	0.5
Boreal Bog Sedge	*Carex magellanica*	Herbaceous	1	0.5	0.5	0.5
Labrador Indian Paintbrush	*Castilleja septentrionalis*	Herbaceous	1	0.5	0.5	0.5
Goldthread	*Coptis trifolia*	Herbaceous	2	0.25	0.5	0.4
Slender Wheatgrass	*Elymus trachycaulus*	Herbaceous	1	1	1	1.0
Black Crowberry	*Empetrum nigrum*	Herbaceous	1	0.5	0.5	0.5
Water Horsetail	*Equisetum fluvitale*	Herbaceous	1	1	1	1.0
Woodland Horsetail	*Equisetum sylvaticum*	Herbaceous	2	0.5	0.5	0.5
Common Cotton Grass	*Eriophorum angustifolium*	Herbaceous	1	0.5	0.5	0.5
Green Keeled Cottongrass	*Eriophorum viridicarinatum*	Herbaceous	1	10	10	10.0
Virginia Strawberry	*Fragaria virginiana*	Herbaceous	2	1	2	1.5

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Northern Commandra	*Geocaulon lividium*	Herbaceous	1	0.5	0.5	0.5
Water Avens	*Geun rivale*	Herbaceous	2	1	5	3.0
Unidentified Grass/Sedge	*Graminoid spp.*	Herbaceous	1	40	40	40.0
Twinflower	*Linnaea borealis*	Herbaceous	1	7.5	7.5	7.5
Naked Bishop's Cap	*Mitella nuda*	Herbaceous	2	0.25	0.5	0.4
Arctic Butterbur	*Petasites frigidus*	Herbaceous	1	2	2	2.0
Mistassini Primrose	*Primula mistassinica*	Herbaceous	2	1	1	1.0
Yellow Rattle	*Rhinanthus minor*	Herbaceous	1	0.5	0.5	0.5
Dwarf Raspberry	*Rubus arcticus*	Herbaceous	2	1	5	3.0
Dewberry	*Rubus pubescens*	Herbaceous	1	0.25	0.25	0.3
Bottle Brush	*Sanguisorba canadensis*	Herbaceous	6	3	35	25.5
Purple Oatgrass	*Schizachne purpurescens*	Herbaceous	1	1	1	1.0
Bog Goldenrod	*Solidago cf. uliginosa*	Herbaceous	1	1	1	1.0
Goldenrod	*Solidago sp.*	Herbaceous	1	0.5	0.5	0.5
Bog Goldenrod	*Solidago uliginosa*	Herbaceous	1	0.5	0.5	0.5
Hooded Ladies Tresses	*Spiranthes romanzoffina*	Herbaceous	1	0.5	0.5	0.5
Swamp Aster	*Symphonotrichum puniceum*	Herbaceous	3	0.5	8	3.5
Unknown Aster	*Symphyotrichum sp.*	Herbaceous	1	2	2	2.0
Tall Meadow Rue	*Thalictrum pubescens*	Herbaceous	3	2	15	7.3
Deergrass	*Trichophorum cespitosum*	Herbaceous	1	10	10	10.0
Unidentified Plant	*Unidentified Forb*	Herbaceous	2	0.5	2	1.3
Unknown Graminoid	*Unknown Graminoid*	Herbaceous	1	3	3	3.0
Partridgeberry	*Vaccinium vitis-idaea*	Herbaceous	1	1	1	1.0
Woods Valerian	*Valeriana diocia*	Herbaceous	1	1	1	1.0
Green false hellebore	*Veratrum viride var.viride*	Herbaceous	4	1	5	3.3
Labrador Violet	*Viola labradorica*	Herbaceous	2	0.25	1	0.6
Tundra Dwarf Birch	*Betula glandulosa*	Low Shrub	4	2	15	7.3

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Common Juniper	*Juniperus communis*	Low Shrub	2	1	7.5	4.3
Shrubby Cinquefoil	*Dasiphora fruticosa*	Low Shrub	6	2	35	18.7
Bog Laurel	*Kalmia polifolia*	Low Shrub	1	1	1	1.0
Eastern Larch	*Larix laricina*	Low Shrub	3	2	5	3.3
Labrador Tea	*Rhododendron groenlandicum*	Low Shrub	1	5	5	5.0
Northern Honeysuckle	*Lonicera villosa*	Low Shrub	4	0.5	20	9.1
Sweetgale	*Myrica gale*	Low Shrub	2	5	20	12.5
Black Spruce	*Picea mariana*	Low Shrub	3	3	5	4.3
Skunk Current	*Ribes glandulosum*	Low Shrub	1	0.25	0.25	0.3
Bog Willow	*Salix pedicellaris*	Low Shrub	2	3	3	3.0
Willow	*Salix sp.*	Low Shrub	1	0.5	0.5	0.5
Rock Willow	*Salix vestida*	Low Shrub	2	5	12	8.5
Squashberry	*Viburnum edule*	Low Shrub	3	1	1	1.0
Stairstep Moss	*Hylocomium splendens*	Moss/Lichen	1	10	10	10.0
Red-stemmed Feathermoss	*Pleurozium shreberi*	Moss/Lichen	2	35	45	40.0
Sphagnum moss	*Sphagnum sp.*	Moss/Lichen	4	40	100	68.8
Eastern Larch	*Larix laricina*	Tall Shrub	4	3	15	8.9
Black Spruce	*Picea mariana*	Tall Shrub	3	10	20	13.3
Pussy Willow	*Salix dicolor*	Tall Shrub	1	1	1	1.0
Eastern Larch	*Larix laricina*	Tree	4	5	10	6.7
White Spruce	*Picea glauca*	Tree	1	5	5	5.0
Black Spruce	*Picea mariana*	Tree	3	5	8	6.0

5.1.8 Softwood Burn/Regeneration

The softwood burn/regeneration ecotype occurs in post fire areas where site conditions have allowed softwood tree species to become re-established but overall tree cover may be sparse. In this ecotype the humus layer is typically shallow with soils that are imperfectly to well drained. Slopes are low to moderate (4 to 15 % was observed during 2023 surveys). The general ecotype characteristics are outlined in Table 5-15, while Figure 5-9 outlines the general ecotype conditions.

Tree species present in this ecotype are typically dominated by black spruce, but balsam fir, white spruce and white birch may also be present. When tree species are present, they are typically within the tall shrub (2-10 m) or low shrub (less than 2 m tall) strata layer with low to moderate cover (maximum cover of any tree species within a plot was 40 %). Labrador tea occurred in all survey plots of the ecotype; while lowbush blueberry, tundra dwarf birch, chuckley pear, swamp birch and skunk current all occurred within sixty percent or more of the survey plots. The cover for each species was variable but never exceeded 40 % for an individual species. While several willow species, tundra bilberry, northern honeysuckle, bog laurel, leatherleaf, northern commandra, green alder and common juniper occur infrequently at low densities (maximum cover for all species was 10 % or less). Prevalent herbaceous species include partridgeberry, creeping snowberry, crackerberry and twinflower but their overall cover was low (10 % or less within a survey plot).

Herbaceous species that occur regularly in this ecotype include crackerberry, fireweed and interrupted clubmoss; while graminoid species, bottle brush, Alaska clubmoss and running pine occurred infrequently and typically at low densities. Interrupted clubmoss was the only species that had a cover in excess of 10 % in any plot. A variety of lichen (*Cladonia sp. and Cladina sp.*) and moss species (red-stemmed feathermoss, sphagnum moss, knights plume moss and haircap moss are variably represented within this ecotype. Mean species richness was 12.2 for vascular plants and 3.6 for non-vascular plants. Table 5-16 provides details on species composition within the ecotype.

Figure 5-9: Softwood Burn/Regeneration

Table 5-15: Summary of the Ecological Characteristics for Softwood Burn/Regeneration

Ecotype: Softwood Burn/Regeneration	
Number of Sample Plots:	5
Sample Plot Identification Codes:	KV-5, KV-10, KV-14, KV-30, KV-35
Slope % (Range):	4-15
Moisture Regime (Range):	Subxeric-Subhydric
Drainage (Range):	Imperfectly-Well
Average Humus thickness (cm):	16.5
Canopy:	*NA*
Understory:	*NA*
Dominant Tree Species[1]:	*NA*
Dominant Tall Shrub Species[1]:	*Picea Mariana*
Dominant Low Shrub Species[1]:	*Chemaedaphne calyculata*

Ecotype: Softwood Burn/Regeneration	
Dominant Herb Species[1,2]:	*Spinulum annotinum*
Dominant Moss/Lichen Species[1]:	*Pleurozium shreberi*

[1]Based upon average cover across all survey plots within this Ecotype.

[2]Includes low growing shrubs typically less than 15 cm in height.

Table 5-16: Plant Species Composition for Softwood Burn/Regeneration

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Fireweed	*Chamerion angustifolium*	Herbaceous	2	1	1	1.0
Crackerberry	*Cornus canadensis*	Herbaceous	3	3	5	4.3
Northern Ground Cedar	*Diphasiastrum complanatum*	Herbaceous	1	N/A	N/A	N/A
Trailing Arbutus	*Epigaea repens*	Herbaceous	1	20	20	20.0
Creeping Snowberry	*Gautheria hispidula*	Herbaceous	3	0.5	5	2.5
Northern Commandra	*Geocaulon lividium*	Herbaceous	1	2	2	2.0
Twinflower	*Linnaea borealis*	Herbaceous	3	0.5	5	2.5
Running Pine	*Lycopodium clavatum*	Herbaceous	1	N/A	N/A	N/A
Bottle Brush	*Sanguisorba canadensis*	Herbaceous	1	10	10	10.0
Interrupted Clubmoss	*Spinulum annotinum*	Herbaceous	2	15	30	22.5
Unknown Plant	*Unidentified Forb*	Herbaceous	1	0.25	0.25	0.3
Partridgeberry	*Vaccinium vitis-idaea*	Herbaceous	4	0.25	10	4.6
Unidentified Grass/Sedge	*Graminoid sp.*	Herbaceous	1	2	2	2.0
Balsam Fir	*Abies balsamea*	Low Shrub	1	0.5	0.5	0.5
Green Alder	*Alnus alnobetula*	Low Shrub	1	0.5	0.5	0.5
Chuckley Pear	*Amelanchier bartramiana*	Low Shrub	2	0.25	1	0.6
Tundra Dwarf Birch	*Betula glandulosa*	Low Shrub	3	10	25	17.5
Swamp Birch	*Betula pumila*	Low Shrub	2	3	20	11.5
Leatherleaf	*Chamaedaphne calyculata*	Low Shrub	1	20	20	20.0
Common Juniper	*Juniperus communis*	Low Shrub	1	1	1	1.0

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Bog Laurel	*Kalmia polifolia*	Low Shrub	1	5	5	5.0
Labrador Tea	*Rhododendron groenlandicum*	Low Shrub	5	2	30	16.4
Northern Honeysuckle	*Lonicera villosa*	Low Shrub	1	10	10	10.0
Black Spruce	*Picea mariana*	Low Shrub	3	5	10	6.7
Skunk Current	*Ribes glandulosum*	Low Shrub	2	0.5	10	5.3
Labrador Willow	*Salix argyrocarpa*	Low Shrub	1	5	5	5.0
Bebb's Willow	*Salix bebbiana*	Low Shrub	1	N/A	N/A	N/A
Pussy Willow	*Salix discolor*	Low Shrub	1	10	10	10.0
Prairie Willow	*Salix humilis*	Low Shrub	1	1	1	1.0
Tea-Leaved Willow	*Salix planifolia*	Low Shrub	1	3	3	3.0
Willow	*Salix sp.*	Low Shrub	1	0.5	0.5	0.5
Lowbush Blueberry	*Vaccinium angustifolium*	Low Shrub	4	5	40	17.5
Tundra Bilberry	*Vaccinium uliginosum*	Low Shrub	1	1	1	1.0
Reindeer Lichen	*Cladina arbuscula*	Moss/Lichen	2	15	45	30.0
Grey Reindeer Lichen	*Cladina rangifera*	Moss/Lichen	2	10	50	30.0
British Soldier Lichen	*Cladonia cristatella*	Moss/Lichen	1	15	15	15.0
Smooth Cladonia	*Cladonia gracilis*	Moss/Lichen	5	0.5	15	8.3
Red-stemmed Feathermoss	*Pleurozium shreberi*	Moss/Lichen	3	7	75	40.7
Haircap Moss	*Polytrichum sp.*	Moss/Lichen	2	2	50	26.0
Knights Plume Moss	*Ptilium crista-castrensis*	Moss/Lichen	1	3	3	3.0
Sphagnum moss	*Sphagnum sp.*	Moss/Lichen	2	25	55	40.0
White Birch	*Betula papyrifera*	Tall Shrub	1	0.5	0.5	0.5
Black Spruce	*Picea mariana*	Tall Shrub	2	10	40	25.0

N/A = Not Applicable.

5.1.9 Hardwood Burn/Regeneration

The Hardwood Burn/Regeneration ecotype is found in areas that were previously burned, and were observed in more sheltered areas along burned hill slopes. Microtopography influences where regenerating hardwoods are found, such that they are more prevalent in locations where there are depressions like a ‘dip’ along the slope burn/regeneration areas. Hardwood/Burn regeneration sites are well drained with a moderately moist (mesic) moisture regime. Typically, these areas have relatively thin humus layer over the underlying soil (average humus depth observed during plot surveys was 9cm). Slopes are moderate (10% to 12% was observed during the plot surveys) and the vegetative. The general ecotype characteristics are outlined in Table 5-17, while Figure 5-10 outlines the general ecotype conditions.

White birch are the dominant tree species (found in all plots surveyed within the ecotype), while black spruce (found in 50 % of plots surveyed within the ecotype) may be present as a subdominant species. White birch and black spruce were represented within the tall shrub strata, likely as result of the limited time for establishment and growth since the forest fire. Shrub species prevalent (occurring in all survey plots) within the low shrub strata layer included green alder, Labrador tea, skunk current and lowbush blueberry, all of which had a maximum cover of 20% or less. Other low shrub species included chuckley pear, tundra dwarf birch, raspberry, showy mountain ash (*Sorbus decora*), tea-leaved willow and prairie willow), with only tundra dwarf birch having an appreciable amount of cover (30%). Herbaceous species occurring in all survey plots included fireweed, crackerberry, twinflower and interrupted clubmoss. With crackerberry and interrupted clubmoss having the greatest range of aerial coverage (25% for crackerberry and 15% to 20% for interrupted clubmoss). The remaining herbaceous species encountered occurred within a single survey plot at low cover percentage (10% or less). Red-stemmed feathermoss (cover 20% to 50%) and haircap moss (cover 0.3% to 4%) was prevalent in all survey plots. While knights plume moss (cover 20%), star-tipped reindeer lichen (cover 1%) and smooth cup lichen (0.3%) occurred within half of the survey plots. Mean species richness was 16 for vascular plants and 3.5 for non-vascular plants. Table 5-18 provides details on species composition within the ecotype.

Figure 5-10: Hardwood Burn/Regeneration Ecotype

Table 5-17: Summary of the Ecological Characteristics for Hardwood Burn/Regeneration

Ecotype: Hardwood Burn/Regeneration	
Number of Sample Plots:	2
Sample Plot Identification Codes:	KV-13, KV-46
Slope % (Range):	10-12
Moisture Regime (Range):	Mesic
Drainage (Range):	Well
Average Humus thickness (cm):	9
Canopy:	N/A

Ecotype: Hardwood Burn/Regeneration	
Understory:	N/A
Dominant Tree Species[1]:	N/A
Dominant Tall Shrub Species[1]:	*Betula papyrifera*
Dominant Low Shrub Species[1]:	*Betula glandulosa*
Dominant Herb Species[1,2]:	*Cornus canadensis*
Dominant Moss/Lichen Species[1]:	*Pleurozium shreberi*

[1]Based upon average cover across all survey plots within this Ecotype.

[2]Includes low growing shrubs typically less than 15 cm in height.

[3]N/A – Not Applicable.

Table 5-18: Plant Species Composition for Hardwood Burn/Regeneration

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Fireweed	*Chamerion angustifolium*	Herbaceous	2	0.3	1	0.5
Crackerberry	*Cornus canadensis*	Herbaceous	2	25	25	25.0
Unidentified Grass/Sedge	*Graminoid spp.*	Herbaceous	2	5	10	7.5
Twinflower	*Linnaea borealis*	Herbaceous	2	1	15	8.0
Fowl Blue Grass	*Poa palustris*	Herbaceous	1	10	10	10.0
Starflower	*Lysimachia borealis*	Herbaceous	1	2	2	2.0
Unidentifed Grass Species	*Poaceae*	Herbaceous	1	3	3	3.0
Interrupted Clubmoss	*Sinulum annotinum*	Herbaceous	2	15	20	17.5
Aster	*Symphonotrichum spp.*	Herbaceous	1	5	5	5.0
Partridgeberry	*Vaccinium vitis-idaea*	Herbaceous	1	3	3	3.0
Green Alder	*Alnus alnobetula*	Low Shrub	2	15	15	15.0
Chuckley Pear	*Amelanchier bartramiana*	Low Shrub	1	0.3	0.3	0.1
Tundra Dwarf Birch	*Betula glandulosa*	Low Shrub	1	30	30	30.0
Labrador Tea	*Rhododendron groenlandicum*	Low Shrub	2	2	20	11.0
Skunk Current	*Ribes glandulosum*	Low Shrub	2	2	15	8.5
Raspberry	*Rubus idaeus*	Low Shrub	1	5	5	5.0

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Tea-Leaved Willow	*Salix planifolia*	Low Shrub	1	2	2	2.0
Showy Mountain Ash	*Sorbus decora*	Low Shrub	1	0.3	0.3	0.3
Lowbush Blueberry	*Vaccinium angustifolium*	Low Shrub	2	15	15	15.0
Star-Tipped Reindeer Lichen	*Cladina stellaris*	Moss/Lichen	1	1	1	1.0
Smooth Cup Lichen	*Cladonia gracilis*	Moss/Lichen	1	0.3	0.3	0.3
Red-stemmed Feathermoss	*Pleurozium shreberi*	Moss/Lichen	2	20	50	35.0
Haircap Moss	*Polytrichum sp.*	Moss/Lichen	2	0.3	4	2.1
Knights Plume Moss	*Ptilium crista-castrensis*	Moss/Lichen	1	20	20	20.0
White Birch	*Betula papyrifera*	Tall Shrub	2	10	30	20.0
Black Spruce	*Picea mariana*	Tall Shrub	1	10	10	10.0
Prairie Willow	*Salix humilis*	Tall Shrub	1	10	10	10.0

5.1.10 Riparian Thickett

The riparian thicket ecotype is generally found along the edges of fluvial and lacustrine areas where the action of water deposits fine sediment. These habitats typically occur along stream sides, rivers, lakes or along the edges of areas with flowing water (e.g., groundwater seepage areas). The humus depth is variable (range observed during 2023 surveys was 0.5 cm to 96 cm), with drainage ranging from poor to well depending upon the underlying substrate composition. Slopes are variable with areas that occur in a flood plain having little slope, while areas along a river channel may have steeper (slope range observed during 2023 surveys was 0% to 8%). The moisture regime ranges from mesic to hydric depending upon location, slope and position along a slope (e.g., a riparian thicket higher up along a steeper would have a 'drier' moisture regime than one along a flood plain). The general ecotype characteristics are outlined in Table 5-19, while Figure 5-11 outlines the general ecotype conditions.

The vegetation that comprises this ecotype typically grows over top of deposited substrates and the area may inundated for periods of time (e.g., during the spring freshet while water levels are high). A treed overstory is not typical of this habitat but tree species such as black spruce, balsam fir and white birch may be present. When present tree species typically make up a small component of overall cover (a maximum cover for either species ranged from 10% to 15% during 2023 field surveys). Willow species are common within riparian thickets often as the dominant or subdominant shrub species within the ecotype, alder may also be present as a dominant shrub species. Within a riparian thicket a single species may be dominant or there may be a number of co-dominant species present. Squashberry had a high prevalence (occurred in 5 of 6 plots surveyed), but percent cover is low (range observed in 2023 was 3% to 10%). Swamp birch, tundra dwarf birch, leatherleaf, northern honeysuckle, and red-osier dogwood accounted for an appreciable amount of cover when they occurred (minimum of 10%). Shrub species such as chuckley pear, Labrador tea, sweetgale, shrubby cinquefoil, raspberry, skunk current, swamp current and others may occur at variable frequencies and densities. Herbaceous species which were frequently encountered (at least 50% of survey plots) include bottlebrush, twisted stalk, swamp aster, tall meadow rue, red baneberry (Actaea rubra), virginia strawberry, dwarf raspberry and green false hellebore all of which had a maximum percent cover of 20% or less. Green false hellebore is identified as a species of conservation concern (see section 2.5) and occurred in 50% of the riparian thicket ecotype vegetation plots surveyed in 2023. The moss layer is comprised of a variety of species including sphagnum mosses, a leafy moss (*Rhizomnium sp*.), red-stemmed feathermoss, knights plume moss and stairstep moss which occur infrequently (each species only occurred within one of the six survey plots for the ecotype) and at variable densities. Mean species richness was 17.2 for vascular plants and 2 for non-vascular plants. Table 5-20 provides details on species composition within the ecotype.

Figure 5-11: Riparian Thickett

Table 5-19: Summary of the Ecological Characteristics for Riparian Thickett

Ecotype: Riparian Thickett	
Number of Sample Plots:	6
Sample Plot Identification Codes:	KV-11, KV-28, KV-29, KV-38, KV-41, KV-44
Slope % (Range):	0-8
Moisture Regime (Range):	Mesic-Hydric
Drainage (Range):	Well-Poor
Average Humus thickness (cm):	36
Canopy:	N/A[3]
Understory:	N/A[3]
Dominant Tree Species[1]:	N/A[3]
Dominant Tall Shrub Species[1]:	*Alnus alnobetula; Salix discolor*
Dominant Low Shrub Species[1]:	*Salix pellita*
Dominant Herb Species[1,2]:	*Unknown grass/sedge;*
Dominant Moss/Lichen Species[1]:	*Sphagnum sp.*

[1]Based upon average cover across all survey plots within this Ecotype.

[2]Includes low growing shrubs typically less than 15 cm in height.

[3]N/A – Not Applicable.

Table 5-20: Plant Species Composition for Riparian Thickett

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Red Baneberry	*Actaea rubra*	Herbaceous	3	0.25	3	1.4
Black Bentgrass	*Agrostis gigantea*	Herbaceous	1	3	3	3.0
Fringed Brome	*Bromus ciliatus*	Herbaceous	2	0.5	1	0.8
Blue-Joint Reedgrass	*Calamagrostis canadensis*	Herbaceous	2	1	5	3.0
Lakeshore Sedge	*Carex lenticularis*	Herbaceous	1	40	40	40.0
Fireweed	*Chamerion angustifolium*	Herbaceous	2	3	3	3.0
Slender Wood Reedgrass	*Cinnia latifolia*	Herbaceous	1	10	10	10.0
Alpine Enchanters Nighshade	*Circaea alpina*	Herbaceous	1	1	1	1.0
Water Horsetail	*Equisetum fluvitale*	Herbaceous	1	0.5	0.5	0.5

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Woodland Horsetail	*Equisetum sylvaticum*	Herbaceous	2	0.5	1	0.8
Tall Cottongrass	*Eriophorum cf. angustifolium*	Herbaceous	1	5	5	5.0
Virginia Strawberry	*Fragaria virginiana*	Herbaceous	4	0.5	15	4.3
Fragrant Bedstraw	*Galium triflorum*	Herbaceous	2	1	2	1.5
Creeping Snowberry	*Gautheria hispidula*	Herbaceous	1	4	4	4.0
Water Avens	*Geun rivale*	Herbaceous	1	30	30	30.0
Fowl Manna Grass	*Glyceria striata*	Herbaceous	1	5	5	5.0
Unidentified Grass/Sedge	*Graminoid spp.*	Herbaceous	1	45	45	45.0
Northern Oak Fern	*Gymnocarpium dryopteris*	Herbaceous	1	1	1	1.0
Naked Bishop's Cap	*Mitella nuda*	Herbaceous	1	0.5	0.5	0.5
Arctic Butterbur	*Petasites frigidus*	Herbaceous	1	2	2	2.0
Kentucky Bluegrass	*Poa praetensis*	Herbaceous	1	15	15	15.0
Broad Leaved Grass	*Poaceae*	Herbaceous	1	50	50	50.0
Dwarf Raspberry	*Rubus arcticus*	Herbaceous	2	1	5	3.0
Dewberry	*Rubus pubescens*	Herbaceous	3	5	20	11.7
Bottle Brush	*Sanguisorba canadensis*	Herbaceous	4	5	15	8.8
Large-Leaf Goldenrod	*Solidago macrophylla*	Herbaceous	1	1	1	1.0
Twisted Stalk	*Streptopus amplexifolius*	Herbaceous	3	0.5	3	1.8
Swamp Aster	*Symphonotrichum puniceum*	Herbaceous	3	2	15	10.7
Unknown Aster	*Symphyotrichum sp.*	Herbaceous	2	5	5	5.0
Tall Meadow Rue	*Thalictrum pubescens*	Herbaceous	3	1	15	6.0
Unknown Moss	*Unknown Moss*	Herbaceous	1	15	15	15.0
Unknown Sedge	*Unknown Sedge*	Herbaceous	1	2	2	2.0
Marshberry	*Vaccinnium oxycoccus*	Herbaceous	1	2	2	2.0
Green false hellebore	*Veratrum viride var.viride*	Herbaceous	3	0.5	5	3.2
Kidney Leaf Violet	*Viola cf. reniflora*	Herbaceous	2	1	5	3.0

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Labrador Violet	*Viola labradorica*	Herbaceous	2	2	5	3.5
Balsam Fir	*Abies balsamea*	Low Shrub	1	1	1	1.0
Green Alder	*Alnus alnobetula*	Low Shrub	1	85	85	85.0
Chuckley Pear	*Amelanchier bartramiana*	Low Shrub	2	0.25	3	1.6
Tundra Dwarf Birch	*Betula glandulosa*	Low Shrub	1	20	20	20.0
Swamp Birch	*Betula pumila*	Low Shrub	1	10	10	10.0
Leatherleaf	*Chamaedaphne calyculata*	Low Shrub	1	25	25	25.0
Red-Osier Dogwood	*Cornus sericea*	Low Shrub	1	25	25	25.0
Shrubby Cinquefoil	*Dasiphora fruticosa*	Low Shrub	1	1	1	1.0
Bog Laurel	*Kalmia polifolia*	Low Shrub	1	0.25	0.25	0.3
Labrador Tea	*Rhododendron groenlandicum*	Low Shrub	2	2	2	2.0
Northern Honeysuckle	*Lonicera villosa*	Low Shrub	1	10	10	10.0
Sweetgale	*Myrica gale*	Low Shrub	2	2	20	11.0
Trembling Aspen	*Populus tremuloides*	Low Shrub	1	1	1	1.0
Skunk Current	*Ribes glandulosum*	Low Shrub	2	3	10	6.5
Swamp Current	*Ribes triste*	Low Shrub	1	1	1	1.0
Raspberry	*Rubus idaeus*	Low Shrub	2	5	20	12.5
Labrador Willow	*Salix argyrocarpa*	Low Shrub	2	30	40	35.0
Prairie Willow	*Salix humilis*	Low Shrub	1	20	20	20.0
Bog Willow	*Salix pedicellaris*	Low Shrub	1	5	5	5.0
Satiny Willow	*Salix pellita*	Low Shrub	1	90	90	90.0
Lowbush Blueberry	*Vaccinium angustifolium*	Low Shrub	1	0.5	0.5	0.5
Squashberry	*Viburnum edule*	Low Shrub	5	3	10	6.6
Snakewort	*Conocephalum salebrosum*	Moss/Lichen	1	N/A	N/A	N/A
Stairstep Moss	*Hylocomium splendens*	Moss/Lichen	1	10	10	10.0
Red-stemmed Feathermoss	*Pleurozium shreberi*	Moss/Lichen	1	30	30	30.0

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Knights Plume Moss	*Ptilium crista-castrensis*	Moss/Lichen	1	15	15	15.0
Leafy Moss	*Rhizomnium sp.*	Moss/Lichen	1	45	45	45.0
Sphagnum moss	*Sphagnum sp.*	Moss/Lichen	1	85	85	85.0
Balsam Fir	*Abies balsamea*	Tall Shrub	1	10	10	10.0
Green Alder	*Alnus alnobetula*	Tall Shrub	1	50	50	50.0
White Birch	*Betula papyrifera*	Tall Shrub	1	15	15	15.0
Black Spruce	*Picea mariana*	Tall Shrub	1	10	10	10.0
Pussy Willow	*Salix discolor*	Tall Shrub	2	40	50	45.0
Willow	*Salix sp.*	Tall Shrub	1	10	10	10.0

5.1.11 Riparian Marsh (Fen)

The riparian marsh ecotype generally occurs in association with waterbodies/watercourses that experience variation in water levels. Similar to the riparian thicket ecotype the substrates are derived from fluvial and lacustrine deposits and are associated with floodplains which are flooded for most of the growing season. The depth of the humus layer may range from thin to deep (mean humus depth observed during field surveys was 26 cm), slopes across the ecotype are minimal and soils are wet (hydric) and poorly drained. The general ecotype characteristics are outlined in Table 5-21, while Figure 5-12 outlines the general ecotype conditions.

Tree species are generally not present but may occur infrequently (e.g., Eastern larch occurred in a single survey plot in 2023 with minimal cover). Shrub species within the ecotype are commonly represented by species that are adept at growing in flooded habitats and include a variety of willow species, sweetgale, leatherleaf, with species less tolerant of flooded habitats (e.g., green alder and tundra dwarf birch) occurring areas which are not inundated. Leatherleaf (0.25 to 2% cover) and sweetgale (15 to 20 % cover) occurred in all plots, while other species occurred in one of the two plots surveyed. Individual species cover was low (5% or less) except for sweetgale, tea leaved willow (10%), and an unidentified willow species (15%). Herbaceous species are represented by a variety of sedge and grass species (bluejoint reed grass, water sedge, little prickly sedge, few seeded sedge, beaked sedge), water horsetail, bog bean, bottlebrush, swamp aster and virginia strawberry all of which only occurred in one of the two plots surveyed. Cover for beaked sedge and an unknown sedge was significant (50% and 20%, respectively); while virginia strawberry, bluejoint reed grass and bottle brush all had a cover of 5%. All other herbaceous species had cover less than 5%. Mosses include sphagnum moss (mean cover of 45%) and feathermoss species (mean cover 5%). Mean species richness was 11 for vascular plants and 1.5 for non-vascular plants. Table 5-22 provides details on species composition within the ecotype.

Figure 5-12: Patterned Shrub Riparian Marsh (Fen) Ecotype

Table 5-21: Summary of the Ecological Characteristics for Riparian Marsh (Fen)

Ecotype: Riparian Marsh (Fen)	
Number of Sample Plots:	2
Sample Plot Identification Codes:	KV-16, KV-49
Slope % (Range):	0-1
Moisture Regime (Range):	Hydric
Drainage (Range):	Poor
Average Humus thickness (cm):	26
Canopy:	N/A[3]
Understory:	N/A[3]
Dominant Tree Species[1]:	N/A[3]
Dominant Tall Shrub Species[1]:	N/A[3]

Ecotype: Riparian Marsh (Fen)	
Dominant Low Shrub Species[1]:	*Myrica gale*
Dominant Herb Species[1,2]:	*Carex rostrata*
Dominant Moss/Lichen Species[1]:	*Sphagnum sp.*

[1]Based upon average cover across all survey plots within this Ecotype.

[2]Includes low growing shrubs typically less than 15 cm in height.

[3]N/A – Not Applicable.

Table 5-22: Plant Species Composition for Riparian Marsh (Fen)

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Blue-Joint Reedgrass	*Calamagrostis canadensis*	Herbaceous	1	5	5	5.0
Water Sedge	*Carex aquatilis*	Herbaceous	1	3	3	3.0
Little Prickly Sedge	*Carex echinata*	Herbaceous	1	1	1	1.0
Few Seeded Sedge	*Carex oligosperma*	Herbaceous	1	0.5	0.5	0.5
Beaked Sedge	*Carex rostrata*	Herbaceous	1	50	50	50.0
Water Horsetail	*Equisetum fluvitale*	Herbaceous	1	0.5	0.5	0.5
Virginia Strawberry	*Fragaria virginiana*	Herbaceous	1	5	5	5.0
Bog Bean	*Menyanthes trifoliata*	Herbaceous	1	0.25	0.25	0.3
Bottle Brush	*Sanguisorba canadensis*	Herbaceous	1	5	5	5.0
Swamp Aster	*Symphyotrichum puniceum*	Herbaceous	1	1	1	1.0
Unknown Sedge	*Unknown Sedge*	Herbaceous	1	20	20	20.0
Green Alder	*Alnus alnobetula*	Low Shrub	1	0.5	0.5	0.5
Tundra Dwarf Birch	*Betula glandulosa*	Low Shrub	1	5	5	5.0
Leatherleaf	*Chamaedaphne calyculata*	Low Shrub	2	0.25	2	1.1
Eastern Larch	*Larix laricina*	Low Shrub	1	1	1	1.0
Sweetgale	*Myrica gale*	Low Shrub	2	15	20	17.5
Labrador Willow	*Salix argyrocarpa*	Low Shrub	1	5	5	5.0
Bog Willow	*Salix pedicellaris*	Low Shrub	1	5	5	5.0
Tea-Leaved Willow	*Salix planifolia*	Low Shrub	1	10	10	10.0
Willow	*Salix sp.*	Low Shrub	1	15	15	15.0

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Feathermoss	*Feathermoss sp.*	Moss/Lichen	5	5	5.0	1
Sphagnum moss	*Sphagnum sp.*	Moss/Lichen	45	100	72.5	2

5.1.12 Patterned Shrub Fen

The patterned shrub fen as is name suggests has a patterned appearance whereby lower lying areas (commonly with pooled water) are separated from one another by vegetated peat moss ridges. The humus layer is thick (commonly in excess of 1 m), slopes are gentle and low (Slopes of 1% were observed during 2023 field surveys), drainage is poor and with soils that are continuously wet (hydric). The general ecotype characteristics are outlined in Table 5-23, while Figure 5-13 outlines the general ecotype conditions.

Tree species (e.g., Eastern larch and black spruce) may be present but are stunted and shrub-like in form and are not overly abundant (maximum cover for either species was 21 %). Ericaceous shrubs are common and include bog rosemary, leatherleaf, bog laurel and labrador tea. Sweetgale, shrubby cinquefoil and bog rosemary were common. With overall cover appreciable for sweetgale (10-25 %) and shrubby cinquefoil (15-30 %) but low for bog rosemary (0.5 to 2 %). Other species such as Labrador tea, bog laurel and leatherleaf were less common, but in some cases comprised a significant proportion of overall cover (e.g., Labrador tea was found in one survey plot but had 75 % cover). Herbaceous species include a variety of sedge and grass species including livid sedge, beaked sedge, few seeded sedge, deergrass , alpine bulrush, cotton grass (*Eriophorum sp.*). Forbs include bog bean, Mistassini primrose, bog goldenrod, swamp aster, spoonleaf sundew (*Drosera intermedia*), roundleaf sundew (*Drosera rotundifolia),* and common butterwort all of which had low densities except for deergrass (50-65 %), bog bean (5-20 %), livid sedge (5-20 %) and bakeapple (10 %) when they occurred in a plot. Mosses include sphagnum, while Cladina sp. lichens may occur infrequently at low densities. Mean species richness was 14 for vascular plants and 1.5 for non-vascular plants. Table 5-24 provides details on species composition within the ecotype.

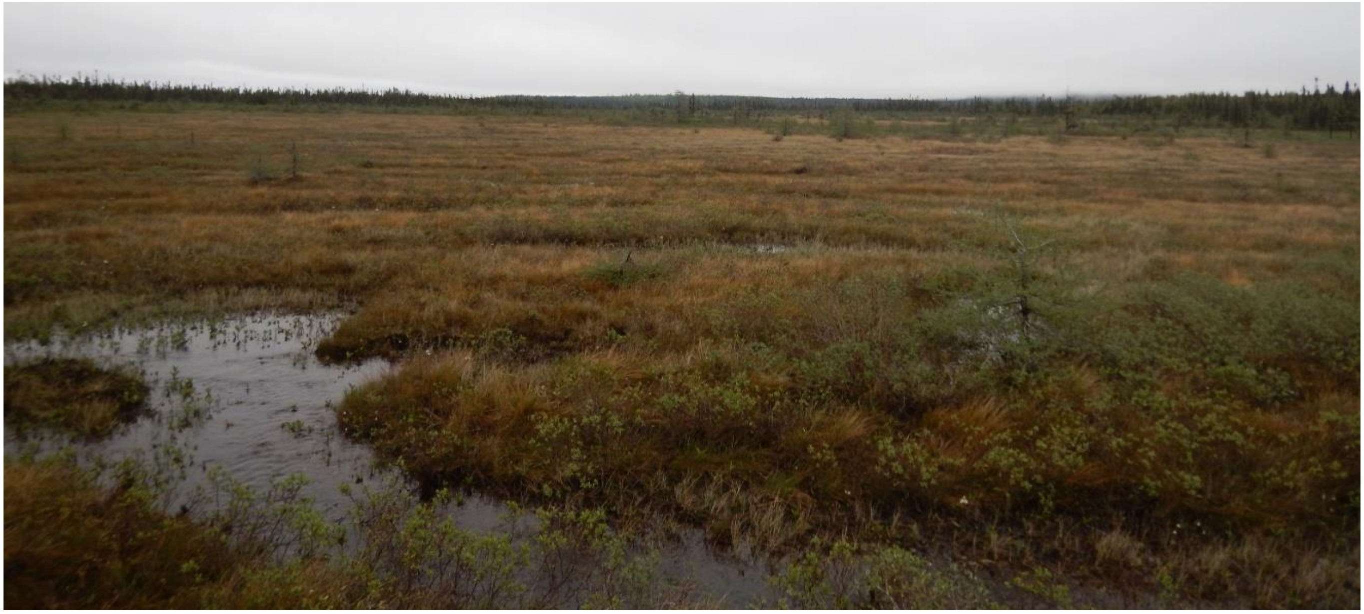


Figure 5-13: Patterned Shrub Fen Ecotype

Table 5-23: Summary of the Ecological Characteristics for Patterned Shrub Fen

Ecotype: Patterned Shrub Fen	
Number of Sample Plots:	3
Sample Plot Identification Codes:	KV-3, KV-47, KV-54
Slope % (Range):	1
Moisture Regime (Range):	Hydric
Drainage (Range):	Poor
Average Humus thickness (cm):	100
Canopy:	N/A
Understory:	N/A
Dominant Tree Species[1]:	N/A
Dominant Tall Shrub Species[1]:	*Picea mariana*
Dominant Low Shrub Species[1]:	*Rhododendron groenlandicum*
Dominant Herb Species[1,2]:	*Trichophorum cespitosum*
Dominant Moss/Lichen Species[1]:	*Sphagnum sp.*

[1]Based upon average cover across all survey plots within this Ecotype.

[2]Includes low growing shrubs typically less than 15 cm in height.

[3]N/A – Not Applicable.

Table 5-24: Plant Species Composition for Patterned Shrub Fen

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Livid Sedge	*Carex livida*	Herbaceous	2	5	20	12.5
Few Seeded Sedge	*Carex oligosperma*	Herbaceous	1	0.5	0.5	0.5
Beaked Sedge	*Carex rostrata*	Herbaceous	2	1	1	1.0
Labrador Indian Paintbrush	*Castilleja septentrionalis*	Herbaceous	1	0.5	0.5	0.5
Spoon Leaved Sundew	*Drosera intermedia*	Herbaceous	2	0.5	1	0.8
Roundleaf Sundew	*Drosera rotundifolia*	Herbaceous	1	1	1	1.0
Black Crowberry	*Empetrum nigrum*	Herbaceous	1	0.5	0.5	0.5
Russet Cottongrass	*Eriophorum russeolum*	Herbaceous	1	0.5	0.5	0.5
Creeping Snowberry	*Gautheria hispidula*	Herbaceous	1	2	2	2.0
Unidentified Grass/Sedge	*Graminoid spp.*	Herbaceous	1	2	2	2.0
Bog Bean	*Menyanthes trifoliata*	Herbaceous	3	5	20	11.7
Bog Muhly	*Muhlenbergia uniflora*	Herbaceous	1	0.25	0.25	0.3
Common Butterwort	*Pinguicula vulgaris*	Herbaceous	1	0.5	0.5	0.5
Mistassini Primrose	*Primula mistassinica*	Herbaceous	1	1	1	1.0
Dwarf Raspberry	*Rubus arcticus*	Herbaceous	1	2	2	2.0
Bakeapple	*Rubus chamaemorus*	Herbaceous	1	10	10	10.0
Bog Goldenrod	*Solidago uliginosa*	Herbaceous	2	0.5	0.5	0.5
Swamp Aster	*Symphonotrichum puniceum*	Herbaceous	2	1	1	1.0
Sticky Tofieldia	*Triantha glutinosa*	Herbaceous	1	0.5	0.5	0.5
Alpine Cotton-Grass	*Trichophorum alpinum*	Herbaceous	1	0.5	0.5	0.5
Deergrass	*Trichophorum cespitosum*	Herbaceous	2	50	65	57.5
Bog Rosemary	*Andromeda glaucophylla*	Low Shrub	2	0.05	2	1.0
Leatherleaf	*Chamaedaphne calyculata*	Low Shrub	1	0.5	0.5	0.5
Shrubby Cinquefoil	*Dasiphora fruticosa*	Low Shrub	2	15	30	22.5
Bog Laurel	*Kalmia polifolia*	Low Shrub	1	15	15	15.0

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Eastern Larch	*Larix laricina*	Low Shrub	2	10	21	15.5
Labrador Tea	*Rhododendron groenlandicum*	Low Shrub	1	75	75	75.0
Sweetgale	*Myrica gale*	Low Shrub	3	10	25	20.0
Black Spruce	*Picea mariana*	Low Shrub	1	3	3	3.0
Star-Tipped Reindeer Lichen	*Cladina stellaris*	Moss/Lichen	1	N/A	N/A	N/A
Sphagnum moss	*Sphagnum sp.*	Moss/Lichen	2	1	100	50.5

N/A = Not Applicable.

5.1.13 Non-Patterned Shrub Fen

The non-patterned shrub fen occurs in low lying locations with poor drainage with no to low gentle slopes (0% to 2% slope). The humus layer is generally thick but may be variable (mean humus depth observed during 2023 surveys was 67 cm), drainage is poor and soils moisture regime is hydric (soils are wet and form under anerobic conditions). The general ecotype characteristics are outlined in Table 5-25, while Figure 5-14 outlines the general ecotype conditions.

The tree strata layer is typically absent, but tree species such as black spruce and eastern larch commonly occur within the tall shrub and/or low shrub layers. When present either species may occur as a stunted tree like form or as a stunted, multibranched low shrub form. During 2023 surveys maximum cover for black spruce (20%) and eastern larch (10%) were low when present in a plot. Ericaceous shrubs are common and include bog laurel, Labrador tea and bog rosemary; while northern honeysuckle, sweetgale, shrubby cinquefoil and bog willow are common non-ericaceous shrub species which occur in the ecotype. Overall cover for low shrub species was low (percent cover was 15% or less for all species listed above). Herbaceous species include a variety of sedge and grass species including Bigelow’s sedge and deergrass. Forbs include but are not limited to bottlebrush, bog goldenrod, creeping snowberry, twinflower and green false hellebore (identified as a species of conservation concern, see Section 5.4). Cover is variable for each species but typically less than 10%. Bottle brush, deergrass, an identified grass species, green false hellebore and Bigelow’s sedge were the only species which had a maximum cover greater than 10% in any survey plot. Mosses include sphagnum (mean cover 95%) and red-stemmed feathermosses (10%), while grey reindeer lichen (*Cladina rangifera*) lichens occurred infrequently at low densities. Mean species richness was 19 for vascular plants and 2 for non-vascular plants. Table 5-26 provides details on species composition within the ecotype.

Figure 5-14: Non-Patterned Shrub Fen Ecotype

Table 5-25: Summary of the Ecological Characteristics for Non-Patterned Shrub Fen

Ecotype: Non-Patterned Shrub Fen	
Number of Sample Plots:	3
Sample Plot Identification Codes:	KV-1, KV-15B, KV-24
Slope % (Range):	0-2
Moisture Regime (Range):	Hydric
Drainage (Range):	Poor
Average Humus thickness (cm):	67
Canopy:	N/A[3]
Understory:	N/A[3]
Dominant Tree Species[1]:	N/A[3]
Dominant Tall Shrub Species[1]:	*Picea mariana*
Dominant Low Shrub Species[1]:	*Myrica gale*

Ecotype: Non-Patterned Shrub Fen	
Dominant Herb Species[1,2]:	*Unknown grass (1 plot); Veratrum viride var.viride (1 plot); Sanguisorba canadensis (3 plots)*
Dominant Moss/Lichen Species[1]:	*Sphagnum sp.*

[1]Based upon average cover across all survey plots within this Ecotype.

[2]Includes low growing shrubs typically less than 15 cm in height.

[3]N/A – Not Applicable.

Table 5-26: Plant Species Composition for Non-Patterned Shrub Fen

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Bigelow's Sedge	*Carex bigelowii*	Herbaceous	1	20	20	20.0
Sedge sp.	*Carex Sect. Acrocystis*	Herbaceous	1	N/A	N/A	N/A
Goldthread	*Coptis trifolia*	Herbaceous	1	1	1	1.0
Crackerberry	*Cornus canadensis*	Herbaceous	1	N/A	N/A	N/A
Black Crowberry	*Empetrum nigrum*	Herbaceous	2	2	2	2.0
Woodland Horsetail	*Equisetum sylvaticum*	Herbaceous	1	1	1	1.0
Creeping Snowberry	*Gautheria hispidula*	Herbaceous	1	10	10	10.0
Twinflower	*Linnaea borealis*	Herbaceous	1	10	10	10.0
Starflower	*Lysimachia borealis*	Herbaceous	1	N/A	N/A	N/A
Canada Mayflower	*Maianthemum canadense*	Herbaceous	1	0.5	0.5	0.5
Naked Bishop's Cap	*Mitella nuda*	Herbaceous	1	2	2	2.0
Arctic Butterbur	*Petasites frigidus*	Herbaceous	1	0.25	0.25	0.3
Dwarf Raspberry	*Rubus arcticus*	Herbaceous	2	1	1	1.0
Bakeapple	*Rubus chamaemorus*	Herbaceous	1	0.5	0.5	0.5
Bottle Brush	*Sanguisorba canadensis*	Herbaceous	3	10	30	20.0
Bog Goldenrod	*Solidago cf. uliginosa*	Herbaceous	2	1	10	5.5
Deergrass	*Trichophorum cespitosum*	Herbaceous	3	2	40	19.0
Unknown Grass	*Unknown Grass*	Herbaceous	1	30	30	30.0
Unknown Sedge	*Unknown Sedge*	Herbaceous	2	10	10	10.0

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Partridgeberry	*Vaccinium vitis-idaea*	Herbaceous	1	2	2	2.0
Green false hellebore	*Veratrum viride var.viride*	Herbaceous	1	30	30	30.0
Violet	*Viola sp.*	Herbaceous	1	N/A	N/A	N/A
Bog Rosemary	*Andromeda glaucophylla*	Low Shrub	2	2	15	8.5
Tundra Dwarf Birch	*Betula glandulosa*	Low Shrub	1	5	5	5.0
Shrubby Cinquefoil	*Dasiphora fruticosa*	Low Shrub	2	2	15	8.5
Bog Laurel	*Kalmia polifolia*	Low Shrub	3	0.5	1	0.8
Eastern Larch	*Larix laricina*	Low Shrub	2	10	10	10.0
Labrador Tea	*Rhododendron groenlandicum*	Low Shrub	3	1	15	8.7
Northern Honeysuckle	*Lonicera villosa*	Low Shrub	3	5	15	8.3
Sweetgale	*Myrica gale*	Low Shrub	2	10	15	12.5
Black Spruce	*Picea mariana*	Low Shrub	1	10	10	10.0
Bebb's Willow	*Salix bebbiana*	Low Shrub	1	5	5	5.0
Bog Willow	*Salix pedicellaris*	Low Shrub	2	5	5	5.0
Lowbush Blueberry	*Vaccinium angustifolium*	Low Shrub	1	1	1	1.0
Grey Reindeer Lichen	*Cladina rangifera*	Moss/Lichen	1	1	1	1.0
Red-stemmed Feathermoss	*Pleurozium shreberi*	Moss/Lichen	2	10	10	10.0
Sphagnum moss	*Sphagnum sp.*	Moss/Lichen	3	90	100	95.0
Eastern Larch	*Larix laricina*	Tall Shrub	2	10	10	10.0
Black Spruce	*Picea mariana*	Tall Shrub	2	10	20	15.0

N/A = Not Applicable.

5.1.14 Graminoid Fen

The Graminoid Fen ecotype is found in low lying areas where topographical and substrate conditions result in areas with poor drainage (poor and very poor drainage was observed during field surveys of this ecotype) and hydric moisture regime. Typically, these areas have thick layer of organic matter over the underlying soil (average humus depth observed during plot surveys was 78 cm) and may occur as a portion of a larger wetland complex. Slopes are low (0 to 2% was observed during the plot surveys) and the vegetative cover is typically comprised of at least 50% graminoid species. The general ecotype characteristics are outlined in Table 5-27, while Figure 5-15 outlines the general ecotype conditions.

Tree species are generally lacking, but if present may be minor components of the tall and low shrub vegetation layers. During field surveys black spruce were found as a component of the tall shrub and low shrub layers within only a single plot, while eastern larch was found in three plots (cover for tree species within the tall and low shrub layers was all less than 1%). A variety of low shrub species were encountered but density was typically low for all species (cover was less than 5% for all species except northern honeysuckle, sweetgale, shrubby cinquefoil) with all but one species (shrubby cinquefoil) occurring in 50% or less of the survey plots. A variety of herbaceous species were present (19 species), most of which occurred within 50% or less of survey plots and had an average cover of less than 5%. Deergrass (51.3% mean cover) and bottle brush (8.4% mean cover) were the only herbaceous species to occur in all survey plots. An unidentified sedge species also accounted for an average of 32.5 of cover across the two plots where it was found. Tall cottongrass accounted for 20% of the cover in one plot while and an unidentified graminoid species also accounted for 15% of cover in a single plot. Hoary sedge also accounted for 5% of cover within a single plot. Mosses present included sphagnum sp., an unknown moss, and red stemmed feathermoss, while the only lichen encountered was smooth cladonia. Mean species richness was 9.8 for vascular plants and 2 for non-vascular plants. Table 5-28 provides details on species composition within the ecotype.

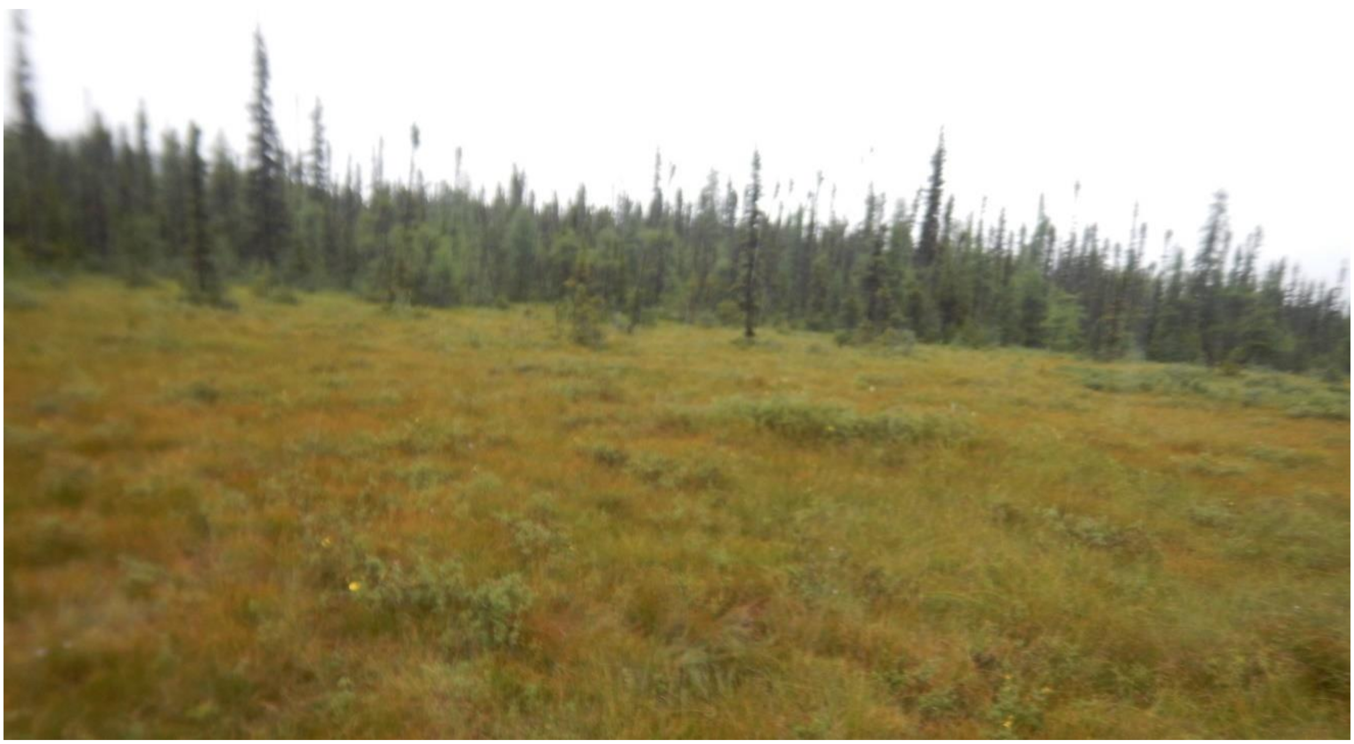


Figure 5-15: Graminoid Fen Ecotype

Table 5-27: Summary of the Ecological Characteristics for Graminoid Fen

Ecotype: Graminoid Fen	
Number of Sample Plots:	4
Sample Plot Identification Codes:	KV-2, KV-8, KV-17,KV-51
Slope % (Range):	0-2
Moisture Regime (Range):	Hydric
Drainage (Range):	Poor-Very Poor
Average Humus thickness (cm):	78
Canopy:	N/A[3]
Understory:	N/A[3]
Dominant Tree Species[1]:	N/A[3]
Dominant Tall Shrub Species[1]:	*Picea mariana*
Dominant Low Shrub Species[1]:	*Dasiphora Fruticosa*
Dominant Herb Species[1,2]:	*Trichophorum cespitosum*
Dominant Moss/Lichen Species[1]:	*Unidentified Moss (1 Plot); Sphagnum sp. (4 plots)*

[1]Based upon average cover across all survey plots within this Ecotype.

[2]Includes low growing shrubs typically less than 15 cm in height.

[3]N/A – Not Applicable.

Table 5-28: Plant Species Composition for Graminoid Fen

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Hoary Sedge	*Carex canescens*	Herbaceous	1	5	5	5.0
Hair-Like Sedge	*Carex capillaris*	Herbaceous	1	0.5	0.5	0.5
Bulrush Sedge	*Carex scirpoidea*	Herbaceous	1	0.5	0.5	0.5
Goldthread	*Coptis trifolia*	Herbaceous	2	0.5	2	1.3
Black Crowberry	*Empetrum nigrum*	Herbaceous	1	4	4	4.0
Tall Cottongrass	*Eriophorum cf. angustifolium*	Herbaceous	1	20	20	20.0
Creeping Snowberry	*Gautheria hispidula*	Herbaceous	1	2	2	2.0
Unidentified Grass/Sedge	*Graminoid spp.*	Herbaceous	1	15	15	15.0
Twinflower	*Linnaea borealis*	Herbaceous	2	1	5	3.0

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Bog Bean	*Menyanthes trifoliata*	Herbaceous	1	0.3	0.3	0.3
Bakeapple	*Rubus chamaemorus*	Herbaceous	2	0.5	0.5	0.5
Bottle Brush	*Sanguisorba canadensis*	Herbaceous	4	0.5	20	8.4
Bog Goldenrod	*Solidago uliginosa*	Herbaceous	2	0.5	2	1.3
Ladies Tresses	*Spiranthes romanzoffiana*	Herbaceous	1	0.5	0.5	0.5
Swamp Aster	*Symphonotrichum puniceum*	Herbaceous	1	0.5	0.5	0.5
Deergrass	*Trichophorum cespitosum*	Herbaceous	4	25	65	51.3
Unknown Sedge	*Unknown Sedge*	Herbaceous	2	20	45	32.5
Marshberry	*Vaccinnium oxycoccus*	Herbaceous	1	1	1	1.0
Labrador Violet	*Viola labradorica*	Herbaceous	2	0.5	1	0.8
Bog Rosemary	*Andromeda glaucophylla*	Low Shrub	2	1	1	1.0
Swamp Birch	*Betula pumila*	Low Shrub	1	1	1	1.0
Shrubby Cinquefoil	*Dasiphora fruticosa*	Low Shrub	3	5	20	13.3
Bog Laurel	*Kalmia polifolia*	Low Shrub	1	1	1	1.0
Eastern Larch	*Larix laricina*	Low Shrub	3	1	10	7.0
Labrador Tea	*Rhododendron groenlandicum*	Low Shrub	2	2.5	3	2.8
Northern Honeysuckle	*Lonicera villosa*	Low Shrub	2	5	8	6.5
Sweetgale	*Myrica gale*	Low Shrub	1	5	5	5.0
Black Spruce	*Picea mariana*	Low Shrub	1	1	1	1.0
Lowbush Blueberry	*Vaccinium angustifolium*	Low Shrub	1	1	1	1.0
Smooth Cladonia	*Cladonia gracilis*	Moss/Lichen	1	0.5	0.5	0.5
Unknown Moss	*Moss spp.*	Moss/Lichen	1	85	85	85.0
Red-stemmed Feathermoss	*Pleurozium shreberi*	Moss/Lichen	2	10	10	10.0
Sphagnum moss	*Sphagnum sp.*	Moss/Lichen	4	13	100	73.3
Black Spruce	*Picea mariana*	Tall Shrub	1	15	15	15.0

5.1.15 Alder Thickett

While not identified as a specific ecotype, 2023 field surveys identified areas where green alder thickets were present. These areas occurred in areas where the landscape was disturbed, in many cases by human activity, and included the edges of gravel pits, roadsides, and other areas where the overlying topsoil has been removed and in the process of regeneration. A single alder thicket survey plot was completed in 2023. Plot characteristics includes a low slope (3%), a thin humus layer (2 cm), well drained soil with a mesic moisture regime. The general ecotype characteristics are outlined in Table 5-29, while Figure 5-16 outlines the general ecotype conditions.

Alders are considered a pioneer species and as such have the ability to fix atmospheric nitrogen as a result of a symbiotic relationship with a bacteria that is found in its root nodules. This ability allows the species colonize exposed mineral soils where nutrients and organic matter are limited. Alder thickets as the name implies are dominated by alders, which may occur as a pure alder thicket or may be interspersed with other species such as willows. The tree strata layer is not present, with alders found as dominant within the tall shrub layer, low shrub layer or both. Within the survey plot from 2023 alders were dominant (60% cover within the tall shrub layer), while pussy willow was subdominant (40% cover within the tall shrub layer). Within alder thickets the cover is typically extensive (often approaching 100 % when alder and subdominant species cover is combined). Lowbush blueberry was the sole species found within the low shrub layer at low density (2%). A variety of herbaceous species were present including viginia strawberry, naked bishop's cap, fireweed, creeping bent grass, colonial bent grass and woodland horsetail among others typically at low densities (5 % or less). Virginia strawberry (30% cover) and naked bishop's cap (10%) were the only species found at higher densities. An unknown feathermoss species was found within the plot at 3% cover. Mean species richness was 13 for vascular plants and 1 for non-vascular plants. **Table 5-30** provides details on species composition within the ecotype.

Figure 5-16: Alder Thickett

Table 5-29: Summary of the Ecological Characteristics for Alder Thickett

Ecotype: Alder Thickett	
Number of Sample Plots:	1
Sample Plot Identification Codes:	KV-60
Slope % (Range):	3
Moisture Regime (Range):	Mesic
Drainage (Range):	Well
Average Humus thickness (cm):	2
Canopy:	N/A[3]
Understory:	N/A[3]

Ecotype: Alder Thickett	
Dominant Tree Species[1]:	N/A[3]
Dominant Tall Shrub Species[1]:	*Alnus alnobetula*
Dominant Low Shrub Species[1]:	*Vaccinium angustifolium*
Dominant Herb Species[1,2]:	*Fragaria virginiana*
Dominant Moss/Lichen Species[1]:	*Unknown Feathermoss sp.*

[1]Based upon average cover across all survey plots within this Ecotype.

[2]Includes low growing shrubs typically less than 15 cm in height.

[3]N/A – Not Applicable.

Table 5-30: Plant Species Composition for Alder Thickett

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Colonial Bentgrass	*Agrostis capillaris*	Herbaceous	1	3	3	3.0
Creeping Bentgrass	*Agrostis stolonifera*	Herbaceous	1	5	5	5.0
Fireweed	*Chamerion angustifolium*	Herbaceous	1	5	5	5.0
Mountain Wood-Fern	*Dryopteris campyloptera*	Herbaceous	1	N/A	N/A	N/A
Woodland Horsetail	*Equisetum sylvaticum*	Herbaceous	1	2	2	2.0
Virginia Strawberry	*Fragaria virginiana*	Herbaceous	1	30	30	30.0
Naked Bishop's Cap	*Mitella nuda*	Herbaceous	1	10	10	10.0
Arctic Butterbur	*Petasites frigidus*	Herbaceous	1	1	1	1.0
Unidentified Grass Species	*Poaceae*	Herbaceous	1	5	5	5.0
Common Dandelion	*Taraxacum officinale*	Herbaceous	1	0.5	0.5	0.5
Lowbush Blueberry	*Vaccinium angustifolium*	Low Shrub	1	2	2	2.0
Feathermoss	*Feathermoss sp.*	Moss/Lichen	1	3	3	3.0
Green Alder	*Alnus alnobetula*	Tall Shrub	1	60	60	60.0
Pussy Willow	*Salix dicolor*	Tall Shrub	1	40	40	40.0

N/A = Not Applicable.

5.1.16 Jack Pine Stand

As with alder thickets a specific jack pine ecotype was not identified during the ELC process, but 2023 surveys identified locations where jack pine stands were present. Evidence of previous harvesting (e.g., stump remnants) seems to indicate that these stands may have been planted after forest harvesting activities. Trees seemed to occur at regularly spaced intervals and are located immediately adjacent to access roads further suggesting that they were planted. Jack pine stands were located along portions of the access road to Elephant Head Lake and Riordan Lake. Within jack pine stands the humus layer was thin (mean humus depth was 6.5 cm), soils were well drained, with a moisture regime that was dry to moist (subxeric to mesic) and with low slopes (3% to 8%). The general ecotype characteristics are outlined in Table 5-31, while Figure 5-17 outlines the general ecotype conditions.

Tree species within jack pine stands included jack pine (30% 40% cover), black spruce (10 to 20% cover), balsam fir (0.5 %) and white birch (2%), with jack pine and black spruce found in all sample plots. Species within the shrub strata layers included pussy willow (tall shrub strata), lowbush blueberry, labrador tea, swamp birch and Bebb’s willow. Lowbush blueberry (20% to 35% cover) and Labrador tea (20%) were found in all sample plots, while the remaining shrub species were found in one plot at low density (5% or less cover). Species within the herbaceous strata layer include crackerberry, interrupted clubmoss, northern ground cedar which were found in both survey plots; while fireweed, partridgeberry and creeping snowberry were found in one survey plot. Cover was low for all occurrences of each species (15 % or less). The moss/lichen layer was dominated by red-stemmed feather moss (50-85 % cover) and knights plume moss (5% to 50% cover) both of which occurred in all survey plots; while star tipped reindeer lichen (5% cover), smooth cladonia (0.5% cover) and haircap moss (0.5% cover) occurred in one of the survey plots. Mean species richness was 7.7 for vascular plants and 3.5 for non-vascular plants. Table 5-32 provides details on species composition within the ecotype.

Figure 5-17: Jack Pine Stand

Table 5-31: Summary of the Ecological Characteristics for Jack Pine Stand

Ecotype: Jack Pine Stand	
Number of Sample Plots:	2
Sample Plot Identification Codes:	KV-7, KV-53
Slope % (Range):	3-8
Moisture Regime (Range):	Subxeric-Mesic
Drainage (Range):	Well
Average Humus thickness (cm):	6.5
Canopy:	*NA*
Understory:	*NA*

Ecotype: Jack Pine Stand	
Dominant Tree Species[1]:	N/A
Dominant Tall Shrub Species[1]:	*Pinus banksiana*
Dominant Low Shrub Species[1]:	*Vaccinium angustifolium*
Dominant Herb Species[1,2]:	*Spinulum annotinum*
Dominant Moss/Lichen Species[1]:	*Pleurozium shreberi*

[1]Based upon average cover across all survey plots within this Ecotype.

[2]Includes low growing shrubs typically less than 15 cm in height.

Table 5-32: Plant Species Composition for Jack Pine Stand

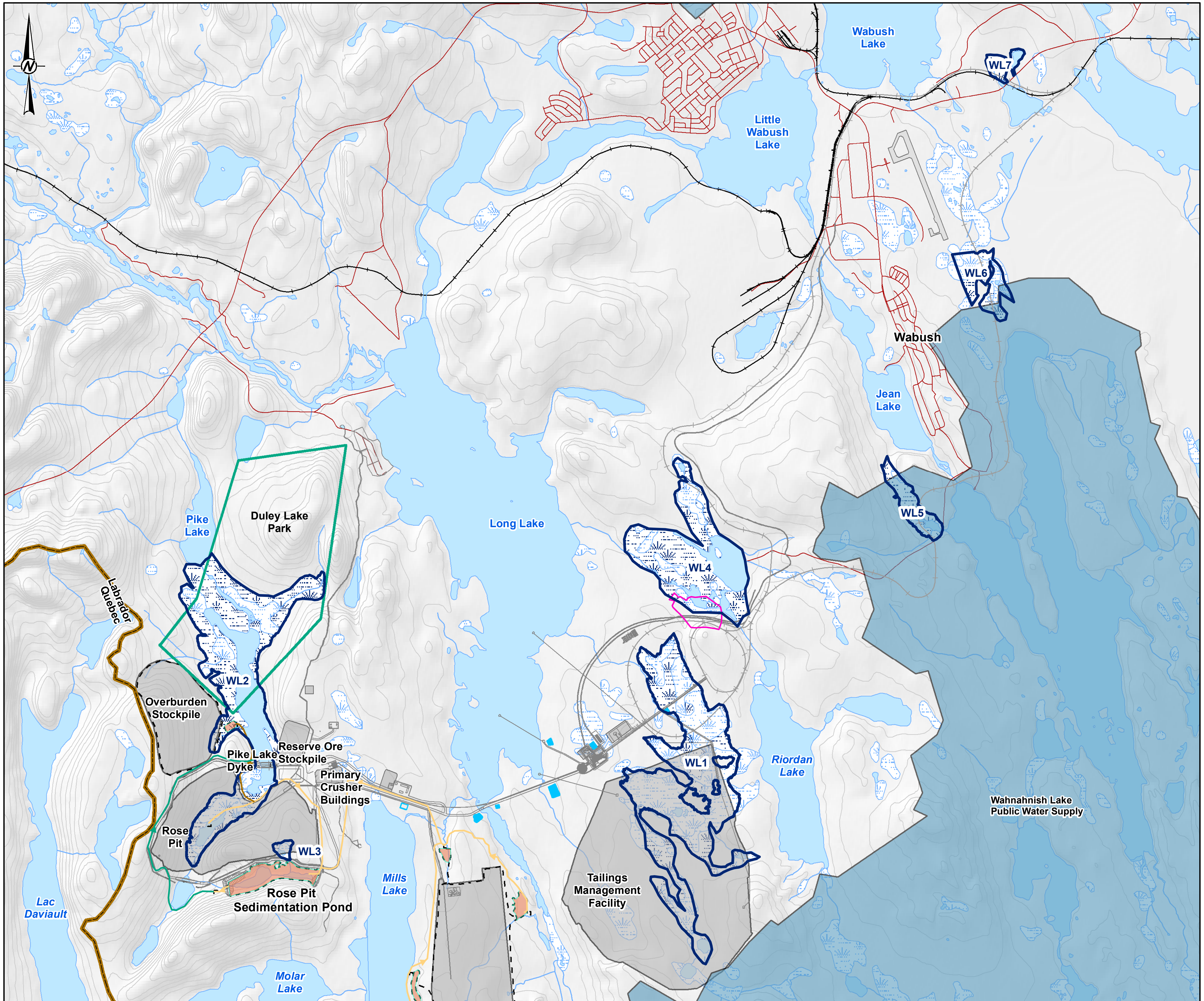
Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Fireweed	*Chamerion angustifolium*	Herbaceous	1	0.5	0.5	0.5
Crackerberry	*Cornus canadensis*	Herbaceous	2	2	15	8.5
Northern Ground Cedar	*Diphasiastrum complanatum*	Herbaceous	2	0.5	5	2.8
Creeping Snowberry	*Gautheria hispidula*	Herbaceous	1	3	3	3.0
Interrupted Clubmoss	*Spinulum annotinum*	Herbaceous	2	10	10	10.0
Partridgeberry	*Vaccinium vitis-idaea*	Low Shrub	1	1	1	1.0
Balsam Fir	*Abies balsamea*	Low Shrub	1	0.5	0.5	0.5
White Birch	*Betula papyrifera*	Low Shrub	1	2	2	2.0
Swamp Birch	*Betula pumila*	Low Shrub	1	3	3	3.0
Labrador Tea	*Rhododendron groenlandicum*	Low Shrub	2	20	20	20.0
Black Spruce	*Picea mariana*	Low Shrub	1	2	2	2.0
Bebb's Willow	*Salix bebbiana*	Low Shrub	1	5	5	5.0
Lowbush Blueberry	*Vaccinium angustifolium*	Moss/Lichen	2	20	35	27.5
Star-Tipped Reindeer Lichen	*Cladina stellaris*	Moss/Lichen	1	5	5	5.0
Smooth Cladonia	*Cladonia gracilis*	Moss/Lichen	1	0.5	0.5	0.5
Red-stemmed Feathermoss	*Pleurozium shreberi*	Moss/Lichen	2	50	85	67.5
Haircap Moss	*Polytrichum sp.*	Moss/Lichen	1	0.5	0.5	0.5

Common Name	Scientific Name	Strata Layer	Prevalence	Cover (%)		
				Min	Max	Avg
Knights Plume Moss	*Ptilium crista-castrensis*	Moss/Lichen	2	5	50	27.5
Black Spruce	*Picea mariana*	Tall Shrub	2	10	20	15.0
Jack Pine	*Pinus banksiana*	Tall Shrub	2	30	40	35.0

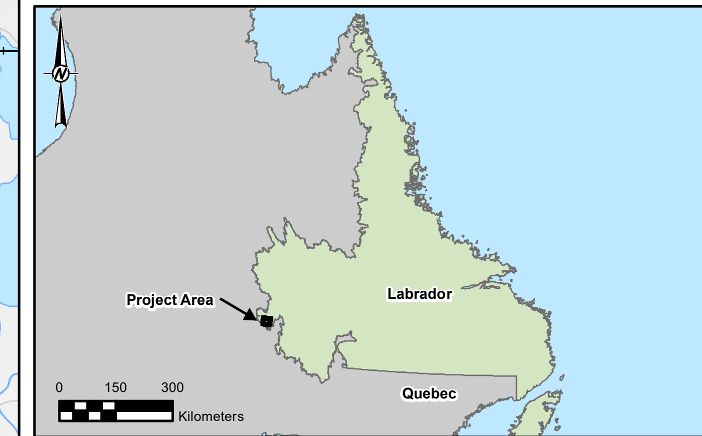
5.2 Wetland Delineation and Functional Assessment

Wetland surveys were completed within the SSA and BSA between August 1st and August 3rd, 2023. During the 2023 field surveys, seven distinct areas of wetland habitat were identified (Figure 5-18). Wetlands assessed in 2023 ranged in size from 6.2 to 387.5 ha and were classified as either fen, fen bordered by a treed swamp or marsh bordered by a shrub swamp. In all cases when soil pits were excavated, histosols were present that were in excess of 40 cm deep, there was a high-water table with surface water visibly present within the wetland. Wetlands were slightly basic (pH 7.30 to 7.74), suggesting they lie overtop of calcareous soils, or were mildly acidic (pH 5.24 to 5.46). Table 5-33 provides a summary of the wetland characteristics for the seven wetlands assessed in 2023, and Table 5-34 provides a summary of WESP-AC function and benefit ratings for grouped wetland functions (presented in Table 4-2). A total of 85 identifiable species were encountered during the wetland surveys, none of which were SAR. The only species of SOCC encountered during the wetland surveys was Green False Hellebore (encountered in Wetlands 1, 4 and 5).

Refer to Appendix B for a list of all plants identified within the wetlands, including relevant COSEWIC, SARA, NLESA and ACCDC Provincial Rarity (Labrador) rankings. Representative photos of each wetland are provided in Appendix C, while the WESP-AC (Non-tidal) data summary and calculation tables are provided in Appendix D.



KEY MAP



SCALE 1:20,000,000

PROJECT DATA	BASEMAP INFORMATION
Proposed Ditches	Existing Railway
Proposed Infrastructure	River/Stream
Proposed Railway	Existing Road
Proposed Pond	Contour
2023 Wetlands Surveys	Bog/Wetland
Contact Water	Waterbody
Non-Contact Water	Labrador/Quebec Boundary
Treated Water	
Proposed Sedimentation Pond	
Proposed Infrastructure	
Wabush Habitat Management Unit	

0 625 1,250 2,500

1:60,986 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT
CHAMPION IRON MINES

PROJECT
KAMI IRON ORE PROJECT
WABUSH, NL

TITLE
WETLANDS DELINIATED DURING 2023 WETLAND SURVEY

CONSULTANT

YYYY-MM-DD	2024-01-11
DESIGNED	----
PREPARED	JMA
REVIEWED	MM
APPROVED	MM

PROJECT NO.	CONTROL	REV.	FIGURE
TE23930010	0001	A	Figure 5-18

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25mm

Table 5-33: Summary of Wetland Characteristics

ID	Inferred Area (ha)	Wetland Type	Landscape Position	Landform	Waterflow	Wetland Boundary	Soil Plot (Munsell Soil Colour)	Surface / Hydrologic Conditions	Vegetation Plot Strata		
									Herb	Shrub	Tree
WL1	376.3	Fen	Terrene	Basin	Inflow	Gentle - Moderate	A1: Histosol 0-88 cm Peat on hard surface (10YR2/1)	1. Surface water 2. High water table	*Sanguisorba canadensis* (20%), *Andromeda glaucophylla* (4%), *Maianthemum trifolium* (15%), *Eriophorum sp.* (2%), *Dasiphora fruticosa* (10%), *Platanthera dilatata* (1%), *Solidago macrophylla (1%),* Unknown Grass (1%), *Trichophorum cespitosum* (80%)	*Larix laricina* (5%), *Picea mariana* (5%)	*Picea mariana* (3%)
WL2	387.5	Fen	Terrene	Sloped into Basin	Throughflow	Gentle - Moderate	A1: Histosol 0-120 cm Peat on hard surface (10YR2/1)	1. Surface water 2. High water table (pH 7.31)	*Sanguisorba canadensis* (20%), *Chamaedaphne calyculata* (10%), *Salix spp.* (10%), *Myrica gale* (20%), *Rhododendron groenlandicum* (5%), *Linnaea borealis* (5%) *Unknown Grass* (5%).	N/A	N/A
WL3	6.2	Fen	Terrene	Basin	Outflow	Gentle - Moderate	A1: Histosol >40 cm Peat on hard surface (10YR2/1)	1. Surface water 2. High water table (pH 7.74)	*Chamaedaphne calyculata* (15%), *Myrica gale* (50%), *Sphagnum spp.* (10%), *Kalmia polifolia* (1%), *Drosera rotundifolia* (2%), *Vaccinium oxycoccos* (1%), *Trichophorum cespitosum* (80%), *Andromeda glaucophylla* (1%)	N/A	N/A
WL4	231.9	Fen bordered by a Treed Swamp	Lotic	Fringe	Throughflow	Gentle - Moderate	A1: Histosol 0-102 cm Peat on hard surface (10YR2/1)	1. Surface water 2. High water table (pH 7.30) 3. Defined watercourse channel and drainage from higher elevation.	*Larix laricina* (15%), *Sanguisorba canadensis (15%), Andromeda glaucophylla* (10%), *Salix spp.* (20%), *Rhododendron groenlandicum* (10%), *Geocaulon lividum* (3%), *Sphagnum spp.* (95%), *Eurybia radula* (5%), *Salix spp.* (15%), *Rubus arcticus (2%), Trichophorum cespitosum* (30%), *Lonicera villosa* (2%), *Eurybia radula* (5%)	*Larix laricina (10%), Picea mariana* (10%)	*Picea mariana* (5%)
WL5	38.2	Fen bordered by a Treed Swamp	Lentic	Fringe	Bidirectional	Gentle - Moderate	A1: Histosol 0-102 cm Peat on hard surface (10YR2/1)	1. Surface water 2. High water table (pH 7.30)	*Sanguisorba canadensis* (15%), *Salix spp.* (10%), *Rhododendron groenlandicum* (5%), *Equisetum sylvaticum* (30%), *Sphagnum spp.* (80%), *Betula michauxii* (20%), *Carex disperma* (40%), *Glyceria striata* (20%), *Alnus alnobetula* (20%)	*Betula michauxii* (45%), *Salix sp.* (10%), *Picea sp.* (10%).	*Larix laricina* (10%), *Picea mariana* (15%).
WL6	52.4	Fen bordered by a Treed Swamp	Lotic	Fringe	Throughflow	Gentle - Moderate	A1: Histosol 0-60 cm Peat on hard surface (10YR2/1)	1. Surface water 2. High water table (pH 5.46)	*Chamaedaphne calyculata* (40%), *Betula glandulosa* (25%), *Salix sp.* (5%), *Rhododendron groenlandicum* (15%), *Sphagnum spp.* (90%), *Picea mariana* (15%), *Empetrum nigrum* (2%), *Gaultheria hispidula* (2%), *Equisetum sylvaticum* (10%), *Rubus chamaemorus* (10%)	*Picea mariana* (20%), *Betula glandulosa* (2%).	*Picea mariana* (10%), *Larix laricina* (5%).
WL7	16.9	Marsh bordered by a Shrub Swamp	Lentic	Fringe	Bidirectional	Gentle - Moderate	A1: Histosol 0-56 cm Peat on hard surface (10YR2/1)	1. Surface water 2. High water table (pH 5.24)	*Myrica gale* (15%), *Chamaedaphne calyculata* (15%), *Sphagnum spp.* (20%)	*Picea mariana* (10%), *Larix laricina* (5%)	N/A

Table 5-34: WESP-AC summary ratings for grouped functions outlined in Table 4-2

Grouped Wetland Functions	Wetland 1 (WL1)		Wetland 2 (WL2)		Wetland 3 (WL3)		Wetland 4 (WL4)		Wetland 5 (WL5)		Wetland 6 (WL6)		Wetland 7 (WL7)	
	Function	Benefit	Function	Benefit	Function	Benefit	Function	Benefit	Function	Benefit	Function	Benefit	Function	Benefit
Hydrologic		Higher		Higher		Higher		Higher		Higher		Higher		Higher
Water Quality	Lower	Higher	Lower	Higher	Higher	Higher	Moderate	Higher	Moderate	Higher	Lower	Higher	Moderate	Higher
Aquatic Support	Moderate	Higher	Moderate	Higher	Lower	Moderate	Higher	Higher	Higher	Higher	Higher	Higher	Higher	Higher
Aquatic Habitat	Higher	Moderate	Higher	Moderate	Higher	Moderate	Higher	Moderate	Higher	Moderate	Higher	Higher	Higher	Moderate
Transition Habitat	Moderate	Higher	Higher	Higher	Higher	Higher	Higher	Higher	Higher	Higher	Higher	Higher	Higher	Higher
Wetland Condition		Lower		Lower		Lower		Higher		Lower		Moderate		Moderate
Wetland Risk		Higher		Higher		Higher		Higher		Higher		Higher		Higher

Blue shading indicates Functions which are not ranked by the WESP-AC calculator

5.3 Species at Risk Assessment

A review of the Species at Risk Registry for vascular plants, lichens and mosses in the region (Newfoundland and Labrador) identified eleven Species at Risk that occur in the province. However, based upon a review of the COSEWIC status reports and other information from the Species at Risk Registry website (ECCC 2023) it was determined that the occurrence of any species at risk in the assessment area was unlikely based upon known species distributions, climatic variables and/or habitat requirements.

A review of the Endangered Species List Regulations identified a total of thirty-four vascular plant, moss or lichen species combined that are listed as endangered, threatened or vulnerable within the province. Based upon a review of the SSAC status reports or applicable information available from the Government of Newfoundland and Labrador Department of Fisheries, Forestry and Agriculture website (Government of Newfoundland and Labrador 2024 a) it was determined that it is unlikely any of the listed species may occur in the project area based upon known species distributions, climatic variables and/or habitat requirements. In general, the species listed under the NLESA are found either within more temperate locations, locations with a maritime influence or with a specific restricted habitat (e.g., the limestone barrens found on the Northern Peninsula of insular Newfoundland). There are historic records of the endangered species Mountain Bladder Fern occurring in the area (Smokey Mountain – Labrador City), (SSAC 2013). However, the species is listed as endangered for the insular portion of the province only and is not either listed as threatened or vulnerable within Labrador (Government of Newfoundland and Labrador 2024 b).

In addition, the results of an ACCDC data search (discussed in the proceeding section) did not identify the occurrence of any federally or provincially listed species at risk within SSA or BSA. Furthermore, vegetation surveys conducted as part of the preliminary baseline studies for the Kami project by Stassinu Stantec (2012b), or by WSP field surveys in 2023 did not document the occurrence of any listed SAR in the area.

5.4 Species of Conservation Concern Assessment

To determine the potential presence of species of conservation concern within the vicinity of the Project, WSP requested that ACCDC complete a data search for SOCC within the BSA. The results of this search identified a total of 406 rare plant records. The total number of species identified was 66 (there were multiple records for many of the species). The provincial rarity ranks for these species ranged from S1 to S3S5, while national ranks ranged from N2 to N5 and with global ranks all generally G5. The higher national and global ranks indicate that the species populations are generally secure at national/global levels. Green false hellebore was the only species identified that is ranked as critically imperiled or imperiled nationally (ranked N2) but is secure globally.

For this assessment the focus was on species that were critically imperiled or imperiled at the provincial level (S1 or S2 ranking). The number of species that fell into this range of ranks was ten. Table 5-35 outlines the species ranked S1 or S2 identified during by the ACCDC search.

It should be noted that while the rarity rankings give an indication of the rarity of species and their habitat they are based upon the occurrence of observations of the species. For species that have few records of observation, the ranking may not be an indication of true species rarity, rather it may be a result of low survey effort in the area. As an example, Bird's Eye Primrose had a rarity ranking of S2 prior to the initial baseline surveys for the Kami Project (2011 to 2012) but the 2020 S-Rank was S3S4 suggesting that additional survey effort for the Kami project and other projects within Labrador (e.g., Wabush 3 Mine) may have attributed to the change in ranking as less rare.

Between the initial baseline studies completed by Stassinu Stantec (2012c) and the vegetation/wetland surveys completed by WSP in 2023, green false hellebore, beautiful sedge, daisy fleabane, jack pine, marsh muhly, northern valerian, running pine and small yellow lady's-slipper were encountered within the BSA search area, and in some cases within the SSA. A brief description of each species is provided below.

Table 5-35: Species of Conservation Concern from ACCDC Search of the Baseline Study Area Ranked S1 or S2

Common Name	Scientific Name	S-Rank	N-Rank	G-Rank	Identified within SSA	Identified within BSA
Green Spleenwort	*Asplenium viride*	S1S2	N5	G5	No	No
Beautiful Sedge	*Carex concinna*	S2	N5	G5	Yes	Yes
Small Yellow Lady's-Slipper	*Cypripedium parviflorum*	S1	N5	G5	Yes	Yes
Mountain Bladder Fern	*Cystopteris montana*	S2	N4N5	G5	No	No
Daisy Fleabane	*Erigeron hyssopifolius*	S2	N5	G5	No	Yes
Limestone Polypody	*Gymnocarpium robertianum*	S1	N3N4	G5	No	No
Running Pine	*Lycopodium clavatum*	S1S3	N5	G5	Yes	Yes
Marsh Muhly	*Muhlenbergia glomerata*	S2?	N5	G5	No	Yes
Jack Pine	*Pinus banksiana*	S1	N5	G5	Possibly[1]	Yes
Northern Valerian	*Valeriana dioica subsp. sylvatica*	S2	N4N5	G5T4T5	Yes	Yes
Green False Hellebore	*Veratrum viride var. viride*	S2	N2	G5TNR	Yes	Yes

[1]Project components such as the rail line, and other project infrastructure may be within the vicinity of species location.

Green Spleenwort (*Asplenium viride*)

Green spleenwort is a low growing creeping or ascending frequently branched plant found growing on limestone or other basic rocks. Leaves are compound (mono-pinnate) ranging from 2 cm to 13 cm in length by 0.6 cm to 1.2 cm wide. Each leaf has 6 to 21 pairs of pinnae per leaf with each pinnae almost as wide as long (Wagner et al. 2024). The species has a disjunct circumpolar distribution which includes insular Newfoundland (except southern portion) and from southeast to western Labrador (Meades and Meades 2024 a).

Beautiful Sedge (*Carex concinna*)

The beautiful sedge is found in a variety of habitats which include moist to dry meadows, riverbanks, tickets, floodplains, and open woodlands typically on calcareous substrates. Plants are short with culms up to 20 cm and typically with basal leaves narrow (1-3 mm wide) and shorter than culms (Crins 2024). The range of the species includes boreal areas of North America. Provincially the species range includes western and northwestern portions of insular Newfoundland, north to western Labrador (Meades and Meades 2024 b).

Small Yellow Lady's Slipper (*Cypripedium parviflorum*)

Small yellow lady's slipper is a member of the orchid family which has a conspicuous flower (1-2) which has a bright yellow lower petal which is slipper shaped. Leaves (3-5) alternate, erect to spreading and ranging from orbiculate to oblanceolate in shape (Sheviak 2024). Meades and Meades (2024c) provides a distribution of the *pubescens* variety which includes temperate to boreal North America, with distribution from southwestern to northwestern Newfoundland and western Labrador over calcareous substrates. Meades and Meades (2024c) also indicate that the first record of this species and variety in Labrador was located during previous studies by Stassinu Stantec in 2013 near Wabush.

Mountain Bladder Fern (*Cystopteris montana*)

Mountain bladder fern is species of fern which has fronds that may be three to four times pinnate and up to 45 cm in length. Pinnae generally ascending with leaf veins directed into notches. The species is found in wet woodlands or along water courses (Haufler et al. 2024) while having an affinity for calcareous substrates (Meades and Meades 2024d). The species range includes boreal cordilleran areas while it has a disjunct distribution in the northwestern portion of insular Newfoundland it is also distributed in southeastern, western and northern Labrador (Meades and Meades 2024d).

Daisy Fleabane (*Erigeron hyssopifolius*)

Daisy fleabane can be found in a variety of habitats which include open woods, gravel areas (barren, roadsides and riverbeds), rock ledges and crevices. Plants are erect, rhizomatous ranging in height from 5 to 35 cm. Leaves are oblong to lanceolate 1 to 3 cm long and narrow (1 to 5 mm) with basal leaves reduced. Flower heads range from one to five each comprised of 20 to 50 white to pinkish florets (Nesom 2024). The species range is boreal North America, insular Newfoundland (except eastern portion-Avalon peninsula) and a disjunct distribution in western Labrador (Meades and Meades 2024 e).

Limestone Polypody (*Gymnocarpium robertanium*)

Limestone polypody is species of fern which has fronds that may be bi- or tri- pinnate and range from 10 to 52 cm in length and 5 to 19 cm wide. The species is typically found growing in calcareous substrates, limestone pavement, outcrops, cliffs and cedar swamps (Pryer 2024). Meades et al. (2000) indicate that the species has a disjunct Eurasian distribution and can be found in southern boreal areas of eastern North America. Provincially, Meades et al. (2000) report the species occurring in western to northern insular Newfoundland but not in Labrador. However, the 2023 ACCDC data search identified two records of the species within the Labrador City/Fermont area which were encountered during rare plant baseline surveys completed for Alderon Iron Ore corporation for the Kami Project.

Running Pine (*Lycopodium clavatum*)

Running pine is a low growing species of clubmoss comprised of a series of branching lateral stems which grow across the forest floor which transition to an upright branched stem. Upright branches are variably forked (1 to 4 times) up to 25 cm tall. Leaves are evergreen, needle like and 3.5 mm to 7 mm in length (Legasy et al. 1995). The species has a disjunct circumboreal distribution which includes insular Newfoundland (except southern portion) and disjunct in central Labrador (Meades and Meades 2024 f).

Marsh Muhly (*Muhlenbergia glomerata*)

Marsh muhly is a perennial grass species that grows in a variety of habitats which include bogs, alkaline fens, lake and stream banks, ditches and gravel slopes. Culms are 30-120 cm tall with leaves 2-15 cm long and 2-6 mm wide and flat. Panicles are 1.5 cm to 12 cm long 0.3 cm to 1.8 cm wide and densely packed. The species has a range throughout boreal North America and provincially occurs generally throughout insular Newfoundland except for the Avalon peninsula (Meades and Meades 2024 g) but not within Labrador, while the 2023 ACCDC search identified 16 records of the species within the Labrador City/Fermont area which were encountered during rare plant baseline surveys completed for Alderon Iron Ore corporation for the Kami Project. Some occurrences of the species were within, or within close proximity, of the SSA.

Jack Pine (*Pinus banksiana*)

Jack pine is a conifer tree species with an irregular rounded to spreading flattened crown that can attain heights of 27 m. The bark is orange to red-brown and scaly. Younger the twigs are orange to red brown which eventually turn grayish brown with age. Jack pine are found in post fire succession areas, in flat dry areas, and on hills where soils are sandy (Kral 2024). The species range is eastern North America boreal regions, it has disjunct distribution in western Labrador and is introduced to insular Newfoundland as a plantation tree (Meades and Meades 2024 h). It naturally occurs at a single site in southwestern Labrador which is included in the Redfir Lake-Kapitagas Channel Ecological Reserve (Meades and Meades 2024 h). Jack pine stands were identified along portions of the access road to Elephant Head Lake and Riordan Lake during 2023 vegetation surveys completed by WSP. Stassinu Stantec (2012b) also identified the occurrence of four individuals at the southern end of Long (Duley) Lake.

Northern Valerian (*Valeria dioica* subsp. *sylvatica*)

Northern valerian is a perennial herbaceous plant found in wet to moist meadows and along stream banks which ranges in height from 10 cm to 40 cm. The basal leaves are generally simple with a spoon to egg shape. Stem leaves are opposite (2 to 4 pairs) twice as long as wide, pinnatifid with the terminal lobe unstalked or with a short stalk. Inflorescence is a compact round topped cluster (Douglas et al. 2001). The species range includes boreal north America with a provincial distribution through western and northwestern Newfoundland into southeastern and western Labrador with an affinity for areas with habitats over calcareous bedrock (Meades and Meades 2024i).

Green False Hellebore (*Veratrum viride var. viride*)

The green False Hellebore is a conspicuous plant found in moist clearings and shaded woodlands with stems that range from 0.5 m to 2 m in height. Leaves are generally oval in shape ranging from 15 cm to 25 cm in length about 2 or 3 as wide as long borne in an ascending to spreading inflorescence, with individual flowers spreading 6 mm to 10 mm in length (McNeil and Shaw 2024). The range of this variety includes temperate through southern boreal regions of eastern north America including western Labrador (Meades and Meades 2024j).

Green false hellebore was encountered within a total of nine survey plots surveyed in 2023 (KV-1, KV-4, KV-27, KV-28, KV-29, KV-38, KV-43, KV-56, KV-59) within Non-Patterned Shrub Fen, Riparian Thicket and Black Spruce/Tamarach-Sphagnum Woodland ecotypes. Green false hellebore was also encountered during wetland surveys within wetlands WL1, WL4 and WL5. Jack pine was found in two 2023 survey plots (KV-7 and KV-53). However, these survey plots were intentionally completed in jack pine stands to primarily highlight the species that co-occur with jack pine. Woods valerian and running pine were each found within a single plot in 2023 (KV-6 and KV-10, respectively). Woods valerian was found in Tamarack/Black Spruce-Feathermoss (Water Track) ecotype while running pine was found in the Softwood Burn/Regeneration ecotype.

6.0 KEY FINDINGS

Ecotype characteristics and species composition of the identified ecotypes are generally comparable between the Stantec baseline studies and what was observed during 2023 field surveys. This suggests that the various ecotypes are 'stable' and not rapidly advancing through successional stages. In addition, there appears to have been little change in the aerial extent of the various ecotypes identified in Stassinu Stantec's ELC in the area since there was no evidence of any large-scale development observed during the 2023 field program.

Since no species at risk (i.e., SARA Schedule 1 or NLESA listed) were found during 2012/2013 baseline surveys, 2023 baseline surveys or were identified by ACCDC, it is unlikely that any legally protected species at risk occur in the vicinity of the Project. Species of conservation concern (S1 or S2 provincial ranking) were found within both the SSA and BSA.

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APPENDIX A

Species Encountered During Vegetation Plot Surveys

Table A1: Species Encountered During Vegetation Plot Surveys

Common Name	Scientific Name	COSEWIC	SARA	NLESA	Provincial Rarity Rank
Balsam Fir	*Abies balsamea*	-	-	-	S5
Common Yarrow	*Achillea millefolium*	-	-	-	SNA
Red Baneberry	*Actaea rubra*	-	-	-	S4S5
Colonial Bentgrass	*Agrostis capillaris*	-	-	-	SNA
Black Bentgrass	*Agrostis gigantea*	-	-	-	-
Creeping Bentgrass	*Agrostis stolonifera*	-	-	-	SNA
Witches Hair Lichen	*Alectoria ochroleuca*	-	-	-	S5
Green Alder	*Alnus alnobetula*	-	-	-	S5
Chuckley Pear	*Amelanchier bartramiana*	-	-	-	S4S5
Bog Rosemary	*Andromeda glaucophylla*	-	-	-	S5
Alpine Bearberry	*Arctos alpina*	-	-	-	S5
Tundra Dwarf Birch	*Betula glandulosa*	-	-	-	S5
White Birch	*Betula papyrifera*	-	-	-	S4S5
Swamp Birch	*Betula pumila*	-	-	-	S5
Fringed Brome	*Bromus ciliatus*	-	-	-	S4S5
Blue-Joint Reedgrass	*Calamagrostis canadensis*	-	-	-	S5
Water Sedge	*Carex aquatilis*	-	-	-	S4S5
Bigelow's Sedge	*Carex bigelowii*	-	-	-	S4S5
Hoary Sedge	*Carex canescens*	-	-	-	S3S5
Hair-Like Sedge	*Carex capillaris*	-	-	-	S4S5
Chestnut-Colored Sedge	*Carex castanea*	-	-	-	-
Little Prickly Sedge	*Carex echinata*	-	-	-	S3S5
Northern Bog Sedge	*Carex gynocrates*	-	-	-	S3S4
Lakeshore Sedge	*Carex lenticularis*	-	-	-	S4S5
Livid Sedge	*Carex livida*	-	-	-	S3S5
Boreal Bog Sedge	*Carex magellanica*	-	-	-	S5
Few Seeded Sedge	*Carex oligosperma*	-	-	-	S5
Beaked Sedge	*Carex rostrata*	-	-	-	S4S5
Bulrush Sedge	*Carex scirpoidea*	-	-	-	S3S5
Three Seeded Sedge	*Carex trisperma*	-	-	-	S4S5
Labrador Indian Paintbrush	*Castilleja septentrionalis*	-	-	-	S4S5
Leatherleaf	*Chamaedaphne calyculata*	-	-	-	S5
Fireweed	*Chamerion angustifolium*	-	-	-	S5
Slender Wood Reedgrass	*Cinnia latifolia*	-	-	-	S4S5
Alpine Enchanters Nighshade	*Circaea alpina*	-	-	-	S4S5
Reindeer Lichen	*Cladina arbuscula*	-	-	-	S5

Table A1: Species Encountered During Vegetation Plot Surveys

Common Name	Scientific Name	COSEWIC	SARA	NLESA	Provincial Rarity Rank
Grey Reindeer Lichen	*Cladina rangifera*	-	-	-	S5
Star-Tipped Reindeer Lichen	*Cladina stellaris*	-	-	-	S5
British Soldier Lichen	*Cladonia cristatella*	-	-	-	S5
Smooth Cladonia	*Cladonia gracilis*	-	-	-	S4
Bluebead Lilly	*Clintonia borealis*	-	-	-	S5
Snakewort	*Conocephalum salebrosum*	-	-	-	S2S3
Goldthread	*Coptis trifolia*	-	-	-	S5
Crackerberry	*Cornus canadensis*	-	-	-	S5
Red-Osier Dogwood	*Cornus sericea*	-	-	-	S5
Shrubby Cinquefoil	*Dasiphora fruticosa*	-	-	-	S3S4
Diapensia	*Diapensia lapponica*	-	-	-	S5
Northern Ground Cedar	*Diphasiastrum complanatum*	-	-	-	S5
Spoon Leaved Sundew	*Drosera intermedia*	-	-	-	S3S4
Roundleaf Sundew	*Drosera rotundifolia*	-	-	-	S5
Mountain Wood Fern	*Dryopteris campyloptera*	-	-	-	S4
Spinulose Wood Fern	*Dryopteris carthusiana*	-	-	-	S4
Slender Wheatgrass	*Elymus trachycaulus*	-	-	-	S5
Black Crowberry	*Empetrum nigrum*	-	-	-	S5
Trailing Arbutus	*Epigaea repens*	-	-	-	S2S3
Field Horsetail	*Equisetum arvense*	-	-	-	S5
Water Horsetail	*Equisetum fluvitale*	-	-	-	S3S4
Woodland Horsetail	*Equisetum sylvaticum*	-	-	-	S5
Common Cotton Grass	*Eriophorum angustifolium*	-	-	-	S4S5
Russet Cottongrass	*Eriophorum russeolum*	-	-	-	S3S5
Green Keeled Cottongrass	*Eriophorum viridicarinatum*	-	-	-	S3S4
Crinkled Snow Lichen	*Flavacetraria nivalis*	-	-	-	S4
Virginia Strawberry	*Fragaria virginiana*	-	-	-	S3S4
Fragrant Bedstraw	*Galium triflorum*	-	-	-	S4S5
Creeping Snowberry	*Gautheria hispidula*	-	-	-	-
Northern Commandra	*Geocaulon lividium*	-	-	-	-
Water Avens	*Geun rivale*	-	-	-	S3S4
Fowl Manna Grass	*Glyceria striata*	-	-	-	S4S5
Northern Oak Fern	*Gymnocarpium dryopteris*	-	-	-	S5
Stairstep Moss	*Hylocomium splendens*	-	-	-	S4S5
Common Juniper	*Juniperus communis*	-	-	-	S4S5
Sheep Laurel	*Kalmia angustifolia*	-	-	-	S3S4
Bog Laurel	*Kalmia polifolia*	-	-	-	S5

Table A1: Species Encountered During Vegetation Plot Surveys

Common Name	Scientific Name	COSEWIC	SARA	NLESA	Provincial Rarity Rank
Eastern Larch	*Larix laricina*	-	-	-	S5
Twinflower	*Linnaea borealis*	-	-	-	S5
Northern Honeysuckle	*Lonicera villosa*	-	-	-	S5
Interrupted Clubmoss	*Spinulum annotinum*	-	-	-	S5
Arctic Stag-Horn Clubmoss	*Lycopodium clavatum*	-	-	-	S1S3
Canada Mayflower	*Maianthemum canadense*	-	-	-	S5
Three Leaved False Solomon Seal	*Maianthemum trifolium*	-	-	-	S5
Bog Bean	*Menyanthes trifoliata*	-	-	-	S5
Naked Bishop's Cap	*Mitella nuda*	-	-	-	S4S5
Bog Muhly	*Muhlenbergia uniflora*	-	-	-	S2S3
Sweetgale	*Myrica gale*	-	-	-	S5
Freckled Pelt Lichen	*Peltigera aphthosa*	-	-	-	S5
Arctic Butterbur	*Petasites frigidus*	-	-	-	S4S5
White Spruce	*Picea glauca*	-	-	-	S5
Black Spruce	*Picea mariana*	-	-	-	S5
Common Butterwort	*Pinguicula vulgaris*	-	-	-	S4S5
Jack Pine	*Pinus banksiana*	-	-	-	S1
Red-stemmed Feathermoss	*Pleurozium shreberi*	-	-	-	S4S5
Fowl Blue Grass	*Poa palustris*	-	-	-	S4S5
Kentucky Bluegrass	*Poa praetensis*	-	-	-	S3S4
Trembling Aspen	*Populus tremuloides*	-	-	-	S4S5
Mistassini Primrose	*Primula mistassinica*	-	-	-	S3S4
Knights Plume Moss	*Ptilium crista-castrensis*	-	-	-	S4S5
Yellow Rattle	*Rhinanthus minor*	-	-	-	SU
Labrador Tea	*Rhododendron groenlandicum*	-	-	-	S5
Skunk Current	*Ribes glandulosum*	-	-	-	S5
Swamp Current	*Ribes triste*	-	-	-	S3
Arctic Raspberry	*Rubus arcticus*	-	-	-	S5
Bakeapple	*Rubus chamaemorus*	-	-	-	S5
Raspberry	*Rubus idaeus*	-	-	-	S4S5
Dwarf Raspberry	*Rubus pubescens*	-	-	-	S5
Labrador Willow	*Salix argyrocarpa*	-	-	-	S4S5
Bebb's Willow	*Salix bebbiana*	-	-	-	S3S4
Pussy Willow	*Salix discolor*	-	-	-	S3S5
Prairie Willow	*Salix humilis*	-	-	-	S4S5
Bog Willow	*Salix pedicellaris*	-	-	-	S4

Table A1: Species Encountered During Vegetation Plot Surveys

Common Name	Scientific Name	COSEWIC	SARA	NLESA	Provincial Rarity Rank
Satiny Willow	*Salix pellita*	-	-	-	S4
Tea-Leaved Willow	*Salix planifolia*	-	-	-	S5
Rock Willow	*Salix vestida*	-	-	-	S4
Bottle Brush	*Sanguisorba canadensis*	-	-	-	S4S5
Purple Oatgrass	*Schizachne purpurescens*	-	-	-	S3S5
Large-Leaf Goldenrod	*Solidago macrophylla*	-	-	-	S5
Bog Goldenrod	*Solidago uliginosa*	-	-	-	S5
Showy Mountain Ash	*Sorbus decora*	-	-	-	S4S5
Hooded Ladies Tresses	*Spiranthes romanzoffiana*	-	-	-	S3S4
Easter Lichen	*Stereocaulon paschale*	-	-	-	S3S5
Twisted Stalk	*Streptopus amplexifolius*	-	-	-	S5
Swamp Aster	*Symphyotrichum puniceum*	-	-	-	S4
Common Dandelion	*Taraxacum officinale*	-	-	-	SNA
Tall Meadow Rue	*Thalictrum pubescens*	-	-	-	-
Sticky Tofieldia	*Triantha glutinosa*	-	-	-	S3S4
Alpine Cotton Grass	*Trichophorum alpinum*	-	-	-	S3S5
Deergrass	*Trichophorum cespitosum*	-	-	-	S5
Starflower	*Lysimachia borealis*	-	-	-	S5
Lowbush Blueberry	*Vaccinium angustifolium*	-	-	-	S5
Tundra Bilberry	*Vaccinium uliginosum*	-	-	-	S5
Partridgeberry	*Vaccinium vitis-idaea*	-	-	-	S5
Marshberry	*Vaccinnium oxycoccus*	-	-	-	S5
Woods Valerian	*Valeriana diocia*	-	-	-	S2
Green False hellebore	*Veratrum viride var.viride*	-	-	-	S2
Squashberry	*Viburnum edule*	-	-	-	S5
Kidney Leaf Violet	*Viola* cf. *reniflora*	-	-	-	S3S4
Labrador Violet	*Viola labradorica*	-	-	-	S4S5

APPENDIX B

Species Encountered During Wetland Surveys

Table B1: Species Encountered During Wetland Surveys

Common Name	Scientific Name	COSEWIC	SARA	NLESA	Provincial Rarity Rank
Balsam Fir	*Abies balsamea*	-	-	-	S5
Green Alder	*Alnus alnobetula*	-	-	-	S5
Speckled Alder	*Alnus incana*	-	-	-	S4S5
Chuckley Pear	*Amelanchier bartramiana*	-	-	-	S4S5
Bog Rosemary	*Andromeda glaucophylla*	-	-	-	S5
Small-Flower Anemone	*Anemone parviflora*	-	-	-	S3S4
Tundra Dwarf Birch	*Betula glandulosa*	-	-	-	S5
Newfoundland Dwarf Birch	*Betula michauxii*	-	-	-	S5
Swamp Birch	*Betula pumila*	-	-	-	S5
Blue-Joint Reedgrass	*Calamagrostis canadensis*	-	-	-	S5
Water Sedge	*Carex aquatilis*	-	-	-	S4S5
Brownish Sedge	*Carex brunnescens*	-	-	-	S5
Buxbaum's Sedge	*Carex buxbaumii*	-	-	-	S3
Hair-Like Sedge	*Carex capillaris*	-	-	-	S4S5
Lesser Panicled Sedge	*Carex diandra*	-	-	-	S2S4
Softleaf Sedge	*Carex disperma*	-	-	-	S3S5
Coast Sedge	*Carex exilis*	-	-	-	S3S5
Yellow Sedge	*Carex flava*	-	-	-	S3S4
Mud Sedge	*Carex limosa*	-	-	-	S5
Boreal Bog Sedge	*Carex magellanica*	-	-	-	S5
Few-Seeded Sedge	*Carex oligosperma*	-	-	-	S5
Few-Flowered Sedge	*Carex pauciflora*	-	-	-	S4S5
Loose-Flowered Sedge	*Carex rariflora*	-	-	-	S4S5
Beaked Sedge	*Carex rostrata*	-	-	-	S4S5
Three-Seed Sedge	*Carex trisperma*	-	-	-	S4S5
Bear Sedge	*Carex utriculata*	-	-	-	S2S4

Table B1: Species Encountered During Wetland Surveys

Common Name	Scientific Name	COSEWIC	SARA	NLESA	Provincial Rarity Rank
Labrador Indian-Paintbrush	*Castilleja septentrionalis*	-	-	-	S4S5
Leatherleaf	*Chamaedaphne calyculata*	-	-	-	S5
Fireweed	*Chamerion angustifolium*	-	-	-	S5
Lapland Buttercup	*Coptidium lapponicum*	-	-	-	S2S4
Goldthread	*Coptis trifolia*	-	-	-	S5
Crackerberry	*Cornus canadensis*	-	-	-	S5
Shrubby Cinquefoil	*Dasiphora fruticosa*	-	-	-	S3S4
Spoon-Leaved Sundew	*Drosera intermedia*	-	-	-	S3S4
Roundleaf Sundew	*Drosera rotundifolia*	-	-	-	S5
Slender Wheatgrass	*Elymus trachycaulus*	-	-	-	S5
Black Crowberry	*Empetrum nigrum*	-	-	-	S5
Water Horsetail	*Equisetum fluviatile*	-	-	-	S3S4
Woodland Horsetail	*Equisetum sylvaticum*	-	-	-	S5
Russet Cotton-Grass	*Eriophorum russeolum*	-	-	-	S3S5
Rough-Leaved Aster	*Eurybia radula*	-	-	-	S4S5
Virginia Strawberry	*Fragaria virginiana*	-	-	-	S3S4
Creeping Snowberry	*Gaultheria hispidula*	-	-	-	S5
Northern Comandra	*Geocaulon lividum*	-	-	-	S5
Water Avens	*Geum rivale*	-	-	-	S3S4
Fowl Manna-Grass	*Glyceria striata*	-	-	-	S4S5
Common Juniper	*Juniperus communis*	-	-	-	S4S5
Bog Laurel	*Kalmia polifolia*	-	-	-	S5
Eastern Larch	*Larix laricina*	-	-	-	S5

Table B1: Species Encountered During Wetland Surveys

Common Name	Scientific Name	COSEWIC	SARA	NLESA	Provincial Rarity Rank
Twinflower	*Linnaea borealis*	-	-	-	S5
Northern Honeysuckle	*Lonicera villosa*	-	-	-	S5
Three-Leaf False Solomon's Seal	*Maianthemum trifolium*	-	-	-	S5
Bogbean	*Menyanthes trifoliata*	-	-	-	S5
Two-eyed Berry	*Mitchella repens*	-	-	-	-
Sweet Gale	*Myrica gale*	-	-	-	S5
Golden Groundsel	*Packera aurea*	-	-	-	S3S4
Arctic Butter-Bur	*Petasites frigidus*	-	-	-	S4S5
Black Spruce	*Picea mariana*	-	-	-	S5
Common Butterwort	*Pinguicula vulgaris*	-	-	-	S4S5
Leafy White Orchid	*Platanthera dilatata*	-	-	-	S4S5
Common Labrador-tea	*Rhododendron groenlandicum*	-	-	-	S5
Skunk Currant	*Ribes glandulosum*	-	-	-	S5
Swamp Red Currant	*Ribes triste*	-	-	-	S3
Dwarf Raspberry	*Rubus arcticus*	-	-	-	S3S4
Bakeapple	*Rubus chamaemorus*	-	-	-	S5
Hoary Willow	*Salix candida*	-	-	-	S2S3
Bog Willow	*Salix pedicellaris*	-	-	-	S4
Tea-Leaved Willow	*Salix planifolia*	-	-	-	S5
Rock Willow	*Salix vestita*	-	-	-	S4
Canada Burnet	*Sanguisorba canadensis*	-	-	-	S4S5
Northern Pitcher-Plant	*Sarracenia purpurea*	-	-	-	S4
Pod Grass	*Scheuchzeria palustris*	-	-	-	S4S5

Table B1: Species Encountered During Wetland Surveys

Common Name	Scientific Name	COSEWIC	SARA	NLESA	Provincial Rarity Rank
Large-Leaf Goldenrod	*Solidago macrophylla*	-	-	-	S5
Alpine Goldenrod	*Solidago multiradiata*	-	-	-	S3S4
Bog Goldenrod	*Solidago uliginosa*	-	-	-	S5
Hooded Ladies-Tresses	*Spiranthes romanzoffiana*	-	-	-	S3S4
Small False Asphodel	*Tofieldia pusilla*	-	-	-	S4S5
Sticky False Asphodel	*Triantha glutinosa*	-	-	-	S3S4
Alpine Cotton-Grass	*Trichophorum alpinum*	-	-	-	S3S5
Deergrass	*Trichophorum cespitosum*	-	-	-	S5
Common Bog Arrow-Grass	*Triglochin maritima*	-	-	-	S4S5
Lowbush Blueberry	*Vaccinium angustifolium*	-	-	-	S5
Marshberry	*Vaccinium oxycoccos*	-	-	-	S5
Tundra Bilberry	*Vaccinium uliginosum*	-	-	-	S5
Partridgeberry	*Vaccinium vitis-idaea*	-	-	-	S5
Green False Hellebore	*Veratrum viride var. viride*	-	-	-	S2
Squashberry	*Viburnum edule*	-	-	-	S5

APPENDIX C

Wetland Photo Log

Photo 1: Wetland 1; a calcareous Fen

Photo 2: Wetland 2; a calcareous Fen

Photo 3: Wetland 3; a calcareous Fen

Photo 4: Wetland 4; Fen bordered by a Treed Swamp

Photo 5: Wetland 5; Fen bordered by a Treed Swamp

Photo 6: Wetland 6; Fen bordered by a Treed Swamp

Photo 7: Marsh bordered by a Shrub Swamp

APPENDIX D

WESP -Atlantic Canada Assessment Output

wsp.com

CHAMPION IRON

APPENDIX K

Avifauna Baseline Report

REPORT

Avifauna Baseline Report

Kami Iron Ore Mine Project

Submitted to:

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April 2024

Distribution List

Champion Iron Mines Ltd.

Study Limitations

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EXECUTIVE SUMMARY

Two study areas were developed to support the characterization of baseline conditions of avifauna within the vicinity of the Kami Project; a Site Assessment Area (SAA) and Regional Study Area (RSA). A range of taxonomic and functional groups are well represented in the proposed SAA including waterfowl, sparrows, thrushes, and wood warblers. Collectively, these species inhabit all terrestrial and riparian habitats including black spruce dominated forest, early successional post-fire habitat, and wetlands. The most prevalent species detected during point count surveys were ruby-crowned kinglet, white-throated sparrow, yellow-rumped warbler, hermit thrush, American robin, and Tennessee warbler. Birds of prey also utilize this area (e.g. bald eagle, northern goshawk) though abundance is low as is expected for this upper-level trophic group. Common waterfowl species confirmed to nest in the SAA include American black duck, common goldeneye, and both merganser species. The early season migratory bird species survey which focused on wetland areas did not indicate any significant staging areas for waterfowl, though the earlier than normal onset of spring may have resulted in a shorter stopover period in this region during the northward migration of this species group.

Overall, the assemblage of bird species found in the SAA is reflective of community composition that has been more extensively described for this region of Labrador from long-term submissions of data to eBIRD and the ACCDC. The only species at risk detected during point count surveys was olive-sided flycatcher though an actively nesting common nighthawk was recorded in the SAA by AMEC in 2014 (AMEC Environment and Infrastructure, 2014). Several other species at risk are known to occur in the Labrador City region (i.e. short-eared owl, rusty blackbird, harlequin duck) but were not found during the survey window in 2023.

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1.0 INTRODUCTION

The Kamistiatusset (Kami) Iron Ore Mine Project (the Project) is a proposed iron ore mine in Newfoundland and Labrador. The Project site is located entirely in Labrador, approximately seven kilometres from the Town of Wabush, 10 kilometres from the Town of Labrador City, and five kilometres east of Ville de Fermont, Québec (Figure 1-1).

The Project was originally proposed by the Alderon Iron Ore Corporation (Alderon) and underwent a provincial and federal environmental impact assessment from 2011 to 2013, including a comprehensive baseline program that was completed in 2011 and 2012. The Project was released from the provincial and federal EA process in 2014. In 2021, Champion Iron Mines Ltd. (Champion) completed the acquisition of the Project from Alderon.

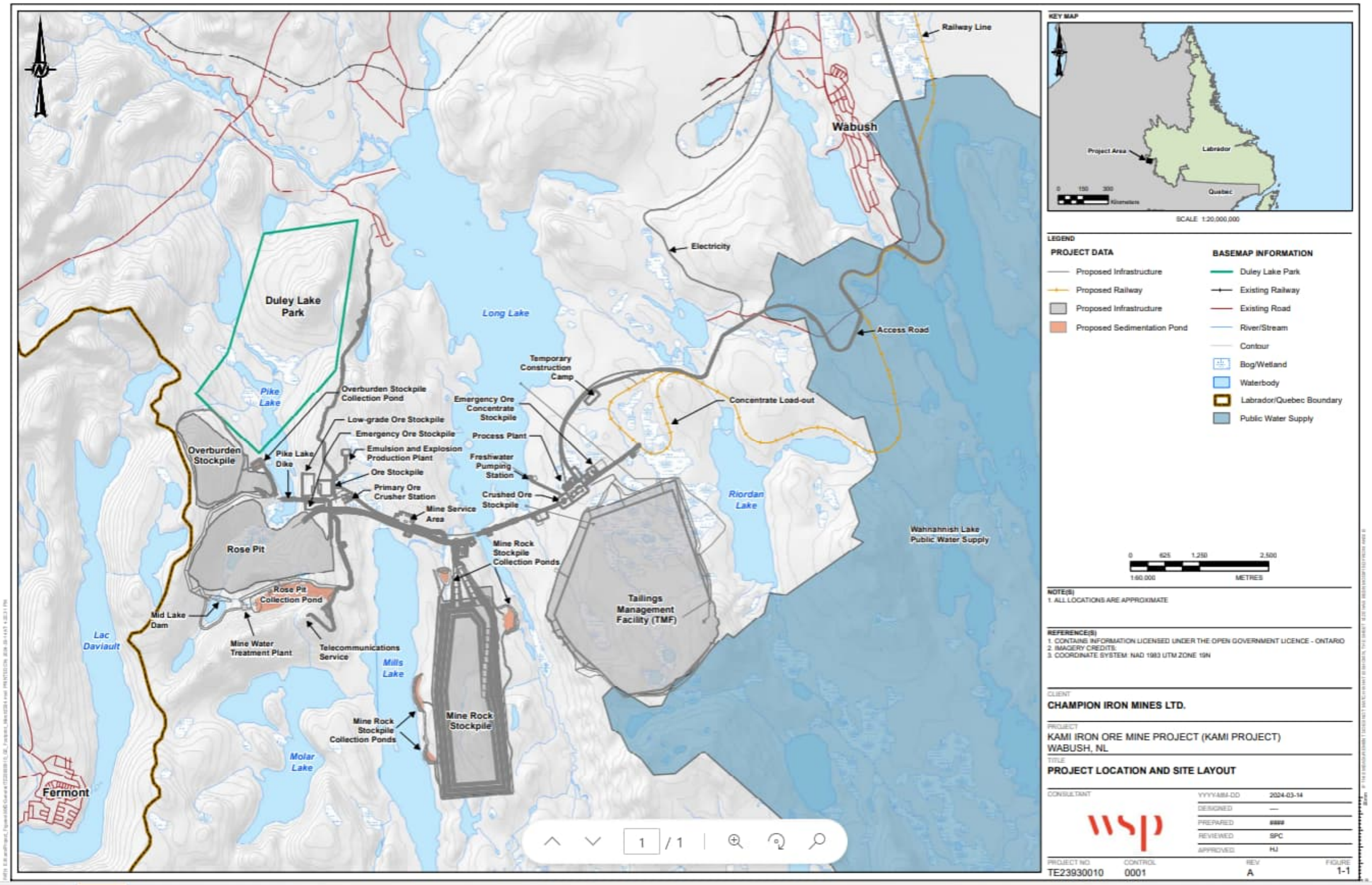
Champion is proposing several optimizations to the Project design proposed by Alderon through the previous EIS. These proposed optimizations include improvements to the Project's water management strategy and modernization of the proposed ore handling, conveyance, and processing. Champion's objective for the Kami Project is to produce high purity (>67.5%) iron ore concentrate, which can be used as direct reduction pellet feed for electric arc furnaces in the green steel supply chain. Champion is planning to submit a Project Registration to the Newfoundland and Labrador Environmental Assessment Division of the Department of Environment and Climate Change in 2024.

To support the Project Registration and assessment of effects from the revised Project design optimizations, Champion has commissioned the services of WSP Canada Inc. to complete a comprehensive baseline field program that documents the existing natural and socio-economic environments in the anticipated area of the Project. The Avifauna Baseline Report represents a component of the comprehensive baseline program and was undertaken to provide context from which environmental effects could be evaluated in the Project Planning and Environmental Assessment (EA) process.

Figure 1-1 outlines some of the main components of the Project site including:

- Open Pit (Rose Pit);
- Mine rock stockpile;
- Ore stockpiles (operational, low-grade and emergency);
- Tailings management facility (TMF);
- Overburden stockpile;
- Processing infrastructure including crushing and concentrating;
- Ancillary infrastructure to support the mine and process plant.

Figure 1-1: Project location Site Layout



2.0 STUDY AREAS

2.1 Ecological Setting

The north-western portion of the proposed Kami mining development occurs within the *Mid Subarctic Ecoregion* (Canada Committee on Ecological Land Classification 1989) and contains multiple ecotypes including open black spruce-lichen forest, post-fire/willow habitat, alpine shrub, bog, and a range of wetland habitats. Within Canada's classification of Bird Conservation Regions (Stralberg et al. 2018), the Labrador City region occurs within the Taiga Shield and Hudson Plains Region (BCR 7). Habitat diversity within this region enables occupancy by a range of functional groups including waterfowl, birds of prey, shorebirds, woodpeckers, and a number of passerine species (e.g. sparrows, wood warblers, and flycatchers).

2.2 Baseline Study Areas

Two study areas were developed to support the characterization of baseline conditions of avifauna within the vicinity of the Kami Project; a site assessment area (SAA) and regional study area (RSA).

The SAA was defined as the area of potential direct disturbance (i.e., location of proposed infrastructure) and is the area where most of the direct effects from the proposed Project are likely to occur. It is represented by the proposed Project footprint and the area immediately adjacent to the proposed Kami Project where extensive ground disturbance and infrastructure development will potentially occur (Figure 1-1). This zone extends to a radius of 10 km from the northern extent of Mills Lake and encompasses all features of the proposed development including the TMF, Rose Pit, overburden and mine rock stockpiles, and site access roads. All field-based surveys conducted in 2023 (i.e. waterfowl and point count surveys) occurred within this SAA (see Figure 5-1 and Figure 5-2).

The RSA was developed to further understand the occurrence of avifauna at a larger spatial scale and included the SAA, the adjacent municipalities of Labrador City and Wabush, and properties managed by the Iron Ore Company of Canada. Bird communities within the RSA have been more extensively documented as a function of their accessibility to citizen scientists and their inclusion in previous environmental assessments.

3.0 RATIONALE AND OBJECTIVES

Birds are an important component of boreal environments and are often used as indicators of ecosystem health. Ecologically, birds occupy multiple trophic levels as scavengers, predators and prey and can function as seed dispersers of dominant tree and shrub species. Some groups, including waterfowl and upland game birds, are harvested as a food source, or are hunted recreationally (e.g. willow ptarmigan). Avifauna also provide recreational and aesthetic value through non-consumptive activities including bird viewing and photography. Many bird species are declining throughout their historic ranges because of their sensitivity to various forms of anthropogenic disturbance (North American Bird Conservation Initiative Canada 2012). Consequently, birds have been given increasing consideration during the environmental assessment process and are a valued ecosystem component for the proposed Kami Project.

A number of bird species (including raptors, waterfowl, and songbirds) are known or are likely to occur within the area of the proposed Project; therefore, the potential impact on resident and migratory birds is an important consideration during all phases of the Project (i.e., Construction, Operations and Closure). Of particular concern are potential impacts on species listed under the Canadian *Species at Risk Act* (SARA) and the *Newfoundland and Labrador Endangered Species Act* (NL ESA).

The purpose of the survey program is to characterize baseline conditions of the site prior to any future mining development on the property. Results of the baseline study will be used to support the environmental assessment of the Project and will provide the necessary data to quantify the potential harmful effects of avifauna and their habitat. Specific objectives of this study are to:

1) Provide a description of the seasonal occurrence, population status, distribution, and habitat associations of avifauna that are known or are likely to occur in the area of the Project with emphasis on federally and provincially listed Species at Risk; and

2) Identify ecologically sensitive habitats, and time periods.

4.0 METHODS

4.1 Desktop Review

A thorough desktop literature review was conducted of existing data sources on the occurrence and distribution of avifauna in the SAA and the RSA. Information sources included publications from scientific journals, government reports, previous Environmental Assessments, species at risk data maintained by the Atlantic Canada Conservation Data Centre (ACCDC), and general species accounts available from online portals (i.e. eBird Canada and nf.birds). A description of each data source is provided in the sections below. Given the remoteness and inaccessibility of much of the SAA there have been few structured surveys conducted for birds in this region. Therefore, most inference on the assemblage of bird species that occur within this area was based on their known occurrence in similar habitats at a larger spatial scale (i.e. the RSA).

4.1.1 Atlantic Canada Conservation Data Centre

The Atlantic Canada Conservation Data Centre (ACCDC) is a not-for-profit organization and an affiliate of NatureServe Canada. The ACCDC compiles and provides objective data on the biological diversity of Atlantic Canada and functions to further the collective understanding of the distribution and status of species of conservation concern. The ACCDC is a valuable database for assessing the occurrence and location of species and is extensively used for land use planning and environmental assessment processes. For this baseline study, the ACCDC (Corner Brook, NL office) was contacted to provide relevant data on the occurrence and distribution of raptors and avian species at risk within a 15 km radius buffer around the Kami Project Area.

4.1.2 Online Databases

Information on the occurrence and location of birds is also available through an online data portal (eBird) which is administered by the Cornell Lab of Ornithology and the National Audubon Society in partnership with Bird Studies Canada. This online checklist provides a portal for recreational birders to record their observations and is a powerful tool for providing basic information on bird abundance and distribution. Note that all records of federally and provincially listed species at risk obtained from eBird were from the adjacent municipality of Labrador City-Wabush and not within the immediate SAA. Field Surveys

4.1.3 Early-Season Migratory Bird Species Survey

Field surveys were conducted during the late-spring or early summer period to evaluate the occurrence of avifauna within the SAA. This temporal period generally coincides with winter break-up and the availability of open water to support both resident breeders and species destined for more northern regions. Focal species for this effort included waterfowl (ducks and geese), shorebirds, birds of prey, and other species associated with aquatic habitats (e.g. terns, kingfishers etc.). Field staff travelled by vehicle, boat, and by foot to survey all accessible aquatic habitats within the SAA that were likely to support these species groups. Species identification and breeding status was determined using a combination of visual, auditory, and behavioural cues.

4.1.4 Point Count Surveys for Migratory Songbirds

Early morning (6 am to 10 am) point count surveys were conducted for breeding birds at 71 locations (June 11 to 18, 2023) by a team of two experienced biologists. The point-count survey design followed the standing operating procedures as used for recent land-bird monitoring in Newfoundland and Labrador. This approach involved identifying the occurrence of all species within pre-defined point count locations. These locations were stratified and spatially weighted within available habitat types and resulted in effective coverage of accessible areas (i.e. < 1 km from primary access roads and trails) within the SAA. Once on site, all birds within a radius of 400 m were identified to species based on vocal signatures and physical characteristics. Additional information collected at each point count location included weather conditions, habitat characteristics (e. g. conifer forest, upland barrens, wetlands etc.), time and date, the distance of each observation relative to each survey point location, and the presence of other wildlife species. Since weather conditions play an important role in the activity of birds and the ability of observers to detect birds, surveys were not conducted during periods of inclement weather (e.g. periods of sustained rain or wind >40 km/h).

The occurrence of all bird species and nesting sites that were detected incidentally (during other component studies) and outside of systematic survey efforts were also recorded. Collectively, this approach provides a detailed description of the bird community within the SAA and will allow for more effective mitigation during all phases of project development and operation.

5.0 RESULTS

5.1 Early-Season Migratory Bird Species Survey

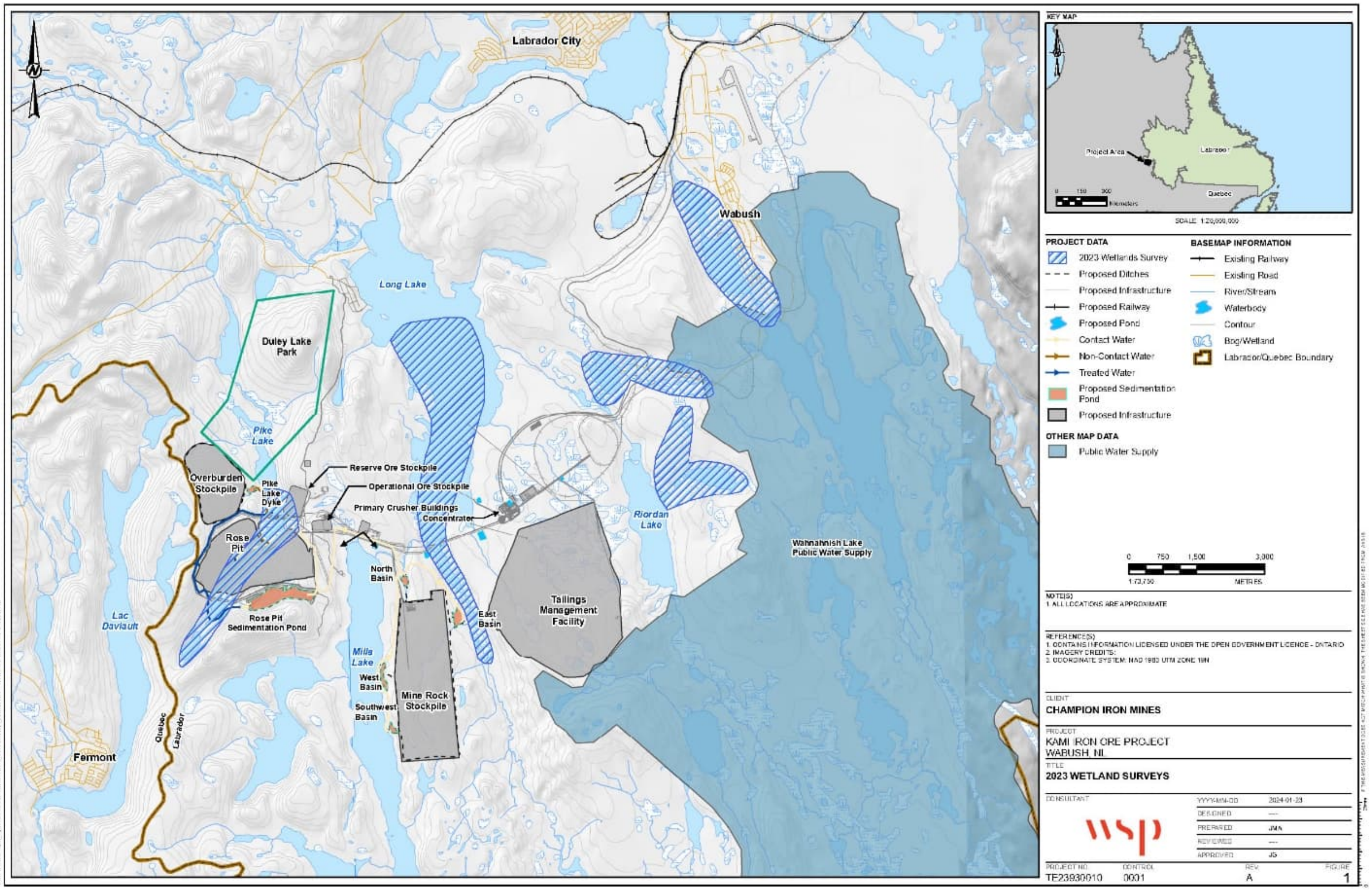
Spring break-up occurred earlier in the Labrador West region than normal during the 2023 season and waterbodies were mostly ice-free during the survey period (June 7, 2023 to June 11, 2023). Wetland habitats within the SAA included large lakes with rocky shorelines, smaller ponds (i.e. < 1 km^2) with emergent vegetation, shallow meandering streams, and sphagnum bog with standing water. Surveys encompassed the full range of these available habitats and are shown in Figure 5-1. Large congregations of migrating waterfowl were not detected but seven species were recorded that had initiated breeding. All wetland habitat types were utilized, and species included Canada goose, red-breasted merganser, common merganser, common goldeneye, American black duck, and green-winged teal. One of these species (common goldeneye) were using a wooden nest box on a small pond south of Pike Lake and had laid a clutch of 12 eggs. Other wetland associated species detected during this sampling period included common loon, Wilson's snipe, and common tern. These are all expected species for boreal regions at this latitude and the occurrence of paired individuals during the surveys indicates that these are local breeders. Breeding status of these species is further corroborated by long-term observations submitted to eBird from multiple observers (Table 5-1).

Table 5-1: Relative Abundance of Bird Species Encountered Within the Site Assessment Area During the Early Summer Migration Period (June 7, 2023 to June 11, 2023)

Common Name	Scientific Name	General location	Number of individuals	Date
American black duck	*Anas rubripes*	South end of Pike Lake	2 (breeding pair)	June 7
Common loon	*Gavia immer*	South end of Pike Lake	2	June 7
Ring-necked duck	*Aythya collaris*	Small pond 500 m south of Pike Lake	2 (breeding pair)	June 7
Wilson's snipe	*Gallinago delicata*	Small pond 500 m south of Pike Lake	2	June 7
Common goldeneye	*Bucephala clangula*	Small pond 500 m south of Pike Lake	4 (two breeding pairs + a nest box with 12 eggs)	June 7
American black duck	*Anas rubripes*	Small pond 1.5 km south of Pike Lake	1	June 8
Common loon	*Gavia immer*	Small pond 1.5 km south of Pike Lake	3 (Pair + single individual)	June 8
Wilson's snipe	*Gallinago delicata*	Small pond 1.5 km south of Pike Lake	1	June 8
Bald eagle	*Haliaeetus leucocephalus*	Small pond 1.5 km south of Pike Lake	1	June 8
Common tern	*Sterna hirundo*	Elephant Lake and connecting ponds	1	June 9
Osprey	*Pandion haliaetus*	Elephant Lake and connecting ponds	1	June 9
Wilson's snipe	*Gallinago delicata*	Elephant Lake and connecting ponds	1	June 9

Common Name	Scientific Name	General location	Number of individuals	Date
Common loon	*Gavia immer*	Riordan Lake and Harris Lake	2 (1 individual/pond)	June 9
Canada goose	*Branta canadensis*	Riordan Lake	Accumulated faeces	June 9
Green-winged teal	*Anas crecca*	Harris Lake	3 (2 males and 1 female)	June 9
Common loon	*Gavia immer*	Long Lake	4 (2 breeding pairs)	June 10
Red-breasted merganser	*Mergus serrator*	Long Lake	3 (breeding pair + 1 individual)	June 10
Canada goose	*Branta canadensis*	Long Lake	1	June 10
Common merganser	*Mergus merganser*	Wetland/inflow south of Long Lake	10 (Flyover)	June 10
Common loon	*Gavia immer*	Jean Lake	1	June 11
Common tern	*Sterna hirundo*	Jean Lake	1	June 11
Red-breasted merganser	*Mergus serrator*	Jean Lake	1	June 11

Figure 5-1: Wetland areas surveyed (blue-hatched polygons) for early-season migratory species in the SAA, June 7-11, 2023.



5.2 Point Count Surveys for Migratory Songbirds

All available terrestrial habitats within the SAA were sampled with an emphasis on the most dominant forest classes (i.e. mature black spruce forest and post-fire regenerating forest; Appendix A). The distribution of point count locations (n=71) is shown in Figure 5-2. The six most common species detected (by frequency of occurrence) were ruby-crowned kinglet, white-throated sparrow, yellow-rumped warbler, hermit thrush, American robin, and Tennessee warbler (Table 5-2). All species detected during this survey were ‘expected’ species given their known distribution in western Labrador and their prevalence in eBird records (Table 5-2). However, there are multiple species that were not detected during the surveys that likely inhabit the SAA. This is a consequence of their low density, secretive behaviour (both of which limit detectability) and the limited time frame during which WSP conducted surveys. Table 5-3 provides a more complete list of birds that have been recorded in this region over the past several decades and reflects a greater diversity than the accounts from the sampling period in 2023.

Overall, the assemblage of bird species found in the SAA is reflective of community composition that has been more extensively described for the western Labrador region. All terrestrial habitats provide nesting, roosting, and foraging opportunities for distinct bird communities thus emphasizing the importance of mitigations and best management practices throughout the future phases of the Project.

Table 5-2: The Relative Abundance of Species Encountered Across Point Count Stations (N=71) Within the Site Assessment Area From June 12, 2023, to June 18, 2023

Species	Scientific name	Total	Percent of point counts occupied
Fox sparrow	*Passerella liliaca*	15	15.49
White-throated sparrow	*Zonotrichia albicollis*	63	60.56
Song sparrow	*Melospiza melodia*	1	1.41
White-crowned sparrow	*Zonotrichia leucophrys*	7	7.04
Savannah sparrow	*Passerculus sandwichensis*	1	1.41
Swamp sparrow	*Melospiza georgina*	1	1.41
Lincoln’s sparrow	*Melospiza lincolnii*	7	8.45
Dark-eyed junco	*Junco hyemalis*	17	22.54
Hermit thrush	*Catharus guttatus*	33	32.39
Swainson’s thrush	*Catharus ustulatus*	11	11.27
American robin	*Turdus migratorius*	37	29.58
Canada jay	*Perisoreus canadensis*	7	9.86
Common raven	*Corvus corax*	7	7.04
Ruby-crowned kinglet	*Regulus calendula*	90	84.51
Golden-crowned kinglet	*Regulus satrapa*	1	1.41
Boreal chickadee	*Poecile hudsonicus*	2	1.41
Yellow-bellied flycatcher	*Empidonax flavivetris*	11	14.08
Olive-sided flycatcher	*Contopus cooperii*	1	1.41
Alder flycatcher	*Empidonax alnorum*	13	14.08

Species	Scientific name	Total	Percent of point counts occupied
Magnolia warbler	*Dendroica magnolia*	3	4.23
Yellow warbler	*Dendroica petechia*	3	4.23
Yellow-rumped warbler	*Dendroica coronata*	26	33.80
Tennessee warbler	*Vermivora peregrine*	28	29.58
Orange-crowned warbler	*Vermivora celata*	12	15.49
Blackpoll warbler	*Dendroica striata*	3	4.23
Northern waterthrush	*Seirus noveboracensis*	5	7.04
Wilson’s warbler	*Wilsonia pusilla*	2	2.82
Northern goshawk	*Accipiter gentilis*	1	1.41
Greater yellowlegs	*Tringa melanoleuca*	9	11.27
Winter wren	*Troglodytes troglodytes*	1	1.41
Wilson's snipe	*Gallinago delicata*	13	14.08
Pine siskin	*Spinus pinus*	1	1.41
Common tern	*Sterna hirundo*	2	2.82
Northern flicker	*Colaptes auratus*	4	5.63
Black-backed woodpecker	*Picoides arcticus*	1	1.41

Figure 5-2: Point Count Survey Locations

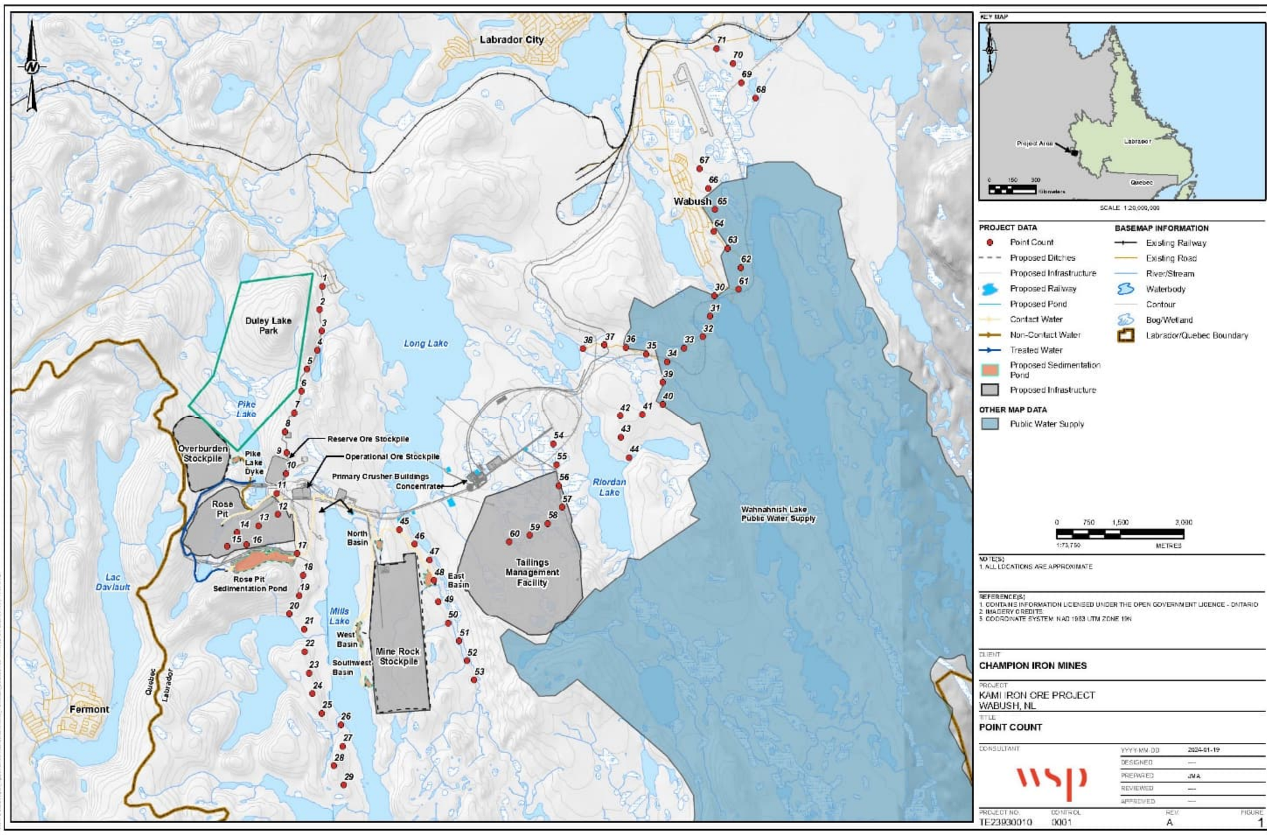


Table 5-3: Avian Species that Occur or Potentially Occur Within the Site Assessment Area and Regional Study Area

Species	Scientific name	Occurrence	Data source	Relative abundance (breeding status)	Habitat
Canada goose	*Branta canadensis*	CONFIRMED	WSP, EBIRD	Common (breeder)	Wetlands
Snow goose	*Answer caerulescens*	CONFIRMED	EBIRD	Uncommon (migrant)	Wetlands
American black duck	*Anas rubripes*	CONFIRMED	WSP, EBIRD	Common (breeder)	Wetlands
Ring-necked duck	*Aythya collaris*	CONFIRMED	WSP, EBIRD	Common (breeder)	Wetlands
Common goldeneye	*Bucephala clangula*	CONFIRMED	WSP, EBIRD	Common (breeder)	Wetlands
Harlequin duck	*Histrionicus histrionicus*	Not expected	EBIRD	Uncommon (migrant)	Wetlands
Common merganser	*Mergus merganser*	CONFIRMED	WSP, EBIRD	Common (breeder)	Wetlands
Red-breasted merganser	*Mergus serrator*	CONFIRMED	WSP, EBIRD	Common (breeder)	Wetlands
Mallard	*Anas platyrhynchos*	CONFIRMED	EBIRD	Uncommon (breeder)	Wetlands
Surf scoter	*Melanitta perspicillata*	CONFIRMED	EBIRD	Uncommon (breeder)	Wetlands
Black scoter	*Melanitta americana*	CONFIRMED	ACCDC	Uncommon (migrant)	Wetlands
Northern Pintail	*Anas acuta*	CONFIRMED	EBIRD	Uncommon (breeder)	Wetlands
Green-winged teal	*Anas crecca*	CONFIRMED	WSP, EBIRD	Uncommon (breeder)	Wetlands
Greater scaup	*Aythya marila*	CONFIRMED	EBIRD	Uncommon (breeder)	Wetlands
Long-tailed duck	*Clangula hyemalis*	CONFIRMED	EBIRD	Uncommon (breeder)	Wetlands
Bufflehead	*Bucephala albeola*	CONFIRMED	EBIRD	Uncommon (breeder)	Wetlands
Barrow's goldeneye	*Bucephala islandica*	CONFIRMED	EBIRD	Uncommon (breeder)	Wetlands
Ruffed grouse	*Bonas umbellus*	CONFIRMED	EBIRD	Common (breeder)	Forest
Spruce grouse	*Falcipennis canadensis*	CONFIRMED	EBIRD	Uncommon (breeder)	Forest
Willow ptarmigan	*Lagopus lagopus*	CONFIRMED	EBIRD	Common (breeder)	Barrens
Common nighthawk	*Chordeiles minor*	CONFIRMED	AMEC; 2014	Uncommon (breeder)	Open forest
American golden plover	*Pluvialis dominica*	CONFIRMED	EBIRD	Common in migration	Upland barrens/shoreline
Semipalmated plover	*Charadrius semipalmatus*	CONFIRMED	EBIRD	Common in migration	Shoreline habitat
Red knot	*Calidris canutus*	CONFIRMED	ACCDC	Uncommon (migrant)	Shoreline habitats
Least sandpiper	*Calidris minutilla*	CONFIRMED	EBIRD	Uncommon (breeder)	Upland barrens/shoreline
Semipalmated sandpiper	*Calidris pusilla*	CONFIRMED	EBIRD	Uncommon breeder	Shoreline habitat
Wilson's snipe	*Gallinago delicata*	CONFIRMED	WSP, EBIRD	Common (breeder)	Wetlands
Greater yellowlegs	*Tringa melanoleuca*	CONFIRMED	WSP, EBIRD	Common (breeder)	Wetlands

Species	Scientific name	Occurrence	Data source	Relative abundance (breeding status)	Habitat
Spotted sandpiper	*Actitis macularius*	CONFIRMED	EBIRD	Common (breeder)	Shoreline habitat
Ring-billed gull	*Larus delawarensis*	CONFIRMED	EBIRD	Common (breeder)	General
Great black-backed gull	*Larus marinus*	CONFIRMED	EBIRD	Common (breeder)	General
Herring gull	*Larus argentatus*	CONFIRMED	EBIRD	Common (breeder)	General
Common tern	*Sterna hirundo*	CONFIRMED	WSP, EBIRD	Common (breeder)	Aquatic habitats
Common loon	*Gavia immer*	CONFIRMED	WSP, EBIRD	Common (breeder)	Wetlands
Osprey	*Pandion haliaetus*	CONFIRMED	WSP, EBIRD	Common (breeder)	Riparian forest
Bald eagle	*Haliaeetus leucocephalus*	CONFIRMED	WSP, EBIRD	Common (breeder)	General
Golden eagle	*Aquila chrysaetos*	CONFIRMED	EBIRD	Uncommon (migrant)	Forest/barrens
Northern harrier	*Circus cyaneus*	CONFIRMED	EBIRD	Uncommon (breeder)	Open, vegetated habitat
Sharp-shinned hawk	*Accipiter striatus*	CONFIRMED	EBIRD	Uncommon (breeder)	Forest
Northern goshawk	*Accipiter gentilis*	CONFIRMED	WSP, EBIRD	Uncommon (breeder)	Forest
Rough-legged hawk	*Buteo lagopus*	CONFIRMED	EBIRD	Uncommon (breeder)	Barrens
Red-tailed hawk	*Buteo jamaicensis*	CONFIRMED	EBIRD	Uncommon (breeder)	Barrens
Great horned owl	*Bubo virginianus*	CONFIRMED	EBIRD	Uncommon (breeder)	Forest
Northern hawk owl	*Surnia ulula*	Unknown		Uncommon (breeder)	Barrens/forest
Short-eared owl	*Asio flammeus*	CONFIRMED	EBIRD	Uncommon (breeder)	Barrens
Boreal owl	*Aegolius funereus*	CONFIRMED	EBIRD	Uncommon (breeder)	Forest
Belted kingfisher	*Megaceryle alcyon*	CONFIRMED	EBIRD	Common (breeder)	Wetlands
American three-toed woodpecker	*Picoides dorsalis*	CONFIRMED	WSP, EBIRD	Common (breeder)	Coniferous forest
Black-backed woodpecker	*Picoides arcticus*	CONFIRMED	EBIRD	Common (breeder)	Coniferous forest
Hairy woodpecker	*Picoides villosus*	CONFIRMED	EBIRD	Uncommon (breeder)	Forest
Northern flicker	*Colaptes auratus*	CONFIRMED	WSP, EBIRD	Common (breeder)	Forest
American kestrel	*Falco sparverius*	CONFIRMED	EBIRD	Uncommon (breeder)	Barrens
Merlin	*Falco columbarius*	CONFIRMED	EBIRD	Common (breeder)	Forest/barrens
Peregrine falcon	*Falco peregrinus anatum*	CONFIRMED	EBIRD	Uncommon migrant	Forest/barrens
Olive-sided flycatcher	*Contopus cooperii*	CONFIRMED	WSP, EBIRD	Uncommon (breeder)	Forest

Species	Scientific name	Occurrence	Data source	Relative abundance (breeding status)	Habitat
Yellow-bellied flycatcher	*Empidonax flavivetris*	CONFIRMED	WSP, EBIRD	Common (breeder)	Forest
Alder flycatcher	*Empidonax alnorum*	CONFIRMED	WSP, EBIRD	Common (breeder)	Forest
Least flycatcher	*Empidonax minimus*	CONFIRMED	EBIRD	Uncommon (breeder)	Forest
Blue-headed vireo	*Vireo solitaries*	CONFIRMED	EBIRD	Uncommon (breeder)	Mixed forest
Red-eyed vireo	*Vireo olivaceus*	CONFIRMED	EBIRD	Uncommon (breeder)	Mixed forest
Philadelphia vireo	*Vireo philadelphicus*	CONFIRMED	EBIRD	Uncommon (breeder)	Mixed forest
Northern shrike	*Lanius borealis*	CONFIRMED	EBIRD	Uncommon (breeder)	Forest
Canada jay	*Perisoreus canadensis*	CONFIRMED	WSP, EBIRD	Common (breeder)	Coniferous forest
Blue jay	*Cyanocitta cristata*	CONFIRMED	EBIRD	Common (breeder)	Forest/towns
American crow	*Corvus brachyrhynchos*	CONFIRMED	WSP, EBIRD	Common (breeder)	General
Common raven	*Corvus corax*	CONFIRMED	WSP, EBIRD	Common (breeder)	General
Black-capped chickadee	*Poecile atricapillus*	CONFIRMED	EBIRD	Common (breeder)	Forest
Boreal chickadee	*Poecile hudsonicus*	CONFIRMED	EBIRD	Common (breeder)	Forest
Horned lark	*Eremophila alpestris*	CONFIRMED	EBIRD	Uncommon (breeder)	Barrens
Bank swallow	*Riparia riparia*	CONFIRMED	EBIRD	Uncommon (breeder)	Wetlands
Tree swallow	*Tachycineta bicolor*	CONFIRMED	WSP, EBIRD	Common (breeder)	Wetlands
Ruby-crowned kinglet	*Regulus calendula*	CONFIRMED	WSP, EBIRD	Common (breeder)	Forest
Golden-crowned kinglet	*Regulus satrapa*	CONFIRMED	WSP, EBIRD	Common (breeder)	Forest
Cedar waxwing	*Bombycilla cedrorum*	CONFIRMED	EBIRD	Uncommon (breeder)	Forest
Red-breasted nuthatch	*Sitta canadensis*	CONFIRMED	EBIRD	Common (breeder)	Forest
Brown creeper	*Certhia americana*	CONFIRMED	EBIRD	Uncommon (breeder)	Forest
Winter wren	*Troglodytes troglodytes*	CONFIRMED	WSP, EBIRD	Uncommon (breeder)	Forest
European starling	*Sturnus vulgaris*	CONFIRMED	EBIRD	Common (breeder)	Towns
Gray-cheeked thrush	*Catharus minimus*	CONFIRMED	EBIRD	Uncommon (breeder)	Forest
Swainson’s thrush	*Catharus ustulatus*	CONFIRMED	WSP, EBIRD	Common (breeder)	Forest
Hermit thrush	*Catharus guttatus*	CONFIRMED	WSP, EBIRD	Common (breeder)	Forest
American robin	*Turdus migratorius*	CONFIRMED	WSP, EBIRD	Common (breeder)	General
Evening grosbeak	*Coccothraustes vespertinus*	Unknown		Uncommon (breeder)	Forest
Pine grosbeak	*Pinicola enucleator*	CONFIRMED	EBIRD	Common (breeder)	Forest
Purple finch	*Carpodacus purpureus*	CONFIRMED	EBIRD	Common (breeder)	Coniferous forest

Species	Scientific name	Occurrence	Data source	Relative abundance (breeding status)	Habitat
Common redpoll	*Acanthis flammea*	CONFIRMED	EBIRD	Common (breeder)	Barrens/forest
Hoary redpoll	*Acanthis hornemanni*	CONFIRMED	EBIRD	Uncommon (breeder)	Barrens/forest
White-winged crossbill	*Loxia leucoptera*	CONFIRMED	EBIRD	Common (breeder)	Coniferous forest
Red crossbill	*Loxia curvirostra*	CONFIRMED	EBIRD	Uncommon (breeder)	Coniferous forest
Pine siskin	*Spinus pinus*	CONFIRMED	EBIRD	Common (breeder)	Barrens/forest
Lapland longspur	*Calcarius lapponicus*	CONFIRMED	EBIRD	Common (migrant)	General habitat during migration
Snow bunting	*Plectrophenax nivalis*	CONFIRMED	EBIRD	Common (migrant)	General habitat during migration
Fox sparrow	*Passerella liliaca*	CONFIRMED	WSP, EBIRD	Common (breeder)	Forest
American tree sparrow	*Spizella arborea*	CONFIRMED	EBIRD	Uncommon (breeder)	Barrens/forest
Dark-eyed junco	*Junco hyemalis*	CONFIRMED	WSP, EBIRD	Common (breeder)	Forest
White-crowned sparrow	*Zonotrichia leucophrys*	CONFIRMED	WSP, EBIRD	Uncommon (breeder)	Forest
White-throated sparrow	*Zonotrichia albicollis*	CONFIRMED	WSP, EBIRD	Common (breeder)	Forest
Savannah sparrow	*Passerculus sandwichensis*	CONFIRMED	WSP, EBIRD	Common (breeder)	Post-fire habitat/barrens
Song sparrow	*Melospiza melodia*	CONFIRMED	WSP, EBIRD	Uncommon (breeder)	Forest
Lincoln's sparrow	*Melospiza lincolnii*	CONFIRMED	WSP, EBIRD	Common (breeder)	Barrens
Swamp sparrow	*Melospiza georgina*	CONFIRMED	WSP, EBIRD	Common (breeder)	Wetlands/forest
Rusty blackbird	*Euphagus carolinus*	CONFIRMED	EBIRD	Uncommon (breeder)	Wetlands
Red-winged blackbird	*Agelaius phoeniceus*	CONFIRMED	EBIRD	Uncommon (breeder)	Wetlands
Common grackle	*Quiscalus quiscula*	CONFIRMED	EBIRD	Uncommon (breeder)	Towns
Northern waterthrush	*Seirus noveboracensis*	CONFIRMED	WSP, EBIRD	Common (breeder)	Forest
Tennessee warbler	*Vermivora peregrine*	CONFIRMED	WSP, EBIRD	Common (breeder)	Forest
Orange-crowned warbler	*Vermivora celata*	CONFIRMED	WSP, EBIRD	Common (breeder)	Forest
Magnolia warbler	*Dendroica magnolia*	CONFIRMED	WSP, EBIRD	Uncommon (breeder)	Forest
Yellow-rumped warbler	*Dendroica coronate*	CONFIRMED	WSP, EBIRD	Common (breeder)	Forest
Blackpoll warbler	*Dendroica striata*	CONFIRMED	WSP, EBIRD	Common (breeder)	Forest
Wilson's warbler	*Wilsonia pusilla*	CONFIRMED	WSP, EBIRD	Common (breeder)	Forest
Yellow warbler	*Dendroica petechia*	CONFIRMED	WSP, EBIRD	Common (breeder)	Forest

Note: Species occurrences shown in bold text are confirmed to occur within the immediate SAA.

Data sources; WSP point counts and early season, waterfowl surveys, 2023; AMEC = Amec Environment and Infrastructure (2014) consultant report; ACCDC = Atlantic Canada Conservation Data Centre; EBIRD = Observations submitted to eBird.com

5.3 Species of Special Conservation Status

The *Species at Risk Act* (SARA) prohibits the harming or harassing of "wildlife species at risk" and the damage or destruction of their residences (i.e., nests or dens). Under the Act, Schedule 1 is the official list of wildlife Species at Risk. The Act also protects these species' habitat on federally owned lands. On other lands, the Act allows for the designation and protection of "critical habitat" of these species, namely, habitat necessary for the survival or recovery of endangered, threatened or extirpated species. Critical habitat may be designated in species-specific recovery strategies or action plans. The Minister of the Environment may issue permits to authorize an activity that would contravene the Act if the effects on the species are incidental to the carrying out of the activity, if all reasonable alternatives have been considered, all feasible measures will be taken to minimize the impact, and the activity will not jeopardize the survival or recovery of the species.

Like SARA, the NL ESA protects individuals, their residences, and designated critical habitat or recovery habitat of wildlife species designated under this Act. Critical habitat or recovery habitat may be identified during species recovery planning and may be designated for protection under the Act.

There are eight Species at Risk that potentially occur within the SAA and the RSA; of this group, two were recorded during systematic point count surveys by WSP in 2023 (olive-sided flycatcher) and AMEC Environment and Infrastructure in 2014 (common nighthawk). These species are either listed on Schedule 1 of the federal *Species at Risk Act* (SARA) or under the NL ESA (Table 5-4). For each of these species a brief overview is provided of known breeding range, general biology, and the likelihood of their occurrence in the SAA. It should be noted that critical habitat has not been designated for any of these species.

Table 5-4: Species at Risk that are Known or Potentially Occur Within the Site Assessment Area or Regional Study Area

Species	Scientific name	Legal designation	SAR status
Harlequin duck	*Histrionicus histrionicus*	NLESA SARA	Vulnerable Special Concern
Barrow's goldeneye	*Bucephala islandica*	NLESA SARA	Vulnerable Special Concern
Red knot	*Calidris canutus rufa*	NLESA SARA	Endangered
Peregrine falcon	*Falco peregrinus anatum*	NLESA SARA	Vulnerable Special Concern
Short-eared owl	*Asio flammeus*	NLESA SARA	Vulnerable Special Concern
Olive-sided flycatcher	*Contopus cooperii*	NLESA SARA	Threatened
Rusty blackbird	*Euphagus carolinus*	NLESA SARA	Vulnerable Special Concern

Species	Scientific name	Legal designation	SAR status
Common nighthawk	*Chordeiles minor*	NLESA SARA	Threatened

NLESA = Newfoundland and Labrador *Endangered Species Act*; SARA = Federal *Species at Risk Act*.

5.3.1 Harlequin Duck

The eastern population of harlequin duck breeds on inland rivers and streams from northern New Brunswick to Nunavut, and winters in coastal areas from Newfoundland, south to Maryland, and parts of southwest Greenland (Environment Canada 2007). Breeding habitat generally includes fast flowing river systems (Rodway 1998) while wintering areas are typically areas of rocky coastline, exposed headlands, and sub-tidal ledges (Robertson and Goudie 1999). Harlequin ducks were originally federally designated as Endangered in 1990; however, an increase in abundance at four main wintering areas and the discovery of an additional over-wintering population in southwest Greenland led to a down listing to Special Concern in 2001 (Environment Canada 2007). Only two individuals have been reported around the Labrador City region (1999 and 2005; eBird) which suggests that they do not breed in this portion of Labrador or regularly utilize this region as staging or over-wintering habitat. Harlequin ducks were not detected in the SAA during breeding bird surveys in 2014 (Amec Environment and Infrastructure, 2014) or 2023 (this survey).

5.3.2 Barrow's Goldeneye

The breeding range of barrow's goldeneye is discontinuous in North America with more than 90% of birds occurring in the northwest portion of the continent. The eastern North American population is estimated at just 4,500 individuals. These birds are thought to nest in high elevation lakes north of the St. Lawrence Estuary and the Quebec North Shore (Schmelzer 2006). The overwintering area for 90% of this population includes two main regions in the Gulf of St. Lawrence. The remaining 10% use a range of sites elsewhere in Atlantic Canada and Maine (Robert et. al. 2000; Savard 1990). There has been some indication that this species may breed on the Northern Peninsula of Newfoundland (Daury and Bateman 1996) though this has not been confirmed. There are only two observations of this species in the Labrador City region (single individuals in 2004 and 2007; eBIRD) which strongly suggests that it is not a common breeder and similarly does not overwinter in this region. Barrow's goldeneyes were not detected in the SAA during breeding bird surveys in 2014 (Amec Environment and Infrastructure, 2014) or 2023 (this survey).

5.3.3 Red Knot

The red knot is a medium-sized, migratory shorebird that winters in South America and breeds in coastal regions of the Canadian Arctic. There are six subspecies of red knot worldwide; three of which occur in Canada, and one of these in Newfoundland and Labrador (*rufa* subspecies). Red knots are regularly seen during the fall migration at several key stop-over locations around the province. These include the Stephenville Crossing area, St. Paul's inlet, the northeast coast (Cape Freels), the southern Avalon Peninsula and Bellevue Beach. There are just two observations of red knots in the Labrador City area (2007 and 2010; eBird) which suggests that this area in not an important location for this migratory species. Red knots were not detected in the SAA during breeding bird surveys in 2014 (AMEC Environment and Infrastructure, 2014) or 2023 (this survey).

5.3.4 Peregrine Falcon

The peregrine falcon breeds in coastal and mountainous regions across much of northern Canada. Within Labrador, their breeding range extends from Cape Chidley to Black Tickle and includes some of the larger river valleys in the north (COSEWIC 2007). There is only one account of this species in the Labrador west region (two individuals in 2007; eBIRD) which suggests that it does not breed locally. These observations occurred on a single day in late summer which suggests that these were transient birds on their southward migration. Peregrine falcons were not detected in the SAA during breeding bird surveys in 2014 (AMEC Environment and Infrastructure, 2014) or 2023 (this survey).

5.3.5 Short-eared Owl

Short-eared owls have a nearly global distribution though only one subspecies (*Asio flammeus flammeus*) occurs in North America. Across their range, short-eared owls are mostly associated with grasslands and barrens of subarctic and temperate environments (Schmelzer 2005). Populations are typically irruptive and nomadic as they track small mammals, their primary prey, across the landscape. Short-eared owls were regularly observed in the Labrador City region between 2003 and 2009 including near mining tailings and the Wabush Airport. Given the vast expanse of open, post-fire habitat within and adjacent to the SAA, it is likely that short-eared owls are regular breeders in this area. Short-eared owls were not detected in the SAA during breeding bird surveys in 2014 (AMEC Environment and Infrastructure, 2014) or 2023 (this survey).

5.3.6 Olive-sided Flycatcher

The olive-sided flycatcher (*Contopus cooperi*) is a medium-sized aerial insectivore that has a New World distribution. The species is generally distributed across boreal regions of North America during the breeding season (May to August) and over-winters in Central and South America. Habitat types used during the breeding season include post-fire stands, partially open coniferous forest, and forest edges along riparian areas (Hutto and Young 1999, Lance and Phinney 2001, Altman and Sallabanks 2000). Olive-sided flycatchers are designated as *threatened* under both the federal *Species at Risk Act* and the Newfoundland and Labrador *Endangered Species Act*. Reasons for the continent-wide decline are unknown, though habitat degradation in both breeding and non-breeding areas has been implicated (Petit et al. 1993, Altman and Sallabanks 2000). Olive-sided flycatchers are known to breed in Newfoundland and Labrador though the distribution and abundance of this species is not well understood. The only known source of trend data for Newfoundland and Labrador (i.e. breeding bird survey data) suggests a population decline over recent decades. Potential threats to local populations may include both temporary and permanent alteration of habitat, changes to prey abundance and availability, and nest predation. Territorial olive-sided flycatchers were recorded singing in the SAA during point count surveys in both 2014 (AMEC Environment and Infrastructure) and 2023 suggesting that they breed in this area at low density.

5.3.7 Rusty Blackbird

The breeding range of the rusty includes most boreal forest regions of Canada (including Newfoundland and Labrador) and the northern United States. Over-wintering areas include the eastern United States and southern portions of the eastern provinces of Canada (COSEWIC 2006). Habitats used by this species during the breeding season include riparian forest, sedge meadows, marshes, and the edges of swamps and cultivated fields. The population of this species in Canada has declined by 5.1% per year since 1966 (COSEWIC 2006). The primary reason for this decline is thought to be the conversion of over-wintering forest habitat to agricultural and urban landscapes.

Rusty blackbirds are a common breeder at low density in western Labrador and have been regularly recorded in suitable habitat around Labrador City-Wabush across multiple years (Table 5-4). Though this species was not detected during surveys in 2023, it is highly likely that the species occurs in portions of the SAA that were not assessed as part of baseline field investigations.

5.3.8 Common Nighthawk

The breeding range of the common nighthawk includes all Canadian Provinces and Territories, except for Nunavut. Its' wintering range includes southern Brazil and regions of eastern Peru and Ecuador (COSEWIC 2007). The common nighthawk is an aerial insectivore and is associated with open habitats including recently burned forest, clearcuts, barrens, and open fields. Like other insectivores, this species has experienced a significant long-term decline (1968 to 2005) throughout its' breeding range. Reasons for this decline are unclear though a reduction of insect prey stemming from the wide-scale use of pesticides has been suggested (COSEWIC 2007).

Common nighthawks are known to breed throughout the Labrador City region though densities appear to be low. Though not detected during point count surveys in 2023, an active nest was found in the SAA by AMEC biologists in 2014 (AMEC Environment and Infrastructure, 2014).

6.0 KEY FINDINGS

A range of taxonomic and functional groups are well represented in the proposed SAA including waterfowl, sparrows, thrushes, and wood warblers. Collectively, these species inhabit all terrestrial and riparian habitats including black spruce dominated forest, early successional post-fire habitat, and wetlands. The most prevalent species detected during the point count surveys were ruby-crowned kinglet, white-throated sparrow, yellow-rumped warbler, hermit thrush, American robin, and Tennessee warbler. Birds of prey also utilize this area (e.g. bald eagle, northern goshawk) though abundance is low as is expected for this upper-level trophic group. Common waterfowl species confirmed to nest in the SAA include American black duck, common goldeneye, and both merganser species. The early season migratory bird species survey which focused on wetland areas did not indicate any significant staging areas for waterfowl, though the earlier than normal onset of spring may have resulted in a shorter stopover period in this region during the northward migration of this species group.

Overall, the assemblage of bird species found in the SAA is reflective of community composition that has been more extensively described for this region of Labrador from long-term submissions of data to eBIRD and the ACCDC. The only species at risk detected during point count surveys was olive-sided flycatcher though an actively nesting common nighthawk was recorded in the SAA by AMEC in 2014 (AMEC Environment and Infrastructure, 2014). Several other species at risk are known to occur in the Labrador City region (i.e. short-eared owl, rusty blackbird, harlequin duck) but were not found during the limited survey window in 2023.

Signature Page

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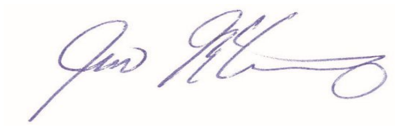

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APPENDIX

A

GENERAL HABITAT DESCRIPTIONS AND LOCATIONS OF POINT COUNT SURVEYS

Point Count #	Habitat Description	Northing	Easting
1	Mature black spruce forest	5861391	634659
2	Mature black spruce forest with a mix of eastern larch	5860838	634600
3	Mature black spruce forest	5860329	634650
4	Mature black spruce forest	5859880	634542
5	Mature black spruce forest	5859433	634301
6	Mature black spruce forest	5858911	634167
7	Mature black spruce forest	5858400	634005
8	Mature black spruce forest	5857939	633780
9	Mature black spruce forest	5857444	633819
10	Mature black spruce forest	5856956	633805
11	Post-fire habitat with low (<2 m) black spruce, willow sp., dwarf birch and heath vegetation (sheep laurel and Labrador tea)	5856486	633585
12	Post-fire habitat with low (<2 m) black spruce, willow sp., dwarf birch and heath vegetation (sheep laurel and Labrador tea)	5855982	633608
13	Post-fire habitat with low (<2 m) black spruce, willow sp., dwarf birch and heath vegetation (sheep laurel and Labrador tea)	5855721	633162
14	Post-fire habitat with low (<2 m) black spruce, willow sp., dwarf birch and heath vegetation (sheep laurel and Labrador tea)	5855564	632651
15	Post-fire habitat with low (<2 m) black spruce, willow sp., dwarf birch and heath vegetation (sheep laurel and Labrador tea)	5855235	632419
16	Post-fire habitat with low (<2 m) black spruce, willow sp., dwarf birch and heath vegetation (sheep laurel and Labrador tea)	5855267	632875
17	Mature black spruce forest	5855057	634066
18	Mature black spruce forest	5854543	634208
19	Mature black spruce forest	5854064	634124
20	Mature black spruce forest	5853626	633878
21	Mature black spruce forest	5853270	634235
22	Mature black spruce forest	5852738	634248

Point Count #	Habitat Description	Northing	Easting
23	Mature black spruce forest	5852229	634349
24	Mature black spruce forest	5851736	634431
25	Mature black spruce forest	5851279	634656
26	Mature black spruce forest	5851009	635107
27	Mature black spruce forest	5850496	635148
28	Mature black spruce forest	5850030	634939
29	Mature black spruce forest	5849574	635170
30	Riverine habitat with dense willow and dwarf birch understory and open-canopied black spruce forest	5861173	643952
31	Roadside/forest edge habitat with a black spruce overstory and a mixed alder/willow understory	5860684	643844
32	Roadside/forest edge habitat with a black spruce overstory and a mixed alder/willow understory	5860198	643681
33	Roadside/forest edge habitat with a black spruce overstory and a mixed alder/willow understory	5859941	643230
34	Roadside/forest edge habitat with a black spruce overstory and a mixed alder/willow understory	5859614	642829
35	Roadside/forest edge habitat with a black spruce overstory and a mixed alder/willow understory	5859790	642336
36	Roadside/forest edge habitat with a black spruce overstory and a mixed alder/willow understory	5859947	641849
37	Eastern larch forest with a sub-dominant black spruce component	5860004	641345
38	Eastern larch forest with a sub-dominant black spruce component	5859924	640833
39	Jack pine plantation	5859119	642731
40	Jack pine plantation	5858598	642726
41	Mixed black spruce/willow wetland habitat	5858365	642248
42	Mature black spruce forest	5858329	641713
43	Mixed black spruce, jack pine, trembling aspen forest	5857810	641731
44	Stunted (<3 m) black spruce forest	5857324	641929

Point Count #	Habitat Description	Northing	Easting
45	Mature black spruce forest	5855626	636486
46	Post-fire habitat with low (<2 m) black spruce, willow sp., dwarf birch and heath vegetation (sheep laurel and Labrador tea)	5855280	636850
47	Post-fire habitat with low (<2 m) black spruce, willow sp., dwarf birch and heath vegetation (sheep laurel and Labrador tea)	5854906	637196
48	Post-fire habitat with low (<2 m) black spruce, willow sp., dwarf birch and heath vegetation (sheep laurel and Labrador tea)	5854417	637311
49	Post-fire habitat with low (<2 m) black spruce, willow sp., dwarf birch and heath vegetation (sheep laurel and Labrador tea)	5853911	637410
50	Post-fire habitat with low (<2 m) black spruce, willow sp., dwarf birch and heath vegetation (sheep laurel and Labrador tea)	5853416	637639
51	Post-fire habitat with low (<2 m) black spruce, willow sp., dwarf birch and heath vegetation (sheep laurel and Labrador tea)	5852989	637909
52	Post-fire habitat with low (<2 m) black spruce, willow sp., dwarf birch and heath vegetation (sheep laurel and Labrador tea)	5852518	638092
53	Post-fire habitat with low (<2 m) black spruce, willow sp., dwarf birch and heath vegetation (sheep laurel and Labrador tea)	5852068	638261
54	Open fen/peat bog with a low density of stunted black spruce and eastern larch	5857659	640132
55	Open fen/peat bog with a low density of stunted black spruce and eastern larch	5857166	640216
56	Open fen/peat bog with a low density of stunted black spruce and eastern larch	5856664	640268
57	Open fen/peat bog with a low density of stunted black spruce and eastern larch	5856153	640342
58	Open fen/peat bog with a low density of stunted black spruce and eastern larch	5855771	640001
59	Open fen/peat bog with a low density of stunted black spruce and eastern larch	5855490	639578
60	Open fen/peat bog with a low density of stunted black spruce and eastern larch	5855332	639097
61	Roadside alder and willow shrub habitat	5861322	644522

Point Count #	Habitat Description	Northing	Easting
62	Roadside alder and willow shrub habitat	5861836	644576
63	Mature black spruce with a disturbed soil ground layer	5862290	644262
64	Mature black spruce forest	5862691	643934
65	Previously disturbed gravel pit with dense alder re-growth	5863210	643960
66	Previously disturbed gravel pit with dense alder re-growth	5863708	643803
67	Alder/willow roadside vegetation	5864183	643591
68	Mature black spruce forest	5865846	644926
69	Mature black spruce forest	5866212	644591
70	Mature black spruce forest adjacent to a vegetated wetland	5866663	644385
71	Wetland bordered by an alder/willow thicket.	5867015	643998

CHAMPION IRON

wsp

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APPENDIX L

Wildlife Baseline Report

REPORT

Wildlife Baseline Report

Kami Iron Ore Mine Project

Submitted to:

Champion Iron
1155 René-Lévesque Blvd. West
Suite 3300
Montréal, QC H3B 3X7

Submitted by:

WSP Canada Inc.
25 York St.
Suite 700
Toronto, ON M5J 2V5

April 2024

Distribution List

Champion Iron Mines Ltd.

Study Limitations

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APPENDICES

1.0 INTRODUCTION

The Kamistiatusset (Kami) Iron Ore Mine Project (the Project) is a proposed iron ore mine in Newfoundland and Labrador. The Project site is located entirely in Labrador, approximately seven kilometres from the Town of Wabush, 10 kilometres from the Town of Labrador City, and five kilometres east of Ville de Fermont, Québec (Figure 1-1).

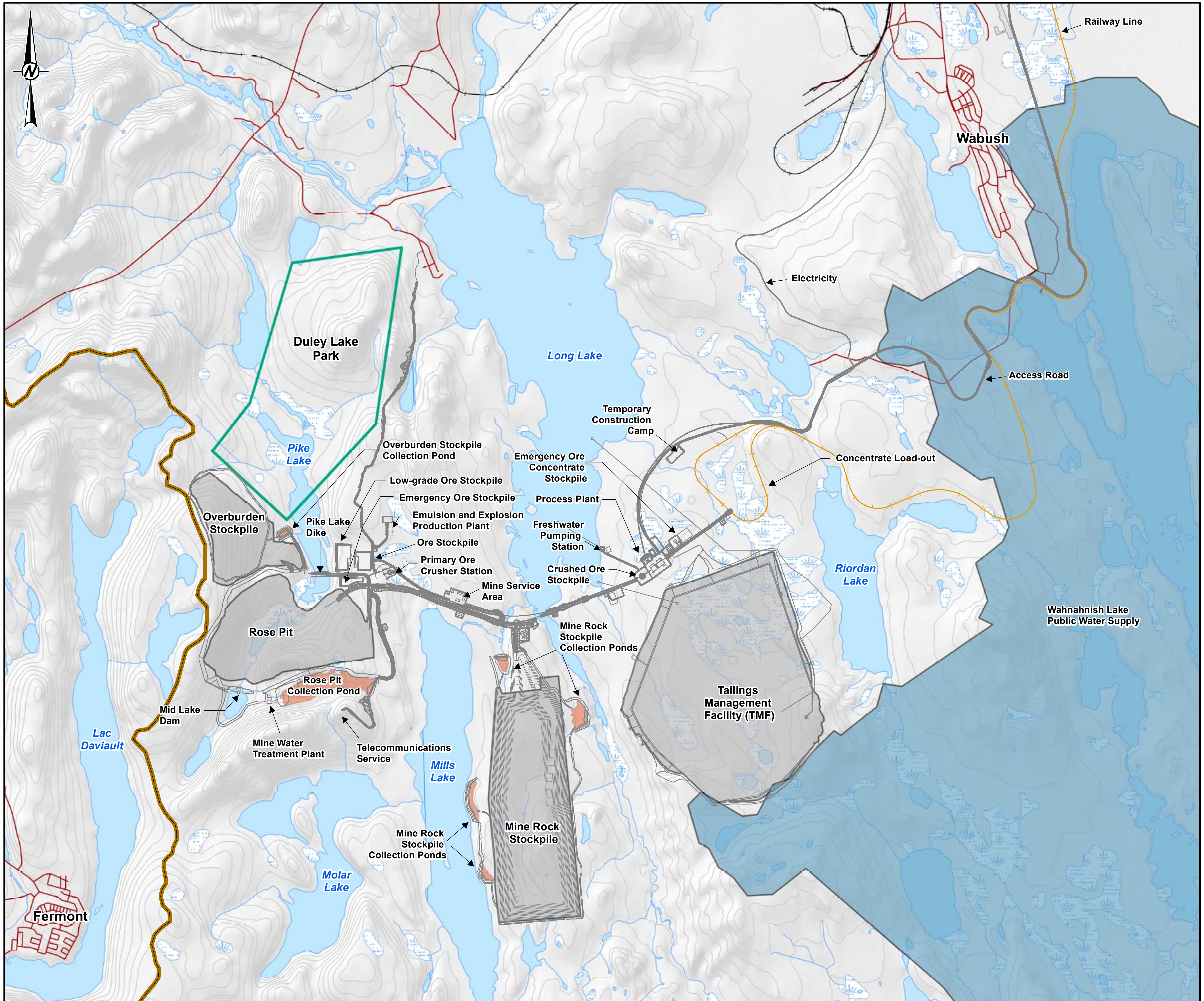
The Project was originally proposed by the Alderon Iron Ore Corporation (Alderon) and underwent a provincial and federal environmental impact assessment from 2011 to 2013, including a comprehensive baseline program that was completed in 2011 and 2012. The Project was released from the provincial and federal EA process in 2014. In 2021, Champion Iron Mines Ltd. (Champion) completed the acquisition of the Project from Alderon.

Champion is proposing several optimizations to the Project design proposed by Alderon through the previous EIS. These proposed optimizations include updates to the Project's water management strategy and modernization of the proposed ore handling, conveyance, and processing. Champion's objective for the Kami Project is to produce high purity (>69%) iron concentrate, which can be used as direct reduction pellet feed for electric arc furnaces in the green steel supply chain. Champion is planning to submit a Project Registration to the Newfoundland and Labrador Environmental Assessment Division of the Department of Environment and Climate Change in 2024.

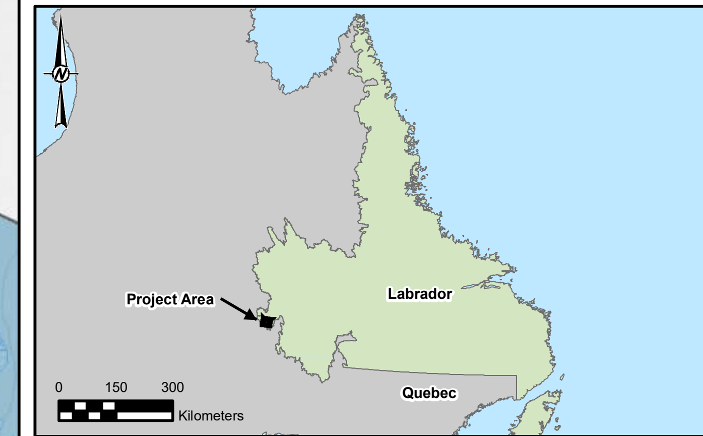
To support the Project Registration and assessment of effects from the revised Project design changes, Champion has commissioned the services of WSP Canada Inc. (WSP) to complete a comprehensive baseline field program that documents the existing natural and socio-economic environments in the anticipated area of the Project. The wildlife baseline report represents a component of the comprehensive baseline program and was undertaken to provide context from which environmental effects could be evaluated in the Project Registration.

Figure 1-1 outlines some of the main components of the Project site including:

- Open Pit (Rose Pit);
- Mine rock stockpile;
- Ore stockpiles (operational, low-grade and emergency);
- Tailings management facility (TMF);
- Overburden stockpile;
- Processing infrastructure including crushing and concentrating;
- Ancillary infrastructure to support the mine and process plant.



KEY MAP



SCALE 1:20,000,000

LEGEND

PROJECT DATA	BASEMAP INFORMATION
Proposed Infrastructure	Duley Lake Park
Proposed Railway	Existing Railway
Proposed Infrastructure	Existing Road
Proposed Sedimentation Pond	River/Stream
	Contour
	Bog/Wetland
	Waterbody
	Labrador/Quebec Boundary
	Public Water Supply

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT
CHAMPION IRON MINES LTD.

PROJECT
KAMI IRON ORE MINE PROJECT (KAMI PROJECT)
WABUSH, NL

TITLE
PROJECT LOCATION AND SITE LAYOUT

CONSULTANT

YYYY-MM-DD	2024-03-14
DESIGNED	----
PREPARED	####
REVIEWED	SPC
APPROVED	HJ

PROJECT NO.	CONTROL	REV.	FIGURE
TE23930010	0001	A	1-1

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2.0 STUDY AREA

The north-western portion of the proposed Kami mining development (i.e., east of Duley Lake Provincial Park) occurs within the Mid Subarctic Ecoregion (Canada Committee on Ecological Land Classification 1989) and contains multiple ecotypes including open black spruce-lichen forest, post-fire/willow habitat, alpine shrub, bog, and a range of wetland habitats. Within Canada's classification of Bird Conservation Regions (Stralberg et al. 2018), the Labrador City region occurs within the Taiga Shield and Hudson Plains Region (BCR 7). Habitat diversity within this study area enables occupancy by a range of small mammal species, herbivorous species (e.g. snowshoe hare, red squirrel), meso-carnivores (e.g. American marten, short-tailed weasel), and large mammals including black bear, moose, and woodland caribou.

The wildlife baseline study area was defined as the area of potential direct disturbance (i.e., location of proposed infrastructure, presented in Figure 1-1) and is the area where most of the direct effects from the proposed Project are likely to occur. It is represented by the proposed Project footprint and is approximately 2,681 hectares (ha). The study was based on the Project design information available at the time of planning for the field program.

3.0 RATIONALE AND OBJECTIVES

Mammals are an integral component of boreal-subarctic regions and have important ecological and socio-cultural value. From an ecological perspective, mammals occupy multiple trophic levels as prey species for raptors and other carnivores (e.g. meadow voles and southern red-backed voles), top-level predators that can influence community composition (e.g. gray wolves; Johnson et al. 2019), and species that can modify the composition of plant communities and aquatic habitats (e.g. beavers; Law et al. 2016). Some groups, including ungulates and small game are harvested as a food source or are hunted and trapped for recreational enjoyment or a source of income. Wildlife also provides recreational and aesthetic value through non-consumptive activities including photography.

A range of mammal species (including small mammals, carnivores, and ungulates) are known or are likely to occur within the baseline study area; therefore, the potential impact on resident mammals is an important consideration during all phases of project development and operation. Of particular concern are potential impacts on species listed under the Canadian *Species at Risk Act* (SARA) and the Newfoundland and Labrador *Endangered Species Act* (NL ESA).

The purpose of the survey program was to characterize baseline conditions of the site prior to any future mining development on the property. Results of the baseline study will be used to support the environmental assessment of the Project and will provide the necessary data to quantify the potential harmful alteration or destruction of wildlife species and their habitat. Specific objectives of this study are to:

1) Provide a description of the occurrence, population status, and habitat associations of mammals that are known or are likely to occur in the study area with emphasis on federally and provincially listed Species at Risk; and

2) Identify ecologically sensitive habitats, and time periods.

4.0 METHODS

A review of existing scientific publications and environmental studies was undertaken to assess the diversity and relative abundance of mammals in the Labrador City-Wabush region. Wildlife communities are generally similar across broad spatial scales within the boreal ecoregion, particularly along latitudinal gradients with a similar composition of vegetation types. However, to further ensure the assessment was as site-specific as possible, efforts were focused to review studies conducted within the Labrador City region (Jacques Whitford Environment Ltd. 2001, Labrador Iron Mines Ltd. 22009, Amec Environment and Infrastructure 2012) and within the Churchill River valley in east-central Labrador (Minuskuat 2008). Therefore, mammalian diversity based on this previous work is considered indicative of mammalian diversity in the study area. Wildlife survey methods used during these assessments included winter track surveys along linear routes, small mammal trapping within dominant habitat types during summer, and incidental observations collected during avifauna point counts surveys. Complete descriptions of survey locations and sampling techniques are provided in these respective reports.

4.1 Atlantic Canada Conservation Data Centre

The Atlantic Canada Conservation Data Centre (ACCDC) is a not-for-profit organization and an affiliate of NatureServe Canada. The ACCDC compiles and provides objective data on the biological diversity of Atlantic Canada and functions to further our collective understanding of the distribution and status of species of conservation concern. The ACCDC is a valuable database for assessing the occurrence and location of species and is extensively used for land use planning, environmental assessment processes etc. For this component study, the ACCDC (Corner Brook, NL office) was contacted to provide relevant data on the occurrence of mammal species of conservation concern within a 348 km^2 area encompassing the proposed study area. Data provided to WSP by the ACCDC is current to December 11, 2023.

4.2 Passive Acoustic Bat Monitoring Survey

Four (4) autonomous recording units (ARUs; Mini Bat 2, Wildlife Acoustics) were used to passively monitor bat activity in the area at each of the following locations: Harris Lake, Long Lake, Mills Lake, and Mid Lake (Figure 4-1; Table 4-1; Appendix A). Autonomous recording units were deployed to capture the breeding and fall migration periods, between June 16th, 2023 and September 8th, 2023, with the exception of the Harris Lake ARU which was deployed August 1st, 2023 to September 8th, 2023. Recording parameters were set to limit environmental noise while maximizing detection of bat species typical of the region (Table 4-2). As bat activity is dependent on environmental conditions, weather data were obtained from the nearest weather station located at the Wabush Airport, roughly 14 km from the Project site.

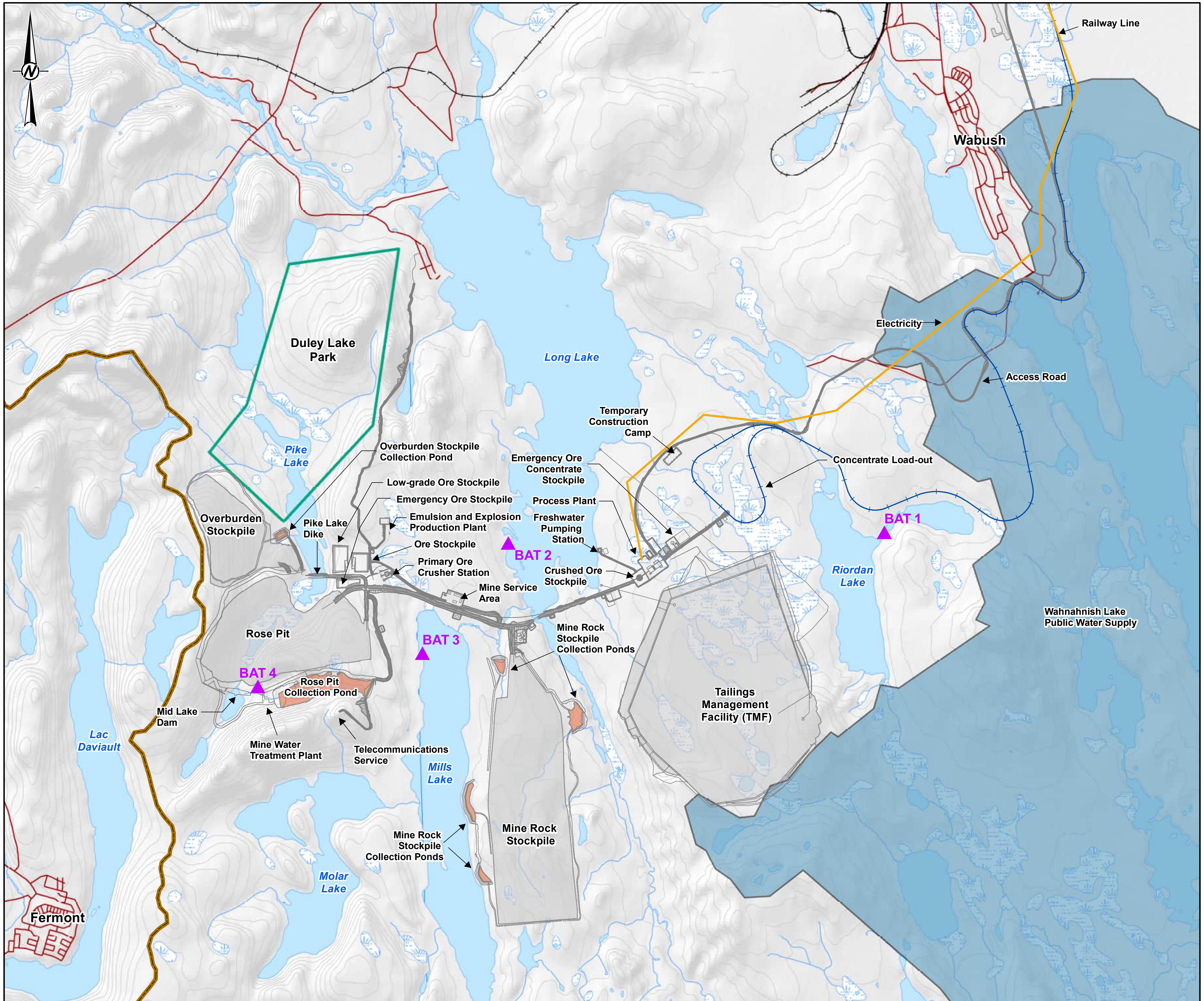
Resulting files were analyzed using auto-ID in Kaleidoscope Pro (Wildlife Acoustics). Files were then manually vetted following Canadian Wildlife Health Cooperative guidelines (McBurney and Segers, 2021). Files were identified to species where possible and assigned to a species group that shared call features when calls were too degraded, and therefore did not contain enough diagnostic features. Acoustic monitoring cannot differentiate among individuals and therefore activity levels are not indicative of the number of individuals in an area. Rather, they indicate the relative value of the habitat where higher activity suggests an area represents higher quality habitat.

Table 4-1: Summary of Bat Acoustic Survey Stations in the Study Area

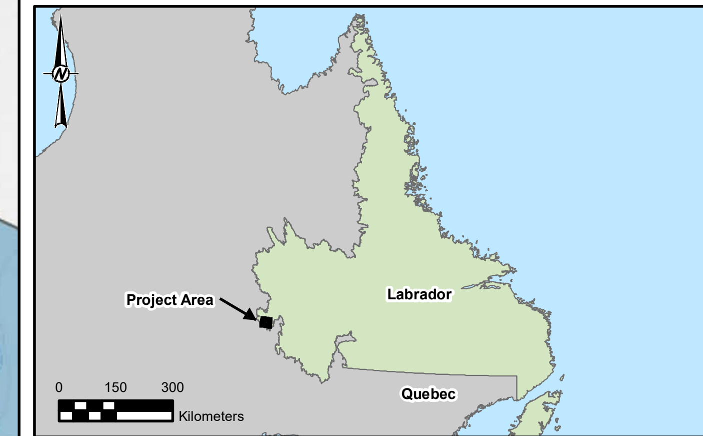
Station	Coordinates (Zone 19t)		Site and Habitat Description
BAT01 Harris Lake	N 5857286.99	E 641958.00	Riparian area located roughly 100 m from Harris Lake along a small tributary. The ARU was deployed at the edge of trees and tributary, with the microphone facing an open riparian area. Surrounding habitat consisted of short, dense black spruce, tamarack, and alder. Several buildings were located nearby, connected by small access roads. (Appendix A, Photo 1 and 2).
BAT02 Long Lake	N 5857160.97	E 636135.00	Riparian area located adjacent to a large lake (approximately 1250ha). The ARU was deployed at the edge of trees and the lake, with the microphone facing the lake. Surrounding habitat consisted of short, dense black spruce, tamarack, and alder. Several buildings are nearby, connected by small access roads. (Appendix A, Photo 3 and 4).
BAT03 Mills Lake	N 5855406.97	E 634806.01	Riparian area located adjacent to a large lake (approximately 430ha). The ARU was deployed at the edge of trees and lake, with the microphone facing the lake. Surrounding habitat consisted of alder, willow, white birch, balsam fir, black spruce. Several buildings are nearby, connected by small access roads. (Appendix A, Photo 5 and 6).
BAT04 Mid Lake	N 5854975.99	E 632255.00	Wetland located approximately 300m from Mid Lake and less than 1 km from two additional small lakes. The ARU was deployed at the edge of trees and wetland, with the microphone facing the wetland. Surrounding habitat consisted of black spruce, dwarf birch, tamarack, and alder (Appendix A, Photo 7 and 8).

Table 4-2: Summary of ARU Parameters for Bat Monitoring in the Study Area

PARAMETER	SETTING
Gain	12dB
16 kHz Filter	ON
Sample Rate	256 kHz
Minimum Duration	1.0ms
Maximum Duration	none
Minimum Trigger Frequency	16 kHz
Trigger Level	12 dB
Trigger Window	3.0s
Maximum Length	00:15s
Compression	none
Sunset/Sunrise	solar



KEY MAP



SCALE 1:20,000,000

LEGEND

PROJECT DATA

- Bat Monitoring Location
- Proposed Infrastructure
- Proposed Infrastructure
- Electricity
- Proposed Railway
- Proposed Sedimentation Pond

BASEMAP INFORMATION

- Duley Lake Park
- Existing Railway
- Existing Road
- River/Stream
- Contour
- Bog/Wetland
- Waterbody
- Labrador/Quebec Boundary
- Public Water Supply

0 625 1,250 2,500

1:60,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT

CHAMPION IRON MINES LTD.

PROJECT

KAMI IRON ORE MINE PROJECT (KAMI PROJECT)
WABUSH, NL

TITLE

ACOUSTIC BAT MONITORING LOCATIONS

CONSULTANT

YYYY-MM-DD	2024-04-23
DESIGNED	----
PREPARED	####
REVIEWED	SPC
APPROVED	HJ

PROJECT NO.	CONTROL	REV.	FIGURE
TE23930010	0001	A	Figure 4-1

4.3 Quality Assurance / Quality Control Procedures

Dedicated field programs, apart from installation of bat monitors, were not completed for assessing wildlife within the study area during 2023. This baseline report primarily involves summarizing data collected during past field programs by completed by Stantec (2011) and AMEC (2012), and then augmented with data collected from the bat maternity roosting habitat assessment and monitoring surveys in 2023 and incidental observations of other wildlife during 2023 field programs. For the bat surveys, a Quality Assurance / Quality Control program was implemented to verify that data collection, data entry, and data analysis were conducted with a high level of confidence. Quality Assurance / Quality Control of field data and data summary calculations consisted of:

- Summarizing data collected as part of past field programs completed by Stantec (2011) and AMEC (2012);
- Reviewing and verifying field data on site, at the end of each day, and at the end of each field shift to maintain data quality and consistency;
- Following the appropriate acoustic monitor installation procedures;
- Field work in pairs to limit observational gaps; and
- Transferring and backing-up field data and field photos to online databases and laptops regularly.

5.0 RESULTS

5.1 Literature Review and ACCDC Records

Based on literature reviews of previous wildlife surveys conducted in the Labrador City-Wabush region as well as limited observations during other resource component surveys, a range of mammal species are known, or are likely to occur within the vicinity of the Kami Project. These include American beaver, muskrat, and river otter within aquatic habitats, black bear, Canada lynx, American marten, and red squirrels within black spruce dominated forest, and red fox, meadow vole, and meadow jumping mouse in open, barren habitats (see Table 5-1 for a complete list of species). There were no available data from which population sizes could be inferred. Data received from the ACCDC did not yield any occurrences of species of conservation concern within the study area (e.g. SARA of NLESA listed species). However, it is likely that little brown and northern myotis occur in this area as they have been documented elsewhere in northern Labrador and northern Quebec (Broders et al. 2013; Burns et al. 2015; Fabianek et al. 2015). They were reported within the vicinity of the wildlife baseline area by ACCDC, but reports are inconclusive as capture records are required for definitive species identification. The ACCDC report did not indicate the potential for bat hibernacula in the area. Moreover, the literature review suggest bats are unlikely to hibernate in the area as suitable hibernation conditions are unlikely at latitudes above 55° (Ministère de l'Environnement et de la Faune, 1996).

Table 5-1: Mammal Species Known or Potentially Known to Occur within the Vicinity of the Kami Project In Western Labrador

Species	Scientific name	Relative Abundance	Occurrence	Data Source
Black bear	*Ursus americanus*	Common	Confirmed	Province of NL
Red fox	*Vulpes vulpes*	Uncommon	Confirmed	JWEL 2001; AMEC 2012
Arctic fox	*Alopex lagopus*	NA	Unconfirmed	NA
Gray wolf	*Canis lupus*	Uncommon	Confirmed	AMEC 2012
Eastern coyote	*Canis latrans*	Uncommon	Confirmed	AMEC 2012
Canada lynx	*Lynx canadensis*	Uncommon	Confirmed	Labrador Iron Mines Ltd.
American marten	*Martes americana*	Common	Confirmed	JWEL 2001; AMEC 2012
Fisher	*Martes pennanti*	NA	Unconfirmed	NA
Wolverine	*Gulo gulo*	NA	Unconfirmed	NA
River otter	*Lontra canadensis*	Common	Confirmed	JWEL 2001; Minaskuat 2008a
American mink	*Mustela vison*	Common	Confirmed	Minaskuat 2008a; AMEC 2012
Short-tailed weasel	*Mustela erminea*	Common	Confirmed	AMEC 2012
Moose	*Alces alces*	Common	Confirmed	Province of NL
Woodland caribou	*Rangifer tarandus caribou*	NA	Unconfirmed	NA
Snowshoe hare	*Lepus americanus*	Common	Confirmed	AMEC 2012
Arctic hare	*Lepus arcticus*	NA	Unconfirmed	NA
Beaver	*Castor canadensis*	Common	Confirmed	WSP 2023
Red squirrel	*Tamiasciurus hudsonicus*	Common	Confirmed	AMEC 2012; WSP 2023
Northern flying squirrel	*Glaucomys sabrinus*	NA	Unconfirmed	NA

Species	Scientific name	Relative Abundance	Occurrence	Data Source
Muskrat	*Ondatra zibethicus*	Common	Confirmed	Labrador Iron Mines Ltd.
Porcupine	*Erethizon dorsatum*	Uncommon	Confirmed	Minaskuat 2008b; AMEC 2012
Woodchuck	*Marmota monax*	NA	Unconfirmed	NA
Meadow vole	*Microtus pennsylvanicus*	Common	Confirmed	AMEC 2012
Southern red-backed vole	*Clethrionomys gapperi*	Common	Confirmed	AMEC 2012
Meadow jumping mouse	*Zapus hudsonicus*	Uncommon	Confirmed	Simon et al. 2002
Woodland jumping mouse	*Napaeozapus insignis*	Common	Confirmed	Stantec Consulting Ltd. 2010
Eastern heather vole	*Phenacomys ungava*	NA	Unconfirmed	NA
Deer mouse	*Peromyscus maniculatus*	NA	Unconfirmed	NA
Northern bog lemming	*Synaptomys borealis*	NA	Unconfirmed	NA
Masked shrew	*Sorex cinereus*	Common	Confirmed	AMEC 2012
Rock vole	*Microtus chrotorrhinus*	NA	Unconfirmed	NA
Little brown myotis	*Myotis lucifugus*	NA	Unconfirmed	NA
Northern myotis	*Myotis septentrionalis*	NA	Unconfirmed	NA
NA = Not applicable; JWEL = Jacques Whitford Environment Limited; AMEC = AMEC Environment and Infrastructure.				

5.2 Passive Acoustic Bat Monitoring Survey

Survey conditions were suitable (> 10°C, no precipitation, winds < 20km/h for at least 4 hours) for at least 48 nights during the breeding period and 15 nights during fall migration (Table 5-2; Appendix B). During this time, a total of 375 bat passes were detected for multiple species across the four (4) locations (Table 5-3, Table 5-4; Appendix C).

Table 5-2: Summary of Bat Acoustic Survey Effort for the Study Area

Monitoring Period	Date Range	Number of Nights >10°C[a]	Number of Nights with No Rain[a]	Number of Nights with Wind <20 km/h[a]
Spring Migration	n/a			
Summer Breeding	June 16th to August 14th	48	58	60
Fall Migration	August 15th to September 8th	15	24	24

refer to nights where conditions were met for at least 4 hours

5.2.1 Spatial Distribution

Mid Lake (BAT04) had the highest number of bat detections (n = 299/375), while detections were much lower at the remaining three (3) locations and lowest (n=8/375) at Harris Lake (BAT01). This pattern was most notable for the SAR species as 149/175 passes confirmed as SAR were detected at Mid Lake. The lower activity at Harris Lake can be partially explained by the shorter monitoring period.

The Mid Lake monitoring location where the highest bat activity was detected corresponds with the proposed location for the open pit (Rose Pit).

5.2.2 Temporal Pattern

The number of detections per night varied across the season (Figure 5-1). After accounting for sampling effort (total number of monitoring nights across all detectors), activity was higher during the breeding period (n = 1.47 passes/ night) compared to during fall migration (n = 0.94 passes/night).

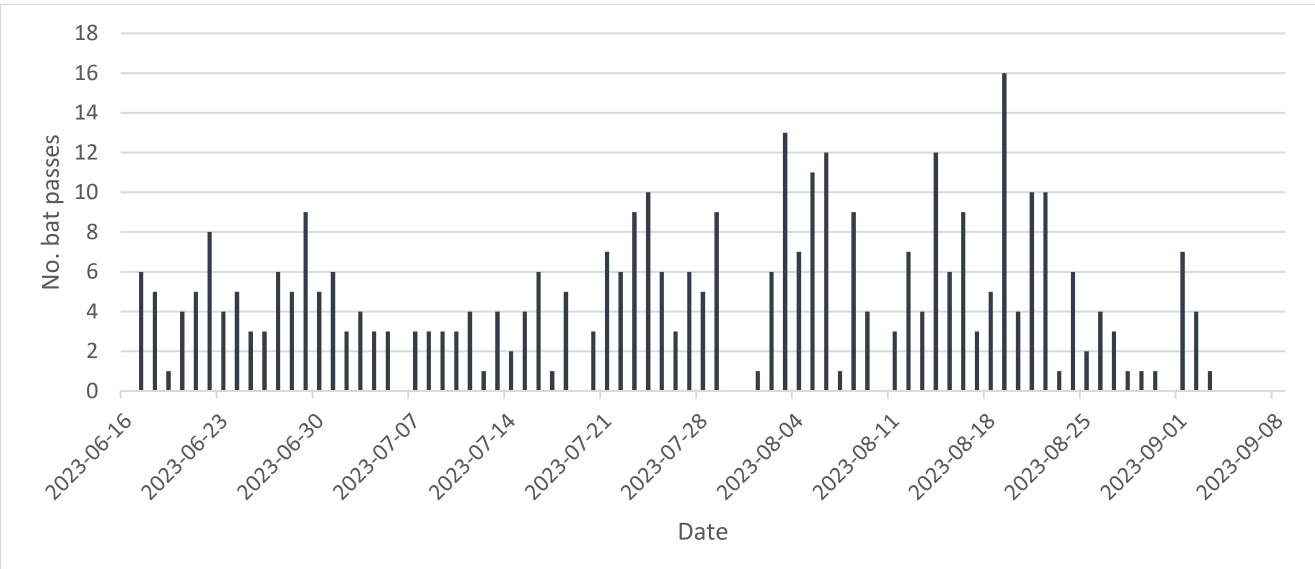


Figure 5-1 Temporal Pattern of Bat Activity in the Study Area

5.2.3 Species Composition

Of the 375 bat passes, 167 were confirmed SAR species and 25 were confirmed SOCC species (Table 5-4, Table 5-5). Of the confirmed SAR passes, two (2) were attributed to Little brown myotis (MYLU), fifteen (15) were attributed to northern myotis (MYSE), and 150 were produced by Myotis bats but the species could not be confirmed (Table 5-4; Table 5-5). Of the confirmed SOCC passes, nineteen (19) were attributed to the hoary bat (LACI), one (1) was attributed to the silver-haired bat (LANO), and five (5) were produced by the eastern red bat (LABO). The remaining passes could not be reliably identified to species and were therefore identified to species groups (Table 5-4, Table 5-5).

Table 5-3: Summary of Bat Species/Species Group Codes and Explanations

Species/Species Group Code	Latin Name/ Description	Common Name
MYLU	*Myotis lucifugus*	Little Brown Myotis
MYSE	*Myotis septentrionalis*	Northern Myotis
MYOTIS	could not differentiate between *M. lucifugus* or *M. septentrionalis*	
PESU	*Perimyotis subflavus*	Tricolored Bat
EPFU	*Eptesicus fuscus*	Big Brown Bat
LANO	*Lasionycteris noctivagans*	Silver-haired Bat

Species/Species Group Code	Latin Name/ Description	Common Name
EPFU/LANO	Could not differentiate between *E. fuscus* or *L. noctivagans*	
LABO	*Lasiurus borealis*	Eastern Red Bat
LACI	*Lasiurus cinereus*	Hoary Bat
Unknown HighF (MYLU, MYSE, PESU, LABO)	Could not differentiate among species with minimum frequencies ≥35 kHz	
Unknown LowF (EPFU, LACI, LANO)	Could not differentiate among species with minimum frequencies ≤ 25 kHz	
NoID	Could not differentiate among any species; calls too degraded	

Table 5-4: Summary of Bat Acoustic Survey Results (# Passes) within the Wildlife Study Area

Species/Species Group	BAT01	BAT02	BAT03	BAT04	TOTALS
EPFU	0	0	0	0	0
LABO	0	0	0	5	5
LACI	2	7	9	1	19
LANO	0	0	0	1	1
EPFU/LANO	0	1	2	0	3
MYLU	1	1	0	0	2
MYSE	0	1	0	14	15
Myotis	3	12	0	135	150
PESU	0	0	0	0	0
LowF	0	0	0	3	3
HighF	2	27	8	140	177
NoID	0	0	0	0	0
Total Number of Bats	**8**	**49**	**19**	**299**	**375**

Table 5-5: Summary of Bat SAR and SOCC (# Passes) Confirmed within the Wildlife Study Area

SAR/SOCC	BAT01	BAT02	BAT03	BAT04	TOTALS
Confirmed SAR (MYLU, MYSE, MYOTIS)	4	14	0	149	167
Confirmed SOCC (LABO, LACI)	2	7	9	7	25

5.3 Species of Special Conservation Status

There are five mammalian Species at Risk (SAR) that potentially occur within the proposed Kami study area and the adjacent landscape. These species are either listed on Schedule 1 of SARA or under the NL ESA, Table 4. For each of these species a brief overview is provided of known breeding range, general biology, and the likelihood of their occurrence in the study area. It should be noted that critical habitat has not been designated for any of these species.

The *Species at Risk Act* prohibits the harming or harassing of “wildlife species at risk” and the damage or destruction of their residences (i.e., nests or dens). Under the Act, Schedule 1 is the official list of wildlife Species at Risk. The Act also protects these species’ habitat on federally owned lands. On other lands, the Act allows for the designation and protection of “critical habitat” of these species, namely, habitat necessary for the survival or recovery of endangered, threatened or extirpated species. Critical habitat may be designated in species-specific recovery strategies or action plans. The Minister of the Environment may issue permits to authorize an activity that would contravene the Act if the effects on the species are incidental to the carrying out of the activity, if all reasonable alternatives have been considered, all feasible measures will be taken to minimize the impact, and the activity will not jeopardize the survival or recovery of the species.

Like SARA, NL ESA protects individuals, their residences, and designated critical habitat or recovery habitat of wildlife species designated under this Act. Critical habitat or recovery habitat may be identified during species recovery planning and may be designated for protection under the Act.

Acoustic monitoring surveys confirmed the presence of two (2) SAR bat species within the study area, as well as three (3) Species of Conservation Concern (SOCC). A brief overview is provided of their general biology.

5.3.1 Woodland Caribou

Woodland caribou (*Rangifer tarandus caribou*) are an important ecological component of Labrador and northern Quebec and have special cultural and recreational value to both Aboriginal and local people of this region. Two distinct populations (ecotypes) of woodland caribou occur in western Labrador/north-eastern Quebec:

3) Migratory woodland caribou (the George River herd); and

4) sedentary woodland caribou (including the Red Wine, Mealy Mountains and Lac Joseph herds).

Migratory caribou utilize summer calving grounds above the tree line then expand their distribution to encompass areas of high-quality forage which ultimately leads to increased rates of growth and neonate survival (Miller 2003; Bergerud et al. 2008). In autumn, these caribou migrate to forested areas and over-winter along the southern extent of their range. During this time, migratory caribou occasionally overlap with sedentary populations that occur in smaller groups in southwestern Labrador (Schmelzer and Otto 2003).

Caribou populations are known to experience regular and significant fluctuations in abundance (Messier et al. 1988; Festa-Bianchet et al. 2011). In the 1950s, the population estimate for the George River herd was 5,000 individuals (Banfield and Tener 1958), but by 1993 the estimate had increased to 776,000 (Couturier et al. 1996). The population subsequently declined to 385,000 individuals by 2001 (Couturier et al. 2004).

Although the George River Herd has historically occurred closer to Labrador City during the winter season, there is no evidence that animals have extended as far south as the Trans Labrador Highway in recent years. George River caribou now appear to winter closer to their calving area to the north and evidently utilize the Project area to a much lower extent than has previously been observed (DOEC 2012).

Among the three sedentary woodland caribou herds present in Labrador (all of which are listed as threatened under the NL ESA and SARA; Schmelzer 2011), the Lac Joseph Herd has been the most extensively studied through aerial surveys and telemetry (Schmelzer et al. 2004; Schmelzer 2011).

According to the aerial surveys carried out in Labrador between 1975 and 2009, the herd has declined significantly since 1975, and the latest population estimate is 1,047 individuals (Schmelzer 2011). Along with these reduced caribou numbers, the geographic range of the Lac Joseph Herd likewise appears to have decreased in size since 1980 (Schmelzer et al., 2004). Although the historic range of the population previously extended to the north and west of Labrador City / Wabush at that time, it now appears to be limited to an area east of longitude 66° 30' W (Schmelzer et al. 2011). Saint-Martin (1987) speculated that the northern calving range was abandoned after 1970 because of hydroelectric reservoir flooding and/or the development and increased use of the Trans Labrador Highway, and that the summer ranges were simply extensions of the calving ranges (Schmelzer et al. 2004). Recent surveys indicate that these caribou primarily occur in an area south of Labrador City-Wabush and well outside of the proposed Kami Project site.

5.3.2 Wolverine

The wolverine is listed as endangered under both SARA and the NL ESA. Wolverines historically occurred on the Ungava Peninsula, although there have been no verified reports from Labrador since 1965 (COSEWIC 2003). As a result of increasing anecdotal reports, formal surveys using hair capture stations and aerial surveys were conducted from 2003 and 2005 (Fortin et al. 2005); this effort failed to yield any evidence of their occurrence in Labrador. Wolverines have exceptionally large territories and encompass a wide range of habitats within these home ranges (Fortin et al. 2005). Their diet primarily consists of small mammals and ungulate carrion. Wolverines could potentially utilize the area encompassed by the proposed Kami Project (based on habitat suitability) however, this species is currently considered absent from this area.

5.3.3 Polar bear

Polar bears are listed as Vulnerable under the NL ESA. This species is relatively common along coastal regions of eastern Labrador but is not known to occur in western Labrador.

5.3.4 Bat Species

5.3.4.1 Little brown myotis and Northern myotis

Little brown myotis (*Myotis lucifugus*) and Northern myotis (*M. septentrionalis*) are considered 'resident' species because they breed in NL and move short distances to overwinter in hibernacula. Northern populations of little brown myotis are thought to initiate their period of winter torpor in September and emerge from their winter hibernacula (caves and abandoned mine shafts) in mid-May (Fenton and Barclay 1980). Females give birth around early July (Broders et al. 2013).

Both species are aerial insectivores that feed primarily on smaller, nocturnal Diptera (flies) and Hymenoptera (moths). Northern myotis typically forage in mature forest interior, as well as over ponds and wetlands. They roost under exfoliating bark, as well as in cracks and crevices in mature trees. Little brown myotis typically forage along forest edges, as well as over ponds and wetlands. In Labrador, they likely roost in buildings, as well as tree cavities, cracks, and crevices in mature trees (ECCC, 2018). Prior this baseline investigation, the little brown myotis was only known to occur throughout portions of south-central Labrador (Broders et al. 2013; Burns et al. 2015) and northern myotis was only recorded in this region for the first time in 2013 (Broders et al. 2013).

Like all bats, these species have slow life histories, meaning they are long lived but have very low reproductive rates as females typically produce only one (1) pup a year. They are therefore vulnerable to any disturbance that could impact survival and reproductive success. This is particularly true in areas like Labrador where they are at the northern extent of their range (ECCC 2018). In addition, both species have suffered dramatic population declines since the arrival of a fungal pathogen (*Pseudogymnoascus destructans*) that infects hibernating bats and causes the disease white-nose syndrome (Frick et al. 2010; ECCC, 2018). White-nose syndrome has resulted in widespread declines of both species, which are both listed as Endangered under Schedule 1 of SARA and NL ESA and ranked Critically Imperiled (S1) by ACCDC.

5.3.4.2 *Eastern Red Bat, Hoary Bat, and Silver-haired Bat*

The Eastern Red (*Lasiurus borealis*), Hoary Bat (*L. cinereus*), and Silver-haired Bat (*Lasionycteris noctivagans*) were recently assessed as Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2023). They are currently under review for listing as Endangered under Schedule 1 of SARA. All three species' migratory populations are ranked by ACCDC as Critically Imperiled (S1M), but there is currently insufficient information to rank their breeding populations (SUB). These three (3) species are considered migratory species because they come to Canada to breed but migrate to overwinter farther south. These species have been suffering declines largely due to cumulative impacts of wind energy (COSEWIC 2023).

All three species are aerial insectivores that feed on larger nocturnal Diptera and Hymenoptera, as well as smaller Coleoptera (beetles). Compared to the Myotis species, they are larger and therefore less agile. As a result, these species are confined to edge habitat and open spaces while commuting and foraging. Hoary and Red Bats roost in foliage of trees, while Silver-haired Bats roost under exfoliating bark and in tree cavities, cracks, and crevices (COSEWIC 2023).

Table 5-6: Species at Risk that are Known or Potentially Known to Occur within the Wildlife Study Area

Species	Scientific name	Legal designation	SAR status	Active Within Wildlife Study Area
Woodland caribou (Mealy Mountains, Red Wine Mountains, and Lac Joseph herds)	*Rangifer tarandus caribou*	NLESA SARA	Threatened	No
Wolverine	*Gulo gulo*	NLESA COSEWIC	Endangered	No
Polar bear	*Ursus maritimus*	NLESA SARA	Vulnerable	No
Little brown myotis	*Myotis lucifugus*	NLESA SARA	Endangered	Yes
Northern myotis	*Myotis septentrionalis*	NLESA SARA	Endangered	Yes

NLESA = Newfoundland and Labrador Endangered Species Act; SARA = Federal Species at Risk Act; COSEWIC = Committee on the Status of Endangered Wildlife in Canada.

5.4 Important Areas and Time Periods

All terrestrial and wetland habitats within the study area provide important life history characteristics depending on the species considered and the time of year. For example, shallow, vegetated ponds and streams enable occupation by beavers, muskrat, and American mink. Upland barrens and sphagnum bogs are utilized by small mammal species and associated carnivores (i.e. red foxes) and dense conifer forest provides denning and foraging opportunities for American marten, Canada lynx, and red squirrels. With respect to biologically critical time periods, the breeding season is the most energetically demanding time for mammals as most species are vulnerable to disturbance during this life history stage. Disturbance of females during the post-parturition stage can lead to abandonment or predation of newborn young. Many wildlife species are also vulnerable to direct/indirect disturbance during late mid to late winter when ambient air temperature and snow cover increase energetic requirements. Disruption of individuals from critical habitats that provide protective cover or adequate food resources can lead to mortality or decreased reproduction output during subsequent seasons (Shively et al. 2005, Tablado and Jenni, 2017). Like all bats, the species detected in the study area have slow life histories, meaning they are long lived but have very low reproductive rates. They are therefore vulnerable to any disturbance that could impact survival and reproductive success. This is particularly true in areas like Labrador where they are at the northern extent of their range (ECCC, 2018). Habitat loss and impacts on insect prey pose a risk to all species. Disturbance during hibernation poses a risk to survival and reproductive success as bats are already experiencing considerable challenges related to white-nose syndrome. Migratory bats face increasing challenges during migration across their range as they must navigate increasing numbers of wind energy developments, as well as habitat loss (COSEWIC 2023).

6.0 KEY FINDINGS

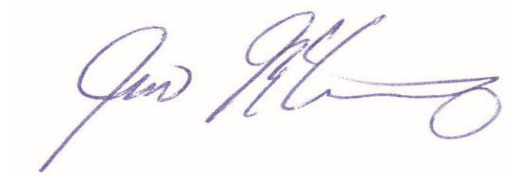
This report is primarily based on the occurrence of mammals as described in previous environmental assessment projects (see Table 1). Data collected during 2023 is limited to incidental accounts collected during concurrent studies and acoustic monitoring for bats. Given the wide range of terrestrial and aquatic habitats throughout the Project area (including late-successional black spruce forest, recently burned forest, barrens, wetlands, and riparian habitat), an extensive assemblage of mammals has been documented for this region. Common species include black bear, red fox, American beaver, snowshoe hare, and meadow vole. Less common species that are sporadically encountered include Canada lynx, porcupine, and meadow jumping mouse. A more thorough description of resident and transient mammals could be attained through future surveys that employ a range of detection techniques (i.e. aerial surveys, snow track surveys, detection cameras, and small mammal trapping) across the range of seasons and habitats within the study area. This approach would be more likely to detect rare and secretive species that often go undetected during routine travel over a limited time frame. Species at risk (listed in NL ESA, Table 4) were not reported in any of the previous studies that WSP reviewed.

A desktop review suggests bat hibernacula are unlikely to occur in the area. Similarly, a desktop review and site visit suggest roosting habitat is limited in the study area. Field acoustic monitoring for bats conducted between June 16th, 2023 and September 8th, 2023, confirmed the presence of the two endangered *Myotis* species. Acoustic data also revealed the presence of three Species of Conservation Concern that are under review for listing under SARA, namely the eastern red bat, hoary bat, and silver-haired bat. The monitoring station located at Mid Lake (BAT04) had the highest number of bat detections, and this pattern was most notable for the SAR species as approximately 85% of all SAR passes confirmed were detected at Mid Lake.

Each of these species are vulnerable to disturbance year-round. This is particularly true in areas like Labrador where they are at the northern extent of their range (ECCC, 2018). Habitat loss and impacts on insect prey pose a risk to all species. Disturbance during hibernation poses a risk to survival and reproductive success as hibernating bats are already experiencing considerable challenges related to white-nose syndrome. Migratory bats face increasing challenges during migration across their range as they must navigate increasing numbers of wind energy developments, as well as habitat loss (COSEWIC 2023).

Signature Page

WSP Canada Inc.



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APPENDIX A

Photolog

Photo 1. BAT01 Facing west.

Photo 2. Google Earth view of BAT01 (imagery date 6/12/2023)

Photo 3. BAT02 Facing northeast.

Photo 4. Google Earth view of BAT02 (imagery date 6/12/2023)

Photo 5. BAT03 Facing northwest

Photo 6. Google Earth view of BAT03 (imagery date 9/2/2021; 6/10/2019)

Photo 7. BAT04 Facing south

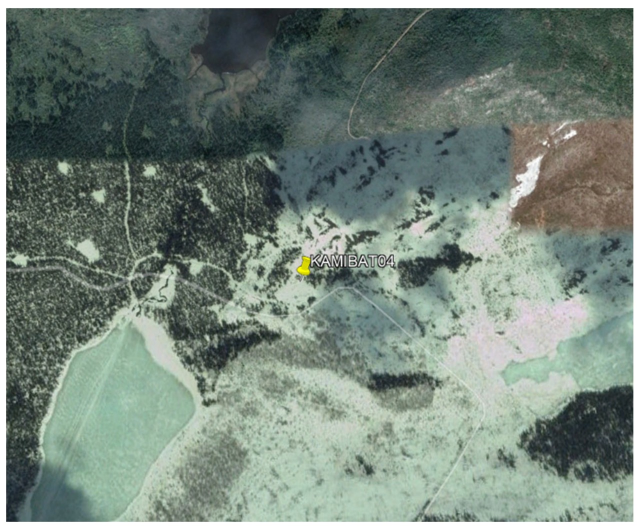

Photo 8. Google Earth view of BAT04 (imagery date 5/3/2016)

APPENDIX B

Weather Conditions

Weather conditions during bat mointoring surveys in Kami Project Area

Month	Day	min temp (^{o}C)	max temp (^{o}C)	total precip (mm)	mean wind (km/hr)	# hours >10 ^{o}C	# hours no rain	# hours wind <20 km/hr
6	16	4.5	5.5	0.2	15.3	0	7	7
6	17	6.3	8.1	0	11.6	0	8	8
6	18	7.5	9.6	0	5.4	0	8	8
6	19	2.8	12	0	5.3	1	8	8
6	20	9.8	20	0	9.1	6	8	8
6	21	20.1	23	0	12.3	8	8	8
6	22	19.6	24.7	0	12.0	8	8	8
6	23	13.9	20.2	0.8	4.8	8	7	8
6	24	8.5	15.2	0	9.3	5	8	8
6	25	2.6	12.3	0	6.3	1	8	8
6	26	10.6	16.7	0	15.4	8	8	6
6	27	12	12.8	3.2	7.0	8	3	8
6	28	5.8	12.6	0	3.3	2	8	8
6	29	6.8	16	0	5.8	3	8	8
6	30	10	18.2	0	5.9	7	8	8
7	1	15	19.4	0.8	8.1	9	8	9
7	2	13.5	17.5	0	6.5	10	10	10
7	3	12.8	22.3	0	3.6	10	10	10
7	4	9.9	24.5	0	2.9	9	10	10
7	5	11.7	24.9	0	4.2	10	10	10
7	6	16.6	23.4	1.3	5.2	10	8	10
7	7	13.7	17.8	0	10.9	10	10	9
7	8	11.8	20.2	0	3.3	10	10	10
7	9	18	23.9	0	12.8	10	10	9
7	10	17.9	23.6	0	11.4	10	10	10
7	11	14.2	15.1	2.4	12.6	10	8	10
7	12	7.6	13.9	0	6.6	8	10	10
7	13	16.5	19.2	0	8.1	10	10	10
7	14	11.9	17.9	0	9.0	10	10	10
7	15	10.5	18.6	0	8.3	10	10	10
7	16	17.1	21.6	3.1	8.3	10	6	10
7	17	15.4	22.4	0	13.8	10	10	9
7	18	14	20.3	0	8.0	10	10	10
7	19	10.4	15.7	2.5	10.7	10	9	10
7	20	11.4	15.4	0	5.4	10	10	10
7	21	13.2	16.6	0.9	3.0	10	7	10
7	22	14.9	17.2	9	5.5	10	6	10
7	23	12.7	19.4	0	7.4	10	10	10
7	24	15.1	22.8	0	6.9	10	10	10
7	25	8.6	15.6	0	7.2	7	10	10
7	26	11.8	16.8	0	11.6	10	10	8
7	27	9.2	10.9	0	11.7	3	10	10
7	28	12	14.5	0	8.5	10	10	10
7	29	4.5	12.7	0	3.5	2	10	10

Weather conditions during bat mointoring surveys in Kami Project Area

Month	Day	min temp (^oC)	max temp (^oC)	total precip (mm)	mean wind (km/hr)	# hours >10 ^oC	# hours no rain	# hours wind <20 km/hr
7	30	3.4	13.6	0	2.8	1	10	10
7	31	2.5	9.6	1.2	5.2	0	9	10
8	1	8.9	13	2	8.5	3	8	10
8	2	9	13.9	0.7	5.9	4	9	11
8	3	9.8	16.4	0	6.8	10	11	11
8	4	11.8	13.6	0.2	11.2	11	10	11
8	5	12.7	16.2	5.9	7.9	11	5	11
8	6	6.2	14.9	1	4.5	4	10	11
8	7	13	18.6	0	3.3	11	11	11
8	8	10.1	15.5	5.2	10.5	11	3	11
8	9	11.2	12.4	1.2	7.5	11	5	11
8	10	12.4	16.1	0	6.9	11	11	11
8	11	11.3	15.9	0	5.2	11	11	11
8	12	8.1	18.4	0	2.7	4	11	11
8	13	11.5	18.1	0	7.5	11	11	11
8	14	11.7	15.2	0	7.5	11	11	11
8	15	8.4	16.7	0	5.5	7	11	11
8	16	9.6	17.2	0	5.5	10	11	11
8	17	15.3	19.6	0	12.8	11	11	10
8	18	12.4	17.1	0	8.2	11	11	11
8	19	13.1	16.3	0.4	4.6	11	9	11
8	20	12.2	18	3.6	14.5	11	6	10
8	21	6.9	10.6	0	13.5	1	11	10
8	22	7.7	9.8	0.4	10.3	0	9	11
8	23	0	9.1	0	7.8	0	11	10
8	24	9.4	13.7	0	11.3	9	11	11
8	25	8.7	12.6	7.5	6.7	8	5	11
8	26	1.2	9.9	0	4.6	0	11	11
8	27	6.4	14.9	0	7.2	2	11	11
8	28	5.7	17.4	0	7.3	4	11	11
8	29	9.4	11.2	1	7.0	2	2	3
8	30	4.9	9.1	0	14.9	0	11	8
8	31	5.4	8.1	0	8.0	0	5	5
9	1	9.7	12.7	0.9	9.9	11	10	13
9	2	13.2	14.6	0.2	10.2	13	12	13
9	3	11.2	22	3.5	18.4	13	11	7
9	4	6.3	19.5	0	7.8	4	13	13
9	5	14	22	0	10.3	13	13	13
9	6	6.5	25.9	16	19.4	8	8	7
9	7	5.5	7.3	2.2	17.0	0	9	10
9	8	6.7	7.5	4.6	8.5	0	6	13

APPENDIX C

Bat Activity

Bat activity across nights at Harris Lake monitoring station in Kami Project Area.

Night of	EPFU	LABO	LACI	LANO	EPFU/ LANO	MYLU	MYSE	Myotis	PESU	LowF	HighF	NoID	Noise	Totals	Total Bats
8/1/2023	0	0	0	0	0	0	0	0	0	0	0	0	6	6	0
8/2/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/3/2023	0	0	0	0	0	0	0	0	0	0	0	0	9	9	0
8/4/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/5/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/6/2023	0	0	0	0	0	1	0	3	0	0	2	0	94	100	6
8/7/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/8/2023	0	0	1	0	0	0	0	0	0	0	0	0	14	15	1
8/9/2023	0	0	0	0	0	0	0	0	0	0	0	0	91	91	0
8/10/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/11/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/12/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/13/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/14/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/15/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/16/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/17/2023	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
8/18/2023	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0
8/19/2023	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
8/20/2023	0	0	0	0	0	0	0	0	0	0	0	0	48	48	0
8/21/2023	0	0	0	0	0	0	0	0	0	0	0	0	79	79	0
8/22/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/23/2023	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
8/24/2023	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0
8/25/2023	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
8/26/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/27/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/28/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/29/2023	0	0	1	0	0	0	0	0	0	0	0	0	58	59	1
8/30/2023	0	0	0	0	0	0	0	0	0	0	0	0	90	90	0
8/31/2023	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
9/1/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/2/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/3/2023	0	0	0	0	0	0	0	0	0	0	0	0	118	118	0
9/4/2023	0	0	0	0	0	0	0	0	0	0	0	0	41	41	0
9/5/2023	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
9/6/2023	0	0	0	0	0	0	0	0	0	0	0	0	5	5	0
9/7/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/8/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	**0**	**0**	**2**	**0**	**0**	**1**	**0**	**3**	**0**	**0**	**2**	**0**	**669**	**677**	**8**

Bat activity across nights at Long Lake monitoring station in Kami Project Area.

Night of	EPFU	LABO	LACI	LANO	EPFU/ LANO	MYLU	MYSE	Myotis	PESU	LowF	HighF	NoID	Noise	Totals	Total Bats
6/16/2023	0	0	0	0	0	0	0	0	0	0	0	0	67	67	0
6/17/2023	0	0	0	0	0	0	0	0	0	0	0	0	5	5	0
6/18/2023	0	0	0	0	0	0	0	0	0	0	0	0	15	15	0
6/19/2023	0	0	0	0	0	0	0	0	0	0	0	0	19	19	0
6/20/2023	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
6/21/2023	0	0	0	0	0	0	0	0	0	0	0	0	17	17	0
6/22/2023	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
6/23/2023	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0
6/24/2023	0	0	0	0	0	0	0	1	0	0	0	0	12	13	1
6/25/2023	0	0	0	0	0	0	0	0	0	0	0	0	16	16	0
6/26/2023	0	0	0	0	0	0	0	0	0	0	0	0	8	8	0
6/27/2023	0	0	0	0	0	0	0	0	0	0	0	0	37	37	0
6/28/2023	0	0	0	0	0	0	0	0	0	0	0	0	180	180	0
6/29/2023	0	0	0	0	0	0	0	0	0	0	0	0	14	14	0
6/30/2023	0	0	0	0	0	0	0	0	0	0	0	0	9	9	0
7/1/2023	0	0	0	0	0	0	0	1	0	0	0	0	10	11	1
7/2/2023	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0
7/3/2023	0	0	0	0	0	1	0	0	0	0	1	0	0	2	2
7/4/2023	0	0	0	0	0	0	0	0	0	0	0	0	14	14	0
7/5/2023	0	0	0	0	0	0	0	0	0	0	0	0	12	12	0
7/6/2023	0	0	0	0	0	0	0	0	0	0	0	0	17	17	0
7/7/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/8/2023	0	0	0	0	0	0	0	0	0	0	0	0	9	9	0
7/9/2023	0	0	0	0	1	0	0	0	0	0	0	0	12	13	1
7/10/2023	0	0	2	0	0	0	0	0	0	0	0	0	0	2	2
7/11/2023	0	0	0	0	0	0	0	1	0	0	0	0	2	3	1
7/12/2023	0	0	0	0	0	0	0	0	0	0	0	0	76	76	0
7/13/2023	0	0	1	0	0	0	0	0	0	0	0	0	17	18	1
7/14/2023	0	0	0	0	0	0	0	2	0	0	0	0	2	4	2
7/15/2023	0	0	0	0	0	0	0	0	0	0	0	0	9	9	0
7/16/2023	0	0	0	0	0	0	0	0	0	0	0	0	10	10	0
7/17/2023	0	0	0	0	0	0	0	0	0	0	0	0	58	58	0
7/18/2023	0	0	2	0	0	0	0	2	0	0	0	0	4	8	4
7/19/2023	0	0	0	0	0	0	0	0	0	0	0	0	8	8	0
7/20/2023	0	0	0	0	0	0	0	1	0	0	1	0	15	17	2
7/21/2023	0	0	0	0	0	0	0	0	0	0	2	0	13	15	2
7/22/2023	0	0	0	0	0	0	0	1	0	0	0	0	26	27	1
7/23/2023	0	0	0	0	0	0	0	0	0	0	0	0	9	9	0
7/24/2023	0	0	0	0	0	0	0	0	0	0	0	0	7	7	0
7/25/2023	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0
7/26/2023	0	0	0	0	0	0	0	0	0	0	0	0	14	14	0
7/27/2023	0	0	0	0	0	0	0	0	0	0	1	0	17	18	1
7/28/2023	0	0	0	0	0	0	0	0	0	0	0	0	10	10	0
7/29/2023	0	0	0	0	0	0	0	0	0	0	0	0	9	9	0

Bat activity across nights at Long Lake monitoring station in Kami Project Area.

Night of	EPFU	LABO	LACI	LANO	EPFU/ LANO	MYLU	MYSE	Myotis	PESU	LowF	HighF	NoID	Noise	Totals	Total Bats
7/30/2023	0	0	0	0	0	0	0	0	0	0	0	0	13	13	0
7/31/2023	0	0	0	0	0	0	0	0	0	0	0	0	10	10	0
8/1/2023	0	0	0	0	0	0	0	0	0	0	0	0	8	8	0
8/2/2023	0	0	0	0	0	0	0	0	0	0	0	0	13	13	0
8/3/2023	0	0	0	0	0	0	0	0	0	0	0	0	16	16	0
8/4/2023	0	0	0	0	0	0	0	0	0	0	0	0	25	25	0
8/5/2023	0	0	0	0	0	0	0	0	0	0	0	0	11	11	0
8/6/2023	0	0	0	0	0	0	0	1	0	0	1	0	139	141	2
8/7/2023	0	0	0	0	0	0	0	0	0	0	1	0	11	12	1
8/8/2023	0	0	0	0	0	0	0	0	0	0	0	0	22	22	0
8/9/2023	0	0	1	0	0	0	0	0	0	0	0	0	71	72	1
8/10/2023	0	0	0	0	0	0	0	0	0	0	0	0	108	108	0
8/11/2023	0	0	0	0	0	0	0	0	0	0	0	0	8	8	0
8/12/2023	0	0	0	0	0	0	0	0	0	0	0	0	16	16	0
8/13/2023	0	0	0	0	0	0	0	0	0	0	1	0	11	12	1
8/14/2023	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0
8/15/2023	0	0	0	0	0	0	0	0	0	0	0	0	8	8	0
8/16/2023	0	0	0	0	0	0	0	0	0	0	0	0	19	19	0
8/17/2023	0	0	0	0	0	0	0	1	0	0	0	0	14	15	1
8/18/2023	0	0	0	0	0	0	0	0	0	0	0	0	12	12	0
8/19/2023	0	0	0	0	0	0	0	1	0	0	0	0	39	40	1
8/20/2023	0	0	0	0	0	0	0	0	0	0	1	0	240	241	1
8/21/2023	0	0	0	0	0	0	0	0	0	0	0	0	25	25	0
8/22/2023	0	0	0	0	0	0	0	0	0	0	0	0	19	19	0
8/23/2023	0	0	0	0	0	0	0	0	0	0	0	0	14	14	0
8/24/2023	0	0	1	0	0	0	0	0	0	0	2	0	7	10	3
8/25/2023	0	0	0	0	0	0	0	0	0	0	0	0	21	21	0
8/26/2023	0	0	0	0	0	0	0	0	0	0	2	0	11	13	2
8/27/2023	0	0	0	0	0	0	0	0	0	0	3	0	7	10	3
8/28/2023	0	0	0	0	0	0	0	0	0	0	0	0	7	7	0
8/29/2023	0	0	0	0	0	0	0	0	0	0	0	0	36	36	0
8/30/2023	0	0	0	0	0	0	0	0	0	0	1	0	14	15	1
8/31/2023	0	0	0	0	0	0	0	0	0	0	0	0	12	12	0
9/1/2023	0	0	0	0	0	0	0	0	0	0	7	0	21	28	7
9/2/2023	0	0	0	0	0	0	1	0	0	0	2	0	7	10	3
9/3/2023	0	0	0	0	0	0	0	0	0	0	1	0	4	5	1
9/4/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/5/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/6/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/7/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/8/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	**0**	**0**	**7**	**0**	**1**	**1**	**1**	**12**	**0**	**0**	**27**	**0**	**1817**	**1866**	**49**

Bat activity across nights at Mills Lake monitoring station in Kami Project Area.

Night of	EPFU	LABO	LACI	LANO	EPFU/ LANO	MYLU	MYSE	Myotis	PESU	LowF	HighF	NoID	Noise	Totals	Total Bats
6/16/2023	0	0	0	0	0	0	0	0	0	0	0	0	35	35	0
6/17/2023	0	0	0	0	0	0	0	0	0	0	0	0	9	9	0
6/18/2023	0	0	0	0	0	0	0	0	0	0	0	0	16	16	0
6/19/2023	0	0	0	0	0	0	0	0	0	0	0	0	7	7	0
6/20/2023	0	0	0	0	0	0	0	0	0	0	0	0	8	8	0
6/21/2023	0	0	0	0	0	0	0	0	0	0	0	0	5	5	0
6/22/2023	0	0	0	0	0	0	0	0	0	0	0	0	6	6	0
6/23/2023	0	0	0	0	0	0	0	0	0	0	0	0	7	7	0
6/24/2023	0	0	0	0	0	0	0	0	0	0	2	0	3	5	2
6/25/2023	0	0	0	0	0	0	0	0	0	0	0	0	16	16	0
6/26/2023	0	0	0	0	0	0	0	0	0	0	0	0	18	18	0
6/27/2023	0	0	0	0	0	0	0	0	0	0	0	0	19	19	0
6/28/2023	0	0	0	0	0	0	0	0	0	0	0	0	34	34	0
6/29/2023	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0
6/30/2023	0	0	0	0	0	0	0	0	0	0	1	0	7	8	1
7/1/2023	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
7/2/2023	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
7/3/2023	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
7/4/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/5/2023	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
7/6/2023	0	0	0	0	0	0	0	0	0	0	0	0	6	6	0
7/7/2023	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
7/8/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/9/2023	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0
7/10/2023	0	0	0	0	0	0	0	0	0	0	0	0	5	5	0
7/11/2023	0	0	0	0	0	0	0	0	0	0	0	0	6	6	0
7/12/2023	0	0	0	0	0	0	0	0	0	0	0	0	57	57	0
7/13/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/14/2023	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
7/15/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/16/2023	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
7/17/2023	0	0	0	0	0	0	0	0	0	0	1	0	7	8	1
7/18/2023	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
7/19/2023	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
7/20/2023	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
7/21/2023	0	0	0	0	0	0	0	0	0	0	0	0	7	7	0
7/22/2023	0	0	1	0	0	0	0	0	0	0	0	0	4	5	1
7/23/2023	0	0	0	0	0	0	0	0	0	0	0	0	13	13	0
7/24/2023	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
7/25/2023	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
7/26/2023	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0
7/27/2023	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
7/28/2023	0	0	0	0	0	0	0	0	0	0	0	0	7	7	0
7/29/2023	0	0	0	0	0	0	0	0	0	0	0	0	15	15	0

Bat activity across nights at Mills Lake monitoring station in Kami Project Area.

Night of	EPFU	LABO	LACI	LANO	EPFU/ LANO	MYLU	MYSE	Myotis	PESU	LowF	HighF	NoID	Noise	Totals	Total Bats
7/30/2023	0	0	0	0	0	0	0	0	0	0	0	0	10	10	0
7/31/2023	0	0	0	0	0	0	0	0	0	0	0	0	16	16	0
8/1/2023	0	0	0	0	0	0	0	0	0	0	0	0	18	18	0
8/2/2023	0	0	1	0	0	0	0	0	0	0	0	0	8	9	1
8/3/2023	0	0	1	0	0	0	0	0	0	0	0	0	7	8	1
8/4/2023	0	0	0	0	0	0	0	0	0	0	0	0	8	8	0
8/5/2023	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0
8/6/2023	0	0	0	0	0	0	0	0	0	0	0	0	51	51	0
8/7/2023	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
8/8/2023	0	0	1	0	2	0	0	0	0	0	1	0	10	14	4
8/9/2023	0	0	0	0	0	0	0	0	0	0	1	0	16	17	1
8/10/2023	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0
8/11/2023	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
8/12/2023	0	0	2	0	0	0	0	0	0	0	0	0	2	4	2
8/13/2023	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0
8/14/2023	0	0	0	0	0	0	0	0	0	0	0	0	7	7	0
8/15/2023	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
8/16/2023	0	0	0	0	0	0	0	0	0	0	1	0	2	3	1
8/17/2023	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0
8/18/2023	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0
8/19/2023	0	0	2	0	0	0	0	0	0	0	0	0	3	5	2
8/20/2023	0	0	0	0	0	0	0	0	0	0	0	0	94	94	0
8/21/2023	0	0	0	0	0	0	0	0	0	0	0	0	91	91	0
8/22/2023	0	0	0	0	0	0	0	0	0	0	0	0	10	10	0
8/23/2023	0	0	0	0	0	0	0	0	0	0	0	0	18	18	0
8/24/2023	0	0	0	0	0	0	0	0	0	0	0	0	7	7	0
8/25/2023	0	0	0	0	0	0	0	0	0	0	0	0	5	5	0
8/26/2023	0	0	0	0	0	0	0	0	0	0	0	0	5	5	0
8/27/2023	0	0	0	0	0	0	0	0	0	0	0	0	10	10	0
8/28/2023	0	0	1	0	0	0	0	0	0	0	0	0	11	12	1
8/29/2023	0	0	0	0	0	0	0	0	0	0	0	0	23	23	0
8/30/2023	0	0	0	0	0	0	0	0	0	0	0	0	22	22	0
8/31/2023	0	0	0	0	0	0	0	0	0	0	0	0	15	15	0
9/1/2023	0	0	0	0	0	0	0	0	0	0	0	0	21	21	0
9/2/2023	0	0	0	0	0	0	0	0	0	0	1	0	7	8	1
9/3/2023	0	0	0	0	0	0	0	0	0	0	0	0	20	20	0
9/4/2023	0	0	0	0	0	0	0	0	0	0	0	0	58	58	0
9/5/2023	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
9/6/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/7/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/8/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	**0**	**0**	**9**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**941**	**960**	**19**

Bat activity across nights at Pike Lake monitoring station in Kami Project Area.

Night of	EPFU	LABO	LACI	LANO	EPFU/ LANO	MYLU	MYSE	Myotis	PESU	LowF	HighF	NoID	Noise	Totals	Total Bats
6/16/2023	0	0	0	0	0	0	0	0	0	0	0	0	250	250	0
6/17/2023	0	0	0	0	0	0	0	1	0	0	5	0	47	53	6
6/18/2023	0	0	0	0	0	0	0	4	0	0	1	0	0	5	5
6/19/2023	0	0	0	0	0	0	0	0	0	0	1	0	10	11	1
6/20/2023	0	0	0	0	0	0	0	3	0	0	1	0	1	5	4
6/21/2023	0	0	0	0	0	0	0	4	0	0	1	0	0	5	5
6/22/2023	0	0	0	0	0	0	2	4	0	0	2	0	1	9	8
6/23/2023	0	0	0	0	0	0	0	0	0	0	4	0	13	17	4
6/24/2023	0	0	0	0	0	0	0	0	0	0	2	0	14	16	2
6/25/2023	0	0	0	0	0	0	0	2	0	0	1	0	0	3	3
6/26/2023	0	0	0	0	0	0	0	1	0	0	2	0	1	4	3
6/27/2023	0	0	0	0	0	0	0	5	0	0	1	0	3	9	6
6/28/2023	0	0	0	0	0	0	1	4	0	0	0	0	32	37	5
6/29/2023	0	0	0	0	0	0	2	3	0	0	4	0	2	11	9
6/30/2023	0	0	0	0	0	0	0	3	0	0	1	0	0	4	4
7/1/2023	0	0	0	0	0	0	0	1	0	0	4	0	6	11	5
7/2/2023	0	0	0	0	0	0	0	1	0	0	2	0	3	6	3
7/3/2023	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
7/4/2023	0	0	0	0	0	0	0	1	0	0	2	0	0	3	3
7/5/2023	0	0	0	0	0	0	0	1	0	0	2	0	0	3	3
7/6/2023	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
7/7/2023	0	0	1	0	0	0	0	2	0	0	0	0	0	3	3
7/8/2023	0	0	0	0	0	0	1	0	0	0	2	0	0	3	3
7/9/2023	0	0	0	0	0	0	0	0	0	0	2	0	0	2	2
7/10/2023	0	0	0	0	0	0	0	1	0	0	0	0	2	3	1
7/11/2023	0	0	0	0	0	0	0	2	0	0	1	0	0	3	3
7/12/2023	0	0	0	0	0	0	0	0	0	0	1	0	39	40	1
7/13/2023	0	0	0	0	0	0	0	3	0	0	0	0	0	3	3
7/14/2023	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0
7/15/2023	0	0	0	0	0	0	0	2	0	0	2	0	0	4	4
7/16/2023	0	0	0	0	0	0	0	4	0	0	2	0	0	6	6
7/17/2023	0	0	0	0	0	0	0	0	0	0	0	0	31	31	0
7/18/2023	0	0	0	0	0	0	0	1	0	0	0	0	4	5	1
7/19/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/20/2023	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
7/21/2023	0	0	0	0	0	0	0	0	0	0	5	0	0	5	5
7/22/2023	0	0	0	0	0	0	0	0	0	0	4	0	7	11	4
7/23/2023	0	0	0	0	0	0	1	2	0	0	6	0	120	129	9
7/24/2023	0	0	0	0	0	0	0	4	0	0	6	0	0	10	10
7/25/2023	0	0	0	0	0	0	0	3	0	0	3	0	1	7	6
7/26/2023	0	0	0	0	0	0	0	3	0	0	0	0	1	4	3
7/27/2023	0	0	0	0	0	0	0	4	0	0	1	0	0	5	5
7/28/2023	0	0	0	0	0	0	0	5	0	0	0	0	0	5	5
7/29/2023	0	0	0	0	0	0	0	5	0	0	4	0	0	9	9
7/30/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7/31/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8/1/2023	0	0	0	0	0	0	0	1	0	0	0	0	57	58	1
8/2/2023	0	0	0	0	0	0	0	1	0	0	4	0	5	10	5
8/3/2023	0	0	0	0	0	0	0	6	0	0	6	0	10	22	12
8/4/2023	0	0	0	0	0	0	1	3	0	0	3	0	0	7	7
8/5/2023	0	0	0	0	0	0	2	5	0	0	4	0	7	18	11
8/6/2023	0	0	0	0	0	0	0	3	0	0	1	0	252	256	4
8/7/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Bat activity across nights at Pike Lake monitoring station in Kami Project Area.

Night of	EPFU	LABO	LACI	LANO	EPFU/ LANO	MYLU	MYSE	Myotis	PESU	LowF	HighF	NoID	Noise	Totals	Total Bats
8/8/2023	0	0	0	0	0	0	0	4	0	0	0	0	4	8	4
8/9/2023	0	0	0	0	0	0	0	1	0	0	1	0	125	127	2
8/10/2023	0	0	0	0	0	0	0	0	0	0	0	0	173	173	0
8/11/2023	0	0	0	0	0	0	1	1	0	0	1	0	1	4	3
8/12/2023	0	1	0	0	0	0	0	2	0	1	1	0	0	5	5
8/13/2023	0	1	0	0	0	0	0	1	0	0	1	0	0	3	3
8/14/2023	0	0	0	0	0	0	2	5	0	1	4	0	1	13	12
8/15/2023	0	0	0	0	0	0	0	3	0	0	3	0	1	7	6
8/16/2023	0	3	0	0	0	0	0	2	0	0	3	0	1	9	8
8/17/2023	0	0	0	0	0	0	0	1	0	0	1	0	0	2	2
8/18/2023	0	0	0	0	0	0	0	2	0	0	3	0	5	10	5
8/19/2023	0	0	0	1	0	0	1	5	0	1	5	0	13	26	13
8/20/2023	0	0	0	0	0	0	0	2	0	0	1	0	71	74	3
8/21/2023	0	0	0	0	0	0	0	4	0	0	6	0	36	46	10
8/22/2023	0	0	0	0	0	0	0	1	0	0	9	0	2	12	10
8/23/2023	0	0	0	0	0	0	0	1	0	0	0	0	12	13	1
8/24/2023	0	0	0	0	0	0	0	0	0	0	3	0	2	5	3
8/25/2023	0	0	0	0	0	0	0	2	0	0	0	0	81	83	2
8/26/2023	0	0	0	0	0	0	0	0	0	0	2	0	137	139	2
8/27/2023	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0
8/28/2023	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
8/29/2023	0	0	0	0	0	0	0	0	0	0	0	0	17	17	0
8/30/2023	0	0	0	0	0	0	0	0	0	0	0	0	201	201	0
8/31/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/1/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/2/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/3/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/4/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/5/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/6/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/7/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9/8/2023	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	**0**	**5**	**1**	**1**	**0**	**0**	**14**	**135**	**0**	**3**	**140**	**0**	**1817**	**2116**	**299**

CHAMPION IRON

wsp

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APPENDIX M

Historic and Heritage Resources Baseline Report

REPORT

Historic and Heritage Resources Baseline Report

Kami Iron Ore Mine Project

Submitted to:

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1155 René-Lévesque Blvd. West
Suite 3300
Montréal, QC H3B 3X7

Submitted by:

WSP Canada Inc.
25 York St.
Suite 700
Toronto, ON M5J 2V5

April 2024

Distribution List

Champion Iron Mines Ltd.

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EXECUTIVE SUMMARY

The 2023 investigation into archaeological and heritage resources within the Kamistiatusset (Kami) Iron Ore Mine Project area was limited to a desktop assessment. As no fieldwork was undertaken, a Provincial Archaeology Office (PAO) permit was not required. The background research explored the land-use history of the Project area and its environs. The goals were to identify known archaeological and historic sites and to delineate areas of archaeological potential. Environmental attributes and historical settlement and development patterns of the study area and surrounding region were reviewed to provide the necessary information for evaluating the area's archaeological potential. The background study focused primarily on previous archaeological research and assessments carried out within, or in proximity to, the Project area.

According to the PAO, there are no known archaeological resources within, or near, the immediate Project area (2023). However, previous archaeological investigations have demonstrated the region's archaeological significance with respect to Maritime Archaic, Intermediate Period, Recent Period, Innu, and Naskapi cultures (Loring 1992; McCaffrey 2006; Schwarz 2007; Thomson 1984).

An Historic Resources Overview Assessment (HROA) was completed for the Project area in 2011. The HROA consisted of background research, visual assessment, and limited subsurface testing in select areas determined to exhibit high potential for archaeological resources (Stassinu 2012). Several additional areas of high archaeological potential were identified within the Project area, but outside of planned Project impacts at that time. The remainder of the Project area was determined to exhibit low archaeological potential, and no further archaeological investigation was required in those areas.

The 2011 HROA concluded that additional field assessment may be required, in areas of high archaeological potential, once Project designs have been finalized (Stassinu 2012). Based on a review of the most-recent Project design plans (September 2023), three proposed impact areas intersect with areas of high archaeological potential, specifically: the Waldorf River outflow crossing, Mine Rock Stockpile, and West Basin. The review also identified several proposed impact areas that were not included in the 2011 assessment.

Table of Contents

FIGURES

1.0 INTRODUCTION

The Kamistiatusset (Kami) Iron Ore Mine Project (the Project) is a proposed iron ore mine in Newfoundland and Labrador. The Project site is located entirely in Labrador, approximately seven kilometres (km) from the Town of Wabush, 10 km from the Town of Labrador City, and five km east of Ville de Fermont, Québec (Figure 1-1).

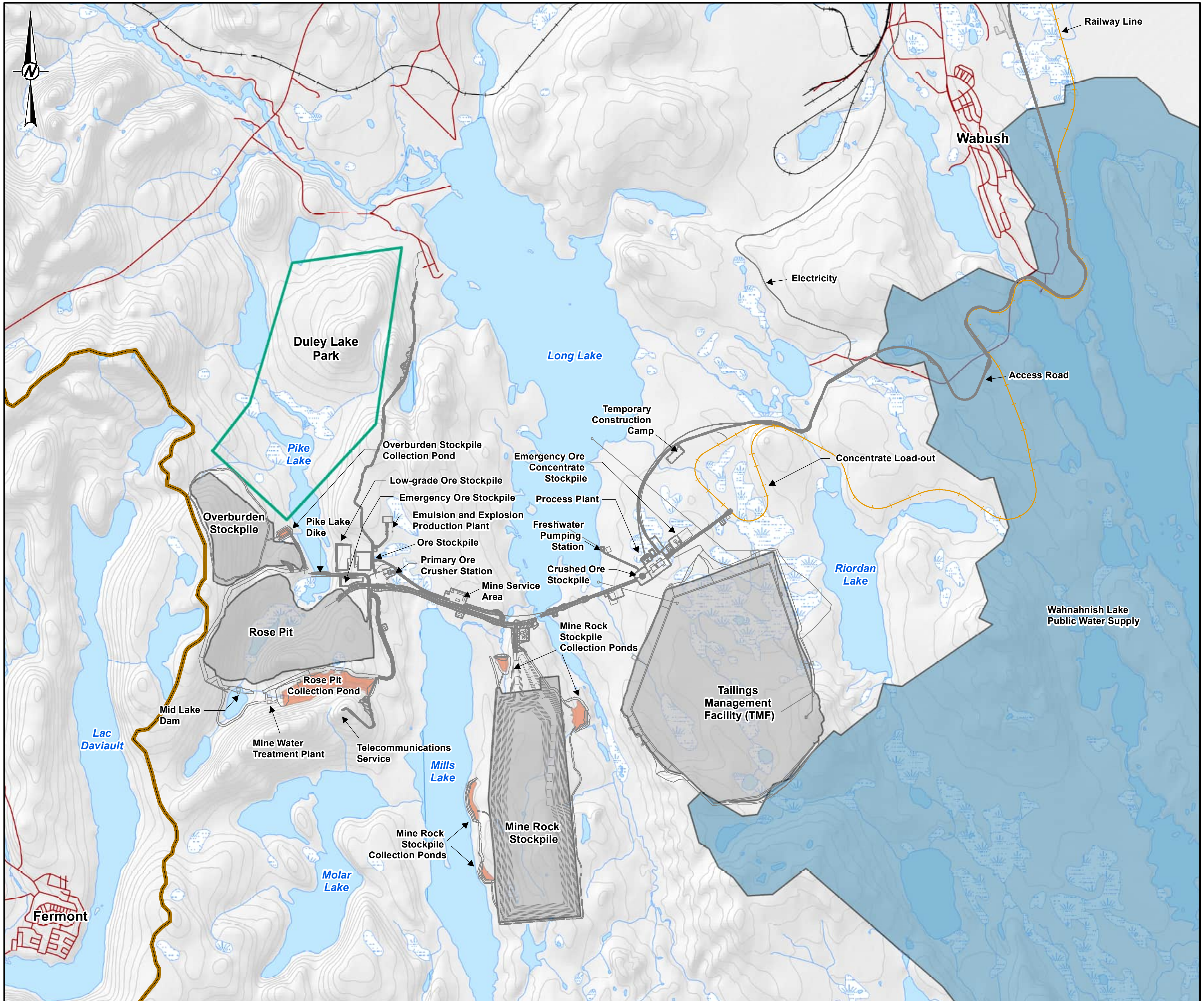
The Project was originally proposed by the Alderon Iron Ore Corporation (Alderon) and underwent a provincial and federal environmental impact assessment from 2011 to 2013, including a comprehensive baseline program that was completed in 2011 and 2012. The Project was released from the provincial and federal EA process in 2014. In 2021, Champion Iron Mines Ltd. (Champion) completed the acquisition of the Project from Alderon.

Champion is proposing several optimizations to the Project design proposed by Alderon through the previous EIS. These proposed optimizations include improvements to the Project's water management strategy and modernization of the proposed ore handling, conveyance, and processing. Champion's objective for the Kami Project is to produce high purity (>67.5%) iron ore concentrate, which can be used as direct reduction pellet feed for electric arc furnaces in the green steel supply chain. Champion is planning to submit a Project Registration to the Newfoundland and Labrador Environmental Assessment Division of the Ministry of the Environment and Climate Change in 2024.

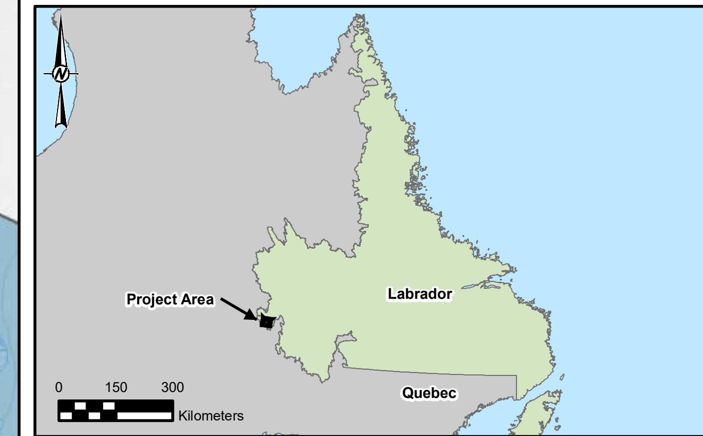
To support the Project Registration and assessment of effects from the revised Project design optimizations, Champion has commissioned the services of WSP Canada Inc. to complete a comprehensive baseline field program that documents the existing natural and socio-economic environments in the anticipated area of the Project. The Heritage and Historic Resources baseline report represents one component of the comprehensive baseline program and was undertaken to provide context from which Project effects on such resources could be evaluated in the Project Planning and Environmental Assessment (EA) process.

Figure 1-1 outlines some of the main components of the Project site including:

- Open Pit (Rose Pit);
- Mine rock stockpile;
- Ore stockpiles (operational, low-grade and emergency);
- Tailings management facility (TMF);
- Overburden stockpile;
- Processing infrastructure including crushing and concentrating;
- Ancillary infrastructure to support the mine and process plant.



KEY MAP



SCALE 1:20,000,000

LEGEND

PROJECT DATA

- Proposed Infrastructure
- Proposed Railway
- Proposed Infrastructure
- Proposed Sedimentation Pond

BASEMAP INFORMATION

- Duley Lake Park
- Existing Railway
- Existing Road
- River/Stream
- Contour
- Bog/Wetland
- Waterbody
- Labrador/Quebec Boundary
- Public Water Supply

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT
CHAMPION IRON MINES LTD.

PROJECT
KAMI IRON ORE MINE PROJECT (KAMI PROJECT)
WABUSH, NL

TITLE
PROJECT LOCATION AND SITE LAYOUT

CONSULTANT

YYYY-MM-DD	2024-03-14
DESIGNED	----
PREPARED	####
REVIEWED	SPC
APPROVED	HJ

PROJECT NO.	CONTROL	REV.	FIGURE
TE23930010	0001	A	1-1

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25mm

2.0 RATIONALE AND OBJECTIVES

Historic and heritage resources include sites and objects of historic, archaeological, cultural, spiritual, and paleontological importance. In Newfoundland and Labrador, such resources fall under the authority of the Provincial Archaeology Office (PAO) of the Department of Tourism, Culture, Arts and Recreation. The *Historic Resources Act* (1990), administered by the PAO, protects the province's more than 5000 documented archaeological sites and prohibits any unauthorised interference with newly discovered historic and heritage resources. Known archaeological sites date from almost 9000 years ago to the 20th century and represent a variety of cultures: Pre-Inuit, Inuit, Intermediate Period, Innu, Maritime Archaic, Recent Period, Mi'kmaq, Beothuk, and European. In addition, areas exhibiting elevated potential for undiscovered archaeological resources have been identified throughout the province, both on land and in coastal waters (PAO 2015).

It should be noted, a Cultural Heritage baseline report has been prepared, under a separate cover, to identify known and potential built heritage resources and cultural heritage landscapes in the Project area (WSP 2024).

3.0 STUDY AREA

The Project site is located entirely in Labrador, approximately seven km from the Town of Wabush, 10 km from the Town of Labrador City, and five km east of Ville de Fermont, Québec (Figure 1-1). For the purposes of this report, the study area was limited to the proposed Kami Project site.

4.0 METHODS

The 2023 investigation into archaeological and heritage resources within the Project area was limited to a desktop assessment. As no fieldwork was undertaken, a PAO Historic Resources Impact Assessment (HRIA) permit was not required. The background study explored the land-use history of the Project area and its environs. The goals were to identify known archaeological and historic sites and to delineate areas of archaeological potential. Environmental attributes and historical settlement and development patterns of the study area and surrounding region were reviewed to provide the necessary information for evaluating the area's archaeological potential. The background study focused primarily on previous archaeological research and assessments carried out within, or in proximity to, the Project area.

5.0 STUDY RESULTS

According to the PAO, there are no known archaeological resources within, or near, the immediate Project area (PAO 2023). However, previous archaeological investigations have demonstrated the region's archaeological significance with respect to Maritime Archaic, Intermediate Period, Recent Period, Innu, and Naskapi cultures (Loring 1992; McCaffrey 2006; Schwarz 2007; Thomson 1984).

The Maritime Archaic tradition is the name given to people who arrived in southern Labrador, from the Maritimes and the lower north shore of Quebec, approximately 7500 years ago (McGhee and Tuck 1975; Schwarz 2010). Their descendants gradually moved north, along the coast, reaching northern Labrador approximately 6500 years ago (Fitzhugh 1978). Previous archaeological and historical investigations indicate that human occupation of western Labrador, and portions of nearby Quebec, began shortly after deglaciation, which was completed approximately 6000 years ago (Ives et al. 1976; Loring et al. 2003). The Maritime Archaic period lasted until approximately 3500 years ago (Betts and Hrynick 2021). Evidence of Maritime Archaic occupation in western Labrador is limited to stone tools found in the vicinity of what is now the Smallwood Reservoir, over 200 km northeast of the Project area (Neilsen 2016).

The Intermediate Period lasted from approximately 3500 to 1500 years ago (PAO 2015). Human occupation during this period appears to have been focused on interior locations rather than the coast. To date, the majority of archaeological finds recovered in the interior of Labrador have been attributed to the Intermediate Period, although none have been found in the vicinity of the Project area (Schwarz 2007; Stassinu 2012).

The Recent Period dates from approximately 1500 to 500 years ago. Archaeologists recognize two Recent Period populations in Labrador: the earlier Daniel Rattle complex and the later Point Revenge Complex (PAO 2015). These First Nations pre-date European contact and have been identified according to the geographic locations at which each culture was first recognized archaeologically. Sites from this period frequently contain the remains of structures that have been interpreted as communal dwellings. Previous archaeological investigations have revealed a pattern of marine and terrestrial resource use, with a greater emphasis on marine sources in comparison with the preceding period (Stassinu 2012). As such, Recent Period archaeological sites are much less common in the interior of Labrador than those dating to the Intermediate Period. Recent Period peoples are ancestral to historic and contemporary Quebec-Labrador Innu and Naskapi (Stassinu 2012).

Approximately 500 years ago, Labrador and the lower north shore of Quebec became a focus for European activities. Basque whalers, as well as fisherman from other European countries, began operating in great numbers along the coast (Tuck and Grenier 1989). European activity in the interior was much more limited at this time. Explorer and trader Louis Jolliet visited the Ashuanipi area (approximately 50 km east of the Project area), in 1695, and wrote of the significance of Ashuanipi Lake as a gathering place for the Innu (Stassinu 2012). Very few indigenous sites from this period have been identified in the interior of Labrador. In the later half of the nineteenth century, the fur trade in Labrador reached its peak. Europeans, with the help of Innu guides, first documented the presence of iron in the interior of Labrador during this period (Venovcevs 2022).

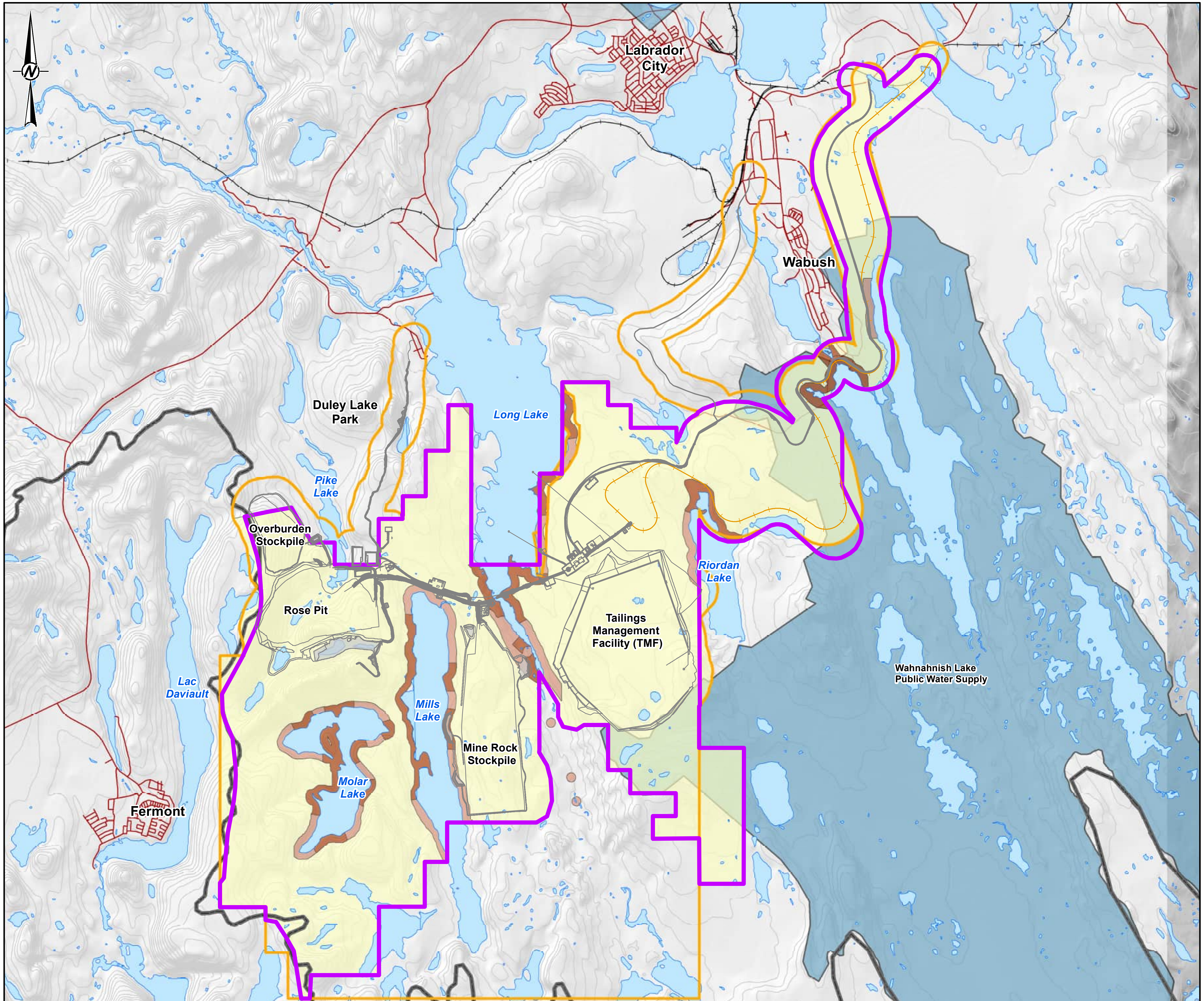
The iron deposit's remote location meant that it was of little commercial interest until the Second World War when iron sources became a strategic necessity. The first economically viable iron deposit was identified at Knob Lake, 200 km north of the Project area, which resulted in the growth of the mining town of Schefferville at that location. To access the ore, five U.S.-based companies formed the Iron Ore Company of Canada and built a 579 km railway from Sept-Iles, Quebec to Schefferville. Construction took place from 1950 to 1954 and, ultimately, opened the interior of western Labrador to future development (Venovcevs 2022).

In 2011, an Historic Resources Overview Assessment (HROA) was completed for the Project area, consisting of background research, visual assessment, and limited subsurface testing in select areas determined to exhibit high potential for archaeological resources (Stassinu 2012). Several additional areas of high archaeological potential were identified within the Project area, but outside of any planned Project impacts at that time. The remainder of the Project area was determined to exhibit low archaeological potential, and no further archaeological investigation was required in those areas.

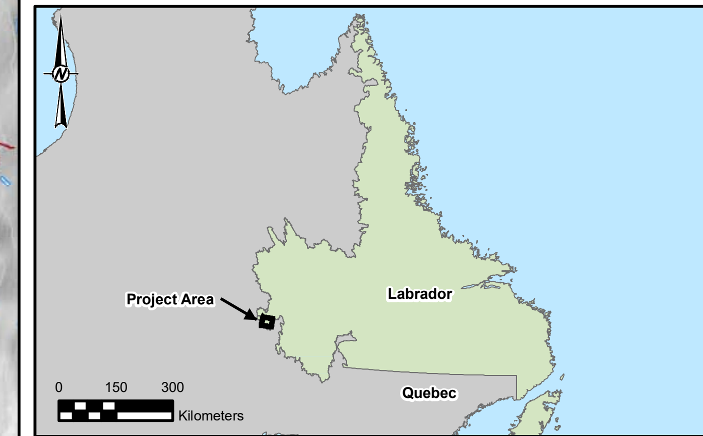
The 2011 HROA concluded that additional field assessment may be required, in areas of high archaeological potential, once Project designs have been finalized (Stassinu 2012). Based on a review of the most-recent 2024 design plans, three proposed impact areas intersect with areas of high archaeological potential, specifically: the crossing of the Waldorf River outflow into Long Lake, the northeast corner of Mine Rock Stockpile, and the west Mine Rock Stockpile collection pond (**Figure 5-1**). These areas should be subjected to further archaeological investigation, including subsurface testing, prior to any ground disturbance.

The 2023 investigation into archaeological and heritage resources identified several proposed Project impact areas that were not included in the 2011 HROA, specifically: the north portion of Overburden stockpile, the Reserve Ore Stockpile, the road leading north along the east side of Duley Lake Park, and the proposed road and railway from Elephant Head Lake to Wabush. These areas should be subjected to an HRIA, including background research and visual assessment, prior to any ground disturbance.

Finally, the 2011 HROA recommended that the project-specific Environmental Protection Plan include procedures to be followed in the event of the accidental discovery of archaeological or cultural resources, as construction activities and associated ground disturbance, can damage or destroy previously unknown archaeological and heritage resources.



KEY MAP



SCALE 1:20,000,000

LEGEND

PROJECT DATA	BASEMAP INFORMATION
Local Study Area	Duley Lake Park
Proposed Infrastructure	Existing Railway
Proposed Railway	Existing Road
Proposed Infrastructure	River/Stream
2011 Assessment Area	Contour
2011 Potential Ratings	Bog/Wetland
Low	Waterbody
Moderate	Labrador/Quebec Boundary
Higher	Public Water Supply

0 875 1,750 3,500

1:85,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT
CHAMPION IRON MINES LTD.

PROJECT
KAMI IRON ORE MINE PROJECT (KAMI PROJECT)
WABUSH, NL

TITLE
ARCHAEOLOGY - LSA AND PROJECT FOOTPRINT

CONSULTANT

wsp

YYYY-MM-DD	2024-03-27
DESIGNED	----
PREPARED	####
REVIEWED	SPC
APPROVED	HJ

PROJECT NO.	CONTROL	REV.	FIGURE
TE23930010	0001	A	Figure 5-1

6.0 KEY FINDINGS

The 2023 investigation into archaeological and heritage resources within the Project area was limited to a desktop assessment. The background study focused primarily on previous archaeological research and assessments carried out within, or in proximity to, the Project area.

According to the PAO, there are no known archaeological resources within, or near, the immediate Project Area (2023). However, previous archaeological investigations have demonstrated the region's archaeological significance with respect to Maritime Archaic, Intermediate Period, Recent Period, Innu, and Naskapi cultures (Loring 1992; McCaffrey 2006; Schwarz 2007; Thomson 1984).

An HROA was completed for the Project area in 2011. The HROA consisted of background research, visual assessment, and limited subsurface testing in select areas determined to exhibit high potential for archaeological resources (Stassinu 2012). Several additional areas of high archaeological potential were identified within the Project area, but outside of planned Project impacts at that time. The remainder of the Project area was determined to exhibit low archaeological potential, and no further archaeological investigation was required in those areas.

The 2011 HROA concluded that additional field assessment may be required, in areas of high archaeological potential, once Project designs have been finalized (Stassinu 2012 - see Figure 4.2, pg. 26). Based on a review of the most-recent design plans (September 2023), three proposed impact areas intersect with areas of high archaeological potential, specifically, the Waldorf River outflow crossing, Mine Rock Stockpile, and West Basin. The review also identified several proposed impact areas that were not included in the 2011 assessment (Figure 5-1).

Signature Page

WSP Canada Inc.

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Reviewed by:

Darcy J. Dingnam, MA, RPA
Associate Archaeologist
Atlantic Canada

https://wsponlinecan.sharepoint.com/sites/ca-kamieaca00030925894/shared documents/04_issued to client/12_project registration_final/01_appendices/appendix m_archaeology baseline report/ca00030925894-r-rev0_historic and heritage resources.docx

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CHAMPION IRON

wsp

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APPENDIX N

Cultural Heritage Screening Report

CHAMPION IRON

REPORT

Cultural Heritage Screening Report

Kami Iron Ore Mine Project

Submitted to:

Champion Iron Mines Ltd.
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Montréal, QC H3B 3X7

Submitted by:

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April 2024

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Mapping and GIS	Juanita Abbott, GIS Specialist

Acknowledgements

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Government of Newfoundland & Labrador	Jamie Brake, PhD, Provincial Archaeologist, Department of Tourism, Culture, Arts, and Recreation
Government of Newfoundland & Labrador	Scott Andrews,, Manager, Provincial Historic Sites, Department of Tourism, Culture, Arts, and Recreation
Heritage Newfoundland & Labrador	Andrea O’Brien, Outreach/Provincial Registrar

Study Limitations

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Executive Summary

The Kamistiatusset (Kami) Iron Ore Mine Project (the Project) is a proposed iron ore mine in Newfoundland and Labrador. The Project site is located entirely in Labrador, approximately seven kilometres from the Town of Wabush, ten kilometres from the Town of Labrador City, and five kilometres east of Ville de Fermont, Québec. For the purposes of this report, the study area was limited to the proposed Kami Project site.

To support the Project Registration and assessment of effects from the revised Project design changes, Champion has commissioned the services of WSP Canada Inc. (WSP) to complete a comprehensive baseline field program that documents the existing natural and socio-economic environments in the anticipated area of the Project. The Cultural Heritage Screening Report represents a component of the comprehensive baseline program and was undertaken to provide context from which Project effects to potential built heritage resources and cultural heritage landscapes could be evaluated in the Project Planning and Environmental Assessment (EA) process.

The desktop information gathering and data collection determined that there are no known or potential built heritage resources or cultural heritage landscapes within the study area. The study area is in the vicinity of two properties that are over 40 years old (Dudley Lake Provincial Park and Elephant Head Lake campground), but these properties appear to have been established relatively recently (mid- to late 20th century), have not been identified as having potential heritage significance by stakeholders, and will not be impacted by the Project. Accordingly, the following recommendations are made:

1) No potential-built heritage resources or cultural heritage landscapes were identified within the study area. No further work is recommended from a cultural heritage perspective.

2) Responses to the information gathering requests sent to the 'Heritage Foundation of Newfoundland and Labrador', the 'Ministry of Tourism, Culture, Arts and Recreation Register of Provincial Historic Sites', the 'Office of Indigenous Affairs and Reconciliation' have yet to be received. The results of this desktop Cultural Heritage Screening Report will be confirmed once responses are received.

3) Cultural heritage landscapes may have significance to Indigenous Nations. This Cultural Heritage Screening Report should be circulated to Indigenous Nations being engaged as part of the Project for information purposes.

Table of Contents

TABLES

FIGURES

1.0 INTRODUCTION

The Kamistiatusset (Kami) Iron Ore Mine Project (the Project) is a proposed iron ore mine in Newfoundland and Labrador. The Project site is located entirely in Labrador, approximately seven kilometres from the Town of Wabush, ten kilometres from the Town of Labrador City, and five kilometres east of Ville de Fermont, Québec (Figure 1-1). For the purposes of this report, the study area was limited to the proposed Kami Project site, also know the Site Assessment Area (SAA).

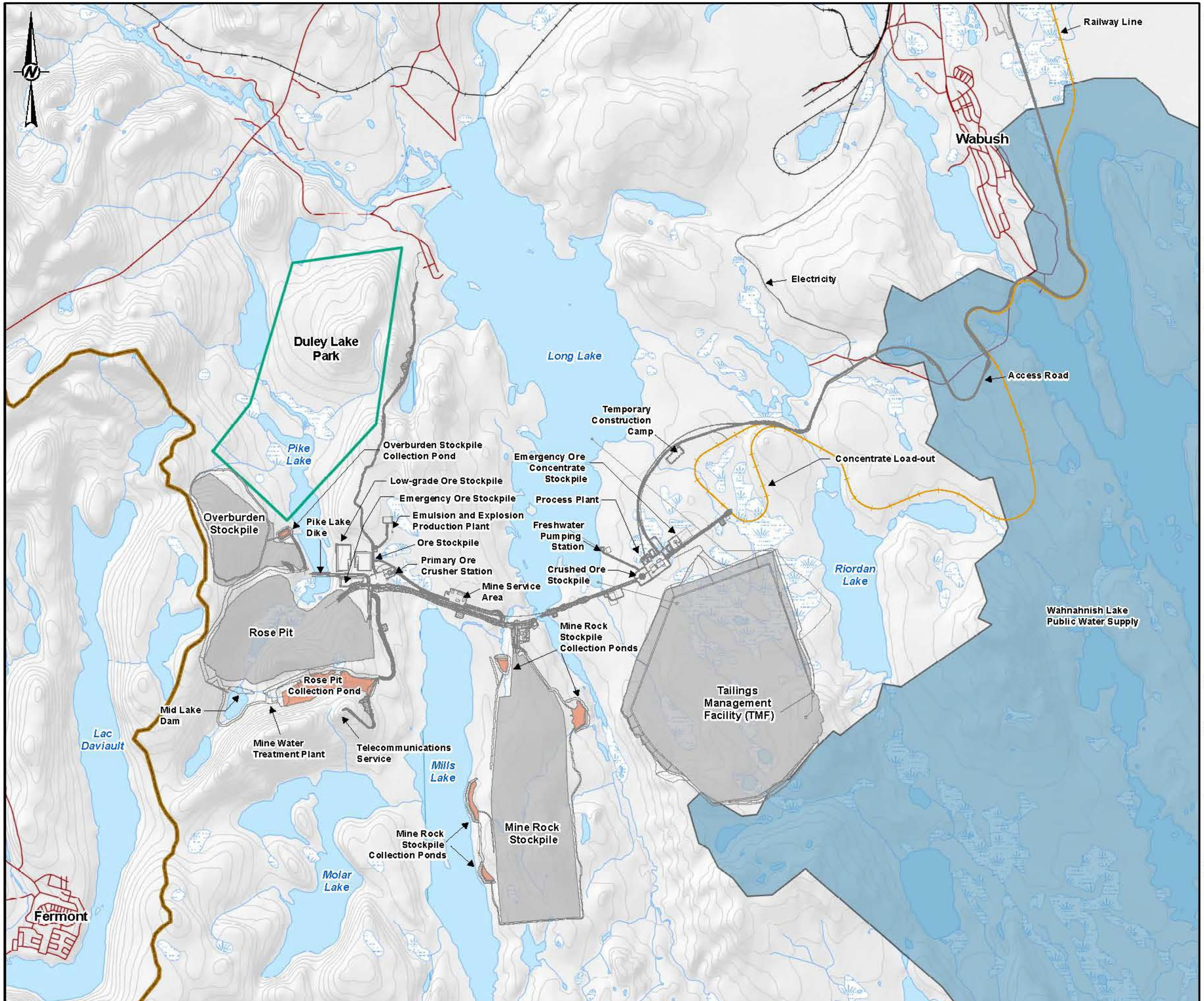
The Project was originally proposed by the Alderon Iron Ore Corporation (Alderon) and underwent a provincial and federal environmental impact assessment from 2011 to 2013, including a comprehensive baseline program that was completed in 2011 and 2012. The Project was released from the provincial and federal EA process in 2014. In 2021, Champion Iron Mines Ltd. (Champion) completed the acquisition of the Project from Alderon.

Champion is proposing several optimizations to the Project design proposed by Alderon through the previous EIS. These proposed optimizations include improvements to the Project's water management strategy and modernization of the proposed ore handling, conveyance, and processing. Champion's objective for the Kami Project is to produce high purity (>67.5%) iron ore concentrate, which can be used as direct reduction pellet feed for electric arc furnaces in the green steel supply chain. Champion is planning to submit a Project Registration to the Newfoundland and Labrador Environmental Assessment Division of the Ministry of the Environment and Climate Change in 2024.

To support the Project Registration and assessment of effects from the revised Project design optimizations, Champion has commissioned the services of WSP Canada Inc. (WSP) to complete a comprehensive baseline field program that documents the existing natural and socio-economic environments in the anticipated area of the Project. The Cultural Heritage Screening Report represents a component of the comprehensive baseline program and was undertaken to provide context from which Project effects to potential built heritage resources and cultural heritage landscapes could be evaluated in the Project Planning and Environmental Assessment (EA) process.

Figure 1-1 outlines some of the main components of the Project site including:

- Open Pit (Rose Pit);
- Mine rock stockpile;
- Ore stockpiles (operational, low-grade and emergency);
- Tailings management facility (TMF);
- Overburden stockpile;
- Processing infrastructure including crushing and concentrating;
- Ancillary infrastructure to support the mine and process plant.



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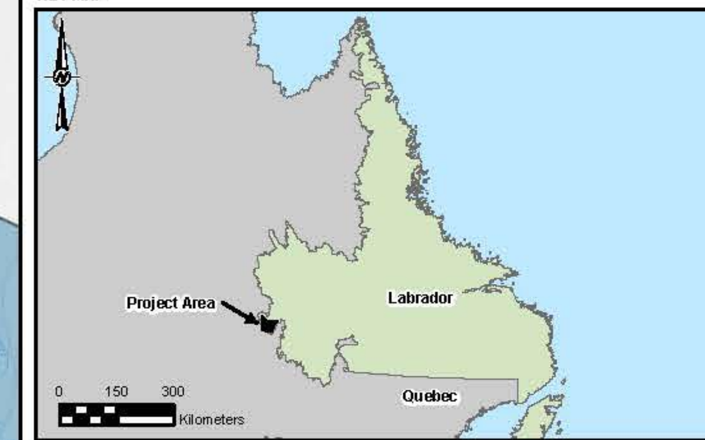

SCALE 1:20,000,000

LEGEND

PROJECT DATA	BASEMAP INFORMATION
Proposed Infrastructure	Duley Lake Park
Proposed Railway	Existing Railway
Proposed Infrastructure	Existing Road
Proposed Sedimentation Pond	River/Stream
	Contour
	Bog/Wetland
	Waterbody
	Labrador/Quebec Boundary
	Public Water Supply

0 625 1,250 2,500

1:60,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT

CHAMPION IRON MINES LTD.

PROJECT

KAMI IRON ORE MINE PROJECT (KAMI PROJECT)
WABUSH, NL

TITLE

SITE LAYOUT

CONSULTANT

wsp

YYYY-MM-DD	2024-03-20
DESIGNED	----
PREPARED	####
REVIEWED	SPC
APPROVED	HJ

PROJECT NO.	CONTROL	REV.	FIGURE
TE23930010	0001	A	Figure 1-1

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2.0 RATIONALE AND OBJECTIVES

Historic and heritage resources include sites and objects of historic, archaeological, cultural, spiritual, and paleontological importance. In Newfoundland and Labrador, such resources fall under the authority of the Provincial Archaeology Office (PAO) of the Department of Tourism, Culture, Arts and Recreation. The *Historic Resources Act* (1990), administered by the PAO, protects the province's more than 5000 documented archaeological sites and prohibits any unauthorised interference with newly discovered historic and heritage resources.

The objective of this desktop Cultural Heritage (CH) Screening Report is to identify known and potential built heritage resources and cultural heritage landscapes in the vicinity of the Project and determine if the Project will require further cultural heritage studies, such as a Cultural Heritage Report: Existing Conditions and Preliminary Impact Assessment (Cultural Heritage Report), Cultural Heritage Evaluation Report (CHER), or a Heritage Impact Assessment (HIA).

The tasks completed to prepare this desktop review include:

- Background Review: Primary and secondary sources, including historical maps and aerial photographs, were reviewed to understand the history of the study area and identify heritage themes.
- Information Gathering: Information gathering requests were sent to the following agencies:
  - Heritage Foundation of Newfoundland and Labrador'
  - Ministry of Tourism, Culture, Arts and Recreation Register of Provincial Historic Sites
  - Office of Indigenous Affairs and Reconciliation, Government of Newfoundland & Labrador

3.0 METHODOLOGY

3.1 Legislative Requirements

Under Section 7(1)I(I and iii) of the *Impact Assessment Act* (IAA) (Government of Canada 2019), the proponent of a project must not do any act or thing that will impact, with respect to the Indigenous peoples of Canada, physical and cultural heritage, and any structure, site or thing that is of historical, archaeological, paleontological or architectural significance. Accordingly, consideration of archaeological resources, built heritage resources, and cultural heritage landscapes is required for the Project.

The *Historic Resources Act*, RSNL 1990 Chapter H-4 (Government of Newfoundland and Labrador 1990) defines a “historic resource” as a work of nature or of humans that is primarily of value for its archaeological, prehistoric, historic, cultural, natural, scientific or aesthetic interest and includes archaeological, prehistoric, historic or natural sites, structures or objects. The *Historic Resources Act* prohibits a person from moving, destroying, damaging, defacing, altering, adding to, marking, interfering with, and removing from a provincial historic site or registered provincial cultural resource archaeological objects, buildings, monuments, things or other structures located on, in or under a provincial historic site or registered provincial cultural resource (Government of Newfoundland and Labrador 1990). The Ministry of Tourism, Culture, Arts and Recreation may order an impact assessment at their opinion that an operation or activity will or is likely to result in the alteration damage or destruction of or otherwise adversely affect historic resources.

While beyond the scope of this report, under the *Historic Resources Act*, the Ministry of Tourism, Culture, Arts and Recreation may order an impact assessment with regards to paleontological resources at their opinion that an operation or activity will or is likely to result in the alteration damage or destruction of or otherwise adversely affect such resources (Government of Newfoundland and Labrador 1990).

3.2 Information Gathering and Desktop Data Collection

The desktop review was completed through a combination of desktop data collection and information gathering conducted through correspondence with applicable regulatory agencies. To identify known heritage properties, the following online sources were reviewed:

- Canadian Heritage Rivers List (Canadian Heritage Rivers System n.d.)
- Heritage Foundation of Newfoundland and Labrador Heritage Property Register (Heritage NL 2023)
- Ministry of Tourism, Culture, Arts and Recreation List of Archaeology Sites (Government of Newfoundland and Labrador n.d.a., 2023)
- Ministry of Tourism, Culture, Arts and Recreation Provincial Historic Sites Register (Government of Newfoundland and Labrador n.d.b.)
- Parks Canada Heritage Railway Stations of Canada Database (Government of Canada 2022)
- Parks Canada National Historic Sites Database (Government of Canda 2023b)
- UNESCO World Heritage List (UNESCO 1992-2023)

To identify potential resources over 40 years of age, historical mapping (Eaton 1895, 1896), National Topographic System mapping (Department of Energy, Mines and Resources 1983, 1990) and historical aerial photographs from 1949 from the National Air Photo Library (Government of Canada n.d.) were reviewed to identify the presence of properties containing buildings and structures 40 years or older. The Labrador Inuit Land Claims Agreement Map (Government of Newfoundland and Labrador 2010) and the New Dawn Agreement/Tshash Petapen Agreement Map (Government of Newfoundland and Labrador 2008) were also reviewed as part of the desktop review to identify areas with potential Indigenous cultural heritage value.

Information requests were submitted to identify known built heritage resources, cultural heritage landscapes, registered/designated cultural/heritage resources within and adjacent to the study area.

4.0 RESULTS

The study area was screened for the presence of known or potential built heritage resources. The information gathering results are presented in Section 4.1, the desktop data collection results are presented in Section 4.2, and a summary of the results is presented in Table 4-1.

4.1 Information Gathering

Information gathering emails were sent to the Heritage Foundation of Newfoundland and Labrador, the Ministry of Tourism, Culture, Arts and Recreation Register of Provincial Historic Sites, and Office of Indigenous Affairs and Reconciliation, Government of Newfoundland & Labrador.

Andrea O'Brien, Outreach/Provincial Registrar with the Heritage Foundation of Newfoundland & Labrador responded to WSP's information gathering request on February 23 and March 18, 2024. In their response it was confirmed that Heritage Newfoundland & Labrador has not designated any structures in the study area. Andrea O'Brien further noted that WSP should contact the Provincial Archaeology Office (PAO) to verify these results.

Scott Andrews, Manager, Provincial Historic Sites at the Ministry of Tourism, Culture, Arts and Recreation acknowledged the information gathering request on February 26, 2024, and confirmed that there are no registered heritage sites with the Province in the study area. Scott Andrews also forwarded the request to the PAO.

Owen Savage, Senior Analyst, Office of Indigenous Affairs and Reconciliation, acknowledged the information gathering request on March 4, 2024. Owen Savage noted that the Provincial Archaeology Office (PAO) department would be best positioned to respond to the request and forwarded the email to Jamie Brake. On March 19, 2024, Jamie Blake confirmed that the PAO has no records of non-archaeological heritage sites in the study area.

4.2 Desktop Data Collection

The review of the Canadian Heritage Rivers list determined that there are no designated Canadian Heritage Rivers within or adjacent to the study area (Canadian Heritage Rivers n.d.).

The review of Heritage Foundation of Newfoundland and Labrador Heritage Property Register determined that there are no registered heritage properties within or adjacent to the study area (Heritage NL 2023).

The review of the Labrador Inuit Land Claims Agreement Map determined that the study area is outside of the identified Labrador Inuit Lands and Labrador Inuit Settlement Area (Government of Newfoundland and Labrador 2010).

The review of the Ministry of Tourism, Culture, Arts and Recreation List of Archaeology Sites determined that there are no registered archaeological sites within a 10 km radius of the study area (Government of Newfoundland and Labrador n.d.a, 2023).

The review of the Ministry of Tourism, Culture, Arts and Recreation Register of Provincial Historic Sites determined that there are no registered provincial historic sites within or adjacent to the study area (Government of Newfoundland and Labrador n.d.b.).

The review of the New Dawn Agreement/Tshash Petapen Agreement Map determined that the study area is located outside of the identified Labrador Innu Lands, Labrador Innu Settlement Area, and Category 3 lands (subject to migratory species harvesting rights) (Government of Newfoundland and Labrador 2008). However, the background research determined that the region of Little Wabush Lake and Duley Lake was occupied by an Innu family as recently as the early 1960s (Venovcevs 2022:233).

The review of the Canadian Heritage Rail Stations of Canada Database determined that there are no designated heritage rail stations within or adjacent to the study area (Government of Canada 2022).

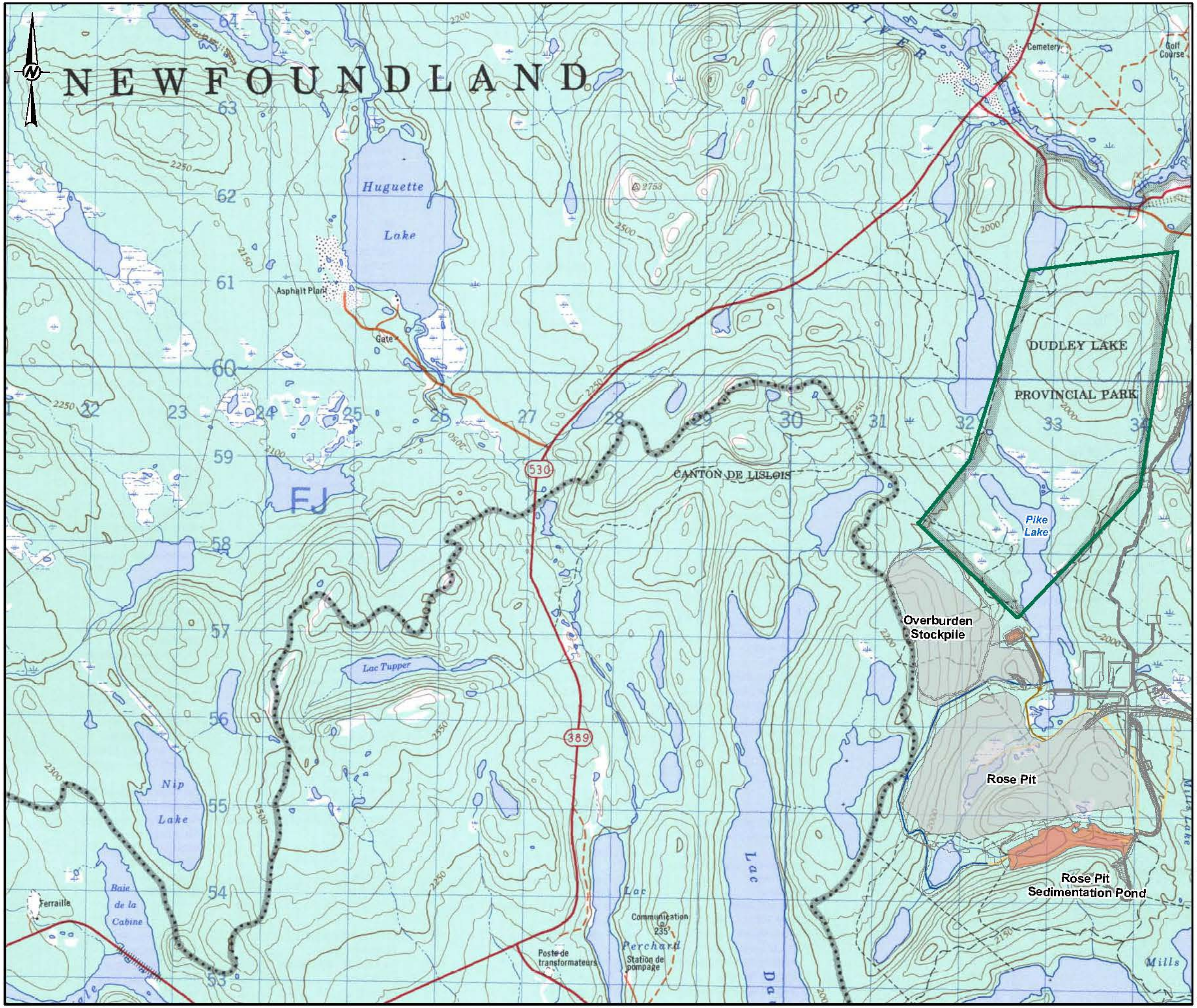
The review of the Heritage Lighthouses in Canada database determined that there are no designated heritage lighthouses within or adjacent to the study area (Government of Canada 2024)

The review of the National Historic Sites database determined that there are no National Historic Sites within or adjacent to the study area (Government of Canada 2023b).

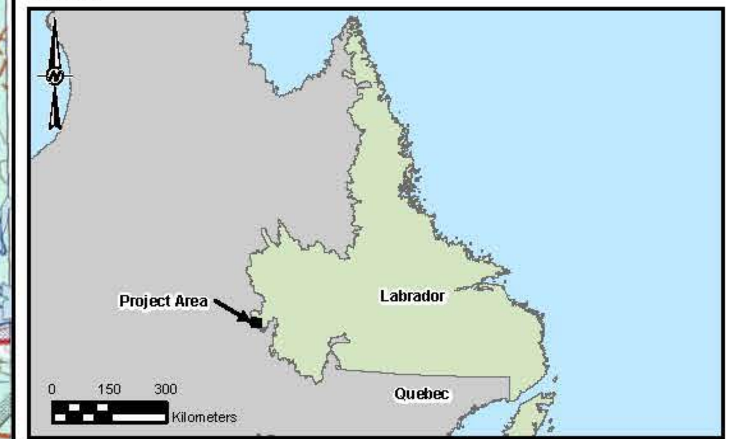
The review of UNESCO's World Heritage List determined that there are no listed UNESCO World Heritage Sites within or adjacent to the study area (UNESCO 1992-2023).

The review of the historical mapping (Eaton 1895, 1896) and historical aerial photographs from 1949 from the National Air Photo Library (Government of Canada n.d.) did not identify potential historical built heritage resources or cultural heritage landscapes within the study area.

The review of the National Topographic System mapping shows that the study area is adjacent properties that are over 40 years old (Figure 4-1 to Figure 4-3), including the Duley Lake Provincial Park and Elephant Head Lake campground (Department of Energy, Mines and Resources 1983). The Duley Lake Provincial Park was created in 1975 to "provide a foundation for spiritual, scientific, educational, recreational and visitor opportunities" (Government of Canada 2023a). The study area is located in the vicinity of the Elephant Head Lake campground, multiple warehouses located west of 1st Avenue, and is within 100 m of a private cabin located on the east shore of Long Lake (Department of Energy, Mines and Resources 1990). The background research did not determine the date of the Elephant Head Lake campground, or the latter mentioned structures. The features shown on the Flora Lake National Topographic map sheet are current as of 1988, making these features at least 35 years old at the time of writing (Department of Energy, Mines and Resources 1990). Elephant Head Lake campground was popular locally for family camping in the summer (CBC 2014).



KEY MAP



SCALE 1:20,000,000

PROJECT DATA

- Proposed Infrastructure
- Proposed Railway
- Contact Water
- Non-Contact Water
- Treated Water
- Proposed Infrastructure
- Proposed Sedimentation Pond
- Duley Lake Provincial Park (Current Boundaries)

0 462.5 925 1,850

1:44,083 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - NL
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT

CHAMPION IRON MINES

PROJECT

KAMI IRON ORE PROJECT
WABUSH, NL

TITLE

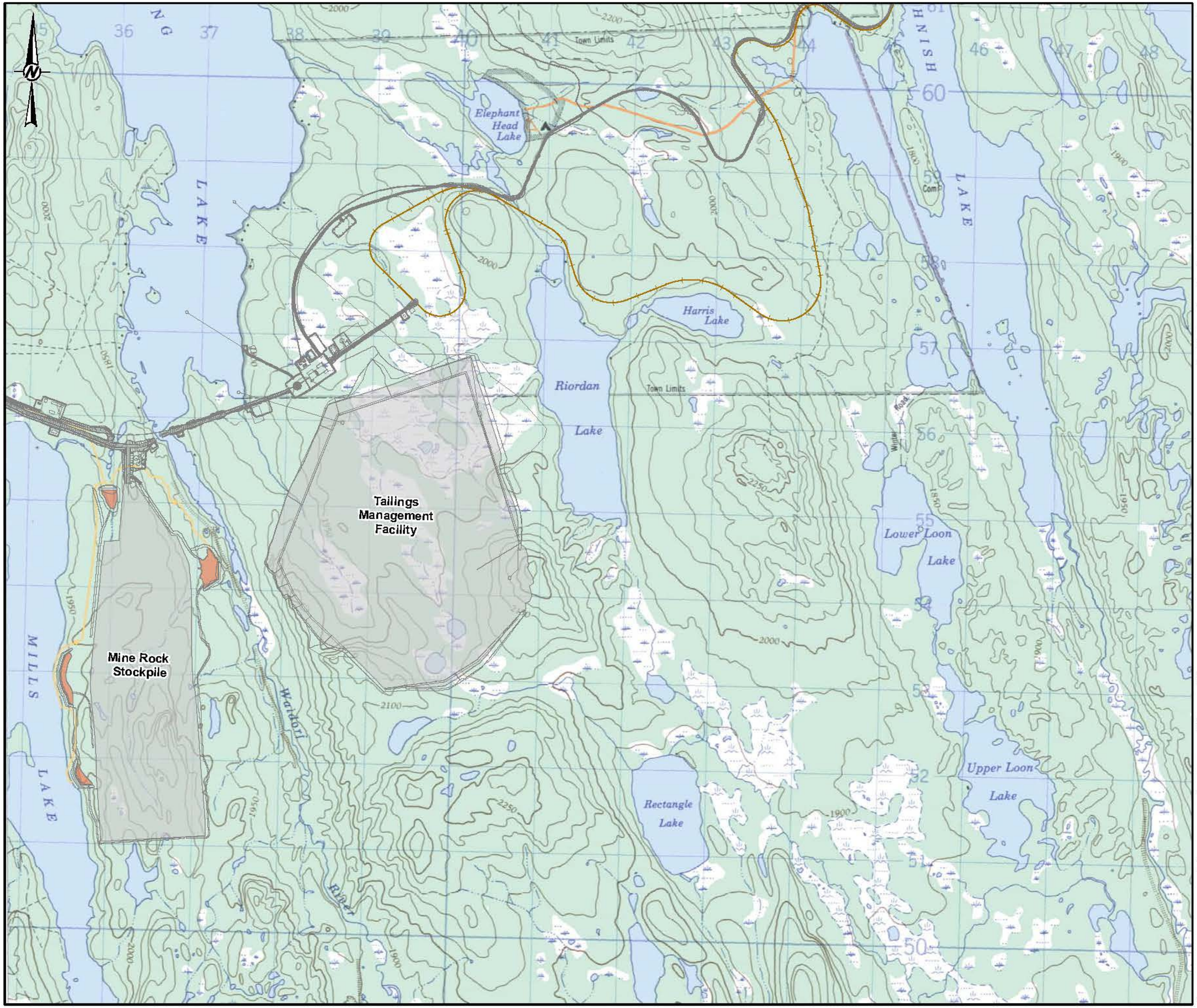
LOCATION OF THE STUDY AREA ON THE 1983 NTS MAP

CONSULTANT

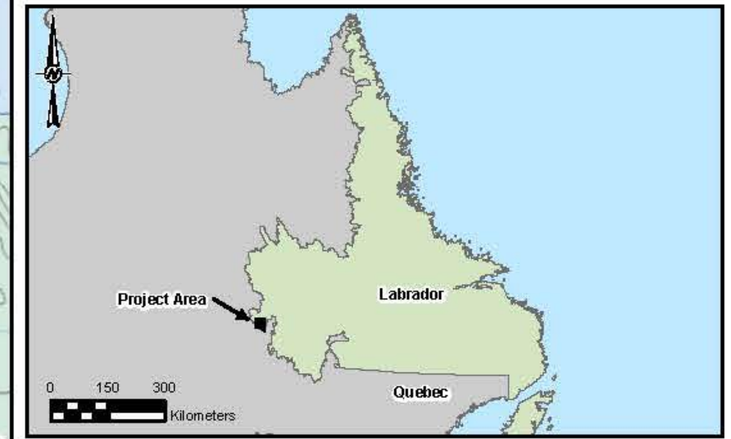
wsp

YYYY-MM-DD	2024-03-20
DESIGNED	----
PREPARED	JMA
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
TE23930010	0001	A	4-1



KEY MAP



SCALE 1:20,000,000

PROJECT DATA

- Proposed Infrastructure
- Proposed Railway
- Contact Water
- Non-Contact Water
- Treated Water
- Proposed Infrastructure
- Proposed Sedimentation Pond

0 475 950 1,900

1:45,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT
CHAMPION IRON MINES

PROJECT
KAMI IRON ORE PROJECT
WABUSH, NL

TITLE
LOCATION OF THE STUDY AREA ON THE 1990 NTS MAP

CONSULTANT

YYYY-MM-DD	2024-03-20
DESIGNED	----
PREPARED	JMA
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
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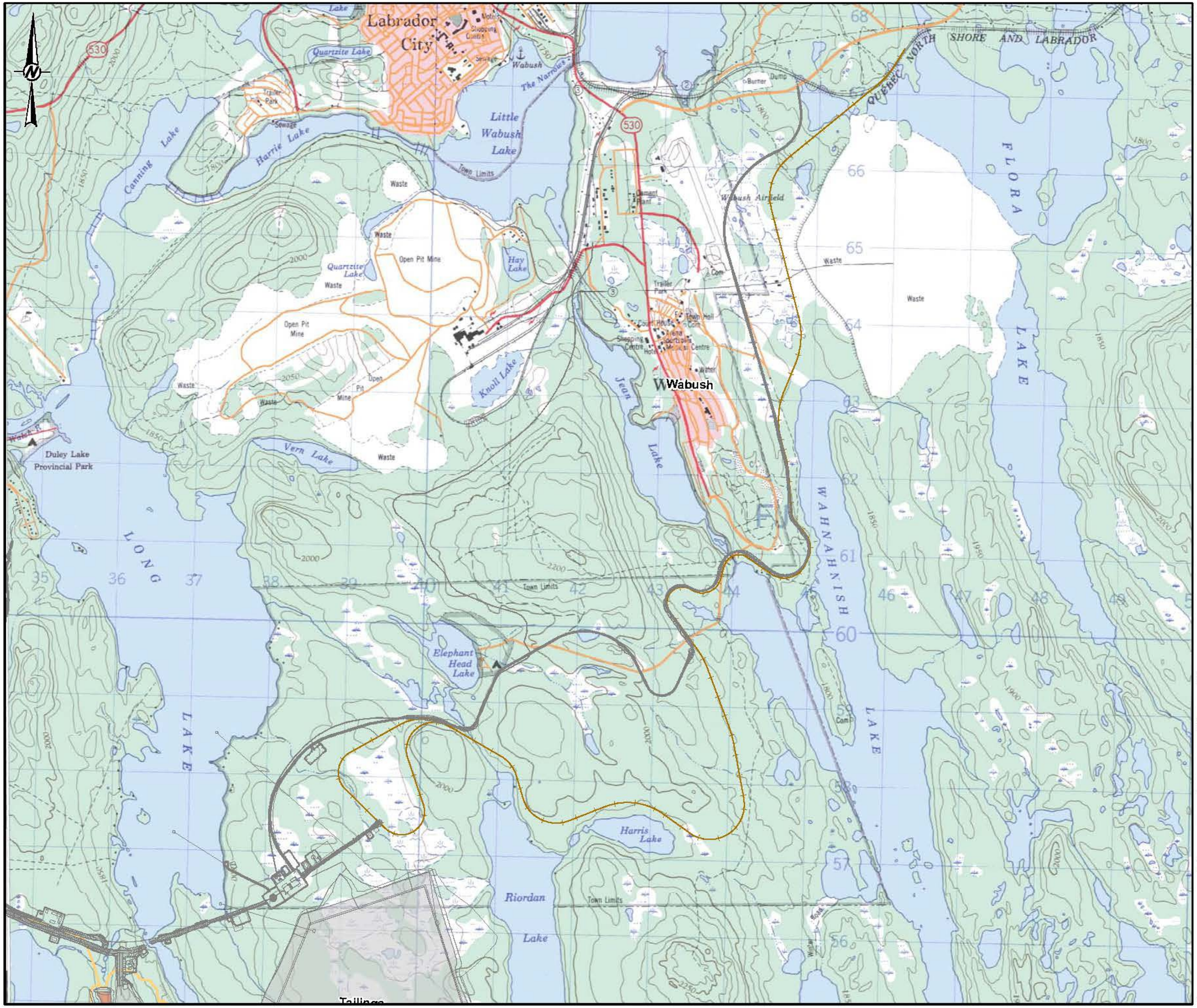
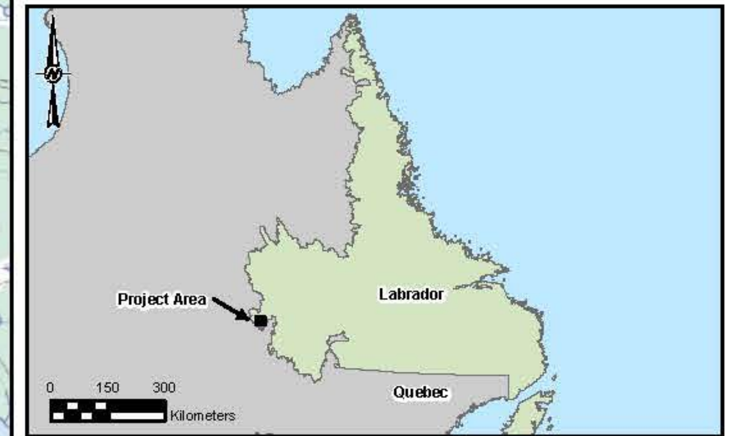


KEY MAP



SCALE 1:20,000,000

PROJECT DATA

- Proposed Infrastructure
- Proposed Railway
- Contact Water
- Non-Contact Water
- Treated Water
- Proposed Infrastructure
- Proposed Sedimentation Pond

0 500 1,000 2,000
1:50,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. IMAGERY CREDITS:
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT
CHAMPION IRON MINES

PROJECT
KAMI IRON ORE PROJECT
WABUSH, NL

TITLE
LOCATION OF THE STUDY AREA ON THE 1990 NTS MAP

CONSULTANT

wsp

YYYY-MM-DD	2024-03-20
DESIGNED	----
PREPARED	JMA
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
TE23930010	0001	A	4-3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

4.3 Summary of Cultural Heritage Screening

Based on the results of information gathering and desktop data collection, there are no indicators of known or potential built heritage resources or cultural heritage landscapes in the study area (Table 4-1). While there are properties with structures and landscape elements that are over 40 years old in the vicinity of the Study Area (Dudley Lake Provincial Park and Elephant Head Lake campground), these properties were established relatively recently (mid- to late 20th century) and are not anticipated to be impacted by the Project.

Table 4-1: Summary of Desktop Cultural Heritage Screening Results

SCREENING QUESTIONS	YES	NO
1. Is there a pre-approved screening checklist, methodology or process in place?		✓
Part A: Screening for known (or recognized) Cultural Heritage Value		
2. Has the Study Area been evaluated before and not found to be of cultural heritage value?		✓
3. Is the Study Area:		
a. Identified, designated or otherwise protected through the 'Heritage Foundation of Newfoundland and Labrador Heritage Property Register' or 'Ministry of Tourism, Culture, Arts and Recreation Provincial Historic Sites Register'?		✓
b. A National Historic Site (or part of)?		✓
c. Designated under the Heritage Railway Stations Protection Act?		✓
d. Designated under the Heritage Lighthouse Protection Act?		✓
e. Identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office (FHBRO)?		✓
f. Located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?		✓
Part B: Screening for Potential Cultural Heritage Value		
Does the property (or project area) contain a parcel of land that:		
a. Is the subject of a municipal, provincial or federal commemorative or interpretive plaque?		✓
b. Has or is adjacent to a known burial site and/or cemetery?		✓
c. Is in a Canadian Heritage River watershed?		✓
d. Contains buildings or structures that are 40 or more years old?		✓
Part C: Other Considerations		
Is there local or Indigenous knowledge or accessible documentation suggesting that the property (or project area):		
a. Is considered a landmark in the local community or contains any structures or sites that are important in defining the character of the area?		✓
b. Has a special association with a community, person, or historical event?		✓
c. Contains or is part of a cultural heritage landscape?		✓

5.0 KEY FINDINGS

The desktop information gathering and data collection determined that there are no known or potential built heritage resources or cultural heritage landscapes within the study area. The study area is in the vicinity of two properties that are over 40 years old (Dudley Lake Provincial Park and Elephant Head Lake campground), but these properties appear to have been established relatively recently (mid- to late 20th century), have not been identified as having potential heritage significance by stakeholders, and will not be impacted by the Project.

SIGNATURE PAGE

We trust that the information presented in this memo meets your current requirements. Should you have any questions, or concerns, please do not hesitate to contact the undersigned.

WSP Canada Inc.

Paul David Ritchie, MA
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paul.ritchie@wsp.com

Heidy Schopf, MES, CAHP
Cultural Heritage Team Lead
heidy.schopf@wsp.com

PD/HS/sp

https://wsponlinecan.sharepoint.com/sites/ca-kamieaca00030925894/shared documents/04_issued to client/12_project registration_final/01_appendices/appendix m_cultual heritage screening report/ca00030925894-r-rev0-final_cultural_heritage_screening_report_april2024.docx

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CHAMPION IRON

wsp

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APPENDIX O

Socio-economic Baseline Report

REPORT

Socio-economic Baseline Report

Kami Iron Ore Mine Project

Submitted to:

Champion Iron Mines Ltd.
1155 René-Lévesque Blvd. West
Suite 3300
Montréal, QC H3B 3X7

Submitted by:

WSP Canada Inc.
25 York St.
Suite 700
Toronto, ON M5J 2V5

April 2024

Distribution List

Champion Iron Mine Ltd.

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EXECUTIVE SUMMARY

This Socio-Economic Baseline Conditions Report characterizes the social and economic conditions in the municipalities, regions, and Indigenous communities with the potential to be impacted by the Kamistiatusset (Kami) Iron Ore Mine Project (the Project).

Demographics

According to the 2021 Census, the average age for men+ in the Local Study Area (LSA) municipalities ranged from 33.8 to 37.6, and the average age for women+ ranged from 32.0 to 38.0; in the Regional Study Area (RSA) regions, the average age for men+ ranged from 38.6 to 40.8, and the average age for women+ ranged from 39.1 to 41.6; and in the Indigenous communities, the average age for men+ ranged from 25.2 to 36.0, and the average age for women+ ranged from 25.0 to 35.3 (Statistics Canada, 2022h, 2022h, 2022a, 2022d, 2022d, 2022j, 2022i, 2022g, 2022f, 2022e).

In the LSA municipalities, the median age for men+ ranged from 34.8 to 38.4, and the median age for women+ ranged from 32.8 to 38.8; in the RSA regions, the median age for men+ ranged from 38.8 to 41.6, and the median age for women+ ranged from 39.6 to 42.4; and in the Indigenous communities, the median age for men+ ranged from 20.8 to 35.2, and the median age for women+ ranged from 21.8 to 34.4 (Statistics Canada, 2022h, 2022h, 2022a, 2022d, 2022d, 2022j, 2022i, 2022g, 2022f, 2022e).

In the LSA municipalities, between 86.5% and 91.8% of respondents to the 2021 Census reported not moving in the previous year; in the RSA regions, between 88.4% and 90.1% reported not moving in the previous year; and in the Indigenous communities, between 86.4% and 94.9% reported not moving in the previous year (Statistics Canada, 2022h, 2022h, 2022a, 2022d, 2022d, 2022j, 2022i, 2022g, 2022f, 2022e).

The average household size ranged from 2.3 to 2.5 persons in the LSA municipalities, 2.2 to 2.5 persons in the RSA regions, and 3.0 to 4.4 persons in the Indigenous communities. In the LSA municipalities, between 59.2% and 84.0% of respondents were owners of their households; in the RSA regions, between 63.3% and 70.6% were owners of their households; and in the Indigenous communities, between 5.1% and 37.1% were owners of their households. In the LSA municipalities, between 98.4% and 98.4% of respondents reported their housing as being suitable; in the RSA regions, between 96.8% and 97.8% reported their housing as being suitable; in the Indigenous communities, between 76.9% and 89.9% of respondents reported their housing as being suitable (Statistics Canada, 2022h, 2022h, 2022a, 2022d, 2022d, 2022j, 2022i, 2022g, 2022f, 2022e).

In the LSA municipalities, between 12.0% and 33.7% of respondents to the 2021 Census reported knowing both official languages; in the RSA regions, between 7.6% and 27.7% reported knowing both official languages; and in the Indigenous communities, between 1.2% and 29.7% reported knowing both official (Statistics Canada, 2022h, 2022h, 2022a, 2022d, 2022d, 2022j, 2022i, 2022g, 2022f, 2022e). In the Indigenous communities, the rate of individuals speaking Indigenous languages most often at home ranged from 32.2% to 83.3% (Statistics Canada, 2022h, 2022h, 2022a, 2022d, 2022d, 2022j, 2022i, 2022g, 2022f, 2022e).

For men+ the LSA municipalities, the largest proportion of the population 15 years and over had an apprenticeship or trades certificate or diploma as their highest educational attainment, with a range of 31.9% to 48.7%. For women+ in the LSA municipalities, the largest proportion of the population 15 years and over had a secondary school diploma or equivalency, or a college or non-university certificate, as their highest educational attainment, with ranges of 23.9% to 30.2%, and 25.3% to 28.0%, respectively (Statistics Canada, 2022h, 2022h, 2022a, 2022d, 2022d, 2022j, 2022i, 2022g, 2022f, 2022e).

For men+ the RSA regions, the largest proportion of the population 15 years and over had an apprenticeship or trades certificate or diploma, or a college or non-university certificate, as their highest educational attainment, with ranges of 22.8% to 27.8%, and 19.7% to 28.0%, respectively. For women+ in the RSA regions, the largest proportion of the population 15 years and over had a college or non-university certificate as their highest educational attainment, with a range of 22.8% to 28.1% (Statistics Canada, 2022h, 2022h, 2022a, 2022d, 2022d, 2022j, 2022i, 2022g, 2022f, 2022e).

For men+ and women+ the Indigenous communities, the largest proportion of the population 15 years and over did not have a certificate, diploma, or degree, with ranges of 27.5% to 59.3%, and 27.5% to 58.5%, respectively (Statistics Canada, 2022h, 2022h, 2022a, 2022d, 2022d, 2022j, 2022i, 2022g, 2022f, 2022e).

Community Services and Infrastructure

Residents and visitors in the LSA municipalities, RSA regions, and Indigenous communities have access to several recreation and leisure facilities (including community centres, libraries, and museums), social services (including crisis centres and counselling services), health services (including hospital and Public Health (Preventive Measures, Health Education, and Community Health Services and facilities), education services (primary, secondary, and post-secondary), employment and economic development services (including employment and recruitment services), housing services (affordable housing and financial assistance), temporary accommodations (including hotels), emergency services (including police, fire, and EMS services), and transportation and utilities (including communication and transportation services).

Economy, Employment, and Business

According to the 2021 Census, the labour force participation rate in the LSA municipalities ranged from 78.3% to 86.0% for men+, and 66.5% to 78.7% for women+; in the RSA regions, it ranged from 66.4% to 72.4% for men+, and 60.4% to 65.0% for women+; and in the Indigenous communities, it ranged from 45.5% to 67.6% for men+, and 46.1% to 63.8% for women+ (Statistics Canada, 2022h, 2022h, 2022a, 2022d, 2022d, 2022j, 2022i, 2022g, 2022f, 2022e).

In the LSA municipalities, the unemployment rate ranged from 1.8% to 4.7% for men+, and 4.1% to 6.5% for women+; in the RSA regions, it ranged from 6.1% to 13.1% for men+, and 5.2% to 11.0% for women+; and in the Indigenous communities, it ranged from 13.0% to 33.3% for men+, and 7.7% to 16.7% for women+ (Statistics Canada, 2022h, 2022h, 2022a, 2022d, 2022d, 2022j, 2022i, 2022g, 2022f, 2022e).

For men+ in the study areas, mining, quarrying, and oil and gas extraction, and public administration, were the top industries. For women+ in the study areas, mining, quarrying, and oil and gas extraction;

health care and social assistance; and public administration were the top industries (Statistics Canada, 2022h, 2022h, 2022a, 2022d, 2022d, 2022j, 2022i, 2022g, 2022f, 2022e).

For men+ in the study areas, trades, transport and equipment operators, and related occupations was the top occupation category. For women+ in the study areas, sales and service occupations, and occupations in education, law, and social, community, and government services, were the top occupation categories (Statistics Canada, 2022h, 2022h, 2022a, 2022d, 2022d, 2022j, 2022i, 2022g, 2022f, 2022e).

For men+, employment income accounted for between 88.4% and 96.4% in the LSA municipalities, 77.0% and 83.4% in the RSA regions, and 60.0% and 78.0% in the Indigenous communities. For women+, employment income accounted for between 78.8% and 84.0% in the LSA municipalities, 65.8% and 72.6% in the RSA regions, and 43.6% and 68.4% in the Indigenous communities (Statistics Canada, 2022h, 2022h, 2022a, 2022d, 2022d, 2022j, 2022i, 2022g, 2022f, 2022e).

In the LSA municipalities, median and average employment incomes ranged from $120,000 and $115,600 to $144,00 and $137,500 for men+, and from $60,000 and $66,000 to $73,000 and $73,600 for women+. In the RSA regions, the median and average employment incomes ranged from $89,000 and $91,400 to $101,00 and $104,000 for men+, and from $51,600 and $58,400 to $57,600 and $63,550 for women+. In the Indigenous communities, the median and average employment incomes ranged from $43,600 and $40,000 to $79,000 and $85,800 for men+, and from $33,200 and $36,00 to $51,600 and $56,600 for women+ (Statistics Canada, 2022h, 2022h, 2022a, 2022d, 2022d, 2022j, 2022i, 2022g, 2022f, 2022e).

Table of Contents

TABLES

FIGURES

ACRONYMS AND ABBREVIATIONS

Acronym or Abbreviation	Definition
ARINEQA	Agreement Respecting the Implementation of the Northeastern Québec Agreement
Aug.	August
CBC	Canadian Broadcasting Corporation
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
CLD	Centre local de développement
EIS	Environmental Impact Statement
EMS	Emergency medical services
FNIGC	First Nation Information Governance Centre
GBA+	Gender-Based Analysis Plus
IBA	Impacts and Benefits Agreement
IOC	Iron Ore Company of Canada
ITUM	Innu Takuaikan Uashat mak Mani-Utenam
km	Kilometres
LMA	Labrador Métis Association
LMN	Labrador Métis Nation
LSA	Local Study Area
MOU	Memorandum of Understanding
MRC	Municipalité régionale de comté
N/A	Not applicable
NANL	Native Association of Newfoundland and Labrador
NCC	NunatuKavut Community Council
NEQA	Northeastern Québec Agreement
NIMLJ	La Nation Innu Matimekush-Lac John
NMIA	Naskapi Montagnais Innu Association
NNK	Naskapi Nation of Kawawachikamach
Nov.	November
OCAP®	Ownership, Control, Access, and Possession
PTO	Provincial-Territorial Organization
RCSCC	Royal Canadian Sea Cadet Corps
RSA	Regional Study Area
Sept.	September

1.0 INTRODUCTION

The Kamistiatusset (Kami) Iron Ore Mine Project (the Project) is a proposed iron ore mine in Newfoundland and Labrador. The Project site is located entirely in Labrador, approximately seven kilometres from the Town of Wabush, 10 kilometres from the Town of Labrador City, and five kilometres east of Ville de Fermont, Québec (Figure 1.1).

The Project was originally proposed by the Alderon Iron Ore Corporation (Alderon) and underwent a provincial and federal environmental impact assessment from 2011 to 2013, including a comprehensive baseline program that was completed in 2011 and 2012. The Project was released from the provincial and federal EA process in 2014. In 2021, Champion Iron Mines Ltd. (Champion) completed the acquisition of the Project from Alderon.

Champion is proposing several optimizations to the Project design proposed by Alderon through the previous Environmental Impact Study (EIS). These proposed optimizations include improvements to the Project's water management strategy and modernization of the proposed ore handling, conveyance, and processing. Champion's objective for the Kami Project is to produce high purity (>67.5%) iron ore concentrate, which can be used as direct reduction pellet feed for electric arc furnaces in the green steel supply chain. Champion is planning to submit a Project Registration to the Newfoundland and Labrador Environmental Assessment Division of the Department of the Environment and Climate Change (the Department) in 2024.

To support the Project Registration and assessment of effects from the revised Project design optimizations, Champion has commissioned the services of WSP Canada Inc. to complete a comprehensive baseline that documents the existing natural and socio-economic environments in the anticipated area of the Project. This Socio-Economic Baseline Report represents a component of the comprehensive baseline program and was undertaken to provide context from which Project socio-economic effects could be evaluated in the Project Registration.

Figure 1.1 outlines some of the main activities of the Project site including:

- Open pit (Rose Pit);
- Mine rock stockpile;
- Ore stockpiles (operational, low-grade and emergency);
- Tailings management facility;
- Overburden stockpile;
- Processing infrastructure including crushing and concentrating;
- Ancillary infrastructure to support the mine and process plant.

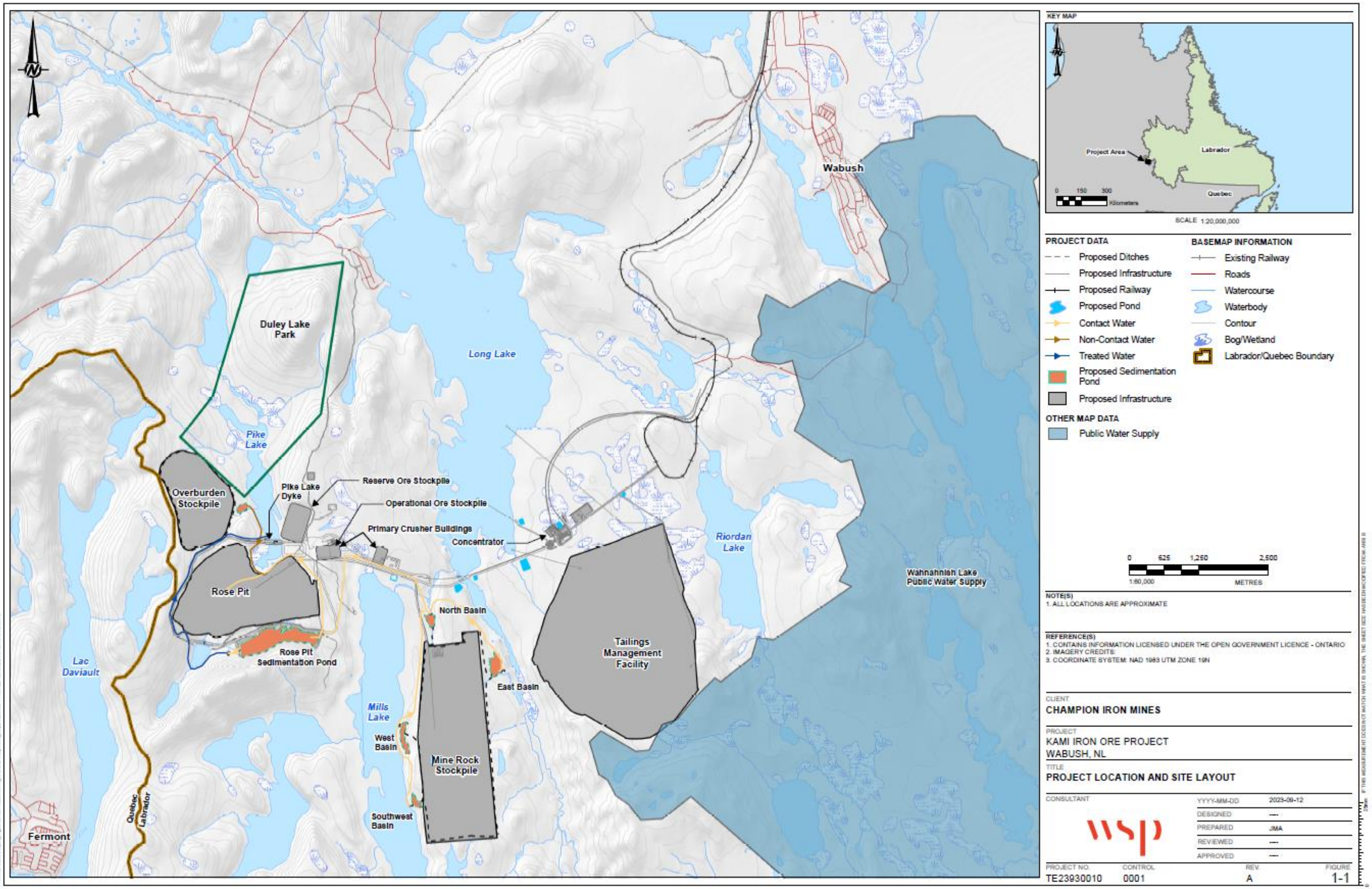


Figure 1-1: Project Location and Site Layout

2.0 RATIONALE AND OBJECTIVES

Champion is undertaking a feasibility study and re-entering the provincial environmental assessment process for the Project. The purpose of this Socio-economic Baseline Report (Baseline Report) is to characterize the existing local and regional community social and economic conditions, which will support the assessment of project and cumulative effects in the updated Project Registration.

2.1 Previous Studies

Socio-economic baseline studies conducted by Alderon for the Project's previous EIS included statistics drawn from the 2006 Census, the 2011 Census, and the 2011 National Household Survey (Alderon Iron Ore Corp., 2012). Portions of the Alderon Baseline Study have been used to inform the approach of this baseline study; however, this Baseline Report includes updated statistics drawn from the 2016 and 2021 Censuses. This Baseline Report also includes updated information regarding community governance, services, and infrastructure. The Indigenous communities and municipalities researched in this Baseline Report are based on the communities assessed in the previous Alderdon baseline study and have informed the delineation of the Local Study Area (LSA) and Regional Study Area (RSA) (Alderon Iron Ore Corp., 2012). Portions of the Alderon study examined the Towns of Labrador City and Wabush collectively as "Labrador West"; this Baseline Report examines the two municipalities separately throughout, to reflect the distinct histories and demographics of the neighbouring municipalities.

3.0 STUDY AREA

Spatial boundaries define the geographic extent within which potential socio-economic effects of the Project may be experienced. This report documents socio-economic baseline conditions for the Project's LSA and RSA.

The LSA is the maximum area within which Project-related effects can be predicted or measured with a reasonable degree of accuracy. The RSA is the area within which cumulative effects may occur. Socio-economic spatial boundaries in this Baseline Report are defined by the administrative boundaries for which data is available, as described below.

Based on these understandings, and consistent with the Project's 2013 environmental impact assessment, the LSA for this Baseline Report includes the following three municipalities in proximity to the Project site:

- Town of Labrador City,
- Town of Wabush, and
- Ville de Fermont.

A map of the LSA municipalities, in relation to the Project site, can be found in Figure 3-1.

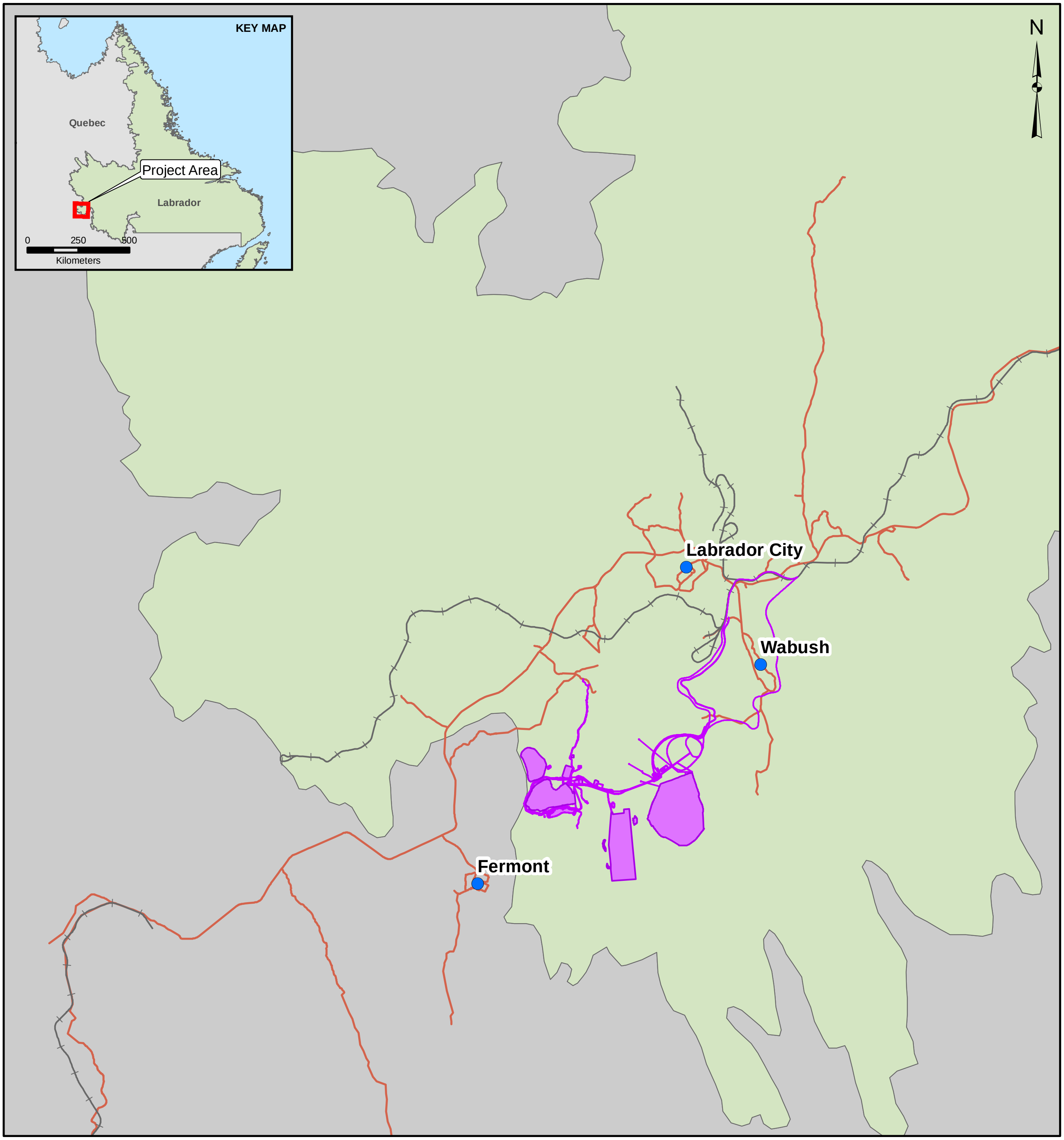
The province of Newfoundland and Labrador has a duty to consult, and where appropriate, accommodate Indigenous groups when it considers conduct that might adversely impact potential or established Indigenous or treaty rights. During the previous EA, five Indigenous groups were identified by the former CEA Agency as having potential Indigenous and/or treaty rights that could be adversely affected by the Project. These include:

- Innu Takuaikan Uashat mak Mani-Utenam (ITUM),
- La Nation Innu Matimekush-Lac John (NIMLJ),
- Innu Nation,
- Naskapi Nation of Kawawachikamach (NNK), and
- NunatuKavut Community Council (NCC).

Champion has confirmed with the Newfoundland and Labrador Office of Indigenous Affairs and Reconciliation that the Indigenous groups previously identified for engagement in 2011 for the previous EA remain the same.

Currently, no Indigenous groups have a settled land claim including the Project area; however, the five aforementioned Indigenous communities have asserted Aboriginal rights in or near the Project area (Alderon Iron Ore Corp., 2012). Two of the Indigenous communities reside in Labrador (Innu Nation and NCC), and three reside in Québec (ITUM, NIMLJ, and NNK). Figure 3-2 shows the location of the Project in relation to the reserve lands of the Innu Nation, ITUM, NIMLJ, and NNK. The NCC do not have defined reserve lands and are therefore not represented in the figure.

The RSA for this Baseline Report includes Census Division No. 10, Newfoundland and Labrador, and Sept-Rivières—Caniapiscau. A map of the RSA in relation to the Project site can be found in Figure 3-3.



LEGEND

- LSA Municipalities
- Road
- Existing Railway
- Kami Mine Site Proposed Infrastructure
- Kami Mine Site Proposed Linear Infrastructure

0 1,900 3,800 7,600
1:300,000 Meters

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION PROVIDED BY THE CLIENT
2. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT
CHAMPION IRON

PROJECT
KAMI IRON ORE PROJECT
WABUSH, NL

TITLE
SOCIO-ECONOMIC LOCAL STUDY AREA MUNICIPALITIES

CONSULTANT
wsp

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PROJECT NO.	CONTROL	REV.	FIGURE
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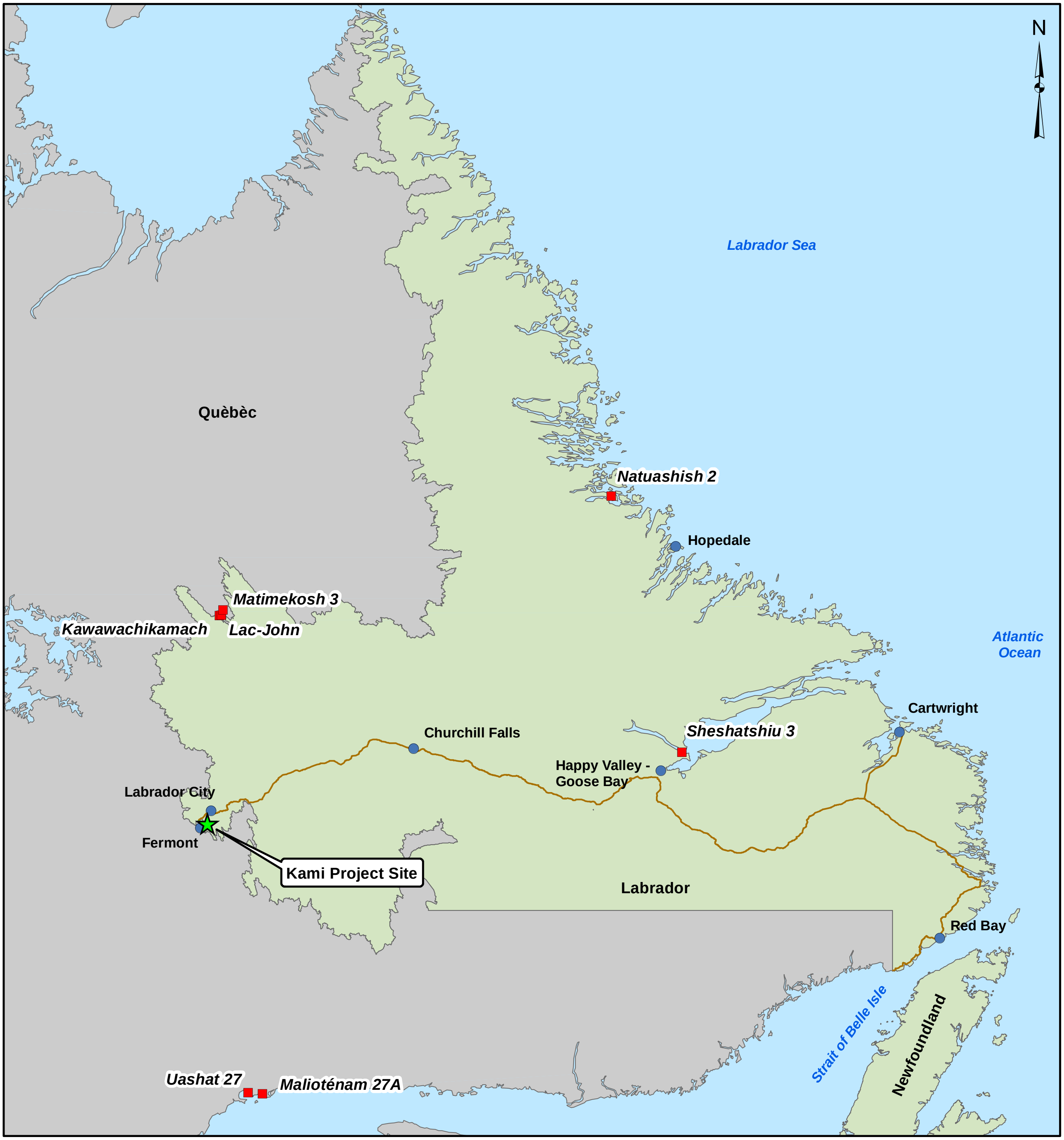

LEGEND

- Kami Project Site
- Indigenous Reserves
- Select Communities
- TransLabrador Highway

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1:6,425,000 Kilometers

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION PROVIDED BY THE CLIENT
2. COORDINATE SYSTEM: WORLD GALL STEREOGRAPHIC

CLIENT
CHAMPION IRON

PROJECT
KAMI IRON ORE PROJECT
WABUSH, NL

TITLE
SOCIO-ECONOMIC LOCAL STUDY AREA INDIGENOUS RESERVES

CONSULTANT
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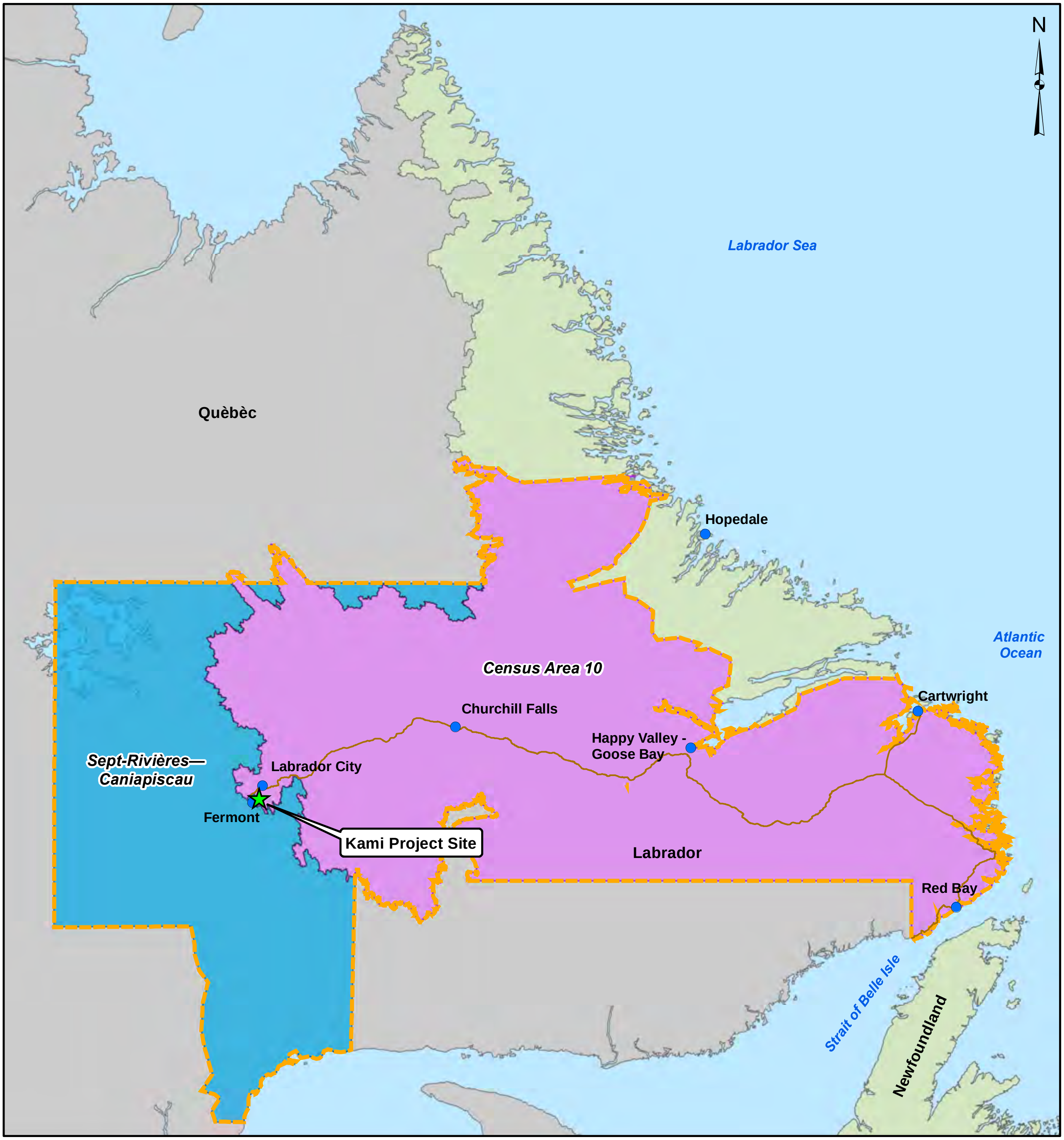

LEGEND

- Kami Project Site
- RSA
- Select Communities
- TransLabrador Highway
- Census Area 10
- Sept-Rivières—Caniapiscau

0 35 70 140
1:6,750,000 Kilometers

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION PROVIDED BY THE CLIENT
2. COORDINATE SYSTEM: WORLD GALL STEREOGRAPHIC

CLIENT
CHAMPION IRON

PROJECT
KAMI IRON ORE PROJECT
WABUSH, NL

TITLE
SOCIO-ECONOMIC REGIONAL STUDY AREA

CONSULTANT
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4.0 METHODS

The following sections provide an overview of the information sources, limitations, and validation methods for this Baseline Report, in addition to outlining how Gender-Based Analysis Plus considerations have been applied to this work.

Section 5 of this Baseline Report will provide overviews of demographics, community services and infrastructure, and economic conditions in the municipalities and regions in the LSA and RSA. Section 6 of this Baseline Report will provide overviews of demographics, community services and infrastructure, and economic conditions for the Indigenous communities that have asserted Aboriginal rights in or near the Project area.

4.1 Information Sources

Overview information for Indigenous communities has been drawn from the First Nations Profiles available on the Crown-Indigenous and Northern Affairs Canada (CIRNAC) website, provincial government websites, and the Indigenous communities' websites, where available. Community overviews for the municipalities in the LSA and RSA have largely been drawn from the municipalities' websites and provincial government websites.

The statistics presented in Sections 5.1, 5.3, 6.1, and 6.3 are primarily sourced from the 2016 and 2021 Censuses. Census data for the Innu and Naskapi communities in Sections 6.1 and 6.3 is available for on-reserve community members. Census data for Indigenous Peoples living off reserve is represented in the social and economic condition profiles of the municipalities in which they reside.

Demographic data for NCC members was drawn from self-identified Inuit individuals living in Census Division No. 10, Newfoundland and Labrador, as that Census division most closely aligns with the NCC traditional territory (NunatuKavut Community Council, 2023). This data includes both NCC community members who self-identified as Inuit in the 2016 and 2021 Census, and members of other Inuit communities, including Nunatsiavut Inuit, living in that Census division.

In Sections 5.2 and 6.2, numerous sources were used to outline available resources for individuals living on Indigenous reserves and in the municipalities in the LSA, including municipal websites, organization websites, and public databases.

4.2 Gender-Based Analysis Plus

Gender-Based Analysis Plus (GBA+) is an analytical tool for assessing systemic inequalities. GBA+ considers intersecting identity factors such as gender, race, ethnicity, age, and mental or physical disabilities, and seeks to understand how individuals may experience policies, programs, and initiatives differently. A GBA+ lens has been applied in the drafting of this Baseline Report, as information has been included and, where possible, disaggregated in a way allowing for greater understanding of how baseline conditions in the LSA and RSA differ based on gender and other identity factors.

4.3 Information Limitations

Statistics Canada is prohibited by law from releasing any information it collects that could identify any respondent, unless consent has been given by the respondent or as permitted by the Statistics Act (Statistics Canada, 2022a). To prevent unlawful publication or disclosure of information, data may be suppressed for geographic areas with populations below a specified threshold (Statistics Canada, 2022a). Further, counts in Census tabulations undergo random rounding to reduce the possibility of identifying individuals (Statistics Canada, 2022a). For these reasons, values may not equate to the exact totals.

The 2016 Census of Population provided respondents with two categories for gender identity: “male” and “female,” and to select the category with which they most associated themselves or to leave this question unanswered (Statistics Canada, 2017l). As not all individuals were able to see themselves in the two existing responses of “male” and “female,” the 2021 Census of Population included two questions for respondents to identify their sex at birth and current gender (which may differ from the sex assigned at birth and sex indicated on legal documents) (Statistics Canada, 2022c). However, for lower levels of geography, Statistics Canada aggregated responses to a two-category gender variable as “men+” and “women+” to protect the confidentiality of responses from non-binary individuals and prevent disclosure of identifiable data. Consequently, a precise comparison is not possible for gender identity between 2016 and 2021 (Statistics Canada, 2022b).

Limited information was available on community services, infrastructure, and economic sectors for some LSA communities. Housing occupancy and vacancy rates for the LSA municipalities and Indigenous communities were not available at the time of desktop research. Annual financial statements for the Town of Wabush and Ville de Fermont were not available at the time of desktop research.

Data for the Indigenous communities presented in this Baseline Report, including community overviews and Census data, has not been validated by the communities. Census data for the Innu and Naskapi communities does not account for off-reserve community members. Household data for self-identified Inuit People living in Census Division No. 10 was not available at the time of desktop research.

4.4 Information Validation

Indigenous communities described in this Baseline Report will be provided with an opportunity to review and assess the information on their communities, including information drawn from public sources such as Statistics Canada, CIRNAC, and the Indigenous communities’ websites. Information provided by Indigenous communities with the purpose of being included in this Baseline Report will align with the First Nations principles of Ownership, Control, Access, and Possession (OCAP®). As defined by the First Nation Information Governance Centre (FNIGC), OCAP® ensures Indigenous ownership and jurisdiction over their information. Under OCAP®, the principle of Ownership asserts that Indigenous communities own their cultural knowledge, data, and information collectively; the principle of Control affirms that Indigenous communities are within their rights to seek control over all aspects of research, including planning, management, and review; the principle of Access states indicates that Indigenous communities must have access to information and data about themselves, regardless of where that information and data is held; and the principle of Possession refers to the mechanism by which physical control of Indigenous data can be asserted and protected.

5.0 MUNICIPALITIES AND REGIONS

5.1 Community Overviews and Demographics

The sections below provide an overview of demographic information in the LSA municipalities of Labrador City, Wabush, and Fermont, and the RSA regions of Census Division No. 10, Newfoundland and Labrador, and Sept-Rivières—Caniapiscau.

5.1.1 Municipalities

The sections below provide an overview of demographic information in the Town of Labrador City, the Town of Wabush, and Ville de Fermont, including age and gender, migration and mobility, housing, language, and educational attainment.

According to the 2021 Census, the average age for men+ in the LSA municipalities ranged from 33.8 (Fermont) to 37.6 (Labrador City), and the average age for women+ ranged from 32.0 (Fermont) to 38.0 (Labrador City). The median age for men+ ranged from 34.8 (Fermont) to 38.4 (Labrador City), and the median age for women+ ranged from 32.8 (Fermont) to 38.8 (Labrador City).

In the 2021 Census, between 86.5% (Wabush) and 91.8% (Fermont) of respondents to the 2021 Census reported not moving in the previous year. The average household size ranged from 2.3 (Fermont) to 2.5 (Wabush) persons. Between 59.2% (Fermont) and 84.0% (Wabush) of respondents to the 2021 Census were owners of their households; between 98.4% (Labrador City) and 98.4% (Wabush) of respondents reported their housing as being suitable; and between 94.3% (Labrador City) and 98.5% (Fermont) of respondents reported spending less than 30% of their income on shelter costs.

Between 12.0% (Labrador City) and 33.7% (Fermont) of respondents to the 2021 Census reported knowing both official languages. Rates of individuals 15 years and over without a certificate, diploma, or degree ranged from 9.1% (Wabush) to 9.5% (Labrador City) for men+, and 7.7% (Fermont) to 13.7% (Labrador City) for women+. For men+, between 15.5% (Fermont) and 23.6% (Labrador City) reported a secondary school diploma or equivalency as their highest educational attainment; between 31.9% (Labrador City) and 48.7% (Fermont) reported an apprenticeship or trades certificate or diploma; between 19.7% (Fermont) and 28.0% (Wabush) reported a college or non-university certificate; and between 5.5% (Wabush) and 9.5% (Labrador City) reported a Bachelor’s degree or higher. For women+, between 23.9% (Fermont) and 30.2% (Labrador City) reported a secondary school diploma or equivalency as their highest educational attainment; between 9.7% (Wabush) and 23.2% (Fermont) reported an apprenticeship or trades certificate or diploma; between 25.3% (Wabush) and 28.0% (Labrador City) reported a college or non-university certificate; and between 15.5% (Fermont) and 22.7% (Wabush) reported a Bachelor’s degree or higher.

5.1.1.1 Town of Labrador City

5.1.1.1.1 Community Overview

The Town of Labrador City is located near the Québec border in western Labrador, on the shores of Little Wabush Lake. Labrador City was first established as a camp to house temporary workers at the IOC Carole Project in the late 1950s (Labrador West, n.d.-a). Originally exclusively accessible by air, a rail connection was made to Ville de Sept-Îles, Québec, in 1960, shortly before the town’s incorporation as a Local Improvement District (1961) ("Labrador City," 1991). In 1976, a road link was built to Ville de Fermont, Québec ("Wabush," 1994). Labrador City's peak population, in 1980, was approximately 12,000 people; that same year, Labrador City was incorporated as a town ("Labrador City," 1991). The following year, the first municipal elections were held and a population decline began, as the first demand for iron declined ("Labrador City," 1991). In 1992, the first phase of the Trans-Labrador Highway was completed, connecting Labrador City to Churchill Falls and Happy Valley-Goose Bay (Atter, 2022).

With a population of 7,415 according to the 2021 Census, the Town of Labrador City is currently the second-largest population centre in Labrador (Statistics Canada, 2022d). Labrador City and the neighbouring town of Wabush, form the region of Labrador West which is self-described as the "Iron Ore Capital of Canada" (Labrador West, n.d.-a).

Governance

The mayor of Labrador City is Belinda Adam (appointed in 2022), and the deputy mayor is Mitchell Marsh. Elected officials for the municipality are listed in Table 5-1.

Table 5-1: Town of Labrador City Officials

Title	Name	Term
Mayor	Belinda Adams	2022 - 2025
Deputy Mayor	Mitchell Marsh	2021 - 2025
Councillor	Junior Humphries	
Councillor	Ryan Pike	
Councillor	Dawn Willcott	
Councillor	Kim Hartery	
Councillor	Jonathan Riviere	

Source: (Labrador West, n.d.-b)

5.1.1.1.2 Age and Gender

According to the 2021 Census, there were 7,415 individuals living in the Town of Labrador City, of which 3,850 identified as men+ and 3,565 identified as women+ (Statistics Canada, 2022d). The average age was 37.8 (37.6 for men+ and 38.0 for women+) and the median age was 38.4 (38.4 for men+ and 38.8 for women+) (Statistics Canada, 2022d). Labrador City's population increased by 2.7% between the 2016 Census and 2021 Census (Statistics Canada, 2022d). For men+, 40-to-44-year-olds made up the largest percentage of the total population, at 9.4% (Statistics Canada, 2022d). For women+, 35-to-39-year-olds made up the largest percentage of the total population, at 9.1% (Statistics Canada, 2022d). The age distribution for the Town of Labrador City can be found in Figure 5-1, and population characteristics can be found in Table 5-2.

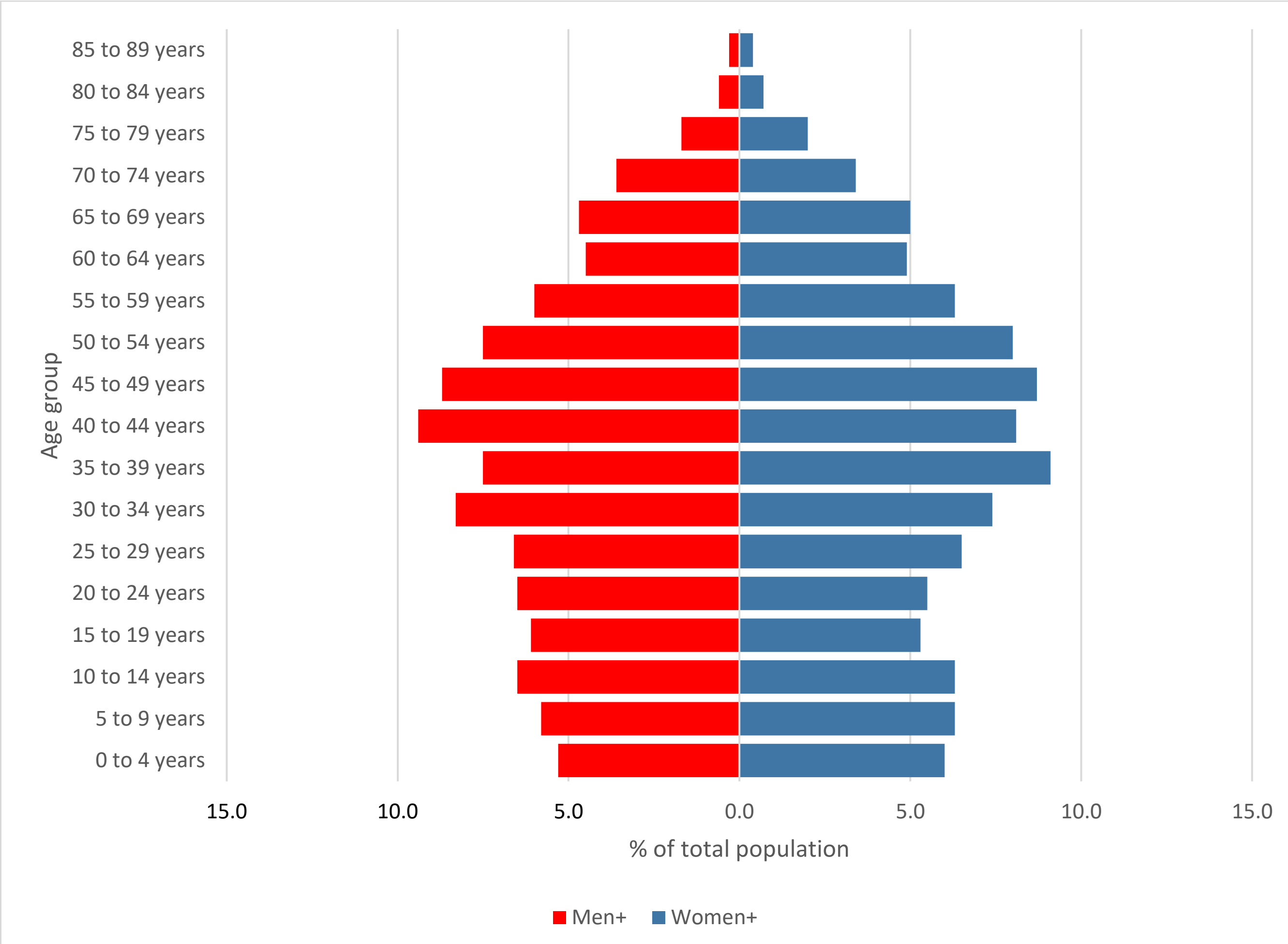

Figure 5-1: Town of Labrador City Population by Age Group, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022d)

Table 5-2: Town of Labrador City Population Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Age Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total Population	7,415	3,850	3,565	7,220	3,760	3,455	2.7	2.4	3.2
0 to 14 years	1,350	685	665	1,330	710	625	1.5	-3.5	6.4
15 to 64 years	5,230	2,745	2,490	5,290	2,735	2,550	-1.1	0.4	-2.4
65 years and over	830	420	410	600	320	285	38.3	31.3	43.9

2021				2016			Change from 2016 to 2021		
Age Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Average Age	37.8	37.6	38	36.7	36.6	36.9	1.1	1.0	3.0
Median Age	38.4	38.4	38.8	37.4	37.4	37.5	1.0	1.0	1.3

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017d, 2022d)

5.1.1.1.3 Migration and Mobility

Relevant Census data for the Town of Labrador City is presented in Table 5-3. According to the 2021 Census, 87.6% of individuals living in Labrador City did not move in the previous year (87.7% of men+ and 87.5% of women+). This is a 2.7% decrease from 2016 (Statistics Canada, 2017d, 2022d). In the 2021 Census, 2.3% of individuals living in Labrador City reported moving within Newfoundland and Labrador in the previous year (2.3% of men+ and 2.5% of women+), a 1.5% increase over 2016, and 1.6% of individuals living in Labrador City reported moving into Newfoundland and Labrador from a different province in the previous year (1.7% of men+ and 1.5% of women+) (Statistics Canada, 2017d, 2022d).

Table 5-3: Town of Labrador City Mobility Characteristics, 2021

2021				2016			Change from 2016 to 2021		
Mobility Characteristics (25% sample data)	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total responses	7,310	3,755	3,555	7,110	3,690	3,420	2.8	1.8	3.9
Did not move in the past year (%)	87.6	87.7	87.5	90.3	90.1	90.6	-2.7	-2.4	-3.1
Moved within Newfoundland and Labrador (%)	2.3	2.5	2.1	0.8	0.8	0.9	1.5	1.7	1.2
Moved into Newfoundland and Labrador from a different province (%)	1.6	1.7	1.5	0.0	0.3	0.0	1.6	1.4	1.5

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017d, 2022d)

5.1.1.1.4 Housing

Relevant 2021 Census data for the Town of Labrador City is presented in Table 5-4. According to the 2021 Census, there were 3,368 private dwellings in Labrador City, of which 91.2% were occupied by the usual residents (Statistics Canada, 2022d). The average dwelling housed 2.4 persons, a decrease from 2.5

persons in 2016 (Statistics Canada, 2017d, 2022d). In 2021, 77.5% of respondents were owners of their household, 22.3% were renters, and 0.0% were living in a household provided by the local government (Statistics Canada, 2022d). With regards to household conditions, 98.4% of respondents reported their household as being suitable, 94.3% of households were in need of only regular maintenance and minor repairs, and 5.7% of households were in need of major repairs (Statistics Canada, 2022d). With regards to household affordability, 94.8% of owners and tenants reported spending less than 30.0% of their income on shelter costs, a 1.3% increase over 2016; and 5.4% reported spending more than 30.0% of their income on shelter costs, a 1.1% decrease from 2016 (Statistics Canada, 2017d, 2022d).

Table 5-4: Town of Labrador City Housing Characteristics, 2021

Housing Characteristics (25% sample data)	2021 Total	2016 Total	% Change from 2016 to 2021
Total private dwellings	3,368	3,474	-3.1
Private dwellings occupied by usual residents	3,070	2,909	5.5
Private dwellings occupied by usual residents (%)	91.2	83.7	7.4
Average household size (persons)	2.4	2.5	-0.1
Household Tenure			
Private household by tenure: Owner (%)	77.5	78.7	-1.2
Private household by tenure: Renter (%)	22.3	21.1	1.2
Private household by tenure: Dwelling provided by local government, or First Nation band (%)	0.0	0.0	0.0
Household Conditions			
Housing is suitable (%)	98.4	98.8	-0.4
Housing is not suitable (%)	1.6	1.0	0.6
Dwelling in need of only regular maintenance and minor repairs (%)	94.3	94.8	-0.5
Dwelling in need of major repairs (%)	5.7	5.2	0.5
Household Affordability			
Owner or tenant spending less than 30% of income on shelter costs (%)	94.8	93.5	1.3
Owner or tenant spending more than 30% of income on shelter costs (%)	5.4	6.5	-1.1

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017d, 2022d)

5.1.1.1.5 Language

Relevant 2021 Census data for the Town of Labrador City is presented in Table 5-5. According to the 2021 Census, 87.6% of individuals living in Labrador City reported knowing only English (89.1% of men+ and 85.8% of women+), a 0.0% change from 2016 (Statistics Canada, 2017d, 2022d). A lower number of respondents (12.0% total; 10.4% of men+ and 13.6% of women+) reported knowing both French and English in the 2021 Census, a 0.1% increase over 2016 (Statistics Canada, 2017d, 2022d). In the 2021 Census, 0.3% reported knowing only French (0.3% of men+ and 0.4% of women+), a 0.0% change from

2016 (Statistics Canada, 2017d, 2022d). In the 2021 Census, a majority of Labrador City residents (94.2%) reported speaking English most often at home, a 0.2% increase over 2016; 1.6% reported speaking French most often at home, a 0.3% decrease from 2016; and 0.0% reported speaking Indigenous languages most often at home in 2021, the same as in 2016 (Statistics Canada, 2017d, 2022d).

Table 5-5: Town of Labrador City Language Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Language Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total Responses (Knowledge of Official Languages)	7,400	3,850	3,555	7,205	3,755	3,450	2.7	2.5	3.0
English Only (%)	87.6	89.1	85.8	87.6	89.3	85.8	0.0	-0.2	0.0
French Only (%)	0.3	0.3	0.4	0.3	0.4	0.4	0.0	-0.1	0.0
English & French (%)	12.0	10.4	13.6	11.9	10.4	13.8	0.1	0.0	-0.2
Total Responses (Language spoken most often at home)	7,400	3,850	3,555	7,205	3,755	3,450	2.7	2.5	3.0
Indigenous languages spoken most often at home (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
English spoken most often at home (%)	94.2	94.3	94.0	94.0	93.9	94.1	0.2	0.4	-0.1
French spoken most often at home (%)	1.6	1.4	1.5	1.9	2.0	1.9	-0.3	-0.6	-0.4

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017d, 2022d)

5.1.1.1.6 Educational Attainment

Relevant 2021 Census data for the Town of Labrador City can be found in Table 5-6. According to the 2021 Census, 11.5% of the total population 15 years and over did not have a certificate, diploma, or degree (9.5% of men+ and 13.7% of women+), a 3.2% decrease from 2016 for men+ and a 2.2% decrease from 2016 for women+ (Statistics Canada, 2017d, 2022d). In 2021, 26.8% of the population 15 years and over reported a secondary school diploma or equivalency as their highest educational attainment (23.6% of men+ and 30.2% of women+), a 1.4% increase over 2016 for men+ and a 2.7% increase over 2016 for women+; 21.6% reported an apprenticeship or trades certificate or diploma (31.9% of men+ and 10.4% of women+), a 2.7% increase over 2016 for men+ and a 2.0% increase over 2016 for women+; 26.1% reported a college or non-university certificate (24.4% of men+ and 28.0% of women+), a 1.3% decrease from 2016 for men+ and a 2.2% decrease from 2016 for women+; and 12.8% reported a Bachelor's degree or higher (9.5% of men+ and 16.3% of women+), a 0.1% decrease from 2016 for men+ and a 0.7% increase over 2016 for women+ (Statistics Canada, 2017d, 2022d).

Table 5-6: Town of Labrador City Education Characteristics, 2021

Education Characteristics	2021 Total	2021 Men+	2021 Women+	2016 Total	2016 Males	2016 Females	Change from 2016 to 2021 Total (%)	Change from 2016 to 2021 Men+/ Males (%)	Change from 2016 to 2021 Women+/ Females (%)
Population 15 years and over	5,995	3,115	2,880	5,835	3,035	2,795	2.7	2.6	3.0
No certificate; diploma; degree (%)	11.5	9.5	13.7	14.2	12.7	15.9	-2.7	-3.2	-2.2
Secondary (high) school diploma or equivalency certificate (%)	26.8	23.6	30.2	24.7	22.2	27.5	2.1	1.4	2.7
Apprenticeship or trades certificate or diploma (%)	21.6	31.9	10.4	19.2	29.2	8.4	2.4	2.7	2.0
College, or non university certificate (%)	26.1	24.4	28.0	27.9	25.7	30.2	-1.8	-1.3	-2.2
University certificate below bachelor level (%)	1.2	1.1	1.2	1.6	0.8	2.5	-0.4	0.3	-1.3
Bachelor's degree or higher (%)	12.8	9.5	16.3	12.3	9.6	15.6	0.5	-0.1	0.7

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017d, 2022d)

5.1.1.2 Town of Wabush

5.1.1.2.1 Community Overview

The Town of Wabush is located near the Québec border in western Labrador, on the shores of Jean Lake, five kilometres south of the Town of Labrador City. Wabush was first established as a camp in the early 1960s, housing workers for the Scully Mine (Wabush Mines Ltd.). In 1967, Wabush was incorporated as a town, and in 1976 a road link was built to Ville de Fermont, Québec (“Wabush,” 1994). Wabush’s peak population, in 1980, was approximately 4,000 people, before a decline in demand for iron led to layoffs at the Scully Mine (“Wabush,” 1994). In 1992, the first phase of the Trans-Labrador Highway was completed, connecting Wabush and Labrador City to Churchill Falls and Happy Valley-Goose Bay (Atter, 2022).

Wabush Mines operated the Scully Mine until 2011, when Cliffs Natural Resources became the sole owner of the mine (Newfoundland and Labrador Department of Industry, Energy and Technology, n.d.). In 2014, the mine was closed (Newfoundland and Labrador Department of Industry, Energy and Technology, n.d.). The closed Scully Mine was acquired by Tacore Resources Inc. in 2017, and was re-opened in 2019 (Tacora Resources Inc., 2021). Wabush and its neighbouring town, Labrador City, form the region of Labrador West, the self-described “Iron Ore Capital of Canada” (Labrador West, n.d.-a).

Governance

The mayor of Labrador City is Ron Barron and the deputy mayor is Kelly O’Brien. Elected officials for the municipality are listed in Table 5-7.

Table 5-7: Town of Wabush Council Officials

Title	Name	Term
Mayor	Ron Barron	2021 - 2025
Deputy Mayor	Kelly O’Brien	
Councillor	Rita Rynn	
Councillor	Shazia Razi	
Councillor	Rick Burke	
Councillor	Mary Lou Battock	
Councillor	Bob Cole	

Source: (Labrador West, n.d.-b)

5.1.1.2.2 Age and Gender

According to the 2021 Census, there were 1,965 individuals living in the Town of Wabush, of which 1,005 identified as men+ and 960 identified as women+. The average age was 36.8 (36.3 for men+ and 37.4 for women+) and the median age was 36.8 (36.4 for men+ and 37.2 for women+) (Statistics Canada, 2022k). Wabush’s population increased by 3.1% between the 2016 Census and 2021 Census (Statistics Canada, 2022k). For men+, 45-to-49-year-olds made up the largest percentage of the total population, at 8.5% (Statistics Canada, 2022k). For women+, 30-to-34-year-olds, 40-to-44-year-olds, 45-to-49-year-olds, and 50-to-54-year-olds made up the largest percentage of the total population, at 8.3% each (Statistics Canada, 2022k). The age distribution for the Town of Wabush can be found in Figure 5-2, and population characteristics can be found in Table 5-8.

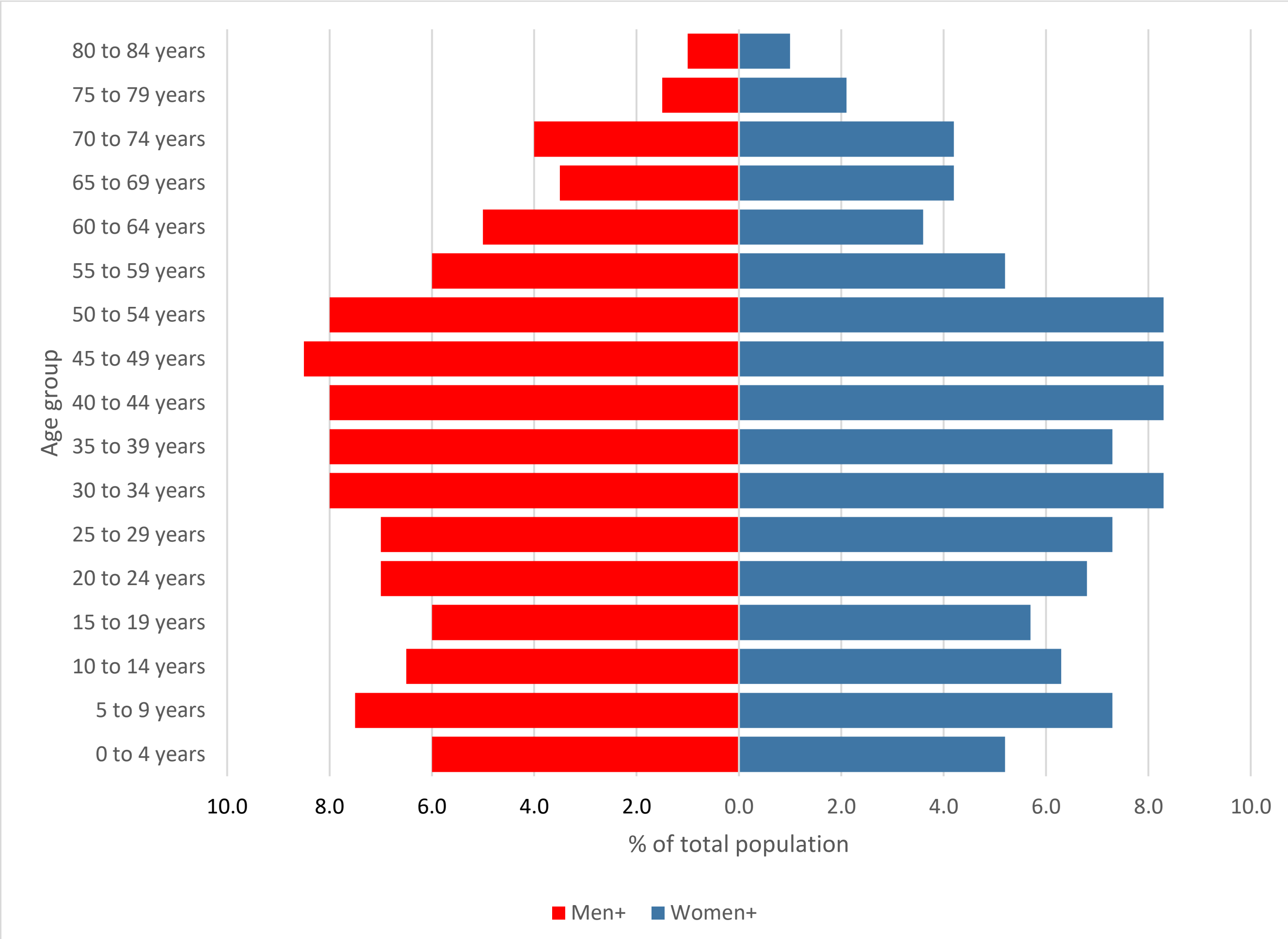

Figure 5-2: Town of Wabush Population by Age Group, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022k)

Table 5-8: Town of Wabush Population Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Age Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total Population	1,965	1,005	960	1,905	975	935	3.1	3.1	2.7
0 to 14 years	385	200	180	395	210	185	-2.5	-4.8	-2.7
15 to 64 years	1,370	710	660	1,340	675	665	2.2	5.2	-0.8
65 years and over	215	100	115	170	85	85	26.5	17.6	35.3
Average Age	36.8	36.3	37.4	35.5	35.5	35.5	1.3	0.8	5.4

	2021			2016			Change from 2016 to 2021		
Age Characteristics	**Total**	**Men+**	**Women+**	**Total**	**Males**	**Females**	**Total (%)**	**Men+/ Males (%)**	**Women+/ Females (%)**
Median Age	36.8	36.4	37.2	36.1	36.4	35.7	0.7	0.0	1.5

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017k, 2022k)

5.1.1.2.3 Migration and Mobility

Relevant 2021 Census data for the Town of Wabush is presented in Table 5-9. According to the 2021 Census, 86.5% of individuals living in Wabush did not move in the previous year (86.6% of men+ and 86.5% of women+), a 3.6% decrease from 2016 (Statistics Canada, 2017k, 2022k). In the 2021 Census, 3.1% of individuals living in Wabush reported moving within Newfoundland and Labrador in the previous year (2.5% of men+ and 3.2% of women+), a 3.3% decrease from 2016, and 1.3% of individuals living in Wabush reported moving into Newfoundland and Labrador from a different province in the previous year (1.5% of men+ and 1.6% of women+), a 0.6% decrease from 2016 (Statistics Canada, 2017k, 2022k).

Table 5-9: Town of Wabush Mobility Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Mobility Characteristics (25% sample data)	**Total**	**Men+**	**Women+**	**Total**	**Males**	**Females**	**Total (%)**	**Men+/ Males (%)**	**Women+/ Females (%)**
Total responses	1,925	1,005	925	1,865	975	895	3.2	3.1	3.4
Did not move in the past year (%)	86.5	86.6	86.5	90.1	89.2	90.5	-3.6	-2.6	-4.0
Moved within Newfoundland and Labrador (%)	3.1	2.5	3.2	6.4	7.2	5.6	-3.3	-4.7	-2.4
Moved into Newfoundland and Labrador from a different province (%)	1.3	1.5	1.6	1.9	1.5	2.2	-0.6	0.0	-0.6

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017k, 2022k)

5.1.1.2.4 Housing

Relevant 2021 Census data for the Town of Wabush is presented in Table 5-10. According to the 2021 Census, there were 864 private dwellings in Wabush, of which 92.4% were occupied by the usual residents. The average dwelling housed 2.5 persons, a decrease from 2.6 persons in 2016 (Statistics Canada, 2017k, 2022k). In 2021, 84.0% of respondents were owners of their household, 16.7% were renters, and 0.0% were living in a household provided by the local government (Statistics Canada, 2022k).

With regards to household conditions, 98.8% of respondents reported their household as being suitable, 95.7% of households were in need of only regular maintenance and minor repairs, and 3.7% of households were in need of major repairs (Statistics Canada, 2022k). With regards to household affordability, 96.9% of owners and tenants reported spending less than 30.0% of their income on shelter costs, a 5.0% increase over 2016; and 3.1% reported spending more than 30.0% of their income on shelter costs, a 4.3% decrease from 2016 (Statistics Canada, 2017k, 2022k).

Table 5-10: Town of Wabush Housing Characteristics, 2021

Housing Characteristics (25% sample data)	2021 Total	2016 Total	% Change from 2016 to 2021
Total private dwellings	864	950	-9.1
Private dwellings occupied by usual residents	798	741	7.7
Private dwellings occupied by usual residents (%)	92.4	78.0	14.4
Average household size (persons)	2.5	2.6	-0.1
Household Tenure			
Private household by tenure: Owner (%)	84.0	79.2	4.8
Private household by tenure: Renter (%)	16.7	20.8	-4.1
Private household by tenure: Dwelling provided by local government, or First Nation band (%)	0.0	0.0	0.0
Household Conditions			
Housing is suitable (%)	98.8	100.0	-1.2
Housing is not suitable (%)	1.9	0.0	1.9
Dwelling in need of only regular maintenance and minor repairs (%)	95.7	94.0	1.7
Dwelling in need of major repairs (%)	3.7	5.4	-1.7
Household Affordability			
Owner or tenant spending less than 30% of income on shelter costs (%)	96.9	91.9	5.0
Owner or tenant spending more than 30% of income on shelter costs (%)	3.1	7.4	-4.3

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017k, 2022k)

5.1.1.2.5 Language

Relevant 2021 Census data for the Town of Wabush is presented in Table 5-11. According to the 2021 Census, 87.0% of individuals living in Wabush reported knowing only English (88.1% of men+ and 85.9% of women+), a 0.9% increase over 2016 (Statistics Canada, 2017k, 2022k). A lower number of respondents (12.7% total; 11.9% of men+ and 13.5% of women+) reported knowing both French and English in the 2021 Census, a 0.4% decrease from 2016 (Statistics Canada, 2017k, 2022k). In the 2021 Census, 0.3% reported knowing only French (0.5% of men+ and 0.5% of women+), a 0.2% decrease from 2016 (Statistics Canada, 2017k, 2022k). In the 2021 Census, a majority of Wabush residents (97.2%) reported speaking English most often at home, a 1.4% increase over 2016; 1.8% reported speaking

French most often at home, a 0.3% decrease from 2016; and 0.0% reported speaking Indigenous languages most often at home in 2021, the same as in 2016 (Statistics Canada, 2017k, 2022k).

Table 5-11: Town of Wabush Language Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Language Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total Responses (Knowledge of Official Languages)	1,965	1,005	960	1,910	975	935	2.9	3.1	2.7
English Only (%)	87.0	88.1	85.9	86.1	88.7	83.4	0.9	-0.6	2.5
French Only (%)	0.3	0.5	0.5	0.5	0.5	1.1	-0.2	0.0	-0.6
English & French (%)	12.7	11.9	13.5	13.1	10.8	16.0	-0.4	1.1	-2.5
Total Responses (Language spoken most often at home)	1,965	1,005	960	1,905	975	935	3.1	3.1	2.7
Indigenous languages spoken most often at home (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
English spoken most often at home (%)	97.2	97.0	96.9	95.8	95.9	95.2	1.4	1.1	1.7
French spoken most often at home (%)	1.8	1.5	2.1	2.1	2.1	2.1	-0.3	-0.6	0.0

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017k, 2022k)

5.1.1.2.6 Educational Attainment

Relevant 2021 Census data for the Town of Wabush is presented in Table 5-12. According to the 2021 Census, 10.4% of the total population 15 years and over did not have a certificate, diploma, or degree (9.1% of men+ and 11.7% of women+), a 0.8% decrease from 2016 for men+ and a 0.5% decrease from 2016 for women+ (Statistics Canada, 2017k, 2022k). In 2021, 26.1% of the population 15 years and over reported a secondary school diploma or equivalency as their highest educational attainment (23.2% of men+ and 29.2% of women+), a 0.7% increase over 2016 for men+ and a 1.2% decrease from 2016 for women+; 21.1% reported an apprenticeship or trades certificate or diploma (32.3% of men+ and 9.7% of women+), a 0.5% increase over 2016 for men+ and a 2.3% decrease from 2016 for women+; 26.7% reported a college or non-university certificate (28.0% of men+ and 25.3% of women+), a 0.8% increase over 2016 for men+ and a 9.2% decrease from 2016 for women+; and 13.5% reported a Bachelor's degree or higher (5.5% of men+ and 22.7% of women+), a 1.8% decrease from 2016 for men+ and a 11.2% increase over 2016 for women+ (Statistics Canada, 2017k, 2022k).

Table 5-12: Town of Wabush Education Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Education Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Population 15 years and over	1,590	820	770	1,490	755	740	6.7	8.6	4.1
No certificate; diploma; degree (%)	10.4	9.1	11.7	11.1	9.9	12.2	-0.7	-0.8	-0.5
Secondary (high) school diploma or equivalency certificate (%)	26.1	23.2	29.2	26.5	22.5	30.4	-0.4	0.7	-1.2
Apprenticeship or trades certificate or diploma (%)	21.1	32.3	9.7	19.5	31.8	7.4	1.6	0.5	2.3
College, or non university certificate (%)	26.7	28.0	25.3	30.9	27.2	34.5	-4.2	0.8	-9.2
University certificate below bachelor level (%)	1.9	2.4	1.9	3.0	2.6	3.4	-1.1	-0.2	-1.5
Bachelor's degree or higher (%)	13.5	5.5	22.7	9.1	7.3	11.5	4.4	-1.8	11.2

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017k, 2022k)

5.1.1.3 Ville de Fermont

5.1.1.3.1 Community Overview

Ville de Fermont is located near the Newfoundland and Labrador border in northeastern Québec, approximately 30 kilometres from the neighbouring towns of Labrador City and Wabush. Fermont was first built in the late 1960s to house workers and families supporting the Québec Cartier Mining Company’s Mont Wright Mine (acquired by ArcelorMittal in 2007) (Commission de toponymie du Québec, 2012a). The first workers and families moved to the newly-built Fermont in 1972, two years before it was incorporated as a town (Commission de toponymie du Québec, 2012a). In 1976, a road link was built between Fermont and the towns of Labrador City and Wabush in Newfoundland and Labrador (“Wabush,” 1994). One of Fermont’s most distinctive features is its 15 metre-high, 1.3 kilometre-long screen wall on the town’s windward side (MRC de Caniapiscau, 2023d). Known as “the Wall,” the structure was inspired by similar projects in Sweden and includes housing units, community services, a shopping centre, and the town hall, connected by a controlled-atmosphere pedestrian walkway (MRC de Caniapiscau, 2023d).

Governance

The mayor of Ville de Fermont is Martin St-Laurent. Elected officials for the municipality are listed in Table 5-13.

Table 5-13: Ville de Fermont Officials

Title	Name	Term
Mayor	Martin St-Laurent	2021 - 2025
Deputy Mayor	Bernard Dupont	
Councillor	Danny Bouchard	
Councillor	Cindy Vignola	
Councillor	Marco Ouellet	
Councillor	Daniel Bergeron	
Councillor	Shannon Power	

Source: (Ville de Fermont, 2023a)

5.1.1.3.2 Age and Gender

According to the 2021 Census, there were 2,255 individuals living in Ville de Fermont, of which 1,225 identified as men+ and 1,025 identified as women+ (Statistics Canada, 2022b). The average age was 33.0 (33.8 for men+ and 32.0 for women+) and the median age was 34.0 (34.8 for men+ and 32.8 for women+) (Statistics Canada, 2022b). Fermont's population decreased by 8.9% between the 2016 Census and 2021 Census (Statistics Canada, 2022b). For men+, 40-to-44-year-olds made up the largest percentage of the total population, at 9.8% (Statistics Canada, 2022b). For women+, 30-to-34-year-olds made up the largest percentage of the total population, at 10.2% (Statistics Canada, 2022b). The age distribution for the Town of Labrador City can be found in Figure 5-3, and population characteristics can be found in Table 5-14.

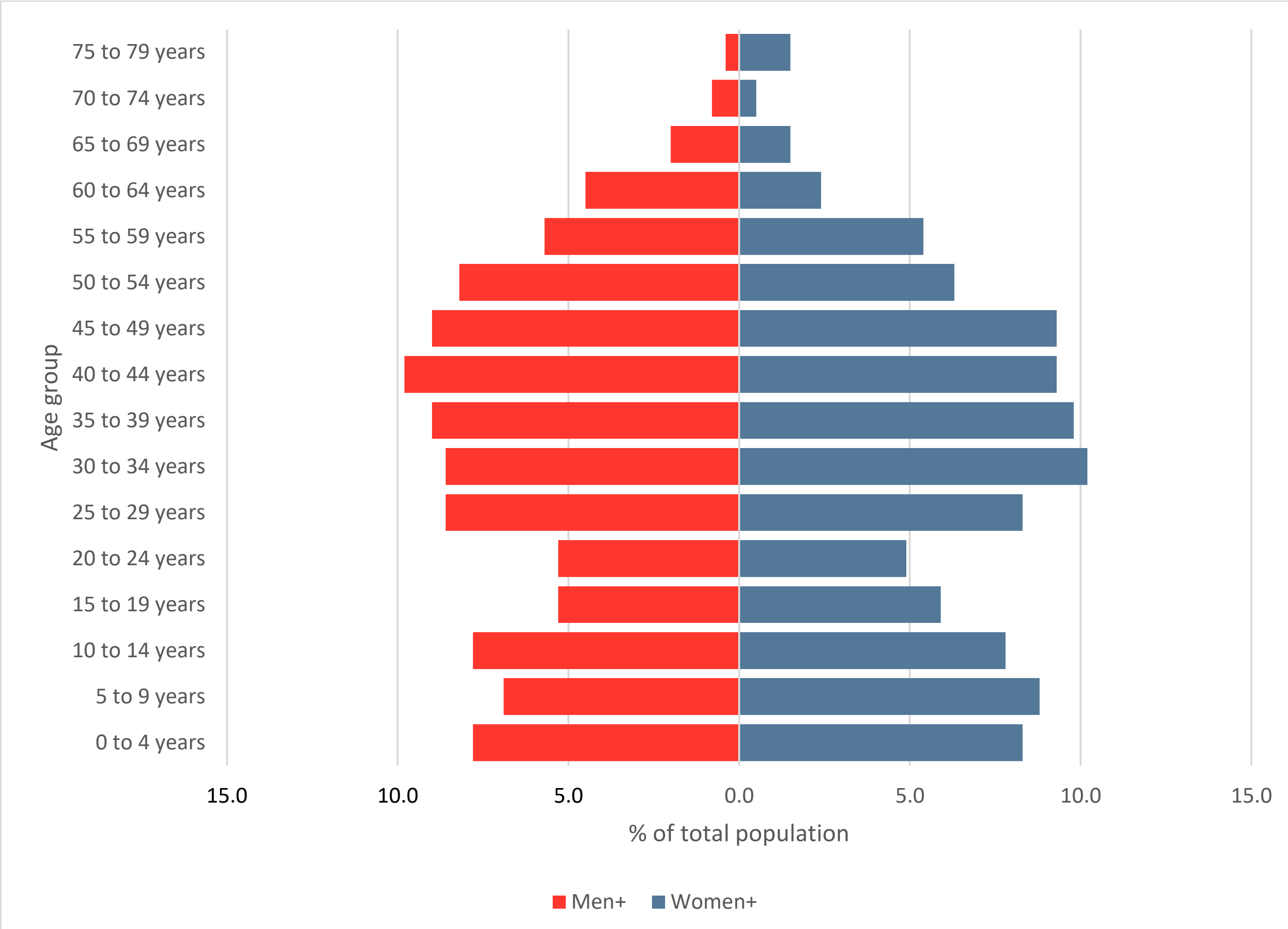

Figure 5-3: Ville de Fermont Population by Age Group, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022b)

Table 5-14: Ville de Fermont Population Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Age Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total Population	2,255	1,225	1,025	2,475	1,360	1,110	-8.9	-9.9	-7.7
0 to 14 years	530	275	255	530	265	265	0.0	3.8	-3.8
15 to 64 years	1,650	910	740	1,895	1,070	825	-12.9	-15.0	-10.3
65 years and over	85	45	40	45	30	20	88.9	50.0	100.0
Average Age	33	33.8	32	33.5	34.2	32.6	-0.5	-0.4	-1.8

	2021			2016			Change from 2016 to 2021		
Age Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Median Age	34	34.8	32.8	35	35.6	34.3	-1.0	-0.8	-1.5

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017b, 2022b)

5.1.1.3.3 Migration and Mobility

Relevant 2021 Census data for Ville de Fermont can be found in Table 5-15. According to the 2021 Census, 91.8% of individuals living in Fermont did not move in the previous year (90.4% of men+ and 94.0% of women+), a 4.6% increase over 2016 (Statistics Canada, 2017b, 2022b). In the 2021 Census, 4.9% of individuals living in Fermont reported moving within Québec in the previous year (6.4% of men+ and 3.0% of women+), a 0.8% increase over 2016, and 0.0% of individuals living in Fermont reported moving into Québec from a different province in the previous year (Statistics Canada, 2017b, 2022b).

Table 5-15: Ville de Fermont Mobility Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Mobility Characteristics (25% sample data)	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total responses	2,250	1,255	995	2,455	1,385	1,070	-8.4	-9.4	-7.0
Did not move in the past year (%)	91.8	90.4	94.0	87.2	88.8	85.5	4.6	1.6	8.5
Moved within Québec (%)	4.9	6.4	3.0	4.1	3.2	4.7	0.8	3.2	-1.7
Moved into Québec from a different province (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017b, 2022b)

5.1.1.3.4 Housing

Relevant 2021 Census data for Ville de Fermont housing can be found in Table 5-16. According to the 2021 Census, there were 1,538 private dwellings in Labrador City, of which 63.5% were occupied by the usual residents (Statistics Canada, 2022b). The average dwelling housed 2.3 persons, the same as in 2016 (Statistics Canada, 2017b, 2022b). In 2021, 59.2% of respondents were owners of their household, 40.3% were renters, and 0.0% were living in a household provided by the local government. With regards to household conditions, 98.5% of respondents reported their household as being suitable, 91.8% of households were in need of only regular maintenance and minor repairs, and 8.2% of households were in need of major repairs (Statistics Canada, 2022b). With regards to household affordability, 98.5% of owners and tenants reported spending less than 30.0% of their income on shelter costs, a 0.1% decrease from 2016; and 0.0% reported spending more than 30.0% of their income on shelter costs (Statistics Canada, 2017b, 2022b).

Table 5-16: Ville de Fermont Housing Characteristics, 2021

Housing Characteristics (25% sample data)	2021 Total	2016 Total	% Change from 2016 to 2021
Total private dwellings	1,538	1,638	-6.1
Private dwellings occupied by usual residents	976	1,061	-8.0
Private dwellings occupied by usual residents (%)	63.5	64.8	-1.3
Average household size (persons)	2.3	2.3	0.0
Household Tenure			
Private household by tenure: Owner (%)	59.2	60.7	-1.5
Private household by tenure: Renter (%)	40.3	39.3	1.0
Private household by tenure: Dwelling provided by local government, or First Nation band (%)	0.0	0.0	0.0
Household Conditions			
Housing is suitable (%)	98.5	99.5	-1.0
Housing is not suitable (%)	1.0	0.9	0.1
Dwelling in need of only regular maintenance and minor repairs (%)	91.8	93.0	-1.2
Dwelling in need of major repairs (%)	8.2	7.0	1.2
Household Affordability			
Owner or tenant spending less than 30% of income on shelter costs (%)	98.5	98.6	-0.1
Owner or tenant spending more than 30% of income on shelter costs (%)	0.0	1.4	-1.4

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017b, 2022b)

5.1.1.3.5 Language

Relevant 2021 Census language data for Ville de Fermont can be found in Table 5-17. According to the 2021 Census, 66.3% of individuals living in Fermont reported knowing only French (66.7% of men+ and 65.4% of women+), a 3.6% decrease from 2016 (Statistics Canada, 2017b, 2022b). A lower number of respondents (33.7% total; 33.3% of men+ and 33.7% of women+) reported knowing both French and English in the 2021 Census, a 4.0% increase over 2016. In the 2021 Census, 0.4% reported knowing only English (0.0% of men+ and 0.5% of women+), a 0.2% increase over 2016 (Statistics Canada, 2017b, 2022b). In the 2021 Census, a majority of Fermont residents (96.0%) reported speaking French most often at home, a 1.8% decrease from 2016; 1.3% reported speaking English most often at home, a 0.5% increase over 2016; and 0.0% reported speaking Indigenous languages most often at home in 2021, the same as in 2016 (Statistics Canada, 2017b, 2022b).

Table 5-17: Ville de Fermont Language Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Language Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total Responses (Knowledge of Official Languages)	2,255	1,230	1,025	2,475	1,365	1,115	-8.9	-9.9	-8.1
English Only (%)	0.4	0.0	0.5	0.2	0.4	0.4	0.2	-0.4	0.1
French Only (%)	66.3	66.7	65.4	69.9	68.1	72.2	-3.6	-1.4	-6.8
English & French (%)	33.7	33.3	33.7	29.7	31.9	26.9	4.0	1.4	6.8
Total Responses (Language spoken most often at home)	2,255	1,230	1,025	2,475	1,365	1,115	-8.9	-9.9	-8.1
Indigenous languages spoken most often at home (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
English spoken most often at home (%)	1.3	1.2	2.0	0.8	1.1	0.9	0.5	0.1	1.1
French spoken most often at home (%)	96.0	95.9	96.1	97.8	98.2	96.9	-1.8	-2.3	-0.8

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017b, 2022b)

5.1.1.3.6 Educational Attainment

Relevant 2021 Census educational attaiment data for Ville de Fermont can be found in Table 5-18. According to the 2021 Census, 8.6% of the total population 15 years and over did not have a certificate, diploma, or degree (9.3% of men+ and 7.7% of women+), a 0.2% decrease from 2016 for men+ and a 6.3% decrease from 2016 for women+ (Statistics Canada, 2017b, 2022b). In 2021, 19.3% of the population 15 years and over reported a secondary school diploma or equivalency as their highest educational attainment (15.5% of men+ and 23.9% of women+), a 0.6% increase over 2016 for men+ and a 1.8% decrease from 2016 for women+; 37.4% reported an apprenticeship or trades certificate or diploma (48.7% of men+ and 23.2% of women+), a 2.3% increase over 2016 for men+ and a 0.4% increase over 2016 for women+; 22.4% reported a college or non-university certificate (19.7% of men+ and 26.5% of women+), a 4.2% decrease from 2016 for men+ and a 6.0% increase over 2016 for women+; and 10.3% reported a Bachelor's degree or higher (6.2% of men+ and 15.5% of women+), a 3.0% increase over 2016 for men+ and a 3.8% increase over 2016 for women+ (Statistics Canada, 2017b, 2022b).

Table 5-18: Ville de Fermont Education Characteristics, 2021

Education Characteristics, 2021				2016			Change from 2016 to 2021		
Education Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Population 15 years and over	1,740	965	775	1,965	1,110	855	-11.5	-13.1	-9.4
No certificate; diploma; degree (%)	8.6	9.3	7.7	11.5	9.5	14.0	-2.9	-0.2	-6.3
Secondary (high) school diploma or equivalency certificate (%)	19.3	15.5	23.9	19.8	14.9	25.7	-0.5	0.6	-1.8
Apprenticeship or trades certificate or diploma (%)	37.4	48.7	23.2	36.4	46.4	22.8	1.0	2.3	0.4
College, or non university certificate (%)	22.4	19.7	26.5	22.4	23.9	20.5	0.0	-4.2	6.0
University certificate below bachelor level (%)	2.0	1.6	3.2	2.5	1.4	4.1	-0.5	0.2	-0.9
Bachelor's degree or higher (%)	10.3	6.2	15.5	7.1	3.2	11.7	3.2	3.0	3.8

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017b, 2022b)

5.1.2 Regions

The sections below provide an overview of social conditions in Census Division No. 10, Newfoundland and Labrador, and Sept-Rivières—Caniapiscau, including age and gender, migration and mobility, housing, language, and educational attainment.

According to the 2021 Census, the average age for men+ ranged from 38.6 (Division No. 10) to 40.8 (Sept-Rivières—Caniapiscau), and the average age for women+ ranged from 39.1 (Division No. 10) to 41.6 (Sept-Rivières—Caniapiscau) (Statistics Canada, 2022a, 2022h). The median age for men+ ranged from 38.8 (Division No. 10) to 41.6 (Sept-Rivières—Caniapiscau), and the median age for women+ ranged from 39.6 (Division No. 10) to 42.4 (Sept-Rivières—Caniapiscau) (Statistics Canada, 2022a, 2022h).

In the 2021 Census, between 88.4% (Division No. 10) and 90.1% (Sept-Rivières—Caniapiscau) of respondents to the 2021 Census reported not moving in the previous year (Statistics Canada, 2022a, 2022h). The average household size ranged from 2.2 (Sept-Rivières—Caniapiscau) to 2.5 (Division No. 10) persons. Between 63.3% (Sept-Rivières—Caniapiscau) and 70.6% (Division No. 10) of respondents to the 2021 Census were owners of their households; between 96.8% (Division No. 10) and 97.8% (Sept-Rivières—Caniapiscau) of respondents reported their housing as being suitable; and between 91.2%

(Sept-Rivières—Caniapiscau) and 93.9% (Division No. 10) of respondents reported spending less than 30% of their income on shelter costs (Statistics Canada, 2022a, 2022h).

Between 7.6% (Division No. 10) and 27.7% (Sept-Rivières—Caniapiscau) of respondents to the 2021 Census reported knowing both official languages (Statistics Canada, 2022a, 2022h). Rates of individuals 15 years and over without a certificate, diploma, or degree ranged from 19.8% (Division No. 10) to 26.9% (Sept-Rivières—Caniapiscau) for men+, and 20.0% (Division No. 10) to 26.6% (Sept-Rivières—Caniapiscau) for women+ (Statistics Canada, 2022a, 2022h). For men+, between 18.9% (Division No. 10) and 22.9% (Sept-Rivières—Caniapiscau) reported a secondary school diploma or equivalency as their highest educational attainment; between 22.8% (Division No. 10) and 27.8% (Sept-Rivières—Caniapiscau) reported an apprenticeship or trades certificate or diploma; between 16.4% (Sept-Rivières—Caniapiscau) and 24.7% (Division No. 10) reported a college or non-university certificate; and between 8.3% (Sept-Rivières—Caniapiscau) and 8.4% (Division No. 10) reported a Bachelor's degree or higher (Statistics Canada, 2022a, 2022h). For women+, between 22.8% (Sept-Rivières—Caniapiscau) and 28.1% (Division No. 10) reported a secondary school diploma or equivalency as their highest educational attainment; between 7.2% (Division No. 10) and 13.4% (Sept-Rivières—Caniapiscau) reported an apprenticeship or trades certificate or diploma; between 19.1% (Sept-Rivières—Caniapiscau) and 25.8% (Division No. 10) reported a college or non-university certificate; and between 14.5% (Sept-Rivières—Caniapiscau) and 17.0% (Division No. 10) reported a Bachelor's degree or higher .

5.1.2.1 Census Division No. 10, Newfoundland and Labrador

5.1.2.1.1 Region Overview

Census Division No. 10 is composed of the Labrador region of Newfoundland and Labrador, excluding the Inuit territory of Nunatsiavut. It is bordered by the Province of Québec to the west and south and is separated from the island of Newfoundland by the Strait of Belle Isle. Division No. 10 includes the LSA municipalities of Labrador City and Wabush, the Natuashish 2 and Sheshatshiu 3 reserves, and NunatuKavut Community Council Areas 1 through 6. The largest population centres in the region are the Towns of Happy Valley-Goose Bay, home to Canadian Forces Base Goose Bay, and Labrador City.

5.1.2.1.2 Age and Gender

According to the 2021 Census, there were 24,330 individuals living in Census Division No. 10, Newfoundland and Labrador, of which 12,340 identified as men+ and 11,995 identified as women+ (Statistics Canada, 2022a). The average age was 38.8 (38.6 for men+ and 39.1 for women+) and the median age was 39.2 (38.8 for men+ and 39.6 for women+) (Statistics Canada, 2022a). Census Division No. 10's population decreased by 1.3% between the 2016 Census and 2021 Census (Statistics Canada, 2022a). For men+ and women+, 50-to-54-year-olds made up the largest percentage of the total population, at 8.2% (Statistics Canada, 2022a). The age distribution for Census Division No. 10, Newfoundland and Labrador, is presented in Figure 5-4, and population characteristics can be found in Table 5-19.

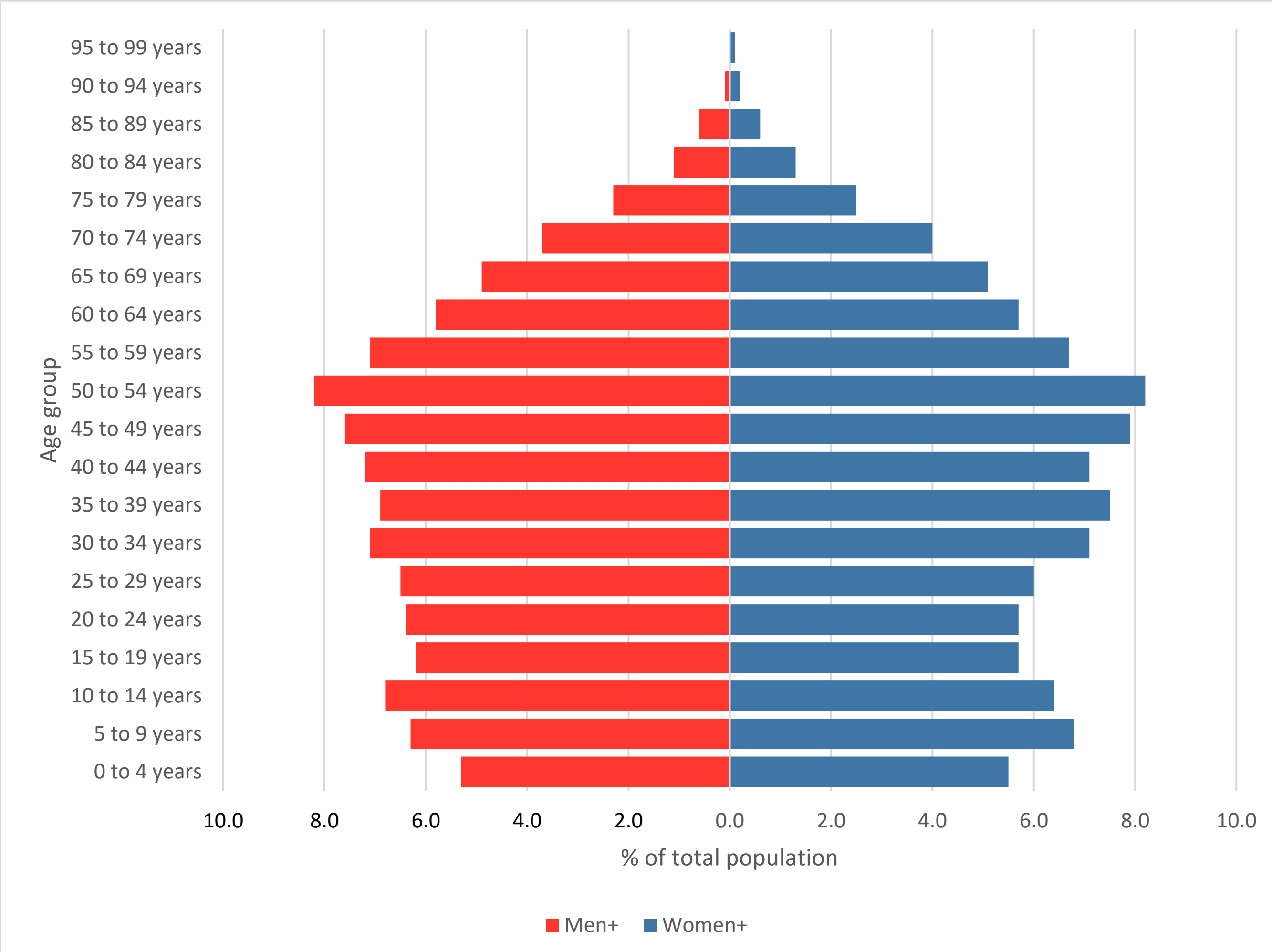

Figure 5-4: Census Division No. 10, Newfoundland and Labrador, Population by Age Group, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022a)

Table 5-19: Census Division No. 10, Newfoundland and Labrador, Population Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Age Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total Population	24,330	12,340	11,995	24,640	12,495	12,145	-1.3	-1.2	-1.2
0 to 14 years	4,505	2,270	2,235	4,790	2,485	2,310	-5.9	-8.7	-3.2
15 to 64 years	16,605	8,500	8,105	17,265	8,715	8,550	-3.8	-2.5	-5.2
65 years and over	3,225	1,570	1,655	2,590	1,300	1,290	24.5	20.8	28.3
Average Age	38.8	38.6	39.1	37.3	37.1	37.4	1.5	1.5	4.5

Age Characteristics	2021 Total	2021 Men+	2021 Women+	2016 Total	2016 Males	2016 Females	Change from 2016 to 2021 Total (%)	Change from 2016 to 2021 Men+/ Males (%)	Change from 2016 to 2021 Women+/ Females (%)
Median Age	39.2	38.8	39.6	37.8	38	37.6	1.4	0.8	2.0

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017a, 2022a)

5.1.2.1.3 Migration and Mobility

Relevant 2021 Census data for Census Division No. 10, Newfoundland and Labrador, is presented in Table 5-20. According to the 2021 Census, 88.4% of individuals living in Census Division No. 10 did not move in the previous year (89.1% of men+ and 87.6% of women+), a 1.7% decrease from 2016 (Statistics Canada, 2017a, 2022a). In the 2021 Census, 2.6% of individuals living in Census Division No. 10 reported moving within Newfoundland and Labrador in the previous year (2.7% of men+ and 2.4% of women+), a 0.3% increase over 2016, and 1.5% of individuals living in Census Division No. 10 reported moving into Newfoundland and Labrador from a different province in the previous year (1.4% of men+ and 1.6% of women+), a 0.3% increase over 2016 (Statistics Canada, 2017a, 2022a).

Table 5-20: Census Division No. 10, Newfoundland and Labrador, Mobility Characteristics, 2021

Mobility Characteristics (25% sample data)	2021 Total	2021 Men+	2021 Women+	2016 Total	2016 Males	2016 Females	Change from 2016 to 2021 Total (%)	Change from 2016 to 2021 Men+/ Males (%)	Change from 2016 to 2021 Women+/ Females (%)
Total responses	23,640	11,905	11,740	24,025	12,130	11,895	-1.6	-1.9	-1.3
Did not move in the past year (%)	88.4	89.1	87.6	90.1	90.1	90.0	-1.7	-1.0	-2.4
Moved within Newfoundland and Labrador (%)	2.6	2.7	2.4	2.3	2.2	2.4	0.3	0.5	0.0
Moved into Newfoundland and Labrador from a different province (%)	1.5	1.4	1.6	1.2	1.3	1.1	0.3	0.1	0.5

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017a, 2022a)

5.1.2.1.4 Housing

Relevant 2021 Census housing data for Census Division No. 10, Newfoundland and Labrador, is presented in Table 5-21. According to the 2021 Census, there were 10,941 private dwellings in Census Division No. 10, of which 87.0% were occupied by the usual residents (Statistics Canada, 2022a). The average dwelling housed 2.5 persons, a decrease from 2.6 persons in 2016 (Statistics Canada, 2017a, 2022a). In 2021, 70.6% of respondents were owners of their household, 25.2% were renters, and 4.1% were living in a household provided by the local government or First Nation band (Statistics Canada, 2022a). With regards to household conditions, 96.8% of respondents reported their household as being suitable, 92.9% of households were in need of only regular maintenance and minor repairs, and 7.1% of households were in need of major repairs (Statistics Canada, 2022a). With regards to household affordability, 93.9% of owners and tenants reported spending less than 30.0% of their income on shelter costs, a 1.3% increase over 2016; and 6.1% reported spending more than 30.0% of their income on shelter costs, a 1.3% decrease from 2016 (Statistics Canada, 2017a, 2022a).

Table 5-21: Census Division No. 10, Newfoundland and Labrador, Housing Characteristics, 2021

Housing Characteristics (25% sample data)	2021 Total	2016 Total	% Change from 2016 to 2021
Total private dwellings	10,941	10,758	1.7
Private dwellings occupied by usual residents	9,518	9,193	3.5
Private dwellings occupied by usual residents (%)	87.0	85.5	1.5
Average household size (persons)	2.5	2.6	-0.1
Household Tenure			
Private household by tenure: Owner (%)	70.6	71.1	-0.5
Private household by tenure: Renter (%)	25.2	24.5	0.7
Private household by tenure: Dwelling provided by local government, or First Nation band (%)	4.1	4.5	-0.4
Household Conditions			
Housing is suitable (%)	96.8	95.6	1.2
Housing is not suitable (%)	3.2	4.4	-1.2
Dwelling in need of only regular maintenance and minor repairs (%)	92.9	91.1	1.8
Dwelling in need of major repairs (%)	7.1	8.9	-1.8
Household Affordability			
Owner or tenant spending less than 30% of income on shelter costs (%)	93.9	92.6	1.3
Owner or tenant spending more than 30% of income on shelter costs (%)	6.1	7.4	-1.3

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017a, 2022a)

5.1.2.1.5 Language

Relevant 2021 Census language data for the Census Division No. 10, Newfoundland and Labrador, is presented in Table 5-22. According to the 2021 Census, 91.9% of individuals living in Census Division No. 10 reported knowing only English (92.6% of men+ and 91.1% of women+), a 0.3% increase over 2016 (Statistics Canada, 2017a, 2022a). A lower number of respondents (7.6% total; 7.0% of men+ and 8.3% of women+) reported knowing both French and English in the 2021 Census, a 0.0% change from 2016 (Statistics Canada, 2017a, 2022a). In the 2021 Census, 0.2% reported knowing only French (0.2% of men+

and 0.2% of women+), a 0.0% change from 2016 (Statistics Canada, 2017a, 2022a). In the 2021 Census, a majority of Census Division No. 10 residents (89.9%) reported speaking English most often at home, a 0.8% increase over 2016; 0.8% reported speaking French most often at home, a 0.2% decrease from 2016; and 5.4% reported speaking Indigenous languages most often at home in 2021, a 2.0% decrease from 2016 (Statistics Canada, 2017a, 2022a).

Table 5-22: Census Division No. 10, Newfoundland and Labrador, Language Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Language Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total Responses (Knowledge of Official Languages)	24,065	12,150	11,915	24,490	12,405	12,090	-1.7	-2.1	-1.4
English Only (%)	91.9	92.6	91.1	91.6	92.5	90.7	0.3	0.1	0.4
French Only (%)	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0
English & French (%)	7.6	7.0	8.3	7.6	6.7	8.4	0.0	0.3	-0.1
Total Responses (Language spoken most often at home)	24,065	12,150	11,915	24,485	12,400	12,085	-1.7	-2.0	-1.4
Indigenous languages spoken most often at home (%)	5.4	5.3	5.5	7.4	7.2	7.6	-2.0	-1.9	-2.1
English spoken most often at home (%)	89.9	90.3	89.5	89.1	89.1	89.0	0.8	1.2	0.5
French spoken most often at home (%)	0.8	0.8	0.8	1.0	1.0	0.9	-0.2	-0.2	-0.1

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017a, 2022a)

5.1.2.1.6 Educational Attainment

Relevant 2021 Census educational attainment data for the Census Division No. 10, Newfoundland and Labrador, is presented in Table 5-23. According to the 2021 Census, 19.9% of the total population 15 years and over did not have a certificate, diploma, or degree (19.8% of men+ and 20.0% of women+), a 4.3% decrease from 2016 for men+ and a 5.3% decrease from 2016 for women+ (Statistics Canada, 2017a, 2022a). In 2021, 25.5% of the population 15 years and over reported a secondary school diploma or equivalency as their highest educational attainment (22.9% of men+ and 28.1% of women+), a 4.1% increase over 2016 for men+ and a 3.2% increase over 2016 for women+; 15.0% reported an apprenticeship or trades certificate or diploma (22.8% of men+ and 7.2% of women+), a 0.7% decrease from 2016 for men+ and a 0.6% increase over 2016 for women+; 25.3% reported a college or non-university certificate (24.7% of men+ and 25.8% of women+), a 0.5% increase over 2016 for men+ and a 1.3% decrease from 2016 for women+; and 12.7% reported a Bachelor's degree or higher (8.4% of men+ and 17.0% of women+), a 0.6% increase over 2016 for men+ and a 3.6% increase over 2016 for women+ (Statistics Canada, 2017a, 2022a).

Table 5-23: Census Division No. 10, Newfoundland and Labrador, Education Characteristics, 2021

2021				2016			Change from 2016 to 2021		
Education Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Population 15 years and over	19,390	9,760	9,630	19,560	9,835	9,730	-0.9	-0.8	-1.0
No certificate; diploma; degree (%)	19.9	19.8	20.0	24.7	24.1	25.3	-4.8	-4.3	-5.3
Secondary (high) school diploma or equivalency certificate (%)	25.5	22.9	28.1	21.9	18.8	24.9	3.6	4.1	3.2
Apprenticeship or trades certificate or diploma (%)	15.0	22.8	7.2	15.1	23.5	6.6	-0.1	-0.7	0.6
College, or non university certificate (%)	25.3	24.7	25.8	25.6	24.2	27.1	-0.3	0.5	-1.3
University certificate below bachelor level (%)	1.6	1.3	2.0	2.2	1.6	2.7	-0.6	-0.3	-0.7
Bachelor's degree or higher (%)	12.7	8.4	17.0	10.6	7.8	13.4	2.1	0.6	3.6

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017a, 2022a)

5.1.2.2 Sept-Rivières—Caniapiscau

5.1.2.2.1 Region Overview

The Census Division of Sept-Rivières—Caniapiscau is composed of the regional county municipalities of Sept-Rivières and Caniapiscau, in the Côte-Nord region of Québec. Sept-Rivières—Caniapiscau includes the LSA municipality of Fermont and the Mani-Utenam, Uashat 27, Matimekush, Lac-John, and Kawawachikamach reserves. The county seat of Sept- Rivières is Ville de Sept-Îles and the county seat of Caniapiscau is Ville de Fermont. The largest population centres in the region are Ville de Sept-Îles (first), Ville de Port-Cartier (second), and Ville de Fermont (third).

5.1.2.2.2 Age and Gender

According to the 2021 Census, there were 38,240 individuals living in Sept-Rivières—Caniapiscau, of which 19,365 identified as men+ and 18,870 identified as women+ (Statistics Canada, 2022h). The average age was 41.2 (40.8 for men+ and 41.6 for women+) and the median age was 42.0 (41.6 for men+ and 42.4 for women+) (Statistics Canada, 2022h). Sept-Rivières—Caniapiscau's population decreased by 2.8% between the 2016 Census and 2021 Census (Statistics Canada, 2022h). For men+ and women+, 55-to-59-year-olds made up the largest percentage of the total population, at 7.7% (Statistics Canada, 2022h). The age distribution for Sept-Rivières—Caniapiscau is presented in Figure 5-5, and population characteristics can be found in Table 5-24.

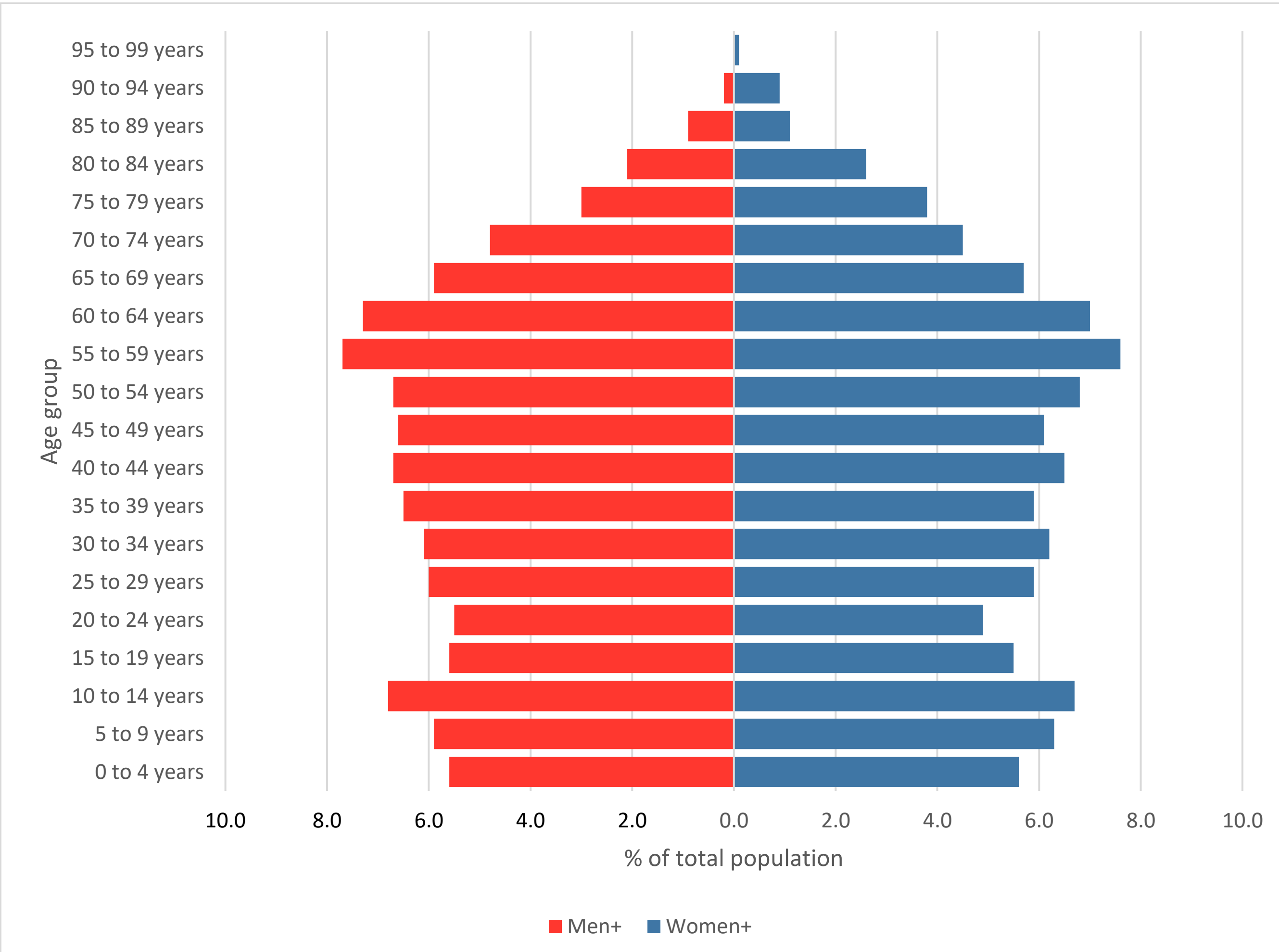

Figure 5-5: Sept-Rivières—Caniapiscau Population by Age Group, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022h)

Table 5-24: Sept-Rivières—Caniapiscau Population Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Age Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total Population	38,240	19,365	18,870	39,325	20,090	19,235	-2.8	-3.6	-1.9
0 to 14 years	7,060	3,550	3,510	7,295	3,735	3,560	-3.2	-5.0	-1.4
15 to 64 years	24,310	12,505	11,810	26,160	13,505	12,650	-7.1	-7.4	-6.6
65 years and over	6,870	3,315	3,560	5,860	2,845	3,020	17.2	16.5	17.9
Average Age	41.2	40.8	41.6	40	39.6	40.3	1.2	1.2	3.2
Median Age	42	41.6	42.4	40.9	40.6	41.2	1.1	1.0	1.2

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017h, 2022h)

5.1.2.2.3 Migration and Mobility

Relevant 2021 Census data for Sept-Rivières—Caniapiscau can be found in Table 5-25. According to the 2021 Census, 90.1% of individuals living in Sept-Rivières—Caniapiscau did not move in the previous year (90.4% of men+ and 89.8% of women+), a 0.3% increase over 2016 (Statistics Canada, 2017h, 2022h). In the 2021 Census, 2.6% of individuals living in Sept-Rivières—Caniapiscau reported moving within Québec in the previous year (2.6% of men+ and 2.7% of women+), a 0.1% increase over 2016, and 0.2% of individuals living in Sept-Rivières—Caniapiscau reported moving into Québec from a different province in the previous year (0.2% of men+ and 0.2% of women+), a 0.1% increase over 2016 (Statistics Canada, 2017h, 2022h).

Table 5-25: Sept-Rivières—Caniapiscau Mobility Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Mobility Characteristics (25% sample data)	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total responses	37,015	18,760	18,250	38,135	19,440	18,695	-2.9	-3.5	-2.4
Did not move in the past year (%)	90.1	90.4	89.9	89.8	90.5	89.0	0.3	-0.1	0.9
Moved within Québec (%)	2.6	2.6	2.7	2.5	2.3	2.7	0.1	0.3	0.0
Moved into Québec from a different province (%)	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017h, 2022h)

5.1.2.2.4 Housing

Relevant 2021 Census housing data for Sept-Rivières—Caniapiscau is presented in Table 5-26. According to the 2021 Census, there were 19,507 private dwellings in Sept-Rivières—Caniapiscau, of which 86.2% were occupied by the usual residents (Statistics Canada, 2022h). The average dwelling housed 2.2 persons, a decrease from 2.3 persons in 2016 (Statistics Canada, 2017h, 2022h). In 2021, 63.3% of respondents were owners of their household, 31.4% were renters, and 5.2% were living in a household provided by the local government or First Nation band (Statistics Canada, 2022h). With regards to household conditions, 97.8% of respondents reported their household as being suitable, 91.6% of households were in need of only regular maintenance and minor repairs, and 8.4% of households were in need of major repairs (Statistics Canada, 2022h). With regards to household affordability, 91.2% of owners and tenants reported spending less than 30.0% of their income on shelter costs, a 2.9% increase over 2016; and 8.8% reported spending more than 30.0% of their income on shelter costs, a 2.9% decrease from 2016 (Statistics Canada, 2017h, 2022h).

Table 5-26: Sept-Rivières—Caniapiscau Housing Characteristics, 2021

Housing Characteristics (25% sample data)	2021 Total	2016 Total	% Change from 2016 to 2021
Total private dwellings	19,507	19,307	1.0
Private dwellings occupied by usual residents	16,808	16,764	0.3
Private dwellings occupied by usual residents (%)	86.2	86.8	-0.7
Average household size (persons)	2.2	2.3	-0.1
Household Tenure			
Private household by tenure: Owner (%)	63.3	65.4	-2.1
Private household by tenure: Renter (%)	31.4	30.5	0.9
Private household by tenure: Dwelling provided by local government, or First Nation band (%)	5.2	4.2	1.0
Household Conditions			
Housing is suitable (%)	97.8	97.3	0.5
Housing is not suitable (%)	2.2	2.7	-0.5
Dwelling in need of only regular maintenance and minor repairs (%)	91.6	89.1	2.5
Dwelling in need of major repairs (%)	8.4	10.9	-2.5
Household Affordability			
Owner or tenant spending less than 30% of income on shelter costs (%)	91.2	88.3	2.9
Owner or tenant spending more than 30% of income on shelter costs (%)	8.8	11.7	-2.9

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017h, 2022h)

5.1.2.2.5 Language

Relevant 2021 Census language data for Sept-Rivières—Caniapiscau can be found in Table 5-27. According to the 2021 Census, 69.2% of individuals living in Sept-Rivières—Caniapiscau reported knowing only French (66.6% of men+ and 71.9% of women+), a 2.5% decrease from 2016 (Statistics Canada, 2017h, 2022h). A lower number of respondents (27.7% total; 30.3% of men+ and 25.0% of women+) reported knowing both French and English in the 2021 Census, a 1.7% increase over 2016. In the 2021 Census, 2.7% reported knowing only English (2.5% of men+ and 2.8% of women+), a 0.8% increase over 2016 (Statistics Canada, 2017h, 2022h). In the 2021 Census, a majority of Sept-Rivières—Caniapiscau residents (87.3%) reported speaking French most often at home, a 0.0% change from 2016; 2.6% reported speaking English most often at home, a 0.3% increase over 2016; and 7.0% reported speaking Indigenous languages most often at home in 2021, a 1.4% decrease from 2016 (Statistics Canada, 2017h, 2022h).

Table 5-27: Sept-Rivières—Caniapiscau Language Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Language Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total Responses (Knowledge of Official Languages)	37,675	19,040	18,630	38,820	19,745	19,075	-2.9	-3.6	-2.3
English Only (%)	2.7	2.5	2.8	1.9	1.8	2.0	0.8	0.7	0.8
French Only (%)	69.2	66.6	71.9	71.7	68.8	74.7	-2.5	-2.2	-2.8
English & French (%)	27.7	30.3	25.0	26.0	29.0	22.9	1.7	1.3	2.1
Total Responses (Language spoken most often at home)	37,675	19,040	18,630	38,820	19,750	19,075	-2.9	-3.6	-2.3
Indigenous languages spoken most often at home (%)	7.0	6.5	7.4	8.4	7.9	8.8	-1.4	-1.4	-1.4
English spoken most often at home (%)	2.6	2.5	2.6	2.3	2.2	2.4	0.3	0.3	0.2
French spoken most often at home (%)	87.3	87.9	86.8	87.3	87.9	86.7	0.0	0.0	0.1

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017h, 2022h)

5.1.2.2.6 Educational Attainment

Relevant 2021 Census educational attainment data for the Sept-Rivières—Caniapiscau can be found in Table 5-28. According to the 2021 Census, 26.8% of the total population 15 years and over did not have a certificate, diploma, or degree (26.9% of men+ and 26.6% of women+), a 1.0% decrease from 2016 for men+ and a 2.2% decrease from 2016 for women+ (Statistics Canada, 2017h, 2022h). In 2021, 20.9% of the population 15 years and over reported a secondary school diploma or equivalency as their highest educational attainment (18.9% of men+ and 22.8% of women+), a 0.6% increase over 2016 for men+ and a 1.2% increase over 2016 for women+; 20.7% reported an apprenticeship or trades certificate or diploma (27.8% of men+ and 13.4% of women+), a 1.3% decrease from 2016 for men+ and a 0.9% decrease from 2016 for women+; 17.7% reported a college or non-university certificate (16.4% of men+ and 19.1% of women+), a 0.4% increase over 2016 for men+ and a 0.5% increase over 2016 for women+; and 11.4% reported a Bachelor's degree or higher (8.3% of men+ and 14.5% of women+), a 1.0% increase over 2016 for men+ and a 1.2% increase over 2016 for women+ (Statistics Canada, 2017h, 2022h).

Table 5-28: Sept-Rivières—Caniapiscau Education Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Education Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Population 15 years and over	30,380	15,385	14,995	31,285	15,995	15,285	-2.9	-3.8	-1.9
No certificate; diploma; degree (%)	26.8	26.9	26.6	28.3	27.9	28.8	-1.5	-1.0	-2.2
Secondary (high) school diploma or equivalency certificate (%)	20.9	18.9	22.8	19.9	18.3	21.6	1.0	0.6	1.2
Apprenticeship or trades certificate or diploma (%)	20.7	27.8	13.4	21.8	29.1	14.3	-1.1	-1.3	-0.9
College, or non-university certificate (%)	17.7	16.4	19.1	17.3	16.0	18.6	0.4	0.4	0.5
University certificate below bachelor level (%)	2.7	1.7	3.6	2.4	1.4	3.4	0.3	0.3	0.2
Bachelor's degree or higher (%)	11.4	8.3	14.5	10.3	7.3	13.3	1.1	1.0	1.2

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017h, 2022h)

5.2 Community Services and Infrastructure

The sections below provide an overview of community services and infrastructure in the Town of Labrador City, the Town of Wabush, and Ville de Fermont, including recreation and leisure, social services, health services, education services, employment and economic development services, housing services, temporary accommodations, emergency services, and transportation and utilities.

5.2.1 Town of Labrador City

5.2.1.1 Recreation and Leisure

The Town of Labrador City has several recreational sites and services available to residents and visitors. Labrador City Arena is a recreational hub, hosting events and housing the Town's Recreation Department, in addition to the Polaris Figuring Skating Club and the Labrador West Minor Hockey Association (Labrador West, 2023o). The Town also has several sports fields, recreational clubs, parks, trails, and other indoor and outdoor recreation activities. Labrador City Public Library offers community resources and focuses on early literacy (Labrador West, 2023q).

An overview of recreation and leisure services available in the Town of Labrador City, found through desktop research, is presented in Table 5-29.

Table 5-29: Town of Labrador City Recreation and Leisure Services

Category	Provider/Service	Description
Arts and Culture (Exhibitions, Art Galleries, Museums)	No information was available from secondary sources at the time of desktop research.	▪ N/A
Community Recreation (Community Centres, Sports Clubs, Athletic Fields)	Labrador City Arena	▪ Capacity – 1,800 ▪ Event Space ▪ Meeting room ▪ 5 dressing rooms
	Al Thoms Softball Area	▪ Three fields ▪ Hosts minor softball programs
	Gordie Young Softball Field	▪ Single field ▪ Hosts adult softball
	Stan Jackowski Soccer Field	▪ Three fields ▪ Hosts minor, master and recreational soccer programs
	Carol Curling Club	▪ Four-sheet curling facility ▪ Hosts leagues and tournaments ▪ Indoor and outdoor event space
	Labrador Trap & Skeet Club	▪ Gun Club facility ▪ Olympic Grade machines ▪ Venue rentals and team-building events
	Labrador West Minor Soccer Association	▪ Outdoor summer soccer program
Entertainment and Events (Theaters, Concert Venues, Festivals, Movie Theaters)	No information was available from secondary sources at the time of desktop research.	▪ N/A
	2977 Royal Canadian Army Cadets Labrador West	▪ Outdoor and indoor skills and activities for youth 12 and older

Category	Provider/Service	Description
Civic Recreation Programs (Government-Organized Recreational Activities)	Royal Canadian Sea Cadet Corps (RCSCC) 191 Labrador	▪ Free program including life skills, leadership, responsibility, and community service
Libraries and Learning Resources (Libraries, Learning Materials)	Labrador City Public Library	▪ Community resources ▪ Early literacy promotion
Parks and Outdoor Recreation (Campgrounds, Beaches, Hiking Trails)	The Barking Lot	▪ Off leash dog park
	Trick Lane Skate Park	▪ Skateboard Park
	Tanya Beach	▪ Beach on Tanya Lake
	Jean Lake	▪ 5 km trail intermediate hiking trail
	Crystal Falls Hiking Trail	▪ 1.5 km advanced hiking trail
	Snowmobiling & Winter Trails	▪ 800 km trail network ▪ Labrador West issues approximately 1,800 snowmobile trail passes annually
	Menihek Interpretive Trail	▪ 5 km Nordic Trails
	Tanya Lake	▪ 3 km beginners hike
	Smokey Mountain Ski Club	▪ Advanced lift systems, including a new Skytrac Quad Chair Lift, two Poma Lifts, and a Magic Carpet for beginners.

Source: (Labrador West, 2023f, 2023o, 2023a, 2023c, 2023k, 2023z, 2023s, 2023q, 2023l)

5.2.1.2 Social Services

The Town of Labrador City has several social services available to residents. These services include Little Twigs childcare centre and the First Steps Family Resource Centre, a non-profit centre offering free programs for children from birth to age six, supporting families through play, education, and networking (First Steps Family Resource Center, n.d.; Labrador West, 2023v). The Labrador West Status of Women Council advocates for ending violence against women, achieving wage parity, promoting women in leadership, women's health, and gender equity (Labrador West, 2023u). The Labrador West Housing and Homelessness Coalition works to create affordable housing options, supporting individuals and families in Labrador West through development and awareness efforts (Labrador West, 2023t). The Labrador West Association for New Canadians is a non-profit serving immigrants and refugees, focused on settlement and integration services (Labrador West, 2023b).

An overview of social services available in the Town of Labrador City, as found through desktop research, is presented in Table 5-30.

Table 5-30: Town of Labrador City Social Services

Category	Provider/Service	Description
Childcare and Youth Development	Little Twigs Child Care	▪ In-Home Childcare Centre
	First Steps Family Resource Centre	▪ Free programming for children up to six years of age
Comprehensive Support Services	Labrador West Status of Women Council	▪ Advocacy group
Crisis Centres and Transition Houses	Labrador West Housing and Homelessness Coalition	▪ Provides support through development and awareness efforts.
	Hope Haven	▪ Women's Transition House for women aged 16 years and older
Hunger and Nutritional Assistance	No information was available from secondary sources at the time of desktop research.	▪ N/A
Immigrant and Refugee	Association for New Canadians – Labrador West	▪ Non-profit providing settlement and integration services to immigrants and refugees
Indigenous Peoples	No information was available from secondary sources at the time of desktop research.	▪ N/A
Legal Assistance and Advocacy		
Mental Health and Counselling		
Substance Use and Addiction Recovery		

Source: (First Steps Family Resource Center, n.d.; Labrador West, 2023v, 2023n, 2023t, 2023b, 2023u)

5.2.1.3 Health Services

The Labrador West Health Centre is the Town of Labrador City's hospital, with 28 beds, of which 14 are for long-term care (Labrador West, 2023m). The Health Centre provides fee-for-service by family physicians, a general surgeon, an obstetrician/gynecologist, and an anesthesiologist (Labrador West, 2023m). Specialists visit the hospital regularly (Labrador West, 2023m). Walk-in care clinics provide IV medications, injections, infusions, simple/complex dressings, and Phlebotomies (Labrador West, 2023m). Acute services are supported by:

- outpatient clinics with visiting specialists;
- emergency department;
- satellite dialysis;
- maternity care provided by an obstetrician/gynecologist, family physicians and nurses;
- laboratory and diagnostic imaging, including general radiology, ultrasound, computerized tomography, mammography and bone density services;
- physiotherapy, occupational therapy, speech language pathology, and audiology;

- respiratory therapy, electroencephalography, electrocardiogram, and oncology/chemotherapy services;
- dietary services;
- diabetes education;
- mental health and addictions services; and
- population health client services, including home care, health promotion, health education, child health clinics, child birth education, post-natal follow-up, adult immunization, communicable disease control, audio-visual testing services, pre-school health checks, school health program, and wellness clinics (Labrador West, 2023m).

Mental health services in the Town are provided by New Light, offering counselling, the Mental Health and Addictions Walk-In Clinics, providing no-appointment-necessary mental health services three days per week, and the Peer Support Warm Line, offering confidential peer support for mental health (Labrador West, 2023x).

An overview of health services available in the Town of Labrador City, as found through desktop research, is presented in Table 5-31.

Table 5-31: Town of Labrador City Health Services

Category	Provider/Service	Description
Clinical Services (Hospitals, Clinics, and Primary Care Services)	Labrador West Health Centre	▪ Hospital with 28 beds (14 for long-term care)
Public Health (Preventive Measures, Health Education, and Community Health Services)	New Light	▪ Mental Health Counselling
	Mental Health and Addictions Walk-in Clinics	▪ Provides no-appointment-necessary mental health services
	Peer Support Warm Line	▪ Peer support for mental health. ▪ Call-in hotline
Long-Term Care Facilities (Nursing Homes)	No information was available from secondary sources at the time of desktop research.	▪ N/A

Source: (Labrador West, 2023i, 2023x, 2023w)

5.2.1.4 Education Services

In the Town of Labrador City, children can attend AP Low Primary School for kindergarten through grade three, R. Smallwood Middle School for grades four through seven, and Menihek High School for grades eight through 12, with French immersion options available from kindergarten to grade 12 (Labrador West, 2023j). French education is also provided through Le Centre éducatif L'ENVOL for children of all ages (Labrador West, 2023j). Post-secondary education is available through the College of the North Atlantic's Labrador West (Labrador West, 2023j). Pre-school services are offered through the Lab City Child Care Centre, providing pre-school (ages three to four) and school-age (ages four to 13) programs in English and French (Labrador West, 2023g). The First Steps Family Resource Centre supports child development from birth to age six through parent-assisted programs. Adult education is offered through Academy Canada (First Steps Family Resource Center, n.d.).

An overview of education services available in the Town of Labrador City, as found through desktop research, is presented in Table 5-32.

Table 5-32: Town of Labrador City Education Services

Category	Provider/Service	Description
Primary / Secondary Education	AP Low Primary	▪ Kindergarten to grade three
	R. Smallwood Middle School	▪ Grades four to seven
	Menihek High School	▪ Grades eight to 12
	Le Centre éducatif L'ENVOL	▪ Francophone education for all grades
Post-Secondary Education	College of the North Atlantic – Labrador West Campus	▪ No information was available from secondary sources at the time of desktop research
Other	Lab City Child Care Centre	▪ Pre-school and school-age programs in English and French
	First Steps Family Resource Centre	▪ Parent-assisted programs
	Building Blocks	▪ Childcare program (age two to five)
	Academy Canada	▪ Adult Basic Education (high school graduation) training

Source: (LabradorWest, 2023)

5.2.1.5 Employment and Economic Development Services

Employment and recruitment services in the Town of Labrador City are offered through the Labrador West Employment Corporation, an agency offering workforce development strategies for organizations to support business success (Labrador West Employment Corporation, 2020). Their Supportive Employment program helps individuals with disabilities find work by offering employer-supported assistance (Labrador West Employment Corporation, 2020).

An overview of employment and economic development services available in the Town of Labrador City, found through desktop research, is presented in Table 5-33.

Table 5-33: Town of Labrador City Employment and Economic Development Services

Category	Provider/Service	Description
Economic Development	No information was available from secondary sources at the time of desktop research.	▪ N/A
Employment and Recruitment	Labrador West Employment Corporation	▪ Employment agency.
Training	No information was available from secondary sources at the time of desktop research.	▪ N/A

Source: (Labrador West Employment Corporation, 2020)

5.2.1.6 Housing Services

The Newfoundland and Labrador Housing Corporation has an office in the Town Labrador City, offering a Rental Housing Program, Home Energy Savings Program, Home Modification Program, and Provincial Home Repair Program (Newfoundland and Labrador Housing Corporation, 2019).

An overview of housing services available in the Town of Labrador City, found through desktop research, is presented in Table 5-34.

Table 5-34: Town of Labrador City Housing Services

Category	Provider/Service	Description
Affordable Housing and Financial Assistance	Newfoundland and Labrador Housing Corporation	▪ Housing programs
Homelessness	No information was available from secondary sources at the time of desktop research.	▪ N/A
Public Housing		

Source: (Newfoundland and Labrador Housing Corporation, 2023)

5.2.1.7 Temporary Accommodations

There are four hotels and one bed and breakfast, Trish's Place, in the Town of Labrador City. Collegiate Suites and Two Seasons Inn offer conference rooms; Dexter Inn & Suites and Two Seasons Inn offer on-site exercise facilities; and Dexter Inn & Suites and Northern Inn & Suites are listed as being wheelchair accessible (Dexter Inn, n.d.; Northern Inn and Suites, n.d.; The Collegiate, n.d.; Two Seasons Inn, n.d.). An overview of temporary accommodations available in the Town of Labrador City, as found through desktop research, is presented in Table 5-35.

Table 5-35: Town of Labrador City Temporary Accommodations

Provider/Service	Description
Collegiate Suites	▪ Offers suites and two conference rooms
Dexter Inn & Suites	▪ 214-room facility ▪ Wheelchair accessible ▪ Gym ▪ Lounge room ▪ Cafeteria-style dining hall
Northern Inn & Suites	▪ 24-room facility ▪ Wheelchair accessible
Trish's Place	▪ Two-room Bed & Breakfast
Two Seasons Inn	▪ 54-room facility ▪ Two conference rooms ▪ Gym ▪ Restaurant and bar

Source: (Dexter Inn, n.d.; Northern Inn and Suites, n.d.; The Collegiate, n.d.; Two Seasons Inn, n.d.)

5.2.1.8 Emergency Services

Police services for the Town of Labrador City are provided through the Royal Newfoundland Constabulary (RNC). Established in 1729, the RNC operates in seven detachments in the province, providing specialized investigative services, police services, and the traffic safety monitoring, including waterways and trails (Royal Newfoundland Constabulary, 2017). The Labrador City Fire Department comprises six full-time staff, including the Fire Chief, and forty-five volunteer firefighters (Labrador West, 2023p). They operate 24 hours a day, providing fire protection services to Labrador City residents and backup support for the Town of Wabush, as necessary (Labrador West, 2023p). Labrador-Grenfall Health provides paramedicine and ambulance/medical transport in Labrador City and surrounding areas, based out of the Labrador West Health Centre (Labrador-Grenfall Health, n.d.).

An overview of emergency services available in the Town of Labrador City, as found through desktop research, is presented in Table 5-36.

Table 5-36: Town of Labrador City Emergency Services

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Police	Yes	▪ Police services, investigative services, and traffic safety monitoring through Royal Newfoundland Constabulary (RNC)
Fire	Yes	▪ Six full-time staff, including the Fire Chief, and forty-five volunteer firefighters

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Emergency Medical Services	Yes	▪ Paramedicine and ambulance/medical transport through Labrador-Grenfell Health

Source: (Labrador Grenfell Health, 2018; Labrador West, 2023r, 2023y)

5.2.1.9 Transportation and Utilities

The Town of Labrador City has two newspapers, four radio stations, a municipal website, and telecommunication services provided by Rogers, Bell, TekSavvy, and Xplore. Energy is supplied by Newfoundland & Labrador Hydro. Solid waste management is provided by the Labrador West Regional Landfill. The Town of Labrador City is accessible by road, air, and rail, with railways primarily being used for the shipment of iron ore (Williams, 2021). Transportation and Infrastructure, Government of Newfoundland and Labrador, is responsible for the construction and maintenance of provincial highways (Transportation and Infrastructure, Government of Newfoundland and Labrador, n.d.). The Public Works department is responsible for the maintenance of water/sewer mains and storm drains, the delivery of drinking water, and sewerage treatment plant operation and maintenance (Town of Labrador City, 2018). The primary water treatment plant is the Drake Waste Water Treatment Plant, with an average daily flow of approximately 4,000 m3/day and a capacity of 8,172 m3/day. The Harrie Lake Waste Water Treatment Plant has an average day flow 1,323 m3/day (Town of Labrador City, 2018).

An overview of transportation and utilities available in the Town of Labrador City, as found through desktop research, is presented in Table 5-37.

Table 5-37: Town of Labrador City Transportation and Utilities

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Communications	Yes	▪ **Newspaper**: The Aurora, The Labradorian ▪ **Radio**: CJRM-FM 97.3 Rafale Canadian Broadcasting Corporation francophone station, CLFC 97.9 FM Big Land, CBDQ-FM 96.3 FM CBC, VOAR-12-FM 102.5FM Lighthouse FM ▪ **Municipality Website**: Labrador West ▪ **Telecommunication services**: Telephone and internet services provided by Rogers, Bell, TekSavvy, and Xplore

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Energy Supply	Yes	▪ Newfoundland & Labrador Hydro ▪ No information was found in desktop research regarding natural gas and propane Provider/Services.
Public Transit	No information was available from secondary sources at the time of desktop research.	▪ N/A
Solid Waste Management	Yes	▪ Labrador West Regional Landfill, receiving Household Hazardous Waste
Transportation – Road	Yes	▪ Highway 500 ▪ Highway 389
Transportation – Winter Road	N/A	▪ N/A
Transportation – Air	Yes	▪ Wabush-Labrador Airport
Transportation – Rail	Yes	▪ Railways owned and/or operated by Rail Enterprises, Inc., QNS&L, and Tshiuetin Rail Transportation Inc. ▪ Railways primarily used for the shipment of iron ore
Water and Sewage	Yes	▪ Public Works department maintains water/sewer mains and storm drains, delivers drinking water, and operates and maintains sewerage treatment plant ▪ Drake Wastewater Treatment Plant: average daily flow of approximately 4,000 m3/day and a capacity of 8,172 m3/day ▪ Harrie Lake Wastewater Treatment Plant: average day flow 1,323 m3/day

Source: (Labrador West, 2023h, 2023e, 2023d; Quebec North Shore and Labrador Railway, 2023; Town of Labrador City, 2018)

5.2.2 Town of Wabush

5.2.2.1 Recreation and Leisure

The Town of Wabush has several recreational sites and services available to residents and visitors. The Wabush Recreation Department organizes annual events and maintains community parks (Town of Wabush, 2018). The Wabush Area offers diverse activities annually and is the base for the Wabush Figure Skating Club, Labrador West Minor Hockey, and Recreation and Olympic Hockey, and the Mike Adam Recreation Complex includes a gym, pool, bowling alley, and fitness centre (Town of Wabush, 2018). For outdoor activities, Wabush has a vast trail network, including frozen water bodies and wilderness areas, and a softball field (Town of Wabush, 2018). Labrador West issues about 1,800 snowmobile trail passes annually for 800 kilometres of trails (Town of Wabush, 2018).

An overview of recreation and leisure services available in the Town of Wabush, as found through desktop research, is presented in Table 5-38.

Table 5-38: Town of Wabush Recreation and Leisure Services

Category	Provider/Service	Description
Arts and Culture (Exhibitions, Art Galleries, Museums)	No information was available from secondary sources at the time of desktop research.	▪ N/A
Community Recreation (Community Centres, Sports Clubs, Athletic Fields)	Wabush Recreation Department	▪ Organizes annual events and maintains community parks
	Wabush Arena	▪ Skating arena hosting various activities annually
	Mike Adam Recreation Complex	▪ Includes gym, pool, bowling alley, and fitness centre
Entertainment and Events (Theaters, Concert Venues, Festivals, Movie Theaters)	No information was available from secondary sources at the time of desktop research.	▪ N/A
Civic Recreation Programs (Government-Organized Recreational Activities)		
Libraries and Learning Resources (Libraries, Learning Materials)		
Parks and Outdoor Recreation (Campgrounds, Beaches, Hiking Trails)	Snowmobiling & Winter Trails	▪ 800km trail network ▪ Labrador West issues approximately 1,800 snowmobile trail passes annually
	Bev Martin Softball Field	▪ Hosts the Wabush Men's Softball League

Source: (Labrador West, 2023aa, 2023c; Town of Wabush, 2018)

5.2.2.2 Social Services

At the time of desktop research, there was no information publicly available regarding social services in the Town of Wabush.

5.2.2.3 Health Services

Health services for the Town of Wabush, as found through desktop research and presented in Table 5-39Table 5-39, are offered through the Wabush Medical Clinic. Health services can also be accessed through the Labrador West Health Centre in the Town of Labrador City.

Table 5-39: Town of Wabush Health Services

Category	Provider/Service	Description
Clinical Services (Hospitals, Clinics, and Primary Care Services)	Wabush Medical Clinic	No information was available from secondary sources at the time of desktop research.
Public Health (Preventive Measures, Health Education, and Community Health Services)	No information was available from secondary sources at the time of desktop research.	N/A
Long-Term Care Facilities (Nursing Homes)		

5.2.2.4 Education Services

At the time of desktop research, there was no information publicly available regarding education services in the Town of Wabush. Students in Wabush attend school in Labrador City (Government of Newfoundland and Labrador, n.d.-b).

5.2.2.5 Employment and Economic Development Services

At the time of desktop research, there was no information publicly available regarding employment and economic services for the Town of Wabush.

5.2.2.6 Housing Services

At the time of desktop research, there was no information publicly available regarding housing services for the Town of Wabush. Housing programs are offered through the Newfoundland and Labrador Housing Corporation, with an office in the Town of Labrador City (Newfoundland and Labrador Housing Corporation, 2023).

5.2.2.7 Temporary Accommodations

There is one hotel, the Wabush Hotel, and one bed and breakfast, the Ptarmigan's Nest. The Wabush Hotel is a chalet-style facility with banquet halls, a restaurant and bar, a gym, barber shop, and meeting room to rent (Wabush Hotel, n.d.). An overview of temporary accommodations available in the Town of Wabush, as found through desktop research, is presented in Table 5-40.

Table 5-40: Town of Wabush Temporary Accommodations

Provider/Service	Description
The Ptarmigan's Nest	▪ Bed & Breakfast
Wabush Hotel	▪ Gym ▪ Restaurant and bar ▪ Banquet Hall ▪ Meeting room

Source: (Wabush Hotel, n.d.)

5.2.2.8 Emergency Services

Police services for the Town of Wabush are provided through the Royal Newfoundland Constabulary (RNC) (Royal Newfoundland Constabulary, 2017). Established in 1729, the RNC operates in seven detachments in the province, providing specialized investigative services, police services, and the traffic safety monitoring, including waterways and trails (Royal Newfoundland Constabulary, 2017). Wabush a volunteer fire department, with 24 firefighters providing fire protection services to Wabush residents and backup support for the Town of Labrador City, as necessary (Town of Wabush, 2018). Labrador-Grenfall Health provides paramedicine and ambulance/medical transport in Wabush and surrounding areas, based out of the Labrador West Health Centre in Labrador City (Labrador-Grenfall Health, n.d.).

An overview of emergency services available in the Town of Wabush, as found through desktop research, is presented in Table 5-41.

Table 5-41: Town of Wabush Emergency Services

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Police	Yes	▪ Police services, investigative services, and traffic safety monitoring through Royal Newfoundland Constabulary (RNC).
Fire	Yes	▪ Volunteer fire department with 24 firefighters.
Emergency Medical Services	Yes	▪ Paramedicine and ambulance/medical transport through Labrador-Grenfall Health.

Source: (Town of Wabush, 2018)

5.2.2.9 Transportation and Utilities

The Town of Wabush has a municipal website, and telecommunication services provided by Rogers, Bell, TekSavvy, and Xplore. Energy is supplied by Newfoundland & Labrador Hydro and Superior Propane. The incinerator and waste disposal site in Wabush is closed, and a new engineered landfill in Labrador City serves the region, with cost-sharing based on population through an agreement between the two towns (Town of Wabush, 2018). The Town of Wabush is accessible by road, air, and rail, with railways primarily being used for the shipment of iron ore (Town of Wabush, 2018). Transportation and Infrastructure, Government of Newfoundland and Labrador, is responsible for the construction and maintenance of provincial highways (Town of Wabush, 2018). The Public Works department is responsible for the maintenance of water/sewer mains and storm drains, the delivery of drinking water, and sewerage treatment plant operation and maintenance (Town of Wabush, 2018). The primary water treatment plant is the Commercial Street Waste Water Treatment Plant, with an average daily flow of approximately 2,064 m3/day and a capacity of 4,130 m3/day (Town of Wabush, 2018).

An overview of transportation and utilities available in the Town of Wabush, as found through desktop research, is presented in Table 5-42.

Table 5-42: Town of Wabush Transportation and Utilities

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Communications	Yes	▪ **Newspaper:** No ▪ **Radio Station**: No ▪ **Municipality Website:** Yes – Labrador West ▪ **Telecommunication services**: Telephone and internet services provided by Rogers, Bell, TekSavvy, and Xplore
Energy Supply	Yes	▪ Newfoundland & Labrador Hydro ▪ Superior Propane
Public Transit	No information was available from secondary sources at the time of desktop research.	▪ N/A
Solid Waste Management	Yes	▪ Labrador West Regional Landfill, receiving Household Hazardous Waste
Transportation – Road	Yes	▪ Highway 500 ▪ Highway 389
Transportation – Winter Road	N/A	▪ N/A

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Transportation – Air	Yes	▪ Wabush-Labrador Airport ▪ Wabush Water Aerodrome
Transportation – Rail	Yes	▪ Railways owned and/or operated by Rail Enterprises, Inc., QNS&L, and Tshiuetin Rail Transportation Inc. ▪ Railways primarily used for the shipment of iron ore
Water and Sewage	Yes	▪ Public Works department maintains water/sewer mains and storm drains, delivers drinking water, and operates and maintains sewerage treatment plant ▪ Commercial Street Wastewater Treatment Plant: average daily flow of approximately 2,064 m3/day and a capacity of 4,130 m3/day

Source: (Labrador West, 2023b; Town of Wabush, 2018; Wabush Airport, 2023)

5.2.3 Ville de Fermont

5.2.3.1 Recreation and Leisure

Ville de Fermont has several recreational sites and services available to residents and visitors. The municipality has a semi-Olympic pool, gymnasium, skating arena, and public library. Recreation programs include Les journées de la cuture and Service d’accompagnement et d’inclusion en Loisirs (Ville de Fermont, 2023e). The town’s concrete skate park includes a variety of features, including hubba, quarterpipe, funbox, manualpad, flatrail, ledge, bank, roll-in, concrete park, speedbump, handrail, and pole (Ville de Fermont, 2023e). A winter festival is held in the third week of March, with yukigassen tournaments, snow blower races, gift hunts, fort wars, and dog sled races (Ville de Fermont, 2023e). Trails are available at Mont Severson, with available parking and solstice walks (Ville de Fermont, 2023e).

An overview of recreation and leisure services available in Ville de Fermont, as found through desktop research, is presented in Table 5-43.

Table 5-43: Ville de Fermont Recreation and Leisure Services

Category	Provider/Service	Description
Arts and Culture (Exhibitions, Art Galleries, Museums)	No information was available from secondary sources at the time of desktop research.	▪ N/A
Community Recreation (Community Centres, Sports Clubs, Athletic Fields)	Municipal semi-Olympic pool	▪ Swimming, underwater hockey, aquaform
	Gymnasium	▪ Badminton, weights, stationary bicycles, judo available
	l'Aréna Daniel-Demers	▪ Hockey, skating
Entertainment and Events (Theaters, Concert Venues, Festivals, Movie Theaters)	No information was available from secondary sources at the time of desktop research.	▪ N/A
Civic Recreation Programs (Government-Organized Recreational Activities)	Les journées de la cuture (Culture Days)	▪ Sewing, photography workshop, crafting hour, drawing workshop, ceramic painting workshop
	Service d'accompagnement et d'inclusion en Loisirs (Recreation Companion)	▪ Designated companions to support and help the citizens integrate into recreational activities ▪ Financial aid is available for participation
Libraries and Learning Resources (Libraries, Learning Materials)	Bibliothèque Publique de Fermont	▪ In the same building as the school library
Parks and Outdoor Recreation (Campgrounds, Beaches, Hiking Trails)	Plage du lac Daviault	▪ Water sports, boat rentals, and supervised swimming area
	Municipal parks	▪ Softball park, soccer pitch, tennis courts
	Smokey Mountain Ski Club	▪ Ski and Snowboard resort with rentals and shop
	Skateboard Park	▪ Concrete skate park
	Taïga Carnaval	▪ Winter festival
	Trails	▪ Mont Severson

Source: (Ville de Fermont, n.d., 2023e)

5.2.3.2 Social Services

Comprehensive social support services in Ville de Fermont are provided by the Centre intégré de santé et de services sociaux de la Côte-Nord. The centre's services include:

- addiction services,
- youth protection services,
- occupational and physical therapy,
- mental health services for children up to age 18,
- rehabilitation services,
- support for seniors facing maltreatment, and
- spiritual guidance (Centre intégré de santé et de services sociaux de la Côte-Nord, 2020).

Maison d'aide et d'hébergement de Fermont is a 24/7 shelter for domestic violence survivors, offering support during emergencies, convalescence care, crisis intervention, and scheduled family respite to prevent exhaustion (Maison d’aide et d’hébergement de Fermont, 2017).

An overview of social services available in Ville de Fermont, as found through desktop research, is presented in Table 5-44.

Table 5-44: Ville de Fermont Social Services

Category	Provider/Service	Description
Childcare and Youth Development	Centre de la petite enfance (CPE) le Mur-Mûr	▪ French childcare for pre-school children
	Service de garde en milieu scolaire	▪ Before and after school childcare
Comprehensive Support Services	Centre intégré de santé et de services sociaux de la Côte-Nord (Integrated Health and Social Services Centre of the North Shore)	▪ Comprehensive support centre
Crisis Centres and Transition Houses	Maison d'aide et d'hébergement de Fermont	▪ 24/7 shelter for domestic violence survivors
Hunger and Nutritional Assistance	No information was available from secondary sources at the time of desktop research.	▪ N/A
Immigrant and Refugee		
Indigenous Peoples		
Legal Assistance and Advocacy		
Mental Health and Counselling		
Substance Use and Addiction Recovery		

Source: (Centre intégré de santé et de services sociaux de la Côte-Nord, 2020; Maison d’aide et d’hébergement de Fermont, 2017)

5.2.3.3 Health Services

In Ville de Fermont, Centre Multiservices de Santé et de Services Sociaux de Fermont provides emergency care, nurse consultations, medical imaging, and various other medical services, including screenings, vaccinations, equipment rentals (crutches, wheelchairs, breast pumps), minor surgeries, contraception, prenatal classes, detoxification, and end-of-life care (MRC de Caniapiscau, 2023a). Patients requiring care not available at the Centre Multiservices de Santé et de Services Sociaux are referred to Ville de Sept-Îles, and a flat-rate stipend is provided for travel and accommodation costs (MRC de Caniapiscau, 2023a). Point de service de Fermont - Réseau de Santé Publique en Santé au Travail identifies workplace risks (physical, chemical, biological, ergonomic), provides health monitoring, offers risk-related information, supports first aid organization, and ensures safety for pregnant/breastfeeding workers (MRC de Caniapiscau, 2023a).

An overview of health services available in Ville de Fermont, as found through desktop research, is presented in Table 5-45.

Table 5-45: Ville de Fermont Health Services

Category	Provider/Service	Description
Clinical Services (Hospitals, Clinics, and Primary Care Services)	Centre Multiservices de Santé et de Services Sociaux de Fermont (Fermont Multiservice Health and Social Services Centre)	▪ Health centre providing a variety of services
Long-Term Care Facilities (Nursing Homes)	No information was available from secondary sources at the time of desktop research.	▪ N/A
Public Health (Preventive Measures, Health Education, and Community Health Services)	Point de service de Fermont - Réseau de Santé Publique en Santé au Travail (Public Health (Preventive Measures, Health Education, and Community Health Services) Network in Occupational Health)	▪ Provides information, training, and monitoring.

Source: (MRC de Caniapiscau, 2023a, 2023e)

5.2.3.4 Education Services

In Ville de Fermont, children can attend École des Découvertes (French) or Fermont School (English) for kindergarten through grade six. French-language secondary education is available at Polyvalente Horizon-Blanc. Adult education is offered through Centre d’éducation des adultes de Fermont.

An overview of education services available in Ville de Fermont, as found through desktop research, is presented in Table 5-46

Table 5-46: Ville de Fermont Education Services

Category	Provider/Service	Description
Primary / Secondary Education	École des Découvertes	▪ Kindergarten to grade six ▪ French
	Fermont School	▪ Kindergarten to grade six ▪ English
	Polyvalente Horizon-Blanc	▪ Secondary 1 to Secondary 5 ▪ French
Post-Secondary Education	No information was available from secondary sources at the time of desktop research.	▪ N/A
Other	Centre d'éducation des adultes de Fermont	▪ Adult education

Source: (MRC de Caniapiscau, 2023a; Ville de Fermont, 2023d)

5.2.3.5 *Employment and Economic Development Services*

Economic development services in Ville de Fermont are provided though Le service de développement économique de la MRC and the Chambre de commerce Fermont. MRC de Caniapiscau in collaboration with Emplois Québec and le service de développement économique de la MRC provide information about employment and volunteering opportunities for the region (MRC de Caniapiscau, 2023a). Le service de développement économique de la MRC assists with curriculum vitae writing and job searches (MRC de Caniapiscau, 2023a).

An overview of employment and economic development services available in Ville de Fermont, as found through desktop research, is presented in Table 5-47.

Table 5-47: Ville de Fermont Employment and Economic Development Services

Category	Provider/Service	Description
Economic Development	Le service de développement économique de la MRC	▪ Entrepreneurship assistance available
	Chambre de commerce Fermont	▪ Forum for discussion, networking, training or entrepreneurship
Employment and Recruitment	MRC de Caniapiscau in collaboration with Emplois Québec and le service de développement économique de la MRC	▪ Employment and volunteer opportunity information
Training	No information was available from secondary sources at the time of desktop research.	▪ N/A

Source: (MRC de Caniapiscau, 2023c, 2023c)

5.2.3.6 Housing Services

Housing services in Ville de Fermont are offered through Société d'Habitation du Québec, providing affordable social housing (24 units with two or three bedrooms) (MRC de Caniapiscau, 2023a). Applicants need to meet specific criteria to obtain housing through the program. ArcelorMittal, Le Centre de service scolaire du Fer, and La Ville de Fermont provide private real estate portfolios for employees (MRC de Caniapiscau, 2023a).

An overview of housing services available in Ville de Fermont, as found through desktop research, is presented in Table 5-48.

Table 5-48: Ville de Fermont Housing Services

Category	Provider/Service	Description
Affordable Housing and Financial Assistance	ArcelorMittal, Le Centre de service scolaire du Fer, La Ville de Fermont	▪ Private real estate portfolio for employees
	Société d'Habitation du Québec	▪ Affordable social housing consisting of 24 units with two or three bedrooms. There are many criteria to obtain a spot at Habitat de Fermont.
Homelessness	No information was available from secondary sources at the time of desktop research.	▪ N/A
Public Housing		

Source: (Maison d'aide et d'hébergement de Fermont, 2017; MRC de Caniapiscau, 2023a)

5.2.3.7 Temporary Accommodations

There is one hotel, Hotel Fermont, and one motel, Motel Vent du Nord, in Ville de Fermont. Located in the Wall, Hotel Fermont has 57 rooms spread across six floors, a training gym, and three meeting rooms (Hotel Fermont, n.d.). An overview of temporary accommodations available in Ville de Fermont, as found through desktop research, is presented in Table 5-49.

Table 5-49: Ville de Fermont Temporary Accommodations

Provider/Service	Description
Hotel Fermont	▪ 57-room facility ▪ Training gym ▪ Three meeting rooms
Motel Vent du Nord	▪ 20-room facility

Source: (Hotel Fermont, n.d.; Motel Vent du Nord, n.d.)

5.2.3.8 Emergency Services

Emergency fire services in Ville de Fermont are provided by the Ville de Fermont Fire Department, and ambulance service is provided by Centre intégré de santé et de services sociaux de la Côte-Nord.

An overview of emergency services available in Ville de Fermont, as found through desktop research, is presented in Table 5-50.

Table 5-50: Ville de Fermont Emergency Services

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Police	No information was available from secondary sources at the time of desktop research.	▪ N/A
Fire	Yes	▪ Ville de Fermont Fire Department
Emergency Medical Services	Yes	▪ Ambulance service provided by Centre intégré de santé et de services sociaux de la Côte-Nord

Source: (MRC de Caniapiscau, 2023a; Sheppard, Adrian, 2012)

5.2.3.9 Transportation and Utilities

Ville de Fermont has a newspaper, radio station, municipal website, and telecommunication services provided by Diffusion Fermont, Télébec, Bell, and Virgin mobile. Hydro-Québec provides electricity to consumers, businesses, and industrial clients in Fermont. The Québec Ministry of Transportation provides road conditions for Highway 389 and maintains it (MRC de Caniapiscau, 2023a).

An overview of transportation and utilities available in Ville de Fermont, as found through desktop research, is presented in Table 5-51.

Table 5-51: Ville de Fermont Transportation and Utilities

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Communications	Yes	▪ **Newspaper**: Le Trait d'union du Nord ▪ **Radio**: CFMF ▪ **Municipality Website**: Yes ▪ **Telecommunication services:** Telephone and internet services provided by Diffusion Fermont, Télébec, Bell, and Virgin mobile.

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Energy Supply	Yes	▪ Hydro-Québec ▪ No information was found in desktop research regarding natural gas and propane Provider/Services.
Public Transit	No information was available from secondary sources at the time of desktop research.	▪ N/A
Solid Waste Management		
Transportation – Road	Yes	▪ Highway 389
Transportation – Winter Road	N/A	▪ N/A
Transportation – Air	No	▪ N/A
Transportation – Rail		
Water and Sewage	No information was available from secondary sources at the time of desktop research.	▪ N/A

Source: (Gouvernement du Québec, 2023; MRC de Caniapiscau, 2023a)

5.3 Economy, Employment, and Business

The sections below provide an overview of economic conditions in the LSA municipalities of Labrador City, Wabush, and Fermont, and the RSA regions of Census Division No. 10, Newfoundland and Labrador, and Sept-Rivières—Caniapiscau.

5.3.1 Municipalities

The sections below provide an overview of economic conditions in the Town of Labrador City, the Town of Wabush, and Ville de Fermont.

According to the 2021 Census, the labour force participation rate in the LSA municipalities ranged from 78.3% (Labrador City) to 86.0% (Fermont) for men+, and 66.5% (Labrador City) to 78.7% (Fermont) for women+. The unemployment rate ranged from 1.8% (Fermont) to 4.7% (Labrador City) for men+, and 4.1% (Fermont) to 6.5% (Labrador City) for women+.

The top industry for men+ and women+ in all three LSA municipalities was mining, quarrying, and oil and gas extraction, with between 50.0% (Wabush) and 73.5% (Fermont) of men+, and between 18.1% (Wabush) and 30.6% (Fermont) of women+, working in that industry. The top occupation category for men+ in all three LSA municipalities was trades, transport and equipment operators, and related occupations, with between 53.6% (Labrador City) and 59.6% (Fermont) of men+ working in that field. For women+, the top occupation category in all three municipalities was sales and service occupations, employing between 24.0% (Fermont) and 35.0% (Labrador City) of women+.

Employment income accounted for between 88.4% (Labrador City) and 96.4% (Fermont) of total income for men+, and between 78.8% (Labrador City) and 84.0% (Fermont) for women+. The median and average employment incomes ranged from $120,000 and $115,600 (Wabush) to $144,00 and $137,500 (Fermont) for men+, and from $60,000 and $66,000 (Wabush) to $73,000 and $73,600 (Fermont) for women+.

5.3.1.1 Town of Labrador City

5.3.1.1.1 Labour Force Characteristics

The sections below provide an overview of the labour force characteristics for the Town of Labrador City, including participation and unemployment rates, labour supply, and income statistics.

5.3.1.1.1.1 Participation and Unemployment Rates

Relevant 2021 Census data for the Town of Labrador City can be found in Table 5-52. According to the 2021 Census, the labour force participation rate was 72.6% total (78.3% for men+ and 66.5% for women+), a 1.4% increase over 2016 for men+ and a 1.3% increase over 2016 for women+ (Statistics Canada, 2017d, 2022d). The unemployment rate in 2021 was 5.5% total (4.7% for men+ and 6.5% for women+), a 2.8% decrease from 2016 for men+ and a 3.4% decrease from 2016 for women+ (Statistics Canada, 2017d, 2022d).

Table 5-52: Town of Labrador City Labour Force Status, 2021

	2021			2016			Change from 2016 to 2021		
Labour Force Status	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Population 15+ Years	5,995	3,115	2,880	5,835	3,035	2,800	2.7	2.6	2.9
In the labour force	4,355	2,440	1,915	4,160	2,335	1,825	4.7	4.5	4.9
Employed	4,115	2,325	1,790	3,805	2,160	1,645	8.1	7.6	8.8
Unemployed	240	115	125	355	175	180	-32.4	-34.3	-30.6
Not in the labour force	1,640	675	965	1,675	700	970	-2.1	-3.6	-0.5
Participation rate (%)	72.6	78.3	66.5	71.3	76.9	65.2	1.3	1.4	1.3
Employment rate (%)	68.6	74.6	62.2	65.2	71.2	58.8	3.4	3.4	3.4
Unemployment rate (%)	5.5	4.7	6.5	8.5	7.5	9.9	-3.0	-2.8	-3.4

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017d, 2022d)

5.3.1.1.1.2 Labour Supply

Figure 5-6 illustrates the 2021 Census breakdown of the Town of Labrador City workforce by industry. According to the 2021 Census, mining, quarrying, and oil and gas extraction, was by far the dominant industry for men+, followed by retail trade. Mining, quarrying, and oil and gas extraction, followed by health care and social assistance, and retail trade, were the dominant industries for women+ (Statistics Canada, 2022d).

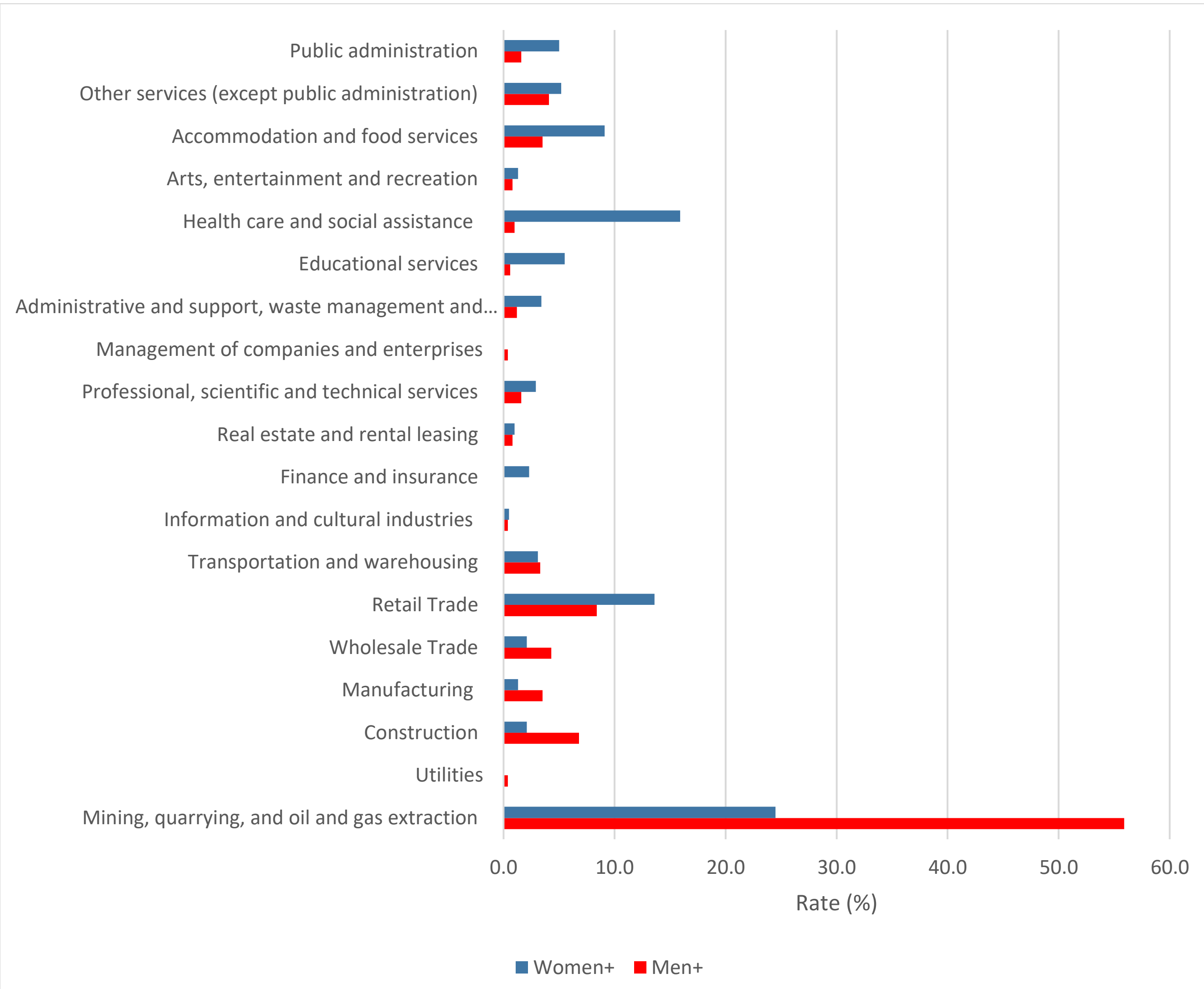

Figure 5-6: Town of Labrador City Workforce by Industry, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022d)

Table 5-53: Town of Labrador City Workforce by Industry, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Agriculture, forestry, fishing and hunting	0	0	0	0	0	0	0.0	0.0	0.0
Mining, quarrying, and oil and gas extraction	42.0	55.9	24.5	33.3	47.3	15.6	8.7	8.6	8.9
Utilities	0.2	0.4	0.0	0.7	1.1	0.0	-0.5	-0.7	0.0
Construction	4.8	6.8	2.1	5.8	8.8	1.9	-1.0	-2.0	0.2
Manufacturing	2.5	3.5	1.3	2.9	3.0	2.7	-0.4	0.5	-1.4
Wholesale Trade	3.4	4.3	2.1	3.0	3.9	2.2	0.4	0.4	-0.1
Retail Trade	10.7	8.4	13.6	14.5	12.0	18.1	-3.8	-3.6	-4.5
Transportation and warehousing	3.1	3.3	3.1	2.5	2.8	2.2	0.6	0.5	0.9
Information and cultural industries	0.5	0.4	0.5	1.0	1.1	0.8	-0.5	-0.7	-0.3
Finance and insurance	1.1	0.0	2.3	0.7	0.0	1.6	0.4	0.0	0.7
Real estate and rental leasing	0.9	0.8	1.0	1.8	1.7	2.5	-0.9	-0.9	-1.5
Professional, scientific and technical services	2.2	1.6	2.9	2.4	1.5	3.6	-0.2	0.1	-0.7
Management of companies and enterprises	0.2	0.4	0.0	0.8	0.9	0.8	-0.6	-0.5	-0.8
Administrative and support, waste management and remediation services	2.2	1.2	3.4	2.2	1.1	3.3	0.0	0.1	0.1
Educational services	2.8	0.6	5.5	4.7	2.4	7.9	-1.9	-1.8	-2.4
Health care and social assistance	7.6	1.0	15.9	6.0	0.9	12.6	1.6	0.1	3.3
Arts, entertainment and recreation	1.1	0.8	1.3	1.1	0.6	1.6	0.0	0.2	-0.3
Accommodation and food services	5.9	3.5	9.1	7.3	3.6	12.1	-1.4	-0.1	-3.0
Other services (except public administration)	4.6	4.1	5.2	4.0	3.9	3.8	0.6	0.2	1.4

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Public administration	3.1	1.6	5.0	4.0	3.2	5.2	-0.9	-1.6	-0.2

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017d, 2022d)

Figure 5-7 illustrates the 2021 Census breakdown of the Town of Labrador City workforce by occupation. According to the 2021 Census, trades, transport and equipment operators, and related occupations, followed by natural resources, agriculture, and related production occupations, were the dominant occupation categories for men+, while sales and service occupations, followed by business, finance, and administration occupations, were the dominant occupation categories for women+ (Statistics Canada, 2022d).

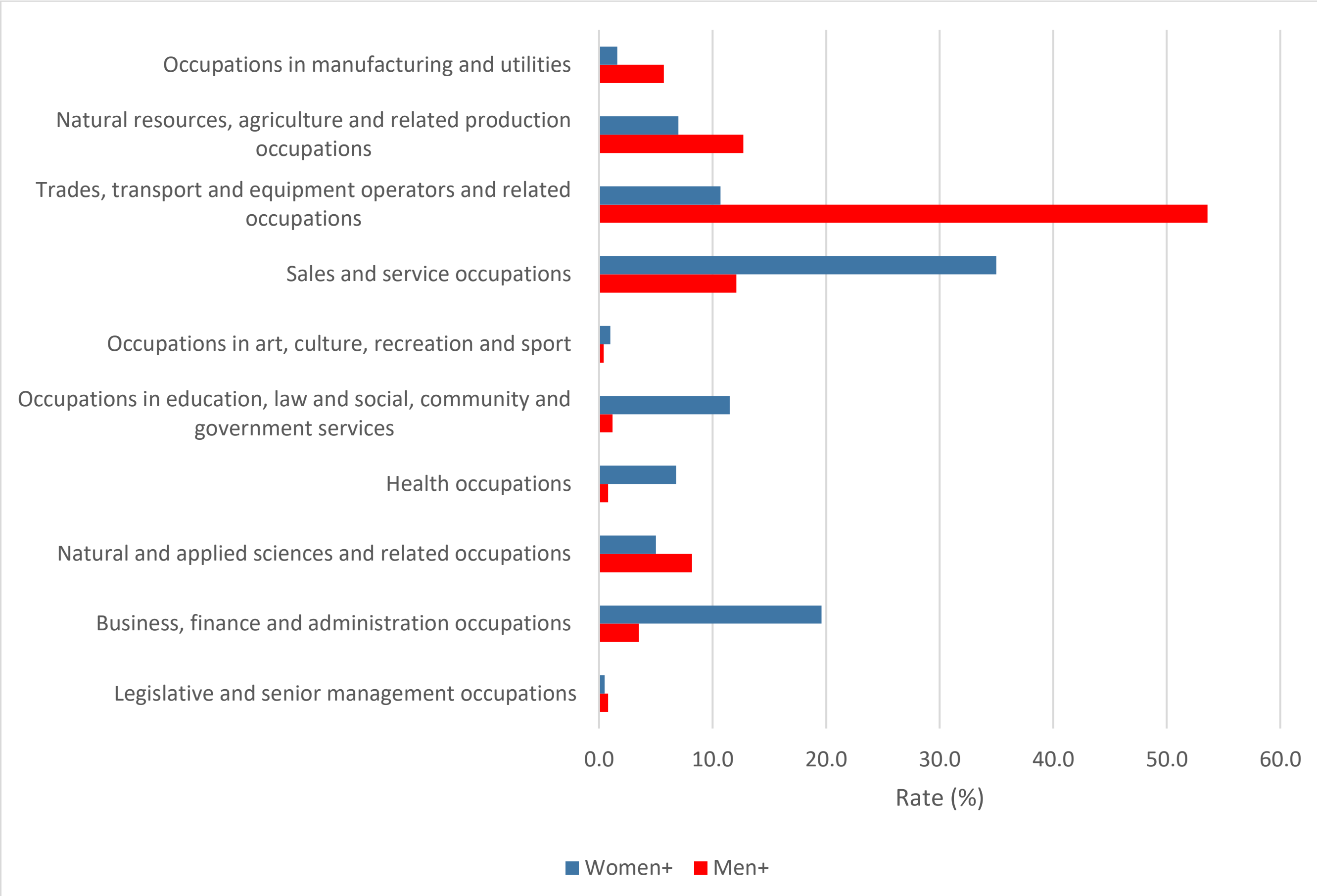

Figure 5-7: Town of Labrador City Workforce by Occupation, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022d)

Table 5-54: Town of Labrador City Workforce by Occupation, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Occupation	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Legislative and senior management occupations	0.6	0.8	0.5	7.0	7.5	6.0	-6.4	-6.7	-5.5
Business, finance and administration occupations	10.6	3.5	19.6	10.2	4.5	17.5	0.4	-1.0	2.1

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Occupation	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Natural and applied sciences and related occupations	6.8	8.2	5.0	5.6	7.5	3.0	1.2	0.7	2.0
Health occupations	3.4	0.8	6.8	2.9	0.0	6.0	0.5	0.8	0.8
Occupations in education, law and social, community and government services	5.9	1.2	11.5	6.5	2.1	12.0	-0.6	-0.9	-0.5
Occupations in art, culture, recreation and sport	0.7	0.4	1.0	1.2	0.6	1.9	-0.5	-0.2	-0.9
Sales and service occupations	22.3	12.1	35.0	23.6	14.1	36.1	-1.3	-2.0	-1.1
Trades, transport and equipment operators and related occupations	34.6	53.6	10.7	30.5	47.3	9.0	4.1	6.3	1.7
Natural resources, agriculture and related production occupations	10.2	12.7	7.0	6.8	9.2	3.8	3.4	3.5	3.2
Occupations in manufacturing and utilities	4.0	5.7	1.6	4.2	6.0	2.2	-0.2	-0.3	-0.6

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017d, 2022d)

5.3.1.1.1.3 Income

Sources of Income

Relevant 2021 Census data for the Town of Labrador City can be found in Table 5-55. According to the 2021 Census, employment income accounted for 85.4% of total income in Labrador City (88.4% for men+ and 78.8% for women+), a 0.3% decrease from 2016 for men+ and a 3.9% decrease from 2016 for women+ (Statistics Canada, 2017d, 2022d). Government transfers accounted for 8.1% of total income in Labrador City (5.2% for men+ and 14.5% for women+), a 1.4% increase over 2016 for men+ and a 3.9% increase over 2016 for women+ (Statistics Canada, 2017d, 2022d).

Table 5-55: Town of Labrador City Income Composition, 2021

Income Composition	2021			2016			Change from 2016 to 2021		
	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Market Income (%)	91.8	94.8	85.6	94.1	96.2	89.3	-2.3	-1.4	-3.7
Employment Income (%)	85.4	88.4	78.8	86.9	88.7	82.7	-1.5	-0.3	-3.9
Government Transfers (%)	8.1	5.2	14.5	5.9	3.8	10.6	2.2	1.4	3.9

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017d, 2022d)

Employment Income

Relevant 2021 Census data for the Town of Labrador City can be found in Table 5-56. According to the 2021 Census, the median employment income was $128,000 for full-year full-time men+ workers, a 17.6% increase over 2016, and $66,500 for full-year full-time women+ workers, a 3.6% increase over 2016 (Statistics Canada, 2017d, 2022d). In the 2021 Census, the average employment income was $120,100 for full-year full-time men+ workers, a 12.8% increase over 2016, and $70,600 for full-year full-time women+ workers, a 4.6% increase over 2016 (Statistics Canada, 2017d, 2022d).

Table 5-56: Town of Labrador City Income Statistics, 2021

Income Statistics	2021			2016			Change from 2016 to 2021		
	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Number of employment income recipients (aged 15 years and over in private households who worked full year full time in 2020)	2,775	1,675	1,100	2,275	1,395	880	22.0	20.1	25.0
Median employment income in 2020 (Full-year full-time workers) ($)	100,000	128,000	66,500	91,335	108,846	64,194	9.5	17.6	3.6

	2021			2016			Change from 2016 to 2021		
Income Statistics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Average employment income in 2020 (Full-year full-time workers) ($)	100,600	120,100	70,600	91,365	106,500	67,469	10.1	12.8	4.6

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017d, 2022d)

5.3.1.1.2 Economic Sector Overview

The sections below provide an overview of the economic sector in the Town of Labrador City, including forestry and construction projects, tourism initiatives and activities, and a goods and services profile.

5.3.1.1.2.1 Forestry

No information was available from secondary sources at the time of desktop research.

5.3.1.1.2.2 Construction

No information was available from secondary sources at the time of desktop research.

5.3.1.1.2.3 Tourism

In the Town of Labrador City Municipal Plan, 2018-2028, the Town expressed a desire to become a "quintessential sustainable northern community," in part through the development of a "resilient eco-tourism industry" (Town of Labrador City, 2018). The Town of Labrador City's website, shared with the Town of Wabush, promotes seasonal and year-round outdoor tourism opportunities, including camping, hunting, fishing, hiking, snowmobiling, dog sledding, and Nordic skiing (Labrador West, n.d.-d).

5.3.1.1.2.4 Goods and Services Profile

Labrador West, a virtual town hall representing both the Town of Wabush and the Town of Labrador City, maintains a registry of businesses in both municipalities. According to Labrador West, there are 511 registered businesses between the two municipalities, offering a wide range of services including shopping, groceries and industrial supply (Labrador West, n.d.-b).

5.3.1.2 Town of Wabush

5.3.1.2.1 Labour Force Characteristics

The sections below provide an overview of the labour force characteristics for the Town of Wabush, including participation and unemployment rates, labour supply, and income statistics.

5.3.1.2.1.1 Participation and Unemployment Rates

Relevant 2021 Census data for the Town of Wabush can be found in Table 5-57. According to the 2021 Census, the labour force participation rate was 76.7% total (84.8% for men+ and 68.2% for women+), a 3.3% increase over 2016 for men+ and an 5.4% increase over 2016 for women+ (Statistics Canada, 2017k, 2022k). The unemployment rate in 2021 was 4.5% total (4.3% for men+ and 4.8% for women+), a 4.6% decrease from 2016 for men+ and a 9.2% decrease from 2016 for women+ (Statistics Canada, 2017k, 2022k).

Table 5-57: Town of Wabush Labour Force Status, 2021

	2021			2016			Change from 2016 to 2021		
Labour Force Status	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Population 15+ Years	1,590	820	770	1,495	755	740	6.4	8.6	4.1
In the labour force	1,220	695	525	1,080	615	465	13.0	13.0	12.9
Employed	1,165	660	505	960	555	405	21.4	18.9	24.7
Unemployed	55	30	25	120	55	65	-54.2	-45.5	-61.5
Not in the labour force	370	125	245	415	140	275	-10.8	-10.7	-10.9
Participation rate (%)	76.7	84.8	68.2	72.2	81.5	62.8	4.5	3.3	5.4
Employment rate (%)	73.3	80.5	65.6	64.2	73.5	54.7	9.1	7.0	10.9
Unemployment rate (%)	4.5	4.3	4.8	11.1	8.9	14.0	-6.6	-4.6	-9.2

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017k, 2022k)

5.3.1.2.1.2 Labour Supply

Figure 5-8 illustrates the 2021 Census breakdown of the Town of Wabush workforce by industry. According to the 2021 Census, mining, quarrying, and oil and gas extraction was by far the dominant industry for men+, followed by construction, Mining, quarrying, and oil and gas extraction, followed by health care and social assistance, and educational services were the dominant industries for women+ (Statistics Canada, 2022k).

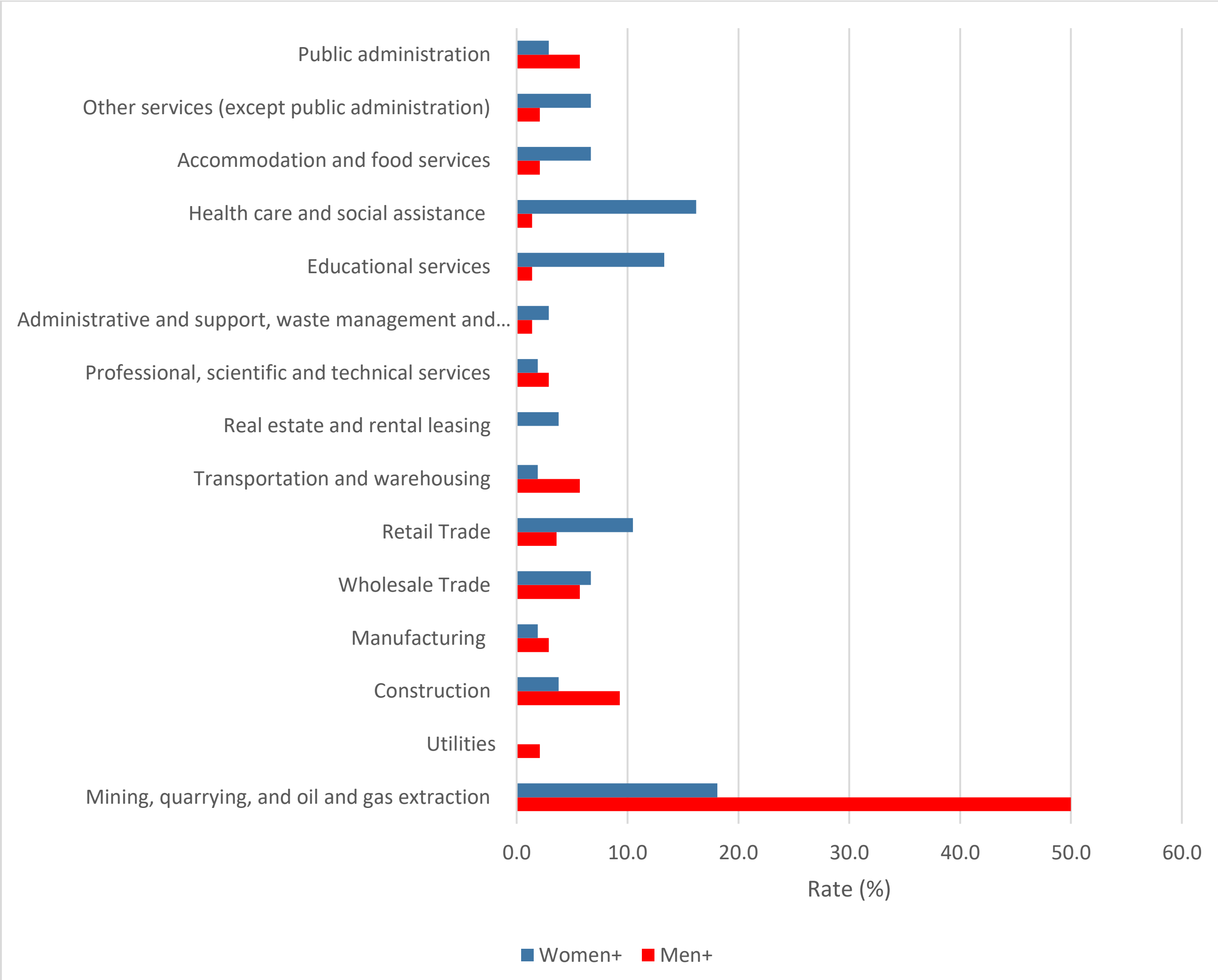

Figure 5-8: Town of Wabush Workforce by Industry, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022k)

Table 5-58: Town of Wabush Workforce by Industry, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Agriculture, forestry, fishing and hunting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining, quarrying, and oil and gas extraction	36.1	50.0	18.1	24.1	30.1	16.0	12.0	19.9	2.1

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Utilities	1.2	2.1	0.0	1.4	1.6	3.2	-0.2	0.5	-3.2
Construction	7.4	9.3	3.8	12.0	17.9	4.3	-4.6	-8.6	-0.5
Manufacturing	2.0	2.9	1.9	3.2	4.9	0.0	-1.2	-2.0	1.9
Wholesale Trade	6.1	5.7	6.7	6.5	7.3	4.3	-0.4	-1.6	2.4
Retail Trade	7.0	3.6	10.5	11.1	8.1	16.0	-4.1	-4.5	-5.5
Transportation and warehousing	4.5	5.7	1.9	3.2	2.4	4.3	1.3	3.3	-2.4
Information and cultural industries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Finance and insurance	0.0	0.0	0.0	0.9	0.0	2.1	-0.9	0.0	-2.1
Real estate and rental leasing	2.0	0.0	3.8	1.4	0.0	0.0	0.6	0.0	3.8
Professional, scientific and technical services	2.9	2.9	1.9	1.4	1.6	0.0	1.5	1.3	1.9
Management of companies and enterprises	0.0	0.0	0.0	0.0	1.6	0.0	0.0	-1.6	0.0
Administrative and support, waste management and remediation services	1.6	1.4	2.9	4.2	4.1	4.3	-2.6	-2.7	-1.4
Educational services	6.6	1.4	13.3	3.7	1.6	7.4	2.9	-0.2	5.9
Health care and social assistance	7.4	1.4	16.2	4.6	0.0	9.6	2.8	1.4	6.6
Arts, entertainment and recreation	0.0	0.0	0.0	2.3	1.6	3.2	-2.3	-1.6	-3.2
Accommodation and food services	4.1	2.1	6.7	3.7	2.4	6.4	0.4	-0.3	0.3
Other services (except public administration)	4.1	2.1	6.7	5.6	4.1	7.4	-1.5	-2.0	-0.7
Public administration	4.5	5.7	2.9	9.3	9.8	8.5	-4.8	-4.1	-5.6

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017k, 2022k)

Figure 5-9 illustrates the 2021 Census breakdown of the Town of Wabush workforce by occupation. According to the 2021 Census, trades, transport and equipment operators, and related occupations was by far the dominant occupation category for men+, followed by natural resources, agriculture, and related production occupations. Sales and service occupations, followed by business, finance, and administration occupations, were the dominant occupation categories for women+ (Statistics Canada, 2022k).

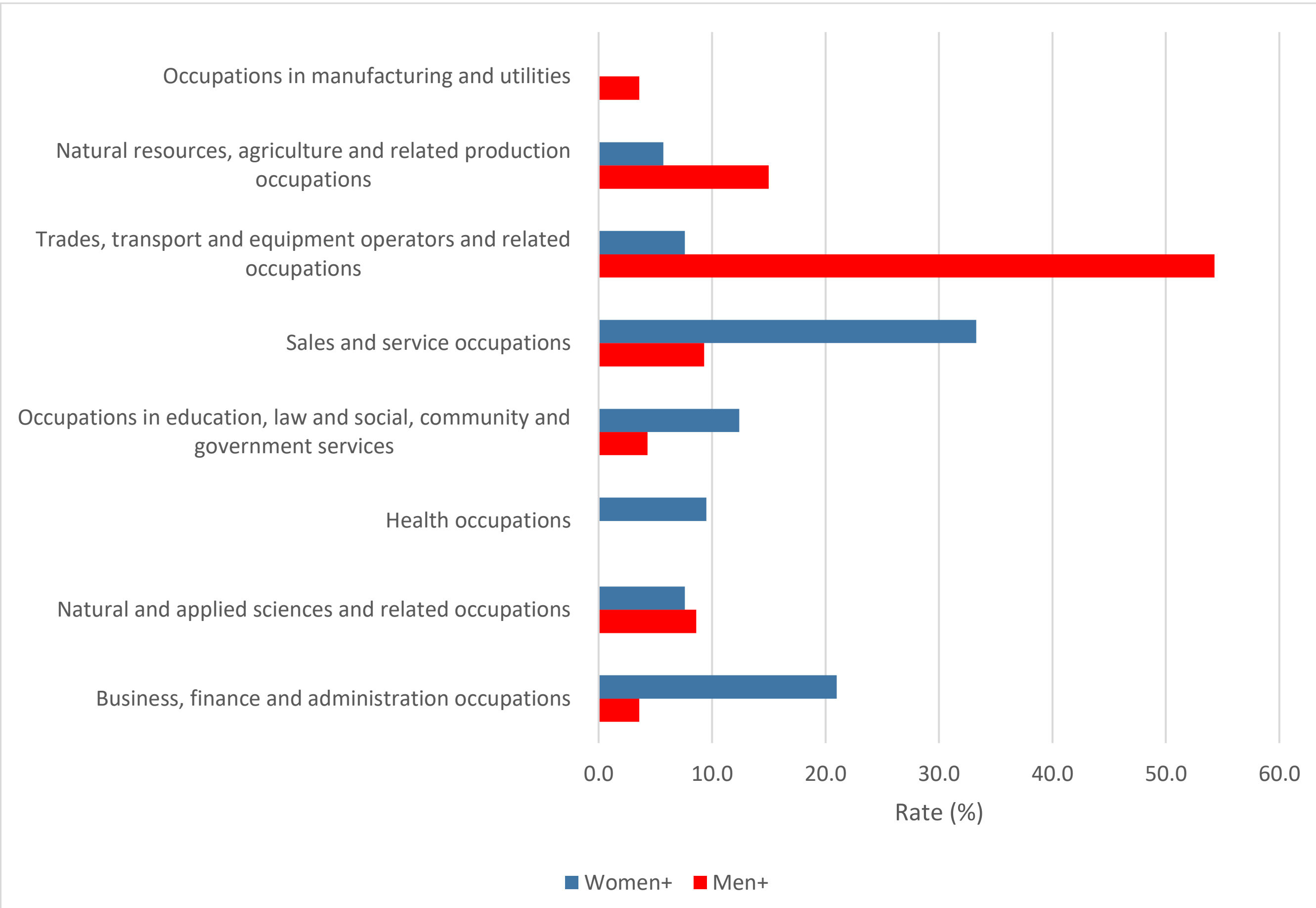

Figure 5-9: Town of Wabush Workforce by Occupation, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022k)

Table 5-59: Town of Wabush Workforce by Occupation, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Occupation	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Legislative and senior management occupations	0.0	0.0	0.0	9.2	9.8	9.7	-9.2	-9.8	-9.7
Business, finance and administration occupations	11.5	3.6	21.0	12.4	7.3	19.4	-0.9	-3.7	1.6
Natural and applied sciences and related occupations	7.4	8.6	7.6	4.6	6.5	2.2	2.8	2.1	5.4
Health occupations	4.5	0.0	9.5	3.7	0.0	7.5	0.8	0.0	2.0
Occupations in education, law and social, community and government services	7.4	4.3	12.4	7.8	6.5	9.7	-0.4	-2.2	2.7
Occupations in art, culture, recreation and sport	0.0	0.0	0.0	0.9	0.0	2.2	-0.9	0.0	-2.2
Sales and service occupations	20.1	9.3	33.3	19.8	14.6	28.0	0.3	-5.3	5.3
Trades, transport and equipment operators and related occupations	34.4	54.3	7.6	34.1	48.0	15.1	0.3	6.3	-7.5
Natural resources, agriculture and related production occupations	11.1	15.0	5.7	4.6	4.1	5.4	6.5	10.9	0.3
Occupations in manufacturing and utilities	2.9	3.6	0.0	1.8	2.4	2.2	1.1	1.2	-2.2

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017k, 2022k)

5.3.1.2.1.3 Income

Sources of Income

Relevant 2021 Census data for the Town of Wabush can be found in Table 5-60. According to the 2021 Census, employment income accounted for 87.6% of total income in Wabush (90.4% for men+ and 82.0% for women+), a 3.3% increase over 2016 for men+ and a 1.1% increase over 2016 for women+ (Statistics Canada, 2017k, 2022k). Government transfers accounted for 8.2% of total income in Wabush (5.2% for men+ and 14.8% for women+), a 10.6% increase over 2016 for men+ and a 20.3% increase over 2016 for women+ (Statistics Canada, 2017k, 2022k).

Table 5-60: Town of Wabush Income Composition, 2021

	2021			2016			Change from 2016 to 2021		
Income Composition	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Market Income (%)	91.8	94.8	85.0	92.7	95.2	87.4	-0.9	-0.4	-2.4
Employment Income (%)	87.6	90.4	82.0	85.5	87.5	81.1	2.1	2.9	0.9
Government Transfers (%)	8.2	5.2	14.8	7.1	4.7	12.3	1.1	0.5	2.5

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017k, 2022k)

Employment Income

Relevant 2021 Census data for the Town of Wabush can be found in Table 5-61. According to the 2021 Census, the median employment income was $120,000 for full-year full-time men+ workers, a 21.0% increase over 2016, and $60,000 for full-year full-time women+ workers, a 5.0% increase over 2016 (Statistics Canada, 2017k, 2022k). In the 2021 Census, the average employment income was $115,600 for full-year full-time men+ workers, a 10.1% increase over 2016, and $66,000 for full-year full-time women+ workers, a 5.2% decrease from 2016 (Statistics Canada, 2017k, 2022k).

Table 5-61: Town of Wabush Income Statistics, 2021

	2021			2016			Change from 2016 to 2021		
Income Statistics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Number of employment income recipients (aged 15 years and over in private households who worked full year full time in 2020)	750	455	295	630	385	240	19.0	18.2	22.9
Median employment income in 2020 (Full-year full-time workers) ($)	98,000	120,000	60,000	88,617	99,170	57,126	10.6	21.0	5.0
Average employment income in 2020 (Full-year full-time workers) ($)	95,800	115,600	66,000	91,459	104,968	69,621	4.7	10.1	-5.2

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017k, 2022k)

5.3.1.2.2 Economic Sector Overview

The sections below provide an overview of the economic sector in the Town of Wabush, including forestry and construction projects, tourism initiatives and activities, and a goods and services profile.

5.3.1.2.2.1 Forestry

No information was available from secondary sources at the time of desktop research.

5.3.1.2.2.2 Construction

No information was available from secondary sources at the time of desktop research.

5.3.1.2.2.3 Tourism

In the Town of Wabush Municipal Plan, 2018-2028, the Town expressed a need to diversify the Town's economy beyond the mining industry. To this end, the Plan states: "The Town will explore new opportunities to develop the tourism industry as a way to diversify the economy" (Town of Wabush, 2018). The Town of Wabush's website, shared with the Town of Labrador City, promotes seasonal and year-round outdoor tourism opportunities, including camping, hunting, fishing, hiking, snowmobiling, dog sledding, and Nordic skiing (Labrador West, n.d.-d).

5.3.1.2.2.4 Goods and Services Profile

Labrador West, a virtual town hall representing both the Town of Wabush and the Town of Labrador City, includes a registry of businesses in both municipalities. According to Labrador West, there are 511 registered businesses between the two municipalities, offering services from shopping to grocery to industrial supply and more (Labrador West, n.d.-b).

5.3.1.3 Ville de Fermont

5.3.1.3.1 Labour Force Characteristics

The sections below provide an overview of the labour force characteristics for Ville de Fermont, including participation and unemployment rates, labour supply, and income statistics.

5.3.1.3.1.1 Participation and Unemployment Rates

Relevant 2021 Census data for Ville de Fermont can be found in Table 5-62. According to the 2021 Census, the labour force participation rate was 82.5% total (86.0% for men+ and 78.7% for women+), a 3.1% decrease from 2016 for men+ and a 6.8% increase over 2016 for women+ (Statistics Canada, 2017b, 2022b). The unemployment rate in 2021 was 2.4% total (1.8% for men+ and 4.1% for women+), a 2.8% decrease from 2016 for men+ and a 4.0% decrease from 2016 for women+ (Statistics Canada, 2017b, 2022b)

Table 5-62: Ville de Fermont Labour Force Status, 2021

	2021			2016			Change from 2016 to 2021		
Labour Force Status	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Population 15+ Years	1,740	965	775	1,965	1,105	855	-11.5	-12.7	-9.4
In the labour force	1,435	830	610	1,595	985	615	-10.0	-15.7	-0.8
Employed	1,400	810	585	1,510	940	565	-7.3	-13.8	3.5
Unemployed	35	15	25	90	45	50	-61.1	-66.7	-50.0
Not in the labour force	300	135	165	365	125	245	-17.8	8.0	-32.7
Participation rate (%)	82.5	86.0	78.7	81.2	89.1	71.9	1.3	-3.1	6.8
Employment rate (%)	80.5	83.9	75.5	76.8	85.1	66.1	3.7	-1.2	9.4
Unemployment rate (%)	2.4	1.8	4.1	5.6	4.6	8.1	-3.2	-2.8	-4.0

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017b, 2022b)

5.3.1.3.1.2 Labour Supply

Figure 5-10 illustrates the 2021 Census breakdown of the Ville de Fermont workforce by industry. According to the 2021 Census, mining, quarrying, and oil and gas extraction was by far the dominant industry for men+,, followed by manufacturing. Mining, quarrying, and oil and gas extraction, followed by health care and social assistance, were the dominant industries for women+ (Statistics Canada, 2022b).

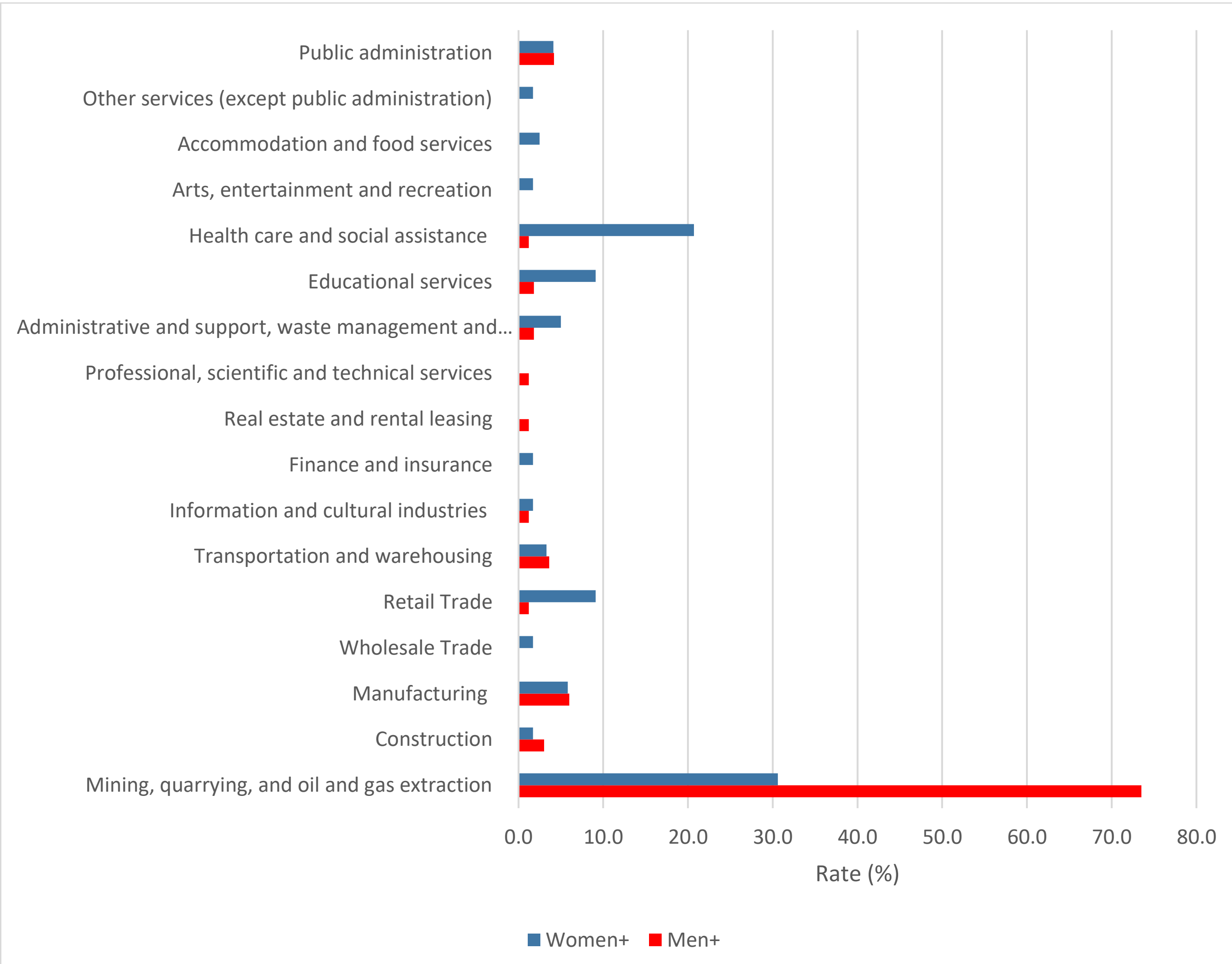

Figure 5-10: Ville de Fermont Workforce by Industry, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022b)

Table 5-63: Ville de Fermont Workforce by Industry, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Agriculture, forestry, fishing and hunting	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mining, quarrying, and oil and gas extraction	54.9	73.5	30.6	51.7	71.9	20.3	3.2	1.6	10.3
Utilities	0.0	0.0	0.0	0.6	1.0	0.0	-0.6	-1.0	0.0
Construction	2.1	3.0	1.7	1.6	2.0	0.0	0.5	1.0	1.7
Manufacturing	5.6	6.0	5.8	6.6	9.2	1.6	-1.0	-3.2	4.2
Wholesale Trade	0.7	0.0	1.7	1.9	2.0	1.6	-1.2	-2.0	0.1
Retail Trade	4.2	1.2	9.1	6.6	3.1	12.2	-2.4	-1.9	-3.1
Transportation and warehousing	3.5	3.6	3.3	2.2	1.5	2.4	1.3	2.1	0.9
Information and cultural industries	1.4	1.2	1.7	0.9	1.0	1.6	0.5	0.2	0.1
Finance and insurance	0.7	0.0	1.7	0.9	0.0	1.6	-0.2	0.0	0.1
Real estate and rental leasing	1.0	1.2	0.0	0.0	0.0	0.0	1.0	1.2	0.0
Professional, scientific and technical services	0.7	1.2	0.0	0.9	1.0	1.6	-0.2	0.2	-1.6
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and support, waste management and remediation services	3.1	1.8	5.0	2.2	1.0	3.3	0.9	0.8	1.7
Educational services	4.5	1.8	9.1	4.1	1.0	9.8	0.4	0.8	-0.7
Health care and social assistance	9.4	1.2	20.7	9.4	0.0	22.8	0.0	1.2	-2.1
Arts, entertainment and recreation	0.7	0.0	1.7	0.6	0.0	0.0	0.1	0.0	1.7
Accommodation and food services	1.0	0.0	2.5	2.2	1.0	4.9	-1.2	-1.0	-2.4
Other services (except public administration)	1.0	0.0	1.7	3.1	2.6	4.1	-2.1	-2.6	-2.4

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Public administration	4.5	4.2	4.1	4.4	3.1	6.5	0.1	1.1	-2.4

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017b, 2022b)

Figure 5-11 illustrates the 2021 Census breakdown of the Ville de Fermont workforce by occupation. According to the 2021 Census, trades, transport and equipment operators and related occupations was by far the dominant occupation category for men+, followed by natural resources, agriculture, and related production occupations. Sales and service occupations, business, finance, and administration occupations, and occupations in education, law and social, community and government services were the dominant occupation categories for women+ (Statistics Canada, 2022b).

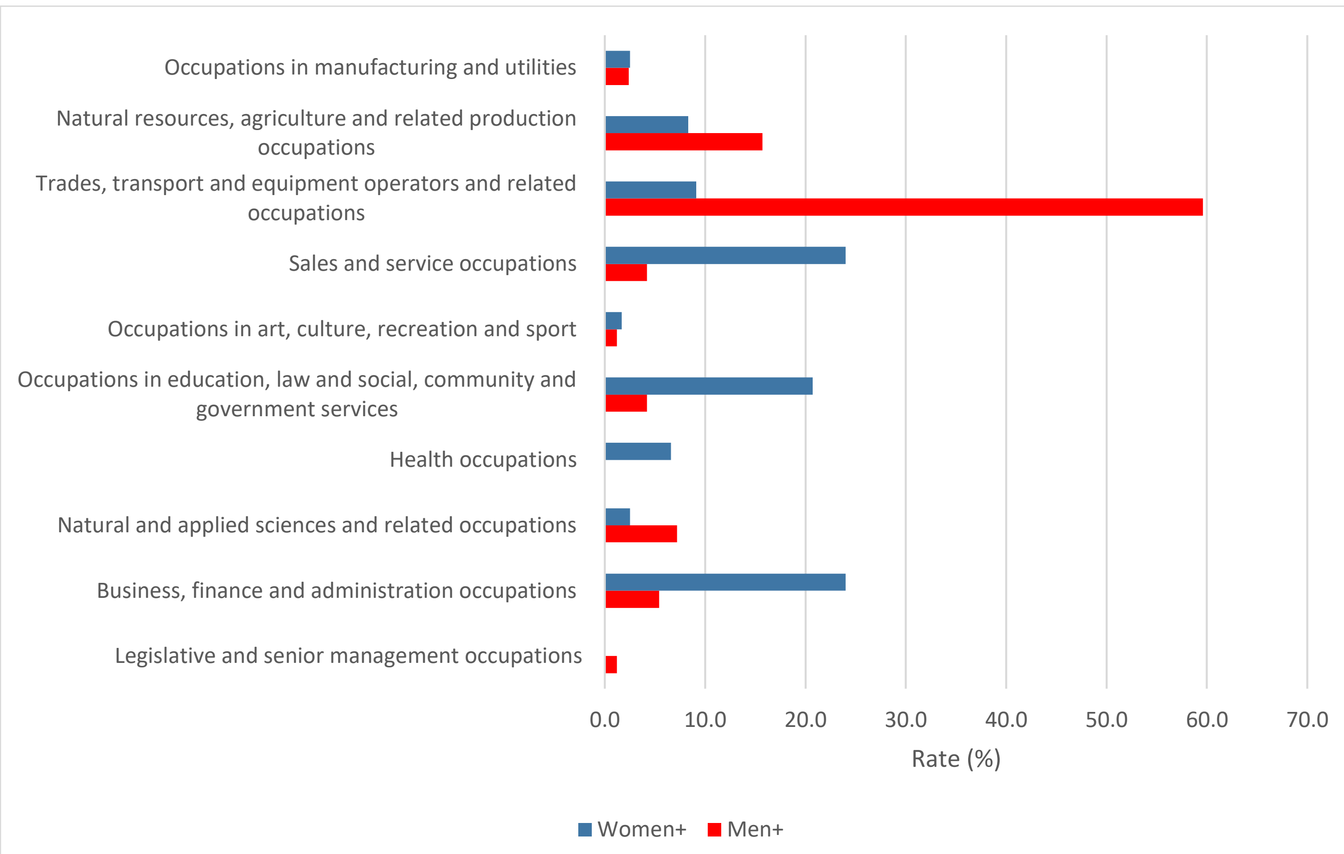

Figure 5-11: Ville de Fermont Workforce by Occupation, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022b)

Table 5-64: Ville de Fermont Workforce by Occupation, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Occupation	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Legislative and senior management occupations	0.7	1.2	0.0	5.3	3.1	8.9	-4.6	-1.9	-8.9
Business, finance and administration occupations	12.8	5.4	24.0	9.4	4.6	17.1	3.4	0.8	6.9
Natural and applied sciences and related occupations	5.2	7.2	2.5	7.8	10.2	4.1	-2.6	-3.0	-1.6
Health occupations	3.1	0.0	6.6	3.4	0.0	8.1	-0.3	0.0	-1.5
Occupations in education, law and social, community and government services	11.5	4.2	20.7	8.5	1.5	18.7	3.0	2.7	2.0
Occupations in art, culture, recreation and sport	1.7	1.2	1.7	1.6	0.0	4.1	0.1	1.2	-2.4
Sales and service occupations	12.5	4.2	24.0	15.0	6.6	27.6	-2.5	-2.4	-3.6
Trades, transport and equipment operators and related occupations	37.8	59.6	9.1	36.7	56.1	5.7	1.1	3.5	3.4
Natural resources, agriculture and related production occupations	12.2	15.7	8.3	8.8	12.8	2.4	3.4	2.9	5.9
Occupations in manufacturing and utilities	2.1	2.4	2.5	3.1	4.6	0.0	-1.0	-2.2	2.5

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017b, 2022b)

5.3.1.3.1.3 Income

Sources of Income

Relevant 2021 Census data for Ville de Fermont can be found in Table 5-65. According to the 2021 Census, employment income accounted for 92.8% of total income in Fermont (96.4% for men+ and 84.0% for women+), a 0.3% increase over 2016 for men+ and a 2.5% decrease from 2016 for women+ (Statistics Canada, 2017b, 2022b). Government transfers accounted for 5.7% of total income in Fermont (2.5% for men+ and 13.5% for women+), a 0.7% increase over 2016 for men+ and a 2.3% increase over 2016 for women+ (Statistics Canada, 2017b, 2022b).

Table 5-65: Ville de Fermont Income Composition, 2021

	2021			2016			Change from 2016 to 2021		
Income Composition	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Market Income (%)	94.4	97.6	86.4	95.7	98.7	89.1	-1.3	-1.1	-2.7
Employment Income (%)	92.8	96.4	84.0	93.4	96.1	86.5	-0.6	0.3	-2.5
Government Transfers (%)	5.7	2.5	13.5	4.2	1.8	11.2	1.5	0.7	2.3

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017b, 2022b)

Employment Income

Relevant 2021 Census data for Ville de Fermont can be found in Table 5-66. According to the 2021 Census, the median employment income was $144,000 for full-year full-time men+ workers, a 14.4% increase over 2016, and $73,000 for full-year full-time women+ workers, a 4.4% increase over 2016 (Statistics Canada, 2017b, 2022b). In the 2021 Census, the average employment income was $137,500 for full-year full-time men+ workers, a 10.5% increase over 2016, and $73,600 for full-year full-time women+ workers, a 6.1% increase over 2016 (Statistics Canada, 2017b, 2022b).

Table 5-66: Ville de Fermont Income Statistics, 2021

	2021			2016			Change from 2016 to 2021		
Income Statistics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Number of employment income recipients (aged 15 years and over in private households who worked full year full time in 2020)	970	630	335	905	625	285	7.2	0.8	17.5
Median employment income in 2020 (Full-year full-time workers) ($)	126,000	144,000	73,000	116,836	125,861	69,896	7.8	14.4	4.4
Average employment income in 2020 (Full-year full-time workers) ($)	115,600	137,500	73,600	107,279	124,387	69,385	7.8	10.5	6.1

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017b, 2022b)

5.3.1.3.2 Economic Sector Overview

The sections below provide an overview of the economic sector in Ville de Fermont, including forestry and construction projects, tourism initiatives and activities, and a goods and services profile.

5.3.1.3.2.1 Forestry

No information was available from secondary sources at the time of desktop research.

5.3.1.3.2.2 Construction

No information was available from secondary sources at the time of desktop research.

5.3.1.3.2.3 Tourism

The MRC de Caniapiscau promotes tourism in the towns of Fermont and Schefferville, and the Indigenous communities of La Nation Innu Matimekush-Lac John and the Naskapi Nation of Kawawachikamach. MRC de Caniapiscau promotes Fermont as the province's highest altitude city, with access to outdoor recreation activities (including hiking, fishing, hunting, and skiing), and the Northern Sweden-inspired Wall as a unique local attraction (MRC de Caniapiscau, 2023b). There are three hotels in Ville de Fermont and four restaurants (Ville de Fermont, 2023c, 2023b).

5.3.1.3.2.4 *Goods and Services Profile*

Ville de Fermont's economy is centred around iron mining; however, the Wall contains a shopping centre (MRC de Caniapiscau, 2023b).

5.3.2 Regions

The sections below provide an overview of social conditions in Census Division No. 10, Newfoundland and Labrador, and Sept-Rivières—Caniapiscau.

According to the 2021 Census, the labour force participation rate in the RSA regions ranged from 66.4% (Sept-Rivières—Caniapiscau) to 72.4% (Division No. 10) for men+, and 60.4% (Sept-Rivières—Caniapiscau) to 65.0% (Division No. 10) for women+ (Statistics Canada, 2022a, 2022h). The unemployment rate ranged from 6.1% (Sept-Rivières—Caniapiscau) to 13.1% (Division No. 10) for men+, and 5.2% (Sept-Rivières—Caniapiscau) to 11.0% (Division No. 10) for women+ (Statistics Canada, 2022a, 2022h).

The top industry for men+ in both regions was mining, quarrying, and oil and gas extraction, employing between 16.1% (Sept-Rivières—Caniapiscau) and 27.6% (Division No. 10) of men+ (Statistics Canada, 2022a, 2022h). The top industry for women+ in both regions was health care and social assistance, employing between 21.1% (Division No. 10) and 25.0% (Sept-Rivières—Caniapiscau) of women+ (Statistics Canada, 2022a, 2022h). The top occupation category for men+ in both regions was trades, transport and equipment operators, and related occupations, with between 40.8% (Sept-Rivières—Caniapiscau) and 46.6% (Division No. 10) of men+ working in that field (Statistics Canada, 2022a, 2022h). For women+, the top occupation category in both regions was sales and service occupations, employing between 30.5% (Sept-Rivières—Caniapiscau) and 32.7% (Division No. 10) of women+ (Statistics Canada, 2022a, 2022h).

Employment income accounted for between 77.0% (Sept-Rivières—Caniapiscau) and 83.4% (Division No. 10) of total income for men+, and between 65.8% (Sept-Rivières—Caniapiscau) and 72.6% (Division No. 10) for women+(Statistics Canada, 2022a, 2022h). The median and average employment incomes ranged from $89,000 and $91,400 (Sept-Rivières—Caniapiscau) to $101,00 and $104,000 (Division No. 10) for men+, and from $51,600 and $58,400 (Sept-Rivières—Caniapiscau) to $57,600 and $63,550 (Division No. 10) for women+ (Statistics Canada, 2022a, 2022h).

5.3.2.1 *Census Division No. 10, Newfoundland and Labrador*

5.3.2.1.1 Labour Force Characteristics

The sections below provide an overview of the labour force characteristics for Census Division No. 10, Newfoundland and Labrador, including participation and unemployment rates, labour supply, and income statistics.

5.3.2.1.1.1 *Participation and Unemployment Rates*

Relevant 2021 Census data for Census Division No. 10, Newfoundland and Labrador, can be found in Table 5-67. According to the 2021 Census, the labour force participation rate was 68.7% total (72.4% for men+ and 65.0% for women+), a 0.0% change from 2016 for men+ and an 1.8% increase over 2016 for women+ (Statistics Canada, 2017a, 2022a). The unemployment rate in 2021 was 12.1% total (13.1% for men+ and 11.0% for women+), a 1.4% decrease from 2016 for men+ and a 1.9% decrease from 2016 for women+ (Statistics Canada, 2017a, 2022a).

Table 5-67: Census Division No. 10, Newfoundland and Labrador, Labour Force Status, 2021

	2021			2016			Change from 2016 to 2021		
Labour Force Status	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Population 15+ Years	19,390	9,760	9,630	19,565	9,835	9,725	-0.9	-0.8	-1.0
In the labour force	13,320	7,070	6,255	13,270	7,125	6,145	0.4	-0.8	1.8
Employed	11,715	6,145	5,570	11,445	6,095	5,350	2.4	0.8	4.1
Unemployed	1,610	925	685	1,820	1,030	795	-11.5	-10.2	-13.8
Not in the labour force	6,065	2,690	3,375	6,295	2,710	3,585	-3.7	-0.7	-5.9
Participation rate (%)	68.7	72.4	65.0	67.8	72.4	63.2	0.9	0.0	1.8
Employment rate (%)	60.4	63.0	57.8	58.5	62.0	55.0	1.9	1.0	2.8
Unemployment rate (%)	12.1	13.1	11.0	13.7	14.5	12.9	-1.6	-1.4	-1.9

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017a, 2022a)

5.3.2.1.1.2 Labour Supply

Figure 5-12 illustrates the 2021 Census breakdown of the Census Division No. 10, Newfoundland and Labrador, workforce by industry. According to the 2021 Census, mining, quarrying, and oil and gas extraction, was by far the dominant industry for men+, followed by construction and public administration. Health care and social assistance, followed by retail trade, were the dominant industries for women+ (Statistics Canada, 2022a).

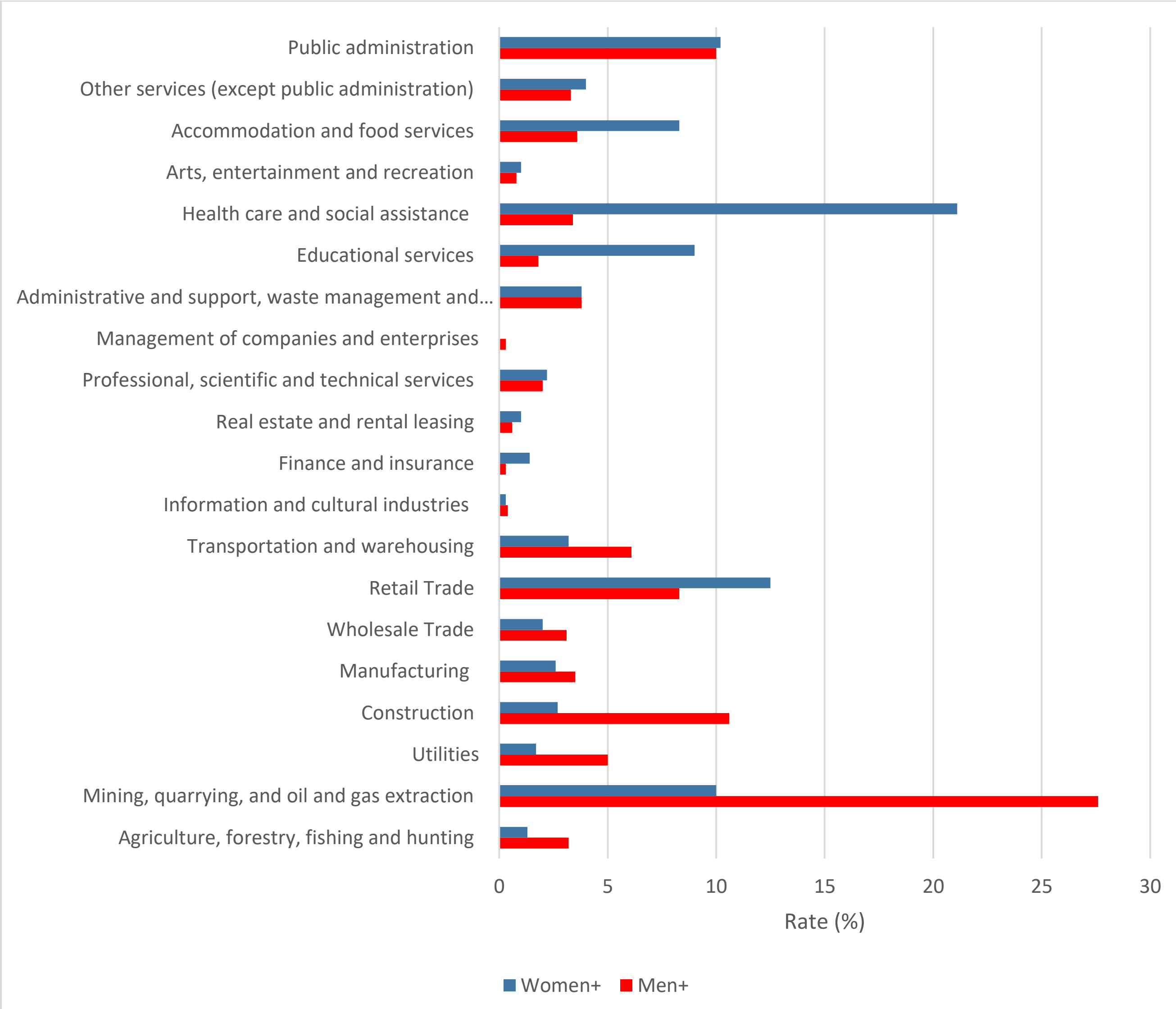

Figure 5-12: Census Division No. 10, Newfoundland and Labrador, Workforce by Industry, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022a)

Table 5-68: Census Division No. 10, Newfoundland and Labrador, Workforce by Industry, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Agriculture, forestry, fishing and hunting	2.3	3.2	1.3	1.1	1.8	0.3	1.2	1.4	1.0
Mining, quarrying, and oil and gas extraction	19.3	27.6	10.0	13.9	20.2	6.5	5.4	7.4	3.5
Utilities	3.4	5.0	1.7	3.4	4.6	2.0	0.0	0.4	-0.3
Construction	6.9	10.6	2.7	10.3	15.9	3.8	-3.4	-5.3	-1.1
Manufacturing	3.0	3.5	2.6	3.9	4.9	2.8	-0.9	-1.4	-0.2
Wholesale Trade	2.6	3.1	2.0	2.6	3.5	1.5	0.0	-0.4	0.5
Retail Trade	10.3	8.3	12.5	11.1	8.9	13.6	-0.8	-0.6	-1.1
Transportation and warehousing	4.8	6.1	3.2	4.4	5.3	3.3	0.4	0.8	-0.1
Information and cultural industries	0.3	0.4	0.3	0.7	0.8	0.4	-0.4	-0.4	-0.1
Finance and insurance	0.8	0.3	1.4	0.9	0.4	1.6	-0.1	-0.1	-0.2
Real estate and rental leasing	0.8	0.6	1.0	1.3	1.2	1.5	-0.5	-0.6	-0.5
Professional, scientific and technical services	2.1	2.0	2.2	2.5	2.4	2.5	-0.4	-0.4	-0.3
Management of companies and enterprises	0.2	0.3	0.0	0.4	0.4	0.2	-0.2	-0.1	-0.2
Administrative and support, waste management and remediation services	3.8	3.8	3.8	3.2	3.1	3.4	0.6	0.7	0.4
Educational services	5.2	1.8	9.0	5.8	2.9	9.1	-0.6	-1.1	-0.1
Health care and social assistance	11.7	3.4	21.1	10.4	3.1	18.9	1.3	0.3	2.2
Arts, entertainment and recreation	0.9	0.8	1.0	1.1	0.8	1.3	-0.2	0.0	-0.3
Accommodation and food services	5.8	3.6	8.3	7.4	4.6	10.6	-1.6	-1.0	-2.3
Other services (except public administration)	3.7	3.3	4.0	4.0	3.6	4.3	-0.3	-0.3	-0.3

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Public administration	10.1	10.0	10.2	10.1	9.9	10.4	0.0	0.1	-0.2

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017a, 2022a)

Figure 5-13 illustrates the 2021 Census breakdown of the Census Division No. 10, Newfoundland and Labrador, workforce by occupation. According to the 2021 Census, trades, transport and equipment operators and related occupations was by far the dominant occupation category for men+,, followed by sales and service occupations. Sales and service occupations, business, finance, and administration occupations, and occupations in education, law and social, community and government services were the dominant occupation categories for women+ (Statistics Canada, 2022a).

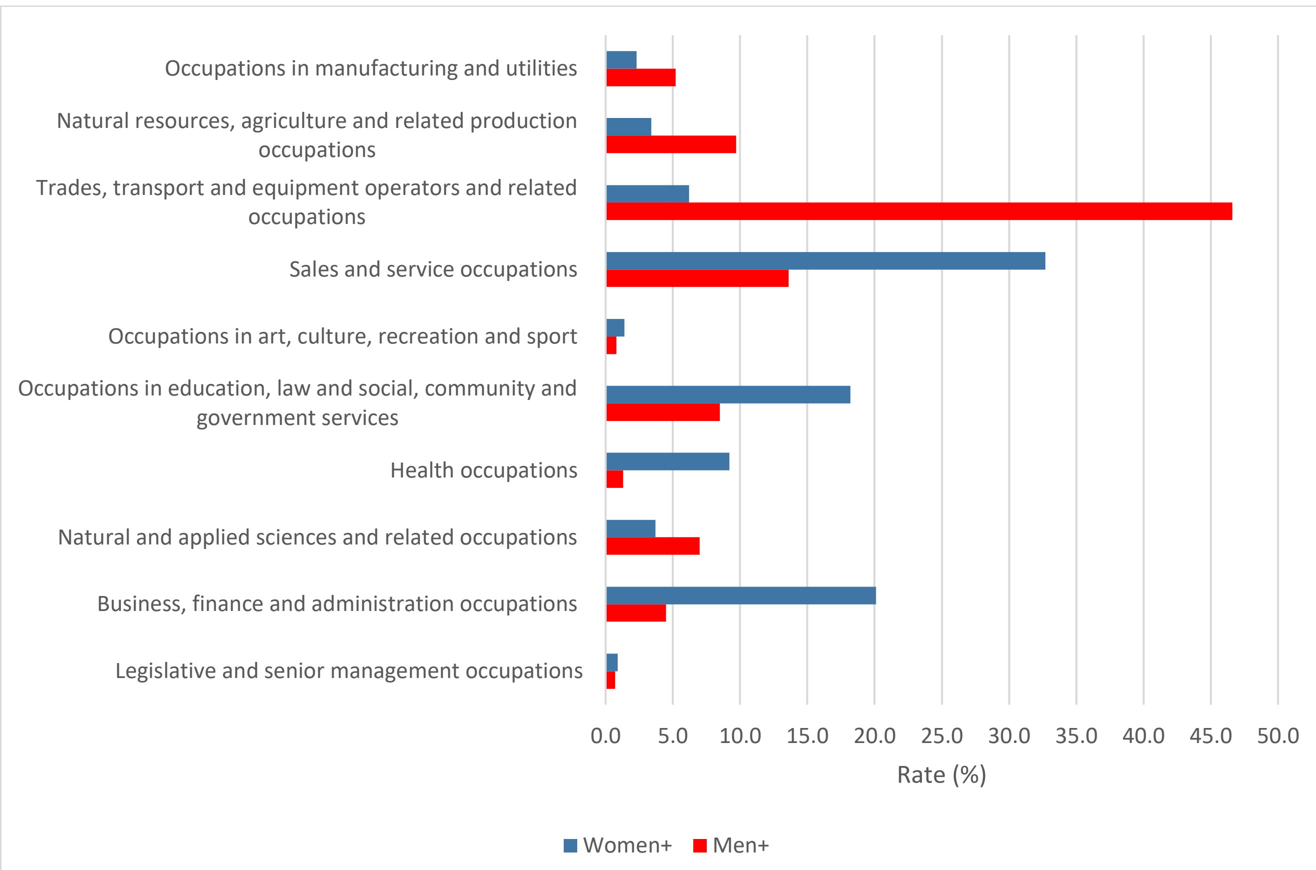

Figure 5-13: Census Division No. 10, Newfoundland and Labrador, Workforce by Occupation, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022a)

Table 5-69: Census Division No. 10, Newfoundland and Labrador, Workforce by Occupation, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Occupation	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Legislative and senior management occupations	0.8	0.7	0.9	8.2	8.8	7.4	-7.4	-8.1	-6.5
Business, finance and administration occupations	11.8	4.5	20.1	12.0	4.6	20.5	-0.2	-0.1	-0.4
Natural and applied sciences and related occupations	5.4	7.0	3.7	5.5	8.2	2.4	-0.1	-1.2	1.3
Health occupations	5.0	1.3	9.2	4.4	1.3	8.1	0.6	0.0	1.1
Occupations in education, law and social, community and government services	13.0	8.5	18.2	12.1	6.5	18.6	0.9	2.0	-0.4
Occupations in art, culture, recreation and sport	1.1	0.8	1.4	1.2	0.8	1.6	-0.1	0.0	-0.2
Sales and service occupations	22.6	13.6	32.7	21.6	14.5	29.9	1.0	-0.9	2.8
Trades, transport and equipment operators and related occupations	27.7	46.6	6.2	25.6	42.3	6.1	2.1	4.3	0.1
Natural resources, agriculture and related production occupations	6.7	9.7	3.4	4.4	6.5	2.0	2.3	3.2	1.4
Occupations in manufacturing and utilities	3.9	5.2	2.3	3.5	5.1	1.7	0.4	0.1	0.6

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017a, 2022a)

5.3.2.1.1.3 Income

Sources of Income

Relevant 2021 Census data for the Census Division No. 10, Newfoundland and Labrador, can be found in Table 5-70. According to the 2021 Census, employment income accounted for 79.2% of total income in Census Division No. 10 (83.4% for men+ and 72.6% for women+), a 3.8% decrease from 2016 for men+ and a 6.2% decrease from 2016 for women+ (Statistics Canada, 2017a, 2022a). Government transfers accounted for 13.5% of total income in Census Division No. 10 (9.9% for men+ and 19.3% for women+), a 3.6% increase over 2016 for men+ and a 4.6% increase over 2016 for women+ (Statistics Canada, 2017a, 2022a).

Table 5-70: Census Division No. 10, Newfoundland and Labrador, Income Composition, 2021

	2021			2016			Change from 2016 to 2021		
Income Composition	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Market Income (%)	86.6	90.0	80.6	90.9	93.7	85.3	-4.3	-3.7	-4.7
Employment Income (%)	79.2	83.4	72.6	84.3	87.2	78.8	-5.1	-3.8	-6.2
Government Transfers (%)	13.5	9.9	19.3	9.2	6.3	14.7	4.3	3.6	4.6

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017a, 2022a)

Employment Income

Relevant 2021 Census data for Census Division No. 10, Newfoundland and Labrador, can be found in Table 5-71. According to the 2021 Census, the median employment income was $101,000 for full-year full-time men+ workers, a 9.5% increase over 2016, and $57,600 for full-year full-time women+ workers, a 0.6% decrease from 2016 (Statistics Canada, 2017a, 2022a). In the 2021 Census, the average employment income was $104,000 for full-year full-time men+ workers, a 9.0% increase over 2016, and $63,550 for full-year full-time women+ workers, a 1.3% increase over 2016 (Statistics Canada, 2017a, 2022a).

Table 5-71: Census Division No. 10, Newfoundland and Labrador, Income Statistics, 2021

	2021			2016			Change from 2016 to 2021		
Income Statistics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Number of employment income recipients (aged 15 years and over in private households who worked full year full time in 2020)	7,745	4,315	3,440	7,270	4,080	3,190	6.5	5.8	7.8
Median employment income in 2020 (Full-year full-time workers) ($)	78,000	101,000	57,600	74,917	92,237	57,929	4.1	9.5	-0.6
Average employment income in 2020 (Full-year full-time workers) ($)	86,200	104,000	63,550	81,028	95,376	62,705	6.4	9.0	1.3

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017a, 2022a)

5.3.2.1.2 Major Regional Projects

Mining is the main economic driver in the region (Town of Labrador City, 2018; Town of Wabush, 2018). Western Labrador's primary resource is iron ore production, though mining sector outputs in the region also include iron ore concentrate and pellets, dolomite, silica (Labrador West, n.d.-c). Nickel, cobalt, and copper have been discovered north and south of the region; Voisey's Bay, within Census Division No. 10, is the site of a substantial nickel discovery (Labrador West, n.d.-c).

The IOC has operated the Carol Lake Mine (iron ore) since 1962 (Newfoundland and Labrador Department of Industry, Energy and Technology, n.d.). The Carol Lake Mine is linked to an IOC-operated port facility in Sept-Îles (Newfoundland and Labrador Department of Industry, Energy and Technology, n.d.). From 1965 until 2011, Wabush Mines operated the Scully Mine (iron ore) in Labrador (Newfoundland and Labrador Department of Industry, Energy and Technology, n.d.). In 2011, Cliffs Natural Resources became the sole owner of the mine, and in 2014 the mine was closed (Newfoundland and Labrador Department of Industry, Energy and Technology, n.d.). The closed Scully Mine was acquired by Tacore Resources Inc. in 2017, and was re-opened in 2019 (Tacora Resources Inc., 2021). Vale Newfoundland and Labrador (VNL) have copper, cobalt and nickel operations in Labrador (Newfoundland and Labrador Department of Industry, Energy and Technology, n.d.). VNL's Voisey's Bay mine expansion (nickel) is currently underway (Vale, n.d.).

5.3.2.2 Sept-Rivières—Caniapiscau

5.3.2.2.1 Labour Force Characteristics

The sections below provide an overview of the labour force characteristics for Sept-Rivières—Caniapiscau, including participation and unemployment rates, labour supply, and income statistics.

5.3.2.2.1.1 Participation and Unemployment Rates

Relevant 2021 Census data for Sept-Rivières—Caniapiscau can be found in Table 5-72. According to the 2021 Census, the labour force participation rate was 63.4% total (66.4% for men+ and 60.4% for women+), a 1.3% decrease from 2016 for men+ and an 0.8% decrease from 2016 for women+ (Statistics Canada, 2017h, 2022h). The unemployment rate in 2021 was 5.7% total (6.1% for men+ and 5.2% for women+), a 50.4% decrease from 2016 for men+ and a 38.8% decrease from 2016 for women+ (Statistics Canada, 2017h, 2022h).

Table 5-72: Sept-Rivières—Caniapiscau Labour Force Status, 2021

	2021			2016			Change from 2016 to 2021		
Labour Force Status	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Population 15+ Years	30,380	15,385	14,995	31,285	16,000	15,290	-2.9	-3.8	-1.9
In the labour force	19,275	10,215	9,060	20,080	10,775	9,310	-4.0	-5.2	-2.7
Employed	18,180	9,590	8,585	17,955	9,445	8,515	1.3	1.5	0.8
Unemployed	1,090	620	470	2,125	1,330	795	-48.7	-53.4	-40.9
Not in the labour force	11,105	5,175	5,935	11,210	5,225	5,980	-0.9	-1.0	-0.8
Participation rate (%)	63.4	66.4	60.4	64.2	67.3	60.9	-0.8	-0.9	-0.5
Employment rate (%)	59.8	62.3	57.3	57.4	59.0	55.7	2.4	3.3	1.6
Unemployment rate (%)	5.7	6.1	5.2	10.6	12.3	8.5	-4.9	-6.2	-3.3

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017h, 2022h)

5.3.2.2.1.2 Labour Supply

Figure 5-14 illustrates the 2021 Census breakdown of the Sept-Rivières—Caniapiscau workforce by industry. According to the 2021 Census, mining, quarrying, and oil and gas extraction, followed by manufacturing, were the dominant industries for men+, while health care and social assistance, followed by retail trade, and educational services, were the dominant industries for women+ (Statistics Canada, 2022h).

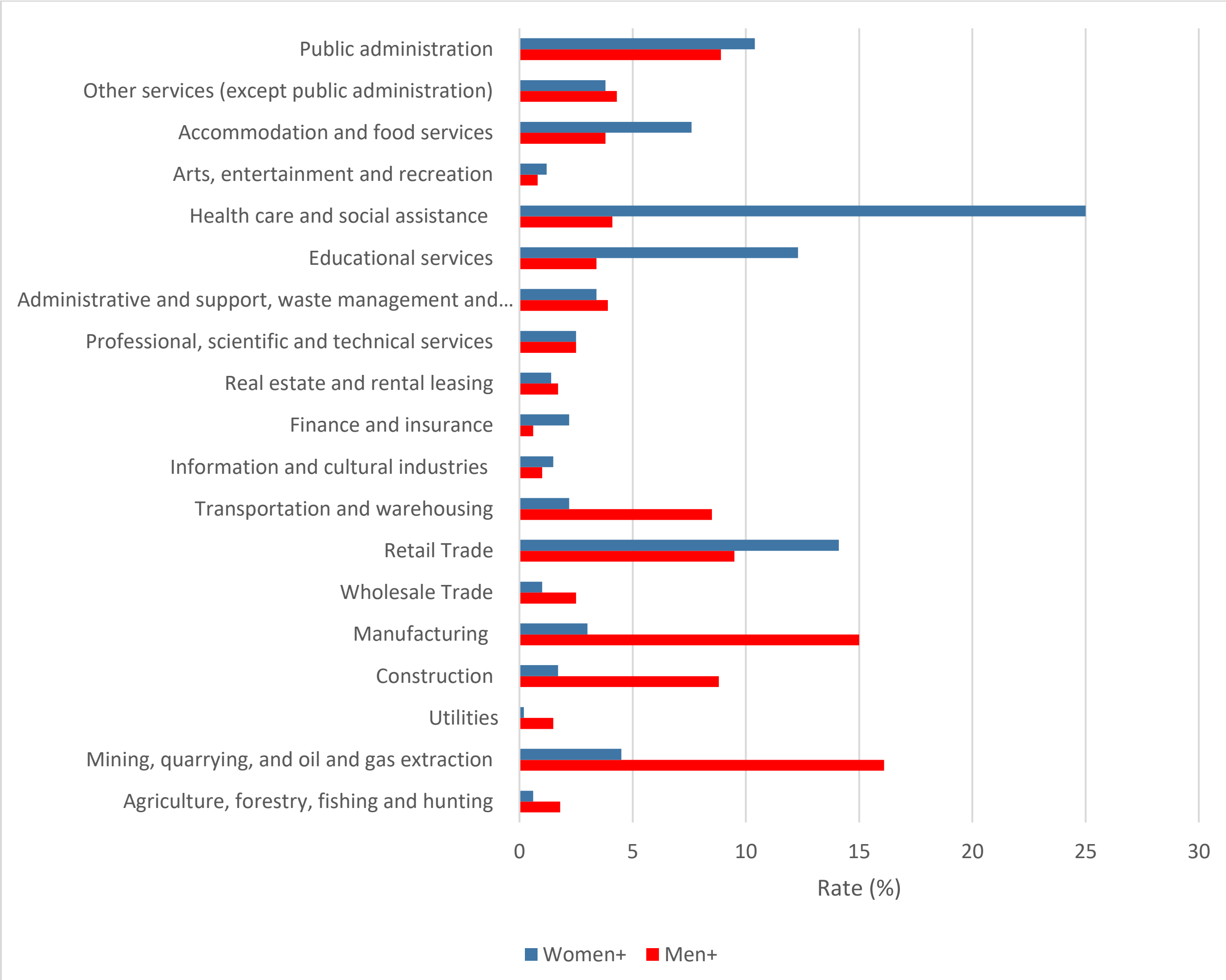

Figure 5-14: Sept-Rivières—Caniapiscau Workforce by Industry, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022h)

Table 5-73: Sept-Rivières—Caniapiscau Workforce by Industry, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Agriculture, forestry, fishing and hunting	1.2	1.8	0.6	1.2	1.8	0.6	0.0	0.0	0.0
Mining, quarrying, and oil and gas extraction	10.6	16.1	4.5	9.7	15.0	3.5	0.9	1.1	1.0

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Utilities	0.9	1.5	0.2	1.4	2.2	0.5	-0.5	-0.7	-0.3
Construction	5.5	8.8	1.7	6.5	10.8	1.6	-1.0	-2.0	0.1
Manufacturing	9.4	15.0	3.0	9.0	14.5	2.8	0.4	0.5	0.2
Wholesale Trade	1.8	2.5	1.0	2.2	3.0	1.3	-0.4	-0.5	-0.3
Retail Trade	11.7	9.5	14.1	11.2	9.0	13.9	0.5	0.5	0.2
Transportation and warehousing	5.5	8.5	2.2	5.3	8.0	2.2	0.2	0.5	0.0
Information and cultural industries	1.3	1.0	1.5	1.1	1.2	1.1	0.2	-0.2	0.4
Finance and insurance	1.4	0.6	2.2	1.3	0.5	2.2	0.1	0.1	0.0
Real estate and rental leasing	1.6	1.7	1.4	1.5	1.8	1.1	0.1	-0.1	0.3
Professional, scientific and technical services	2.5	2.5	2.5	2.4	2.3	2.6	0.1	0.2	-0.1
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and support, waste management and remediation services	3.7	3.9	3.4	3.5	4.1	2.8	0.2	-0.2	0.6
Educational services	7.6	3.4	12.3	6.9	2.7	11.7	0.7	0.7	0.6
Health care and social assistance	13.9	4.1	25.0	13.5	3.4	25.1	0.4	0.7	-0.1
Arts, entertainment and recreation	1.0	0.8	1.2	0.9	1.0	0.9	0.1	-0.2	0.3
Accommodation and food services	5.6	3.8	7.6	6.8	4.1	9.9	-1.2	-0.3	-2.3
Other services (except public administration)	4.0	4.3	3.8	4.8	4.5	5.2	-0.8	-0.2	-1.4
Public administration	9.6	8.9	10.4	8.0	7.6	8.5	1.6	1.3	1.9

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017h, 2022h)

Figure 5-15 illustrates the 2021 Census breakdown of the Sept-Rivières—Caniapiscau workforce by occupation. According to the 2021 Census, trades, transport and equipment operators and related occupations was by far the dominant occupation category for men+, followed by sales and service occupations. Sales and service occupations, occupations in education, law, and social, community and government services, and business, finance and administration occupations were the dominant occupation categories for women+ (Statistics Canada, 2022h).

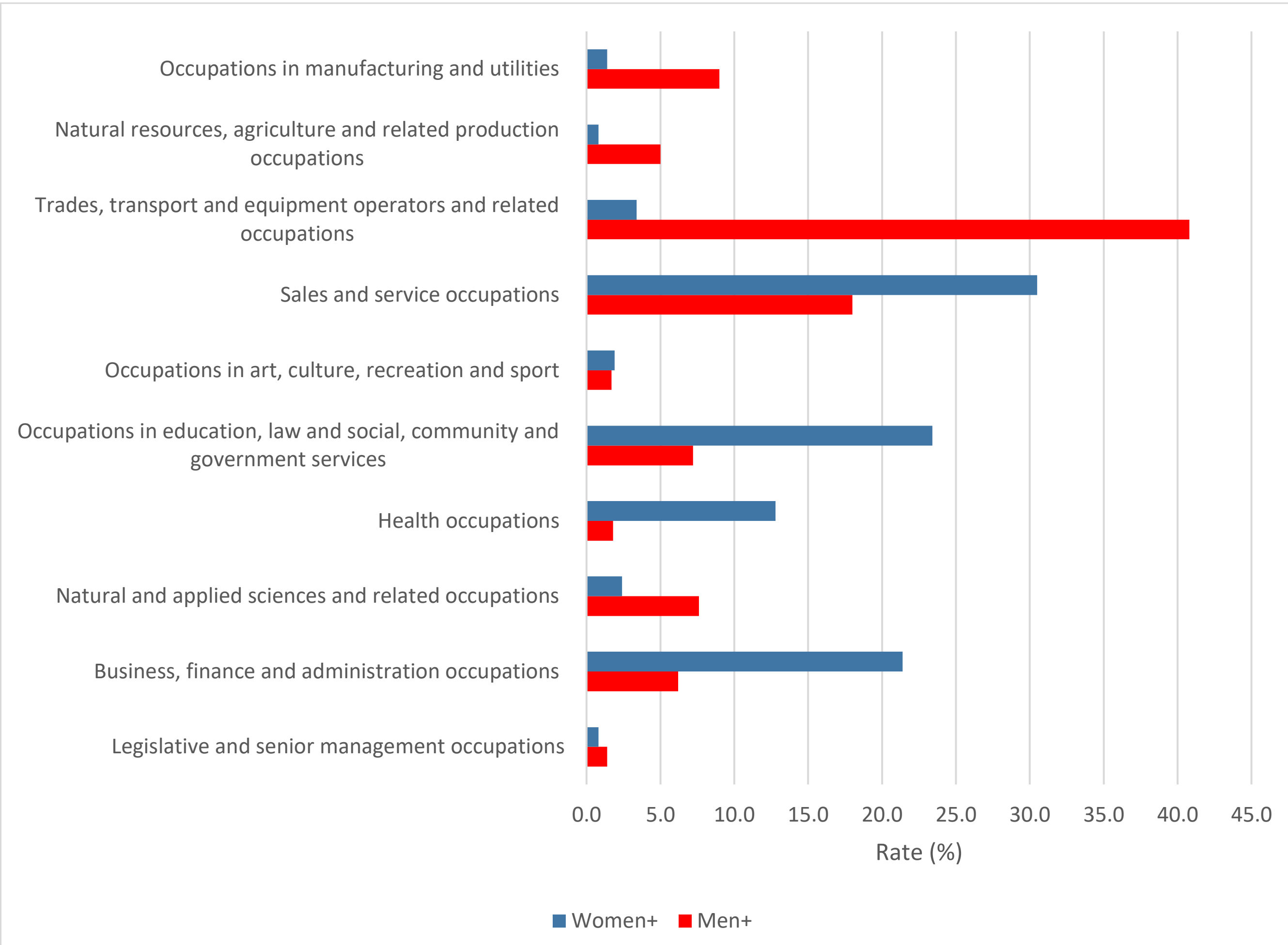

Figure 5-15: Sept-Rivières—Caniapiscau Workforce by Occupation, 2021

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022h)

Table 5-74: Sept-Rivières—Caniapiscau Workforce by Occupation, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Occupation	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Legislative and senior management occupations	1.1	1.4	0.8	7.4	7.1	7.8	-6.3	-5.7	-7.0
Business, finance and administration occupations	13.4	6.2	21.4	12.7	6.3	20.0	0.7	-0.1	1.4
Natural and applied sciences and related occupations	5.2	7.6	2.4	5.2	8.2	1.7	0.0	-0.6	0.7
Health occupations	7.0	1.8	12.8	6.1	1.5	11.4	0.9	0.3	1.4
Occupations in education, law and social, community and government services	14.8	7.2	23.4	13.5	6.4	21.8	1.3	0.8	1.6
Occupations in art, culture, recreation and sport	1.8	1.7	1.9	1.6	1.3	2.1	0.2	0.4	-0.2
Sales and service occupations	23.9	18.0	30.5	22.0	17.1	27.8	1.9	0.9	2.7
Trades, transport and equipment operators and related occupations	23.2	40.8	3.4	21.3	37.5	2.7	1.9	3.3	0.7
Natural resources, agriculture and related production occupations	3.0	5.0	0.8	2.3	3.9	0.6	0.7	1.1	0.2
Occupations in manufacturing and utilities	5.4	9.0	1.4	5.0	8.2	1.3	0.4	0.8	0.1

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017h, 2022h)

5.3.2.2.1.3 Income

Sources of Income

Relevant 2021 Census data for the Sept-Rivières—Caniapiscau can be found in Table 5-75. According to the 2021 Census, employment income accounted for 72.6% of total income in Sept-Rivières—Caniapiscau (77.0% for men+ and 65.8% for women+), a 2.7% decrease from 2016 for men+ and a 3.9% decrease from 2016 for women+ (Statistics Canada, 2017h, 2022h). Government transfers accounted for 17.2% of total income in Sept-Rivières—Caniapiscau (12.5% for men+ and 24.5% for women+), a 2.8% increase over 2016 for men+ and an 3.8% increase over 2016 for women+ (Statistics Canada, 2017h, 2022h).

Table 5-75: Sept-Rivières—Caniapiscau Income Composition, 2021

2021				2016			Change from 2016 to 2021		
Income Composition	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Market Income (%)	82.8	87.6	75.6	86.3	90.3	79.4	-3.5	-2.7	-3.8
Employment Income (%)	72.6	77.0	65.8	76.1	79.7	69.7	-3.5	-2.7	-3.9
Government Transfers (%)	17.2	12.5	24.5	13.7	9.7	20.7	3.5	2.8	3.8

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017h, 2022h)

Employment Income

Relevant 2021 Census data for Sept-Rivières—Caniapiscau can be found in Table 5-76 According to the 2021 Census, the median employment income was $89,000 for full-year full-time men+ workers, a 13.7% increase over 2016, and $51,600 for full-year full-time women+ workers, a 14.6% increase over 2016 (Statistics Canada, 2017h, 2022h). In the 2021 Census, the average employment income was $91,400 for full-year full-time men+ workers, a 10.8% increase over 2016, and $58,400 for full-year full-time women+ workers, a 13.5% increase over 2016 (Statistics Canada, 2017h, 2022h).

Table 5-76: Sept-Rivières—Caniapiscau Income Statistics, 2021

	2021			2016			Change from 2016 to 2021		
Income Statistics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Number of employment income recipients (aged 15 years and over in private households who worked full year full time in 2020)	11,485	6,480	5,000	10,005	5,690	4,315	14.8	13.9	15.9
Median employment income in 2020 (Full-year full-time workers) ($)	66,500	89,000	51,600	58,973	78,302	45,022	12.8	13.7	14.6
Average employment income in 2020 (Full-year full-time workers) ($)	77,000	91,400	58,400	69,103	82,466	51,474	11.4	10.8	13.5

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017h, 2022h)

5.3.2.2.2 Major Regional Projects

Mining is a major economic driver in the region. ArcelorMittal Canada operates the Mont Wright and Fire Lake mines (iron), near Fermont, and a pellet plant in Port-Cartier (ArcelorMittal, n.d.). Champion Iron operates the Bloom Lake mine, near Fermont, having acquired the mine from Cliffs Natural Resources in 2016 (Champion Iron, 2023). Iron ore from Bloom Lake is transported to a loading port in Sept-Îles (Champion Iron, 2023). Additional Champion Iron Projects in the region include Consolidated Fire Lake North, Moiré Lake, Harvey Tuttle, and O'Keefe-Purdy (Champion Iron, 2023).

5.3.3 Government Revenues

The sections below provide an overview of municipal taxation and revenues in the Town of Labrador City, the Town of Wabush, and Ville de Fermont, and an overview of provincial taxation and revenues in the Province of Newfoundland and Labrador and the Province of Québec.

5.3.3.1 Municipal Taxation and Revenues

5.3.3.1.1 Town of Labrador City

Table 5-77 provides an overview of the Town of Labrador City's revenues for the fiscal years 2020-2021 and 2021-2022. According to the Town of Labrador City's public accounts, the town's revenues were $23.4 million in the financial year 2021-2022, a 0.9% increase over the previous fiscal year. This change was largely due to increases in investment income and the sale of goods and services. Revenue from government grants transfers decreased by 29.2% from the previous fiscal year. The town had an annual surplus of $3.3 million in 2021-2022, down from $5.0 million in 2020-2021 (Town of Labrador City, 2022).

Table 5-77: Town of Labrador City Revenues ($ millions)

Revenue	2021-2022	2020-2021	% Change
Taxation	9.1	9.1	0.0
Grants in lieu of taxes and tax agreements	8.8	8.6	2.9
Sale of goods and services	0.5	0.2	149.7
Government grants and transfers	3.2	4.5	-29.2
Investment income	0.8	0.2	255.4
Other revenue	1.1	1.1	4.4
Total revenue	23.4	23.6	0.9
Annual surplus / (deficit)	3.3	5.0	-34.8

Source: (Town of Labrador City, 2022)

5.3.3.1.2 Town of Wabush

No information was available from secondary sources at the time of desktop research.

5.3.3.1.3 Ville de Fermont

No information was available from secondary sources at the time of desktop research.

5.3.3.2 Provincial Taxation and Revenues

5.3.3.2.1 Province of Newfoundland and Labrador

Table 5-78 provides an overview of the Province of Newfoundland and Labrador's revenues for the financial years 2020-2021 and 2021-2022. According to Newfoundland and Labrador's public accounts, the province's revenues were $8.6 billion in the financial year 2021-2022, a 17.3% increase over the previous fiscal year. This change was largely due to increases in offshore royalties (a 107.5% increase over the previous fiscal year) and fees and fines (a 40.0% increase over the previous fiscal year). Revenue from federal government transfers decreased by 11.8% from the previous fiscal year. The province had an annual deficit of $271.9 million in 2021-2022, down from $1.5 billion in 2020-2021 (Province of Newfoundland and Labrador, 2022).

Table 5-78: Province of Newfoundland and Labrador Revenues ($ millions)

Revenue	2021-2022	2020-2021	% Change
Provincial taxation	4,501.9	3,804.3	18.3
Investment	97.7	93,0	5.1
Fees and fines	500.6	357.5	40.0
Offshore royalties	1,196.0	576.4	107.5

Revenue	2021-2022	2020-2021	% Change
Other	516.9	495.0	4.4
Federal government transfers	1,387.3	1,572.5	-11.8
Total revenue	8,595.9	7,328.1	17.3
Annual surplus / (deficit)	(271.9)	(1,491.8)	81.8

Source: (Province of Newfoundland and Labrador, 2022)

5.3.3.2.2 Province of Québec

Table 5-79 provides an overview of the Province of Québec's revenues for the financial years 2020-2021 and 2021-2022. According to Québec's public accounts, the province's revenues were $138.8 billion in the financial year 2021-2022, a 13.2% increase over the previous fiscal year. This change was largely due to increases in revenue from government enterprises (a 32.7% increase over the previous fiscal year), duties and permits (a 31.3% increase over the previous fiscal year), and income and property taxes (a 21.0% increase over the previous fiscal year). Revenue from federal government transfers decreased by 5.0% from the previous fiscal year. The province had an annual surplus of $2.8 billion in 2021-2022; in 2020-2021, the province had a $4.2 billion deficit (Gouvernement du Québec, 2022).

Table 5-79: Province of Québec Revenues ($ millions)

Revenue	2021-2022	2020-2021	% Change
Income and property taxes	62,328	51,503	21.0
Consumption taxes	24,597	21,377	15.1
Duties and permits	6,057	4,613	31.3
Miscellaneous revenue	10,705	9,911	8.0
Revenue from government enterprises	5,960	4,491	32.7
Federal government transfers	29,184	30,716	-5.0
Total revenue	138,831	122,611	13.2
Annual surplus / (deficit)	2,845	(4,226)	N/A

Source: (Gouvernement du Québec, 2022)

6.0 INDIGENOUS PEOPLES

The sections below provide an overview of the social conditions, community services and infrastructure, and economic conditions in the Indigenous communities identified for the Project, including:

- Innu Nation;
- Innu Takuaikan Uashat mak Mani-Utenam (ITUM);
- La Nation Innu Matimekush-Lac John (NIMLJ);
- Naskapi Nation of Kawawachikamach (NNK); and
- NunatuKavut Community Council (NCC).

6.1 Community Overviews and Demographics

The sections below provide an overview of demographic information in the Indigenous communities of the ITUM, the NIMLJ, the Innu Nation, the NNK, and the NCC, including age and gender, migration and mobility, housing, language, and educational attainment.

Census data for the Innu Nation is drawn from the populations of Natuashish 2 and Sheshatshiu 3 reserves, data for the ITUM is drawn from the populations of Mani-Utenam and Uashat 27 reserves, data for the NIMLJ is drawn from the population of Matimekush reserve, data for NNK is drawn from the population of Kawawachikamach reserve, and data for the NCC is drawn from the self-identified Inuit population in Census Division No. 10, Newfoundland and Labrador.

According to the 2021 Census, the average age for men+ ranged from 25.2 (Natuashish 2 reserve) to 36.0 (Inuit in Division No. 10), and the average age for women+ ranged from 25.0 (Natuashish 2 reserve) to 35.3 (Inuit in Division No. 10). The median age for men+ ranged from 20.8 (Natuashish 2 reserve) to 35.2 (Inuit in Division No. 10), and the median age for women+ ranged from 21.8 (Natuashish 2 reserve) to 34.4 (Inuit in Division No. 10).

In the 2021 Census, between 86.4% (Kawawachikamach reserve) and 94.9% (Kawawachikamach reserve) of respondents to the 2021 Census reported not moving in the previous year. The average household size ranged from 3.0 (Mani-Utenam) to 4.4 (Mani-Utenam reserve) persons. Between 5.1% (Natuashish 2 reserve) and 37.1% (Mani-Utenam reserve) of respondents to the 2021 Census were owners of their households; and between 76.9% (Natuashish 2) and 89.9% (Kawawachikamach reserve) of respondents reported their housing as being suitable.

Between 1.2% (Natuashish 2 reserve) and 29.7% (Matimekush reserve) of respondents to the 2021 Census reported knowing both official languages, and between 32.2% (Uashat 27 reserve) and 83.3% (Matimekush reserve) reported speaking Indigenous languages most often at home. Rates of individuals 15 years and over without a certificate, diploma, or degree ranged from 29.3% (Inuit in Division No. 10) to 59.3% (Natuashish 2 reserve) for men+, and 27.5% (Inuit in Division No. 10) to 58.5% (Natuashish 2 reserve) for women+. For men+, between 10.3% (Matimekush reserve) and 25.5% (Kawawachikamach reserve) reported a secondary school diploma or equivalency as their highest educational attainment; between 7.4% (Natuashish 2 reserve) and 28.2% (Matimekush reserve) reported an apprenticeship or trades certificate or diploma; between 5.1% (Matimekush reserve) and 24.5% (Inuit in Division No. 10) reported a college or non-university certificate; and between 0.0% (Kawawachikamach and Matimekush reserves) and 6.3% (Sheshatshiu 3 reserve) reported a Bachelor's degree or higher. For women+, between 11.6% (Uashat 27 reserve) and 28.1% (Inuit in Division No. 10) reported a secondary school diploma or equivalency as their highest educational attainment; between 2.3% (Sheshatshiu 3 reserve) and 14.9% (Matimekush reserve) reported an apprenticeship or trades certificate or diploma; between 6.4% (Matimekush reserve) and 26.4% (Inuit in Division No. 10) reported a college or non-university certificate; and between 0.0% (Kawawachikamach reserve) and 10.4% (Inuit in Division No. 10) reported a Bachelor's degree or higher.

6.1.1 Innu Nation

6.1.1.1 Community Overview

The Innu Nation represents the Innu communities of the Mushuau Innu First Nation and the Sheshatshiu Innu First Nation. From 1973 to 1976, the Innu people of Labrador, together with the Mi'kmaq and Inuit people in the province, were part of the Native Association of Newfoundland and Labrador (NANL) (Higgins, 2008). In 1976, the Innu people left the NANL, and formed the Naskapi Montagnais Innu Association (NMIA) (Higgins, 2008). In 1990, the NMIA changed its name to the Innu Nation (Higgins, 2008). The Innu Nation protects the rights and interests of the Mushuau and Sheshatshiu Innu communities (Higgins, 2008).

Land claim negotiations between the Innu Nation and the federal and provincial governments is ongoing (Office of Indigenous Affairs and Reconciliation, 2021). A framework agreement between the Innu Nation, the Government of Canada, and the Province of Newfoundland and Labrador was signed in 1996. The framework agreement establishes rules for land claim negotiations (Office of Indigenous Affairs and Reconciliation, 2021). The Tshash Petapen (New Dawn) Agreement was signed by the Innu Nation and the Province of Newfoundland and Labrador on September 26, 2008. The agreement addresses several key issues related to ongoing land claim agreements, the Lower Churchill Project Impacts and Benefits Agreement (IBA), and the Upper Churchill Project redress (Office of Indigenous Affairs and Reconciliation, 2021). An agreement in principle between the Innu Nation, the Government of Canada, and the Province of Newfoundland and Labrador was signed in 2011 (Whitten, 2023).

Governance

The Grand Chief and Deputy Grand Chief of the Innu Nation, alongside a board of directors, are elected to three-year terms. The Grand Chief of the Innu Nation is Simon Pokue and the Deputy Grand Chief of the Innu Nation is Chris Rich; their terms began on August 15, 2023 (CBC News, 2023).

The Chiefs and Councils for Mushuau Innu First Nation and Sheshatshiu First Nation, elected to three-year terms, are listed in Table 6-1 and Table 6-2, respectively.

Table 6-1: Mushuau Innu First Nation Officials

Title	Name	Term
Chief	John Nui	Nov. 18, 2022 - Nov. 17, 2025
Councillor	Patricia Andrew	
Councillor	Mary Dicker	
Councillor	Angela Pasteen	
Councillor	Sebastian Piwas	
Councillor	Len Rich	
Councillor	Mathias Rich	

Source: (CIRNAC, 2023c, 2023e)

Table 6-2: Sheshatshiu Innu First Nation Officials

Title	Name	Term
Chief	Eitenne Rich	Sept. 11, 2021 - Sept. 10, 2024
Councillor	Laureen Ashini	
Councillor	Damiana Benuen	
Councillor	Jimmy Lee Jack	
Councillor	Karen Penunsi	
Councillor	Daniel Pone-Pinette	
Councillor	Penute Andrew	

Source: (CIRNAC, 2023c, 2023e)

Population Characteristics

Mushuau Inn First Nation’s reserve is Natuashish 2 reserve, located approximately 500 kilometres northeast of the Project site. The reserve, federally recognized in 2003, does not have year-round road access, but is instead accessible by air or sea (CIRNAC, 2023c). The registered population for Mushuau Innu First Nation is provided in Table 6-3. According to the CIRNAC Nation profile, 92.3% of Mushuau Innu First Nation community members live on reserve (CIRNAC, 2023c).

Table 6-3: Mushuau Innu First Nation Registered Population as of July 2023

Residency	Number of People
Registered Males on Own Reserve	531
Registered Females on Own Reserve	567
Registered Males on Other Reserves	2
Registered Females on Other Reserves	3
Registered Males on Own Crown Land	0
Registered Females on Own Crown Land	0
Registered Males on Other Band Crown Land	0
Registered Females on Other Band Crown Land	0
Registered Males on No Band Crown Land	0
Registered Females on No Band Crown Land	0
Registered Males Off Reserve	37
Registered Females Off Reserve	50
Total Registered Population	**1,190**

Source: (CIRNAC, 2023c).

Sheshatshiu Innu First Nation's reserve is Sheshatshiu 3 reserve, located approximately 465 kilometres east of the Project site. The reserve, immediately south of the Town of North West River, Newfoundland and Labrador, was federally recognized in 2006 (CIRNAC, 2023e). The registered population for Sheshatshiu First Nation as of July 2023 is presented in Table 6-4. According to the CIRNAC Nation profile, 88.9% of Sheshatshiu Innu First Nation community members live on reserve (CIRNAC, 2023e).

Table 6-4: Sheshatshiu Innu First Nation Registered Population as of July 2023

Residency	Number of People
Registered Males on Own Reserve	880
Registered Females on Own Reserve	869
Registered Males on Other Reserves	9
Registered Females on Other Reserves	6
Registered Males on Own Crown Land	1
Registered Females on Own Crown Land	0
Registered Males on Other Band Crown Land	0
Registered Females on Other Band Crown Land	0
Registered Males on No Band Crown Land	0
Registered Females on No Band Crown Land	0
Registered Males Off Reserve	79

Residency	Number of People
Registered Females Off Reserve	123
Total Registered Population	**1,967**

Source: (CIRNAC, 2023e)

Additional information regarding the Innu Nation is provided in the Current Use of Lands and Resources for Traditional Purposes study (WSP 2024).

6.1.1.2 Age and Gender

The 2021 Census presents age and gender statistics from respondents on Natuashish 2 and Sheshatshiu 3 reserves, which the CIRNAC Nation profiles identify as the reserves affiliated with Mushuau Innu First Nation and Sheshatshiu Innu First Nation. According to the 2021 Census, there were 860 individuals living on Mushuau Innu First Nation's Natuashish 2 reserve, of which 420 identified as men+ and 435 identified as women+ (Statistics Canada, 2022g). The average age was 25.1 (25.2 for men+ and 25.0 for women+) and the median age was 21.2 (20.8 for men+ and 21.8 for women+) (Statistics Canada, 2022g). Mushuau Innu First Nation's on-reserve population decreased by 8.0% between the 2016 Census and 2021 Census (Statistics Canada, 2022g). For men+, 15-to-19-year-olds made up the largest percentage of the total population, at 13.1% (Statistics Canada, 2022g). For women+, 5-to-9-year-olds made up the largest percentage of the total population, at 14.9% (Statistics Canada, 2022g).

According to the 2021 Census, there were 1,220 individuals living on Sheshatshiu Innu First Nation's Sheshatshiu 3 reserve, of which 560 identified as men+ and 660 identified as women+ (Statistics Canada, 2022i). The average age was 29.6 (31.1 for men+ and 28.4 for women+) and the median age was 27.0 (31.1 for men+ and 28.4 for women+) (Statistics Canada, 2022i). Sheshatshiu Innu First Nation's on-reserve population increased by 19.6% between the 2016 Census and 2021 Census (Statistics Canada, 2022i). For men+, 10-to-14-year-olds made up the largest percentage of the total population, at 13.4%. For women+, 5-to-9-year-olds made up the largest percentage of the total population, at 11.4% (Statistics Canada, 2022i).

The age distribution of the Innu Nation's on-reserve populations is presented in Figure 6-1, and population characteristics can be found in Table 6-5.

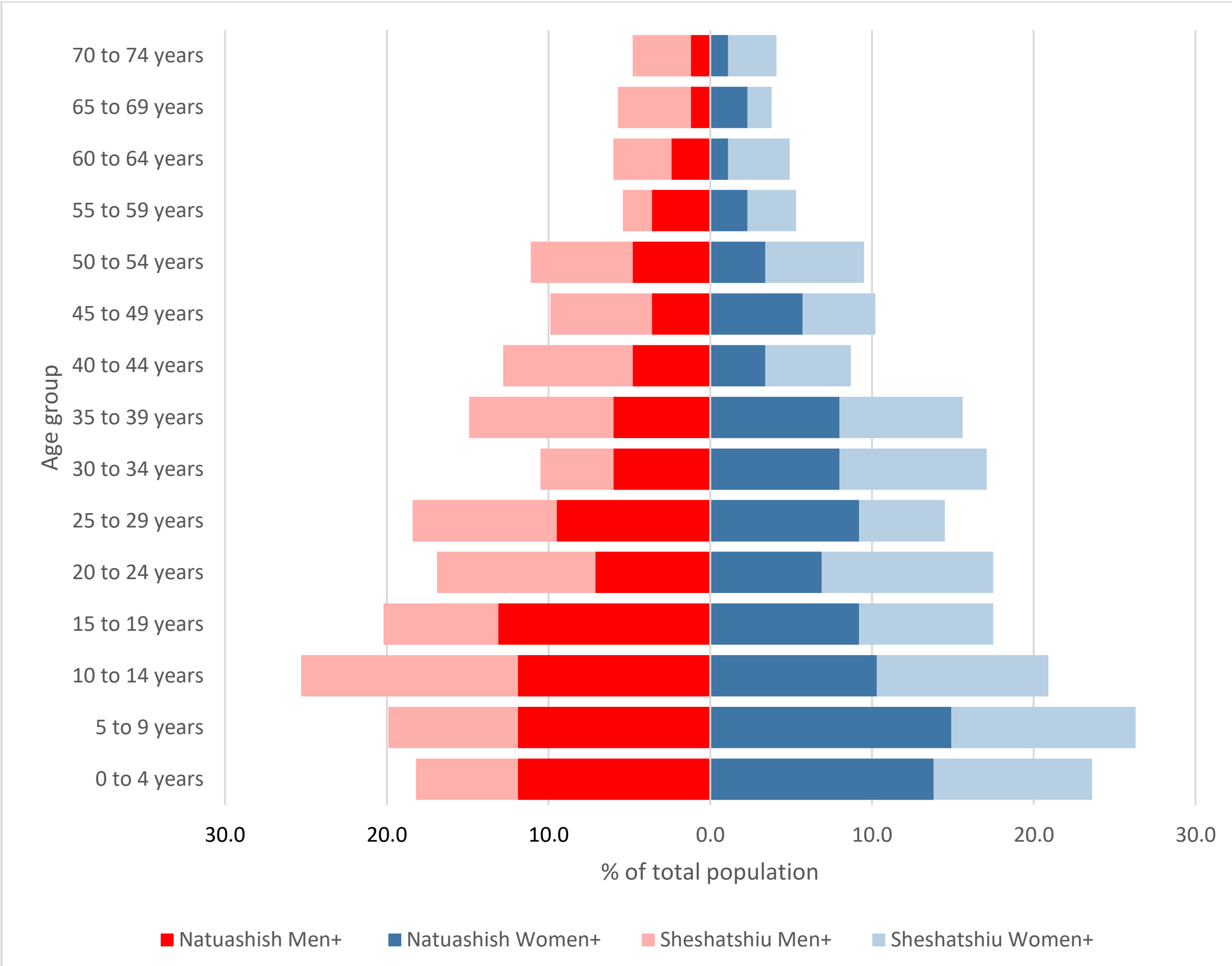

Figure 6-1: Innu Nation Population by Age Group, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022g, 2022i)

Table 6-5: Innu Nation Population Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Age Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
NATUASHISH 2 RESERVE									
Total Population	860	420	435	935	450	485	-8.0	-6.7	-10.3
0 to 14 years	320	150	170	375	180	195	-14.7	-16.7	-12.8
15 to 64 years	510	260	255	535	265	275	-4.7	-1.9	-7.3
65 years and over	20	5	15	20	10	15	0.0	-50.0	0.0
Average Age	25.1	25.2	25	24.2	24.2	24.1	0.9	1.0	3.7

2021				2016			Change from 2016 to 2021		
Age Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Median Age	21.2	20.8	21.8	21.6	22.1	21.2	-0.4	-1.3	0.6
SHESHATSHIU 3 RESERVE									
Total Population	1,220	560	660	1,020	510	510	19.6	9.8	29.4
0 to 14 years	370	160	210	370	210	160	0.0	-23.8	31.3
15 to 64 years	780	355	425	625	290	335	24.8	22.4	26.9
65 years and over	75	45	30	30	15	20	150.0	200.0	50.0
Average Age	29.6	31.1	28.4	25.6	24.7	26.6	4.0	6.4	6.8
Median Age	27	28	24.8	21.4	18.8	23.8	5.6	9.2	1.0

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017g, 2017i, 2022g, 2022i)

6.1.1.3 Migration and Mobility

The 2021 Census provides mobility statistics from respondents on Natuashish 2 and Sheshatshiu 3 reserves. Table 6-6 presents mobility characteristics for the Innu Nation as reported in the 2021 Census. As the data indicates, 93.4% of individuals living on Natuashish 2 reserve (93.9% of men+ and 92.9% of women+) did not move in the previous year, a 5.4% increase over 2016; and 94.9% of individuals living on Sheshatshiu 3 reserve (94.6% of men+ and 94.4% of women+) did not move in the previous year. This represents a 3.9% increase since 2016. The 2021 Census indicates 2.4% of individuals living on Natuashish 2 reserve reported moving within Newfoundland and Labrador in the previous year (2.4% of men+ and 2.4% of women+), a 0.9% decrease from 2016; 0.8% of individuals living on Sheshatshiu 3 reserve reported moving within Newfoundland and Labrador in the previous year (1.8% of men+ and 0.0% of women+), a 0.2% decrease from 2016 (Statistics Canada, 2017g, 2017i, 2022g, 2022i). In the 2021 Census, 1.2% of individuals living on Natuashish 2 reserve reported moving into Newfoundland and Labrador from a different province in the previous year (2.4% of men+ and 0.0% of women+), a 0.4% decrease from 2016; 1.3% of individuals living on Sheshatshiu 3 reserve reported moving into Newfoundland and Labrador from a different province in the previous year (0.0% of men+ and 2.4% of women+), a 0.3% decrease from 2016 (Statistics Canada, 2017g, 2017i, 2022g, 2022i).

Table 6-6: Innu Nation Mobility Characteristics, 2021

2021				2016			Change from 2016 to 2021		
Mobility Characteristics (25% sample data)	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
NATUASHISH 2 RESERVE									
Total responses	835	410	420	915	445	470	-8.7	-7.9	-10.6
Did not move in the past year (%)	93.4	93.9	92.9	88.0	87.6	87.2	5.4	6.3	5.7

2021				2016			Change from 2016 to 2021		
Mobility Characteristics (25% sample data)	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Moved within Newfoundland and Labrador (%)	2.4	2.4	2.4	3.3	2.2	3.2	-0.9	0.2	-0.8
Moved into Newfoundland and Labrador from a different province (%)	1.2	2.4	0.0	1.6	0.0	2.1	-0.4	2.4	-2.1
SHESHATSHIU 3 RESERVE									
Total responses	1,180	555	625	995	490	505	18.6	13.3	23.8
Did not move in the past year (%)	94.9	94.6	94.4	91.0	91.8	91.1	3.9	2.8	3.3
Moved within Newfoundland and Labrador (%)	0.8	1.8	0.0	1.0	0.0	0.0	-0.2	1.8	0.0
Moved into Newfoundland and Labrador from a different province (%)	1.3	0.0	2.4	1.0	2.0	0.0	0.3	-2.0	2.4

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017g, 2017i, 2022g, 2022i)

6.1.1.4 Housing

The 2021 Census presents housing statistics from respondents on Natuashish 2 and Sheshatshiu 3 reserves. Relevant 2021 Census data is presented in Table 6-7. According to the 2021 Census, there were 239 private dwellings on Natuashish 2 reserve, of which 82.0% were occupied by the usual residents, and there were 373 private dwellings on Sheshatshiu 3 reserve, of which 91.2% were occupied by the usual residents (Statistics Canada, 2022g, 2022i). The average dwelling on Natuashish 2 reserve housed 4.4 persons, the same as in 2016, and the average dwelling on Sheshatshiu 3 reserve housed 3.6 persons, a decrease from 4.5 persons in 2016 (Statistics Canada, 2017g, 2017i, 2022g, 2022i). In 2021, 5.1% of respondents on Natuashish 2 reserve were owners of their household, 12.8% were renters, and 87.2% were living in a household provided by the First Nation band; 25.0% of respondents on Sheshatshiu 3 reserve were owners of their household, 7.4% were renters, and 67.6% were living in a household provided by the First Nation band (Statistics Canada, 2022g, 2022i). With regards to household conditions, 76.9% of respondents on Natuashish 2 reported their household as being suitable, 56.4% of households were in need of only regular maintenance and minor repairs, and 43.6% of households were in need of major repairs; 85.3% of respondents on Sheshatshiu 3 reserve reported their household as being suitable, 82.4% of households were in need of only regular maintenance and minor repairs, and 17.6% of households were in need of major repairs (Statistics Canada, 2022g, 2022i).

Table 6-7: Innu Nation Housing Characteristics, 2021

Housing Characteristics (25% sample data)	2021 Total	2016 Total	% Change from 2016 to 2021
NATUASHISH 2 RESERVE			
Total private dwellings	239	228	4.8
Private dwellings occupied by usual residents	196	216	-9.3
Private dwellings occupied by usual residents (%)	82.0	94.7	-12.7
Average household size (persons)	4.4	4.4	0.0
Household Tenure			
Private household by tenure: Owner (%)	5.1	4.5	0.6
Private household by tenure: Renter (%)	12.8	0.0	12.8
Private household by tenure: Dwelling provided by local government, or First Nation band (%)	87.2	95.5	-8.3
Household Conditions			
Housing is suitable (%)	76.9	68.2	8.7
Housing is not suitable (%)	25.6	29.5	-3.9
Dwelling in need of only regular maintenance and minor repairs (%)	56.4	51.2	5.2
Dwelling in need of major repairs (%)	43.6	48.8	-5.2
Household Affordability			
Owner or tenant spending less than 30% of income on shelter costs (%)	Data not available		N/A
Owner or tenant spending more than 30% of income on shelter costs (%)			
SHESHATSHIU 3 RESERVE			
Total private dwellings	373	249	49.8
Private dwellings occupied by usual residents	340	226	50.4
Private dwellings occupied by usual residents (%)	91.2	90.8	0.4
Average household size (persons)	3.6	4.5	-0.9
Household Tenure			
Private household by tenure: Owner (%)	25.0	8.9	16.1
Private household by tenure: Renter (%)	7.4	0.0	7.4
Private household by tenure: Dwelling provided by local government, or First Nation band (%)	67.6	88.9	-21.3
Household Conditions			
Housing is suitable (%)	85.3	66.7	18.6
Housing is not suitable (%)	14.7	33.3	-18.6
Dwelling in need of only regular maintenance and minor repairs (%)	82.4	66.7	15.7
Dwelling in need of major repairs (%)	17.6	33.3	-15.7
Household Affordability			

Housing Characteristics (25% sample data)	2021 Total	2016 Total	% Change from 2016 to 2021
Owner or tenant spending less than 30% of income on shelter costs (%)	Data not available		N/A
Owner or tenant spending more than 30% of income on shelter costs (%)			

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017g, 2017i, 2022g, 2022i)

6.1.1.5 Language

The 2021 Census presents language statistics from respondents on Natuashish 2 and Sheshatshiu 3 reserves. Relevant 2021 Census data is presented in Table 6-8. According to the 2021 Census, in reference to knowledge of official languages, 97.7% of individuals living on Natuashish 2 reserve reported knowing only English (98.8% of men+ and 96.6% of women+), a 6.8% increase over 2016 (Statistics Canada, 2017g, 2022g). A lower number of respondents (1.2% total; 1.2% of men+ and 1.1% of women+) reported knowing both French and English in the 2021 Census, a 0.1% decrease from 2016 (Statistics Canada, 2017g, 2022g). In the 2021 Census, 0.0% reported knowing only French, the same as in 2016 (Statistics Canada, 2017g, 2022g). In the 2021 Census, a majority of respondents (69.0%) reported speaking Indigenous languages most often at home, a 13.9% decrease from 2016; 15.8% reported speaking English most often at home, a 0.2% decrease from 2016; and 0.0% reported speaking French most often at home, the same as in 2016 (Statistics Canada, 2017g, 2022g).

According to the 2021 Census, in reference to knowledge of official languages, 92.2% of individuals living on Sheshatshiu 3 reserve reported knowing only English (92.0% of men+ and 93.8% of women+), a 2.4% decrease from 2016 (Statistics Canada, 2017i, 2022i). A lower number of respondents (3.7% total; 4.5% of men+ and 2.3% of women+) reported knowing both French and English in the 2021 Census, a 0.8% increase over 2016. In the 2021 Census, 0.4% reported knowing only French (1.8% of men+ and 0.0% of women+), a 0.1% decrease from 2016 (Statistics Canada, 2017i, 2022i). In the 2021 Census, a majority of respondents (48.6%) reported speaking Indigenous languages most often at home, a 15.6% decrease from 2016; 39.1% reported speaking English most often at home, a 5.3% increase over 2016; and 0.4% reported speaking French most often at home, up from 0.0% in 2016 (Statistics Canada, 2017i, 2022i).

Table 6-8: Innu Nation Language Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Language Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
NATUASHISH 2 RESERVE									
Total Responses (Knowledge of Official Languages)	855	420	435	935	450	485	-8.6	-6.7	-10.3
English Only (%)	97.7	98.8	96.6	90.9	92.2	89.7	6.8	6.6	6.9
French Only (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

2021				2016			Change from 2016 to 2021		
Language Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
English & French (%)	1.2	1.2	1.1	1.1	1.1	0.0	0.1	0.1	1.1
Total Responses (Language spoken most often at home)	855	420	435	935	450	485	-8.6	-6.7	-10.3
Indigenous languages spoken most often at home (%)	69.0	70.2	67.8	82.9	82.2	83.5	-13.9	-12.0	-15.7
English spoken most often at home (%)	15.8	15.5	16.1	16.0	16.7	15.5	-0.2	-1.2	0.6
French spoken most often at home (%)	0.0	0.0	0.0	0.0	1.1	0.0	0.0	-1.1	0.0
SHESHATSHIU 3 RESERVE									
Total Responses (Knowledge of Official Languages)	1,215	560	650	1,020	510	510	19.1	9.8	27.5
English Only (%)	92.2	92.0	93.8	94.6	94.1	95.1	-2.4	-2.1	-1.3
French Only (%)	0.4	1.8	0.0	0.5	2.0	0.0	-0.1	-0.2	0.0
English & French (%)	3.7	4.5	2.3	2.9	2.9	2.9	0.8	1.6	-0.6
Total Responses (Language spoken most often at home)	1,215	560	650	1,020	505	510	19.1	10.9	27.5
Indigenous languages spoken most often at home (%)	48.6	52.7	45.4	64.2	65.3	64.7	-15.6	-12.6	-19.3
English spoken most often at home (%)	39.1	39.3	40.0	33.8	33.7	34.3	5.3	5.6	5.7
French spoken most often at home (%)	0.4	1.8	0.0	0.0	0.0	0.0	0.4	1.8	0.0

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017g, 2017i, 2022g, 2022i)

6.1.1.6 Educational Attainment

The 2021 Census presents education statistics from respondents on Natuashish 2 and Sheshatshiu 3 reserves. Relevant 2021 Census data is presented in Table 6-9. According to the 2021 Census, 57.9% of the total population 15 years and over on Natuashish 2 reserve did not have a certificate, diploma, or degree (59.3% of men+ and 58.5% of women+), an 5.5% decrease from 2016 for men+ and a 7.0% decrease from 2016 for women+ (Statistics Canada, 2017g, 2022g). In 2021, 14.0% of the population 15 years and over reported a secondary school diploma or equivalency as their highest educational attainment (13.0% of men+ and 15.1% of women+), a 5.6% increase over 2016 for men+ and a 6.5% increase over 2016 for women+; 7.5% reported an apprenticeship or trades certificate or diploma (7.4% of men+ and 7.5% of women+), a 3.7% decrease from 2016 for men+ and a 4.1% increase over 2016 for women+; 14.0% reported a college or non-university certificate (13.0% of men+ and 13.2% of women+), a 5.6% increase over 2016 for men+ and a 0.6% decrease from 2016 for women+; and 4.7% reported a Bachelor's degree or higher (3.7% for men+ and 3.8% for women+), a 3.7% decrease from 2016 for men+ and a 0.4% increase over 2016 for women+ (Statistics Canada, 2017g, 2022g).

According to the 2021 Census, 44.4% of the total population 15 years and over on Sheshatshiu 3 reserve did not have a certificate, diploma, or degree (41.3% of men+ and 47.7% of women+), a 20.4% decrease from 2016 for men+ and a 22.3% decrease from 2016 for women+ (Statistics Canada, 2017i, 2022i). In 2021, 24.3% of the population 15 years and over reported a secondary school diploma or equivalency as their highest educational attainment (22.5% of men+ and 27.3% of women+), a 9.2% increase over 2016 for men+ and a 14.4% increase over 2016 for women+; 11.2% reported an apprenticeship or trades certificate or diploma (21.3% of men+ and 2.3% of women+), a 4.6% increase over 2016 for men+ and a 3.4% decrease from 2016 for women+; 13.6% reported a college or non-university certificate (10.0% of men+ and 15.9% of women+), a 3.3% increase over 2016 for men+ and a 8.8% increase over 2016 for women+; and 5.9% reported a Bachelor's degree or higher (6.3% for men+ and 5.7% for women+), a 3.0% increase over 2016 for men+ and a 2.8% increase over 2016 for women+ (Statistics Canada, 2017i, 2022i).

Table 6-9: Innu Nation Education Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Education Characteristics	**Total**	**Men+**	**Women+**	**Total**	**Males**	**Females**	**Total (%)**	**Men+/ Males (%)**	**Women+/ Females (%)**
NATUASHISH 2 RESERVE									
Population 15 years and over	535	270	265	560	270	290	-4.5	0.0	-8.6
No certificate; diploma; degree (%)	57.9	59.3	58.5	65.2	64.8	65.5	-7.3	-5.5	-7.0
Secondary (high) school diploma or equivalency certificate (%)	14.0	13.0	15.1	8.9	7.4	8.6	5.1	5.6	6.5

	2021			2016			Change from 2016 to 2021		
Education Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Apprenticeship or trades certificate or diploma (%)	7.5	7.4	7.5	8.0	11.1	3.4	-0.5	-3.7	4.1
College, or non university certificate (%)	14.0	13.0	13.2	10.7	7.4	13.8	3.3	5.6	-0.6
University certificate below bachelor level (%)	1.9	0.0	3.8	0.0	0.0	0.0	1.9	0.0	3.8
Bachelor's degree or higher (%)	4.7	3.7	3.8	7.1	7.4	3.4	-2.4	-3.7	0.4
SHESHATSHIU 3 RESERVE									
Population 15 years and over	845	400	440	655	300	350	29.0	33.3	25.7
No certificate; diploma; degree (%)	44.4	41.3	47.7	66.4	61.7	70.0	-22.0	-20.4	-22.3
Secondary (high) school diploma or equivalency certificate (%)	24.3	22.5	27.3	13.0	13.3	12.9	11.3	9.2	14.4
Apprenticeship or trades certificate or diploma (%)	11.2	21.3	2.3	9.9	16.7	5.7	1.3	4.6	-3.4
College, or non university certificate (%)	13.6	10.0	15.9	7.6	6.7	7.1	6.0	3.3	8.8
University certificate below bachelor level (%)	1.2	0.0	2.3	1.5	0.0	2.9	-0.3	0.0	-0.6
Bachelor's degree or higher (%)	5.9	6.3	5.7	2.3	3.3	2.9	3.6	3.0	2.8

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017g, 2017i, 2022g, 2022i)

6.1.2 Innu Takuaikan Uashat mak Mani-Utenam

6.1.2.1 Community Overview

The Innu Takuaikan Uashat mak Mani-Utenam (ITUM) is an Innu First Nations band located in the vicinity of Ville de Sept-Îles, Québec, approximately 290 kilometres south of the Project site. In 1954, Innu people from Mani-Utenam moved north to Ville de Schefferville to work in exploration and construction of the Iron Ore Company of Canada (IOC) mining operations in the area (Commission de toponymie du Québec, 2012e). The Innu and Naskapi people in the Schefferville area later formed the reserves of Matimekush 3 and Lac-John, now associated with La Nation Innu Matimekush-Lac John (NIMLJ) (CIRNAC, 2023b).

Governance

The Chief and Council for the ITUM are elected to a three-year term. The current Chief and Council are listed Table 6-10.

Table 6-10: Innu Takuaikan Uashat mak Mani-Utenam Officials

Title	Name	Term
Chief	Mike McKenzie	June 19, 2022 - June 18, 2025
Councillor	Karine Fontaine	
Councillor	Rose-Anne Grégoire	
Councillor	Bruce Michel	
Councillor	Johnny Régis	
Councillor	Kenny Régis	
Councillor	Jonathan St-Onge	

Source: (CIRNAC, 2023a)

Population Characteristics

The ITUM has two reserve parcels, Mani-Utenam (Maliotènam 27A) and Uashat 27, located to the east and west of Sept-Îles, respectively (CIRNAC, 2023a). The registered population for the ITUM as of July 2023 is listed in Table 6-11. According to the CIRNAC Nation profile, 72.7% of Innu Takuaikan Uashat Mak Mani-Utenam community members live on reserve (CIRNAC, 2023a).

Table 6-11: Innu Takuaikan Uashat mak Mani-Utenam Registered Population as of July 2023

Residency	Number of People
Registered Males on Own Reserve	1,808
Registered Females on Own Reserve	1,837
Registered Males on Other Reserves	35
Registered Females on Other Reserves	22
Registered Males on Own Crown Land	1
Registered Females on Own Crown Land	4
Registered Males on Other Band Crown Land	0
Registered Females on Other Band Crown Land	0
Registered Males on No Band Crown Land	1
Registered Females on No Band Crown Land	0
Registered Males Off Reserve	630
Registered Females Off Reserve	677
Total Registered Population	**5,015**

Source: (CIRNAC, 2023a)

Additional information about the ITUM is provided in the Current Use of Lands and Resources for Traditional Purposes study (WSP 2024).

6.1.2.2 Age and Gender

The 2021 Census presents age and gender statistics from respondents on Mani-Utenam and Uashat 27 reserves, which the CIRNAC Nation profiles identify as the reserves affiliated with the ITUM. According to the 2021 Census, there were 1,610 individuals living on Mani-Utenam reserve, of which 780 identified as men+ and 830 identified as women+ (Statistics Canada, 2022e). The average age was 31.3 (30.6 for men+ and 32.0 for women+) and the median age was 27.8 (27.0 for men+ and 28.4 for women+) (Statistics Canada, 2022e). The Nation's on-reserve population increased by 4.2% between the 2016 Census and 2021 Census (Statistics Canada, 2022e). For men+, 0-to-4-year-olds made up the largest percentage of the total population, at 11.5%. For women+, 5-to-9-year-olds made up the largest percentage of the total population, at 11.4% (Statistics Canada, 2022e).

According to the 2021 Census, there were 1,550 individuals living on Uashat 27 reserve, of which 755 identified as men+ and 800 identified as women+ (Statistics Canada, 2022j). The average age was 32.4 (31.6 for men+ and 33.1 for women+) and the median age was 29.6 (28.0 for men+ and 32.0 for women+) (Statistics Canada, 2022j). The Nation's on-reserve population decreased by 2.8% between the 2016 Census and 2021 Census (Statistics Canada, 2022j). For men+, 10-to-14-year-olds made up the largest percentage of the total population, at 11.9% (Statistics Canada, 2022j). For women+, 10-to-14-year-olds made up the largest percentage of the total population, at 12.5% (Statistics Canada, 2022j).

The age distribution of the Innu Takuaikan Uashat Mak Mani-Utenam's on-reserve population is presented in Figure 6-2, and population characteristics can be found in Table 6-12.

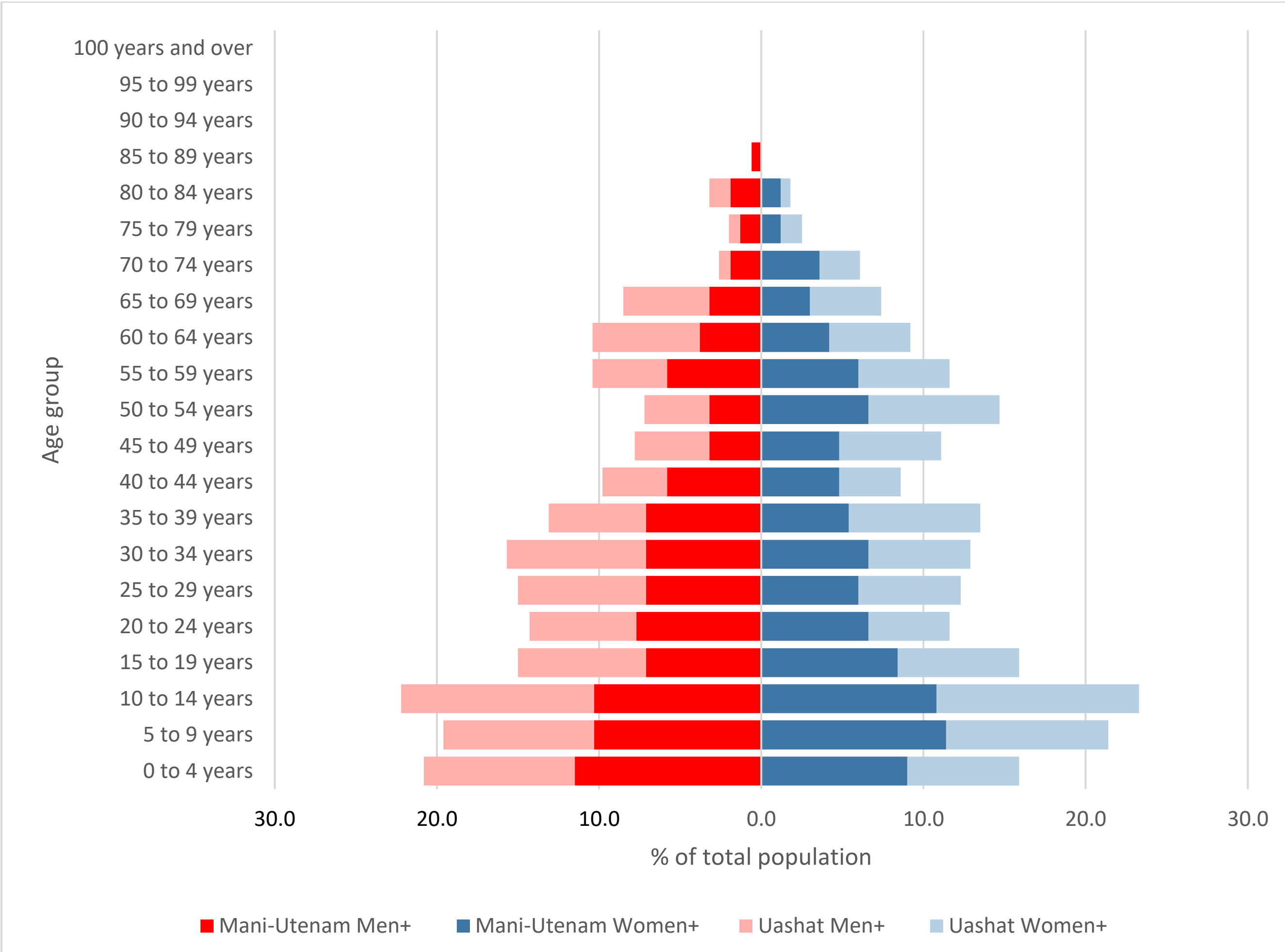

Figure 6-2: Innu Takuaikan Uashat mak Mani-Utenam Population by Age Group, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022e, 2022j)

Table 6-12: Innu Takuaikan Uashat mak Mani-Utenam Population Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Age Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
MANI-UTENAM RESERVE									
Total Population	1,610	780	830	1,545	770	770	4.2	1.3	7.8
0 to 14 years	510	255	255	495	255	240	3.0	0.0	6.3
15 to 64 years	955	455	500	945	470	480	1.1	-3.2	4.2
65 years and over	145	65	80	95	50	50	52.6	30.0	60.0
Average Age	31.3	30.6	32	29.6	29.1	30.1	1.7	1.5	6.3
Median Age	27.8	27	28.4	26.1	25.8	26.7	1.7	1.2	1.7

2021				2016			Change from 2016 to 2021		
Age Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
UASHAT 27 RESERVE									
Total Population	1,550	755	800	1,595	760	835	-2.8	-0.7	-4.2
0 to 14 years	465	225	235	515	245	275	-9.7	-8.2	-14.5
15 to 64 years	955	455	500	980	475	505	-2.6	-4.2	-1.0
65 years and over	135	65	65	95	40	55	42.1	62.5	18.2
Average Age	32.4	31.6	33.1	29.7	29.5	29.9	2.7	2.1	10.7
Median Age	29.6	28	32	26	25.3	26.5	3.6	2.7	5.5

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017e, 2017j, 2022e, 2022j)

6.1.2.3 Migration and Mobility

The 2021 Census presents mobility statistics from respondents on Mani-Utenam and Uashat 27 reserves. Relevant 2021 Census data is presented in Table 6-13. According to the 2021 Census, 94.6% of individuals living on Mani-Utenam reserve (95.4% of men+ and 94.5% of women+) did not move in the previous year, a 10.3% increase over 2016; and 94.7% of individuals living on Uashat 27 reserve (95.1% of men+ and 94.9% of women+) did not move in the previous year, a 2.1% increase over 2016 (Statistics Canada, 2017e, 2017j, 2022e, 2022j). In the 2021 Census, 1.0% of individuals living on Mani-Utenam reserve reported moving within Québec in the previous year (0.0% of men+ and 1.8% of women+), an 5.3% decrease from 2016; 0.7% of individuals living on Uashat 27 reserve reported moving within Québec in the previous year (1.4% of men+ and 1.3% of women+), a 1.2% decrease from 2016. In the 2021 Census, 0.0% of individuals living on Mani-Utenam and Uashat 27 reserves reported moving into Québec from a different province in the previous year, the same as in 2016 (Statistics Canada, 2017e, 2017j, 2022e, 2022j).

Table 6-13: Innu Takuaikan Uashat mak Mani-Utenam Mobility Characteristics, 2021

2021				2016			Change from 2016 to 2021		
Mobility Characteristics (25% sample data)	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
MANI-UTENAM RESERVE									
Total responses	1,570	755	815	1,500	745	745	4.7	1.3	9.4
Did not move in the past year (%)	94.6	95.4	94.5	84.3	85.2	85.2	10.3	10.2	9.3
Moved within Québec (%)	1.0	0.0	1.8	6.3	6.0	6.7	-5.3	-6.0	-4.9
Moved into Québec from a different province (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Mobility Characteristics (25% sample data)	2021 Total	2021 Men+	2021 Women+	2016 Total	2016 Males	2016 Females	Change from 2016 to 2021 Total (%)	Change from 2016 to 2021 Men+/ Males (%)	Change from 2016 to 2021 Women+/ Females (%)
UASHAT 27 RESERVE									
Total responses	1,510	720	785	1,550	750	805	-2.6	-4.0	-2.5
Did not move in the past year (%)	94.7	95.1	94.9	92.6	92.0	92.5	2.1	3.1	2.4
Moved within Québec (%)	0.7	1.4	1.3	1.9	2.0	1.9	-1.2	-0.6	-0.6
Moved into Québec from a different province (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017e, 2017j, 2022e, 2022j)

6.1.2.4 Housing

The 2021 Census presents housing statistics from respondents on Mani-Utenam and Uashat 27 reserves. Relevant 2021 Census data is presented in Table 6-14. According to the 2021 Census, there were 542 private dwellings on Mani-Utenam reserve, of which 97.4% were occupied by the usual residents, and there were 522 private dwellings on Uashat 27 reserve, of which 94.4% were occupied by the usual residents (Statistics Canada, 2022e, 2022j). The average dwelling on Mani-Utenam reserve housed 3.0 persons, the same as in 2016, and the average dwelling on Uashat 27 reserve housed 3.1 persons, a decrease from 3.3 persons in 2016 (Statistics Canada, 2017e, 2017j, 2022e, 2022j). In 2021, 37.1% of respondents on Mani-Utenam reserve were owners of their household, 5.7% were renters, and 57.1% were living in a household provided by the First Nation band; 39.8% of respondents on Uashat 27 reserve were owners of their household, 11.2% were renters, and 49.0% were living in a household provided by the First Nation band (Statistics Canada, 2022e, 2022j). With regards to household conditions, 88.6% of respondents on Mani-Utenam reported their household as being suitable, 77.1% of households were in need of only regular maintenance and minor repairs, and 24.8% of households were in need of major repairs; 83.7% of respondents on Uashat 27 reserve reported their household as being suitable, 74.5% of households were in need of only regular maintenance and minor repairs, and 25.5% of households were in need of major repairs (Statistics Canada, 2022e, 2022j).

Table 6-14: Innu Takuaikan Uashat mak Mani-Utenam Housing Characteristics, 2021

Housing Characteristics (25% sample data)	2021 Total	2016 Total	% Change from 2016 to 2021
MANI-UTENAM RESERVE			
Total private dwellings	542	524	3.4
Private dwellings occupied by usual residents	528	505	4.6
Private dwellings occupied by usual residents (%)	97.4	96.4	1.0

Housing Characteristics (25% sample data)	2021 Total	2016 Total	% Change from 2016 to 2021
Average household size (persons)	3.0	3.0	0.0
Household Tenure			
Private household by tenure: Owner (%)	37.1	48.5	-11.4
Private household by tenure: Renter (%)	5.7	6.9	-1.2
Private household by tenure: Dwelling provided by local government, or First Nation band (%)	57.1	44.6	12.5
Household Conditions			
Housing is suitable (%)	88.6	89.1	-0.5
Housing is not suitable (%)	11.4	10.9	0.5
Dwelling in need of only regular maintenance and minor repairs (%)	77.1	63.4	13.7
Dwelling in need of major repairs (%)	24.8	36.6	-11.8
Household Affordability			
Owner or tenant spending less than 30% of income on shelter costs (%)	Data not available		N/A
Owner or tenant spending more than 30% of income on shelter costs (%)			
UASHAT 27 RESERVE			
Total private dwellings	522	499	4.6
Private dwellings occupied by usual residents	493	481	2.5
Private dwellings occupied by usual residents (%)	94.4	96.4	-1.9
Average household size (persons)	3.1	3.3	-0.2
Household Tenure			
Private household by tenure: Owner (%)	39.8	64.2	-24.4
Private household by tenure: Renter (%)	11.2	5.3	5.9
Private household by tenure: Dwelling provided by local government, or First Nation band (%)	49.0	30.5	18.5
Household Conditions			
Housing is suitable (%)	83.7	83.3	0.4
Housing is not suitable (%)	16.3	15.6	0.7
Dwelling in need of only regular maintenance and minor repairs (%)	74.5	68.4	6.1
Dwelling in need of major repairs (%)	25.5	32.6	-7.1
Household Affordability			
Owner or tenant spending less than 30% of income on shelter costs (%)	Data not availble		N/A
Owner or tenant spending more than 30% of income on shelter costs (%)			

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017e, 2017j, 2022e, 2022j)

6.1.2.5 Language

The 2021 Census provides language statistics from respondents on Mani-Utenam and Uashat 27 reserves. Relevant 2021 Census data is presented in in Table 6-15. According to the 2021 Census, in reference to knowledge of official languages, 81.1% of individuals living on Mani-Utenam reserve reported knowing only French (78.8% of men+ and 83.1% of women+), a 5.6% decrease from 2016 (Statistics Canada, 2017e, 2022e). A lower number of respondents (16.1% total; 17.9% of men+ and 15.1% of women+) reported knowing both French and English in the 2021 Census, a 5.1% increase over 2016 (Statistics Canada, 2017e, 2022e). In the 2021 Census, 0.6% reported knowing only English (0.6% of men+ and 0.6% of women+), a 0.3% increase over 2016 (Statistics Canada, 2017j, 2022j). In the 2021 Census, 50.0% of respondents reported speaking Indigenous languages most often at home, a 13.0% decrease from 2016; 38.8% reported speaking French most often at home, a 14.4% increase over 2016; and 0.0% reported speaking English most often at home, a 1.3 % decrease from 2016 (Statistics Canada, 2017e, 2022e).

According to the 2021 Census, in reference to knowledge of official languages, 83.4% of individuals living on Uashat 27 reserve reported knowing only French (82.3% of men+ and 84.9% of women+), a 5.8% decrease from 2016 (Statistics Canada, 2017j, 2022j). A lower number of respondents (15.3% total; 16.3% of men+ and 13.8% of women+) reported knowing both French and English in the 2021 Census, a 6.4% increase over 2016 (Statistics Canada, 2017j, 2022j). In the 2021 Census, 0.7% reported knowing only English (0.7% of men+ and 0.6% of women+), a 0.1% decrease from 2016 (Statistics Canada, 2017j, 2022j). In the 2021 Census, 32.2% reported speaking Indigenous languages most often at home, a 23.5% decrease from 2016; 52.8% reported speaking French most often at home, a 14.5% increase over 2016; and 1.3% reported speaking English most often at home, a 0.4% increase over 2016 (Statistics Canada, 2017j, 2022j).

Table 6-15: Innu Takuaikan Uashat mak Mani-Utenam Language Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Language Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
MANI-UTENAM RESERVE									
Total Responses (Knowledge of Official Languages)	1,610	780	830	1,540	770	770	4.5	1.3	7.8
English Only (%)	0.6	0.6	0.6	0.3	0.6	0.6	0.3	0.0	0.0
French Only (%)	81.1	78.8	83.1	86.7	85.1	88.3	-5.6	-6.3	-5.2
English & French (%)	16.1	17.9	15.1	11.0	13.6	8.4	5.1	4.3	6.7
Total Responses (Language spoken most often at home)	1,610	780	830	1,540	770	770	4.5	1.3	7.8

	2021			2016			Change from 2016 to 2021		
Language Characteristics	**Total**	**Men+**	**Women+**	**Total**	**Males**	**Females**	**Total (%)**	**Men+/ Males (%)**	**Women+/ Females (%)**
Indigenous languages spoken most often at home (%)	50.0	48.1	51.8	63.0	60.4	65.6	-13.0	-12.3	-13.8
English spoken most often at home (%)	0.0	0.0	0.0	1.3	1.3	1.3	-1.3	-1.3	-1.3
French spoken most often at home (%)	38.8	41.7	36.7	24.4	26.6	22.1	14.4	15.1	14.6
UASHAT 27 RESERVE									
Total Responses (Knowledge of Official Languages)	1,535	735	795	1,580	755	830	-2.8	-2.6	-4.2
English Only (%)	0.7	0.7	0.6	0.6	0.7	0.6	0.1	0.0	0.0
French Only (%)	83.4	82.3	84.9	89.2	89.4	89.2	-5.8	-7.1	-4.3
English & French (%)	15.3	16.3	13.8	8.9	9.3	8.4	6.4	7.0	5.4
Total Responses (Language spoken most often at home)	1,535	735	795	1,580	755	825	-2.8	-2.6	-3.6
Indigenous languages spoken most often at home (%)	32.2	32.7	32.1	55.7	56.3	55.2	-23.5	-23.6	-23.1
English spoken most often at home (%)	1.3	1.4	1.3	0.9	0.7	0.6	0.4	0.7	0.7
French spoken most often at home (%)	52.8	53.1	52.8	38.3	37.7	38.8	14.5	15.4	14.0

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017e, 2017j, 2022e, 2022j)

6.1.2.6 Educational Attainment

The 2021 Census provides education statistics from respondents on Mani-Utenam and Uashat 27 reserves. Relevant 2021 Census data is presented in Table 6-16. According to the 2021 Census, 53.4% of the total population 15 years and over on Mani-Utenam reserve did not have a certificate, diploma, or degree (56.7% of men+ and 50.4% of women+), a 2.0% decrease from 2016 for men+ and an 4.8% decrease from 2016 for women+ (Statistics Canada, 2017e, 2022e). In 2021, 13.2% of the population 15 years and over reported a secondary school diploma or equivalency as their highest educational attainment (11.5% of men+ and 13.9% of women+), a 3.8% increase over 2016 for men+ and a 1.5% increase over 2016 for women+; 15.1% reported an apprenticeship or trades certificate or diploma (19.2% of men+ and 11.3% of women+), a 2.0% decrease from 2016 for men+ and a 0.8% increase over 2016 for women+; 10.5% reported a college or non-university certificate (8.7% of men+ and 13.0% of women+), a 2.0% increase over 2016 for men+ and a 0.3% decrease from 2016 for women+; and 5.0% reported a Bachelor's degree or higher (3.8% for men+ and 7.0% for women+), a 1.9% increase over 2016 for men+ and a 2.2% increase over 2016 for women+ (Statistics Canada, 2017e, 2022e).

According to the 2021 Census, 57.3% of the total population 15 years and over on Uashat 27 reserve did not have a certificate, diploma, or degree (58.4% of men+ and 56.3% of women+), a 7.3% decrease from 2016 for men+ and a 7.3% decrease from 2016 for women+ (Statistics Canada, 2017j, 2022j). In 2021, 12.7% of the population 15 years and over reported a secondary school diploma or equivalency as their highest educational attainment (13.9% of men+ and 11.6% of women+), a 3.1% increase over 2016 for men+ and a 2.5% increase over 2016 for women+; 14.1% reported an apprenticeship or trades certificate or diploma (16.8% of men+ and 10.7% of women+), a 4.1% increase over 2016 for men+ and a 1.6% increase over 2016 for women+; 10.3% reported a college or non-university certificate (6.9% of men+ and 12.5% of women+), a 0.9% decrease from 2016 for men+ and a 2.5% increase over 2016 for women+; and 3.8% reported a Bachelor's degree or higher (2.0% for men+ and 6.3% for women+), a 0.0% change from 2016 for men+ and a 1.8% increase over 2016 for women+ (Statistics Canada, 2017j, 2022j).

Table 6-16: Innu Takuaikan Uashat mak Mani-Utenam Education Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Education Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
MANI-UTENAM RESERVE									
Population 15 years and over	1,095	520	575	1,045	520	525	4.8	0.0	9.5
No certificate; diploma; degree (%)	53.4	56.7	50.4	56.9	58.7	55.2	-3.5	-2.0	-4.8
Secondary (high) school diploma or equivalency certificate (%)	13.2	11.5	13.9	10.5	7.7	12.4	2.7	3.8	1.5
Apprenticeship or trades certificate or diploma (%)	15.1	19.2	11.3	16.3	21.2	10.5	-1.2	-2.0	0.8
College, or non university certificate (%)	10.5	8.7	13.0	10.5	6.7	13.3	0.0	2.0	-0.3
University certificate below bachelor level (%)	2.7	0.0	4.3	2.9	1.9	3.8	-0.2	-1.9	0.5
Bachelor's degree or higher (%)	5.0	3.8	7.0	3.3	1.9	4.8	1.7	1.9	2.2

	2021			2016			Change from 2016 to 2021		
Education Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
UASHAT 27 RESERVE									
Population 15 years and over	1,065	505	560	1,060	510	550	0.5	-1.0	1.8
No certificate; diploma; degree (%)	57.3	58.4	56.3	65.1	65.7	63.6	-7.8	-7.3	-7.3
Secondary (high) school diploma or equivalency certificate (%)	12.7	13.9	11.6	9.9	10.8	9.1	2.8	3.1	2.5
Apprenticeship or trades certificate or diploma (%)	14.1	16.8	10.7	10.8	12.7	9.1	3.3	4.1	1.6
College, or non university certificate (%)	10.3	6.9	12.5	8.5	7.8	10.0	1.8	-0.9	2.5
University certificate below bachelor level (%)	1.9	0.0	2.7	2.4	2.0	3.6	-0.5	-2.0	-0.9
Bachelor's degree or higher (%)	3.8	2.0	6.3	3.3	2.0	4.5	0.5	0.0	1.8

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017e, 2017j, 2022e, 2022j)

6.1.3 La Nation Innu Matimekush-Lac John

6.1.3.1 Community Overview

La Nation Innu Matimekush-Lac John (NIMLJ) is an Innu First Nations band located in the vicinity of Ville de Schefferville, Québec, approximately 220 kilometres north of the Project site. The reserve lands of the NIMLJ constituted the northernmost limit of the traditional hunting and trapping territory of the Innu people (Commission de toponymie du Québec, 2012d). When Schefferville was established as a company town in 1954 to support the IOC’s mining operations in the area, Innu people from Mani-Utenam and Naskapi people from Kuujjuaq settled in the Schefferville area to assist with exploration and construction (Commission de toponymie du Québec, 2012e). In 1957, the Innu and Naskapi at Schefferville were moved to the Lac-John site, without access to services (Commission de toponymie du Québec, 2012c; Naskapi Nation of Kawawachikamach, 2022b). In 1968, the Matimekush land in the centre of Schefferville became a reserve of the Innu and Naskapi people, and in 1972 most Innu and Naskapi people at Lac-John were relocated to Matimekush (Commission de toponymie du Québec, 2012d). In 1978, the Naskapi at Matimekush ceded rights and interests in the reserve as a prerequisite to form their own reserve in Québec, approximately seven kilometres northeast of Matimekush (Naskapi Nation of Kawawachikamach, 2022b). In 1982, the IOC mine near Schefferville closed and most of the municipality’s population left (Naskapi Nation of Kawawachikamach, 2022b).

Governance

The Chief and Council for the NIMLJ are elected to a three-year term. Current Chief and Council is listed in Table 6-17.

Table 6-17: La Nation Innu Matimekush-Lac John Officials

Title	Name	Term
Chief	Réal McKenzie	July 9, 2022 - July 7, 2025
Councillor	Pier-Luc André	
Councillor	Dan-George Gabriel	
Councillor	Didier Grégoire	
Councillor	Nathanlie Tshutshet Gabriel	

Source: (CIRNAC, 2023b)

Population Characteristics

NIMLJ has two reserve parcels, Matimekush (Matimekosh 3) (in the centre of Schefferville) and Lac-John (north of Schefferville) (CIRNAC, 2023b). Schefferville, and the two NIMLJ reserves, are not connected to the provincial road network, and are instead accessible by air or rail (CIRNAC, 2023b). The registered population for the NIMLJ is presented in Table 6-18. According to the CIRNAC Nation profile, 81.0% of Nation Innu Matimekush-Lac John community members live on reserve.

Table 6-18: La Nation Innu Matimekush-Lac John Registered Population as of July 2023

Residency	Number of People
Registered Males on Own Reserve	425
Registered Females on Own Reserve	433
Registered Males on Other Reserves	28
Registered Females on Other Reserves	33
Registered Males on Own Crown Land	1
Registered Females on Own Crown Land	0
Registered Males on Other Band Crown Land	0
Registered Females on Other Band Crown Land	0
Registered Males on No Band Crown Land	0
Registered Females on No Band Crown Land	0
Registered Males Off Reserve	72
Registered Females Off Reserve	67
Total Registered Population	**1,059**

Source: (CIRNAC, 2023b)

Additional information regarding the NIMLJ is provided in the Current Use of Lands and Resources for Traditional Purposes study (WSP 2024).

6.1.3.2 Age and Gender

The 2021 Census provides age and gender statistics from respondents on Matimekush reserve, which the CIRNAC Nation profile identifies as the most populated reserve affiliated with the NIMLJ. According to CIRNAC, there is one other reserve affiliated with the Nation (Lac-John), but Census data is not available for that site. According to the 2021 Census, there were 660 individuals living on Matimekush reserve, of which 280 identified as men+ and 385 identified as women+ (Statistics Canada, 2022f). The average age was 30.6 (32.6 for men+ and 29.2 for women+) and the median age was 26.6 (31.0 for men+ and 23.6 for women+) (Statistics Canada, 2022f). The Nation's on-reserve population increased by 8.2% between the 2016 Census and 2021 Census (Statistics Canada, 2022f). For men+, 0-to-4-year-olds made up the largest percentage of the total population, at 12.5% (Statistics Canada, 2022f). For women+, 5-to-9-year-olds made up the largest percentage of the total population, at 18.2% (Statistics Canada, 2022f). The age distribution of the Nation's on-reserve population is presented in Figure 6-3, and population characteristics can be found in Table 6-19.

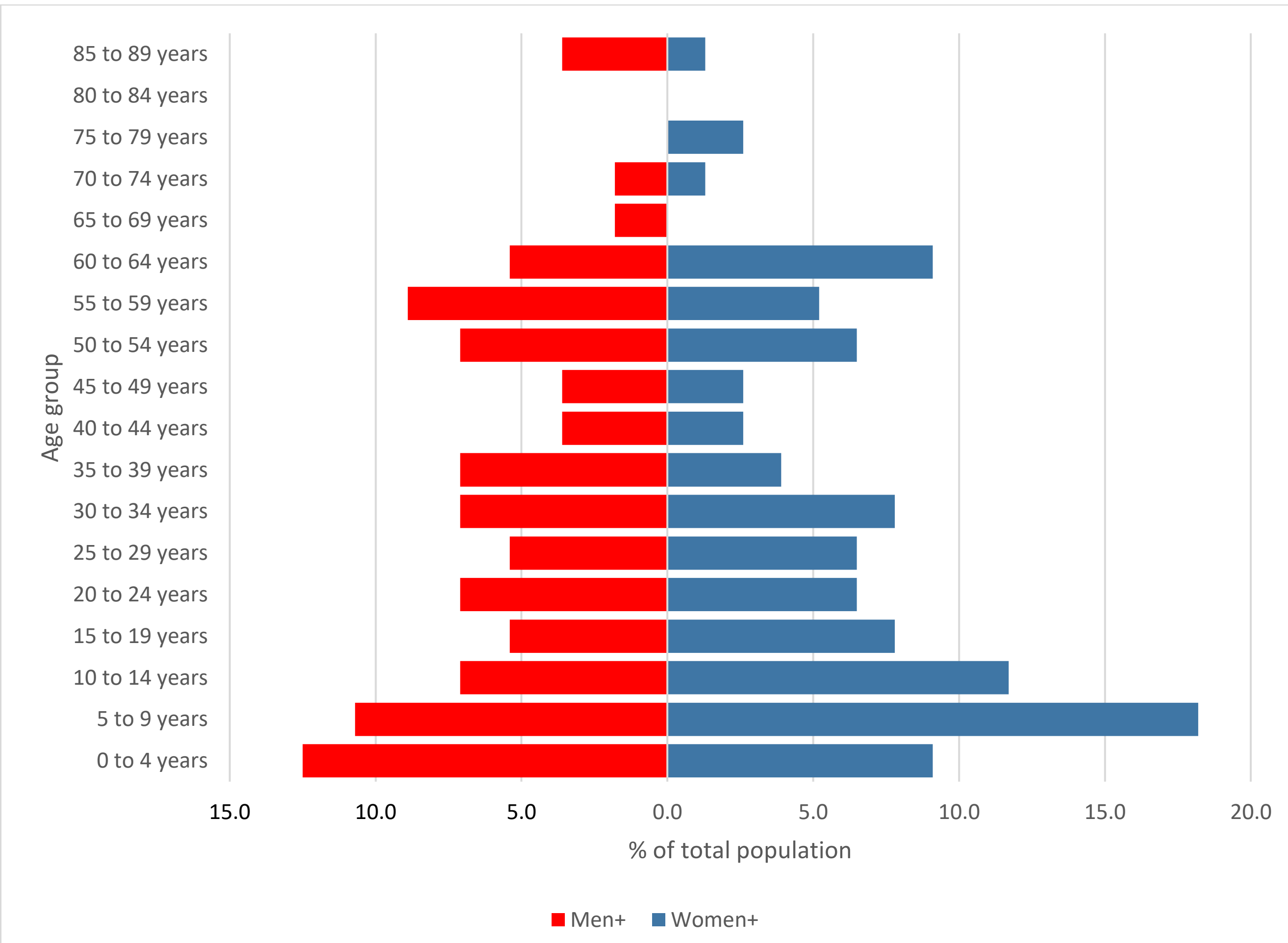

Figure 6-3: La Nation Innu Matimekush-Lac John Population by Age Group, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.
Source: (Statistics Canada, 2022f)

Table 6-19: La Nation Innu Matimekush-Lac John Population Characteristics, 2021

2021				2016			Change from 2016 to 2021		
Age Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total Population	660	280	385	610	295	320	8.2	-5.1	20.3
0 to 14 years	230	85	145	160	85	80	43.8	0.0	81.3
15 to 64 years	390	175	220	390	195	195	0.0	-10.3	12.8
65 years and over	45	20	20	60	15	45	-25.0	33.3	-55.6
Average Age	30.6	32.6	29.2	32.7	30.2	35	-2.1	2.4	-16.6
Median Age	26.6	31	23.6	28.4	26.1	31.5	-1.8	4.9	-7.9

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017f, 2022f)

6.1.3.3 Migration and Mobility

The 2021 Census provides migration and mobility statistics from respondents on Matimekush reserve. Relevant 2021 Census data is presented in Table 6-20. According to the 2021 Census, 94.6% of individuals living on Matimekush reserve (92.6% of men+ and 94.7% of women+) did not move in the previous year, a 4.5% increase over 2016 (Statistics Canada, 2017f, 2022f). In the 2021 Census, 3.1% of individuals living on Matimekush reserve reported moving within Québec in the previous year (3.7% of men+ and 2.6% of women+), a 0.2% decrease from 2016; and 0.0% of individuals living on Matimekush reserve reported moving into Québec from a different province in the previous year, the same as in 2016 (Statistics Canada, 2017f, 2022f).

Table 6-20: La Nation Innu Matimekush-Lac John Mobility Characteristics, 2021

2021				2016			Change from 2016 to 2021		
Mobility Characteristics (25% sample data)	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total responses	645	270	380	605	290	315	6.6	-6.9	20.6
Did not move in the past year (%)	94.6	92.6	94.7	90.1	87.9	93.7	4.5	4.7	1.0
Moved within Québec (%)	3.1	3.7	2.6	3.3	3.4	0.0	-0.2	0.3	2.6
Moved into Québec from a different province (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017f, 2022f)

6.1.3.4 Housing

The 2021 Census presents housing statistics from respondents on Matimekush reserve. Relevant 2021 Census data can be found in Table 6-21. According to the 2021 Census, there were 227 private dwellings on Matimekush reserve, of which 89.4% were occupied by the usual residents (Statistics Canada, 2022f). The average dwelling housed 3.3 persons, an increase from 3.2 persons in 2016 (Statistics Canada, 2017f, 2022f). In 2021, 7.5% of respondents were owners of their household, 10.0% were renters, and 82.5% were living in a household provided by the First Nation band (Statistics Canada, 2022f). With regards to household conditions, 82.5% of respondents reported their household as being suitable, 67.5% of households were in need of only regular maintenance and minor repairs, and 32.5% of households were in need of major repairs (Statistics Canada, 2022f).

Table 6-21: La Nation Innu Matimekush-Lac John Housing Characteristics, 2021

Housing Characteristics (25% sample data)	2021 Total	2016 Total	% Change from 2016 to 2021
Total private dwellings	227	225	0.9
Private dwellings occupied by usual residents	203	194	4.6
Private dwellings occupied by usual residents (%)	89.4	86.2	3.2
Average household size (persons)	3.3	3.2	0.1
Household Tenure			
Private household by tenure: Owner (%)	7.5	7.7	-0.2
Private household by tenure: Renter (%)	10.0	10.3	-0.3
Private household by tenure: Dwelling provided by local government, or First Nation band (%)	82.5	82.1	0.4
Household Conditions			
Housing is suitable (%)	82.5	81.6	0.9
Housing is not suitable (%)	17.5	21.1	-3.6
Dwelling in need of only regular maintenance and minor repairs (%)	67.5	43.6	23.9
Dwelling in need of major repairs (%)	32.5	56.4	-23.9
Household Affordability			
Owner or tenant spending less than 30% of income on shelter costs (%)	Data not available		N/A
Owner or tenant spending more than 30% of income on shelter costs (%)			

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017f, 2022f)

6.1.3.5 Language

The 2021 Census presents language statistics from respondents on Matimekush reserve. Relevant 2021 Census data can be found in Table 6-22. According to the 2021 Census, in reference to knowledge of official languages, 50.0% of individuals living on Matimekush reserve reported knowing only French

(44.6% of men+ and 53.2% of women+), a 4.1% decrease from 2016 (Statistics Canada, 2017f, 2022f). A lower number of respondents (29.5% total; 32.1% of men+ and 27.3% of women+) reported knowing both French and English in the 2021 Census, a 0.8% increase over 2016 (Statistics Canada, 2017f, 2022f). In the 2021 Census, 17.4% reported knowing only English (17.9% of men+ and 16.9% of women+), a 10.0% increase over 2016. In the 2021 Census, a majority of respondents (83.3%) reported speaking Indigenous languages most often at home, a 6.1% decrease from 2016; 8.3% reported speaking French most often at home, a 3.4% increase over 2016; and 3.0% reported speaking English most often at home, a 2.2% increase over 2016 (Statistics Canada, 2017f, 2022f).

Table 6-22: La Nation Innu Matimekush-Lac John Language Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Language Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total Responses (Knowledge of Official Languages)	660	280	385	610	295	320	8.2	-5.1	20.3
English Only (%)	17.4	17.9	16.9	7.4	5.1	9.4	10.0	12.8	7.5
French Only (%)	50.0	44.6	53.2	54.1	52.5	54.7	-4.1	-7.9	-1.5
English & French (%)	29.5	32.1	27.3	28.7	32.2	25.0	0.8	-0.1	2.3
Total Responses (Language spoken most often at home)	660	280	385	615	290	320	7.3	-3.4	20.3
Indigenous languages spoken most often at home (%)	83.3	87.5	80.5	89.4	87.9	92.2	-6.1	-0.4	-11.7
English spoken most often at home (%)	3.0	3.6	3.9	0.8	1.7	1.6	2.2	1.9	2.3
French spoken most often at home (%)	8.3	7.1	9.1	4.9	6.9	4.7	3.4	0.2	4.4

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017f, 2022f)

6.1.3.6 Educational Attainment

The 2021 Census provides education statistics from respondents on Matimekush reserve. Relevant 2021 Census data is presented in Table 6-23. According to the 2021 Census, 52.9% of the total population 15 years and over on Matimekush reserve did not have a certificate, diploma, or degree (53.8% of men+ and 53.2% of women+), a 5.7% decrease from 2016 for men+ and a 9.3% decrease from 2016 for women+ (Statistics Canada, 2017f, 2022f). In 2021, 12.6% of the population 15 years and over reported a secondary school diploma or equivalency as their highest educational attainment (10.3% of men+ and

12.8% of women+), a 5.5% increase over 2016 for men+ and a 1.8% decrease from 2016 for women+; 20.7% reported an apprenticeship or trades certificate or diploma (28.2% of men+ and 14.9% of women+), a 2.8% decrease from 2016 for men+ and a 6.6% increase over 2016 for women+; 5.7% reported a college or non-university certificate (5.1% of men+ and 6.4% of women+), a 0.3% increase over 2016 for men+ and a 2.2% increase over 2016 for women+; and 3.4% reported a Bachelor's degree or higher (0.0% for men+ and 6.4% for women+), a 4.8% decrease from 2016 for men+ and a 0.1% increase over 2016 for women+ (Statistics Canada, 2017f, 2022f).

Table 6-23: La Nation Innu Matimekush-Lac John Education Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Education Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Population 15 years and over	435	195	235	450	210	240	-3.3	-7.1	-2.1
No certificate; diploma; degree (%)	52.9	53.8	53.2	61.1	59.5	62.5	-8.2	-5.7	-9.3
Secondary (high) school diploma or equivalency certificate (%)	12.6	10.3	12.8	10.0	4.8	14.6	2.6	5.5	-1.8
Apprenticeship or trades certificate or diploma (%)	20.7	28.2	14.9	20.0	31.0	8.3	0.7	-2.8	6.6
College, or non university certificate (%)	5.7	5.1	6.4	2.2	4.8	4.2	3.5	0.3	2.2
University certificate below bachelor level (%)	3.4	0.0	6.4	2.2	0.0	4.2	1.2	0.0	2.2
Bachelor's degree or higher (%)	3.4	0.0	6.4	4.4	4.8	6.3	-1.0	-4.8	0.1

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017f, 2022f)

6.1.4 Naskapi Nation of Kawawachikamach

6.1.4.1 Community Overview

The Naskapi Nation of Kawawachikamach (NNK) is a First Nations band located in the vicinity of Ville de Schefferville, Québec. Naskapi people from Kuujjuaq, alongside Innu people from Mani-Utenam, settled near Ville de Schefferville in the mid-1950s to assist with exploration and construction of an IOC mining operation (Commission de toponymie du Québec, 2012e). In 1957, the Naskapi and Innu at Schefferville were moved to what is now the Lac-John reserve, without access to services (Commission de toponymie du Québec, 2012c; Naskapi Nation of Kawawachikamach, 2022b). In 1968, Matimekush reserve was established in the centre of Schefferville, and in 1972 most Naskapi and Innu people at Lac-John were relocated to Matimekush. In 1978, the Naskapi at Matimekush ceded rights and interests in the reserve as a prerequisite to form their own reserve through the Northeastern Québec Agreement (NEQA) (Naskapi Nation of Kawawachikamach, 2022b). Between 1981 and 1983, the Naskapi's Kawawachikamach reserve was established northeast of Schefferville (Commission de toponymie du Québec, 2012b). In 1982, the Iron Ore Company mine near Schefferville closed and most of the municipality's population left (Naskapi Nation of Kawawachikamach, 2022b). In 1990, the NNK and the Government of Canada signed the Agreement Respecting the Implementation of the Northeastern Québec Agreement (ARINEQA), with the goal of addressing issues that arose in the wake of the change in circumstances resulting from the IOC mine closure (Naskapi Nation of Kawawachikamach, 2022b).

Governance

The Chief and Council for the NNK are elected to a three-year term. The current Chief and Council is listed in Table 6-24.

Table 6-24: Naskapi Nation of Kawawachikamach Officials

Title	Name	Term
Chief	Theresa Chemaganish	Aug. 24, 2021 - Aug. 22, 2024
Vice Chief	Louise Nattawappio	
Councillor	Jeremy Einish	
Councillor	Steven Noah Mameanskum	
Councillor	David Swappie	
Councillor	Ronald Tooma	

Source: (CIRNAC, 2023d)

Population Characteristics

The NNK's reserve parcel, Kawawachikamach, is located in the vicinity of Ville de Schefferville, Québec. Schefferville, and Kawawachikamach reserve, is not connected to the provincial road network, and is instead accessible by air or rail (CIRNAC, 2023d). According to the CIRNAC Nation profile, 86.3% of Naskapi Nation of Kawawachikamach community members live on reserve. The registered population for the NNK as of July 2023 is listed in Table 6-25.

Table 6-25: Naskapi Nation of Kawawachikamach Registered Population as of July 2023

Residency	Number of People
Registered Males on Own Reserve	349
Registered Females on Own Reserve	346
Registered Males on Other Reserves	13
Registered Females on Other Reserves	19
Registered Males on Own Crown Land	0
Registered Females on Own Crown Land	0
Registered Males on Other Band Crown Land	0

Residency	Number of People
Registered Females on Other Band Crown Land	0
Registered Males on No Band Crown Land	0
Registered Females on No Band Crown Land	2
Registered Males Off Reserve	35
Registered Females Off Reserve	41
Total Registered Population	**805**

Source: (CIRNAC, 2023d)

Additional information about the NNK is provided in the Current Use of Lands and Resources for Traditional Purposes study (WSP 2024).

6.1.4.2 Age and Gender

The 2021 Census provides age and gender statistics from respondents on Kawawachikamach reserve, which the CIRNAC Nation profile identifies as the most populated reserve affiliated with the NNK. According to the 2021 Census, there were 640 individuals living on Kawawachikamach reserve, of which 325 identified as men+ and 315 identified as women+ (Statistics Canada, 2022c). The average age was 31.1 (29.9 for men+ and 32.2 for women+) and the median age was 27.2 (26.0 for men+ and 28.2 for women+) (Statistics Canada, 2022c). The Nation's on-reserve population increased by 6.7% between the 2016 Census and 2021 Census (Statistics Canada, 2022c). For men+, 20-to-24-year-olds made up the largest percentage of the total population, at 13.8%. For women+, 0-to-4-year-olds made up the largest percentage of the total population, at 12.7% (Statistics Canada, 2022c). The age distribution of the Nation's on-reserve population is presented in Figure 6-4, and population characteristics can be found in Table 6-26.

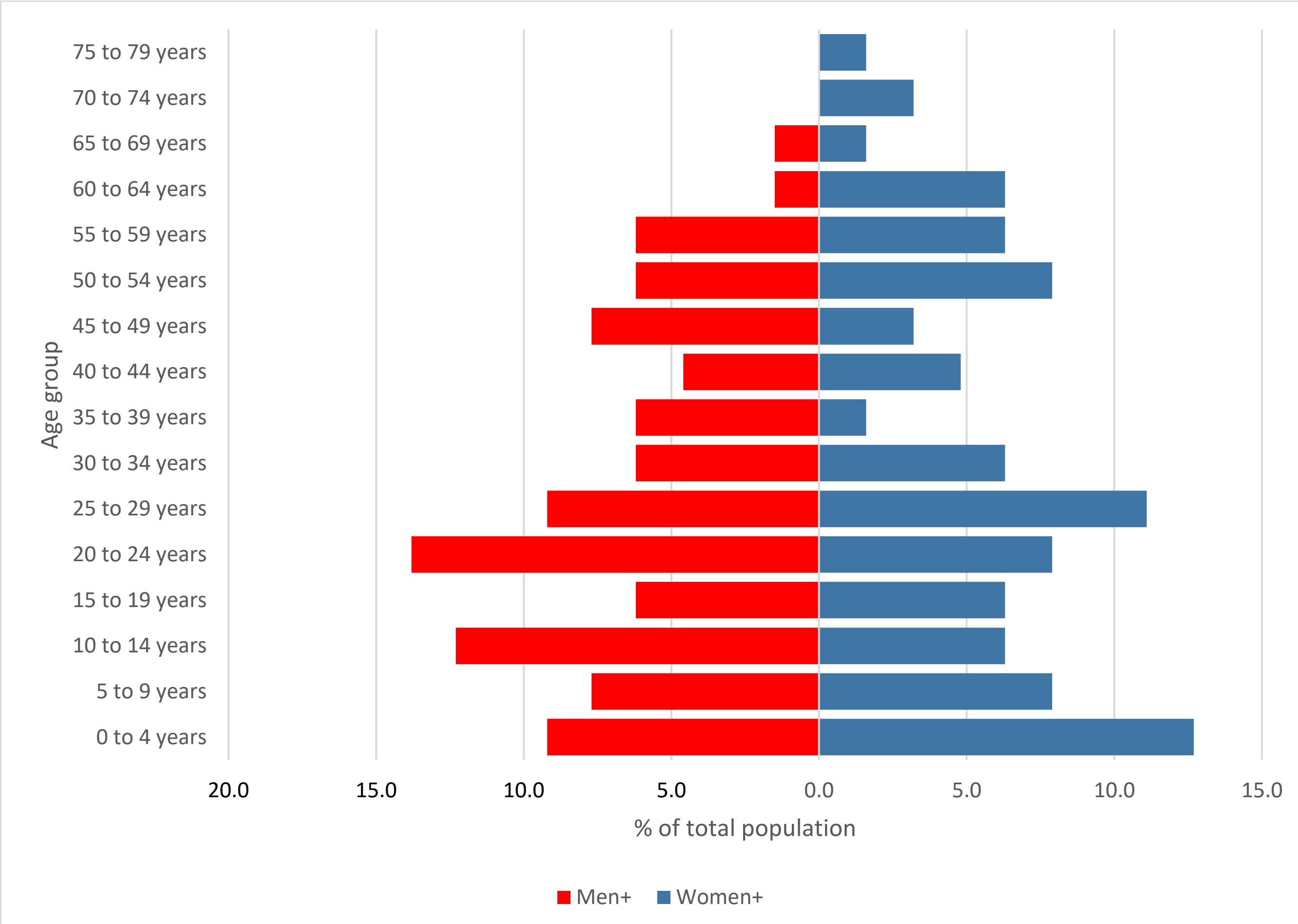

Figure 6-4: Naskapi Nation of Kawawachikamach Population by Age Group, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022c)

Table 6-26: Naskapi Nation of Kawawachikamach Population Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Age Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total Population	640	325	315	600	305	295	6.7	6.6	6.8
0 to 14 years	180	90	85	165	90	80	9.1	0.0	6.3
15 to 64 years	430	220	210	395	200	195	8.9	10.0	7.7
65 years and over	35	15	20	35	20	20	0.0	-25.0	0.0
Average Age	31.1	29.9	32.2	30.5	29.9	31.2	0.6	0.0	3.2

	2021			2016			Change from 2016 to 2021		
Age Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Median Age	27.2	26	28.2	26.5	25.4	27.2	0.7	0.6	1.0

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017c, 2022c)

6.1.4.3 Migration and Mobility

The 2021 Census provides age and gender statistics from respondents on Kawawachikamach reserve. Relevant 2021 Census data is presented in Table 6-27. According to the 2021 Census, 86.4% of individuals living on Kawawachikamach reserve (89.1% of men+ and 83.6% of women+) did not move in the previous year, a 2.7% decrease from 2016 (Statistics Canada, 2017c, 2022c). In the 2021 Census, 2.4% of individuals living on Kawawachikamach reserve reported moving within Québec in the previous year (3.1% of men+ and 0.0% of women+), a 4.3% decrease from 2016; and 0.0% of individuals living on Kawawachikamach reserve reported moving into Québec from a different province in the previous year, the same as in 2016 (Statistics Canada, 2017c, 2022c).

Table 6-27: Naskapi Nation of Kawawachikamach Mobility Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Mobility Characteristics (25% sample data)	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total responses	625	320	305	595	305	295	5.0	4.9	3.4
Did not move in the past year (%)	86.4	89.1	83.6	89.1	88.5	89.8	-2.7	0.6	-6.2
Moved within Québec (%)	2.4	3.1	0.0	6.7	6.6	6.8	-4.3	-3.5	-6.8
Moved into Québec from a different province (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017c, 2022c)

6.1.4.4 Housing

The 2021 Census provides age and gender statistics from respondents on Kawawachikamach reserve. Relevant 2021 Census data is presented in Table 6-28. According to the 2021 Census, there were 203 private dwellings on Kawawachikamach reserve, of which 95.6% were occupied by the usual residents (Statistics Canada, 2022c). The average dwelling housed 3.3 persons, a decrease from 3.6 persons in

2016 (Statistics Canada, 2017c, 2022c). In 2021, 10.5% of respondents were owners of their household, 0.0% were renters, and 86.8% were living in a household provided by the First Nation band. With regards to household conditions, 89.5% of respondents reported their household as being suitable, 73.7% of households were in need of only regular maintenance and minor repairs, and 28.9% of households were in need of major repairs (Statistics Canada, 2022c).

Table 6-28: Naskapi Nation of Kawawachikamach Housing Characteristics, 2021

Housing Characteristics (25% sample data)	2021 Total	2016 Total	% Change from 2016 to 2021
Total private dwellings	203	174	16.7
Private dwellings occupied by usual residents	194	161	20.5
Private dwellings occupied by usual residents (%)	95.6	92.5	3.0
Average household size (persons)	3.3	3.6	-0.3
Household Tenure			
Private household by tenure: Owner (%)	10.5	0.0	10.5
Private household by tenure: Renter (%)	0.0	6.3	-6.3
Private household by tenure: Dwelling provided by local government, or First Nation band (%)	86.8	96.9	-10.1
Household Conditions			
Housing is suitable (%)	89.5	78.8	10.7
Housing is not suitable (%)	15.8	18.2	-2.4
Dwelling in need of only regular maintenance and minor repairs (%)	73.7	50.0	23.7
Dwelling in need of major repairs (%)	28.9	50.0	-21.1
Household Affordability			
Owner or tenant spending less than 30% of income on shelter costs (%)	Data not available		N/A
Owner or tenant spending more than 30% of income on shelter costs (%)			

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017c, 2022c)

6.1.4.5 Language

The 2021 Census provides age and gender statistics from respondents on Kawawachikamach reserve. Relevant 2021 Census data is presented in Table 6-29. According to the 2021 Census, in reference to knowledge of official languages, 84.4% of individuals living on Kawawachikamach reserve reported knowing only English (81.5% of men+ and 90.3% of women+), a 13.6% increase over 2016 (Statistics Canada, 2017c, 2022c). A lower number of respondents (9.4% total; 12.3% of men+ and 4.8% of women+) reported knowing both French and English in the 2021 Census, a 13.1% decrease from 2016 (Statistics Canada, 2017c, 2022c). In the 2021 Census, 1.6% reported knowing only French (3.1% of men+ and 1.6% of women+), a 0.8% increase over 2016 (Statistics Canada, 2017c, 2022c). In the 2021 Census, a majority of respondents (68.8%) reported speaking Indigenous languages most often at home, a 22.9%

decrease from 2016; 19.5% reported speaking English most often at home, a 12.1% increase over 2016; and 0.0% reported speaking French most often at home, a 0.8% decrease from 2016 (Statistics Canada, 2017c, 2022c).

Table 6-29: Naskapi Nation of Kawawachikamach Language Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Language Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total Responses (Knowledge of Official Languages)	640	325	310	600	305	295	6.7	6.6	5.1
English Only (%)	84.4	81.5	90.3	70.8	68.9	72.9	13.6	12.6	17.4
French Only (%)	1.6	3.1	1.6	0.8	1.6	1.7	0.8	1.5	-0.1
English & French (%)	9.4	12.3	4.8	22.5	24.6	20.3	-13.1	-12.3	-15.5
Total Responses (Language spoken most often at home)	640	325	310	605	310	290	5.8	4.8	6.9
Indigenous languages spoken most often at home (%)	68.8	72.3	66.1	91.7	90.3	94.8	-22.9	-18.0	-28.7
English spoken most often at home (%)	19.5	16.9	22.6	7.4	8.1	6.9	12.1	8.8	15.7
French spoken most often at home (%)	0.0	0.0	0.0	0.8	0.0	0.0	-0.8	0.0	0.0

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017c, 2022c)

6.1.4.6 Educational Attainment

The 2021 Census provides age and gender statistics from respondents on Kawawachikamach reserve. Relevant 2021 Census data is presented in Table 6-30. According to the 2021 Census, 52.2% of the total population 15 years and over on Kawawachikamach reserve did not have a certificate, diploma, or degree (53.2% of men+ and 48.9% of women+), a 14.6% increase over 2016 for men+ and a 4.7% increase over 2016 for women+ (Statistics Canada, 2017c, 2022c). In 2021, 25.0% of the population 15 years and over reported a secondary school diploma or equivalency as their highest educational attainment (25.5% of men+ and 21.3% of women+), an 11.9% increase over 2016 for men+ and an 2.0% decrease from 2016 for women+; 10.9% reported an apprenticeship or trades certificate or diploma (10.6% of men+ and 10.6% of women+), a 23.5% decrease from 2016 for men+ and an 1.0% decrease from 2016 for women+; 7.6% reported a college or non-university certificate (6.4% of men+ and 10.6% of women+), a 0.4%

decrease from 2016 for men+ and a 1.3% increase over 2016 for women+; and 2.2% reported a Bachelor's degree or higher, a 0.1% decrease from 2016 (Statistics Canada, 2017c, 2022c).

Table 6-30: Naskapi Nation of Kawawachikamach Education Characteristics, 2021

	2021			2016			Change from 2016 to 2021		
Education Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Population 15 years and over	460	235	235	435	220	215	5.7	6.8	9.3
No certificate; diploma; degree (%)	52.2	53.2	48.9	41.4	38.6	44.2	10.8	14.6	4.7
Secondary (high) school diploma or equivalency certificate (%)	25.0	25.5	21.3	18.4	13.6	23.3	6.6	11.9	-2.0
Apprenticeship or trades certificate or diploma (%)	10.9	10.6	10.6	24.1	34.1	11.6	-13.2	-23.5	-1.0
College, or non university certificate (%)	7.6	6.4	10.6	9.2	6.8	9.3	-1.6	-0.4	1.3
University certificate below bachelor level (%)	3.3	4.3	4.3	4.6	6.8	4.7	-1.3	-2.5	-0.4
Bachelor's degree or higher (%)	2.2	0.0	0.0	2.3	0.0	4.7	-0.1	0.0	-4.7

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017c, 2022c)

6.1.5 NunatuKavut Community Council

6.1.5.1 Community Overview

The NunatuKavut Community Council (NCC) was first established in 1985, then named the Labrador Métis Association (LMA), to represent the people of mixed Inuit and European ancestry living in Labrador (Culture of Southern Inuit of NunatuKavut, 2006). In 1991, the Report of the Royal Commission on Aboriginal Peoples argued that Métis People in Canada, including the Métis in Labrador, "fit our criteria of nationhood [as a] culturally distinct people," after which the LMA changed its name to the Labrador Métis Nation (LMN) (CIRNAC, 2008). That same year, the Native Council of Canada (now the Congress of Aboriginal Peoples) recognized LMN as a Provincial-Territorial Organization (PTO) within the congress, and the LMN filed a land claim with the federal government for land in central and southeastern Labrador (Higgins, 2009). In 2010, the LMN changed its name to the NunatuKavut Community Council, reflecting its members' Inuit heritage, and submitted an updated land claim document with the federal government, titled Unveiling NunatuKavut and identifying its members as a distinct Inuit population in Labrador with Aboriginal title and treaty rights (Newfoundland and Labrador Office of Indigenous Affairs and Reconciliation, 2021). In 2019, the NCC signed a Memorandum of Understanding (MOU) with the federal government, setting the next stage for ongoing discussions on the Recognition of Indigenous Rights and Self-Determination (NunatuKavut Community Council, n.d.).

Governance

The Governing Council of the NCC is elected to a four-year term and is listed in Table 6-31.

Table 6-31: NunatuKavut Community Council Officials

Title	Name	Term
President	Todd Russell	September 29, 2020 - 2024
Councillor, Area 1	Levi Snook	
Councillor, Area 2	Roy Mangrove	
Councillor, Area 3, Executive Member-at-Large	Boyce Turnbull	
Councillor, Area 3	Cyril Campbell	
Councillor, Area 4	Crystal Dyson	
Councillor, Area 5, and Vice-President	James W. Holwell	
Councillor, Area 5	Hughlett Williams	
Councillor, Area 6	Jessie Tobin	
Councillor, Area 7	Anna Thistle	
Councillor, Youth	Zoey Russell	
Councillor, Elder	Harrison Campbell	
Special Elder Advisor	Richard Michelin	

Source: (NunatuKavut Community Council, 2023)

Population Characteristics

The NCC has approximately 6,000 members, living in six NCC regions in Newfoundland and Labrador: Straits (Area 1), Battle Harbour (Area 2), Bolsters Rock to Spear Point (Area 3), Sandwich Island/Island of Ponds (Area 4), Central/Northern Labrador (Area 5), and Western Labrador (Area 6, which includes the Project LSA municipalities of Labrador City and Wabush); NCC members living outside Labrador are represented by Area 7 (NunatuKavut Community Council, 2023).

Additional information regarding the NCC is provided in the Current Use of Lands and Resources for Traditional Purposes study (WSP 2024).

6.1.5.2 Age and Gender

The 2021 Census presents age and gender statistics from self-identified Inuit individuals living in Census Division No. 10, Newfoundland and Labrador. Relevant 2021 Census data can be found in Table 6-32. According to the 2021 Census, there were 2,975 self-identified Inuit individuals living in the Census division, of which 1,460 identified as men+ and 1,510 identified as women+ (Statistics Canada, 2022a). The average age was 40.3 (40.4 for men+ and 40.1 for women+) and the median age was 42.0 (42.0 for men+ and 41.6 for women+) (Statistics Canada, 2022a). The population increased by 20.2% between the 2016 Census and 2021 Census (Statistics Canada, 2022a).

Table 6-32: Population Characteristics, Self-Identified Inuit Identity, Census Division No. 10, Newfoundland and Labrador, 2021

	2021			2016			Change from 2016 to 2021		
Age Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total Population (Inuit Identity)	2,975	1,460	1,510	2,475	1,155	1,320	20.2	26.4	14.4
Average Age	40.3	40.4	40.1	38.9	38.7	39.1	1.4	1.7	1.0
Median Age	42	42.0	41.6	40.2	41.4	39.7	1.8	0.6	1.9

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017a, 2022a)

6.1.5.3 Migration and Mobility

The 2021 Census provides age and gender statistics for self-identified Inuit individuals living in Census Division No. 10, Newfoundland and Labrador. Relevant 2021 Census data is presented in Table 6-33. According to the 2021 Census, 91.0% of self-identified Inuit individuals living in the Census division (94.1% of men+ and 88.0% of women+) did not move in the previous year, a 0.2% decrease from 2016 (Statistics Canada, 2017a, 2022a). In the 2021 Census, 1.2% of respondents reported moving within Newfoundland and Labrador in the previous year (1.0% of men+ and 1.0% of women+), a 0.4% decrease from 2016; and 0.3% of respondents reported moving into Newfoundland and Labrador from a different province in the previous year, a 0.3% decrease from 2016 (Statistics Canada, 2017a, 2022a).

Table 6-33: Mobility Characteristics, Self-Identified Inuit Identity, Census Division No. 10, Newfoundland and Labrador, 2021

	2021			2016			Change from 2016 to 2021		
Mobility Characteristics (25% sample data)	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total responses	2,940	1,435	1,505	2,445	1,135	1,315	20.2	26.4	14.4
Did not move in the past year (%)	91.0	94.1	88.0	91.2	93.4	89.0	-0.2	0.7	-0.9
Moved within Newfoundland and Labrador (%)	1.2	1.0	1.0	1.6	0.9	2.3	-0.4	0.2	-1.3

2021				2016			Change from 2016 to 2021		
Mobility Characteristics (25% sample data)	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Moved into Newfoundland and Labrador from a different province (%)	0.3	0.0	0.7	0.6	0.0	0.8	-0.3	0.0	-0.1

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017a, 2022a)

6.1.5.4 Housing

No information was available from secondary sources at the time of desktop research.

6.1.5.5 Language

The 2021 Census provides age and gender statistics for self-identified Inuit individuals living in Census Division No. 10, Newfoundland and Labrador. Relevant 2021 Census data is presented in Table 6-34. According to the 2021 Census, in reference to knowledge of official languages, 95.5% of self-identified Inuit individuals living in the Census division reported knowing only English (95.9% of men+ and 95.0% of women+), a 2.3% decrease from 2016 (Statistics Canada, 2017a, 2022a). A lower number of respondents (4.4% total; 4.1% of men+ and 4.6% of women+) reported knowing both French and English in the 2021 Census, a 2.1% increase over 2016 (Statistics Canada, 2017a, 2022a). In the 2021 Census, 0.0% reported knowing only French, the same as in 2016 (Statistics Canada, 2017a, 2022a). In the 2021 Census, 4.5% of respondents reported speaking Indigenous languages at home, a 2.3% increase over 2016 (Statistics Canada, 2017a, 2022a).

Table 6-34: Language Characteristics, Self-Identified Inuit Identity, Census Division No. 10, Newfoundland and Labrador, 2021

2021				2016			Change from 2016 to 2021		
Language Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Total responses (knowledge of official languages)	2,975	1,460	1,515	2,475	1,155	1,320	20.2	26.4	14.8
English only (%)	95.5	95.9	95.0	97.8	98.7	97.0	-2.3	-2.8	-1.9
French only (%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
English & French (%)	4.4	4.1	4.6	2.2	1.3	3.0	2.1	2.8	1.6
Indigenous languages spoken at home (%)	4.5	3.8	5.6	2.2	1.3	2.7	2.3	2.5	2.9

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017a, 2022a)

6.1.5.6 Educational Attainment

The 2021 Census provides age and gender statistics for self-identified Inuit individuals living in Census Division No. 10, Newfoundland and Labrador. Relevant 2021 Census data is presented in Table 6-35. According to the 2021 Census, 24.2% self-identified Inuit individuals 15 years and over living in the Census division did not have a certificate, diploma, or degree (26.9% of men+ and 21.7% of women+), a 2.7% decrease 2016 for men+ and a 1.1% decrease from 2016 for women+ (Statistics Canada, 2017a, 2022a). In 2021, 23.8% of the population 15 years and over reported a secondary school diploma or equivalency as their highest educational attainment (22.4% of men+ and 25.3% of women+), a 1.3% increase over 2016 for men+ and an 2.9% decrease from 2016 for women+; 13.0% reported an apprenticeship or trades certificate or diploma (20.8% of men+ and 5.1% of women+), a 0.9% decrease from 2016 for men+ and an 2.0% decrease from 2016 for women+; 28.9% reported a college or non-university certificate (25.3% of men+ and 32.4% of women+), a 3.1% increase over 2016 for men+ and a 0.3% decrease from 2016 for women+; and 8.4% reported a Bachelor's degree or higher (3.3% of men+ and 13.8% of women+), a 0.1% increase over 2016 for men+ and a 2.2% increase over 2016 for women+ (Statistics Canada, 2017a, 2022a).

Table 6-35: Education Characteristics, Self-Identified Inuit Identity, Census Division No. 10, Newfoundland and Labrador, 2021

	2021			2016			Change from 2016 to 2021		
Education Characteristics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Population 15 years and over	2,495	1,225	1,265	2,065	945	1,115	20.8	29.6	13.5
No certificate; diploma; degree (%)	24.2	26.9	21.7	26.2	29.6	22.9	-1.9	-2.7	-1.1
Secondary (high) school diploma or equivalency certificate (%)	23.8	22.4	25.3	21.5	21.2	22.4	2.3	1.3	2.9
Apprenticeship or trades certificate or diploma (%)	13.0	20.8	5.1	13.8	21.7	7.2	-0.8	-0.9	-2.0
College, or non university certificate (%)	28.9	25.3	32.4	28.1	22.2	32.7	0.8	3.1	-0.3
University certificate below bachelor level (%)	1.8	0.8	2.4	2.7	1.6	3.1	-0.9	-0.8	-0.8
Bachelor's degree or higher (%)	8.4	3.3	13.8	7.7	3.2	11.7	0.7	0.1	2.2

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017a, 2022a)

6.2 Community Services and Infrastructure

The sections below provide an overview of the community resources and infrastructure available in the Indigenous communities of the ITUM, the NIMLJ, the Innu Nation, the NNK, and the NCC, including recreation and leisure, social services, health services, education services, employment and economic development services, housing services, temporary accommodations, emergency services, and transportation and utilities.

6.2.1 Innu Nation

6.2.1.1 Recreation and Leisure

Limited information was available at the time of desktop research regarding Innu Nation recreation and leisure services. The Labrador Innu Nation Cultural Facility is actively engaged in repatriating artifacts from various museums, yet its current operational status (open or under construction) was unclear at the time of the desktop research (EVOQ, 2023). An overview of recreation and leisure services available for the Innu Nation, available at the time of desktop research, is presented in Table 6-36.

Table 6-36: Innu Nation Recreation and Leisure Services

Category	Provider/Service	Description
Arts and Culture (Exhibitions, Art Galleries, Museums)	Labrador Innu Nation Cultural Facility	▪ Repatriates' artifacts from various museums
Community Recreation (Community Centres, Sports Clubs, Athletic Fields)	No information was available from secondary sources at the time of desktop research.	▪ N/A
Entertainment and Events (Theaters, Concert Venues, Festivals, Movie Theaters)		
Civic Recreation Programs (Government-Organized Recreational Activities)		
Libraries and Learning Resources (Libraries, Learning Materials)		
Parks and Outdoor Recreation (Campgrounds, Beaches, Hiking Trails)		

Source: (EVOQ, 2023)

6.2.1.2 Social Services

The Innu Round Table Secretariat acts as the implementing body for coordinated administration of various programs and initiatives, including social services, for the Mushuau Innu First Nation, the Sheshatshiu Innu First Nation, and the Innu Nation, collectively known as the Innu Round Table (IRT) (Innu Round Table Secretariat, n.d.-a). IRT manages the Income Support Program and facilitates the Prevention Services Coordination Team. Prevention services in both First Nations are delivered through collaborative efforts involving Innu community workers, social workers, and other Innu health staff (Innu Round Table Secretariat, n.d.-b). These services encompass a wide range of activities and programs, including parenting initiatives, outdoor expeditions for Innu women and girls in the nutshimit, and advocacy for individuals and families (Innu Round Table Secretariat, n.d.-b).

The Mary May Healing Centre in Sheshatshiu offers a comprehensive range of social services and programs, encompassing housing, family support, child protection, foster parent assistance, parental guidance, Fetal Alcohol Spectrum Disorder services, family well-being, mental health support, justice assistance, and general counselling services (Child Welfare League of Canada, 2015). The Natuashish Health Centre provides child protection, foster parent support, and parent support services (Innu Round Table Secretariat, n.d.-b).

The Newfoundland and Labrador Department of Child, Youth and Family Services manages child protection in Newfoundland and Labrador and has offices in Natuashish and Sheshatshiu. While both communities receive round-the-clock child protection services, there are differences in service delivery (Innu Round Table Secretariat, n.d.-b). In Natuashish, workers fly in on a two-week rotation and stay in provided housing, while in Sheshatshiu, some staff live in the community, while others commuting from Happy Valley-Goose Bay (Innu Round Table Secretariat, n.d.-b).

The Mary May Healing Centre in Sheshatshiu offers a wide variety of services, including housing, family support, child protection, foster parent assistance, parental guidance, Fetal Alcohol Spectrum Disorder services, family well-being, mental health support, justice assistance, and general counseling (Child Welfare League of Canada, 2015). Additionally, Sheshatshiu provides various social support programs on the reserve, managed by the Sheshatshiu Social Health Department, which offers mental health and addiction programs and services for both adults and youth (Innu First Nation Sheshatshiu, n.d.-b) There are programs for family treatment, a family resource center with a food bank, a safehouse, a group home, a community health planner, and an FASD Liaison Worker dedicated to promoting and supporting healthy babies within the community (Innu First Nation Sheshatshiu, n.d.-b).

An overview of social services available for the Innu Nation, found through desktop research, is presented in Table 6-37.

Table 6-37: Innu Nation Social Services

Category	Provider/Service	Description
Childcare and Youth Development	Newfoundland and Labrador Department of Child, Youth and Family Services	▪ Child protection services
	Natuashish Health Centre	▪ Child protection services ▪ Parent / foster parent support
Comprehensive Support Services	The Mary May Healing Centre (Sheshatshiu)	▪ Housing support ▪ Family support ▪ Fetal Alcohol Spectrum Disorder (FASD) services ▪ Mental health supports and services ▪ Justice supports and services

Category	Provider/Service	Description
	Innu Round Table Income Support Program	▪ Support and funding for essential living expenses
	Innu Round Table Prevention Services Coordination Team	▪ Parenting support ▪ Outdoor activities ▪ Advocacy services
	Sheshatshiu Social Health Department	▪ Mental health and addiction programs and services
Crisis Centres and Transition Houses Hunger and Nutritional Assistance	No information was available from secondary sources at the time of desktop research.	▪ N/A
Legal Assistance and Advocacy	The Mary May Healing Centre (Sheshatshiu)	▪ Justice supports and services
Mental Health and Counselling	The Mary May Healing Centre (Sheshatshiu)	▪ Mental health supports services
	Sheshatshiu Social Health Department	▪ Mental health supports, programs and services
Substance Use and Addiction Recovery	No information was available from secondary sources at the time of desktop research.	▪ N/A
	Sheshatshiu Social Health Department	▪ Addiction programs and services

Source: (Child Welfare League of Canada, 2015; Innu Round Table Secretariat, n.d.-a, n.d.-b)

6.2.1.3 Health Services

The Labrador Health Centre, located in Happy Valley-Goose Bay, serves as a referral centre for Innu Nation community members, providing 24/7 emergency care, outpatient services, and family physician staffing (Labrador-Grenfell Health, n.d.-a). It also offers specialty care, diagnostic services, therapy, and community health support (Labrador-Grenfell Health, n.d.-a). The Natuashish Community Clinic, operated by Labrador-Grenfell Health in partnership with the Mushuau Innu Health Commission and located on Natuashish 2 reserve, offers various services including trauma care, outpatient and physician clinics, tele-health, mental health, and community care (Mushuau Innu First Nation, n.d.). The clinic is staffed by regional nurses, a personal care attendant, a mental health counselor, and regularly visited by physicians and behavior management specialists (Mushuau Innu First Nation, n.d.). The Mani Ashini Community Clinic provides care by registered nurses to residents of Sheshatshiu 3 reserve and North West River (Labrador-Grenfell Health, n.d.-b). The clinic, located on Sheshatshiu 3 reserve, offers point-of-care testing, basic lab tests, and video conferencing for consultations (Labrador-Grenfell Health, n.d.-b). The clinic has ambulance services for emergencies, is staffed by three nurse practitioners, a personal care attendant, a domestic worker, and a clerk (Labrador-Grenfell Health, n.d.-b).

An overview of health services available for the Innu Nation, as found through desktop research, is presented in Table .

Table 6-38: Innu Nation Health Services

Category	Provider/Service	Description
Clinical Services (Hospitals, Clinics, and Primary Care Services)	Labrador Health Centre	▪ Health facility located in Happy Valley-Goose Bay
	Natuashish Community Clinic	▪ Clinic on Natuashish 2 reserve
	Mani Ashini Community Clinic	▪ Nurse Practitioner-run clinic in Sheshashit 3 reserve
Public Health (Preventive Measures, Health Education, and Community Health Services)	No information was available from secondary sources at the time of desktop research.	▪ N/A
Long-Term Care Facilities (Nursing Homes)		

Source: (Labrador-Grenfell Health, n.d.-b, n.d.-a; Mushuau Innu First Nation, n.d.)

6.2.1.4 Education Services

Mamu Tshishkutamashutau Innu Education (MTIE), founded in 2009, oversees Innu education in Labrador, focusing on First Nations schools and curriculum that respects and celebrates Innu culture and language (Mamu Tshishkutamashutau - Innu Education Inc, 2021a). Governed by a board of trustees chosen by the Mushuau and Sheshatshiu Innu, MTIE manages two schools: Mushuau Innu Natuashish School and Sheshatshiu Innu School (Mamu Tshishkutamashutau - Innu Education Inc, 2021a). Their goal is to provide quality education that aligns with students' needs and Innu culture, while preparing them for active community and societal participation (Mamu Tshishkutamashutau - Innu Education Inc, 2021a).

The Mushuau Innu Natuashish School, located in Sango Bay on the North Coast of Labrador, provides education for students from kindergarten through grade 12. There is a focus on social-emotional learning, building rapport, the Innu culture and the Innu-aimun language (Mamu Tshishkutamashutau - Innu Education Inc, 2021b).

The Sheshatshiu Innu School, located on Lake Melville, approximately 30 kilometres from Goose Bay, Labrador, also provides education for students from kindergarten through grade 12. Extracurricular activities such as traditional crafts and hunting are also provided (Mamu Tshishkutamashutau - Innu Education Inc, 2021c).

The Aboriginal Skills and Employment Training Strategy Program, based in Sheshatshiu Innu First Nation, focuses on policy development, strategic educational initiatives, and skills development (Innu First Nation Sheshatshiu, n.d.-a). The program offers employment opportunities inskilled trades, administrative assistance, cooking, and carpentry, providing financial support for various needs (Innu First Nation Sheshatshiu, n.d.-a). The program includes work experience opportunities, cultural development for at-risk youth, summer work experiences, and childcare services (Innu First Nation Sheshatshiu, n.d.-a). A career information centre with computer access is available to the community (Innu First Nation Sheshatshiu, n.d.-a).

An overview of education services available for the Innu Nation, found through desktop research, is presented in Table 6-39.

Table 6-39: Innu Nation Education Services

Category	Provider/Service	Description
Primary / Secondary Education	Mushuau Innu Natuashish School	▪ Kindergarten to grade 12 ▪ Approximate Student Enrolment: 300
	Sheshatshiu Innu School	▪ Kindergarten to grade 12 ▪ Approximate Student Enrolment: 400-500
Post-Secondary Education	No information was available from secondary sources at the time of desktop research.	▪ N/A
Other	Mamu Tshishkutamashutau Innu Education	▪ Oversees Innu education in Labrador, focusing on First Nations schools and curriculums
	Aboriginal Skills and Employment Training Strategy Program	▪ Policy development ▪ Strategic educational initiatives ▪ Skills development.

Source: (Innu First Nation Sheshatshiu, n.d.-a; Mamu Tshishkutamashutau - Innu Education Inc, 2021b, 2021c)

6.2.1.5 Employment and Economic Development Services

Economic development services are provided through the Innu Development Limited Partnership (IDLP). IDLP is the Innu Nation's economic branch, emphasizing Innu citizen employment at all job levels (Innu Development Limited Partnership, 2023a). IDLP has a preference policy in place to maximize Innu participation. They offer training initiatives, and work with registered Innu Companies (Innu Development Limited Partnership, 2023a). IDLP partners with various companies, including Air Borealis, Ueushuk Fisheries Limited, Innu-Inuit Envest, and Innu-Inuit PDI (Innu Development Limited Partnership, 2023b).

Employment and recruitment services are provided through the Innu Employment and Recruitment Centre (IERC). The IERC shares job opportunities and offers training for Innu Nation members on their Facebook page (Innu Employment and Recruitment Center, n.d.).

Labrador Aboriginal Training Partnership offers a Training-to-Employment Plan. The initiative is focused on education and skills training for Innu Nation, Nunatsiavut Government, and NunatuKavut Community Council members to secure employment in Labrador's resource-based industries (Labrador Aboriginal Training Partnership, 2023). They provide essential support for Indigenous individuals, including those with families, to engage in training opportunities (Labrador Aboriginal Training Partnership, 2023).

An overview of employment and economic development services available for the Innu Nation, found through desktop research, is presented in Table 6-40.

Table 6-40: Innu Nation Employment and Economic Development Services

Category	Provider/Service	Description
Economic Development	Innu Development Limited Partnership	▪ The Innu Nation’s economic branch ▪ Collaborations with Innu companies ▪ Employment training ▪ Capacity development ▪ Sub-contracting, and dividends to bands
Employment and Recruitment	Innu Employment and Recruitment Centre	▪ Job opportunities ▪ Training for Innu Nation members
Training	Labrador Aboriginal Training Partnership	▪ Training-to-Employment Plans for Innu Nation, Nunatsiavut Government, and NunatuKavut Community Council members to secure employment in Labrador's resource-based industries

Source: (Innu Development Limited Partnership, 2023b, 2023a; Innu Employment and Recruitment Center, n.d.; Labrador Aboriginal Training Partnership, 2023)

6.2.1.6 Housing Services

Labrador Affairs Action Team, located in Happy Valley-Goose Bay, adopts a coordinated approach to assist homeless individuals, involving community representatives from various organizations, including Indigenous groups, health authorities, and government entities (Government of Newfoundland and Labrador, n.d.-a).

An overview of housing services available for the Innu Nation, as found through desktop research, is presented in Table 6-41.

Table 6-41: Innu Nation Housing Services

Category	Provider/Service	Description
Affordable Housing and Financial Assistance	No information was available from secondary sources at the time of desktop research.	▪ N/A
Homelessness	Labrador Affairs Action Team	▪ Income support ▪ Legal aid referrals ▪ Housing search services ▪ Health services ▪ Mental health and addictions supports
Public Housing	No information was available from secondary sources at the time of desktop research.	▪ N/A

Source: (Government of Newfoundland and Labrador, n.d.-a; Happy Valley - Goose Bay Hub, 2023)

6.2.1.7 Temporary Accommodations

There is one hotel on Natuashish 2 reserve, the Natuashish Hotel. At the time of desktop research, limited information was available on Natuashish Hotel. Information was not available on temporary accommodations on Sheshatshiu 3 reserve at the time of desktop research; however, temporary accommodations are available in the neighbouring Town of North West River, Newfoundland and Labrador. An overview of temporary accommodations on the Innu Nation reserves, as found through desktop research, is presented in Table 6-42.

Table 6-42: Inn Nation Temporary Accommodations

Provider/Service	Description
Natuashish Hotel	▪ Hotel on Natuashish 2 reserve

Source: (Natuashish Hotel, n.d.)

6.2.1.8 Emergency Services

Police services for the Innu Nation are provided by the Sheshatshiu Detachment of the Royal Canadian Mounted Police (Royal Canadian Mounted Police, 2015). Emergency fire services are provided by the North West River Volunteer Fire Department, serving Sheshatshiu 3 reserve with a team comprising one fire chief, one deputy fire chief, three fire captains, and 15 firefighters (Town of North West River, 2015). The Mani Ashini Community Clinic provides ambulance services to Sheshatshiu community members. The Sheshatshiu Crisis Intervention Team (Mobile Crisis Response) is a group of mental health professionals working alongside local police to assist individuals in the community facing mental health crises (Labrador-Grenfall Health, n.d.).

An overview of emergency services available for the Innu Nation, as found through desktop research, is presented in Table 6-43.

Table 6-43: Innu Nation Emergency Services

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Police	Yes	▪ Royal Canadian Mounted Police - Sheshatshiu Detachment
Fire	Yes	▪ North West River Volunteer Fire Department
Emergency Medical Services	Yes	▪ Ambulance services provided by Mani Ashini Community Clinic ▪ Sheshatshiu Crisis Intervention Team provides mobile crisis response

Source: (Labrador-Grenfall Health, n.d.; Royal Canadian Mounted Police, 2015; Town of North West River, 2015)

6.2.1.9 Transportation and Utilities

Limited information was available at the time of desktop research regarding Innu Nation transportation services and utilities. An overview of transportation and utilities available for the Innu Nation, found through desktop research, is presented in Table 6-44.

Table 6-44: Innu Nation Transportation and Utilities

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Communications	Yes	▪ **Newspaper**: No ▪ **Radio Station**: Yes - Sheshatshiu Innu First Nations 94.1 FM CJIK. ▪ **Nation Website**: Yes ▪ **Telecommunication services**: No information was available from secondary sources at the time of desktop research.
Energy Supply	No information was available from secondary sources at the time of desktop research.	▪ N/A
Public Transit		
Solid Waste Management		
Transportation – Road	Sheshatshiu 3 Reserve: Yes Natuashish 2 Reserve: No	▪ Natuashish 2 reserve: Only accessible by plane or boat ▪ Mushuau Innu First Nation Band Council responsible for road construction and maintenance ▪ The Sheshatshiu Innu First Nation Band Council responsible for road construction and maintenance
Transportation – Winter Road	N/A	▪ N/A
Transportation – Air	No information was available from secondary sources at the time of desktop research.	▪ N/A
Transportation – Rail		
Water and Sewage		

Source: (Nametau innu, 2010c, 2010d)

6.2.2 Innu Takuaikan Uashat mak Mani-Utenam

6.2.2.1 Recreation and Leisure

Mani-Utenam reserve offers various amenities, including an outdoor skating rink, a community hall, a multi-purpose hall, an arena, a ball field, a campground, and an outdoor swimming pool (Nametau innu, 2010a). The Musée Shaputuan features a permanent exhibit about traditional Innu life across seasons and a collection of over one hundred historical objects (Indigenous Tourism Quebec, 2023). It hosts popular events like the Innu Tshitshuk summer solstice, along with a craft shop and hiking opportunities (Indigenous Tourism Quebec, 2023).

An overview of recreation and leisure services available for the ITUM, as found through desktop research, is presented in Table

Table 6-45: Innu Takuaikan Uashat mak Mani-Utenam Recreation and Leisure Services

Category	Provider/Service	Description
Arts and Culture (Exhibitions, Art Galleries, Museums)	Musée Shaputuan (Shaputuan Museum)	▪ Community museum
Community Recreation (Community Centres, Sports Clubs, Athletic Fields)	Mani-Utenam Reserve	▪ Community hall ▪ Multi-purpose hall ▪ Arena
Entertainment and Events (Theaters, Concert Venues, Festivals, Movie Theaters)	No information was available from secondary sources at the time of desktop research.	▪ N/A
Civic Recreation Programs (Government-Organized Recreational Activities)	Innu Takuaikan Uashat mak Mani-Utenam Sports & Leisure Sector	▪ No information was available from secondary sources at the time of desktop research
Libraries and Learning Resources (Libraries, Learning Materials)	No information was available from secondary sources at the time of desktop research.	▪ N/A
Parks and Outdoor Recreation (Campgrounds, Beaches, Hiking Trails)	Mani-Utenam Reserve	▪ Outdoor skating rink ▪ Ball field ▪ Campground ▪ Outdoor swimming pool

Source: (Indigenous Tourism Quebec, 2023; Nametau innu, 2010a)

6.2.2.2 Social Services

The ITUM offers a variety of social services to members such as Childcare and Youth Development, facilitated by the Health and Social Services department, a dedicated Child-Youth-Family Worker, the Ka Ussi-Nametat Program, and the Tshinanu Program. The Health and Social Services department administers the School Health program, which focuses on promoting the health and well-being of youth by offering a range of services, including health promotion, immunization, and preventive care (Innu Takuaikan Uashat mak Mani-Utenam, 2022d). The Jordan's Principle program is designed to provide holistic support to ITUM children from birth to age 17, ensuring that unmet needs are met and that families have access to the necessary services (Innu Takuaikan Uashat mak Mani-Utenam, 2022d). The Child-Youth-Family Worker's role involves mental health and family violence intervention, including participation in prevention groups and activities (Innu Takuaikan Uashat mak Mani-Utenam, 2022c). The Ka Ussi-Nametat Program teaches Innu language and culture to preschoolers, accommodating up to 80 children and hosting special events (Innu Takuaikan Uashat mak Mani-Utenam, 2022c). The Tshinanu Program enhances family well-being through year-round activities and parent support via group workshops (Innu Takuaikan Uashat mak Mani-Utenam, 2022c).

The ITUM offers Comprehensive Support Services through a Community Worker and an Outreach Worker. The Community Worker works with stakeholders on community issues, emphasizing prevention and intervention (Innu Takuaikan Uashat mak Mani-Utenam, 2022c). The Outreach Worker aids vulnerable individuals in their living environment, prioritizing respect and confidentiality (Innu Takuaikan Uashat mak Mani-Utenam, 2022c).

Although detailed information was not available for the Legal Services & Human Resources Department and Protection of Rights and Territory Department, they are known to provide Legal Assistance and Advocacy services.

Mental health services are offered by the ITUM's Psychological Services Department, the Adult Psychosocial Program, and the Residential School Program, addressing various issues including suicide, addiction, and violence while promoting protective factors and crisis intervention for community well-being (Innu Takuaikan Uashat mak Mani-Utenam, 2022c). The Residential School Program supports former Indian Residential School students and their families, with a focus on mental health, including cultural caregiver support, clinical, and preventive activities addressing the residential school impacts (Innu Takuaikan Uashat mak Mani-Utenam, 2022c).

The National Native Alcohol and Drug Abuse Program aids in addiction recovery through prevention services and counselling (Innu Takuaikan Uashat mak Mani-Utenam, 2022c). It includes weekly relapse prevention groups, therapy referrals, and harm reduction activities (Innu Takuaikan Uashat mak Mani-Utenam, 2022c).

An overview of social services available for the ITUM, as found through desktop research, is presented in Table 6-46.

Table 6-46: Innu Takuaikan Uashat mak Mani-Utenam Social Services

Category	Provider/Service	Description
Childcare and Youth Development	Innu Takuaikan Uashat mak Mani-Utenam Health and Social Services Department	▪ School Health ▪ Jordan's Principle program
	Innu Takuaikan Uashat mak Mani-Utenam Child-Youth-Family Worker	▪ Crisis resolution services ▪ Mental health supports ▪ Family violence support
	Innu Takuaikan Uashat mak Mani-Utenam Ka Ussi-Nametat Program	▪ Innu language and culture instruction to preschoolers ▪ Accommodates up to 80 children ▪ Special events
	Innu Takuaikan Uashat mak Mani-Utenam Tshinanu Program	▪ Offers various activities related to parenting. ▪ Group Parental workshops
Comprehensive Support Services	Innu Takuaikan Uashat mak Mani-Utenam Community Worker	▪ Organizes community activities.

Category	Provider/Service	Description
	Innu Takuaikan Uashat mak Mani-Utenam Outreach Worker	▪ Directs vulnerable individuals to appropriate services
Hunger and Nutritional Assistance	No information was available from secondary sources at the time of desktop research.	▪ N/A
Legal Assistance and Advocacy	Innu Takuaikan Uashat mak Mani-Utenam Legal Services & Human Resources Department	▪ No information was available from secondary sources at the time of desktop research.
	Innu Takuaikan Uashat mak Mani-Utenam Protection of Rights and Territory Department	▪ No information was available from secondary sources at the time of desktop research.
Mental Health and Counselling	Psychological Services Department	▪ Two coordinators ▪ Addresses various issues including suicide, addiction, and violence
	Innu Takuaikan Uashat mak Mani-Utenam Adult Psychosocial Program	▪ Prevention and promotion activities ▪ Offers individual or couple meetings, and group workshops
	Innu Takuaikan Uashat mak Mani-Utenam Residential School Program	▪ Mental health and emotional services, including cultural caregiver support
Substance Use and Addiction Recovery	National Native Alcohol and Drug Abuse Program	▪ Prevention services and counselling ▪ Weekly relapse prevention groups ▪ Therapy referrals ▪ Harm reduction activities

Source: (Innu Takuaikan Uashat mak Mani-Utenam, 2022c, 2022d)

6.2.2.3 Health Services

The Mani-Utenam Health Centre and the and Uashat Health Centre provide a range of services including nurse consultations, prenatal and postnatal care, health problem assessments, referrals, blood collection clinic, disease monitoring, vaccination, diabetes support, and chronic disease follow-up (Innu Takuaikan Uashat mak Mani-Utenam, 2022b). Innu Takuaikan Uashat mak Mani-Utenam Health and Social Services Department offers health promotion for healthy lifestyles and a safe environment, immunization services, preventive activities for physical and mental health, and clinics for preventing teenage pregnancies and sexually transmitted and blood borne infections through individual or group sessions (Innu Takuaikan Uashat mak Mani-Utenam, 2022b).

An overview of health services available for the ITUM, as found through desktop research, is presented in Table 6-47.

Table 6-47: Innu Takuaikan Uashat mak Mani-Utenam Health Services

Category	Provider/Service	Description
Clinical Services (Hospitals, Clinics, and Primary Care Services)	Mani-Utenam Health Centre and Uashat Health Centre	▪ Nurse consultations ▪ Blood collection clinic ▪ Vaccination services
Public Health (Preventive Measures, Health Education, and Community Health Services)	Innu Takuaikan Uashat mak Mani-Utenam Health and Social Services Department	▪ Health promotion ▪ Immunization services ▪ Preventive activities for physical and mental health ▪ Counselling and services related to teen pregnancies and sexual health
	Innu Takuaikan Uashat mak Mani-Utenam Maternal and Child Health Program	▪ Prenatal and postnatal education ▪ Consultations ▪ Support for parents ▪ Early childhood activities ▪ Support for high-risk pregnancies
Long-Term Care Facilities (Nursing Homes)	No information was available from secondary sources at the time of desktop research.	▪ N/A

Source: (Innu Takuaikan Uashat mak Mani-Utenam, 2022b)

6.2.2.4 Education Services

There are two elementary schools associated with the ITUM, École Tshishteshinu and École Johnny Pilot, and one secondary school, École Manikanitesh.

The Innu Takuaikan Uashat mak Mani-Utenam Education Department Issues incentive scholarships ranging from $200 to $2,000 for individuals who earned diplomas, certificates, or degrees, which are sponsored by various companies (Innu Takuaikan Uashat mak Mani-Utenam, 2023a). Awards are based on the type of qualification achieved. Arcelor Mittal provides 14 excellence scholarships ranging from $500 to $1,500 for those who also obtained diplomas or degrees within the same timeframe and demonstrated why they deserve the scholarship (Innu Takuaikan Uashat mak Mani-Utenam, 2023a). Rio Tinto IOC presents three renewable study continuity scholarships of $1,000 and three of $1,500 (Innu Takuaikan Uashat mak Mani-Utenam, 2023a). SFP Pointe-Noire offers five $500 scholarships to post-secondary students who have displayed academic perseverance, while Iron Ore Quebec awards six scholarships between $400 and $1,000 to students in arts, culture, sports-study, sports club, or creative talent development programs (Innu Takuaikan Uashat mak Mani-Utenam, 2023a).

An overview of education services available for the ITUM, as found through desktop research, is presented in Table 6-48.

Table 6-48: Innu Takuaikan Uashat mak Mani-Utenam Education Services

Category	Provider/Service	Description
Primary / Secondary Education	École Tshishteshinu	▪ Elementary School ▪ Approximate Student Enrolment: 142
	École Johnny Pilot	▪ Elementary School
	École Manikanitesh	▪ Secondary School
Post-Secondary Education	No information was available from secondary sources at the time of desktop research.	▪ N/A
Other	Institut culturel et educatif Montagnais	▪ Promotion of cultural heritage preservation, language development, and artistic expression
	Innu Takuaikan Uashat mak Mani-Utenam Education Department	▪ Scholarships for diplomas, certificates, or degrees

Source: (Innu Takuaikan Uashat mak Mani-Utenam, 2023a; Institut Tshakapesh, n.d.; Nametau innu, 2010a)

6.2.2.5 Employment and Economic Development Services

Limited information was available at the time of desktop research about ITUM employment and economic development services. An overview of employment and economic development services available for the ITUM, as found through desktop research, is presented in Table 6-49.

Table 6-49: Innu Takuaikan Uashat mak Mani-Utenam Employment and Economic Development Services

Category	Provider/Service	Description
Economic Development	Innu Takuaikan Uashat mak Mani-Utenam Economic Development Department	▪ No information was available from secondary sources at the time of desktop research.
Employment and Recruitment	Mitshim-Shuniau, Employment and Training Department	
Training	No information was available from secondary sources at the time of desktop research.	▪ N/A

Source: (Nametau innu, 2010a)

6.2.2.6 Housing Services

The Innu Takuaikan Uashat mak Mani-Utenam Housing Department manages and provides online information regarding available housing options, and helps to facilitate the application process (Innu Takuaikan Uashat mak Mani-Utenam, 2022a).

ITUM's Affordable Housing Program oversees 48 duplexes in the Mani-Utenam and Uashat 27 reserves (Innu Takuaikan Uashat mak Mani-Utenam, 2023b). It also supports residents looking to transition from a duplex to an affordable single-family home and extends its services to workers and seasonal employees and supports those with financial difficulties (Innu Takuaikan Uashat mak Mani-Utenam, 2023b).

An overview of housing services available for the ITUM, found through desktop research, is presented in Table 6-50.

Table 6-50: Innu Takuaikan Uashat mak Mani-Utenam Housing Services

Category	Provider/Service	Description
Affordable Housing and Financial Assistance	Innu Takuaikan Uashat mak Mani-Utenam Housing Department	▪ Information on available housing options ▪ Facilitates housing application process
	Innu Takuaikan Uashat mak Mani-Utenam Affordable Homes Program	▪ Oversees 48 duplexes ▪ Supports transition from a duplex to a single-family home ▪ Supports workers and seasonal employees
Homelessness	No information was available from secondary sources at the time of desktop research.	▪ N/A
Public Housing		

Source: (Innu Takuaikan Uashat mak Mani-Utenam, 2022a, 2023b)

6.2.2.7 Temporary Accommodations

ITUM has one Chalet, which can host up to 35 people for meetings or events, with an overnight capacity of 20 people (Innu Takuaikan Uashat mak Mani-Utenam, 2022a). Temporary accommodations are also available in the neighbouring Ville de Sept-Îles. An overview of temporary accommodations on the ITUM reserves, found through desktop research, is presented in Table 6-51.

Table 6-51: Innu Takuaikan Uashat mak Mani-Utenam Temporary Accommodations

Provider/Service	Description
Scandinavian Chalet	▪ Capacity of 35 people for meetings or events ▪ Capacity of 20 people for overnight stays

Source: (Innu Takuaikan Uashat mak Mani-Utenam, 2022a)

6.2.2.8 Emergency Services

Police service for Innu Takuaikan Uashat mak Mani-Utenam are provided by Sécurité Publique de Uashat mak Mani-Utenam and emergency fire service are provided by the Service de Sécurité Incendie Innu Takuaikan Uashat mak Mani-Utenam. An overview of emergency services available for the ITUM, as found through desktop research, is presented in Table .

Table 6-52: Innu Takuaikan Uashat mak Mani-Utenam Emergency Services

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Police	Yes	▪ Sécurité Publique de Uashat mak Mani-Utenam
Fire	Yes	▪ Service de Sécurité Incendie Innu Takuaikan Uashat mak Mani-Utenam
Emergency Medical Services	No information was available from secondary sources at the time of desktop research.	▪ N/A

6.2.2.9 Transportation and Utilities

Limited information was available at the time of desktop research regarding ITUM utilities. ITUM has an on-reserve radio station, 104.5 CKAU-FM. Public transportation is accessible to members of the community on weekdays through a minibus service that can also accommodate differently abled individuals (Innu Takuaikan Uashat mak Mani-Utenam, 2022e).

An overview of transportation and utilities available for the ITUM, as found through desktop research, is presented in Table 6-53.

Table 6-53: Innu Takuaikan Uashat mak Mani-Utenam Transportation and Utilities

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Communications	Yes	▪ **Newspaper**: No ▪ **Radio Station:** Yes - CKAU-FM radio station 104.5. ▪ **Nation Website**: Yes ▪ **Telecommunication services**: No information was available from secondary sources at the time of desktop research.

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Energy Supply	No information was available from secondary sources at the time of desktop research.	▪ N/A
Public Transit	Yes	▪ Minibus service
Solid Waste Management	No information was available from secondary sources at the time of desktop research.	▪ N/A
Transportation – Road		
Transportation – Winter Road		
Transportation – Air		
Transportation – Rail		
Water and Sewage		

Source: (Innu Takuaikan Uashat mak Mani-Utenam, 2022e)

6.2.3 La Nation Innu Matimekush-Lac John

6.2.3.1 Recreation and Leisure

The NIMLJ's community centre includes a community hall, strength training gym, and kitchen (CLD de la MRC de Caniapiscau, n.d.). Community members also have access to an arena, gymnasium, and library (CLD de la MRC de Caniapiscau, n.d.).

An overview of recreation and leisure services available for the NIMLJ, as found through desktop research, is presented in Table 6-54.

Table 6-54: La Nation Innu Matimekush-Lac John Recreation and Leisure Services

Category	Provider/Service	Description
Arts and Culture (Exhibitions, Art Galleries, Museums)	No information was available from secondary sources at the time of desktop research.	▪ N/A
Community Recreation (Community Centres, Sports Clubs, Athletic Fields)	La Nation Innu Matimekush-Lac John	▪ Arena ▪ Gymnasium
	La Nation Innu Matimekush-Lac John Community Centre	▪ Strength training gym ▪ Community hall
Entertainment and Events (Theaters, Concert Venues, Festivals, Movie Theaters)	No information was available from secondary sources at the time of desktop research.	▪ N/A
Civic Recreation Programs (Government-Organized Recreational Activities)		

Category	Provider/Service	Description
Libraries and Learning Resources (Libraries, Learning Materials)	La Nation Innu Matimekush-Lac John Library	▪ Community Library
Parks and Outdoor Recreation (Campgrounds, Beaches, Hiking Trails)	No information was available from secondary sources at the time of desktop research.	▪ N/A

Source: (CLD de la MRC de Caniapiscau, n.d.)

6.2.3.2 Social Services

Tshakapesh Institute and Centre d'hébergement autochtone Québec provide comprehensive social support services for NIMLJ community members. Tshakapesh Institute preserves and promotes Innu culture, with a focus on language preservation, educational support, and active parental involvement in children's education (CLD de la MRC de Caniapiscau, n.d.). Centre d'hébergement autochtone Québec women's shelter supports both Innu and non-Indigenous individuals, offering services for women in need and their children (CLD de la MRC de Caniapiscau, n.d.). The staff organize activities to combat isolation, foster community interactions, and enhance the skills of women (CLD de la MRC de Caniapiscau, n.d.). Centre de la petite enfance Uatikuss is an early childhood centre with the ability to accommodate up to 44 children (daycare services can accommodate up to 20 children), operating independently from the Nation's Council (CLD de la MRC de Caniapiscau, n.d.).

An overview of social services available for the NIMLJ, as found through desktop research, is presented in Table 6-55.

Table 6-55: La Nation Innu Matimekush-Lac John Social Services

Category	Provider/Service	Description
Childcare and Youth Development	Centre de la petite enfance Uatikuss	▪ Daycare and early childhood centre ▪ Accommodates 44 children total; 20 children 17 months and younger
Comprehensive Support Services	Tshakapesh Institute	▪ Social services to promote and preserve Innu culture
	Centre d'hébergement autochtone Québec (Québec Native Accommodation Center)	▪ Activities to combat isolation ▪ Fosters community interactions ▪ Enhances the skills of women
Crisis Centres and Transition Houses	No information was available from secondary sources at the time of desktop research.	▪ N/A
Hunger and Nutritional Assistance		
Legal Assistance and Advocacy		
Mental Health and Counselling		
Substance Use and Addiction Recovery		

Source: (CLD de la MRC de Caniapiscau, n.d.)

6.2.3.3 Health Services

The Band council operates a nursing station, La Nation Innu Matimekush-Lac John - Poste de soins infirmiers under a transfer agreement with Health Canada (CLD de la MRC de Caniapiscau, n.d.). It is linked to the Hématite integrated health and social services centre on the North Coast (CLD de la MRC de Caniapiscau, n.d.). In cases where on-site services are insufficient, patients may be transferred to Sept-Îles, Québec, for additional care (CLD de la MRC de Caniapiscau, n.d.).

An overview of health services available for the NIMLJ, found through desktop research, is presented in Table 6-56.

Table 6-56: La Nation Innu Matimekush-Lac John Health Services

Category	Provider/Service	Description
Clinical Services (Hospitals, Clinics, and Primary Care Services)	No information was available from secondary sources at the time of desktop research.	▪ N/A
Public Health (Preventive Measures, Health Education, and Community Health Services)	La Nation Innu Matimekush-Lac John - Poste de soins infirmiers	▪ Nursing station operated by the Band council ▪ Linked to the Hématite integrated health and social services centre
Long-Term Care Facilities (Nursing Homes)	No information was available from secondary sources at the time of desktop research.	▪ N/A

Source: (CLD de la MRC de Caniapiscau, n.d.)

6.2.3.4 Education Services

Students from pre-kindergarten to secondary school age may attend École Kanatamat Tahitipetitamunu. The school has an approximate enrollment of 117 students (Nametau innu, 2010b). Additional information was not available at the time of desktop research.

An overview of education services available for the NIMLJ, found through desktop research, is presented in Table 6-57.

Table 6-57: La Nation Innu Matimekush-Lac John Education Services

Category	Provider/Service	Description
Primary / Secondary Education	École Kanatamat Tahitipetitamunu	▪ Pre-kindergarten to secondary ▪ Approximate Student Enrollment: 117
Post-Secondary Education	No information was available from secondary sources at the time of desktop research.	▪ N/A
Other		

Source: (Nametau innu, 2010b)

6.2.3.5 Employment and Economic Development Services

The local economy is primarily centered around local businesses providing goods and services, as well as construction (Nametau innu, 2010b). The Corporation de développement économique Matimekush - Lac John is responsible for local economic development (Nametau innu, 2010b). The reserve hosts around 10 businesses offering services such as convenience stores, pharmacies, auto repair, camping equipment, plumbing, gas stations, outfitters, and video rentals (Nametau innu, 2010b).

An overview of employment and economic development services available for the NIMLJ, as found through desktop research, is presented in Table 6-58.

Table 6-58: La Nation Innu Matimekush-Lac John Employment and Economic Development Services

Category	Provider/Service	Description
Economic Development	Corporation de développement économique Matimekush (Matimekush – Lac John Economic Development Corporation)	▪ Oversees local economic development
Employment and Recruitment	No information was available from secondary sources at the time of desktop research.	▪ N/A
Training	No information was available from secondary sources at the time of desktop research.	▪ N/A

Source: (Nametau innu, 2010b)

6.2.3.6 Housing Services

At the time of desktop research, information was not publicly available regarding housing services available to NIMLJ members.

6.2.3.7 Temporary Accommodations

There is one hotel on Matimekush reserve. Hôtel Innutel offers both one and two-bed room, and on-site dining (Hôtel Innutel, n.d.). Additional temporary accommodations are available in Ville de Schefferville. An overview of temporary accommodations on the NIMLJ reserves, as found through desktop research, is presented in Table 6-59.

Table 6-59: La Nation Innu Matimekush-Lac John Temporary Accommodations

Provider/Service	Description
Hôtel Innutel	▪ Hotel ▪ On-site dining facilities

Source: (Hôtel Innutel, n.d.)

6.2.3.8 Emergency Services

Police services are provided by the Aboriginal Police Force, established through an agreement between the Band council, the Government of Canada, and the Government of Québec (Nametau innu, 2010b). The service is managed by six police officers responsible for Schefferville and Matimekush-Lac John regions (Nametau innu, 2010b). Emergency fire services are provided by the municipality of Schefferville, with a director and 20 part-time firefighters responsible for fire prevention, personnel training, and rescue (Nametau innu, 2010b). Emergency medical services are provided by the Nursing Station (CLD de la MRC de Caniapiscau, n.d.).

An overview of emergency services available for the NIMLJ, found through desktop research, is presented in Table 6-60.

Table 6-60: La Nation Innu Matimekush-Lac John Emergency Services

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Police	Yes	▪ Aboriginal Police Force ▪ Six officers responsible for Schefferville and Matimekush-Lac John regions
Fire	Yes	▪ Provided by the municipality of Schefferville ▪ One director, 20 part-time firefighters
Emergency Medical Services	Yes	▪ Nursing station

Source: (CLD de la MRC de Caniapiscau, n.d.; Nametau innu, 2010b)

6.2.3.9 Transportation and Utilities

NIMLJ has one radio station and two local radio frequencies. Cable television is available via satellite. A local company, Naskapi Imuun Inc., provides internet and cell phone services (CLD de la MRC de Caniapiscau, n.d.). Télébec manages landline phone installations and repairs in the region (CLD de la MRC de Caniapiscau, n.d.). Hydroelectric power for the Schefferville region is sourced from the Menihek power station in Labrador. The hydroelectric distribution system in the area is managed by Kawawachikamach Energy Services on behalf of Hydro-Québec and Nalcor, using power generated from this station (CLD de la MRC de Caniapiscau, n.d.). Matimekush-Lac John, Kawawachikamach, and Schefferville share a landfill site to manage solid waste (CLD de la MRC de Caniapiscau, n.d.).

The NIMLJ reserves are not accessible via the Québec road network. The Québec Ministry of Transport, Sustainable Mobility, and Transportation Electrification is responsible for the 15 kilometres connecting route between the communities of Matimekush-Lac John, Kawawachikamach, and Schefferville (CLD de la MRC de Caniapiscau, n.d.) . Schefferville Airport is the nearest airport and serves as a hub for domestic flights offered by commercial airlines to destinations in Québec and Newfoundland and Labrador (CLD de la MRC de Caniapiscau, n.d.). Tshiuetin Rail Transport (TFT) provides passenger and freight transportation services from Sept-Îles to Schefferville (CLD de la MRC de Caniapiscau, n.d.). TFT is jointly owned by the Innu Nation Councils of Matimekush-Lac John and Uashat mak Mani-Utenam, along with the Naskapi Nation of Kawawachikamach. The company operates two round trips each week, with a railway terminal station located in Schefferville (CLD de la MRC de Caniapiscau, n.d.).

An overview of transportation and utilities available for the NIMLJ, found through desktop research, is presented in Table 6-61.

Table 6-61: La Nation Innu Matimekush-Lac John Transportation and Utilities

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Communications	Yes	▪ **Newspaper:** No ▪ **Radio Station**: Local radio frequencies include Canada Première 91.1 FM and CBC One 103.1 FM. Matimekush-Lac John features radio Kue Attinukan, CKRA-FM 106.9. ▪ **Nation Website**: No ▪ **Telecommunication services**: Cable TV available via satellite. Naskapi Imuun Inc. provides internet and cell phone services. Télébec manages landline phone installations and repairs.
Energy Supply	Yes	▪ Menihek Hydroelectric power station (managed by Kawawachikamach Energy Services on behalf of Hydro-Québec and Nalcor)
Public Transit	No	▪ N/A
Solid Waste Management	Yes	▪ Matimekush-Lac John, Kawawachikamach, and Schefferville shared landfill site
Transportation – Road	Yes	▪ Not accessible via the Québec road network ▪ 15km connecting route exists between between Matimekush-Lac John, Kawawachikamach, and Schefferville

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Transportation – Winter Road	N/A	▪ N/A
Transportation – Air	Yes	▪ Schefferville Airport
Transportation – Rail	Yes	▪ TFT provides passenger and freight transportation services from Sept-Îles to Schefferville.
Water and Sewage	Yes	▪ Shared water supply and wastewater treatment system with Schefferville

Source: (CLD de la MRC de Caniapiscau, n.d.)

6.2.4 Naskapi Nation of Kawawachikamach

6.2.4.1 Recreation and Leisure

The NNK has recreational sites and services available to residents. The NNK Recreational Activities Committee coordinates and funds activities for the Naskapi community, such as hockey tournaments, Halloween dances, New Year's parties, children's gifts, sculpture competitions, broomball, and boot hockey tournaments (CLD de la MRC de Caniapiscau, n.d.). The Naskapi Community Centre includes a gathering hall, youth centre, multi-purpose room, and kitchen (CLD de la MRC de Caniapiscau, n.d.). The Naskapi Recreation Centre features a swimming pool, Internet café, canteen, kitchen, billiard table, foosball, fitness classes, and training equipment (CLD de la MRC de Caniapiscau, n.d.). The community gymnasium has a basketball court and second-floor gym equipped for cardio-muscular training (CLD de la MRC de Caniapiscau, n.d.).

An overview of recreation and leisure services available for the NNK, found through desktop research, is presented in Table 6-62.

Table 6-62: Naskapi Nation of Kawawachikamach Recreation and Leisure Services

Category	Provider/Service	Description
Arts and Culture (Exhibitions, Art Galleries, Museums)	No information was available from secondary sources at the time of desktop research.	▪ N/A
Community Recreation (Community Centres, Sports Clubs, Athletic Fields)	Recreational Activities Committee	▪ Coordinates and funds activities for the Naskapi community
	Naskapi Community Centre	▪ Gathering hall ▪ Youth centre ▪ Multi-purpose room ▪ Kitchen

Category	Provider/Service	Description
	Naskapi Recreation Centre	▪ Swimming pool ▪ Internet café ▪ Canteen and kitchen ▪ Billiard table and foosball ▪ Fitness classes ▪ Training equipment
	Gymnasium	▪ Gymnasium ▪ Basketball court ▪ Gym
Entertainment and Events (Theatres, Concert Venues, Festivals, Movie Theatres)	No information was available from secondary sources at the time of desktop research.	▪ N/A
Civic Recreation Programs (Government-Organized Recreational Activities)		
Libraries and Learning Resources (Libraries, Learning Materials)		
Parks and Outdoor Recreation (Campgrounds, Beaches, Hiking Trails)		

Source: (CLD de la MRC de Caniapiscau, n.d.)

6.2.4.2 Social Services

Childcare services for the community are provided by Sachidun Daycare, with a maximum capacity of 26 children (CLD de la MRC de Caniapiscau, n.d.). The Naskapi Justice and Support Committee ensures the involvement of Naskapi people in the administration of justice on NNK territory, and provides social reintegration support for people leaving prison (CLD de la MRC de Caniapiscau, n.d.). Mental health services are provided by the Naskapi Health Service, providing assistance and emotional support to individuals who are experiencing grief and loss (CLD de la MRC de Caniapiscau, n.d.).

An overview of social services available for the NNK, as found through desktop research, is presented in Table 6-63.

Table 6-63: Naskapi Nation of Kawawachikamach Social Services

Category	Provider/Service	Description
Childcare and Youth Development	Sachidun Daycare	▪ Childcare services ▪ Maximum capacity: 26 children
Comprehensive Support Services		

Category	Provider/Service	Description
Crisis Centres and Transition Houses	No information was available from secondary sources at the time of desktop research.	▪ N/A
Hunger and Nutritional Assistance		
Legal Assistance and Advocacy	Naskapi Justice and Support Committee	▪ Justice administration ▪ Social reintegration of individuals transitioning from the prison system
Mental Health and Counselling	Naskapi Help Service	▪ Grief and loss support
Substance Use and Addiction Recovery	No information was available from secondary sources at the time of desktop research.	▪ N/A

Source: (CLD de la MRC de Caniapiscau, n.d.)

6.2.4.3 Health Services

The Naskapi Local Community Service Centre provides comprehensive basic healthcare services, including prevention, emergency care, coordination with hospitals and specialists, laboratory testing, COVID screening, and vaccinations (CLSC Naskapi, 2023). Specialized services like chiropractic care, as well as follow-up care for pregnant women, the elderly, and children, are also available (CLSC Naskapi, 2023). An overview of health services available for the NNK, found through desktop research, is presented in Table

Table 6-64: Naskapi Nation of Kawawachikamach Health Services

Category	Provider/Service	Description
Clinical Services (Hospitals, Clinics, and Primary Care Services)	No information was available from secondary sources at the time of desktop research.	▪ N/A
Public Health (Preventive Measures, Health Education, and Community Health Services)	Naskapi Local Community Service Centre	▪ Emergency Care ▪ Coordination with hospitals and specialists ▪ Laboratory testing ▪ Vaccinations ▪ Specialized services (e.g., chiropractic care)
Long-Term Care Facilities (Nursing Homes)	No information was available from secondary sources at the time of desktop research.	▪ N/A

Source: (CLSC Naskapi, 2023)

6.2.4.4 Education Services

The Naskapi Education Committee operates as a school board council, overseeing the school calendar, curriculum for culture and the Naskapi language, and staff recruitment (CLD de la MRC de Caniapiscau, n.d.). The Jimmy Sandy Memorial School provides education from kindergarten through grade five (CLD de la MRC de Caniapiscau, n.d.). In the evenings, the school offers adult education courses and is affiliated with the Central Québec School Board (CLD de la MRC de Caniapiscau, n.d.). The James Chescappio Memorial Education Centre provides online classes and a mining-related skills program, creating job opportunities in regional mining projects (CLD de la MRC de Caniapiscau, n.d.). A program at McGill University provides training for Indigenous individuals to become teachers with the aim of returning to their community to preserve and share Naskapi culture and language (CLD de la MRC de Caniapiscau, n.d.).

An overview of health services available for the NNK, as found through desktop research, is presented in Table 6-65.

Table 6-65: Naskapi Nation of Kawawachikamach Education Services

Category	Provider/Service	Description
Primary / Secondary Education	Jimmy Sandy Memorial School	▪ Kindergarten to grade five ▪ Approximate Student Enrollment: 270
	James Chescappio Memorial Education Centre	▪ Online classes ▪ Mining-related skills program
Post-Secondary Education	McGill University	▪ Teacher training program with the aim of preserving Naskapi culture and language
Other	Naskapi Education Committee	▪ Oversees school calendar, curriculum for culture and Naskapi language, and staff recruitment

Source: (CLD de la MRC de Caniapiscau, n.d.)

6.2.4.5 Employment and Economic Development Services

Employment and economic development services for the NNK are provided by the Naskapi Economic Development Department (NEDD), the Naskapi Development Corporation, and the Naskapi Local Management Council.

The NEDD assists Naskapi members in entrepreneurial endeavors by providing financial assistance and guidance for those interested in starting or expanding their businesses (Naskapi Nation of Kawawachikamach, n.d.-b). They support members in finding quality employment by informing them about job opportunities, helping with job applications and CV creation, and providing training (Naskapi

Nation of Kawawachikamach, n.d.-b). The department also actively collaborates with various regional industries to strengthen partnerships, cooperation, and communication (Naskapi Nation of Kawawachikamach, n.d.-b).

The Naskapi Development Corporation manages funding received from the Northeast Québec Convention and uses it to alleviate poverty, improve the well-being and education of community members, enhance living conditions, preserve the Naskapi way of life, and contribute to the economic and social development of Kawawachikamach (Naskapi Nation of Kawawachikamach, n.d.-b). The Naskapi Local Management Council provides training opportunities and job postings for the community (Naskapi Nation of Kawawachikamach, n.d.-b).

The NNK has a diverse business sector, consisting of Nation-owned businesses and partnerships. Key enterprises include Sichuun, a telecommunications company providing internet and IT services, Kawawachikamach Energy Services Inc., delivering electricity, Naskapi Adoschaouna Services for transportation, Chimo Garage offering car rentals and repairs, Naskapi Civil Works involved in civil construction and heavy equipment rental, Pimi Naskinnuk as a fuel provider, Beton Naskinnu supplying concrete, Tshiuetin Rail Transportation for freight and passenger services, and the Manikin Center, a grocery store (Naskapi Nation of Kawawachikamach, n.d.-a). Additionally, there are smaller Nation operations and privately-owned businesses in areas like retail, transportation, and childcare (Naskapi Nation of Kawawachikamach, n.d.-a).

An overview of employment and economic development services available for the NNK, found through desktop research, is presented in Table 6-66.

Table 6-66: Naskapi Nation of Kawawachikamach Employment and Economic Development Services

Category	Provider/Service	Description
Economic Development	Naskapi Economic Development Department	▪ Financial assistance and guidance ▪ Job opportunities ▪ CV and job applications assistance ▪ Job training ▪ Partnerships and cooperation with regional industries
	Naskapi Development Corporation	▪ Funded by the Northeast Québec Convention ▪ Economic and social support to the community
Employment and Recruitment	Naskapi Local Management Council	▪ Training opportunities ▪ Job postings
Training	No information was available from secondary sources at the time of desktop research.	▪ N/A

Source: (Naskapi Nation of Kawawachikamach, n.d.-b)

6.2.4.6 *Housing Services*

The Naskapi Housing Department Manages housing on Kawawachikamach reserve, working closely with the Naskapi Department of Public Works to coordinate repairs and maintenance (Naskapi Nation of Kawawachikamach, n.d.-b). The Housing Committee handles allocations, housing requests, and maintenance prioritization (Naskapi Nation of Kawawachikamach, n.d.-b). The Naskapi Department of Public Works Capital, Civil and Special Projects Department manages the Nation's construction projects, including house builds, capital projects, and special funding programs (Naskapi Nation of Kawawachikamach, n.d.-b).

An overview of housing services available for the NNK, as found through desktop research, is presented in Table 6-67.

Table 6-67: Naskapi Nation of Kawawachikamach Housing Services

Category	Provider/Service	Description
Affordable Housing and Financial Assistance	No information was available from secondary sources at the time of desktop research.	▪ N/A
Homelessness		
Public Housing	Naskapi Housing Department	▪ Repairs and maintenance coordination ▪ Housing Committee for housing requests and maintenance prioritization
	Naskapi Department of Public Works Capital, Civil and Special Projects Department	▪ Manages construction projects

Source: (Naskapi Nation of Kawawachikamach, n.d.-b)

6.2.4.7 *Temporary Accommodations*

Information was not available regarding temporary accommodations on Kawawachikamach reserve at the time of desktop research.

6.2.4.8 *Emergency Services*

Police services for the NNK are provided by the Naskapi Police Force, with three officers on Kawawachikamach reserve (CLD de la MRC de Caniapiscau, n.d.). The Naskapi Police Force works with Sûreté du Québec officers when necessary, and has a Police Committee to improve services by addressing community needs and priorities (CLD de la MRC de Caniapiscau, n.d.). The NNK has a fire station, providing emergency response and prevention within the community (CLD de la MRC de Caniapiscau, n.d.). An Emergency Planning Committee develops emergency measures in compliance with the Canadian Civil Protection Act and presents them to the Nation's Council for approval (Naskapi Nation of Kawawachikamach, n.d.-b).

An overview of emergency services available for the NNK, found through desktop research, is presented in Table 6-68.

Table 6-68: Naskapi Nation of Kawawachikamach Emergency Services

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Police	Yes	▪ Naskapi Police Force – Three officers
Fire	Yes	▪ Fire station
Emergency Medical Services	No information was available from secondary sources at the time of desktop research.	▪ N/A
Other	Yes	▪ Emergency Planning Committee

Source: (CLD de la MRC de Caniapiscau, n.d.; Naskapi Nation of Kawawachikamach, n.d.-b)

6.2.4.9 Transportation and Utilities

The NNK has an on-reserve radio station, Naskapi Northern Wind, CJCK-FM 89.9, broadcasting in Naskapi languages (Naskapi Nation of Kawawachikamach, n.d.-b). Local radio stations in the area include Canada Première 91.1 FM and CBC One 103.1 FM. Telecommunication services are provided by Sichuun, owned by the Naskapi Nation and First Nation partners. Sichuun offers fiber optic internet, cellphone coverage, and IT services to the area (CLD de la MRC de Caniapiscau, n.d.). Hydroelectric power for the Schefferville region is sourced from the Menihek power station in Labrador. The hydroelectric distribution system in the area is managed by Kawawachikamach Energy Services on behalf of Hydro-Québec and Nalcor, using power generated from this station (CLD de la MRC de Caniapiscau, n.d.). Pimi Naskinnuk, a partnership between the NNK, Innu, and Inuit Nations, serves as the primary fuel Provider/Service for the Schefferville area. In terms of solid waste management, Matimekush-Lac John, Kawawachikamach, and Schefferville share a landfill site (CLD de la MRC de Caniapiscau, n.d.). The Naskapi Department of Public Works Operations and Maintenance is responsible for the general maintenance of the Nation's waste management (Naskapi Nation of Kawawachikamach, n.d.-b).

Kawawachikamach reserve is not accessible via the Québec road network. The Québec Ministry of Transport, Sustainable Mobility, and Transportation Electrification is responsible for the 15 kilometres connecting route between the communities of Matimekush-Lac John, Kawawachikamach, and Schefferville (CLD de la MRC de Caniapiscau, n.d.) . Schefferville Airport is the nearest airport and serves as a hub for domestic flights offered by commercial airlines to destinations in Québec and Newfoundland and Labrador (CLD de la MRC de Caniapiscau, n.d.). Tshiuetin Rail Transport (TFT) provides passenger and freight transportation services from Sept-Îles to Schefferville (CLD de la MRC de Caniapiscau, n.d.). TFT is jointly owned by the Naskapi Nation of Kawawachikamach and the Innu Nation Councils of Matimekush-Lac John and Uashat mak Mani-Utenam (CLD de la MRC de Caniapiscau, n.d.). The company operates two round trips each week, with a railway terminal station located in Schefferville (CLD de la MRC de Caniapiscau, n.d.).

An overview of transportation and utilities available for the NNK, as found through desktop research, is presented in Table 6-69.

Table 6-69: Naskapi Nation of Kawawachikamach Transportation and Utilities

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Communications	Yes	▪ **Newspaper**: No ▪ **Radio Station**: Local radio stations include Canada Première 91.1 FM and CBC One 103.1 FM. NNK station is Naskapi Northern Wind, CJCK-FM 89.9 ▪ **Nation Website:** No ▪ **Telecommunication services:** Provided by Sichuun, offering fiber optic internet, cell phone coverage, and IT services
Energy Supply	Yes	▪ Kawawachikamach Energy Services Inc. supplies hydroelectricity ▪ Pimi Naskinnuk serves as the primary fuel Provider/Service
Public Transit	Yes	▪ N/A
Solid Waste Management	Yes	▪ Matimekush-Lac John, Kawawachikamach, and Schefferville share a landfill site
Transportation – Road	Yes	▪ Not accessible via the Québec road network ▪ 15km connecting route exists between between Matimekush-Lac John, Kawawachikamach, and Schefferville
Transportation – Winter Road	N/A	▪ N/A
Transportation – Air	Yes	▪ Schefferville Airport
Transportation – Rail	Yes	▪ Tshiuetin Rail Transport (TFT) provides passenger and freight transportation services from Sept-Îles to Schefferville.

Service	Available (Yes / No / No information was available from secondary sources at the time of desktop research)	Description
Water and Sewage	Yes	▪ The Department of Public Works Operations and Maintenance is responsible for the general maintenance of the Nation's water and sewage systems.

Source: (CLD de la MRC de Caniapiscau, n.d.; Naskapi Nation of Kawawachikamach, n.d.-b, n.d.-a)

6.2.5 NunatuKavut Community Council

6.2.5.1 Recreation and Leisure

NCC members have access to recreation and leisure facilities in the communities in which they reside.

6.2.5.2 Social Services

NCC members have access to social services in the communities in which they reside, in addition to the services outlined in Table 6-70.

Comprehensive social support services are provided by the NCC Health and Community Services Department, the NCC Labrador West Indigenous Service Centre, and the NCC George Roberts Community Grants Program. The NCC Health and Community Services Department oversees various health and social programs for overall community well-being, including initiatives such as mental health support, Indigenous cancer awareness, and addressing the issue of missing and murdered Indigenous women and girls (Nunatukavut, 2023d). The NCC Labrador West Indigenous Service Centre, located in the Town of Labrador City, offers culturally appropriate programs and services for Indigenous individuals in Labrador West, functioning as a friendship centre (Nunatukavut, 2023g). The NCC George Roberts Community Grants Program assists NunatuKavut communities and groups celebrate their culture and enhance well-being in various aspects, such as economic, social, physical, and mental, providing grants of up to $4,000 to non-profit or community organizations (Nunatukavut, 2023c). The NCC Community Freezer Program provides food assistance to NCC members who are unable to benefit from the communal fishery program, including older adults and individuals with accessibility challenges (Nunatukavut, 2023a). The Nunatukavut Wellness Initiative provides culturally appropriate mental wellness programs, involving storytelling, photovoice, and theatre, leveraging the knowledge and experiences of local individuals, including patients, families, healthcare Provider/Services, and community leaders (Nunatukavut, 2023h).

Table 6-70: NunatuKavut Community Council Social Services

Category	Provider/Service	Description
Childcare and Youth Development	No information was available from secondary sources at the time of desktop research.	▪ N/A

Category	Provider/Service	Description
Comprehensive Support Services	NunatuKavut Community Council Health and Community Services Department	▪ Health and social programs
	NunatuKavut Community Council Labrador West Indigenous Service Centre	▪ Culturally appropriate programs and services for Indigenous individuals in Labrador West
	NunatuKavut Community Council George Roberts Community Grants Program	▪ Culture and well-being grants
Crisis Centres and Transition Houses	No information was available from secondary sources at the time of desktop research.	▪ N/A
Hunger and Nutritional Assistance	NunatuKavut Community Council Community Freezer Program	▪ Food assistance for NCC members who are unable to benefit from the communal fishery program
Legal Assistance and Advocacy	No information was available from secondary sources at the time of desktop research.	▪ N/A
Mental Health and Counselling	Nunatukavut Wellness Initiative	▪ Provides culturally appropriate mental wellness programs
Substance Use and Addiction Recovery	No information was available from secondary sources at the time of desktop research.	▪ N/A

Source: (Nunatukavut, 2023d, 2023g, 2023a, 2023h)

6.2.5.3 Health Services

NCC members have access to health services in the communities in which they reside, in addition to the services outlined in Table 6-71.

The IkajuKatigek Medical Transportation Program offers financial support to NCC community members to assist with travel costs for accessing specialized insured medical services, up to a maximum of to $5,000 per patient, or $7,000 per patient with an escort (Nunatukavut, 2023e).

Table 6-71: NunatuKavut Community Council Health Services

Category	Provider/Service	Description
Clinical Services (Hospitals, Clinics, and Primary Care Services)	IkajuKatigek Medical Transportation Program	▪ Financial support to assist with travel costs for accessing specialized insured medical services

Category	Provider/Service	Description
Public Health (Preventive Measures, Health Education, and Community Health Services)	No information was available from secondary sources at the time of desktop research.	▪ N/A
Long-Term Care Facilities (Nursing Homes)		

Source: (Nunatukavut, 2023d, 2023e)

6.2.5.4 Education Services

NCC members have access to education services in the communities in which they reside, in addition to the services outlined in Table 6-72.

The NCC Community Employment Coordinator Office provides bursaries and a merit award for NunatuKavut members pursuing higher education. The Ikupiatsik NunatuKavut Inuit Education Action Plan organizes diverse cultural events and programs across the region (Nunatukavut, 2023f).

Table 6-72: NunatuKavut Community Council Education Services

Category	Provider/Service	Description
Primary / Secondary Education	No information was available from secondary sources at the time of desktop research.	▪ N/A
Post-Secondary Education		
Other	NunatuKavut Community Council Community Employment Coordinator Office	▪ Provides bursaries and a merit award for NunatuKavut members pursuing higher education
	Ikupiatsik NunatuKavut Inuit Education Action Plan	▪ Cultural events and programs

Source: (Nunatukavut, 2023b, 2023f)

6.2.5.5 Employment and Economic Development Services

NCC members have access to employment and economic services in the communities in which they reside, in addition to the services outlined in Table .

The NCC Employment and Skills Development Department establishes partnerships to support NunatuKavut community members in securing employment (Nunatukavut, 2023b). They manage agreements aimed at assisting unemployed and underemployed individuals, with primary agreements being the Indigenous Skills Employment and Training Program funded by Service Canada and a sub-agreement funded by the Congress of Aboriginal Peoples (Nunatukavut, 2023b).

Table 6-73: NunatuKavut Community Council Employment and Economic Development Services

Category	Provider/Service	Description
Economic Development	No information was available from secondary sources at the time of desktop research.	▪ N/A
Employment and Recruitment	NunatuKavut Community Council Employment and Skills Development Department	▪ Partnerships to support NunatuKavut members in securing employment
Training	No information was available from secondary sources at the time of desktop research.	▪ N/A

Source: (Nunatukavut, 2023b)

6.2.5.6 Housing Services

NCC members have access to housing services in the communities in which they reside, in addition to the service outlined in Table 6-74, including the NCC Home Repair Program.

Table 6-74: NunatuKavut Community Council Housing Services

Category	Provider/Service	Description
Affordable Housing and Financial Assistance	NunatuKavut Community Council Home Repair Program	▪ Financial support for home repairs in NunatuKavut communities
Homelessness	No information was available from secondary sources at the time of desktop research.	▪ N/A
Public Housing	No information was available from secondary sources at the time of desktop research.	▪ N/A

Source: (Labrador West Housing & Homeless Coalition, n.d.; Newfoundland and Labrador Housing Corporation, 2019)

6.2.5.7 Temporary Accommodations

Information was not available on temporary accommodations for the NCC at the time of desktop research.

6.2.5.8 Emergency Services

NCC members access emergency services in the municipalities in which they reside.

6.2.5.9 Transportation and Utilities

NCC members access transportation and utilities in the municipalities in which they reside.

6.3 Economy, Employment, and Business

The sections below provide an overview of economic conditions in the Indigenous communities of the ITUM, the NIMLJ, the Innu Nation, the NNK, and the NCC.

As in Section 6.1, Census data for the Innu Nation is drawn from the populations of Natuashish 2 and Sheshatshiu 3 reserves, data for the ITUM is drawn from the populations of Mani-Utenam and Uashat 27 reserves, data for the NIMLJ is drawn from the population of Matimekush reserve, data for NNK is drawn from the population of Kawawachikamach reserve, and data for the NCC is drawn from the self-identified Inuit population in Census Division No. 10, Newfoundland and Labrador.

According to the 2021 Census, the labour force participation rate ranged from 45.5% (Uashat 27 reserve) to 67.6% (Inuit in Division No. 10) for men+, and 46.1% (Mani-Utenam reserve) to 63.8% (Inuit in Division No. 10) for women+. The unemployment rate ranged from 13.0% (Kawawachikamach and Uashat 27 reserve) to 33.3% (Sheshatshiu 3 reserve) for men+, and 7.7% (Matimekush reserve) to 16.7% (Natuashish 2 and Sheshatshiu 3 reserve) for women+.

The top industry for men+ was public administration on all six First Nations reserves; the top industry for self-identified Inuit men+ living in Census Division No. 10 was mining, quarrying, and oil and gas extraction. The top industry for women+ was public administration on five First Nations reserves (Natuashish 2, Mani-Utenam, Uashat 27, and Matimekush), and health care and social assistance for Sheshatshiu 3 and Kawawachikamach reserves, as well as for self-identified Inuit women+ living in Census Division No. 10. The top occupation category for men+ was trades, transport and equipment operators, and related occupations, on all six First Nations reserves, and for self-identified Inuit men+ living in Census Division No. 10. For women+, the top occupation categories were sales and service occupations, and occupations in education, law, and social, community, and government services, on all six First Nations reserves, and for self-identified Inuit women+ living in Census Division No. 10.

Employment income accounted for between 60.0% (Uashat 27 reserve) and 78.0% (Inuit in Division No. 10) of total income for men+, and between 43.6% (Uashat 27 reserve) and 68.4% (Inuit in Division No. 10) for women+. The median and average employment incomes ranged from $43,600 and $40,000 (Matimekush reserve) to $79,000 and $85,800 (Inuit in Division No. 10) for men+, and from $33,200 and $36,00 (Mani-Utenam reserve) to $51,600 and $56,600 (Inuit in Division No. 10) for women+.

6.3.1 Innu Nation

6.3.1.1 Labour Force Characteristics

The sections below provide an overview of the labour force characteristics for the Innu Nation, including participation and unemployment rates, labour supply, and income statistics.

6.3.1.1.1 Participation and Unemployment Rates

The 2021 Census presents labour force statistics from respondents on Natuashish 2 and Sheshatshiu 3 reserves. Relevant 2021 Census data can be found in Table 6-75. According to the 2021 Census, the labour force participation rate on Natuashish 2 reserve was 53.3% total (51.9% for men+ and 56.6% for women+), a 16.6% decrease from 2016 for men+ and an 5.5% decrease from 2016 for women+; and the unemployment rate in was 17.5% total (17.9% for men+ and 16.7% for women+), a 11.8% decrease from

2016 for men+ and a 2.7% decrease from 2016 for women+ (Statistics Canada, 2017g, 2022g). The labour force participation rate on Sheshatshiu 3 reserve was 57.4% total (60.0% for men+ and 54.5% for women+), a 3.3% increase over 2016 for men+ and a 1.2% decrease from 2016 for women+; and the unemployment rate in was 25.8% total (33.3% for men+ and 16.7% for women+), a 3.9% increase over 2016 for men+ and a 6.4% decrease from 2016 for women+ (Statistics Canada, 2017i, 2022i).

Table 6-75: Innu Nation Labour Force Status, 2021

	2021			2016			Change from 2016 to 2021		
Labour Force Status	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
NATUASHISH 2 RESERVE									
Population 15+ Years	535	270	265	560	270	290	-4.5	0.0	-8.6
In the labour force	285	140	150	360	185	180	-20.8	-24.3	-16.7
Employed	240	115	125	270	130	140	-11.1	-11.5	-10.7
Unemployed	50	25	25	90	55	35	-44.4	-54.5	-28.6
Not in the labour force	245	130	115	195	85	110	25.6	52.9	4.5
Participation rate (%)	53.3	51.9	56.6	64.3	68.5	62.1	-11.0	-16.6	-5.5
Employment rate (%)	44.9	42.6	47.2	48.2	48.1	48.3	-3.3	-5.5	-1.1
Unemployment rate (%)	17.5	17.9	16.7	25.0	29.7	19.4	-7.5	-11.8	-2.7
SHESHATSHIU 3 RESERVE									
Population 15+ Years	845	400	440	655	300	350	29.0	33.3	25.7
In the labour force	485	240	240	365	170	195	32.9	41.2	23.1
Employed	355	160	200	270	120	150	31.5	33.3	33.3
Unemployed	125	80	40	95	50	45	31.6	60.0	-11.1
Not in the labour force	360	160	205	290	130	160	24.1	23.1	28.1
Participation rate (%)	57.4	60.0	54.5	55.7	56.7	55.7	1.7	3.3	-1.2
Employment rate (%)	42.0	40.0	45.5	41.2	40.0	42.9	0.8	0.0	2.6
Unemployment rate (%)	25.8	33.3	16.7	26.0	29.4	23.1	-0.2	3.9	-6.4

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017g, 2017i, 2022g, 2022i)

6.3.1.1.2 Labour Supply

The 2021 Census presents labour supply statistics from respondents on Natuashish 2 and Sheshatshiu 3 reserves. Figure 6-5 illustrates the 2021 Census breakdown of the on-reserve workforce by industry. According to the 2021 Census (Table 6-76), public administration was the dominant industry for men+ and women+ on Natuashish 2 reserve (Statistics Canada, 2022g). On Sheshatshiu 3 reserve, the dominant industry for men+ was public administration and the dominant industry for women+ was health care and social assistance (Statistics Canada, 2022i).

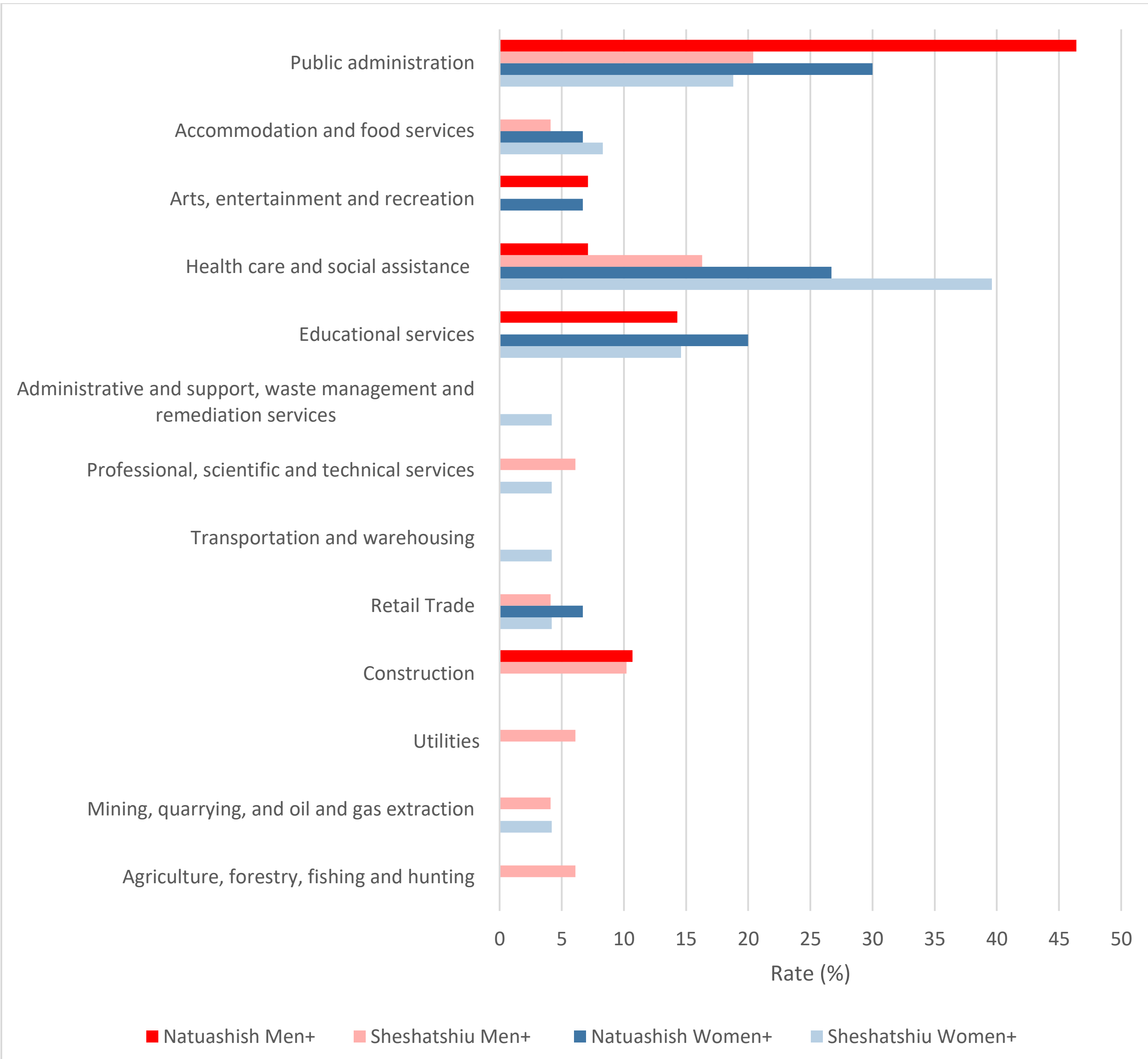

Figure 6-5: Innu Nation Workforce by Industry, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022g, 2022i)

Table 6-76: Innu Nation Workforce by Industry, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
NATUASHISH 2 RESERVE									
Agriculture, forestry, fishing and hunting	3.4	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0
Mining, quarrying, and oil and gas extraction	3.4	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0
Utilities	3.4	0.0	0.0	0.0	5.4	0.0	3.4	-5.4	0.0
Construction	6.9	10.7	0.0	5.5	10.8	5.6	1.4	-0.1	-5.6
Manufacturing	0.0	0.0	0.0	2.7	0.0	0.0	-2.7	0.0	0.0
Wholesale Trade	0.0	0.0	0.0	0.0	5.4	0.0	0.0	-5.4	0.0
Retail Trade	5.2	0.0	6.7	2.7	5.4	0.0	2.5	-5.4	6.7
Transportation and warehousing	0.0	0.0	0.0	0.0	0.0	5.6	0.0	0.0	-5.6
Information and cultural industries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Finance and insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real estate and rental leasing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Professional, scientific and technical services	0.0	0.0	0.0	0.0	0.0	5.6	0.0	0.0	-5.6
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and support, waste management and remediation services	3.4	0.0	0.0	2.7	0.0	0.0	0.7	0.0	0.0
Educational services	15.5	14.3	20.0	17.8	10.8	25.0	-2.3	3.5	-5.0
Health care and social assistance	15.5	7.1	26.7	20.5	8.1	33.3	-5.0	-1.0	-6.6
Arts, entertainment and recreation	3.4	7.1	6.7	2.7	0.0	0.0	0.7	7.1	6.7
Accommodation and food services	3.4	0.0	6.7	2.7	0.0	0.0	0.7	0.0	6.7

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Other services (except public administration)	3.4	0.0	0.0	2.7	5.4	0.0	0.7	-5.4	0.0
Public administration	37.9	46.4	30.0	28.8	37.8	22.2	9.1	8.6	7.8
SHESHATSHIU 3 RESERVE									
Agriculture, forestry, fishing and hunting	4.1	6.1	0.0	0.0	5.7	0	4.1	0.4	0.0
Mining, quarrying, and oil and gas extraction	3.1	4.1	4.2	2.8	0.0	0.0	0.3	4.1	4.2
Utilities	3.1	6.1	0.0	0.0	5.7	0.0	3.1	0.4	0.0
Construction	6.2	10.2	0.0	16.7	25.7	10.5	-10.5	-15.5	-10.5
Manufacturing	0.0	0.0	0.0	2.8	0.0	0.0	-2.8	0.0	0.0
Wholesale Trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail Trade	3.1	4.1	4.2	2.8	5.7	0.0	0.3	-1.6	4.2
Transportation and warehousing	2.1	0.0	4.2	2.8	5.7	0.0	-0.7	-5.7	4.2
Information and cultural industries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Finance and insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real estate and rental leasing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Professional, scientific and technical services	4.1	6.1	4.2	2.8	0.0	0.0	1.3	6.1	4.2
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and support, waste management and remediation services	0.0	0.0	4.2	2.8	0.0	0.0	-2.8	0.0	4.2
Educational services	7.2	0.0	14.6	6.9	0.0	10.5	0.3	0.0	4.1
Health care and social assistance	26.8	16.3	39.6	20.8	14.3	28.9	6.0	2.0	10.7
Arts, entertainment and recreation	2.1	0.0	0.0	2.8	5.7	0.0	-0.7	-5.7	0.0
Accommodation and food services	5.2	4.1	8.3	15.3	11.4	21.1	-10.1	-7.3	-12.8

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Other services (except public administration)	2.1	0.0	0.0	2.8	0.0	5.3	-0.7	0.0	-5.3
Public administration	19.6	20.4	18.8	16.7	14.3	18.4	2.9	6.1	0.4

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017g, 2017i, 2022g, 2022i)

The 2021 Census presents labour force statistics from respondents on Natuashish 2 and Sheshatshiu 3 reserves. Figure 6-6 illustrates the 2021 Census breakdown of the on-reserve workforce by occupation. According to the 2021 Census, trades, transport and equipment operators, and related occupations, as well as occupations in education, law, and social, community, and government services were the dominant occupation categories for men+ on Natuashish 2 reserve and Sheshatshiu 3 reserve; occupations in education, law, and social, community, and government services was the dominant occupation category for women+ on Natuashish 2 reserve and Sheshatshiu 3 reserve (Statistics Canada, 2022g)(Statistics Canada, 2022i).

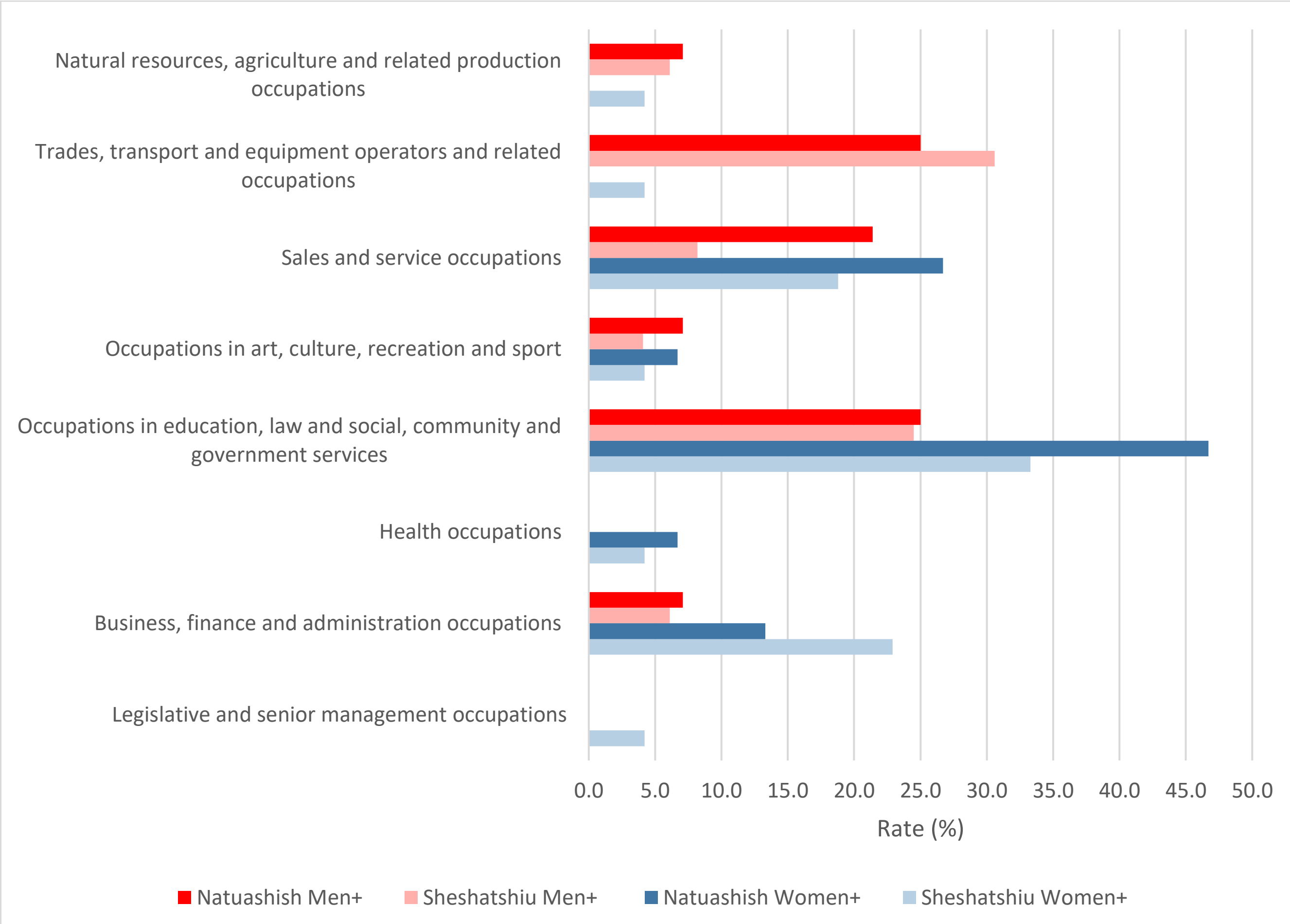

Figure 6-6: Innu Nation Workforce by Occupation, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022g, 2022i)

Table 6-77: Innu Nation Workforce by Occupation, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Occupation	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
NATUASHISH 2 RESERVE									
Legislative and senior management occupations	0.0	0.0	0.0	4.1	5.4	5.6	-4.1	-5.4	-5.6
Business, finance and administration occupations	12.1	7.1	13.3	8.2	5.4	11.1	3.9	1.7	2.2

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Occupation	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Natural and applied sciences and related occupations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health occupations	3.4	0.0	6.7	2.7	0.0	5.6	0.7	0.0	1.1
Occupations in education, law and social, community and government services	34.5	25.0	46.7	38.4	29.7	52.8	-3.9	-4.7	-6.1
Occupations in art, culture, recreation and sport	3.4	7.1	6.7	4.1	5.4	5.6	-0.7	1.7	1.1
Sales and service occupations	22.4	21.4	26.7	16.4	18.9	13.9	6.0	2.5	12.8
Trades, transport and equipment operators and related occupations	13.8	25.0	0.0	11.0	21.6	5.6	2.8	3.4	-5.6
Natural resources, agriculture and related production occupations	3.4	7.1	0.0	2.7	0.0	0.0	0.7	7.1	0.0
Occupations in manufacturing and utilities	0.0	0.0	0.0	2.7	5.4	0.0	-2.7	-5.4	0.0
SHESHATSHIU 3 RESERVE									
Legislative and senior management occupations	2.1	0.0	4.2	5.6	5.9	5.1	-3.5	-5.9	-0.9
Business, finance and administration occupations	13.4	6.1	22.9	12.5	5.9	12.8	0.9	0.2	10.1
Natural and applied sciences and related occupations	0.0	0.0	0.0	2.8	0.0	0.0	-2.8	0.0	0.0
Health occupations	2.1	0.0	4.2	2.8	0.0	5.1	-0.7	0.0	-0.9

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Occupation	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Occupations in education, law and social, community and government services	28.9	24.5	33.3	29.2	11.8	43.6	-0.3	12.7	-10.3
Occupations in art, culture, recreation and sport	4.1	4.1	4.2	2.8	5.9	0.0	1.3	-1.8	4.2
Sales and service occupations	12.4	8.2	18.8	19.4	23.5	15.4	-7.0	-15.3	3.4
Trades, transport and equipment operators and related occupations	17.5	30.6	4.2	19.4	32.4	5.1	-1.9	-1.8	-0.9
Natural resources, agriculture and related production occupations	4.1	6.1	4.2	2.8	5.9	0.0	1.3	0.2	4.2
Occupations in manufacturing and utilities	2.1	0.0	0.0	2.8	5.9	0.0	-0.7	-5.9	0.0

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017g, 2017i, 2022g, 2022i)

6.3.1.1.3 Income

Sources of Income

The 2021 Census presents income composition statistics from respondents on Natuashish 2 and Sheshatshiu 3 reserves. Relevant 2021 Census data can be found in Table 6-78. According to the 2021 Census, employment income accounted for 62.8% of total income on Natuashish 2 reserve (71.0% for men+ and 56.0% for women+), a 13.3% decrease from 2016 for men+ and a 6.7% decrease from 2016 for women+; and 61.2% of total income on Sheshatshiu 3 reserve (65.0% for men+ and 57.0% for women+), a 20.0% decrease from 2016 for men+ and a 12.4% decrease from 2016 for women+ (Statistics Canada, 2017g, 2017i, 2022g, 2022i). Government transfers accounted for 31.4% of total income on Natuashish 2 reserve (22.8% for men+ and 39.0% for women+), a 9.1% increase over 2016 for men+ and a 6.3% increase over 2016 for women+; and 30.9% of total income on Sheshatshiu 3 reserve (28.0% for men+ and 33.2% for women+), a 18.4% increase over 2016 for men+ and a 9.2% increase over 2016 for women+ (Statistics Canada, 2017g, 2017i, 2022g, 2022i).

Table 6-78: Innu Nation Income Composition, 2021

Income Composition	2021			2016			Change from 2016 to 2021		
	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
NATUASHISH 2 RESERVE									
Market Income (%)	68.5	77.0	61.0	77.1	84.6	66.6	-8.6	-7.6	-5.6
Employment Income (%)	62.8	71.0	56.0	72.4	84.3	62.7	-9.6	-13.3	-6.7
Government Transfers (%)	31.4	22.8	39.0	23.5	13.7	32.7	7.9	9.1	6.3
SHESHATSHIU 3 RESERVE									
Market Income (%)	69.0	72.0	66.5	82.7	89.4	75.3	-13.7	-17.4	-8.8
Employment Income (%)	61.2	65.0	57.0	78.2	85.0	69.4	-17.0	-20.0	-12.4
Government Transfers (%)	30.9	28.0	33.2	17.0	9.6	24.0	13.9	18.4	9.2

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017g, 2017i, 2022g, 2022i)

Employment Income

The 2021 Census presents employment income statistics from respondents on Natuashish 2 and Sheshatshiu 3 reserves. Relevant 2021 Census data can be found in Table . According to the 2021 Census, the median employment income on Natuashish 2 reserve was $48,800 for full-year full-time men+ workers, a 14.9% decrease from 2016, and $38,000 for full-year full-time women+ workers, a 2.4% increase over 2016; the median employment income on Sheshatshiu 3 reserve was $58,800 for full-year full-time men+ workers, an 15.1% increase over 2016, and $47,600 for full-year full-time women+ workers, a 14.1% increase over 2016 (Statistics Canada, 2017g, 2017i, 2022g, 2022i). In the 2021 Census, the average employment income on Natuashish 2 reserve was $54,000 for full-year full-time men+ workers, a 5.9% decrease from 2016, and $38,000 for full-year full-time women+ workers, a 17.9% decrease from 2016; the average employment income on Sheshatshiu 3 reserve was $54,000 for full-year full-time men+ workers, a 14.3% decrease from 2016, and $49,000 for full-year full-time women+ workers, a 2.3% decrease from 2016 (Statistics Canada, 2017g, 2017i, 2022g, 2022i).

Table 6-79: Innu Nation Income Statistics, 2021

Income Statistics	2021 Total	2021 Men+	2021 Women+	2016 Total	2016 Males	2016 Females	Change from 2016 to 2021 Total (%)	Change from 2016 to 2021 Men+/ Males (%)	Change from 2016 to 2021 Women+/ Females (%)
NATUASHISH 2 RESERVE									
Number of employment income recipients (aged 15 years and over in private households who worked full year full time in 2020)	195	90	105	180	95	90	8.3	-5.3	16.7
Median employment income in 2020 (Full-year full-time workers) ($)	41,200	48,800	38,000	42,496	57,344	37,120	-3.0	-14.9	2.4
Average employment income in 2020 (Full-year full-time workers) ($)	45,200	54,000	38,000	52,001	57,373	46,262	-13.1	-5.9	-17.9
SHESHATSHIU 3 RESERVE									
Number of employment income recipients (aged 15 years and over in private households who worked full year full time in 2020)	180	75	110	210	100	110	-14.3	-25.0	0.0
Median employment income in 2020 (Full-year full-time workers) ($)	54,400	58,800	47,600	44,608	51,072	41,728	22.0	15.1	14.1
Average employment income in 2020 (Full-year full-time workers) ($)	50,800	54,000	49,000	56,155	63,026	50,159	-9.5	-14.3	-2.3

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017g, 2017i, 2022g, 2022i)

6.3.1.2 Economic Sector Overview

The sections below provide an overview of the Innu Nation's economic sector, including forestry and construction projects, tourism initiatives and activities, and a goods and services profile.

6.3.1.2.1 Forestry

In August 2020, the Inn Nation and JP Forestry and Environmental Inc. announced a two-phase forestry project in central Labrador (Innu Nation, 2020). Phase I of the forestry project involved chipping and selling approximately 400,000 cubic meters of timber harvested between 2013 and 2015 by Nalco Energy for the Lower Churchill hydroelectric project at Muskrat Falls (Innu Nation, 2020). Phase II of the project involves harvesting up to 185,000 cubic meters of timber per year, in accordance with environmental protections set out in the Forest Management District (FMD) 19 operating plan (Innu Nation, 2020).

6.3.1.2.2 Construction

The Sheshatshiu Inn First Nation Residential Subdivision Development Project proposes the development of a fully serviced housing expansion on the Sheshatshiu Innu First Nation reserve, up to 41 residential building lots, to meeting current and future housing needs (IAAC, 2023d). In June 2023, the Impact Assessment Agency of Canada (IAAC) and Indigenous Services Canada issued a Notice of Determination for the project, stating that the project is "not likely to cause significant adverse environmental effects" (IAAC, 2023b).

6.3.1.2.3 Tourism

The Newfoundland and Labrador Indigenous Tourism Association (NLITA) is an Indigenous-led organization supporting tourism in the Province (Newfoundland and Labrador Indigenous Tourism Association, n.d.). The Innu Nation is listed as a partner and supporter of the NLITA (Newfoundland and Labrador Indigenous Tourism Association, n.d.). According to the NLITA website, the Innu Nation Representative Seat and the Innu Nation Indigenous Tourism Industry Seat on the NLITA Board of Directors are both currently vacant (Newfoundland and Labrador Indigenous Tourism Association, n.d.).

6.3.1.2.4 Goods and Services Profile

The Innu Development Limited Partnership (IDLP) represents the economic interests of the Innu communities (IDLP, n.d.). The IDLP partners with a number companies, including Air Borealis, Ueushuk Fisheries Limited, Innu-Inuit Envest, Innu-Inuit Provincial Doors Inc., Innu-Inuit Redpath, Innu-Inuit Toromont, Labrador Catering, Kiewit Contractors, Advanced Combustion Inc. Labrador, and IDLP Properties (IDLP, n.d.). The Innu Business Development Centre (IBDC) seeks to improve and develop economic capacity on Innu land, and assists in the establishment of Innu businesses (Innu Nation, n.d.).

6.3.2 Innu Takuaikan Uashat mak Mani-Utenam

6.3.2.1 Labour Force Characteristics

The sections below provide an overview of the labour force characteristics for the ITUM, including participation and unemployment rates, labour supply, and income statistics.

6.3.2.1.1 Participation and Unemployment Rates

The 2021 Census presents labour force statistics from respondents on Mani-Utenam and Uashat 27 reserves. Relevant 2021 Census data can be found in Table . According to the 2021 Census, the labour force participation rate on Mani-Utenam reserve was 51.1% total (55.8% for men+ and 46.1% for women+), a 6.8% increase over 2016 for men+ and a 0.1% decrease from 2016 for women+; and the unemployment rate in was 11.6% total (13.8% for men+ and 9.4% for women+), a 13.7% decrease from 2016 for men+ and a 0.8% decrease from 2016 for women+ (Statistics Canada, 2017e, 2022e). The labour force participation rate on Uashat 27 reserve was 46.0% total (45.5% for men+ and 47.3% for women+), a 2.0% decrease from 2016 for men+ and an 7.3% increase over 2016 for women+; and the unemployment rate in was 12.2% total (13.0% for men+ and 13.2% for women+),[1] a 18.2% decrease from 2016 for men+ and a 7.3% decrease from 2016 for women+ (Statistics Canada, 2017j, 2022j).

Table 6-80: Innu Takuaikan Uashat mak Mani-Utenam Labour Force Status, 2021

	2021			2016			Change from 2016 to 2021		
Labour Force Status	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
MANI-UTENAM RESERVE									
Population 15+ Years	1,095	520	575	1,050	520	530	4.3	0.0	8.5
In the labour force	560	290	265	500	255	245	12.0	13.7	8.2
Employed	495	255	240	405	185	225	22.2	37.8	6.7
Unemployed	65	40	25	95	70	25	-31.6	-42.9	0.0
Not in the labour force	535	230	305	545	265	280	-1.8	-13.2	8.9
Participation rate (%)	51.1	55.8	46.1	47.6	49.0	46.2	3.5	6.8	-0.1
Employment rate (%)	45.2	49.0	41.7	38.6	35.6	42.5	6.6	13.4	-0.8
Unemployment rate (%)	11.6	13.8	9.4	19.0	27.5	10.2	-7.4	-13.7	-0.8
UASHAT 27 RESERVE									
Population 15+ Years	1,065	505	560	1,060	505	550	0.5	0.0	1.8
In the labour force	490	230	265	455	240	220	7.7	-4.2	20.5
Employed	430	205	230	335	160	175	28.4	28.1	31.4
Unemployed	60	30	35	120	75	45	-50.0	-60.0	-22.2
Not in the labour force	570	275	300	605	270	330	-5.8	1.9	-9.1
Participation rate (%)	46.0	45.5	47.3	42.9	47.5	40.0	3.1	-2.0	7.3

[1] This discrepancy between the total percentage and the percentages for men+ and women+ exists in the raw data from Statistics Canada.

2021				2016			Change from 2016 to 2021		
Labour Force Status	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Employment rate (%)	40.4	40.6	41.1	31.6	31.7	31.8	8.8	8.9	9.3
Unemployment rate (%)	12.2	13.0	13.2	26.4	31.2	20.5	-14.2	-18.2	-7.3

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017e, 2017j, 2022e, 2022j)

6.3.2.1.2 Labour Supply

The 2021 Census presents labour supply statistics from respondents on Mani-Utenam and Uashat 27 reserves. Figure 6-7 illustrates the 2021 Census breakdown of the on-reserve workforce by industry. According to the 2021 Census, public administration was the dominant industry for men+ and women+ on Mani-Utenam and Uashat 27 reserves (Statistics Canada, 2022e, 2022j).

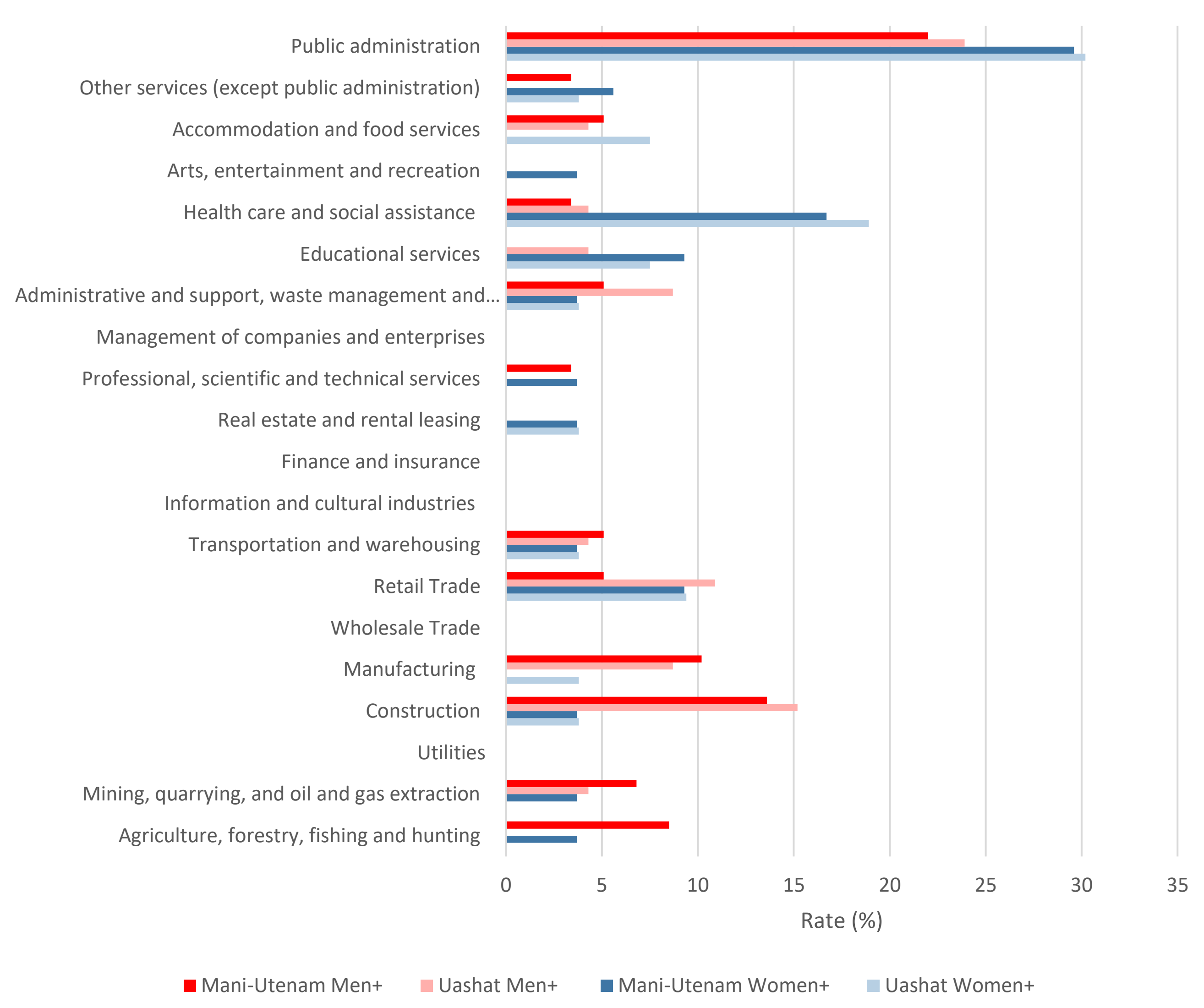

Figure 6-7: Innu Takuaikan Uashat mak Mani-Utenam Workforce by Industry, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022e, 2022j)

Table 6-81: Innu Takuaikan Uashat mak Mani-Utenam Workforce by Industry, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
MANI-UTENAM RESERVE									
Agriculture, forestry, fishing and hunting	5.4	8.5	3.7	6.9	11.8	0.0	-1.5	-3.3	3.7

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Mining, quarrying, and oil and gas extraction	4.5	6.8	3.7	2.0	3.9	0.0	2.5	2.9	3.7
Utilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	8.0	13.6	3.7	8.9	15.7	0.0	-0.9	-2.1	3.7
Manufacturing	6.3	10.2	0.0	5.0	7.8	0.0	1.3	2.4	0.0
Wholesale Trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail Trade	8.0	5.1	9.3	5.0	3.9	8.0	3.0	1.2	1.3
Transportation and warehousing	4.5	5.1	3.7	6.9	9.8	4.0	-2.4	-4.7	-0.3
Information and cultural industries	1.8	0.0	0.0	4.0	3.9	0.0	-2.2	-3.9	0.0
Finance and insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real estate and rental leasing	1.8	0.0	3.7	2.0	0.0	0.0	-0.2	0.0	3.7
Professional, scientific and technical services	1.8	3.4	3.7	0.0	3.9	0.0	1.8	-0.5	3.7
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and support, waste management and remediation services	4.5	5.1	3.7	4.0	7.8	0.0	0.5	-2.7	3.7
Educational services	4.5	0.0	9.3	5.9	0.0	12.0	-1.4	0.0	-2.7
Health care and social assistance	10.7	3.4	16.7	20.8	7.8	34.0	-10.1	-4.4	-17.3
Arts, entertainment and recreation	1.8	0.0	3.7	2.0	0.0	4.0	-0.2	0.0	-0.3
Accommodation and food services	3.6	5.1	0.0	3.0	0.0	6.0	0.6	5.1	-6.0
Other services (except public administration)	4.5	3.4	5.6	3.0	3.9	4.0	1.5	-0.5	1.6
Public administration	25.0	22.0	29.6	14.9	11.8	18.0	10.1	10.2	11.6
UASHAT 27 RESERVE									
Agriculture, forestry, fishing and hunting	2.0	0.0	0.0	2.2	4.2	4.7	-0.2	-4.2	-4.7

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Mining, quarrying, and oil and gas extraction	0.0	4.3	0.0	2.2	4.2	4.7	-2.2	0.1	-4.7
Utilities	2.0	0.0	0.0	2.2	0.0	0.0	-0.2	0.0	0.0
Construction	9.1	15.2	3.8	7.7	14.6	0.0	1.4	0.6	3.8
Manufacturing	5.1	8.7	3.8	3.3	8.3	0.0	1.8	0.4	3.8
Wholesale Trade	0.0	0.0	0.0	2.2	0.0	0.0	-2.2	0.0	0.0
Retail Trade	11.1	10.9	9.4	6.6	6.3	9.3	4.5	4.6	0.1
Transportation and warehousing	2.0	4.3	3.8	4.4	8.3	4.7	-2.4	-4.0	-0.9
Information and cultural industries	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Finance and insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real estate and rental leasing	2.0	0.0	3.8	2.2	4.2	0.0	-0.2	-4.2	3.8
Professional, scientific and technical services	0.0	0.0	0.0	2.2	0.0	0.0	-2.2	0.0	0.0
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and support, waste management and remediation services	5.1	8.7	3.8	7.7	10.4	4.7	-2.6	-1.7	-0.9
Educational services	5.1	4.3	7.5	4.4	0.0	9.3	0.7	4.3	-1.8
Health care and social assistance	12.1	4.3	18.9	11.0	4.2	18.6	1.1	0.1	0.3
Arts, entertainment and recreation	2.0	0.0	0.0	2.2	0.0	0.0	-0.2	0.0	0.0
Accommodation and food services	6.1	4.3	7.5	6.6	6.3	7.0	-0.5	-2.0	0.5
Other services (except public administration)	3.0	0.0	3.8	3.3	0.0	4.7	-0.3	0.0	-0.9
Public administration	28.3	23.9	30.2	22.0	16.7	27.9	6.3	7.2	2.3

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017e, 2017j, 2022e, 2022j)

The 2021 Census presents labour force statistics from respondents on Mani-Utenam and Uashat 27 reserves. Figure 6-8 illustrates the 2021 Census breakdown of the on-reserve workforce by occupation. According to the 2021 Census, trades, transport and equipment operators, and related occupations was the dominant occupation category for men+ on Mani-Utenam reserve, while sales and service occupations, followed closely by occupations in education, law, and social, community, and government services, was the dominant occupation category for women+ on Mani-Utenam reserve (Statistics Canada, 2022e). On Uashat 27 reserve, sales and service occupations, followed closely by trades, transport and equipment operators, and related occupations, was the dominant occupation category for men+; occupations in education, law, and social, community, and government services, followed closely by sales and service occupations, was the dominant occupation category for women+ (Statistics Canada, 2022j).

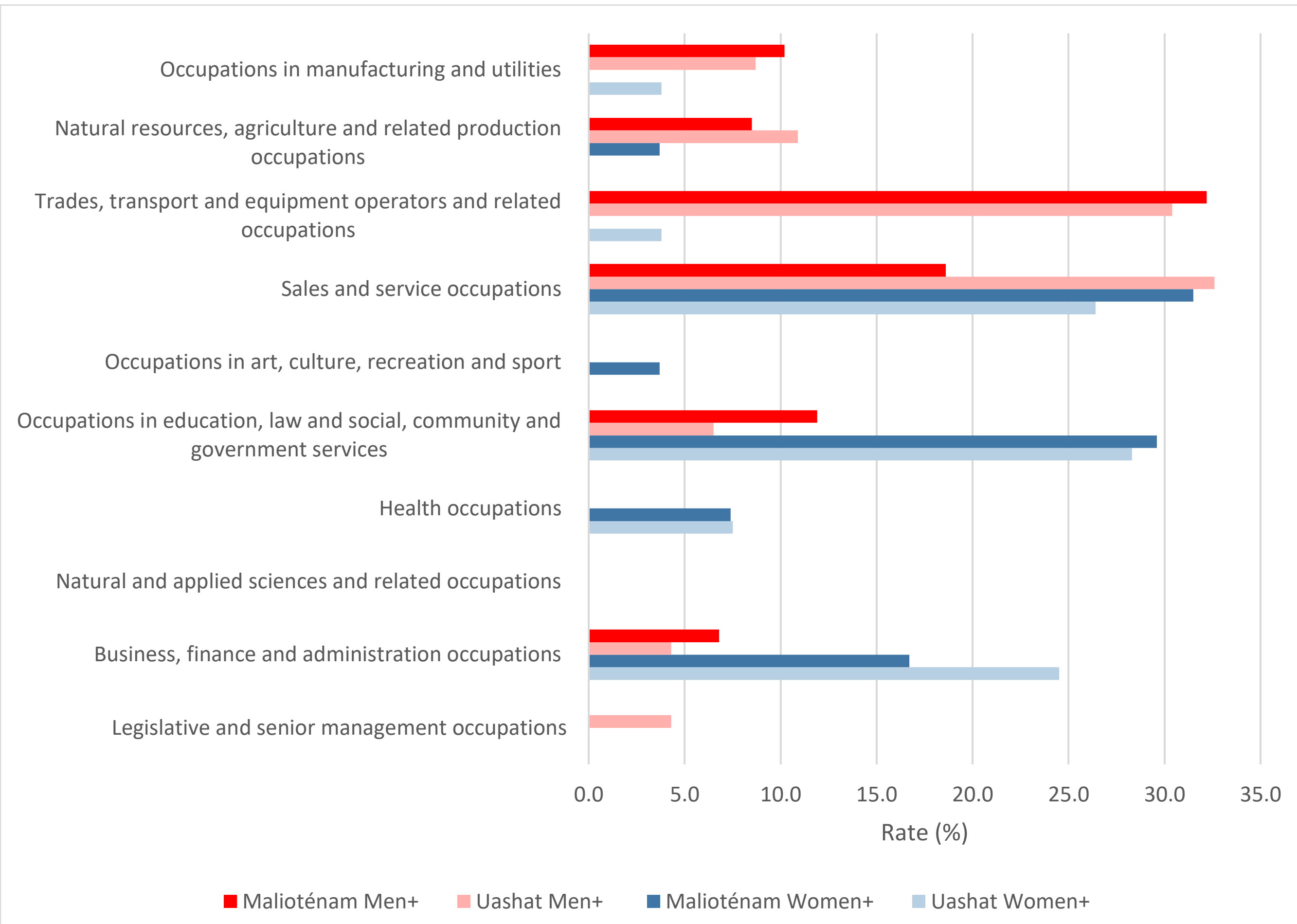

Figure 6-8: Innu Takuaikan Uashat mak Mani-Utenam Workforce by Occupation, 2021

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022e, 2022j)

Table 6-82: Innu Takuaikan Uashat mak Mani-Utenam Workforce by Occupation, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Occupation	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
MANI-UTENAM RESERVE									
Legislative and senior management occupations	0.0	0.0	0.0	6.0	5.9	6.1	-6.0	-5.9	-6.1
Business, finance and administration occupations	11.6	6.8	16.7	12.0	3.9	20.4	-0.4	2.9	-3.7
Natural and applied sciences and related occupations	1.8	0.0	0.0	2.0	3.9	4.1	-0.2	-3.9	-4.1
Health occupations	4.5	0.0	7.4	7.0	3.9	12.2	-2.5	-3.9	-4.8
Occupations in education, law and social, community and government services	19.6	11.9	29.6	20.0	7.8	32.7	-0.4	4.1	-3.1
Occupations in art, culture, recreation and sport	1.8	0.0	3.7	3.0	3.9	4.1	-1.2	-3.9	-0.4
Sales and service occupations	24.1	18.6	31.5	20.0	19.6	18.4	4.1	-1.0	13.1
Trades, transport and equipment operators and related occupations	17.9	32.2	0.0	16.0	29.4	4.1	1.9	2.8	-4.1
Natural resources, agriculture and related production occupations	5.4	8.5	3.7	6.0	9.8	0.0	-0.6	-1.3	3.7
Occupations in manufacturing and utilities	6.3	10.2	0.0	3.0	3.9	0.0	3.3	6.3	0.0
UASHAT 27 RESERVE									
Legislative and senior management occupations	0.0	4.3	0.0	5.5	4.3	6.8	-5.5	0.0	-6.8

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Occupation	**Total**	**Men+**	**Women+**	**Total**	**Males**	**Females**	**Total (%)**	**Men+/ Males (%)**	**Women+/ Females (%)**
Business, finance and administration occupations	15.2	4.3	24.5	13.2	6.4	20.5	2.0	-2.1	4.0
Natural and applied sciences and related occupations	0.0	0.0	0.0	2.2	4.3	0.0	-2.2	-4.3	0.0
Health occupations	5.1	0.0	7.5	3.3	0.0	4.5	1.8	0.0	3.0
Occupations in education, law and social, community and government services	17.2	6.5	28.3	14.3	6.4	22.7	2.9	0.1	5.6
Occupations in art, culture, recreation and sport	2.0	0.0	0.0	3.3	4.3	4.5	-1.3	-4.3	-4.5
Sales and service occupations	28.3	32.6	26.4	25.3	23.4	27.3	3.0	9.2	-0.9
Trades, transport and equipment operators and related occupations	14.1	30.4	3.8	18.7	31.9	4.5	-4.6	-1.5	-0.7
Natural resources, agriculture and related production occupations	4.0	10.9	0.0	3.3	6.4	4.5	0.7	4.5	-4.5
Occupations in manufacturing and utilities	5.1	8.7	3.8	3.3	6.4	0.0	1.8	2.3	3.8

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017e, 2017j, 2022e, 2022j)

6.3.2.1.3 Income

Sources of Income

The 2021 Census presents income composition statistics from respondents on Mani-Utenam and Uashat 27 reserves. Relevant 2021 Census data can be found in Table 6-83. According to the 2021 Census, employment income accounted for 57.0% of total income on Mani-Utenam reserve (67.0% for men+ and

46.8% for women+), a 7.7% decrease from 2016 for men+ and a 7.0% decrease from 2016 for women+; and 50.8% of total income on Uashat 27 reserve (60.0% for men+ and 43.6% for women+), a 12.2% decrease from 2016 for men+ and a 8.1% decrease from 2016 for women+ (Statistics Canada, 2022e, 2022j). Government transfers accounted for 36.0% of total income on Mani-Utenam reserve (25.8% for men+ and 46.4% for women+), a 4.8% increase over 2016 for men+ and a 5.4% increase over 2016 for women+; and 41.2% of total income on Uashat 27 reserve (31.4% for men+ and 48.8% for women+), a 9.9% increase over 2016 for men+ and a 2.9% increase over 2016 for women+ (Statistics Canada, 2022e, 2022j).

Table 6-83: Innu Takuaikan Uashat mak Mani-Utenam Income Composition, 2021

	2021			2016			Change from 2016 to 2021		
Income Composition	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
MANI-UTENAM RESERVE									
Market Income (%)	64.0	74.0	53.2	69.4	79.5	58.6	-5.4	-5.5	-5.4
Employment Income (%)	57.0	67.0	46.8	65.5	74.7	53.8	-8.5	-7.7	-7.0
Government Transfers (%)	36.0	25.8	46.4	30.4	21.0	41.0	5.6	4.8	5.4
UASHAT 27 RESERVE									
Market Income (%)	59.0	68.5	51.2	65.9	77.7	54.2	-6.9	-9.2	-3.0
Employment Income (%)	50.8	60.0	43.6	62.4	72.2	51.7	-11.6	-12.2	-8.1
Government Transfers (%)	41.2	31.4	48.8	33.8	21.5	45.9	7.4	9.9	2.9

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017e, 2017j, 2022e, 2022j)

Employment Income

The 2021 Census presents employment income statistics from respondents on Mani-Utenam and Uashat 27 reserves. Relevant 2021 Census data can be found in Table . According to the 2021 Census, the median employment income on Mani-Utenam reserve was $46,400 for full-year full-time men+ workers, a 2.7% increase over 2016, and $33,200 for full-year full-time women+ workers, a 7.0% decrease from 2016; the median employment income on Uashat 27 reserve was $45,200 for full-year full-time men+ workers, an 8.8% decrease from 2016, and $39,200 for full-year full-time women+ workers, a 6.2% increase over 2016 (Statistics Canada, 2017e, 2017j, 2022e, 2022j). In the 2021 Census, the average employment income on Mani-Utenam reserve was $61,000 for full-year full-time men+ workers, a 0.5% decrease from 2016, and $36,000 for full-year full-time women+ workers, a 6.1% decrease from 2016; the average employment income on Uashat 27 reserve was $57,000 for full-year full-time men+ workers, a 12.8% increase over 2016, and $43,000 for full-year full-time women+ workers, an 11.0% increase over 2016 (Statistics Canada, 2017e, 2017j, 2022e, 2022j).

Table 6-84: Innu Takuaikan Uashat mak Mani-Utenam Income Statistics, 2021

Income Statistics	2021			2016			Change from 2016 to 2021		
	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
MANI-UTENAM RESERVE									
Number of employment income recipients (aged 15 years and over in private households who worked full year full time in 2020)	310	170	145	210	95	115	47.6	78.9	26.1
Median employment income in 2020 (Full-year full-time workers) ($)	39,600	46,400	33,200	40,533	45,184	35,712	-2.3	2.7	-7.0
Average employment income in 2020 (Full-year full-time workers) ($)	49,200	61,000	36,000	48,910	61,283	38,321	0.6	-0.5	-6.1
UASHAT 27 RESERVE									
Number of employment income recipients (aged 15 years and over in private households who worked full year full time in 2020)	240	110	130	175	90	90	37.1	22.2	44.4
Median employment income in 2020 (Full-year full-time workers) ($)	40,000	45,200	39,200	42,624	49,536	36,928	-6.2	-8.8	6.2
Average employment income in 2020 (Full-year full-time workers) ($)	49,200	57,000	43,000	44,604	50,542	38,732	10.3	12.8	11.0

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017e, 2017j, 2022e, 2022j)

6.3.2.2 Economic Sector Overview

The sections below provide an overview of the ITUM's economic sector, including forestry and construction projects, tourism initiatives and activities, and a goods and services profile.

6.3.2.2.1 Forestry

No information regarding forestry was available from secondary sources at the time of desktop research.

6.3.2.2.2 Construction

The Residential Development and Storm Outfall Construction, Mani-Utenam, project proposes the development of a new residential area and storm sewer on Mani-Utenam reserve (IAAC, 2023c). In July 2023, the IAAC and Indigenous Services Canada issued a Notice of Determination for the project, stating that the project is "not likely to cause significant adverse environmental effects" (IAAC, 2023a). The Construction of 150 Housing Units and Supporting Infrastructures project proposes the construction of 100 housing units on Uashat 27 reserve and 50 units on Mani-Utenam reserve, in addition to supporting infrastructure such as streets, water, and sewer services (IAAC, 2022a). In April 2022, the IAAC, the Canada Mortgage and Housing Corporation (CMHC), and Indigenous Services Canada issued a Notice of Determination for the project, stating that the project is "not likely to cause significant adverse environmental effects" (IAAC, 2022b).

6.3.2.2.3 Tourism

Destination Sept-Îles Nakauinanu, incorporated in 2007, promotes Ville de Sept-Îles, the community of Uashat mak Mani-Utenam, and its surroundings, as a stopover for international cruise lines (SDEUM, 2022a). Société de développement économique Uashat mak Mani-Utenam (SDEUM) is developing "glamping" sites in the vicinity of Mani-Utenam reserve (SDEUM, 2022b).

6.3.2.2.4 Goods and Services Profile

The ITUM community specializes in commercial fishing (Agence Mamu Innu Kaikusseht, n.d.). ITUM's commercial fishing activities are managed by Pêcheries Uapan, a commercial fishing management company within the Société de développement économique Uashat mak Mani-Utenam (Agence Mamu Innu Kaikusseht, n.d.). There are approximately 50 businesses between the two ITUM reserves, including a convenience store, shopping centre, beautician, landscaping company, and more (Nametau Innu, n.d.-a, n.d.-c). A museum, Musée Shaputuan, was founded in 1998 (Nametau Innu, n.d.-a, n.d.-c).

6.3.3 La Nation Innu Matimekush-Lac John

6.3.3.1 Labour Force Characteristics

The sections below provide an overview of the labour force characteristics for the NIMLJ, including participation and unemployment rates, labour supply, and income statistics.

6.3.3.1.1 Participation and Unemployment Rates

The 2021 Census presents labour force statistics from respondents on Matimekush reserve. Relevant 2021 Census data can be found in Table 6-85. According to the 2021 Census, the labour force participation rate was 60.9% total (66.7% for men+ and 55.3% for women+), a 9.6% increase over 2016 for men+ and a 5.3% increase over 2016 for women+ (Statistics Canada, 2017f, 2022f). The unemployment rate in 2021 was 11.3% total (15.4% for men+ and 7.7% for women+), a 26.3% decrease from 2016 for men+ and a 17.3% decrease from 2016 for women+ (Statistics Canada, 2017f, 2022f).

Table 6-85: La Nation Innu Matimekush-Lac John Labour Force Status, 2021

	2021			2016			Change from 2016 to 2021		
Labour Force Status	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Population 15+ Years	435	195	235	450	210	240	-3.3	-7.1	-2.1
In the labour force	265	130	130	240	120	120	10.4	8.3	8.3
Employed	235	115	120	160	70	85	46.9	64.3	41.2
Unemployed	30	20	10	80	50	30	-62.5	-60.0	-66.7
Not in the labour force	170	65	105	210	90	120	-19.0	-27.8	-12.5
Participation rate (%)	60.9	66.7	55.3	53.3	57.1	50.0	7.6	9.6	5.3
Employment rate (%)	54.0	59.0	51.1	35.6	33.3	35.4	18.4	25.7	15.7
Unemployment rate (%)	11.3	15.4	7.7	33.3	41.7	25.0	-22.0	-26.3	-17.3

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017f, 2022f)

6.3.3.1.2 Labour Supply

The 2021 Census presents labour supply statistics from respondents on Matimekush reserve. Figure 6-9 illustrates the 2021 Census breakdown of the on-reserve workforce by industry. According to the 2021 Census, public administration was the dominant industry for men+ and women+ (Statistics Canada, 2022f).

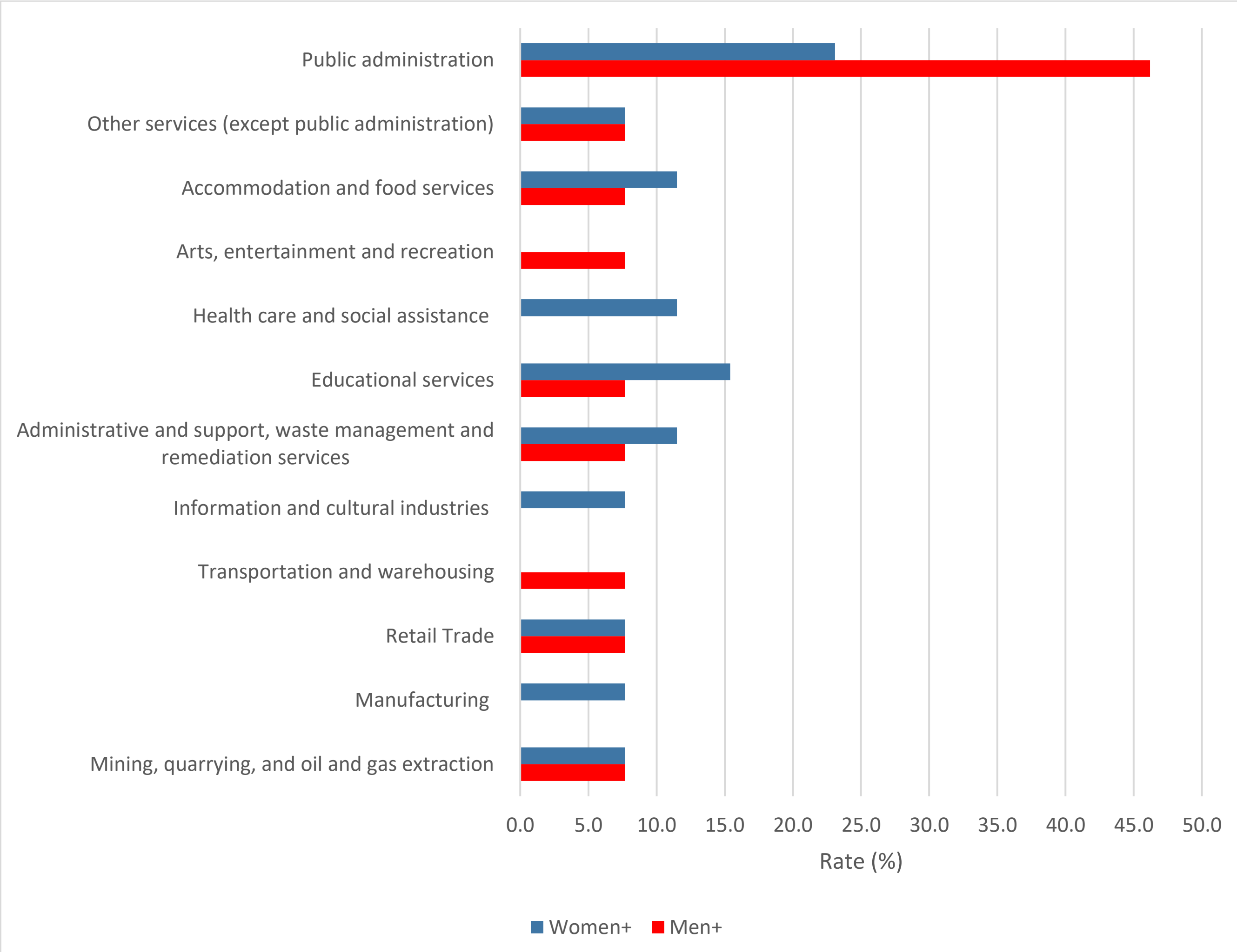

Figure 6-9: La Nation Innu Matimekush-Lac John Workforce by Industry, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022f)

Table 6-86: La Nation Innu Matimekush-Lac John Workforce by Industry, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Agriculture, forestry, fishing and hunting	0.0	0.0	0.0	4.2	8.3	0.0	-4.2	-8.3	0.0
Mining, quarrying, and oil and gas extraction	7.5	7.7	7.7	4.2	8.3	8.3	3.3	-0.6	-0.6
Utilities	0.0	0.0	0.0	4.2	0.0	0.0	-4.2	0.0	0.0

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Construction	0.0	0.0	0.0	6.3	8.3	0.0	-6.3	-8.3	0.0
Manufacturing	3.8	0.0	7.7	0.0	0.0	0.0	3.8	0.0	7.7
Wholesale Trade	0.0	0.0	0.0	4.2	8.3	0.0	-4.2	-8.3	0.0
Retail Trade	5.7	7.7	7.7	4.2	0.0	0.0	1.5	7.7	7.7
Transportation and warehousing	5.7	7.7	0.0	10.4	16.7	8.3	-4.7	-9.0	-8.3
Information and cultural industries	5.7	0.0	7.7	0.0	0.0	0.0	5.7	0.0	7.7
Finance and insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real estate and rental leasing	0.0	0.0	0.0	0.0	0.0	8.3	0.0	0.0	-8.3
Professional, scientific and technical services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and support, waste management and remediation services	5.7	7.7	11.5	4.2	8.3	0.0	1.5	-0.6	11.5
Educational services	9.4	7.7	15.4	16.7	12.5	25.0	-7.3	-4.8	-9.6
Health care and social assistance	5.7	0.0	11.5	8.3	0.0	16.7	-2.6	0.0	-5.2
Arts, entertainment and recreation	0.0	7.7	0.0	4.2	0.0	8.3	-4.2	7.7	-8.3
Accommodation and food services	5.7	7.7	11.5	6.3	8.3	8.3	-0.6	-0.6	3.2
Other services (except public administration)	3.8	7.7	7.7	6.3	8.3	8.3	-2.5	-0.6	-0.6
Public administration	32.1	46.2	23.1	16.7	16.7	16.7	15.4	29.5	6.4

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017f, 2022f)

Figure 6-10 illustrates the 2021 Census breakdown of the on-reserve workforce by occupation. According to the 2021 Census, trades, transport and equipment operators, and related occupations was the dominant occupation category for men+, while sales and service occupations was the dominant occupation category for women+ (Statistics Canada, 2022f).

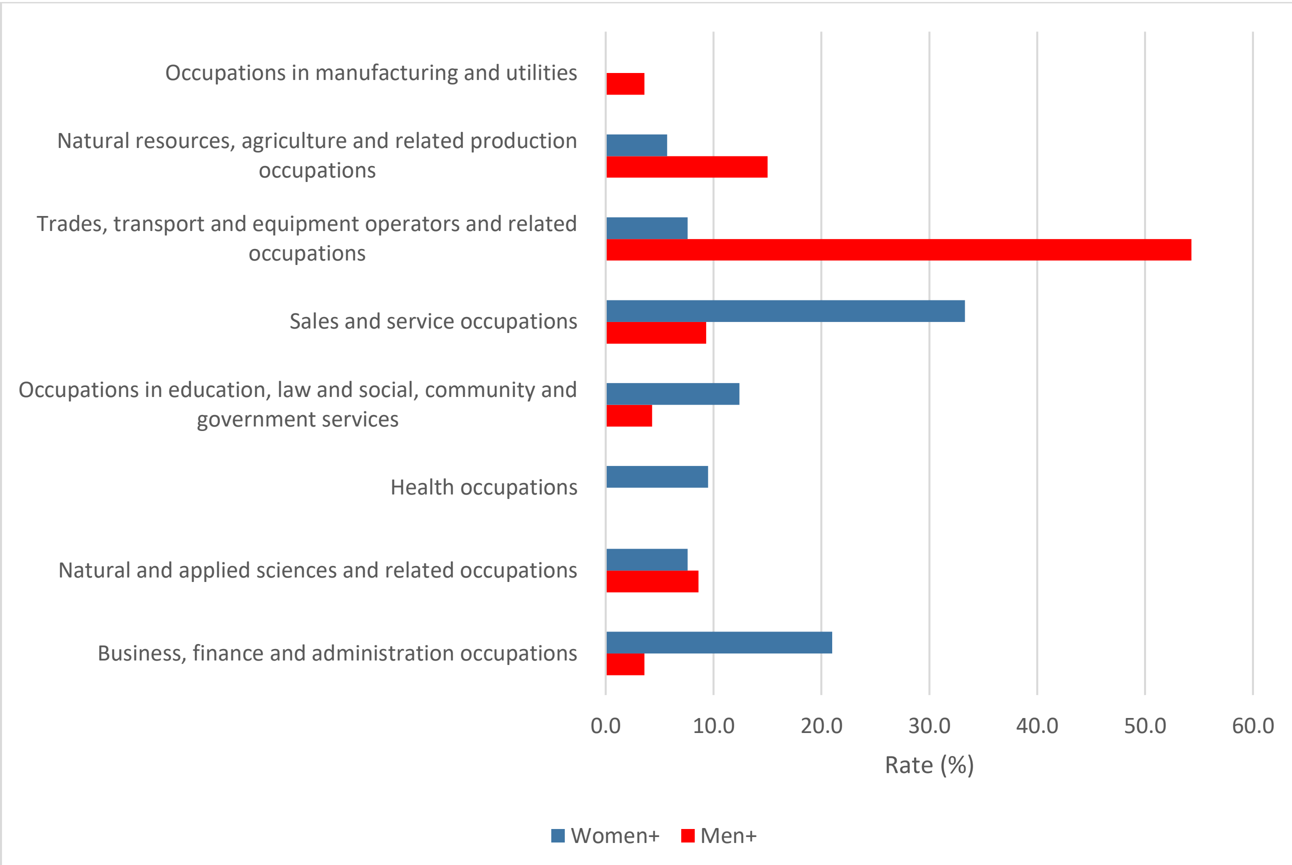

Figure 6-10: La Nation Innu Matimekush-Lac John Workforce by Occupation, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022f)

Table 6-87: La Nation Innu Matimekush-Lac John Workforce by Occupation, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Occupation	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Legislative and senior management occupations	3.8	0.0	7.7	0.0	0.0	8.3	3.8	0.0	-0.6
Business, finance and administration occupations	5.7	0.0	7.7	12.5	0.0	20.8	-6.8	0.0	-13.1

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Occupation	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Natural and applied sciences and related occupations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Health occupations	7.5	0.0	7.7	0.0	0.0	0.0	7.5	0.0	7.7
Occupations in education, law and social, community and government services	18.9	0.0	34.6	20.8	12.5	29.2	-1.9	-12.5	5.4
Occupations in art, culture, recreation and sport	5.7	7.7	7.7	4.2	0.0	0.0	1.5	7.7	7.7
Sales and service occupations	26.4	26.9	26.9	31.3	33.3	29.2	-4.9	-6.4	-2.3
Trades, transport and equipment operators and related occupations	24.5	46.2	7.7	18.8	33.3	8.3	5.7	12.9	-0.6
Natural resources, agriculture and related production occupations	3.8	0.0	7.7	4.2	8.3	0.0	-0.4	-8.3	7.7
Occupations in manufacturing and utilities	3.8	7.7	0.0	0.0	0.0	0.0	3.8	7.7	0.0

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017f, 2022f)

6.3.3.1.3 Income

Sources of Income

The 2021 Census presents income composition statistics from respondents on Matimekush reserve. Relevant 2021 Census data can be found in Table 6-88. According to the 2021 Census, employment income accounted for 66.5% of total income on Matimekush reserve (74.0% for men+ and 61.0% for women+), a 8.8% decrease from 2016 for men+ and an 2.1% decrease from 2016 for women+ (Statistics Canada, 2017f, 2022f). Government transfers accounted for 33.6% of total income on Matimekush reserve (26.8% for men+ and 39.0% for women+), a 10.9% increase over 2016 for men+ and a 2.1% increase over 2016 for women+ (Statistics Canada, 2017f, 2022f).

Table 6-88: La Nation Innu Matimekush-Lac John Income Composition, 2021

	2021			2016			Change from 2016 to 2021		
Income Composition	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Market Income (%)	66.5	74.0	61.0	73.7	82.8	63.1	-7.2	-8.8	-2.1
Employment Income (%)	56.0	64.0	50.0	69.1	82.2	58.6	-13.1	-18.2	-8.6
Government Transfers (%)	33.6	26.8	39.0	26.8	15.9	36.9	6.8	10.9	2.1

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017f, 2022f)

Employment Income

The 2021 Census presents employment income statistics from respondents on Matimekush reserve. Relevant 2021 Census data is presented in in Table 6-89. According to the 2021 Census, the median employment income was $43,600 for full-year full-time men+ workers, an 11.5% decrease from 2016, and $38,800 for full-year full-time women+ workers, a 2.5% increase over 2016 (Statistics Canada, 2017f, 2022f). In the 2021 Census, the average employment income was $40,000 for full-year full-time men+ workers, a 17.2% decrease from 2016, and $50,000 for full-year full-time women+ workers, a 26.8% increase over 2016 (Statistics Canada, 2017f, 2022f).

Table 6-89: La Nation Innu Matimekush-Lac John Income Statistics, 2021

	2021			2016			Change from 2016 to 2021		
Income Statistics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Number of employment income recipients (aged 15 years and over in private households who worked full year full time in 2020)	135	75	65	110	50	60	22.7	50.0	8.3
Median employment income in 2020 (Full-year full-time workers) ($)	41,600	43,600	38,800	41,344	49,280	37,845	0.6	-11.5	2.5

	2021			2016			Change from 2016 to 2021		
Income Statistics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Average employment income in 2020 (Full-year full-time workers) ($)	45,000	40,000	50,000	43,660	48,306	39,422	3.1	-17.2	26.8

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017f, 2022f)

6.3.3.2 Economic Sector Overview

The sections below provide an overview of the NIMLJ's economic sector, including forestry and construction projects, tourism initiatives and activities, and a goods and services profile.

6.3.3.2.1 Forestry

No information regarding forestry was available from secondary sources at the time of desktop research.

6.3.3.2.2 Construction

The Réhabilitation des rues, drainage, développement de lots résidentiels et résidences pour professionnels en éducation à Matimekush-Lac John project proposes the rehabilitation of a roadway, the design of a drainage network, and the development of new residential lots and residences (IAAC, 2022d). In October 2022, the IAAC and Indigenous Services Canada issued a Notice of Determination for the project, stating that the project is "not likely to cause significant adverse environmental effects" (IAAC, 2022c).

6.3.3.2.3 Tourism

The municipalité régionale de comté (MRC) de Caniapiscau promotes tourism in La Nation Innu Matimekush-Lac John and the Naskapi Nation of Kawawachikamach, and the towns of Fermont and Schefferville. Regionally, the MCR de Caniapiscau promotes outdoor recreation activities, with views of the Northern Lights (MRC de Caniapiscau, 2023f).

6.3.3.2.4 Goods and Services Profile

The Corporation de développement économique Matimekush-Lac John is responsible for economic development for the community (Nametau Innu, n.d.-b). Matimekush reserve has approximately 10 businesses, including a convenience store, pharmacy, auto mechanic, and gas station (Nametau Innu, n.d.-b).

6.3.4 Naskapi Nation of Kawawachikamach

6.3.4.1 Labour Force Characteristics

The sections below provide an overview of the labour force characteristics for the NNK, including participation and unemployment rates, labour supply, and income statistics.

6.3.4.1.1 Participation and Unemployment Rates

The 2021 Census presents labour force statistics from respondents on Kawawachikamach reserve. Relevant 2021 Census data can be found in Table 6-90. According to the 2021 Census, the labour force participation rate was 52.2% total (48.9% for men+ and 53.2% for women+), a 12.5% decrease from 2016 for men+ and a 2.6% decrease from 2016 for women+ (Statistics Canada, 2017c, 2022c). The unemployment rate in 2021 was 10.4% total (13.0% for men+ and 8.0% for women+), a 24.0% decrease from 2016 for men+ and a 12.8% decrease from 2016 for women+ (Statistics Canada, 2017c, 2022c).

Table 6-90: Naskapi Nation of Kawawachikamach Labour Force Status, 2021

	2021			2016			Change from 2016 to 2021		
Labour Force Status	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Population 15+ Years	460	235	235	435	220	215	5.7	6.8	9.3
In the labour force	240	115	125	255	135	120	-5.9	-14.8	4.2
Employed	220	100	120	180	85	95	22.2	17.6	26.3
Unemployed	25	15	10	75	50	25	-66.7	-70.0	-60.0
Not in the labour force	220	120	110	180	85	90	22.2	41.2	22.2
Participation rate (%)	52.2	48.9	53.2	58.6	61.4	55.8	-6.4	-12.5	-2.6
Employment rate (%)	47.8	42.6	51.1	41.4	38.6	44.2	6.4	4.0	6.9
Unemployment rate (%)	10.4	13.0	8.0	29.4	37.0	20.8	-19.0	-24.0	-12.8

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017c, 2022c)

6.3.4.1.2 Labour Supply

The 2021 Census presents labour supply statistics from respondents on Kawawachikamach reserve. Figure 6-11 illustrates the 2021 Census breakdown of the on-reserve workforce by industry. According to the 2021 Census, public administration, followed by transportation and warehousing, was the dominant industry for men+, while public administration and health care and social assistance were the dominant industries for women+ (Statistics Canada, 2022c).

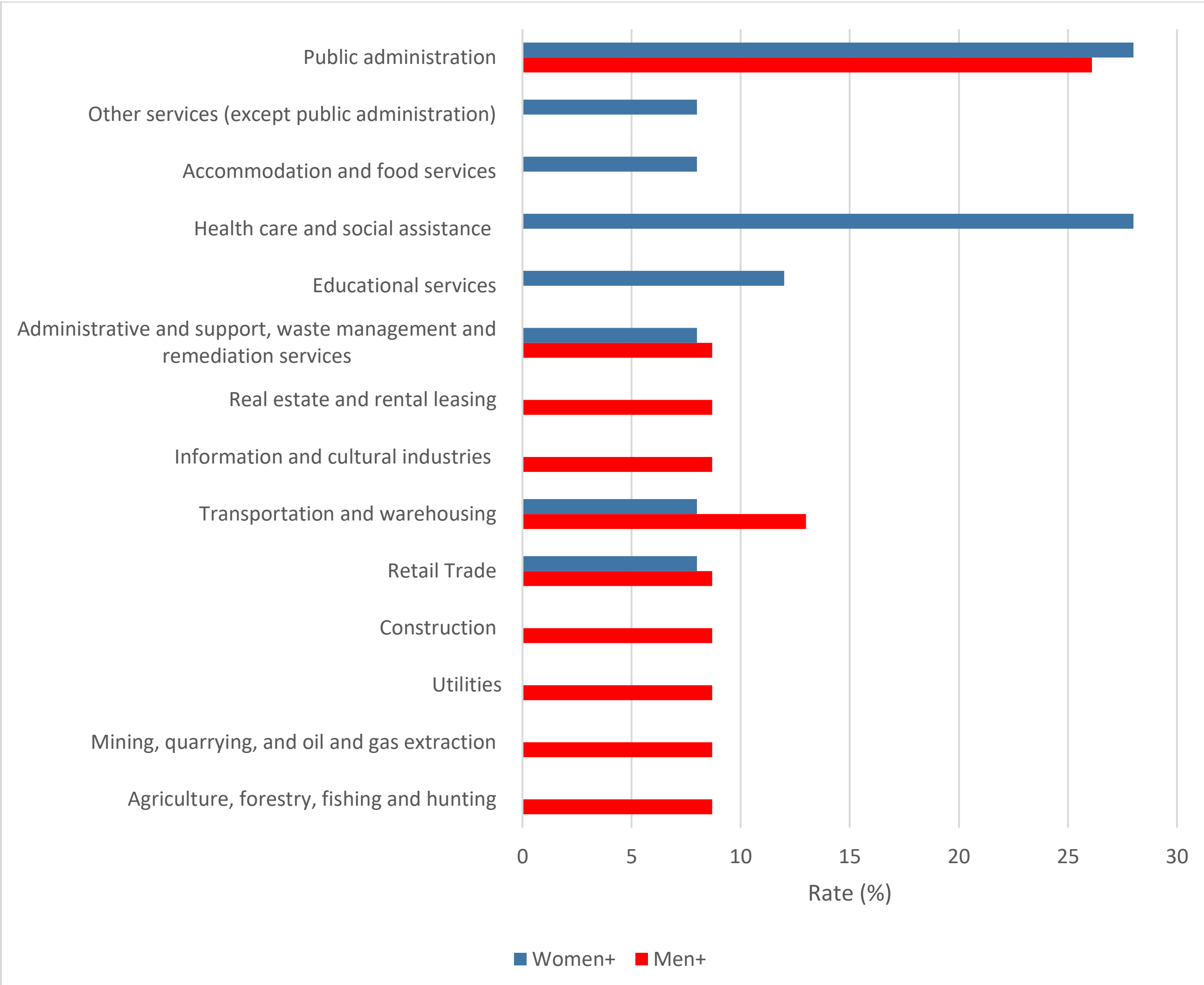

Figure 6-11: Naskapi Nation of Kawawachikamach Workforce by Industry, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022c)

Table 6-91: Naskapi Nation of Kawawachikamach Workforce by Industry, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Agriculture, forestry, fishing and hunting	4.2	8.7	0.0	0.0	0.0	0.0	4.2	8.7	0.0
Mining, quarrying, and oil and gas extraction	4.2	8.7	0.0	7.8	11.1	0.0	-3.6	-2.4	0.0

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Utilities	4.2	8.7	0.0	0.0	0.0	0.0	4.2	8.7	0.0
Construction	4.2	8.7	0.0	7.8	14.8	8.3	-3.6	-6.1	-8.3
Manufacturing	0.0	0.0	0.0	0.0	7.4	0.0	0.0	-7.4	0.0
Wholesale Trade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Retail Trade	8.3	8.7	8.0	5.9	7.4	0.0	2.4	1.3	8.0
Transportation and warehousing	8.3	13.0	8.0	0.0	7.4	0.0	8.3	5.6	8.0
Information and cultural industries	4.2	8.7	0.0	3.9	0.0	0.0	0.3	8.7	0.0
Finance and insurance	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Real estate and rental leasing	4.2	8.7	0.0	0.0	7.4	0.0	4.2	1.3	0.0
Professional, scientific and technical services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and support, waste management and remediation services	4.2	8.7	8.0	3.9	7.4	8.3	0.3	1.3	-0.3
Educational services	8.3	0.0	12.0	7.8	0.0	12.5	0.5	0.0	-0.5
Health care and social assistance	14.6	0.0	28.0	13.7	7.4	20.8	0.9	-7.4	7.2
Arts, entertainment and recreation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Accommodation and food services	4.2	0.0	8.0	0.0	0.0	0.0	4.2	0.0	8.0
Other services (except public administration)	6.3	0.0	8.0	0.0	7.4	8.3	6.3	-7.4	-0.3
Public administration	27.1	26.1	28.0	27.5	25.9	33.3	-0.4	0.2	-5.3

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017c, 2022c)

Figure 6-12 illustrates the 2021 Census breakdown of the on-reserve workforce by occupation. According to the 2021 Census, trades, transport and equipment operators, and related occupations was the dominant occupation category for men+, while occupations in education, law, and social, community, and government services was the dominant occupation category for women+ (Statistics Canada, 2022c).

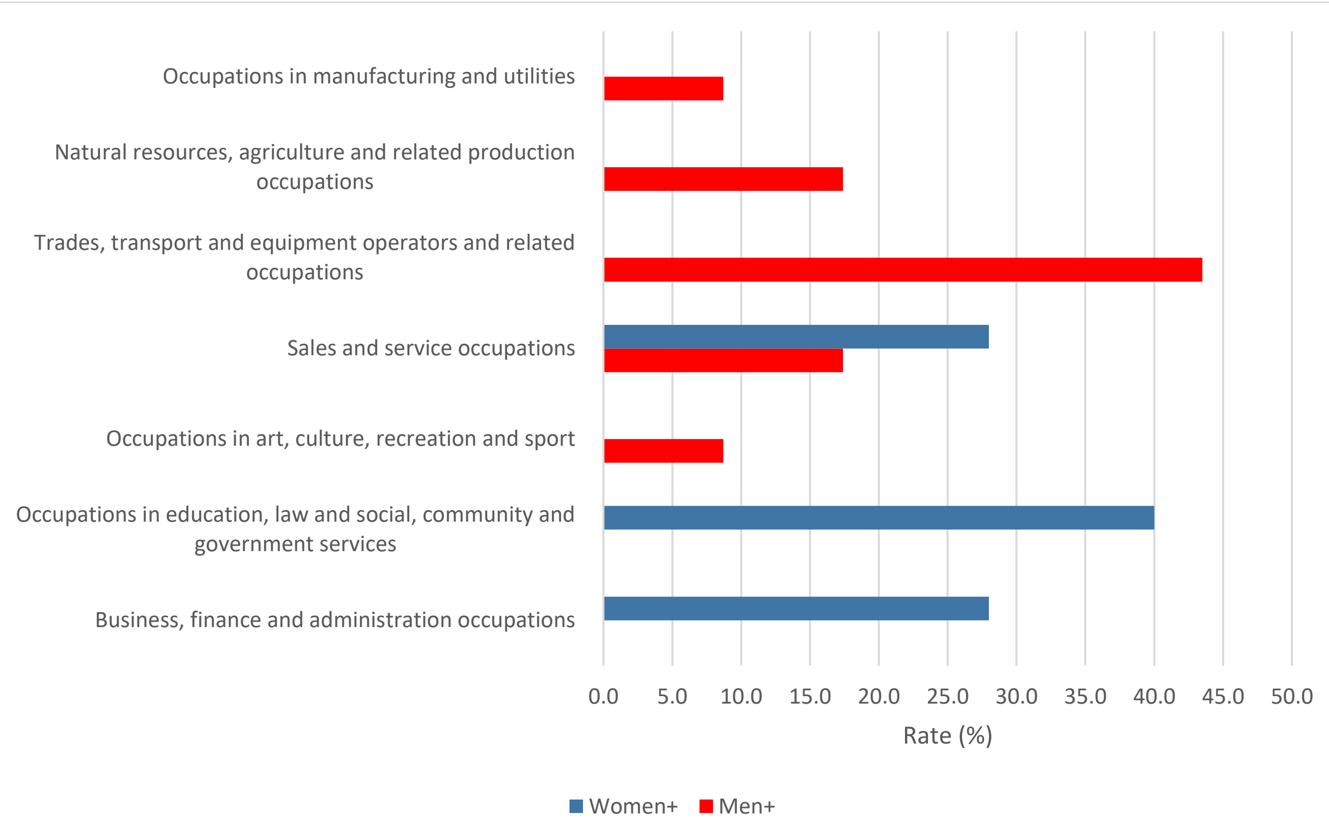

Figure 6-12: Naskapi Nation of Kawawachikamach Workforce by Occupation, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022c)

Table 6-92: Naskapi Nation of Kawawachikamach Workforce by Occupation, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Occupation	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Legislative and senior management occupations	0.0	0.0	0.0	5.9	7.4	8.3	-5.9	-7.4	-8.3

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Occupation	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Business, finance and administration occupations	14.6	0.0	28.0	15.7	7.4	29.2	-1.1	-7.4	-1.2
Natural and applied sciences and related occupations	0.0	0.0	0.0	0.0	7.4	0.0	0.0	-7.4	0.0
Health occupations	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Occupations in education, law and social, community and government services	22.9	0.0	40.0	15.7	11.1	25.0	7.2	-11.1	15.0
Occupations in art, culture, recreation and sport	4.2	8.7	0.0	5.9	0.0	0.0	-1.7	8.7	0.0
Sales and service occupations	20.8	17.4	28.0	19.6	18.5	20.8	1.2	-1.1	7.2
Trades, transport and equipment operators and related occupations	22.9	43.5	0.0	17.6	29.6	0.0	5.3	13.9	0.0
Natural resources, agriculture and related production occupations	8.3	17.4	0.0	3.9	7.4	0.0	4.4	10.0	0.0
Occupations in manufacturing and utilities	4.2	8.7	0.0	5.9	7.4	0.0	-1.7	1.3	0.0

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017c, 2022c)

6.3.4.1.3 Income

Sources of Income

The 2021 Census presents income composition statistics from respondents on Kawawachikamach reserve. Relevant 2021 Census data can be found in Table 6-93. According to the 2021 Census, employment income accounted for 66.0% of total income on Kawawachikamach reserve (74.0% for men+ and 60.0% for women+), a 14.9% decrease from 2016 for men+ and an 5.6% decrease from 2016 for women+ (Statistics Canada, 2017c, 2022c). Government transfers accounted for 26.8% of total income on Kawawachikamach reserve (20.8% for men+ and 32.0% for women+), a 11.3% increase over 2016 for men+ and a 0.5% decrease from 2016 for women+ (Statistics Canada, 2017c, 2022c).

Table 6-93: Naskapi Nation of Kawawachikamach Income Composition, 2021

2021				2016			Change from 2016 to 2021		
Income Composition	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Market Income (%)	73.0	79.0	68.0	79.7	91.8	67.0	-6.7	-12.8	1.0
Employment Income (%)	66.0	74.0	60.0	76.9	88.9	65.6	-10.9	-14.9	-5.6
Government Transfers (%)	26.8	20.8	32.0	20.0	9.5	32.5	6.8	11.3	-0.5

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017c, 2022c)

Employment Income

The 2021 Census presents employment income statistics from respondents on Kawawachikamach reserve. Relevant 2021 Census data can be found in Table 6-94. According to the 2021 Census, the median employment income was $69,500 for full-year full-time men+ workers, a 14.6% increase over 2016, and $48,800 for full-year full-time women+ workers, a 36.6% increase over 2016 (Statistics Canada, 2017c, 2022c). In the 2021 Census, the average employment income was $68,000 for full-year full-time men+ workers, a 13.3% increase over 2016, and $44,000 for full-year full-time women+ workers, a 10.8% decrease from 2016 (Statistics Canada, 2017c, 2022c).

Table 6-94: Naskapi Nation of Kawawachikamach Income Statistics, 2021

2021				2016			Change from 2016 to 2021		
Income Statistics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Number of employment income recipients (aged 15 years and over in private households who worked full year full time in 2020)	140	65	75	115	55	60	21.7	18.2	25.0

	2021			2016			Change from 2016 to 2021		
Income Statistics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Median employment income in 2020 (Full-year full-time workers) ($)	51,200	69,500	48,800	43,072	60,672	35,712	18.9	14.6	36.6
Average employment income in 2020 (Full-year full-time workers) ($)	56,000	68,000	44,000	49,957	60,016	39,722	12.1	13.3	10.8

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017c, 2022c)

6.3.4.2 *Economic Sector Overview*

The sections below provide an overview of the NNK's economic sector, including forestry and construction projects, tourism initiatives and activities, and a goods and services profile.

6.3.4.2.1 Forestry

No information was available from secondary sources at the time of desktop research.

6.3.4.2.2 Construction

Naskapi Civil Works is a Naskapi Nation majority-owned partnership, active in civil construction, mining development, and heavy equipment rentals in Ville de Fermont and the Town of Labrador City (Naskapi Nation of Kawawachikamach, 2022a).

6.3.4.2.3 Tourism

According the Province of Québec's Nation profile, adventure tourism is a key economic activity for the Naskapi Nation of Kawawachikamach (Gouvernement du Québec, n.d.). Indigenous Tourism Québec reports that Naskapi Nation community members apply traditional knowledge to hunting, fishing, and tourist expeditions within the Naskapi's traditional territory (Indigenous Tourism Quebec, n.d.). The MRC de Caniapiscau promotes tourism in the Naskapi Nation of Kawawachikamach and La Nation Innu Matimekush-Lac John, and the towns of Fermont and Schefferville. Regionally, the MCR de Caniapiscau promotes outdoor recreation activities, with views of the Northern Lights (MRC de Caniapiscau, 2023f).

6.3.4.2.4 Goods and Services Profile

According the Province of Québec's Nation profile, the Naskapi Nation of Kawawachikamach's main economic activities include fur trapping and arts and crafts (Gouvernement du Québec, n.d.). Naskapi Nation-owned businesses, commercial partnerships, and ventures from the Naskapi Development Corporation include, but are not limited to:

- Sichuun, a telecommunications company;

- Naskapi Adoschaouna Services, a transportation company;
- Tshiuentin Rail Transportation, partnership between the Naskapi Nation and the Innu communities, providing passenger rail and freight transportation between Ville de Sept-Îles and Ville de Schefferville;
- Pimi Naskinnuk, a partnership between the Naskapi Nation and the Innu and Inuit communities, providing fuel to Schefferville;
- Beton Naskinnu, a concrete supplier; and
- Manikin Center, a grocery store on Kawawachikamach reserve (Naskapi Nation of Kawawachikamach, 2022a).

6.3.5 NunatuKavut Community Council

6.3.5.1 Labour Force Characteristics

The sections below provide an overview of the labour force characteristics for the NCC, including participation and unemployment rates, labour supply, and income statistics.

6.3.5.1.1 Participation and Unemployment Rates

The 2021 Census presents labour force statistics for self-identified Inuit individuals living in Census Division No. 10, Newfoundland and Labrador. Relevant 2021 Census data can be found in Table 6-95. According to the 2021 Census, the labour force participation rate was 64.1% total (64.5% for men+ and 63.6% for women+), a 3.6% decrease from 2016 for men+ and a 0.7% increase over 2016 for women+ (Statistics Canada, 2017a, 2022a). The unemployment rate in 2021 was 14.1% total (20.3% for men+ and 8.1% for women+), a 3.9% increase over 2016 for men+ and a 2.5% decrease from 2016 for women+ (Statistics Canada, 2017a, 2022a).

Table 6-95: Labour Force Status, Self-Identified Inuit Identity, Census Division No. 10, Newfoundland and Labrador, 2021

	2021			2016			Change from 2016 to 2021		
Labour Force Status	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Population 15+ Years	2,495	1,225	1,265	2,060	940	1,120	21.1	30.3	12.9
In the labour force	1,600	790	805	1,345	640	705	19.0	23.4	14.2
Employed	1,370	630	745	1,170	540	630	17.1	16.7	18.3
Unemployed	225	160	65	175	105	75	28.6	52.4	-13.3
Not in the labour force	895	435	465	715	300	415	25.2	45.0	12.0
Participation rate (%)	64.1	64.5	63.6	65.3	68.1	62.9	-1.2	-3.6	0.7
Employment rate (%)	54.9	51.4	58.9	56.8	57.4	56.2	-1.9	-6.0	2.7
Unemployment rate (%)	14.1	20.3	8.1	13.0	16.4	10.6	1.1	3.9	-2.5

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017a, 2022a)

6.3.5.1.2 Labour Supply

The 2021 Census presents labour supply statistics for self-identified Inuit individuals living in Census Division No. 10, Newfoundland and Labrador. Figure 6-13 illustrates the 2021 Census breakdown of the workforce by industry. According to the 2021 Census, mining, quarrying, and oil and gas extraction, followed by public administration, was the dominant industry for men+, while health care and social assistance, followed by public administration, was the dominant industry for women+ (Statistics Canada, 2022a).

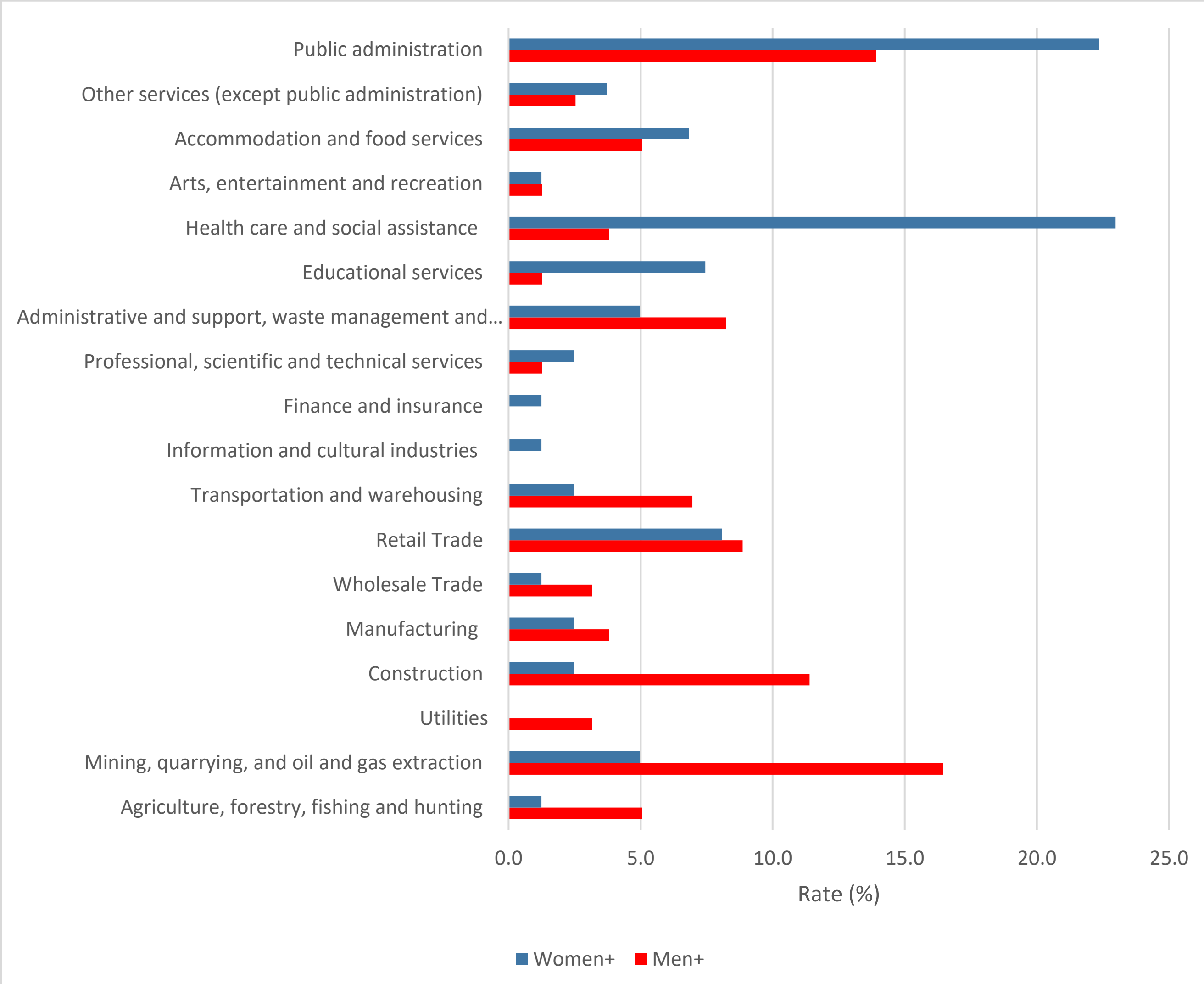

Figure 6-13: Workforce by Industry, Self-Identified Inuit Identity, Census Division No. 10, Newfoundland and Labrador, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022a)

Table 6-96: Workforce by Industry, Self-Identified Inuit Identity, Census Division No. 10, Newfoundland and Labrador, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Agriculture, forestry, fishing and hunting	3.1	5.1	1.2	1.1	1.6	1.4	2.0	3.5	-0.2

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Industry	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Mining, quarrying, and oil and gas extraction	10.6	16.5	5.0	7.0	11.7	2.9	3.6	4.7	2.1
Utilities	1.9	3.2	0.0	2.2	3.1	1.4	-0.3	0.0	-1.4
Construction	6.6	11.4	2.5	11.9	18.8	5.7	-5.3	-7.4	-3.2
Manufacturing	3.1	3.8	2.5	3.7	4.7	2.1	-0.6	-0.9	0.3
Wholesale Trade	2.2	3.2	1.2	1.1	1.6	0.0	1.1	1.6	1.2
Retail Trade	8.1	8.9	8.1	10.7	9.4	11.4	-2.6	-0.5	-3.4
Transportation and warehousing	4.4	7.0	2.5	5.2	7.8	2.1	-0.8	-0.9	0.3
Information and cultural industries	0.6	0.0	1.2	0.0	0.0	1.4	0.6	0.0	-0.2
Finance and insurance	0.6	0.0	1.2	0.7	0.0	1.4	-0.1	0.0	-0.2
Real estate and rental leasing	0.0	0.0	0.0	0.7	0.0	1.4	-0.7	0.0	-1.4
Professional, scientific and technical services	1.9	1.3	2.5	3.3	3.9	2.9	-1.5	-2.6	-0.4
Management of companies and enterprises	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Administrative and support, waste management and remediation services	6.9	8.2	5.0	4.1	4.7	3.6	2.8	3.5	1.4
Educational services	4.1	1.3	7.5	3.3	1.6	5.0	0.7	-0.3	2.5
Health care and social assistance	13.4	3.8	23.0	15.2	4.7	24.3	-1.7	-0.9	-1.3
Arts, entertainment and recreation	1.6	1.3	1.2	0.7	0.0	1.4	0.8	1.3	-0.2
Accommodation and food services	5.6	5.1	6.8	7.8	7.8	7.9	-2.2	-2.7	-1.0
Other services (except public administration)	3.1	2.5	3.7	5.9	4.7	6.4	-2.8	-2.2	-2.7
Public administration	18.1	13.9	22.4	13.3	9.4	17.1	4.8	4.5	5.2

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017a, 2022a)

Figure 6-14 illustrates the 2021 Census breakdown of the workforce by occupation. According to the 2021 Census, trades, transport and equipment operators, and related occupations was the dominant occupation category for men+, while sales and service occupations was the dominant occupation category for women+ (Statistics Canada, 2022a).

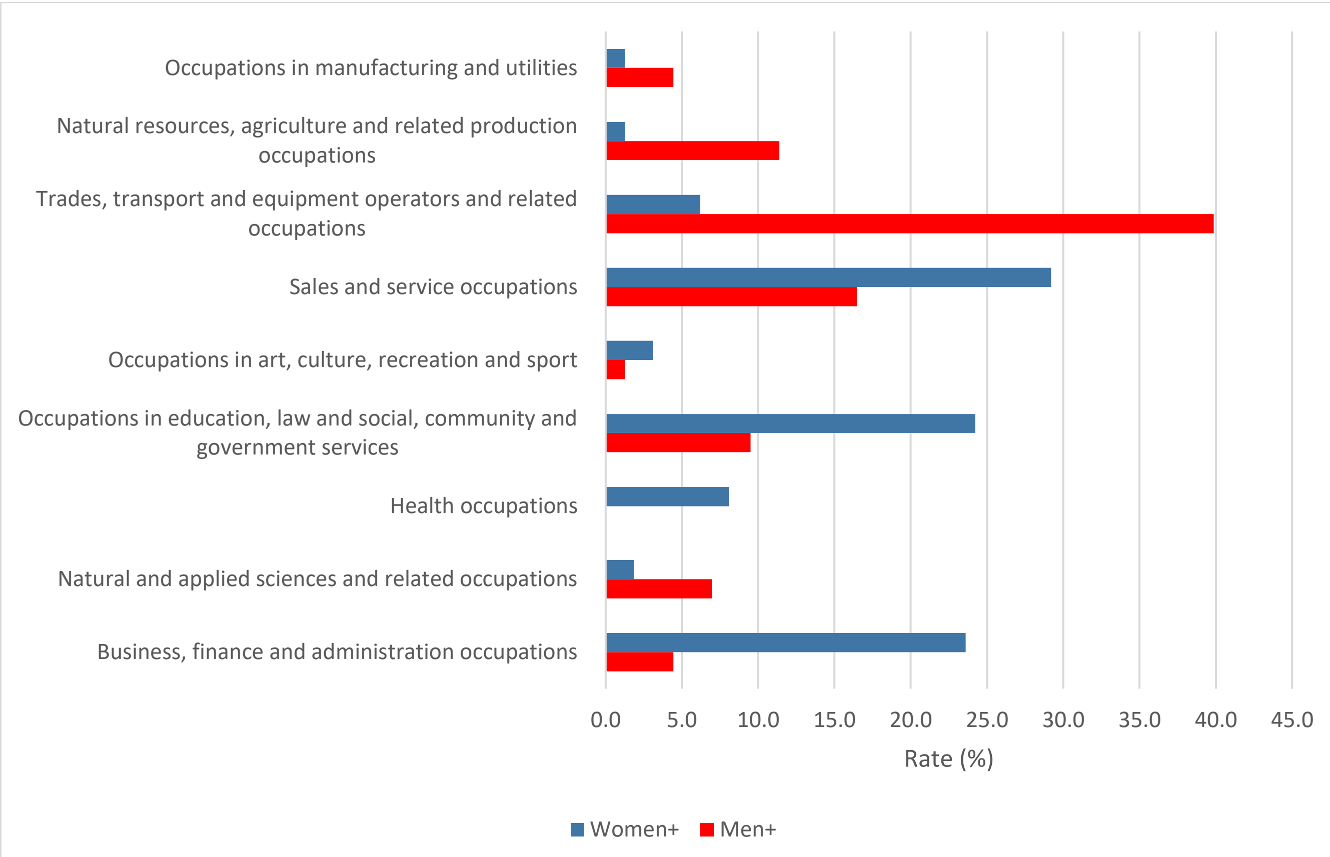

Figure 6-14: Workforce by Occupation, Self-Identified Inuit Identity, Census Division No. 10, Newfoundland and Labrador, 2021

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2022a)

Table 6-97: Workforce by Occupation, Self-Identified Inuit Identity, Census Division No. 10, Newfoundland and Labrador, 2021

Workforce by Industry, 2021				2016			Change from 2016 to 2021		
Workforce by Occupation	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Legislative and senior management occupations	0.6	0.0	0.0	6.7	6.2	7.1	-6.0	-6.2	-7.1
Business, finance and administration occupations	14.4	4.4	23.6	15.9	2.3	28.4	-1.6	2.1	-4.8
Natural and applied sciences and related occupations	5.0	7.0	1.9	3.3	5.4	2.1	1.7	1.5	-0.3
Health occupations	4.4	0.0	8.1	3.7	1.6	6.4	0.7	-1.6	1.7
Occupations in education, law and social, community and government services	16.9	9.5	24.2	13.3	5.4	20.6	3.5	4.1	3.7
Occupations in art, culture, recreation and sport	1.9	1.3	3.1	1.9	1.6	2.1	0.0	-0.3	1.0
Sales and service occupations	22.8	16.5	29.2	23.3	21.7	24.8	-0.5	-5.2	4.4
Trades, transport and equipment operators and related occupations	22.8	39.9	6.2	24.1	42.6	7.1	-1.3	-2.8	-0.9
Natural resources, agriculture and related production occupations	6.3	11.4	1.2	2.6	4.7	1.4	3.7	6.7	-0.2
Occupations in manufacturing and utilities	2.8	4.4	1.2	3.7	6.2	0.0	-0.9	-1.8	1.2

Note: The category "men+" in the 2021 Census includes men, as well as some non-binary persons. The category "women+" in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017d, 2022d)

6.3.5.1.3 Income

Sources of Income

The 2021 Census presents income composition statistics for self-identified Inuit individuals living in Census Division No. 10, Newfoundland and Labrador. Relevant 2021 Census data can be found in Table 6-98. According to the 2021 Census, employment income accounted for 74.2% of total income for self-identified Inuit people living in the Census division (76.8% for men+ and 71.2% for women+), a 6.8% decrease from 2016 for men+ and a 6.0% decrease from 2016 for women+ (Statistics Canada, 2017a, 2022a). Government transfers accounted for 17.9% of total income (16.5% for men+ and 19.6% for women+), an 7.6% increase over 2016 for men+ and a 4.2% increase over 2016 for women+ (Statistics Canada, 2017a, 2022a).

Table 6-98: Income Composition, Self-Identified Inuit Identity, Census Division No. 10, Newfoundland and Labrador, 2021

	2021			2016			Change from 2016 to 2021		
Income Composition	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Market Income (%)	82.0	83.6	80.4	88.3	91.1	84.6	-6.3	-7.5	-4.2
Employment Income (%)	74.2	76.8	71.2	81.0	83.6	77.2	-6.8	-6.8	-6.0
Government Transfers (%)	17.9	16.5	19.6	11.8	8.9	15.4	6.1	7.6	4.2

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017a, 2022a)

Employment Income

The 2021 Census presents employment income statistics for self-identified Inuit individuals living in Census Division No. 10, Newfoundland and Labrador. Relevant 2021 Census data can be found in Table 6-99. According to the 2021 Census, the median employment income was $88,000 for full-year full-time men+ workers, a 28.1% increase over 2016, and $56,400 for full-year full-time women+ workers, a 4.9% increase over 2016 (Statistics Canada, 2017a, 2022a). In the 2021 Census, the average employment income was $90,800 for full-year full-time men+ workers, a 20.6% increase over 2016, and $60,400 for full-year full-time women+ workers, a 3.4% increase over 2016 (Statistics Canada, 2017a, 2022a).

Table 6-99: Income Statistics, Self-Identified Inuit Identity, Census Division No. 10, Newfoundland and Labrador, 2021

	2021			2016			Change from 2016 to 2021		
Income Statistics	Total	Men+	Women+	Total	Males	Females	Total (%)	Men+/ Males (%)	Women+/ Females (%)
Number of employment income recipients (aged 15 years and over in private households who worked full year full time in 2020)	800	385	415	710	325	385	12.7	18.5	7.8
Median employment income in 2020 (Full-year full-time workers) ($)	66,000	88,000	56,400	59,150	68,702	53,764	11.6	28.1	4.9
Average employment income in 2020 (Full-year full-time workers) ($)	74,800	90,800	60,400	66,216	75,304	58,416	13.0	20.6	3.4

Note: The category “men+” in the 2021 Census includes men, as well as some non-binary persons. The category “women+” in the 2021 Census includes women, as well as some non-binary persons.

Source: (Statistics Canada, 2017a, 2022a)

6.3.5.2 *Economic Sector Overview*

The sections below provide an overview of the NCC’s economic sector, including forestry and construction projects, tourism initiatives and activities, and a goods and services profile.

6.3.5.2.1 Forestry

No information regarding forestry was available from secondary sources at the time of desktop research.

6.3.5.2.2 Construction

No information regarding construction was available from secondary sources at the time of desktop research.

6.3.5.2.3 Tourism

No information regarding tourism was available from secondary sources at the time of desktop research.

6.3.5.2.4 Goods and Services Profile

No information regarding goods and services was available from secondary sources at the time of desktop research.

7.0 CLOSING

This Socio-Economic Baseline Conditions Report has characterized the social and economic conditions in the municipalities, regions, and Indigenous communities with the potential to be impacted by the Kami Project. It represents a component of the comprehensive baseline program and was undertaken to provide context from which Project socio-economic effects could be evaluated in the Project Registration.

Following the drafting of this Baseline Report, Indigenous communities described herein will be provided with an opportunity to review and assess the information on their communities, including information drawn from public sources such as Statistics Canada, CIRNAC, and the Indigenous communities' websites. Information provided by Indigenous communities with the purpose of being included in this Baseline Report will align with the First Nations principles of OCAP®.

Signature Page

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APPENDIX P

Communication and Consultation Strategy

COMMUNICATION AND CONSULTATION STRATEGY

Kami Iron Ore Mine Project

Submitted to:

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April 2024

Table of Contents

1.0 INTRODUCTION

The Kamistiatusset (Kami) Iron Ore Mine Project (the Kami Project) is a proposed iron ore mine in Newfoundland and Labrador. The Project site is located entirely in Labrador, approximately seven kilometres from the Town of Wabush, 10 kilometres from the Town of Labrador City, and five kilometres east of Ville de Fermont, Québec.

The Kami Project was originally proposed by the Alderon Iron Ore Corporation (Alderon) and underwent a provincial and federal environmental assessment (EA) from 2011 to 2013, including a comprehensive baseline program that was completed in 2011 and 2012. The Kami Project was released from the provincial and federal EA process in 2014. In 2021, Champion Iron Mines Ltd. (Champion) completed the acquisition of the Project from Alderon.

Champion is proposing several optimizations to the Project design proposed by Alderon through the previous EIS. These proposed optimizations include improvements to the Project's water management strategy and modernization of the proposed ore handling, conveyance, and processing. Champion's objective for the Kami Project is to produce high purity (>67.5%) iron ore concentrate, which can be used as direct reduction pellet feed for electric arc furnaces in the green steel supply chain.

It is understood that the Kami Project, as proposed by Champion, will be subject to an EA process under the Newfoundland and Labrador *Environmental Protection Act* (NLEPA) and associated Environmental Assessment Regulations (EA Regulations). Projects subject to the NLEPA (listed in Part III of the EA Regulations) are required to be registered with the Newfoundland and Labrador Department of Environment and Climate Change (the Department) to determine whether the proposed project can proceed, or whether additional information or reviews are required under the NLEPA. Champion is planning to submit a Project Registration document to the Department in 2024 to register the Kami Project.

To support the Project Registration and EA process for the Project, Champion has commissioned the services of WSP Canada Inc. (WSP) to develop a Communication and Consultation Strategy (the Strategy). The Strategy was developed based on Champion's consultation objectives for the Kami Project and was informed by the previous consultation work completed with Indigenous groups and stakeholders during the 2011-2013 EA process.

1.1 Document Outline

The Strategy is intended to guide consultation activities with Indigenous Groups, public stakeholders, and regulators during the provincial EA and environmental permitting processes. To better guide the implementation of consultation activities, the Strategy will be regularly reviewed and refined based on reviews of its effectiveness and input from Indigenous groups, stakeholders, regulators, and the Champion Project Team. This Strategy is structured as follows:

- Section 1 introduces the Project;
- Section 2 outlines the approach and objectives of the Strategy;
- Sections 3 and 4 identify the Indigenous groups and stakeholders for the Kami Project;

- Section 5 outlines the Strategy, including the principles of consultation that will be followed, the approach to the mapping identified Indigenous groups and stakeholders, the levels of consultation proposed for the mapped Indigenous groups and stakeholders, the approach to consultation tracking and approach to continual evaluation of the Strategy.

1.2 Key Terms

Effective communication and engagement rely on a shared understanding of key terms and concepts. Below is a table presenting key terms that will be referenced throughout this Strategy to provide clarity and coherence to our approach.

Table 1-1: Key Terms

Term	Description
Indigenous groups	Used when discussing leadership/political entity.
Indigenous communities	Used when discussing physical locations of communities.
Indigenous peoples	Broad term for Indigenous people in general.
Local Knowledge	Used when speaking about knowledge from local stakeholders.
Indigenous Knowledge	Used when speaking about Indigenous Knowledge specifically.
Local communities	Used when speaking about Project-vicinity communities (i.e., Fermont, Wabush and Labrador City).
Stakeholders	Used when speaking about non-Indigenous people or groups that could have an interest on the Project or influence the Project.
Rightsholders	Refers to Indigenous peoples whose rights are protected under the Constitution of Canada. Stakeholder is a common corporate term that is not well-received among many Indigenous peoples. Indigenous peoples are Rightsholders rather than stakeholders, as Indigenous peoples hold Indigenous rights protected under the Constitution of Canada.

2.0 STRATEGY OBJECTIVES

Champion's dedication to developing strong relationships with Indigenous groups and stakeholders is built on three pillars, namely:

Supporting human rights.

1) Engaging with communities.

2) Engaging with communities.

3) Contributing to local and Indigenous communities' economic development through local hiring, sourcing, and community investments.

Champion views relationships of trust with Indigenous peoples and local communities as key to the success and sustainability of its operations. It is through local community relationships that Champion can successfully create lasting benefits, minimize negative social and environmental impacts in the areas where they operate, and advance their contributions towards sustainable development.

To align the Kami Project with Champion's approach to developing relationships with Indigenous peoples and local communities, the Strategy was designed to achieve the following objectives:

- Provide information to Indigenous groups and stakeholders in a timely manner, allowing for feedback throughout the Project.
- Communicate openly and consistently with Indigenous groups, public stakeholders, and regulators, continuing to build trust and support for the Project.
- Receive, consider, and, where required, integrate Indigenous, public, and regulator feedback into the Project within designated timelines and regulation, including Impact Benefit Agreement requirements with Indigenous groups and public stakeholders (as applicable).
- Continue to build effective relationships with impacted Indigenous groups and stakeholders, with the goal of a well-supported Project from early planning to closure.

3.0 INDIGENOUS GROUPS

Champion recognizes the unique relationship that Indigenous peoples have with the natural environment in which they live. Champion is committed to developing and maintaining lasting relationships with Indigenous peoples to ensure fruitful collaborations conducive to the establishment of a climate of understanding, trust, transparency, and mutual respect. Champion is therefore committed to:

- Respecting the rights, interests, aspirations, culture, and natural resource-based livelihoods of Indigenous groups and Rightsholders in the design and development of its projects and operations;
- Seeking to reflect the diversity of Indigenous communities and Indigenous groups in Champion's human capital;
- Applying mitigation measures to address adverse effects of Champion's activities on Indigenous communities and Indigenous groups and offer them positive and lasting benefits;
- Seeking to obtain the voluntary, prior, and informed consent of Indigenous groups with recognized rights when significant impacts are likely to occur, either due to the disturbance of land and its use, territories, or cultural heritage that is important to them; and
- Incorporating the results of discussions and consultation processes with Indigenous communities and Indigenous groups in agreements with them.

3.1 Identification of Indigenous Groups

The Province of Newfoundland and Labrador has a duty to consult, and where appropriate, accommodate Indigenous groups when it considers conduct that might adversely impact potential or established Indigenous and/or treaty rights. During the previous EA, five Indigenous groups were identified by the former Canadian Environmental Assessment Agency (CEA Agency) as being potential rightsholders (i.e., having potential Indigenous and/or treaty rights that could be adversely affected by the Project). These include[1]:

- Innu Nation;
- Innu Takuaikan Uashat mak Mani-Utenam (ITUM);
- La Nation Innu Matimekush-Lac John (NIMLJ);
- Naskapi Nation of Kawawachikamach (NNK); and
- NunatuKavut Community Council (NCC).

Champion has confirmed with the Newfoundland and Labrador Office of the Indigenous Affairs and Reconciliation that the Indigenous Groups previously identified as rightsholders requiring consultation in 2011 for the previous EA process remain the same.

Champion's approach to Indigenous consultation is not intended to replace the provincial government's duty to consult obligations with respect to the Project, though it is recognized that consultation conducted by Champion may be used to inform or satisfy procedural aspects of the provincial consultation process. Champion is committed to working with provincial regulators and will provide regular updates on planned consultation activities with Indigenous groups as they are undertaken. Champion is also willing to provide opportunity or facilitate provincial government participation during planned consultation activities with Indigenous groups.

This Strategy will be informed by issues and concerns outlined by Indigenous groups Each Indigenous group may have different communication and consultation protocols. This Strategy is intended to be a living document, and will be co-developed alongside Indigenous Groups, in accordance with the United Nations Declaration on the Rights of Indigenous Peoples' (UNDRIP) free, prior, and informed consent parameters.

4.0 STAKEHOLDERS

4.1 Stakeholder Identification

The term "stakeholder" refers to a broad range of interested and affected individuals and groups including local government organizations, communities, businesses, non-governmental organizations (NGOs), public interest groups and clubs. In the context of this Project, a stakeholder may be any person or group of people who have an interest to protect, who have a stake in the issue, or who have knowledge to contribute. This includes a person or group who would be directly affected by the Project and a person or group with more general or varying degrees of concern, interest, and desire to engage with issues related to the Project.

[1] Indigenous groups, as identified by the Impact Assessment Agency, are listed in alphabetical order.

Stakeholders for this Project have been identified based on previous experience and information acquired from Champion, as well as from a review of available secondary information. Champion identified interested stakeholders using the following criteria:

- Proximity of persons or groups that reside, have property, or have an interest within or near the proposed Project area, or could be potentially affected due to proximity from the proposed Project area;
- Past or current interest of persons or groups in the Project, or similar projects or developments in the vicinity of the Project; and
- Persons or groups not located in close proximity to the Project area, but who could be potentially affected from the outcomes of the Project.

As documented in the 2012 EIS, previous consultation with the following stakeholders took place:

- Local stakeholders included residents of the communities of Labrador City, Wabush and Fermont; and
- Other potentially impacted or interested stakeholders beyond these boundaries, including provincial and federal government agencies and departments, NGOs, economic development organizations, and outdoor recreations users and outfitters.

Table 4-1 provides the preliminary list of stakeholders identified for the Project. Additional stakeholders may be identified through planned consultation activities.

Table 4-1: Stakeholder Groups

Category	Stakeholder
Municipal Governments	Town of Wabush
	Town of Labrador City
	Ville de Fermont
Local Economic Development	Centre local de développement (CLD) de Caniaspicau
	Conseil de développement économique d'Uashat mak Mani-Utenam
	Labrador West Chamber of Commerce
	Labrador West Employment Corporation
	Labrador West Tourism Corporation
	Town of Labrador City Economic Development Department
Local Environment Interest Groups	Conseil régional de l'environnement de la Côte-Nord
	Le Mouvement citoyen de Fermont
	Organisme de Bassin Versant
Local Education, Social Services, and Health Services	College of the North Atlantic
	Centre de santé et service sociaux de L'Hematite

Category	Stakeholder
	Labrador Grenfell Health
	Labrador Institute of Memorial University, Labrador Campus
	Labrador West Status of Women
	Newfoundland and Labrador English School District
	Conseil Scolaire Francophone
	Newfoundland and Labrador Housing Corporation
	Provincial Advisory Council on the Status of Women
	Royal Newfoundland Constabulary
Outfitters and Recreation	Cabin Owners
	Duley Lake Family Park
	Newfoundland and Labrador Outfitters Association
	White Wolf Snowmobile Club

5.0 COMMUNICATION AND CONSULTATION STRATEGY

Communication and consultation typically involve two-way interaction between a project proponent (Champion), or consultants such as WSP acting on its behalf (collectively, the Project Team), as well as parties with an interest in the Project (i.e., rightsholders and stakeholders). Early and ongoing consultation throughout the life of the Project is important to:

1) Build new or strengthen existing relationships,
2) Discuss needs, concerns, plans and potential impacts (positive or negative) to gain insights;
3) Align potential disparities between perceptions of the Project, environmental impacts, changes in land use or landscape or others and Champion's objectives and plans; and
4) Build awareness about the Project through information sharing.

The process of consultation includes an active approach to providing rightsholders and stakeholders with opportunities to learn more about the Project and to express their knowledge and views on aspects of the Project. The Strategy is to raise awareness and understanding about the Project and to solicit feedback to inform diverse, inclusive, and sustainable planning and decision making. Communication and consultation will also help the Project meet regulatory requirements.

To reduce the number of interactions with key participants (and thus avoid consultation fatigue), it will be important to outline which team members need to meet with key participants at specific times and coordinate these efforts accordingly. The Project Team will propose specific outlines for the agendas for discussions and maintain records of consultation to ensure timely follow-up of outstanding commitments.

This will eliminate confusion and reduce consultation fatigue by limiting the number of requested meetings for each Indigenous group or stakeholder. Ongoing meetings with each rightsholder and stakeholder will determine the level of capacity and interest.

The Project Team will consider ongoing studies and important cultural activities and events in planning and scheduling activities, so that appropriate messaging is aligned, and conflicting event timing is avoided.

5.1 Principles of Consultation

The Strategy has been developed in consideration of the nine guiding principles for communication and consultation, following International Association for Public Participation (IAP2) guidelines. The nine guiding principles are listed below:

EARLY NOTIFICATION

Information about the Project will be provided to rightsholders and stakeholders in a comprehensive and timely manner to facilitate early and meaningful consultation.

TRANSPARENT COMMUNICATION

Pertinent information about the Project will be shared with the identified Indigenous groups and stakeholders. Their input will be sought, documented, and addressed appropriately. Records of communication with all Indigenous Groups and stakeholders will be tracked and available as needed to demonstrate transparency.

ACCESSIBILITY AND INCLUSION

A variety of techniques and methods will be used to share information about the Project and to gather feedback. To the greatest extent possible, information will be provided in a language and/or method that facilitates understanding. The Project Team will attempt to identify barriers to participation by equity-deserving groups within Indigenous and non-Indigenous communities, such as women, parents, caregivers, and persons with disability, and make efforts to ensure representation of their viewpoints.

FLEXIBILITY

Feedback on the consultation process will be sought to ensure that sufficient opportunities for meaningful input are provided. The team will continuously evaluate the consultation process and refine this Strategy as required.

CAPACITY BUILDING

Where acceptable and appropriate to those involved, Indigenous groups and stakeholders may be involved through hands-on activities to develop capacity within the Indigenous and local communities (e.g., site-visits, collaboratively designing, authoring, reviewing, or editing sections for socio-economic baselines, Impact Benefit Agreements, Resource Sharing Agreements) so that a skill-transfer can allow for future employment in industry.

MUTUAL RESPECT

Respect will be extended to the differing cultures, values, and constraints of each Indigenous Group, and there will be follow-through on commitments.

EFFICIENCY

The consultation process will be designed to make the most effective use of existing processes and resources.

TIMELY COMMUNICATION

Consultation will be undertaken at key points in the Project when studies and recommendations are still in draft format and can be revised. Clear and reasonable timelines will be established for input and comments.

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Consultation will uphold Indigenous ownership and jurisdiction over their information, and recognize individual and collective ownership of information, control over use of information provided, ensure access to information and possession of information for the benefit of communities.

5.2 Indigenous Group and Stakeholder Mapping

For any project, there can be a broad range of rightsholders and stakeholders, ranging from those who will be directly affected by the proposed project, to individuals or organizations with more general or varying degrees of concern, interest, and desire to engage with issues related to the project. Indigenous groups (representing potential rightsholders) and stakeholders will be assessed for the Kami Project on three parameters, based on current industry best practices and standards for public participation and consultation. These parameters are:

- **Level of Influence:** This category assesses an Indigenous Group or stakeholders' ability to exercise influence and be an important decision-maker in any general context.
- **Proximity:** This category refers to the physical distance of an Indigenous Group or stakeholder from the Project site.

Level of Concern: This category refers to the heightened concern an Indigenous Group or stakeholder might have in an emergency.

Each of the identified Indigenous groups and stakeholders will be assessed for each parameter as either none, low, moderate, high, or unknown. The assessment will also be informed by the level of interest as part of the previous EA process, initial consultation undertaken by Champion, and an understanding of levels of concern and interest with other mining projects.

The assessment of influence and concern for each of the Indigenous groups and stakeholders will be identified and mapped to categories in a matrix along the spectrums of concern/interest and influence. The stakeholder mapping matrix is shown in **Figure** 5-1.

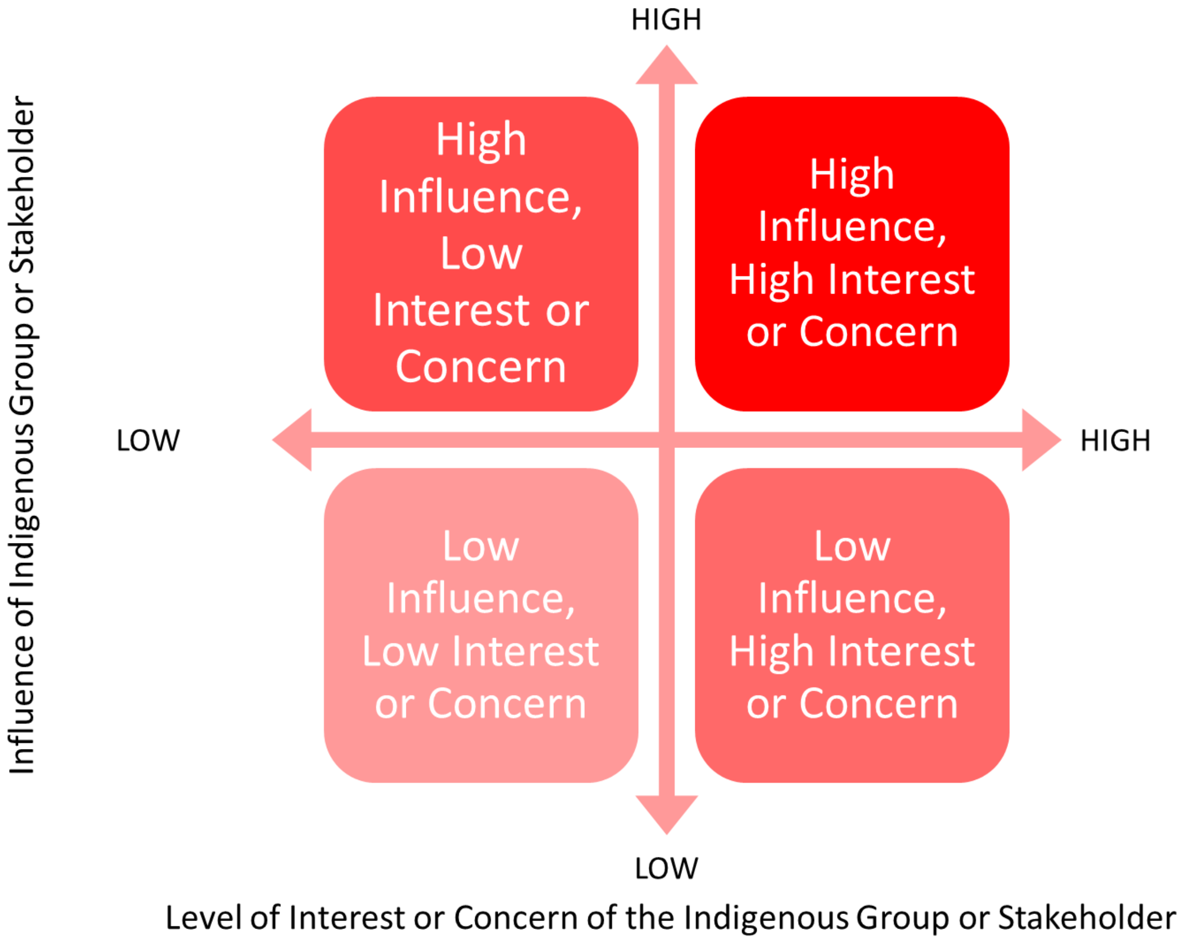

Figure 5-1: Indigenous Group and Stakeholder Mapping Matrix

Stakeholder mapping is an ongoing process that requires frequent iterations throughout the consultation process as additional Indigenous groups or stakeholders identify their interest in the Project or the level of interest or concern regarding the Project for previously identified Indigenous groups and stakeholders changes.

5.3 Levels of Consultation

It is important to align Indigenous groups and stakeholders' priorities, interests, and capacity for their level of involvement with the consultation activities. As these may change over the course of the Project, the consultation preferences will be periodically revised.

The International Association for Public Participation (IAP2) provides a Communication and Consultation Spectrum based on increasing levels of involvement in a consultation process, with the understanding that activities should correlate with the level of interest and potential to be impacted by a project's outcomes. The proposed levels of consultation are enacted in a phase-based manner (i.e., informing occurs before consulting; consulting occurs before involving). The proposed levels of consultation for this Project are identified in **Table** 5-1.

Table 5-1: Levels of Consultation

Inform	Consult	Involve	Collaborate	Empower
Indigenous groups and public stakeholders are kept informed through well balanced and objective information that assists in their understanding of the proposed Project need, and potential impacts associated with the proposed Project.	Indigenous groups and public stakeholders are provided opportunities to have their concerns heard and Champion identifies how their input will influence its decisions related to the Project.	Champion works directly with groups and public stakeholders to completely understand their issues and concerns and incorporate them into the planning process for the proposed Project.	Champion partners with participants to develop solutions and recommendations to identified issues or concerns.	Indigenous groups and public stakeholders have the final decision, and the proponent implements what they decide.

LOW Level of Consultation *HIGH*

The Indigenous group and stakeholder mapping exercise presented in Section 5.2 will help Champion determine the level and frequency of consultation with the various Indigenous groups and stakeholders. Indigenous Groups or stakeholders in the low influence, low interest group will be provided with passive methods of communication and consultation that reflect an “inform” or “consult” level of consultation. Passive methods of communication and consultation could include:

- Sharing Project contact information, with different avenues for individuals to contact Champion. At a minimum, this should include a dedicated phone number and email address.
- The opportunity to provide comment, inquiries and concerns on key milestones during the EA process.
- Providing public Project updates directly to these Indigenous groups or stakeholders via email or mail (whichever is preferred).

Indigenous groups and stakeholders in the high influence, high interest group will require active methods of communication and consultation, with the goal of achieving higher levels of consultation (i.e., involve, collaborate, empower). Active methods of communication and consultation could include:

- All passive methods noted above.
- The identification of preferred communication methods.

- Frequent meetings to provide Project updates, solicit feedback and to offer opportunities to consult on the Project.
- Opportunities to review and provide feedback on the Project design and assessment.
- Champion demonstrating how feedback, recommendations and proposed solutions received through consultation has been incorporated and integrated into the Project.

5.4 Consultation Tracking

A method of tracking consultation feedback including local and Indigenous knowledge shared from all Indigenous and stakeholder consultation activities will be maintained for the Project and will include all records of contact between the Project team with Indigenous groups and/or their representatives and stakeholders. This will be used to generate a report that includes details on:

- Indigenous groups and stakeholders that were consulted;
- Methods of consultation and list of communication activities that took place;
- Concerns, issues, opportunities, and recommendations that were shared; and
- Follow-up actions or commitments arising from communication and consultation activities.

Consultation will be tracked using an internal spreadsheet. Consultation tracking will follow the recommended process outlined below:

1) All communications sent by Champion or the Project Team to Indigenous groups and stakeholders will be blind-copied (bcc) to a consultation tracking email (this includes summaries of phone calls, open houses, etc.). All communications received by Champion and the Project Team will also need to be sent to this mailbox.
2) Communications sent to the consultation mailbox will be inputted into the consultation tracking spreadsheet.
3) The individuals responsible for input will summarize the communications. Copies of the original communications will be kept in a secure folder.
4) On a monthly basis, Champion will review summaries of communications.

5.5 Evaluation

This Strategy and related activities will be evaluated on an ongoing basis to ensure successful implementation. The Project Team is committed to the continual improvement of this Strategy and recognizes that it is a living document that will be revisited as the Project progresses.

An evaluation of ongoing efforts will be solicited from participants and used to refine and improve the strategy and plans where appropriate. Evaluations may be conducted using a variety of methods including comment forms distributed at public meetings, workshops, and Indigenous and local community sessions, documenting verbal feedback from participants, and inviting feedback to be submitted to the Project's email address.