IRON ORE COMPANY OF CANADA
WESTERN HILLSIDE TAILINGS PIPELINE ADVANCEMENT, LABRADOR CITY

Environmental Assessment Registration

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

Submitted by:
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Table of Contents

List of Figures

List of Tables

Appendices

List of Acronyms

ACCDC	Atlantic Canada Conservation Data Centre
ARDML	Acid Rock Drainage and Metal(loid) Leaching
BASA	Biophysical Assessment Study Area
BRRP	Business Resilience and Recovery Program
BTPH	Booster Tailings Pump House
CAC	Criteria Air Contaminants
$CaCO_3$	Calcium Carbonate
CCD	Central Control Dyke
CCME	Canadian Council of Ministers of the Environment
CEA	cumulative effects assessment
CH_4	Methane
CHMP	Cultural Heritage Management Plan
CNWA	Canadian Navigable Waters Act
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalents
CoA	Certificate of Approval
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CSP	Community and Social Performance
DFO	Department of Fisheries and Oceans
DIET	Department of Industry, Energy and Technology
EA	Environmental Assessment
ECCC	Environment and Climate Change Canada
EIS	Environmental Impact Statement
ELC	Ecological Land Classification
EMS	Environmental Management System
EOR	Engineer on Record
EPP	Environmental Protection Plan
EPR	Environmental Preview Report
ERRP	Emergency Response and Reporting Plans
FAA	Fisheries Act Authorization
FFA	Department of Forestry, Fisheries and Agriculture
FHCP	Fish Habitat Compensation Plan
FTE	Full-time Equivalents
FTPH	Fines Tailings Pumphouse
g	Gram
GHG	Greenhouse gas
GWP	Global Warming Potentials
h	hour
Ha	Hectares
HADD	Harmful Alteration, Disruption, or Destruction
HFC	Hydrofluorocarbons
HSEQ MS	Health, Safety and Environment and Quality Management System
ILM	Integrated Land Use Management Plan
IN	Innu Nation
IOC	Iron Ore Company of Canada
ITUM	Innu of Uashat mak Mani-Utenam
K	Condition Factor
km	Kilometer
L	Liter
LIF	Lower Iron Ore Formation
LIORC	Labrador Iron Ore Royalty Corporation
LOM	Life of Mine
LWHC	Labrador West Health Centre
m	Meter

MAC	Mining Association of Canada
MASL	Meters above sea level
MBCA	Migratory Birds Convention Act
mbgs	Meters below ground surface
MDMER	Metal and Diamond Mining Effluent Regulations
mg	Milligram
MGGA	Management of Greenhouse Gas Act
MIF	Middle Iron Ore Formation
MLJ	Innu of Matimekush-Lac John
mm	Millimeter
MTO	Material Take-Off
MW	Megawatt
N_2O	Nitrous oxide
NCC	NunatuKavut Community Council
NH_3	Ammonia
NL	Newfoundland and Labrador
NL EPA	Newfoundland and Labrador Environmental Protection Act
NL ESA	Newfoundland and Labrador Endangered Species Act
NLECC	Newfoundland and Labrador Department of Environment and Climate Change
NLHS	Newfoundland and Labrador Health Services
NNK	Naskapi Nation of Kawawachikamach
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxides
NTPH	New Tailings Pumphouse
NTU	Nephelometric Turbidity Unit
OHS	Occupational Health and Safety Regulations
OTPH	Old Tailings Pumphouse
PAO	Provincial Archaeology Office
PFC	Perfluorocarbons
PM	Particulate Matter
$PM_{2.5}$	Fine Particulate Matter
QNS&L	Quebec North Shore and Labrador
RCP	Rehabilitation and Closure Plan
RPAS	Remotely Piloted Aircraft System
SAR	Species at Risk
SARA	Species at Risk Act
SCC	Species of Conservation Concern
SEM	Sikumiut Environmental Management Limited
SF_6	Sulfur Hexafluoride
SO_2	Sulfur Dioxide
SOP	Standard Operating Procedure
SO_X	Sulfur Oxides
Std. Dev.	Standard Deviation
TIA	Tailings Impoundment Area
TLH	Trans Labrador Highway
TMP	Tailings Management Plan
TOC	Total Organic Carbon
TRT	Tshiuetin Rail Transportation Inc.
TSF	Tailings Storage Facility
TSR	Tailings System Redesign
UIF	Upper Iron Ore Formation
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
V	Volts
WHS	Western Hillside
YOY	Young-of-the-Year

1 Introduction

Project Name: The Western Hillside Project – Tailings Pipeline Advancement

The Iron Ore Company of Canada (IOC) has been operating the Carol Project Mine since 1962, employing open pit mining techniques to extract iron ore and produce refined iron in both concentrate and pellet form. The operation covers an area of approximately 11,000 hectares and has the capacity to produce up to 23 million tonnes of concentrate per year. The open pit and milling operations are to the northeast of the Town of Labrador City, NL while the main tailings area is solely within Wabush Lake (Environmental Assessment Registration #1237).

IOC has used the tailings storage facility (TSF) in Wabush Lake since 1964, and it has served as the sole TSF for the mine. Wabush Lake was designated as a tailings impoundment area (TIA) under the Metal and Diamond Mining Effluent Regulations (MDMER) (Schedule 2) in 2009. IOC operates under two lease boundaries (federal and provincial), which are within the TIA (Figure 1.1). Amendments to the provincial boundary are currently taking place to align with the federal Lease boundary, which is currently under review with the Department of Industry, Energy and Technology. Tailings must be deposited within these boundaries which make up a portion (28%) of the entire TIA of Wabush Lake. The IOC tailings system is designed to transport and dispose of a maximum of approximately 34 million tonnes of tailings (20% to 30% solids) per year at a 23 million tonnes concentrate production run rate. Mill tailings are primarily composed of fine sand, clays and residual iron minerals and other metals. Historically tailings have been deposited on land up-gradient from Wabush Lake and had been permitted to dewater into Wabush Lake. The location of the tailing's disposal area has progressed northward as the tailings topset (i.e., beach) over the years.

As mining operations progress, the tailings deposition will continue to extend northward and infill the shoreline of Wabush Lake. IOC, in conjunction with their Engineer on Record (EOR), has developed a new tailings management plan (TMP) to optimize the existing storage capacity of the Wabush Lake TSF. The proposed Western Hillside (WHS) Project (the "Project") will involve advancing the five coarse discharge pipelines and an access road through a forested area along the Western Hillside of Wabush Lake, which differs from the 2006 TMP. The revised TMP will ensure maximum utilization of the existing TSF without increasing the footprint of the current TSF.

It has been determined that depositing tailings from west to east into the lake from the shoreline will be the most reasonable and effective way to maximize the utilization of the storage capacity within the lease boundaries and maintains IOCs commitment to environmental compliance. The proposed pipelines will advance incrementally as the toe of the tailings continues to move northward. A 5.2 km long, 30 m wide access road will be installed alongside the pipelines (total width of 60 m alignment to accommodate road, pipelines, and transmission lines). Additionally, a 100 m buffer zone will be created between the road infrastructure and terrestrial habitat on the Western Hillside (Figure 1.2). Approximately 31.38 ha of land will be cleared for the construction of the pipeline and access road. Tailings will be released from the hillside down into the TSF at various points along the projected path of the pipeline as it is extended over time. As the deposited tailings reaches its sub-aqueous battery limits, 57.54 ha of forested/riparian area along the shoreline will be infilled. The 70.38 ha of area between the pipeline and the infilled shoreline (Figure 1.2) will be exposed to tailings to some extent but will not be infilled long-term. The total area for "the Project" is 159.3 ha and makes up 0.01% of IOC's operational area.

This Environmental Assessment (EA) Registration document has been prepared by IOC with assistance from Sikumiut Environmental Management Limited (SEM Ltd.). This document format follows the guidance for Project Registration as described under the Newfoundland and Labrador (NL) EA – A Guide to the Process, 2024.

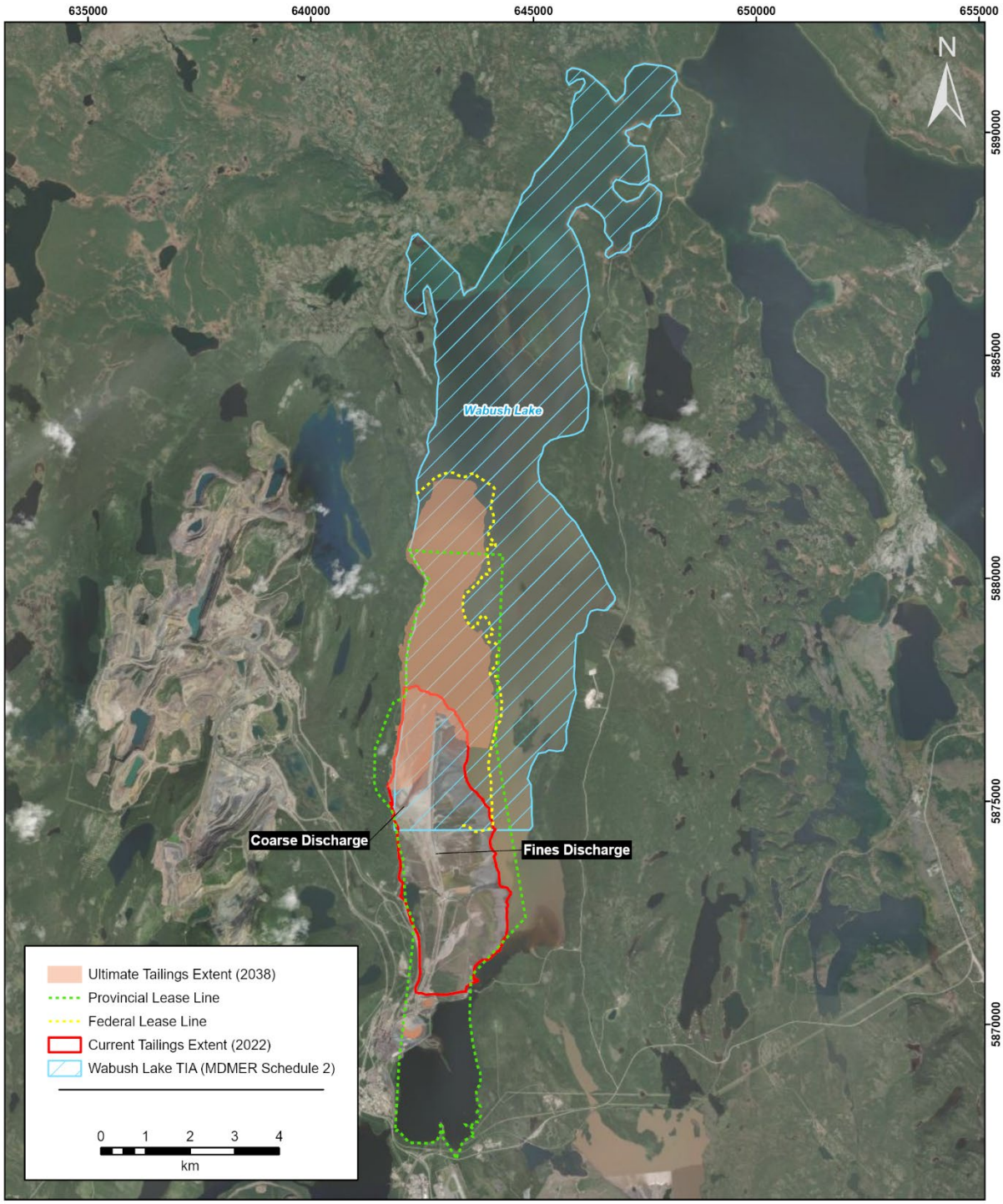

Figure 1.1: Wabush Lake Tailings Impoundment Area

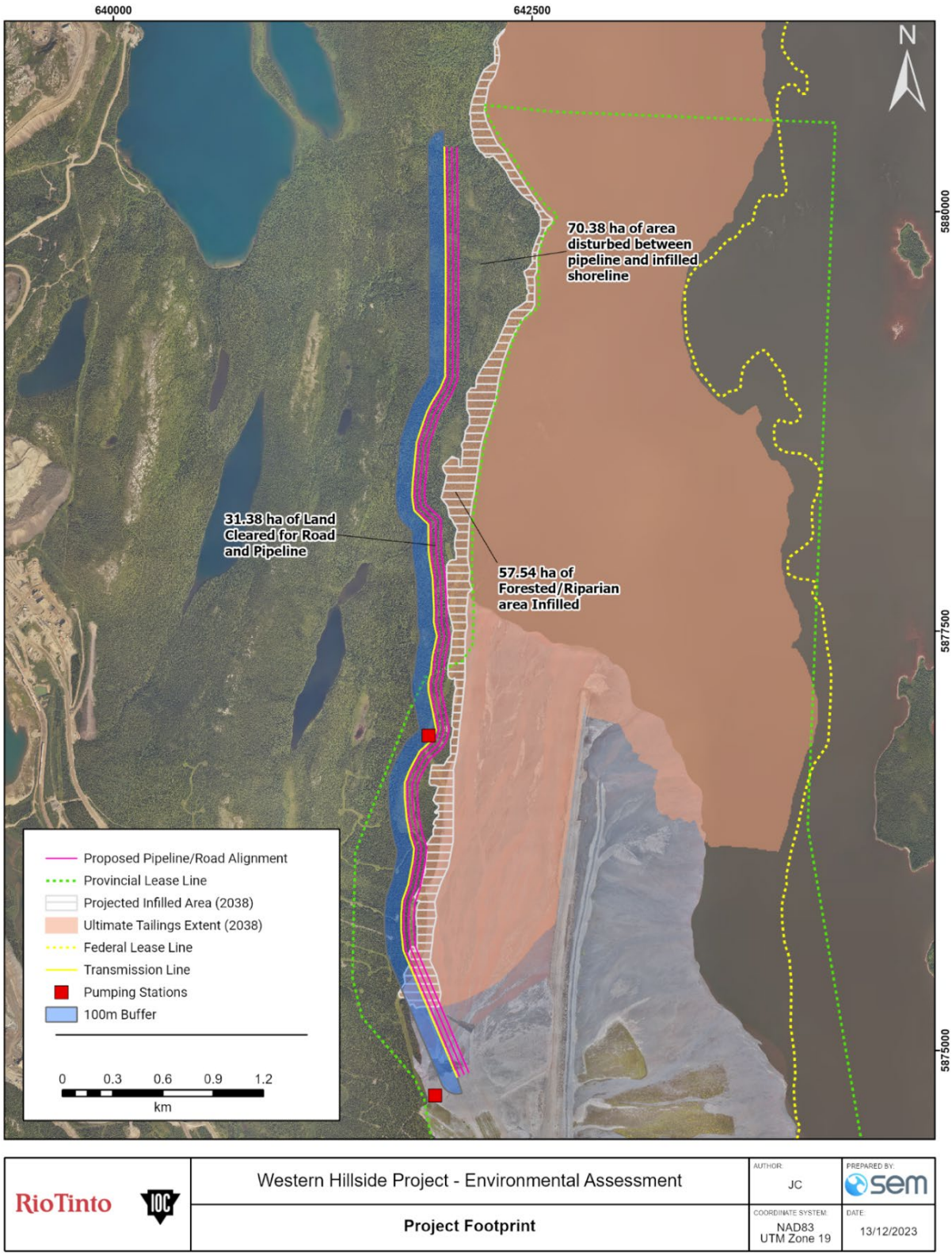

Figure 1.2: Western Hillside Project Footprint

1.1 Proponent Information

Name of Corporate Body:	Iron Ore Company of Canada
Corporate Address:	1190 des Canadiens-de-Montréal Ave., Suite 400, Montréal, Québec H3B 0E3 T: (418) 968-7400
Labrador City Operations Address:	2 Avalon Drive, Labrador City, NL Canada A2V 2Y6
President and Chief Executive Officer:	Mr. Michael McCann
Principal Contact for the Purposes of EA:	Mr. Patrick Lauzière Environment, Business Partner, IOC Environment 1 Retty Street, Sept-Îles, QC, Canada, G4R 3C7 T: (418) 968-7400 (Ext. 7513) Email: Patrick.Lauziere@riotinto.com

IOC currently operates open pit mines, a concentrator, and a pellet plant in Labrador City, and transports its products along a 418 km railway to its port facilities in Sept-Îles, Québec on the St Lawrence Seaway. Approximately 2,908 people are employed in permanent positions at IOC's Labrador City facilities.

The company's existing mining operations in Labrador City consist of four active open pit mining areas (Luce, Moss, Sherwood, and Sherwood North) and four that are currently idled (Humphrey, Magy, Spooks, and Lorraine) (Figure 1.3). IOC's Labrador City properties also contain substantial quantities of additional iron ore reserves for potential future development.

IOC's concentrator has an annual production capacity of approximately 23 million tonnes of iron ore concentrate, which is a 5 million tonne increase since the recent completion of the Concentrator Expansion Program. Of that amount, approximately 9 to 13 million tonnes are pelletized, and the balance is sold directly as iron ore concentrate.

After processing at the Labrador City facilities, the iron ore concentrate and pellets are transported south via the Québec North Shore and Labrador (QNS&L) railway, a wholly owned subsidiary of IOC, to the company's shipping terminal and deep-water port in Sept-Îles, Québec, which handles ore carriers up to 255,000 tonnes. IOC exports its concentrate and pellet products to major North American, European, and Asian steel makers.

IOC has a comprehensive Health, Safety and Environment and Quality Management System (HSEQ MS) with associated health, safety and environmental standards, work practices and procedures in place for its construction and operational activities. These have been developed and implemented, and are continuously updated, in accordance with Rio Tinto's *Iron Ore Health, Safety, Environment, Communities and Quality Policy* (Appendix A) and applicable legislation and policies. As part of its HSEQ MS, IOC has a comprehensive Environmental Management System (EMS), including plans and procedures designed to reduce the environmental effects of IOC's activities. Associated with its HSEQ MS, IOC has a rigorous internal and external auditing process which annually evaluates the management systems' performance with the objective of continuous improvement.

The Project, as it develops through its various phases from conception to closure, will be evaluated to promote conformance to IOC's internal standards and with applicable legislation. Risk evaluation is required through each phase of the Project and mitigation measures will be identified and implemented to avoid or reduce risks. IOC's major shareholder and operator, Rio Tinto, has developed world class standards in health, safety, and environment and community relations.

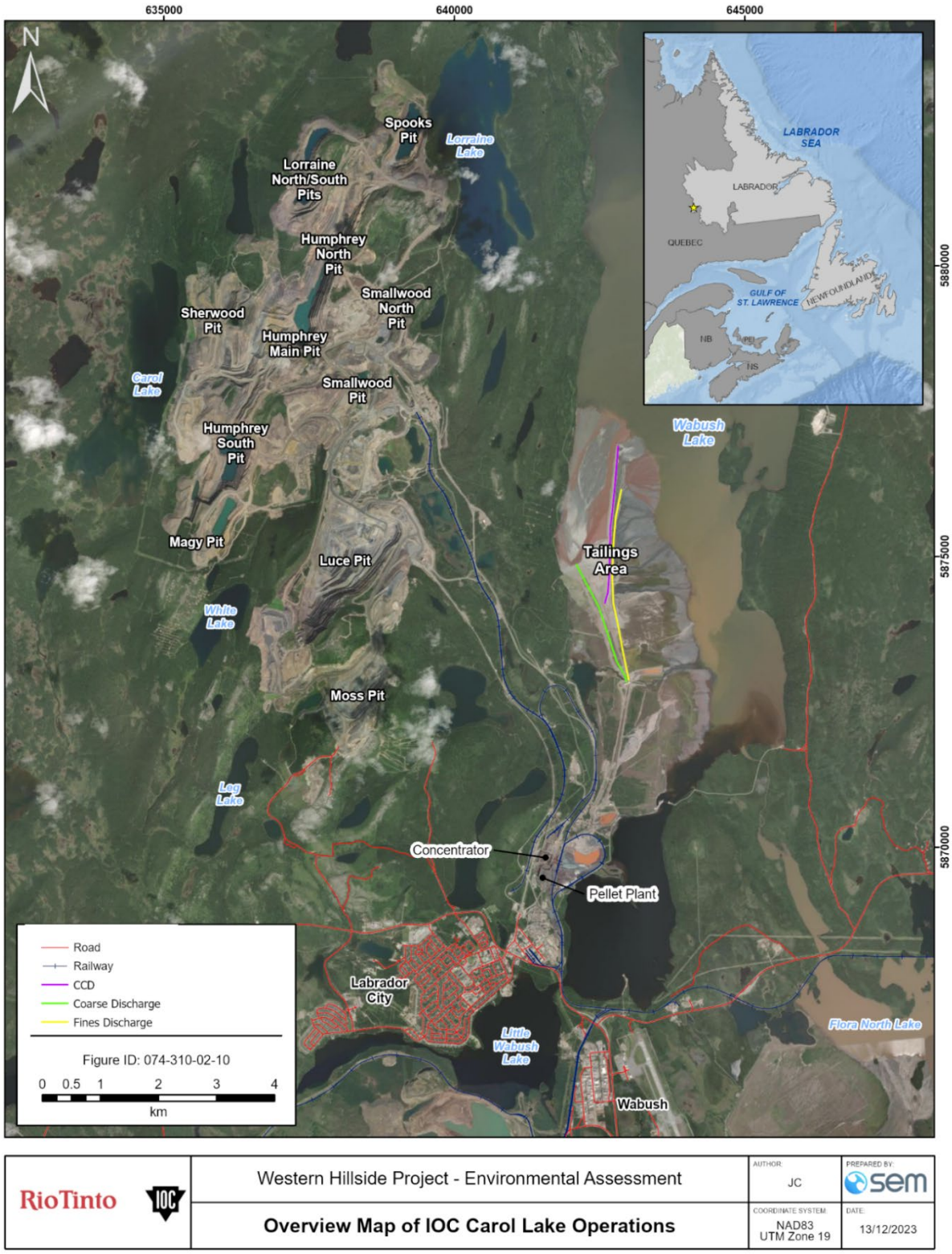

Figure 1.3: Overview Map of IOC Carol Lake Operations

2 Background

In 1999, IOC began assessing options for tailings disposal and storage in order to comply with the new *MDMER* regulations. In April 2000, IOC submitted a TMP that was assessed and released from provincial Environmental Assessment in June 2000. Since 2001, IOC has continued to optimize the approved 2001 TMP and in 2006 it was proposed that the tailings confinement be modified from the 'in-lake rockfill dyke' to a 'minimum impact footprint' based project (Figure 2.1). This new plan became known as the Revised TMP and was submitted for provincial Environmental Assessment in February 2006. The revisions to the original 2001 TMP included:

- Eliminating the construction of the rockfill dyke that was proposed to bisect Wabush Lake longitudinally and confine the tailings to the west side of the lake.
- Flocculating the consolidated effluent prior to it being released into the TIA to reduce red water.
- All water in Wabush Lake being directed to a single channel that would form the final point of release.
- The traditional navigation route being preserved.
- Three short dyke structures would be required to be constructed at the north end of the lake to direct water through the final release channel.

The primary objectives of the 2006 TMP were to establish an approved TIA in Wabush Lake under the *MDMER* and reduce red water by introducing a flocculation program. A pipeline was proposed to run down the middle of Wabush Lake, depositing the coarse tailings into the deepest trench of the lake.

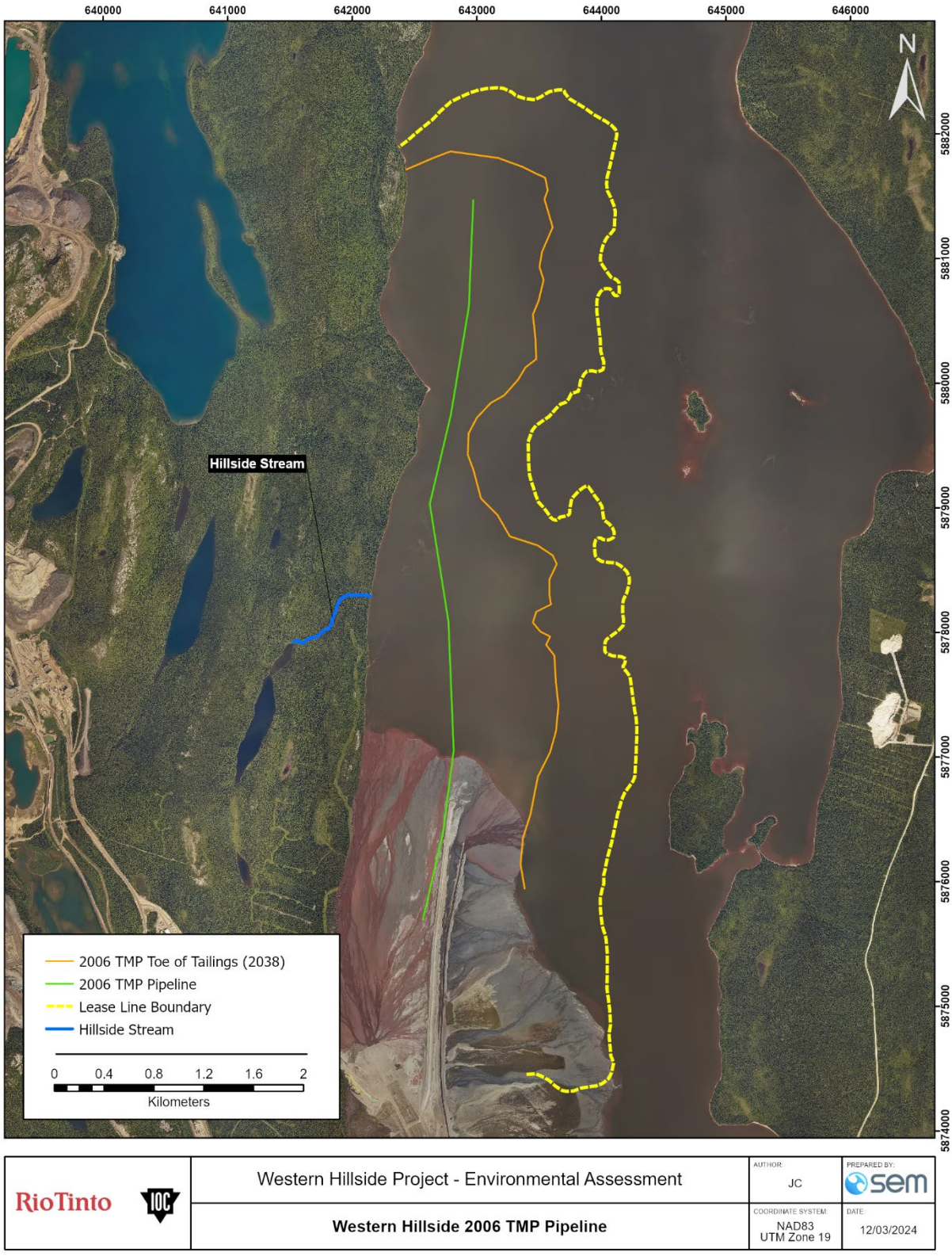

Figure 2.1: Tailings Management Plan, 2006

In June 2002, the *MDMER* became law and required full containment of mine tailings within a designated TIA. Presented with new regulatory restrictions, construction of the elements described in the 2006 TMP were never carried out and IOC instead began developing an operating plan designed to optimize tailings storage within the limits of the newly imposed Federal Lease Line and to minimize related pumping and operating costs. Four tailings disposal options were assessed, all with the goal of optimize tailings discharge through the Booster Tailings Pump House (BTPH) pipelines, as they accounted for 95% of the total disposal rate of tailings (BARR, 2006). The below-water slope of the tailings delta was set at 10%, and the above-water slope was assumed to be 1.7% based on a 2001 survey performed by Journeaux, Bédard & Associates.

The four options presented included:

Option 1: Relocating the discharge of the five BTPH lines to the hillside on the west side of Wabush Lake. The lines would be routed at an elevation as high as necessary to be above the intersection of the tailings surface, which would slope eastward to the tailings beach shoreline.

Option 2: Continuing the current (at the time in 2006) practice of discharging to the north from the middle point of the above-water tailings cone. This option would provide space on the west side of the tailings cone for routing and potentially containing above water the fine tailings conveyed through the Fines Tailings Pump House (FTPH) pipelines.

Option 3a: Similar to Option 2 but involved splitting the direction of the BTPH pipelines beginning at the last pumping station currently (in 2006) in operation. Two lines would be aligned toward the western half of the delta that would be underlain by a secondary trench and the other three lines would be aligned toward the eastern half, underlain by the deepest trench.

Option 3b: A combination of options 1 and 3a.
Analysis by IOC and their EOR at the time (BARR Engineering Co.) concluded that Option 1 was the preferred tailings disposal plan. Option 1 represents the first iteration of what would eventually become the currently proposed WHS Project. Option 2 was eliminated as the configuration of the tailings discharge system would have made it very difficult and costly to implement the changes in the alignment of the FTPH lines west of the BTPH lines. Options 3a and 3b were eliminated as the splitting of the BTPH pipelines would require future construction of separate pumping stages for the western and eastern groups of pipes. This may have resulted in additional capital and operation costs. Therefore, IOC began developing Option 1 and evaluating ways to deposit tailings from west to east into Wabush Lake from the Western Hillside. Figure 2.2 shows the longitudinal profile of the four proposed options, which also highlights the optimized storage capacity provided by Option 1 when compared to the other options.

Option 1 was further refined and described in the 2008 Feasibility Report prepared by IOC and the EOR (BARR). The pipeline corridor was proposed to be 25 m wide with a 10 m wide access road on the west side of the corridor. In the meantime, while Option 1 was being further developed, the discharge pipelines were extended on average 104 m per year until 2013. The Central Control Dyke (CCD), which runs parallel to and west of the fine tailings discharge was extended several times including between 2008 and 2011, in the summer of 2012 and the summer of 2015. The extensions of the central control dyke and the fine tailings channel were intended to keep the coarse tailings from interfering with the fines and to shift the fine tailings deposition towards the north, away from the eastern tailings beach (and the federal lease line). Between 2008 and 2015, the coarse tailings discharge was directed northwest, toward the Western Hillside. Advancement of the pipelines slowed to 70 m per year in 2014 but increased to 160 m per year in 2015.

In 2020, the coarse tailings pipelines were extended approximately 90 m along the coarse tailings beach toward the WHS. As mining operations progress, the tailings deposition will continue to extend northward and infill the shoreline of Wabush Lake. IOC, in conjunction with their EOR (Hatch), began developing a new tailings management plan (TMP) in 2021 to optimize the storage capacity of the Wabush Lake TIA. The proposed TMP known as the Western Hillside Project, presented here, will optimize storage capacity in the Wabush Lake TIA to ensure mining operations can continue without disruption for as long as possible.

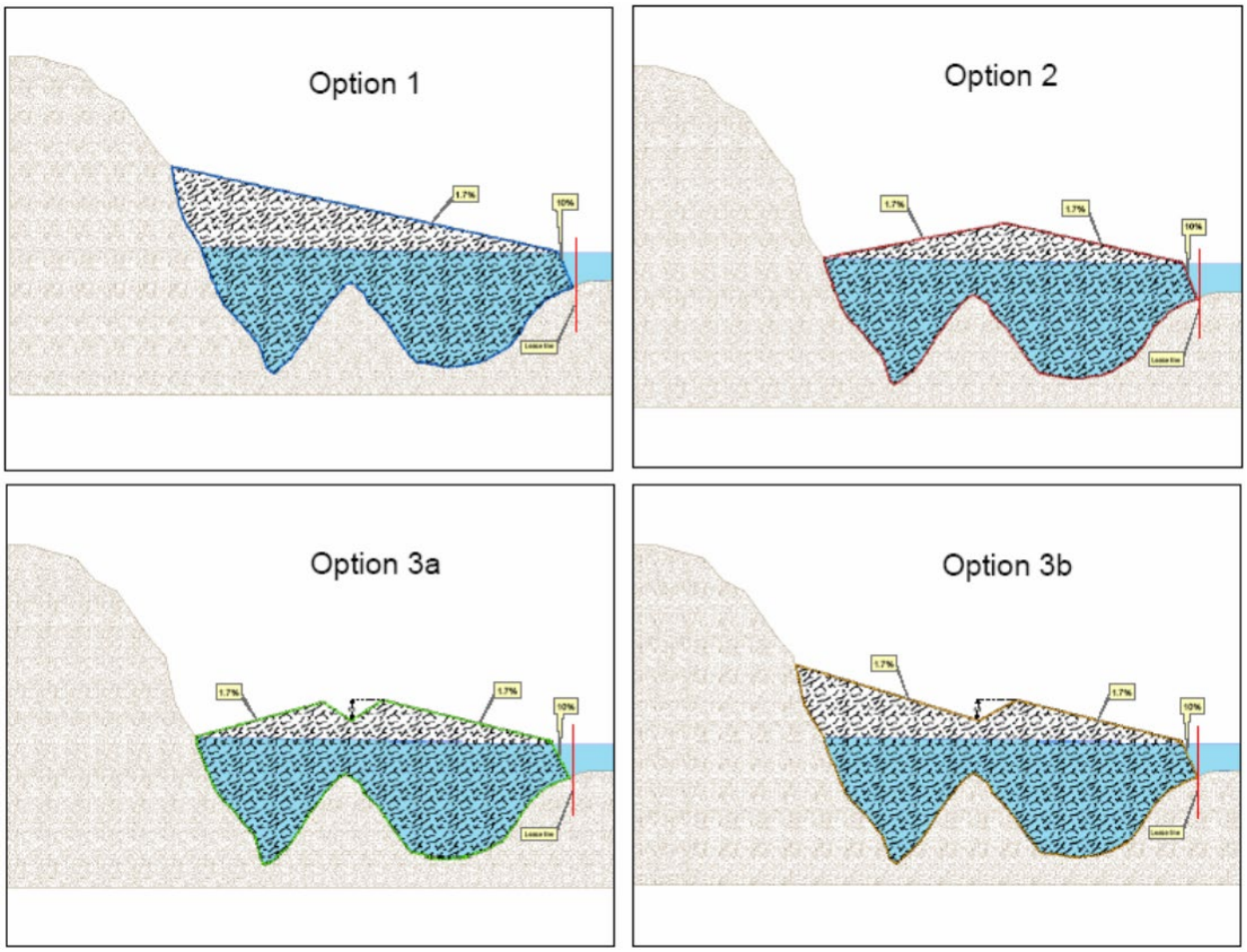

Figure 2.2: Cross-sections of tailings deposition options assessed in 2006

2.1 Rationale for the Undertaking

The most recent TMP for the Carol Mine Project to have passed through the provincial EA process was released on April 4th, 2006. The TSF that was approved was to be bounded to the south by the northern front of the existing tailings beach (at the time) and bounded to the north at approximately 53º00.25'. Construction of water retention dykes and a temporary access road to allow for construction was approved, although the dykes nor the road were ever constructed. A pipeline was proposed to run down the middle of Wabush Lake, depositing the coarse tailings into the deepest trench of the lake (EA #1237). It was estimated that 890 ft/year (271 m/year) of pipeline would be added until 2024, and 833 ft/year (254 m/year) would be added between 2024 and 2035. At the time, the plan was for all tailings to be confined to the western portion of Wabush Lake. The 2006 TMP involved re-aligning separate pipe discharge locations to the one point of discharge and the addition of a flocculant to tailings to control red water and allow for confinement of the tailings within the trench in the deepest part of Wabush Lake This flocculant portion of the TMP was later associated with the fish and fish habitat compensation program and, therefore, fulfilled a requirement under the Fisheries and Oceans Canada (DFO) (*Fisheries Act, Section 36*) for IOC to offset the habitat loss in Wabush Lake.

IOC has been working with their EOR to develop a long-term TMP to optimize the storage capacity of the Wabush Lake TSF. The proposed Western Hillside Project will involve advancing the five coarse discharge pipelines and an access road in a forested area along the Western Hillside of Wabush Lake. This differs from the 2006 TMP where the pipeline was designed to extend down the middle of the TSF in Wabush Lake.

It has been determined that depositing tailings from west to east into the lake from the shoreline will be the most reasonable and effective way to optimize the available storage capacity in the lake. Depositing from the Western Hillside will maximize the above water tailings storage capacity and minimize the reliance on dykes to manage the tailings streams and flow at the TIA, thereby increasing the life of the facility and reducing risk. By optimizing the storage capacity of the current TIA in Wabush Lake, IOC will be able to continue normal operations and avoid having to search for and develop a greenfield/brownfield site for tailings deposition sooner than the anticipated lifespan of the current TSF. Developing a new tailings facility would have more severe environmental and financial impacts than continuing to deposit in Wabush Lake until the designated area marked by the federal lease line boundary is at capacity (2038).

If deposition were to continue as described in the 2006 TMP, it has been projected that the tailings would exceed the federal lease line boundary before the area of the TSF had been fully utilized. This is based on tailings deposition projections and sediment sampling completed as part of IOC's lease line compliance monitoring program. Tailings deposition outside the boundary could also obstruct the channel on the eastern side of Wabush Lake that allows recreational users and watercrafts to travel between Little Wabush Lake and Wabush Lake, which would be a violation of the *Canadian Navigable Waters Act* (CNWA). Navigable waters are defined in the Act as "a body of water… that is used or where there is reasonable likelihood that it will be used by vessels, in full or in part, for any part of the year as a means of transport or travel for commercial or recreational purposes, or as a means of transport or travel for Indigenous peoples of Canada exercising rights recognized and affirmed by section 35 of the *Constitution Act*, 1982." Wabush Lake is heavily used as a travel corridor for recreational boats to gain access to the other lakes of the watershed and for many recreational and culturally significant activities. It is critical that this travel corridor remain accessible to the public and that mine operations do not impact these activities.

IOC also explored the possibility of in-pit disposal of tailings disposal; however, this was not possible. As per the Mining Regulations under the Newfoundland and Labrador *Mining Act* an acceptable condemnation report is required for the footprint of any permanent mining infrastructure including waste dumps, tailings storage facilities, processing facilities etc. For this reason, in-pit tailings disposal is not considered a viable alternative currently.

The proposed 2024 TMP (the Western Hillside Project) will allow to fully use the space available in the approved TSF to continue the life of this deposition area and avoid early development of a greenfield/brownfield site for tailings deposition. In addition, accessibility to Wabush Lake surrounding waters will not be impacted by the tailings deposition plan presented in the updated TMP.

This document has been prepared to register for EA review under the *Newfoundland and Labrador Environmental Protection Act* (NL EPA) to amend the 2006 TMP, that will allow IOC to continue normal operations within the existing TIA and allow the mine to optimize the use of Wabush Lake as a TIA.

2.2 Environmental Assessment Process and Requirements

The NL EPA requires anyone who plans a project that could have a significant effect on the natural, social, or economic environment (an "Undertaking") to present it for examination through the provincial EA process.

Under the NL EPA definitions, an Undertaking "includes an enterprise, activity, project, structure, work or proposal and a modification, abandonment, demolition, decommissioning, rehabilitation and an extension of them that may, in the opinion of the minister, have a significant environmental effect".

The proposed "Project" (The Western Hillside Project) involves building an access road, transmission lines, pump stations, and tailings deposition pipeline alignment along the western shoreline of Wabush Lake in Labrador. The land clearing involved in this project's construction, along with the length and scale of the pipeline alignment and road, triggers the environmental assessment.

Following public, Indigenous, and governmental review of this EA Registration, the Minister of the NL Department of Environment and Climate Change (NLECC) will issue a decision that will be one of the following:

- Release, with or without conditions,
- Further review, in the form of an Environmental Preview Report (EPR) or an Environmental Impact Statement (EIS), or
- Rejection of the proposed undertaking via a recommendation to Cabinet

2.3 Permitting Requirements

A potential list of permits that will be required for the execution of the Western Hillside Project is shown in Table 2.1. These permits will be from municipal, provincial, and federal governments and departments. Not included in this permit list are those associated with the Fish Habitat Compensation plan but are assumed to be required. The list provided may exclude some potential permits which are currently unforeseen. On-going consultation and understanding of the most recent legislation and regulations that apply to this Project will continually be monitored throughout the Project's life.

Table 2.1: Potential Permit Requirements for the Western Hillside Project

Permit/Approval Required	Legislation Reference	Permitting Agency	Approval Timelines
Commercial Cutting Permit	*Forestry Act*	Department of Fisheries, Forestry and Agriculture	2 weeks
Environmental Permits for Alteration to a Body of Water (Application Checklist and Main Form)	*Water Resources Act*	Department of Environment and Climate Change - Water Resources Management Division	2-3 months
Schedule A - Culvert	*Water Resources Act*	Department of Environment and Climate Change - Water Resources Management Division	2-3 months
Schedule F - Stream Modification or Diversion	*Water Resources Act*	Department of Environment and Climate Change - Water Resources Management Division	2-3 months
Environmental Assessment Approval	*Environmental Protection Act and Environmental Assessment Regulations*	Department of Environment and Climate Change - Environmental Assessment Division	2-3 months
Fuel Storage Tank Registration	*Storage and Handling of Gasoline and Associated Products Regulations, 2003, under the Environmental Protection Act*	Digital Government and Service NL	4-6 weeks
Experimental Fishing License	*Fisheries Act*	Fisheries and Oceans Canada	45 days
Request for Review	*Fisheries Act*	Fisheries and Oceans Canada	2-3 months

Fisheries Act Authorization (FAA)	*Fisheries Act*	Fisheries and Oceans Canada	6-12 months
Schedule 2 Amendment	*Fisheries Act* and the *Metal and Diamond Mining Effluent Regulations*	Fisheries and Oceans Canada and Environment and Climate Change Canada	12-24 months

3 Project Description

The following sections describe the Project location, geographic setting, land tenure, explored project alternatives, project components, and construction, operation, and maintenance activities for the life of the project.

3.1 Property Description and Location

The Project is on the Western Hillside of Wabush Lake, within IOC's existing mining property boundaries at Labrador City. The approximate coordinates of the Project are 19N 641,690 m E, 5,875,296 m N at an elevation of 525 meters above sea level (MASL) and approximately 10 km northwest of the Wabush Airport. The area is not accessible to the public and has been surrounded by mining activities since the early 1960s. Wabush Lake has been in use as the TSF for operations at IOC's Carol Mine Project since the 1960s. Deposition into Wabush Lake is restricted by the boundaries outlined in the provincial and federal lease line agreements. With optimal deposition strategies proposed by the Project, the already existing tailings storage boundaries are estimated to have sufficient area to continue to be used as the sole TSF for mine operations until the end of 2038.

3.2 Land Tenure

The Project is located entirely within the IOC's Labrador City mining property and is taking place on land that is covered by an existing subsurface mining lease (Mining Lease 17, Block 22-7), which was issued in the early 1960s to the Labrador Iron Ore Royalty Corporation (LIORC) (Figure 3.1). LIORC also holds surface rights over these subsurface mining leases and subleases the subsurface mineral and surface rights to IOC. The current lease extends tenure to 2052, after which mineral tenure will be governed by the *Mineral Act*, with lease extensions of up to 10 years.

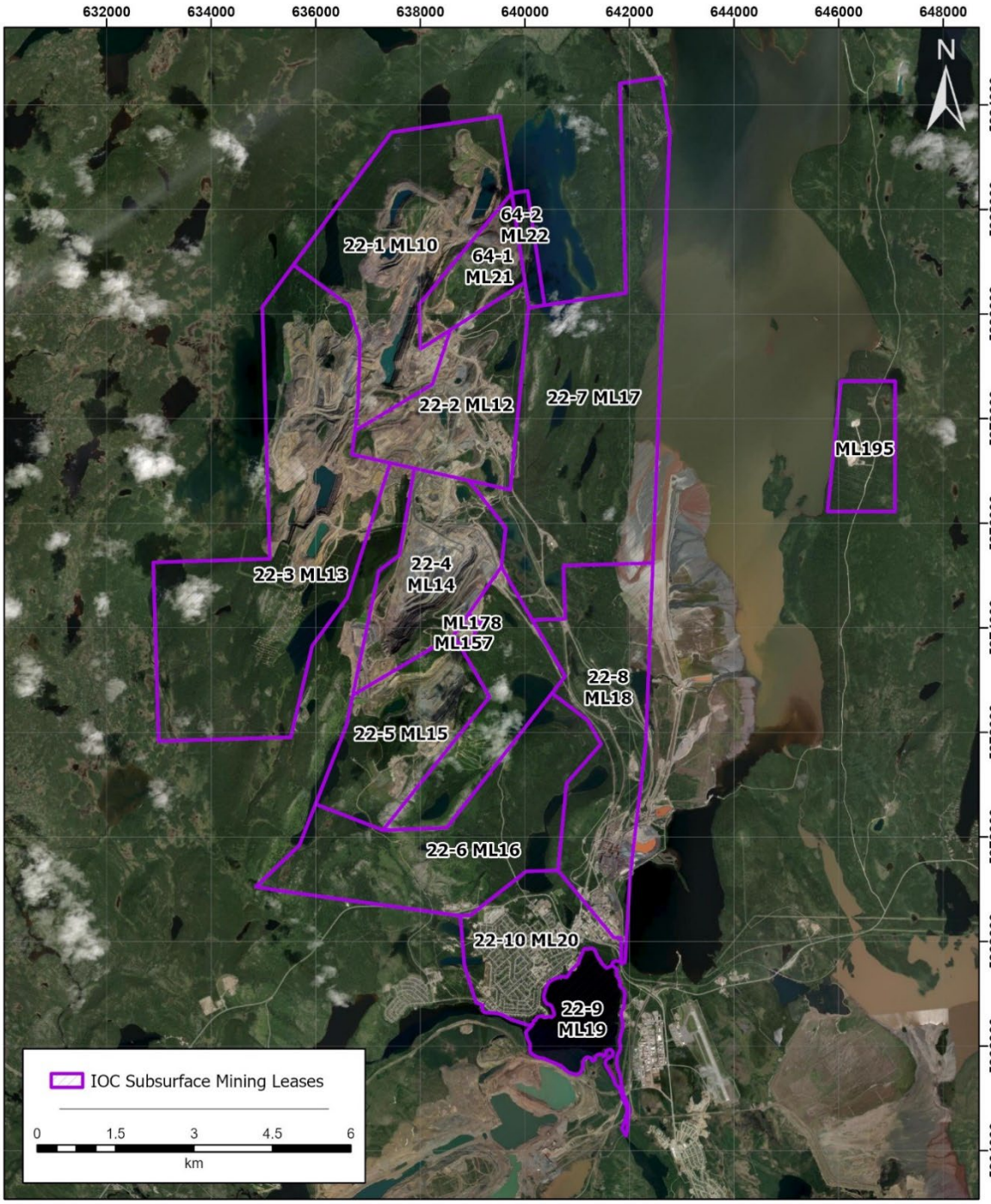

Figure 3.1: IOC Mine Lease Overview

3.3 Alternatives to the Project

The following alternatives to the Project were identified but were rejected for further evaluation since they were found to be non-viable from an environmental, timeline, cost, and feasibility standpoint.

3.3.1 Do Nothing

If IOC were to continue depositing tailings in Wabush Lake following the 2006 TMP deposition plan, the lifespan of the TIA would be reduced by up to approximately 3 years, and the area available within the TIA for tailings storage would not be fully utilized. In addition, if IOC's current deposition plan continued as is, the tailings would soon surpass the lease line and IOC could violate the terms of the established Fish Habitat Compensation Plan (FHCP), and therefore potentially violate the *Fisheries Act*. If no changes are made to the deposition plan, tailings will also soon impact navigable waters within the channel along the eastern side of Wabush Lake that allows for boats to pass between Little Wabush Lake and Wabush Lake, which would be a violation of the CNWA. Continuing tailings deposition in Wabush Lake via the 2006 TMP deposition plan is no longer a viable option for these reasons.

3.3.2 Establishing a Greenfield Site for Tailings Deposition

If IOC did not proceed with the Western Hillside Project, one of the alternatives would be to establish a new Tailings Storage Facility before the lease line boundary is surpassed in Wabush Lake. Establishing a new TSF site for dry-stacking or wet tails would be challenging as it would require extensive permitting and engagement with regulators and stakeholders before operations could begin. This option would also have a greater environmental impact as it could possibly involve depositing in a natural area that is not already affected by tailings. From a financial, timeline and environmental impact point of view, the option of establishing a new TSF for tailings deposition would present many challenges when the current TSF still has storage capacity to optimize. This option is not considered a viable alternative when compared to the WHS Project.

3.3.3 In-Pit Tailings Disposal

IOC explored the possibility of utilizing a brownfield site (in-pit disposal), this could reduce some of the environmental impacts of tailings disposal and regulatory timeline when compared to the greenfield site option. However, from a time and cost perspective this option is not viable as the pits' resources (iron-ore reserves) will not be fully exhausted when the new TSF is required (when tailings in Wabush Lake are about to exceed the lease line). As per the Mining Regulations under the Newfoundland and Labrador *Mining Act* an acceptable condemnation report is required for the footprint of any permanent mining infrastructure including waste dumps, tailings storage facilities, processing facilities etc. For this reason, in-pit tailings disposal is not considered a viable alternative currently.

3.4 Project Components

The following sections describe the components of the Project. Project components are comprised of the construction of an access road, pipeline alignment, infilling of terrestrial habitat by tails, the erection of electrical transmission lines, and the construction of additional pumphouses to convey tailings to the TSF. All project components are depicted in Figure 3.2.

3.4.1 Access Road

IOC anticipates developing the start of the Western Hillside access road as the first Stage of the Project. The access road will follow the same trajectory as the pipeline alignments, which will run along the western side of Wabush Lake (Figure 3.2). After the access road is completed, construction would begin on the pipelines incrementally over the course of the project life. Physical components of Stage 1 include:

- Development of an access plan.
- Clearing to make way for construction of the road.
- Construction of the access road.

3.4.2 Pipeline Advancement

An alignment of five 20-inch coarse discharge pipelines would be installed along the Western Hillside to allow for deposition of tailings from west to east into the lake from the shoreline, which has been determined to be the most reasonable and effective way to optimize storage capacity (Figure 3.1). Pipeline advancements will occur incrementally over the course of 14 years (until the end of 2038) as the TSF begins to reach its subaqueous battery limits associated with the federal and provincial lease lines (Figure 3.2).

3.4.3 Infilling by Tailings

The pipeline will pump tailings along the Western Hillside from West to East direction and release tailings into the TSF at specific points (Figure 3.2). This will result in the eventual infilling of terrestrial habitat along the shoreline of Wabush Lake. Approximately 183 meters of Hillside Stream will be impacted by the gradual infilling with tailings.

3.4.4 Electrical Power Transmission

The proposed Project will include the extension of a transmission line extending from the existing mine road to the new facility (Figure 3.2).

Electrical power will be supplied to several pumphouses through an existing distribution system. The power consumption requirement for the operation is estimated to be a maximum of 39.5 mega watts (MW) and some new infrastructure will be incorporated, as detailed below.
A slightly realigned overhead wood pole electrical distribution line (4160 Volts (V), 3-phase) will follow the realigned access road, and about 50 m of underground line will extend into each pumping station. An outside oil cooled step-down transformer will reduce the voltage to 600 V at the site.

3.4.5 Pumps and Pumphouses

The proposed Project will include the installation of new pumps and two new pump houses along the future access road (Figure 3.2). The pumping requirements are based on the Tailings Life of Mine (LoM) Pipeline and Pumping study (Hatch, 2022) and Tailings System Redesign (TSR) Process Design Criteria (Hatch, 2021a). It is assumed that all pumps are centrifugal horizontal slurry pumps configured as 4 duty and 1 standby.

There is potential for each pump house to require its own dump pond as a means of safe storage when capturing solids and water during unplanned outages. Tailings ponds are engineered structures that store tailings and process affected water. It is constructed for safe storage of tailings materials until the water is ready to be recycled back into the extraction process. Should the dump pond(s) be required, it is anticipated to be built on existing dry tailings with properly engineered storage capacity, earth filled embankments, impermeable geomembrane liners, spillways, and access road.

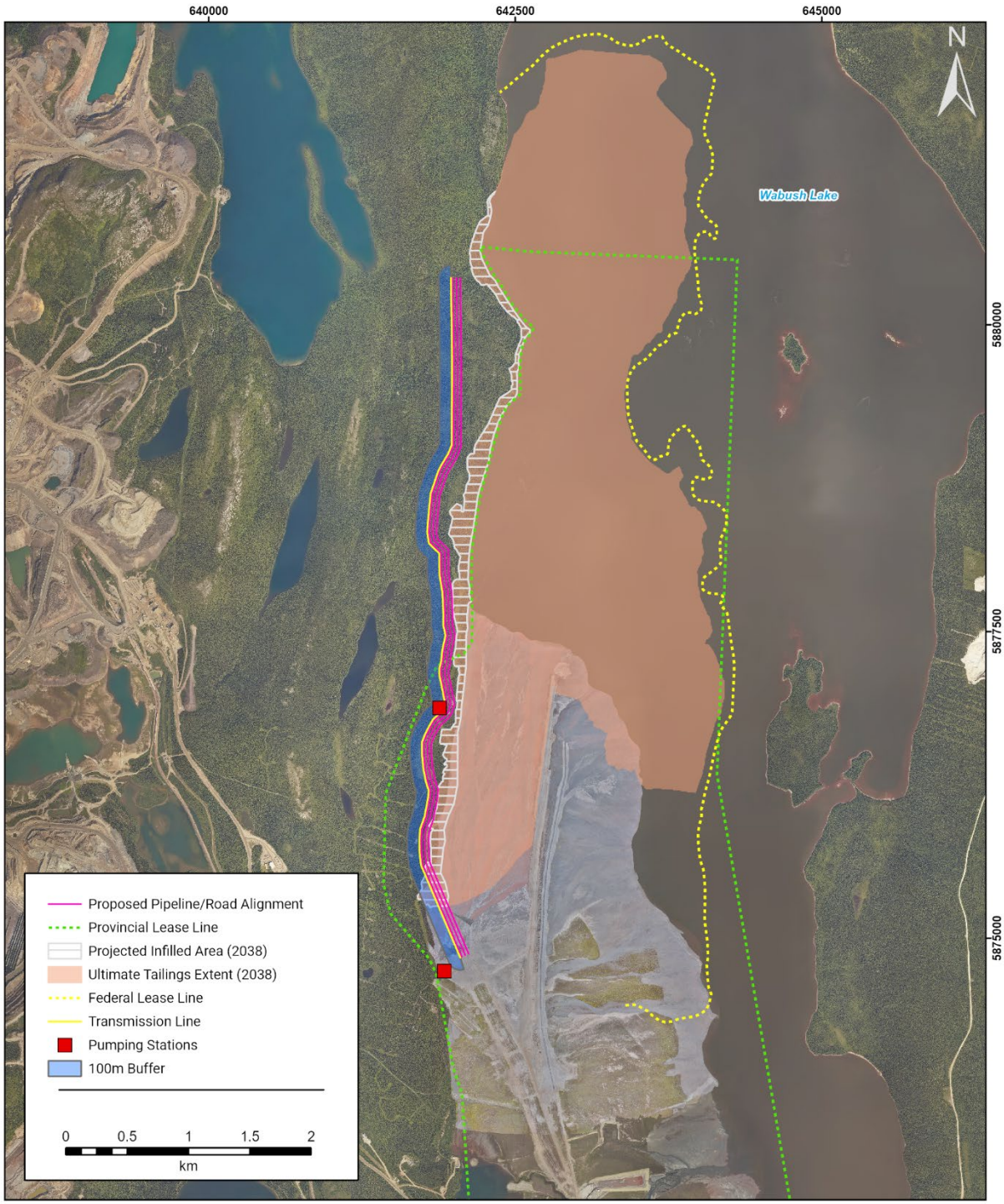

Figure 3.2: Project Components

3.5 Construction

The fine and coarse tailings will continue to be managed separately in Wabush Lake. Capital works will be required yearly and will consist of Central Control Dyke (CCD) earthworks, coarse pipeline extension, fine trench extensions, coarse tailings pumping upgrades and environmental offset works to ensure tailings storage within Wabush Lake is optimized and remains within the federal lease line. It is important to note that while the coarse tailings pipelines will be extended, the pipeline conveying the fines will not be extended.

Construction activities associated with the Project, all phases combined, include the following:

- Vegetation clearing and grubbing;
- CCD earthworks;
- Access road/pipe bench extension and/or construction;
- Transmission line extension and installation;
- Pipeline extension and installation including construction of pumping stations; and
- Future pumphouses to house pumping stations.

3.5.1 Vegetation Clearing and Grubbing

Vegetation clearing (i.e., trees, shrubs) will be required in advance of site preparation activities. Vegetation clearing will see large diameter trees either cut and stockpiled for use as firewood or mulched with other vegetation. The mulched vegetation and topsoil will be removed from the cleared area and either used for tailings rehabilitation works or stockpiled for use in future rehabilitation activities. Measures will be implemented to reduce and control runoff of sediment-laden water during grubbing, and the re-spreading and stockpiling of grubbed materials. Where grubbed materials are re-spread or stockpiled, as many stumps and roots as possible will be left on the ground surface to maintain soil cohesion, dissipate the energy of runoff, and promote natural re-vegetation.

The clearing and removal of vegetation will be restricted to only those areas designated by IOC and the project footprint will be minimized wherever possible and all clearing limits and work areas will be visually demarcated. Trees will be either sawed or mulched using mechanized cutting /mulching equipment. The use of mechanical clearing methods, such as bulldozers, will not occur except where it can be demonstrated that there is no merchantable timber, and where the resulting terrain disturbance and erosion will not result in the loss of topsoil or the sedimentation of any nearby water bodies.

3.5.2 CCD Earthworks

Key CCD extension and/or upstream raise geometries that were assumed for developing Material Take Off's (MTO's) are the same as what has been used for previous extensions/raises and are summarized in Table 3.1. The extensions/raises would be primarily constructed with coarse tailings and have adequate erosion protection and safety berms as required.

Table 3.1: CCD Extensions/Raise Typical Geometry

Parameter	Unit	Value	Notes
Dam Crest Width	m	16.1	Includes allowance for safety berms
Upstream Slope	-	2H:1V	Based on existing CCD dimensions
Downstream Slope	-	2H:1V	Based on existing CCD dimensions
Extension/ Raise Height	m	Varies	Extent of raises/ extensions is dictated by deposition modelling

3.5.3 Pipeline Extensions

The assumed typical cross-sectional pipe bench geometry for the coarse tailings pipeline extensions required periodically along the coarse tailings beach or Western Hillside that were used in the development

of MTO's, are shown in Table 3.2. The pipe bench extensions would require access roads for pipeline maintenance and be wide enough to accommodate the extensions of five coarse tailings pipelines.

Table 3.2: Pipe Bench Typical Geometry

Parameter	Unit	Value	Notes
Pipe Bench Crest Width	m	36.9	Includes allowance for safety berms, access roads, and five coarse tailings pipelines
Upstream Slope	-	2H:1V	-
Downstream Slope	-	2H:1V	-
Pipe Bench Height	m	2.0	Assumed average height to create a level bench on the WHS

The pipeline corridor will be approximately 25 meters wide. A 10-meter-wide access road will be constructed on the west side of the corridor, with the pipes occupying the remaining 15 meters. The road was designed to accommodate the largest vehicle IOC expects to operate during the construction, operation and maintenance of the pipeline. Because the pipes will discharge down the hillside from the east side of the corridor, no access will be provided on the east side of the pipes. It may be necessary to construct access berms over the pipes to install the advancing pipeline and to facilitate snow removal.

3.5.4 Electrical Power Transmission

The annual power consumptions for each pumping stage are shown in Table 3.3. The connected powers are based on the Tailings LoM Pipeline and Pumping study (Hatch, 2022). The operating powers are based on the connected power and an absorbed factor of 0.85. The annual consumptions are based on the operating powers, 8760 available hours per year, and a consumption factor of 0.90.

Table 3.3: Additional Annual Power Consumption

Power	Units	Power Consumption
Connected	kW	4,698
Operating	kW	3,759
Annual Consumption	kWh/y	32,922,953

3.5.5 Pumps and Pumphouses

The process equipment required are shown in Table 3.4. They are based on the Wabush Lake TSF tailings deposition modelling completed for the WHS offset project (Hatch, 2023). The pipeline configuration will consist of 4 duty and 1 standby. Additional piping will also be required as well to provide gland seal water and motor cooling water to the tailings pumps. This piping is only required up to the pump houses and not to the discharge.

Table 3.4: Pipeline and Process Equipment Summary

Year	Pipeline Length	Process Equipment
2026	+ 1,100 m	Wabush Lake New Pump Station Stage F
2030	+ 1,500 m	New Stage G pumps at Wabush Lake Stage F Pump Station
2033	+ 2,650 m	Wabush Lake New Pump Station Stage H

3.5.6 Provisional Space Requirements

A 100 m buffer to the west of the access road and pipeline alignment is included in the project components to accommodate any rerouting of the alignment that may be required due to the presence of large rocks, environmentally sensitive areas, highly sloped terrain or other natural obstacles to construction (Figure 3.2).

3.6 Operations and Maintenance

Once the project has received all required approvals, operational activities will begin as the various pipeline extension phases are completed. The Project will be operated in the same manner as the current IOC's TSF.

In general, operational and maintenance activities for The Project include existing tailings operations, engineering, and contracted work activities related to the five coarse tailings pipelines, pumping stations, and environmental monitoring.

3.6.1 Coarse Tailings Delta

Regular maintenance activities associated with the coarse tailing's operation at the Wabush Lake TSF include the following:

- Repairs, extensions, armoring and raises to existing structures (CCD and Western Dyke) on an as needed basis.
- Coarse discharge management via dozer activity on the coarse tailings beach. Managed from March through to November on a regular basis to prevent coarse tailings from building up at the discharge location. Dozing operations cease during the wintertime due to the formation of canyons on the coarse tailings beach which prevents tailings material from settling near the end of the pipelines discharge.
- Annual coarse tailings pipeline extensions (5 lines).
- Pump motor upgrades and repairs.
- Pipeline maintenance (cribbing, patching, replacement and/or re-alignment).
- Progressive rehabilitation of inactive areas.

3.6.2 Fine Tailings Delta

Regular maintenance activities associated with the fine tailing's operation at the Wabush Lake TSF include the following:

- Extensions to the fine tailings trench on an as needed basis.
- Periodic dredging and re-sloping of the fine tailings trench to prevent uncontrolled washouts.
- Road maintenance including snow clearing and grading.
- Progressive rehabilitation of inactive areas.

3.7 Possible Accidents and Malfunctions

During the construction, operation, and maintenance of the Wabush Lake TSF, an accidental or other unplanned event is a possible outcome. Some of the potential accidental events or malfunctions that may be associated with the Project include:

- Rupture or loss of containment of the coarse / fine tailings discharge line;
- An accidental spill of chemicals, fuels, or other deleterious substances (i.e., trucks, heavy equipment, etc.);
- A fire or explosion;
- Slope failures;
- Electrical malfunctions;
- Equipment failure; and
- Traffic mishaps.

Human health and safety and environmental protection will be paramount considerations by IOC in the planning and detailed design of the Project, and these will continue to be the main priorities during the construction, operation, and maintenance of the Project.

In the construction, operation and maintenance of the Project, established safety procedures specific to human health and environmental protection will be strictly adhered to. IOC has a site wide Environmental Protection Plan (EPP) (Appendix B) whose policies and procedures will be applicable to all aspects of the Project. In addition, there are comprehensive Health, Safety and Environmental and Quality Management Systems and associated plans and procedures in place for all of IOC's operations in Labrador City. These will be updated as required for the Project. In addition, the construction and operation of the Project will be designed in compliance with relevant legislation, regulations, standards, and guidelines. Emergency response and spill response procedures are captured in existing IOC plans and procedures.

3.8 Closure and Decommissioning

Utilization of the Project area will occur over a period of approximately 14 years. Development is staged and as tailings storage areas are filled, progressive reclamation will occur where possible in inactive areas. Progressive rehabilitation of disturbed areas usually involves the placement of a layer of organic matter, over which hay is spread and then drill seeded.

The last iteration of IOC's site wide Rehabilitation and Closure Plan (RCP) for its existing mining, processing and product delivery infrastructure at Labrador City was submitted to NL Department of Industry, Energy and Technology (DIET) and approved in 2019. This RCP has been accepted and the next regular submission is due in 2024. Updates to the RCP are made as needed.

The Closure Plan has been developed for IOC's Labrador City operations. The scope of the Closure Plan and the associated financial assurance will be regularly updated over the remaining life of the mine, with input from stakeholder consultations, revegetation trials, technical studies and evolving mine plans. In accordance with the Rio Tinto Closure Standard, an Order of Magnitude level Closure Plan will be completed 10 years before planned closure, a Pre-Feasibility Study level plan will be completed 5 years before planned closure and a Feasibility Study level plan will be completed and approved one year before planned closure.

IOC is committed to following all guidelines outlined by permitting agencies for closure and rehabilitation activities. IOC undertakes progressive rehabilitation wherever and whenever possible at their Labrador City site and it is their goal to remediate the area to end-states that are safe and stable as well as to preserve local biodiversity. IOC also understands that a final RCP for their Labrador City site must be reviewed by the EA Division prior to the decommissioning of all infrastructure and activities at their Labrador City mining property.

3.9 Effects of the Environment on the Project

The regional topography, climate, existing development, and hydrogeological conditions primarily influenced the design of the Project. The primary anticipated effect from the environment on the Project is erosion due to surface water runoff. Weather conditions will also likely influence the timing of some construction activities. All stages of the Project will not require specific or special mitigation measures beyond normal water management strategies to manage possible effects of the environment on the Project.

3.10 Project Reports

Terrestrial (vegetation, avifauna, mammals, and amphibians) baseline studies and freshwater baseline studies in the Project area were conducted from 2021 to 2023 and these reports are presented in Appendix C and D, respectively. Other studies or plans referenced in this Registration document are also available upon request.

3.11 Project Schedule

The required capital works, on an annual basis, for the Project is summarized in Table 3.5. The necessary CCD earthworks, coarse pipeline and fine trench extensions, coarse tailings pumping upgrades and environmental offset works needed were developed during the WHS offset OoM study (Hatch, 2023). The required upgrades/modifications to the existing tailings infrastructure were identified during workshops

between IOC stakeholders and Hatch. The exact schedule may change over time due to changes in production schedules, emerging risks, or opportunities, or market conditions.

Table 3.5: Estimated Project Schedule

Year	Capital Works Required
2024	- 300 m Coarse Tailings Pipeline Extension on Tailings Beach. - 150 m CCD Extension, 5 m Height. - 65 m Coarse Tailings Flume Replacement - 70 m Fine Tailings Flume Replacement' - 32 Sections of the 42-inch gravity flow pipe from the Boil Box to the Old Tailings Pumphouse (OTPH) - FTPH Gyrol Installation - 250 ft thickener rebuild at the NTPH. - Western Hillside Offset Project Fish Habitat Compensation
2025	- 500 m Coarse Tailings Pipeline Extension on WHS. - 800 m CCD Raise, 5 m Height. - 65 m Coarse Tailings Flume Replacement - 70 m Fine Tailings Flume Replacement' - 32 Sections of the 42-inch gravity flow pipe from the Boil Box to OTPH - Western Hillside Offset Project
2026	- 300 m Coarse Tailings Pipeline Extension on WHS. - Coarse Tailings Stage F Pump Station on WHS. - 150 m CCD Extension, 5 m Height. - 65 m Coarse Tailings Flume Replacement - 70 m Fine Tailings Flume Replacement - 32 Sections of the 42-inch gravity flow pipe from the Boil Box to OTPH - 50,000 Gallon Water Tank Repairs at OTPH - Western Hillside Offset Project
2027	- 300 m Coarse Tailings Pipeline Extension on WHS. - 950 m CCD Raise, 5 m Height. - 500 m Fine Tailings Trench Extension. - 5-Way Distributor Replacement in the NTPH - 32 Sections of the 42-inch gravity flow pipe from the Boil Box to OTPH
2028	- 300 m Coarse Tailings Pipeline Extension on WHS. - 1,000 m CCD Raise, 5 m Height. - 32 Sections of the 42-inch gravity flow pipe from the Boil Box to OTPH - Boil Box Replacement
2029	- 400 m Coarse Tailings Pipeline Extension on WHS. - 650 m CCD Raise, 5 m Height.
2030	- 500 m Coarse Tailings Pipeline Extension on WHS. - Coarse Tailings Stage G Pump Upgrades (At Pump Station F). - 500 m CCD Raise, 5 m Height.
2031	- 500 m Coarse Tailings Pipeline Extension on WHS. - 500 m CCD Raise, 5 m Height
2032	- 750 m Coarse Tailings Pipeline Extension on WHS.
2033	- 1,400 m Coarse Tailings Pipeline Extension on WHS. - Coarse Tailings Stage H Pump Station on WHS. - 300 m Fine Tailings Trench Extension.
2033 to 2038	- Normal operation of tailings deposition.

3.12 Environmental Management and Protection

The Project will be constructed and operated as part of on-going and long-standing work associated with IOC's Labrador City operations. IOC has in place a comprehensive Health, Safety Environmental and Quality Management System (HSEQ MS) and associated environmental plans and procedures for its

development and operational activities. These have been developed and are being implemented and continuously updated in accordance with Rio Tinto's corporate *Health, Safety, Environment, Communities and Quality Policy*, other relevant corporate requirements, and guidelines, and with a view to meeting, and seeking to surpass, the provisions of applicable legislation and regulations.

The Project will be constructed and operated in accordance with applicable legislation and regulations, including the environmental protection and planning measures defined through the EA review, and in compliance with IOC policies, procedures, and standards.

A list of IOC's existing environmental plans for its Labrador City development and operations activities is provided in Table 3.6. A review and updating of these and other existing procedures will be carried out as Project planning and implementation progress, including the incorporation of the Project activities into IOC's overall integrated management system.

Table 3.6: Existing Environmental Management Plans

Title of Plan
Contaminated Soil Management
Spills of Toxic or Hazardous Materials
Environmental Reporting
Spill Response Reporting
IOC Lab City - Operational and Development Environmental Protection Plan (EPP)
Hazardous Materials and Non-Mineral Waste Control and Minimization Plan/Procedures
Water Quality Protection and Water Management Plans/Procedures
Land and Watercourse Disturbance and Rehabilitation Plans/Procedures
Emergency Response and Reporting Plan (ERRP)
Integrated Land Use Management Plan (ILM)
Construction and Development Water Management Plan

3.12.1 Environmental Protection Plan (EPP)

Environmental protection planning is an integral part of IOC's construction, operations and maintenance programs. As a company with substantial experience in constructing, operating and maintaining mining related infrastructure and activities in Labrador City, IOC has proven policies and procedures related to environmental protection and management which will be implemented during the construction and operation of this Project.

An EPP is an important tool for consolidating environmental protection information and procedures in a document that provides sufficient detail for the implementation of environmental protection measures in the field. An EPP provides concise instructions to personnel regarding environmental protection procedures and descriptions of techniques to reduce the environmental effects associated with construction and/or operations activities.

IOC has developed and implemented a site wide EPP for its Labrador City mining activities. This EPP was last updated in March 2024 and describes environmental protection measures associated with components and activities of construction and operation activities of the Project.

The EPP includes procedures and measures relative to activities such as vegetation clearing, grubbing, storage and handling of fuel, blasting, quarrying, dust control, waste and sewage disposal, work in or near water, as well as contingency plans for unplanned events such as spills, rehabilitation, and compliance monitoring. A copy of IOC's current site wide EPP is included in Appendix B.

3.12.2 Emergency Response and Reporting Plan

IOC proactively identifies potential emergency situations and develops Emergency Response and Reporting Plans (ERRP), the purposes of which are to identify responsibilities and procedures in the event of an unplanned incident, such as an incident that may affect human health or safety, or the accidental release of hazardous material, and to provide the information and procedures required for the effective response and reporting of such an incident.

There are comprehensive incident prevention, response and reporting plans and procedures in place for IOC's overall Labrador City mining operations. These plans and procedures will be adopted and updated as required for this Project, which will be designed, constructed, and operated in compliance with relevant legislation, regulations, standards, and guidelines.

IOC has established a Business Resilience and Recovery Program (BRRP) that has identified crisis-level risks and has developed detailed plans to mitigate identified risks. The purpose of the BRRP is to promote readiness by making available the appropriate resources and facilitating the preparation, practice, and availability of appropriate incident response plans. The plans provide an effective response for the mitigation, control and recovery from incidents which can affect business at IOC. Activities associated with the Project will be evaluated under the BRRP. The BRRP is routinely tested and audited to confirm it meets IOC's needs.

3.13 Other Required Environmental Approvals

In addition to approval under the provincial EA process, the Project may require other permits, approvals and/or authorizations. IOC will obtain all required permits, approvals and/or authorizations as listed in Table 2.1.

4 Existing Environment

The sections below provide an overview of the existing biophysical and socioeconomic environments for the Project.

4.1 Natural Environment

The Project is located just outside the municipal boundary of Labrador City, in the Eastern portion of IOC's existing mining property site. The Project is in an area that has been affected by IOC's large scale mining operations for the past five decades.

IOC has identified several components of the natural environment that may be affected by this Project, or alternatively, may affect Project components or the local and/or regional environments. These components have been identified below and descriptions of their existing conditions are presented in this document.

4.1.1 Atmospheric Environment

Iron ore mining forms the industrial base for the Towns of Labrador City and Wabush and is the main industry affecting the quality of the local atmospheric environment. The various components of the atmospheric environment that this document examines include regional climate, air quality, greenhouse gas emissions, noise, and vibration.

4.1.1.1 Regional Climate

The Project is located in Labrador City, within IOC's existing mine property. The site is located within the extensive *Mid Subarctic Forest* ecoregion (Meades 1989; 1990), which encompasses the upland plateaus of central and western Labrador. This area has a continental, subarctic climate with cool, short summers and long cold winters. The Project area, at an elevation of approximately 525 MASL, is located approximately 10 km northwest of the Wabush Airport, at an elevation of 551 MASL.

Climate information for the Labrador West area presented in Table 4.1 is based on data recorded from 1981-2010 at the Wabush Lake Airport climate station (Environment and Climate Change Canada, 2016).

Table 4.1: Wabush Airport Climate Normals (1981 to 2010)

Month	Temperature			Precipitation			Wind
	Monthly Average (°C)	Extreme Maximum (°C)	Extreme Minimum (°C)	Total (mm)	Rain (mm)	Snow (cm)	Maximum Hourly Speed (km/h)[1]
January	-22.2	8.0	-43.9	50.2	1.0	65.1	111.0 (1982)
February	-20.6	6.2	-44.8	40.3	1.6	50.9	130.0 (1991)
March	-13.3	14.7	-41.6	54.1	2.6	65.9	87.0 (1987)
April	-4.3	16.8	-31.4	48.8	11.7	44.3	87.0 (1981)
May	4.0	28.4	-13.4	53.5	40.4	14.4	78.0 (1998)
June	10.3	33.3	-5.1	82.7	80.6	2.1	83.0 (1997)
July	13.8	32.6	-0.2	113.9	113.9	0.0	83.0 (1981)
August	12.5	29.5	-0.5	103.5	103.4	0.1	130.0 (1991)
September	7.6	27.8	-7.0	96.5	92.3	4.4	83.0 (1984/'85)
October	0.5	20.5	-16.8	75.7	42.0	39.0	102.0 (2002)
November	-8.2	10.9	-33.1	70.2	11.8	75.8	104.0 (1991)
December	-17.5	4.1	-42.5	50.4	2.5	66.2	83.0 (1985)
Year	-3.1	19.4	-23.4	839.8	503.8	428.2	96.8

[1]Bracketed values indicate year maximum hourly wind speed was recorded.

At Wabush Airport, daily average temperatures range from -22.2 °C in January to +13.8 °C in July. The average daily temperature drops below freezing in November and remains below zero until May.

Annual average precipitation in Labrador West is approximately 839.8 mm, which includes approximately 503.8 mm of rainfall and 428.2 cm of snow. Monthly average precipitation ranged from a low of 40.3 mm in February to a high of 113.9 mm in July. In addition to temperature and precipitation, incidences of historical extreme weather events were also included. The extreme maximum and minimum average daily temperatures were 33.3°C and -44.8°C, recorded in June 1983 and February 1994, respectively. The highest single day total of precipitation was recorded in July 1984, where 191.1 mm of rain fell. Extreme snow depths were recorded between November and May, with the most extreme snow depth of 161.2 cm measured in November 1983.

Wind data were also collected from the Wabush Airport and are presented below in

The highest wind speeds have been historically detected between October and March. Throughout the year the predominant prevailing wind direction is westerly with some secondary contributions from northerly winds, particularly during the winter months. The highest single day wind speed at Wabush airport was recorded as 130 km/h in both February 1991 and August 1991.

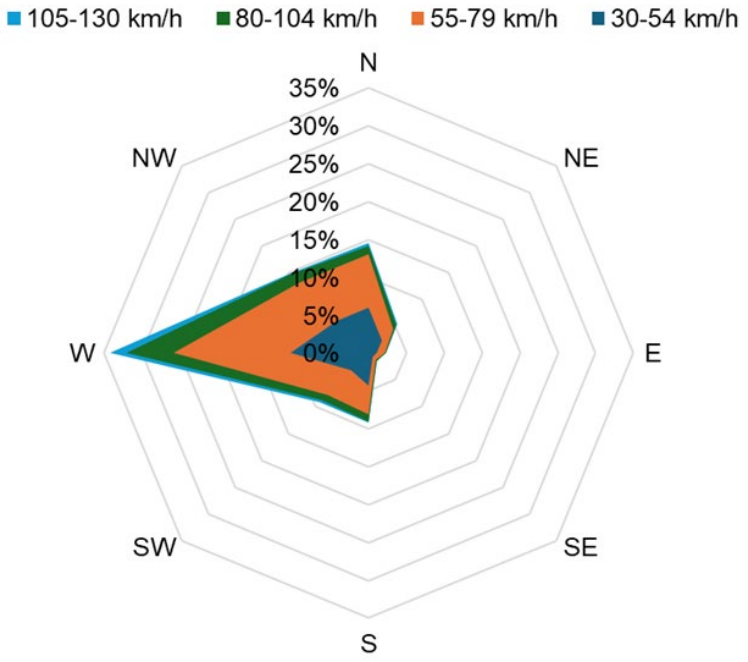

Figure 4.1: Labrador West Wind Data

4.1.1.2 Air Quality

Releases of air contaminants are generally classified into criteria air contaminants (CACs) and greenhouse gases (GHGs). CACs are a set of criteria pollutants that cause smog, acid rain and other health hazards, and include particulate matter (PM), sulfur oxides (SOx; including sulfur dioxide (SO_2)), nitrogen oxides (NOx; including nitrogen dioxide (NO_2)), carbon monoxide (CO), and ammonia (NH_3). Sources of CAC emissions that arise from iron ore mining are outline

Table 4.2: Iron Ore Mining - Sources of CAC Emissions

Source of Emissions	Type of Emission
Use of large trucks and excavators to mine iron ore	Particulate, NO_2, SO_2, CO, VOCs
Blasting	Particulate, NO_X and SO_2
Fugitive emissions from active quarries and tailings piles	Particulate
Rock crushers	Particulate
Concentrator Plants	Particulate, metals, NO_2, SO_2 and CO
Pelletizing Plants	Particulate, metals, NO_2, SO_2, CO and VOCs
Transport – Rail	Particulate, NO_2, SO_2, CO and VOCs
Use of smaller service trucks onsite	Particulate, NO_2, SO_2, CO and VOCs

IOC monitors the air quality in Labrador City from three air quality monitoring stations which are in close proximity to the local community and to recreational facilities (Figure 4.2). Data from these monitoring stations is compiled by the NLDECC and the results compiled and published in annual Air Quality reports.

A major contributor to CAC emissions in Labrador West is IOC's pelletizing operation. IOC has improved the air quality of their operations over the past 20 years through pollution abatement projects. There has also been a large reduction in particulate emissions with the replacement of dry mill processes with wet

grinding mills. Results from 2022 monitoring programs indicate no annual concentration exceedances of SO_2, NO_X, particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), or total particulate matter at established monitoring locations. Data from these monitoring stations is compiled by the NLDECC and the results compiled and published in annual Air Quality reports (Government of Newfoundland and Labrador, 2022).

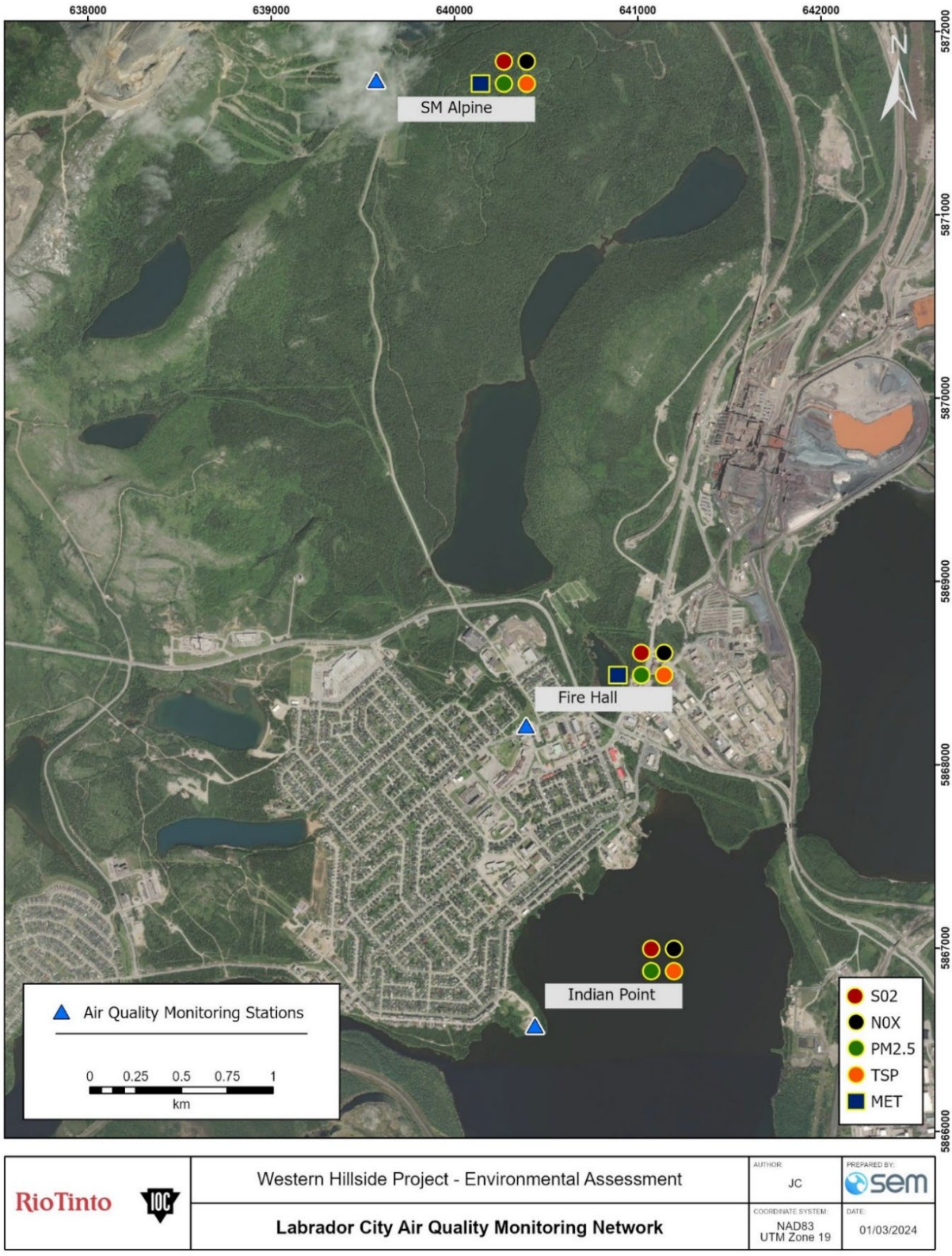

Figure 4.2: Air Quality Monitoring Stations

4.1.1.3 Greenhouse Gases

Greenhouse gas (GHG) emissions in Newfoundland and Labrador predominately originate from large industries including mining, oil refining, electricity generation, and offshore petroleum. There are six key categories of GHGs: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Provincial GHG emissions are dominated by CO_2, CH_4 and N_2O; emissions of fluorinated gases (HFCs, PFCs, SF_6) are less abundant. The *Management of Greenhouse Gas Act* (MGGA) and its regulations stipulates that GHG emissions are reported in terms of carbon dioxide equivalents (CO_2e), allowing emissions from all GHGs to be accurately compared. Emissions are converted to units of CO_2e using global warming potentials (GWPs); the amount of energy a GHG will absorb relative to CO_2 over a given period.

In accordance with the *Management of Greenhouse Gas Act*, industrial facilities are required to report emissions to the Newfoundland and Labrador Department of Environment and Climate Change (NLECC) if annual emissions are 15,000 tonnes (t) of CO_2e or more (Management of Greenhouse Gas Act, 2016). The most recent available data are for the 2022 reporting year; 2023 data was not available at the time of reporting.

The Project is located on IOC property and will not contribute to additional GHG's above baseline levels as this Project does not account for increased production or operation rates at the mine.

4.1.1.4 Noise and Vibration

Ambient noise levels in the Project Area are a culmination of both biogenic (e.g., birds, wave breaking, wind) and anthropogenic (e.g., heavy equipment, earthworks, blasting) sources. Biogenic sources of noise are considered intermittent while noise generated by ongoing construction and industrial activities are more continuous, and thereby substantive. Such sources are concentrated on or near the IOC mine site which, due to regional topography, does not significantly impact regional noise levels. Ambient noise levels in the Project Area are considered to be classified as quiet rural (Health Canada, 2017).

Ambient levels of vibration in the Project Area are low; vibrations occur intermittently based on ongoing construction and industrial activities in the region. Such activities include earthworks, blasting, and movement of heavy equipment. Natural sources of vibration such as volcanic occurrences and seismic activities (i.e., those caused by movement of tectonic plates), are negligible.

4.1.2 Terrestrial Environment

The interior of western Labrador, with its myriad forest types and extensive wetlands, provides habitats for a range of wildlife that are typical of boreal forest ecosystems. A thorough biophysical assessment was conducted for the Study Area, aiming to identify the current habitats (ecotypes) through an Ecological Land Classification (ELC), survey the wildlife species inhabiting the Study Area, and identify any rare flora present on-site. Several desktop and field surveys contributed to the information for this biophysical assessment, including the following components, or 'Valued Components' (VCs):

- Ecological Land Classification:
- Wetlands;
- Rare Flora;
- Avifauna, including:
    - Passeriformes and Other Perching Birds;
    - Raptors; and
    - Waterfowl and Waterbirds.
- Mammals;
  Amphibians; and
- Species at Risk and Species of Conservation Concern.

Prior to field efforts, a data request was submitted to the Atlantic Canada Conservation Data Centre (ACCDC) to obtain a preliminary list of rare species and Species of Conservation Concern (SCC).

4.1.2.1 Ecological Land Classification

The Biophysical Assessment Study Area (BASA) (Figure 4.3) is located approximately 6 km north of Labrador City along the western shore of Wabush Lake. The BASA consisted of the area of land that will be directly impacted by the Project as well as a 100 m buffer that occurs to the west of the pipeline and road corridor (220.82 ha). The BASA is located within the Mid Subarctic Forest Ecoregion (Michikamau) which is characterized by spruce-dominated forests, string bogs and fens, and open spruce-lichen forests (Parks and Natural Areas 2007). The BASA was comprised of several different ecotypes, including closed and open spruce forests, shrub thicket, wetlands, and upland rocky outcrops. Construction activities for the Project will include the removal of forested habitat along the Western Hillside of Wabush Lake to accommodate a pipeline road alignment, and tailings deposition.

For the Ecological Land Classification (ELC), IOC utilized high-resolution colour imagery collected with a SenseFly eBee remotely piloted aircraft system (RPAS). The resulting imagery dataset was comprised of a series of high-resolution digital images (3.3 cm/pixel) captured directly from the sensor onboard the RPAS (in stereo). The orthorectified imagery was imported into ArcGIS for interpretation, and the habitat polygons were interpreted from aerial imagery gathered from ground-truthing efforts in the field. Habitat classification methods were based on the Forest Site Classification Manual (Meades & Moores, 1994), a detailed reference guide for forest site classification for Insular Newfoundland but also compatible with Labrador's ecotypes.

Closed Spruce Forest was the most abundant ecotype within the BASA (Table 4.3), representing over 48% of the Project Area. This ecotype occurs primarily on upland areas with relatively moist conditions and closed canopy. Black spruce (*Picea mariana*) and white spruce (*Picea glauca*), dominate the tree layer. The forest floor and herb layer (<1 m) was comprised of several species of feathermosses including Schreber's moss (*Pleurozium schreberi*), stair-step moss (*Hylocomium splendens*), and plume moss (*Ptilium crista-castrensis*), as well as herbaceous species like bunchberry (*Cornus canadensis*), creeping snowberry (*Gaultheria hispidula*), Labrador tea (*Ledum groenlandicum*), glandular birch (*Betula glandulosum*), sweetgale (*Myrica gale*), low bush blueberry (*Vaccinium angustifolium*), twinflower (*Linnea borealis*), blue bead lily (*Clintonia borealis*), and interrupted clubmoss (*Spinulum annotinum*).

Open Spruce Forest was also prevalent within the BASA, representing approximately 27% of the Project Area. Open Spruce Forest is often found in elevated upland areas over bedrock, with relatively dry conditions. The ground vegetation is usually dominated by a carpet of lichen species from the Genus Cladonia (the "caribou lichens") such as *Cladonia rangiferina*, *Cladonia stellaris*, and *Cladonia mitis* (Meades and Moores 1994). The shrub layer of this ecotype is often characterized by glandular birch, Labrador tea, lowbush blueberry, and sheep laurel. In the BASA, this ecotype represents most of the elevated drier land, often with areas of exposed bedrock (SEM 2023).

Other ecotypes present in the BASA include Shrub Thicket, Wetland, Shoreline, Anthropogenic and Water. Wetlands cover approximately 11% of the BASA and are comprised primarily of fens, characterized by the movement of mineral-rich but nutrient-poor surface water through pools, channels, and seepage (CWCS 1997). Ground cover on treed fens consisted of sparsely populated tree species like Eastern larch and black spruce, while the shrub layer consisted of glandular birch, bog laurel, and sweet gale. Other species observed included Carex (i.e., sedge) species, other graminoid species (i.e., grasses and rushes), mosses (mostly Sphagnum species), and marsh cinquefoil (*Potentilla fruticose*). The Shrub Thicket ecotype occupied approximately 2% of the BASA and was located primarily in an area of exploratory drill-pad and road-cut regrowth where the trees had historically been cleared. Dominant vegetation species included green alder (*Alnus viridis*), graminoids, labrador tea, twinflower, and sapling balsam fir and black spruce. The Shoreline, Water and Rocky Upland ecotypes made up a very small fraction of the BASA (<2%). The Anthropogenic ecotype covered approximately 11% of the BASA and collectively represents the various areas in which human influence has significantly altered the ecosystem for commercial use (e.g., tailings deposition road construction).

Table 4.3: ELC Ecotype Composition

ELC Ecotype/Habitat	Area (ha)	Percentage of Project Area (%)
Water	0.89	0.4
Shoreline	1.27	0.58
Rocky Upland	1.4	0.63
Shrub Thicket	4.82	2.18
Wetland	23.27	10.54
Anthropogenic	23.83	10.79
Open Spruce	58.85	26.65
Closed Spruce	106.49	48.22
Total	**220.82**	**100.0**

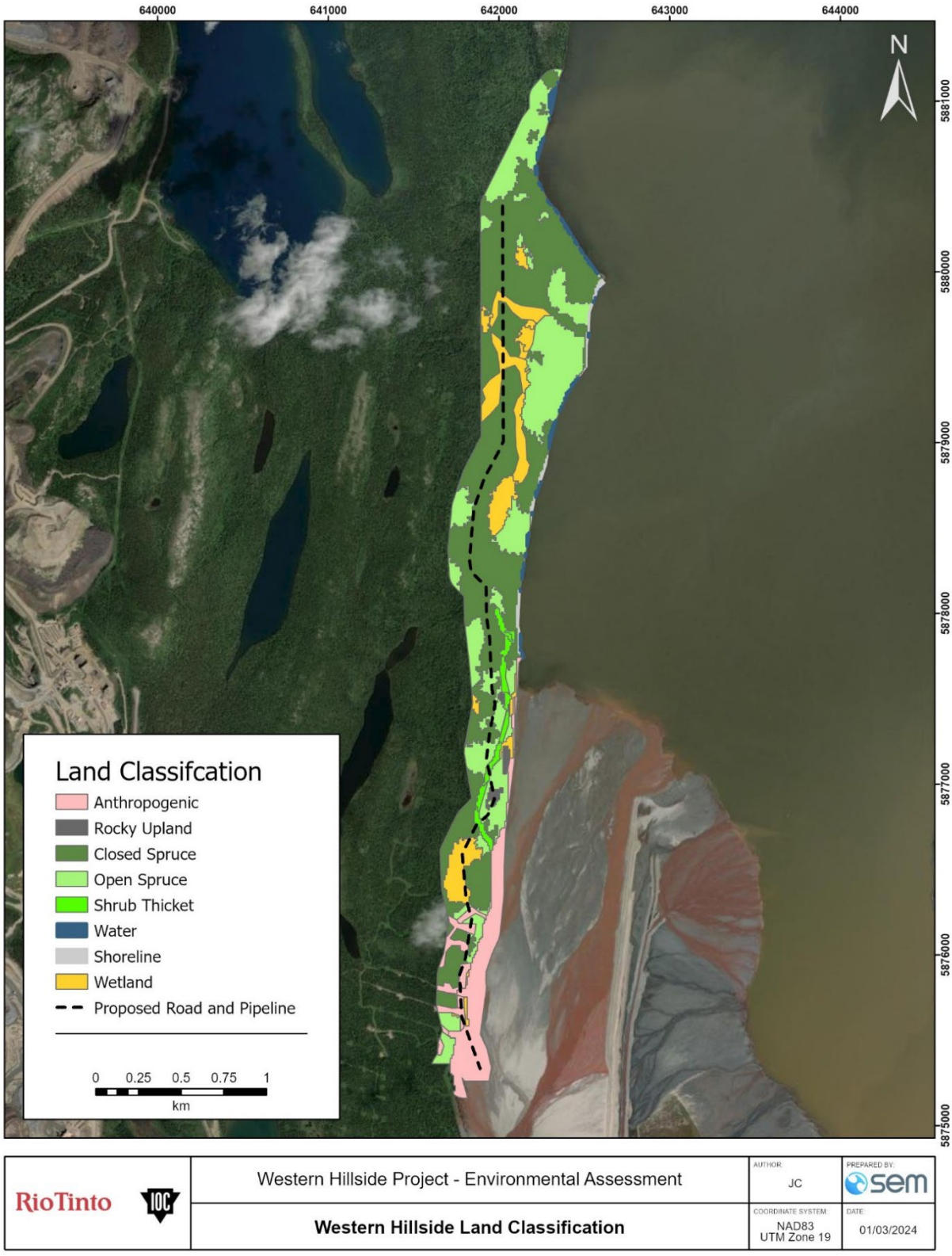

Figure 4.3: Ecological Land Classification map of the BASA.

4.1.2.2 Vegetation and Rare Flora

In conjunction with the ELC, SEM completed rare flora surveys throughout the BASA in 2023. Plant lists and detailed methodologies are outlined in the SEM 2023 Terrestrial Baseline Report (Appendix C). The survey targeted species currently ranked Critically Imperiled to Uncommon (i.e., ranked S1 to S3) by the ACCDC. Species with some uncertainty (due to lack of information) may be marked with a range (e.g., S1S3) which means the species may occur over the region at rarity level between S1 and S3 but currently remains unclear.

One S1 rare plant was identified, slender sedge (*Carex lasiocarpa*) and one S2 rare plant was identified, false hellebore (*Veratum viride*) in the BASA. Slender sedge was observed in a wetland area of the BASA but is outside of any direct Project activities. It was estimated that >500 individuals of this species were present in this region. False hellebore was observed in multiple locations within the BASA, with approximately 300 individual plants observed (Figure 4.4). The margins between wetland and forested sites provided the most individual observations and groupings of 20 or more were seen at various locations in proximity of each other, specifically along treed wetlands. This species thrives in moist to wet environments, spanning various soil types such as sandy, loamy, and organic, particularly in proximity to wetlands and water bodies (Mulligan & Munro, 1987).

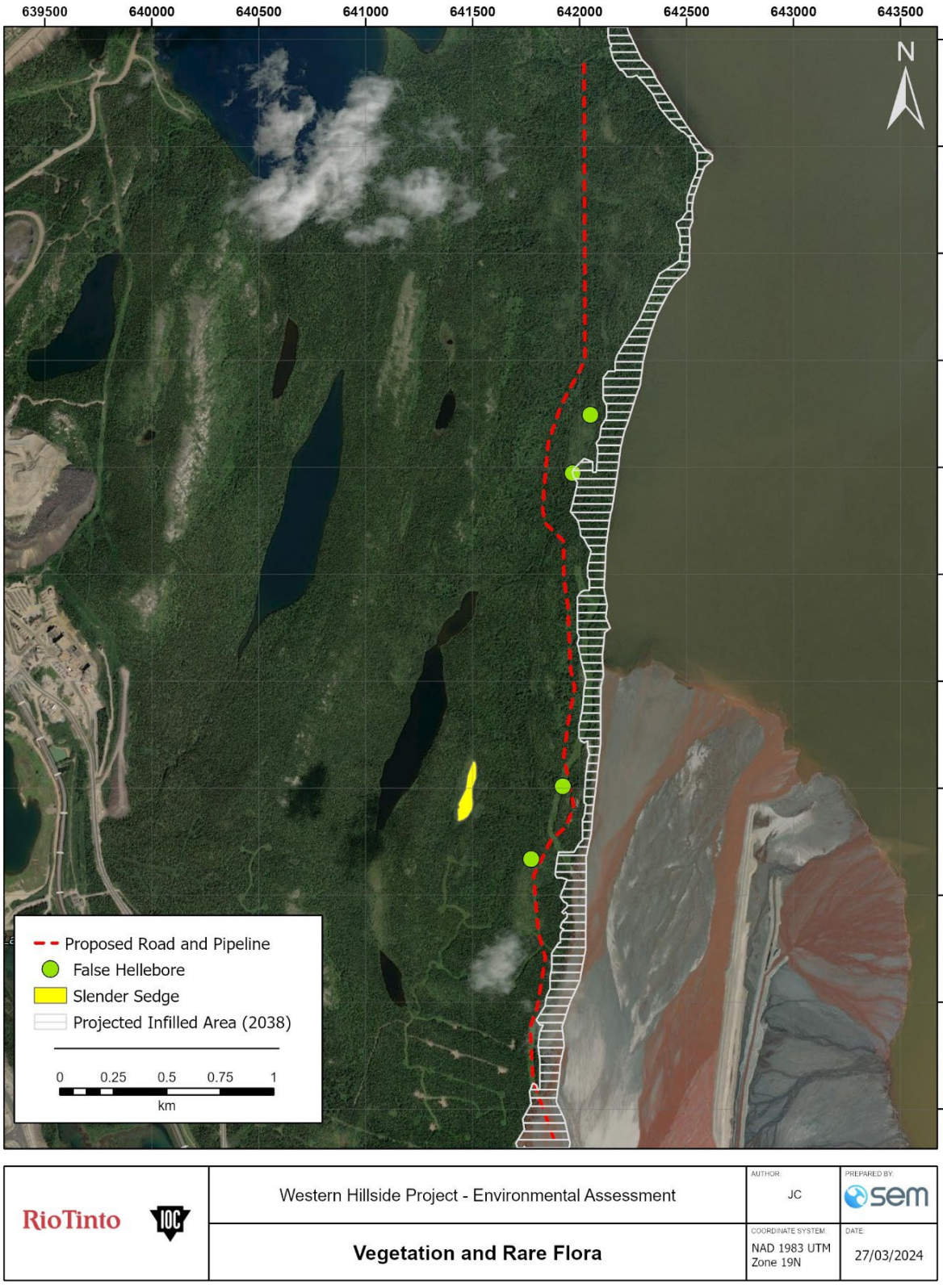

Figure 4.4: S1 and S2 Ranked Rare Flora

4.1.2.3 Avifauna

A desktop avifauna habitat assessment was completed prior to field surveys to determine the avian species that were likely to occur in the BASA, based on the habitat types available (Table 4.4). From previous work completed in Labrador West, several species of passerines and other perching birds were known from IOC. Some of the most common species included:

Table 4.4: Avifauna Known to the Labrador West Area

Common Name	Scientific Name
Ruby-crowned Kinglet	*Regulus calendula*
Yellow-rumped Warbler	*Setophaga coronata*
Dark-eyed Junco	*Junco hyemalis*
White-winged Crossbill	*Loxia leucoptera*
White-throated Sparrow	*Zonotrichia albicollis*
American Robin	*Turdus migratorius*
Wilson's Warbler	*Cardellina pusilla*
Tennessee Warbler	*Leiothlypis peregrina*
Fox Sparrow	*Passerella iliaca*
Swansons Thrush	*Catharus ustulatus*
Alder Flycatcher	*Empidonax alnorum*
Blackpoll Warbler	*Setophaga striata*
Orange-crowned Warbler	*Vermivora celata*
Gray Jay	*Perisoreus canadensis*
Hermit Thrush	*Catharus guttatus*
Yellow Warbler	*Setophaga petechia*
Lincoin’s Sparrow	*Melospiza lincolnii*
Yellow-bellied Flycatcher	*Empidonax flaviventris*
Boreal Chickadee	*Poecile hudsonicus*
Pine Siskin	*Spinus pinus*
Common Redpoll	*Acanthis flammea*
Pine Grosbeak	*Pinicola enucleater*
Wilson’s Snipe	*Gallinago delicata*
Osprey	*Pandion haliaetus*
Tree Swallow	*Tachycineta bicolor*

Several species of raptor were also known to use habitats at IOC. Raptors are protected by the regulations of the Newfoundland and Labrador *Wildlife Act*, which prohibits the hunting, taking, killing, or possessing of any eagle, falcon, hawk, osprey, or owl. In addition, Short-eared Owl is listed as vulnerable under the NL Endangered Species Act (NL ESA).

Table 4.5 shows the raptor species known to IOC.

Table 4.5: Raptor Avifauna know to the Labrador West area

Common Name	Scientific Name
American Kestrel	*Falco sparverius*
Bald Eagle	*Haliaeetus leucocephalus*
Boreal Owl	*Aegolius funereus*
Great-horned Owl	*Bubo virginianus*
Merlin	*Falco columbarius*

Northern Goshawk	*Accipiter gentilis*
Northern Harrier	*Circus cyaneus*
Osprey	*Pandion haliaetus*
Red-tailed Hawk	*Buteo jamaicensis*
Rough-legged Hawk	*Buteo lagopus*
Short-eared Owl	*Asio flammeus*

Waterfowl species are protected federally by the Migratory Birds Convention Act 1994. Table 4.6 shows some of the species known to occur in the Labrador West area.

Table 4.6: Waterfowl know to the Labrador West area.

Common Name	Scientific Name
American Black Duck	*Anas rubripes*
Canada Goose	*Branta canadensis*
Common Goldeneye	*Bucephala clangula*
Common Loon	*Gavia immer*
Common Merganser	*Mergus merganser*
Green-winged Teal	*Anas crecca*
Northern Pintail	*Anas acuta*
Red-breasted Merganser	*Mergus serrator*
Ring-necked Duck	*Aythya collaris*

In addition to waterfowl species there are several species of waterbirds that are known from the Labrador West area from prior studies. Table 4.7 some of which use Labrador as important migratory stopover habitat, including:

Table 4.7: Migratory Waterfowl known to the Labrador West area.

Common Name	Scientific Name
Belted Kingfisher	*Megaceryle alcyon*
Greater Yellowlegs	*Tringa melanoleuca*
Solitary Sandpiper	*Tringa solitaria*
Spotted Sandpiper	*Actitus macularia*
Least Sandpiper	*Caladris minutilla*
Wilson's Snipe	*Gallinago gallinago*
American Golden Plover*	*Pluvialis dominica*
Dunlin*	*Caladris alpina*
Semipalmated Plover*	*Charadrius semipalmatus*
Semipalmated Sandpiper*	*Caladris pusilla*
White-rumped Sandpiper*	*Caladris fuscicollis*
* non-breeding in Labrador, migration only	

Avifauna field surveys were conducted June 19 – 21, 2023 (peak breeding season) throughout all habitat types within the BASA in summer 2023 (Figure 4.5). A total of 33 bird species were observed during the field surveys, with the most commonly observed species comprised of Passeriformes (perching birds), including Tennessee Warbler, Ruby-crowned Kinglet, Swainson's Thrush, Yellow-rumped Warbler and American Robin (SEM, 2023). A complete list of all species observed in the BASA is provided in Table 4.8. No waterfowl were observed in the BASA during the 2023 surveys in the BASA. For waterbirds, only the Greater Yellowlegs was observed within the BASA.

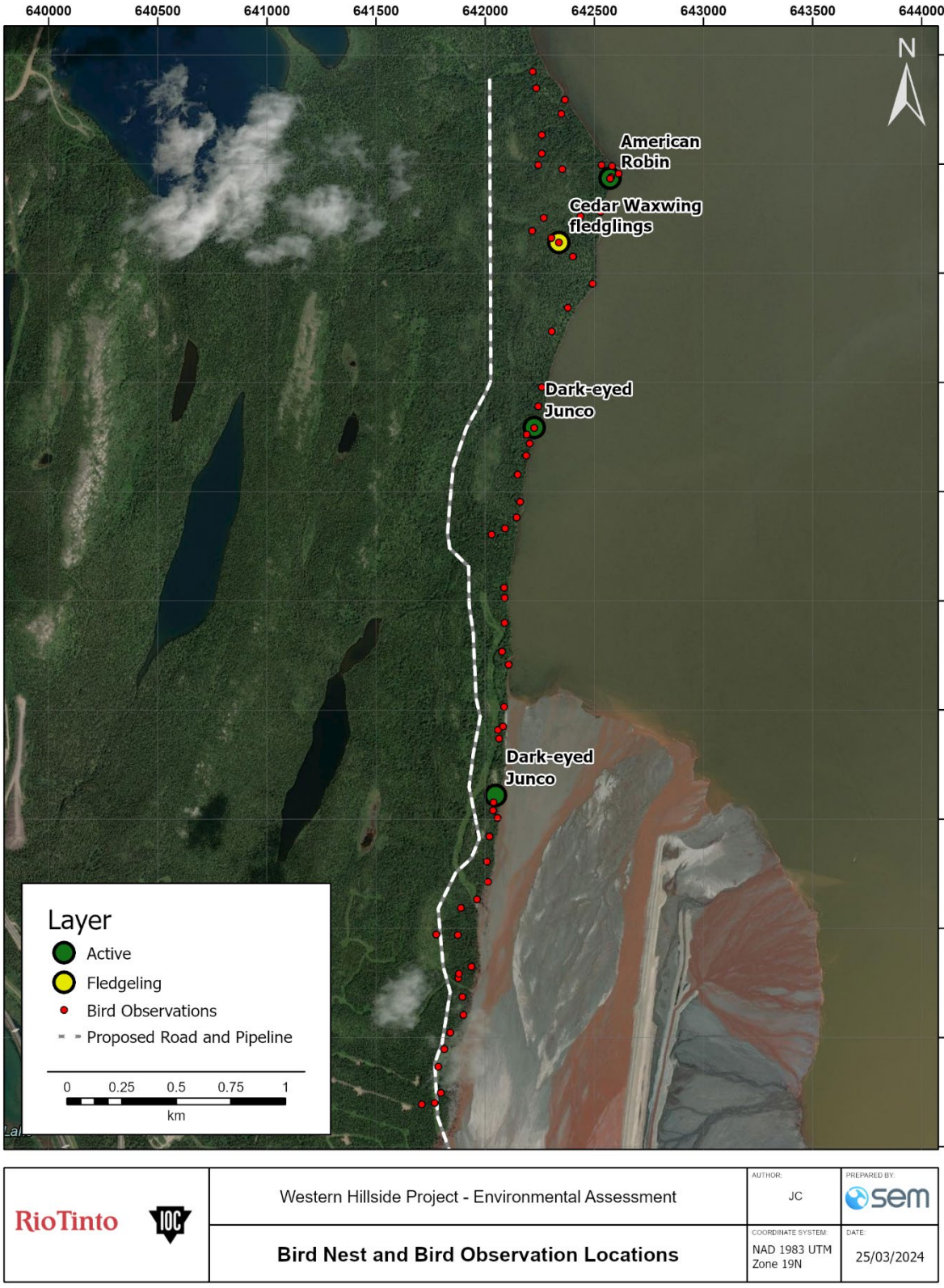

Figure 4.5: Bird Nest and Bird Observation Locations

Table 4.8: Birds Observed in the Project Area

Common Name	Scientific Name	Count
Tennessee Warbler	*Leiothlypis peregrina*	67
Ruby-crowned Kinglet	*Regulus calendula*	49
Swainson's Thrush	*Catharus ustulatus*	33
Yellow-rumped Warbler	*Setophaga coronata*	28
American Robin	*Turdus migratorius*	17
Dark-eyed Junco	*Junco hyemalis*	16
Hermit Thrush	*Catharus guttatus*	12
White-crowned Sparrow	*Zonotrichia leucophrys*	9
White-Winged Crossbill	*Loxia leucoptera*	6
Yellow-bellied Flycatcher	*Empidonax flaviventris*	6
Canada Jay	*Perisoreus canadensis*	4
Herring Gull	*Larus argentatus*	4
Common Raven	*Corvus corax*	3
Fox Sparrow	*Passerella iliaca*	3
Osprey	*Pandion haliaetus**	3
Winter Wren	*Troglodytes hiemalis*	3
Magnolia Warbler	*Setophaga magnolia*	2
Northern Flicker	*Colaptes auratus*	2
Northern Waterthrush	*Parkesia noveboracensis*	2
Orange-crowned Warbler	*Vermivora celata*	2
Wilson's Warbler	*Cardellina pusilla*	2
Woodpecker spp.	*Picidae* spp.	2
Alder Flycatcher	*Empidonax alnorum*	1
Bank Swallow	*Riparia riparia*	1
Black and White Warbler	*Mniotilta varia*	1
Boreal Chickadee	*Poecile hudsonicus*	1
Cedar Waxwing	*Bombycilla cedrorum*	1
Golden-crowned Kinglet	*Regulus satrapa*	1
Greater Yellowlegs	*Tringa melanoleuca*	1
Sharp-Shinned Hawk	*Accipiter striatus*	1
Spotted Sandpiper	*Actitis macularius*	1
Spruce Grouse	*Falcipennis canadensis*	1
Three-toed Woodpecker	*Picoides dorsalis*	1

4.1.2.4 Mammals

Incorporating information from previous studies at IOC, new information from surveys, and local ecological knowledge, a detailed appraisal of mammalian species occurrence was prepared for the BASA. This information, combined with the ELC data, was used to identify the variety of habitats for mammals and any potential habitats for SAR within the project boundaries (e.g., little brown bat). Baseline studies were recently completed for previous EA registrations for Wabush 3, Smallwood North, Sherwood North, and Humphrey South developments, so a wealth of information already existed for IOC. In addition, the Biodiversity Conservation Strategy project has entailed a comprehensive amalgamation of all the biodiversity information for IOC dating back to 2009.

Mammal species detected during preceding surveys at IOC included black bear *(Ursus americanus*), Canada lynx (*Lynx canadensis*), gray wolf (*Canis lupus*), moose (*Alces alces*), muskrat (*Ondatra zibethicus*), red fox (*Vulpes vulpes*), and red squirrel (*Tamiasciurus hudsonicus*), snowshoe hare (*Lepus*

americanus), marten (*Martes americana*), short-tailed weasel (*Mustela ermine*), northern flying squirrel (*Glaucomys sabrinus*) and porcupine (*Erethizon dorsatum*).

Other mammals that may be found in the general area of IOC in Labrador West include beaver (*Castor canadensis*), American mink (*Neovison vison*), pygmy shrew (*Sorex hoyi*), little brown bat, meadow jumping mouse (*Zapus hudsonius*), meadow vole (*Microtus pennsylvanicus*), deermouse (*Peromyscus maniculatus*), otter (*Lontra canadensis*), southern red-backed vole (*Clethrionomys gapperi*), and star-nosed mole (*Condylura cristata*).

It was assumed that many of the aforementioned species would also use the BASA, to detect the presence/abundance of some of those species, however, specialized surveys would likely be required, such as small mammal trapping. Given that these small mammal species are fairly ubiquitous and of low conservation concern, a trapping grid was unnecessary.

The results of the 2023 mammal surveys in the BASA produced similar results to previous efforts at IOC. The most frequently observed mammal species during the surveys (from sign or visual observations) were red squirrel, snowshoe hare and gray wolf. Other species that were observed less frequently were black bear, porcupine, meadow vole, moose, and red fox (Table 4.9). These species were detected from visual observations of scat, caches, bark scaling, auditory and visual observations of individuals, and tracks along transects, throughout the various habitat types of the BASA.

Table 4.9: Species Detected from Observations of Sign or Visuals in the BASA.

Common Name	Scientific Name	Count
Red Squirrel	*Tamiasciurus hudsonicus*	20
Snowshoe Hare	*Lepus americanus*	7
Gray Wolf	*Canis lupus*	7
Meadow Vole	*Microtus pennsylvanicus*	5
Porcupine	*Erethizon dorsatum*	3
Moose	*Alces alces*	1
Red Fox	*Vulpes vulpes*	1
Black Bear	*Ursus americanus*	1

Other mammals that may be found in the BASA but were not detected during 2023 surveys include marten, short-tailed weasel, pygmy shrew, muskrat, beaver, river otter, and Canada lynx.

Information collected from transect surveys (e.g., observations of scat, tracks, etc.) were supplemented with trail camera photographs and videos from three different locations (Figure 4.6).

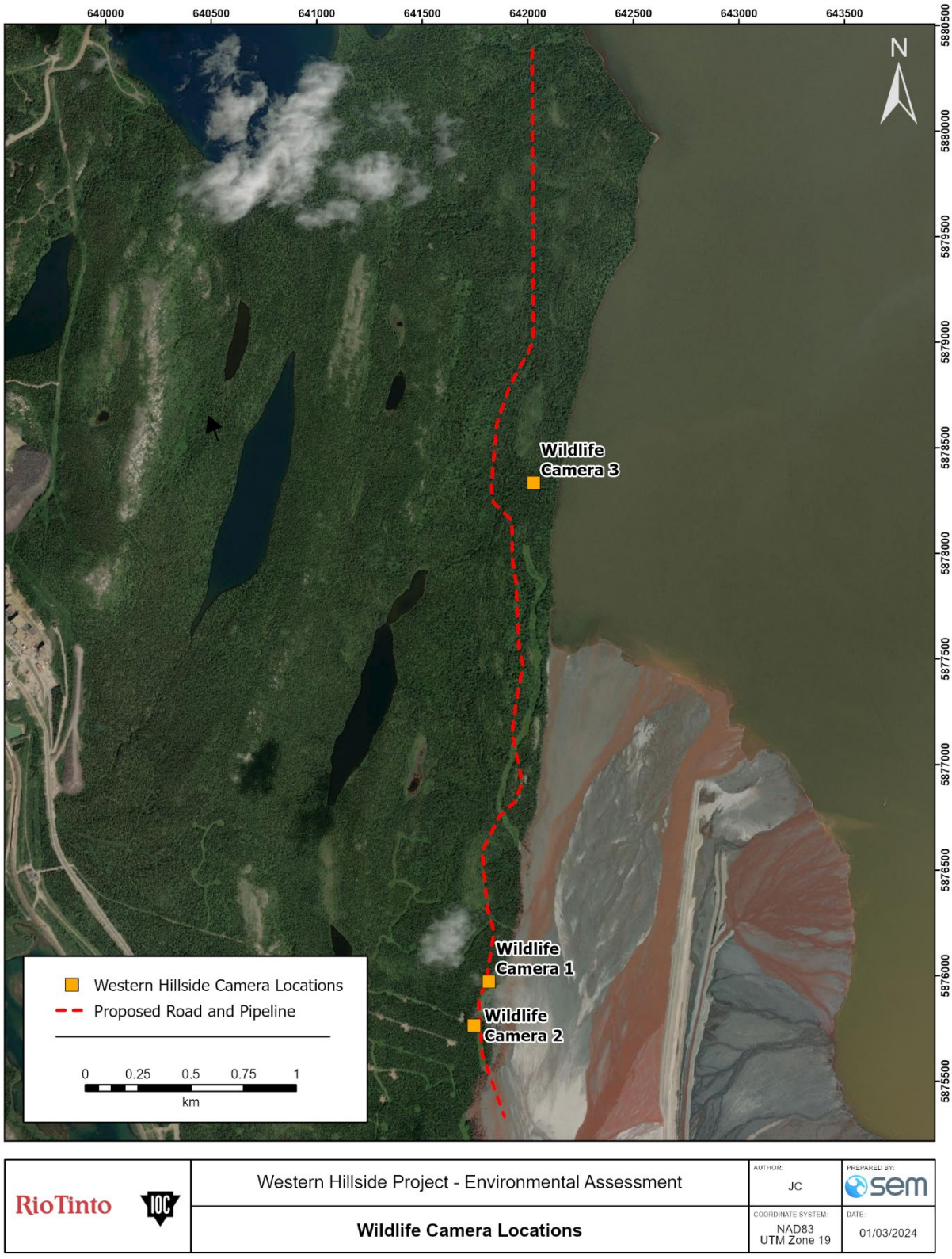

Figure 4.6: Western Hillside Wildlife Camera Locations

Upon review and analysis of collected photos and videos from wildlife cameras, it was determined that at least three gray wolves travelled along this network of trails, with three confirmed individuals utilizing the tailings as a travel corridor and moving from the three cameras. Red foxes were also confirmed to use this travel route. One large Black Bear was also observed at the Camera 3 location (Figure 4.7).

Figure 4.7: Labrador Grey Wolf and Black Bear photographed by on the Western Hillside

4.1.2.5 Species at Risk

Activities associated with a project may have direct and/or indirect effects on SAR. Direct effects include those with individuals of a SAR, or the removal or fragmentation of habitat that directly affects breeding behavior and/or success. Indirect effects can be those that do not impact SAR mortality of adults or young, but may diminish habitat quality (e.g., with anthropogenic influences like noise, human presence, etc.). SAR often require additional survey effort during projects that may interact with their survival, habitat, reproduction, or movement. The delineation of SAR habitat, the determination of presence/absence of SAR, and estimates of abundance, where possible, are often major considerations during all phases of project planning and implementation.

A data query by the Atlantic Canada Conservation Data Centre (ACCDC) of a 5 km radius area encompassing the BASA produced zero fauna SAR records for the area. The only avian SAR observed in the BASA during avifauna surveys was the Bank Swallow. This species burrows into sandy or clay banks with slopes over 70 degrees and is found commonly on the tailings revegetation area where suitable banks form from erosion of tailings (ECCC, 2021). The BASA provides no breeding habitat for this species, although the lake provides foraging habitat. It is not anticipated that this project will interact negatively (directly or indirectly) with Bank Swallow, given the absence of suitable habitat.

According to the NL ESA (2001) and the federal SARA Public Registry (2017), there are three mammal SAR that could potentially occur in Labrador West: wolverine, woodland boreal caribou, and little brown bat. Wolverine has not been verified in Labrador since 1950, and there is no evidence to suggest this species exists in the vicinity of the Project or other IOC properties in Labrador City. The woodland boreal caribou, currently listed as Threatened under the NL ESA and SARA, are unlikely to inhabit lands in such proximity to mining operations. The current range of the Lac Joseph woodland boreal caribou herd is to the south and east of the Project area and current information also indicates that the quickly declining migratory George River herd occurs to the north and northeast of the Project area (SEM 2023).

Using the Anabat bat detectors positioned throughout Western Hillside (Figure 4.8), SEM determined the species of bats present at the site, all of which are currently listed federally as Endangered under SARA, and provincially under the NLESA. Little brown bats, Northern myotis, and hoary bats were all detected in the Project Area. Bat detections are summarized in Table 4.10.

Table 4.10: Bat detection results, Western Hillside 2023

Bat Detector	Coordinates	Habitat Description	Bat Species	Number of Detections
Detector 1	641826.01 m E, 5875941.80 m N	Shrub Thicket (old cut line) meets tailings at a break in black spruce forest	Hoary bat (*Lasiurus cinereus*)	12
			Little brown bat (M*yotis lucifugus*)	3
			Northern myotis (*Myotis septentrionalis*)	10
Detector 2	642354.69 m E, 5880330.24 m N	Shoreline Habitat - Shallow cove with stillwater foraging habitat	Hoary Bat	2
			Little brown bat	1
			Northern myotis	1
Detector 3	642536.26 m E, 5879807.97 m N	Shoreline Habitat - Deep water cove where treed wetland meets lakeshore	Hoary Bat	1
			Little brown bat	22
			Northern myotis	6
Total Number of Bat Detections				**58**

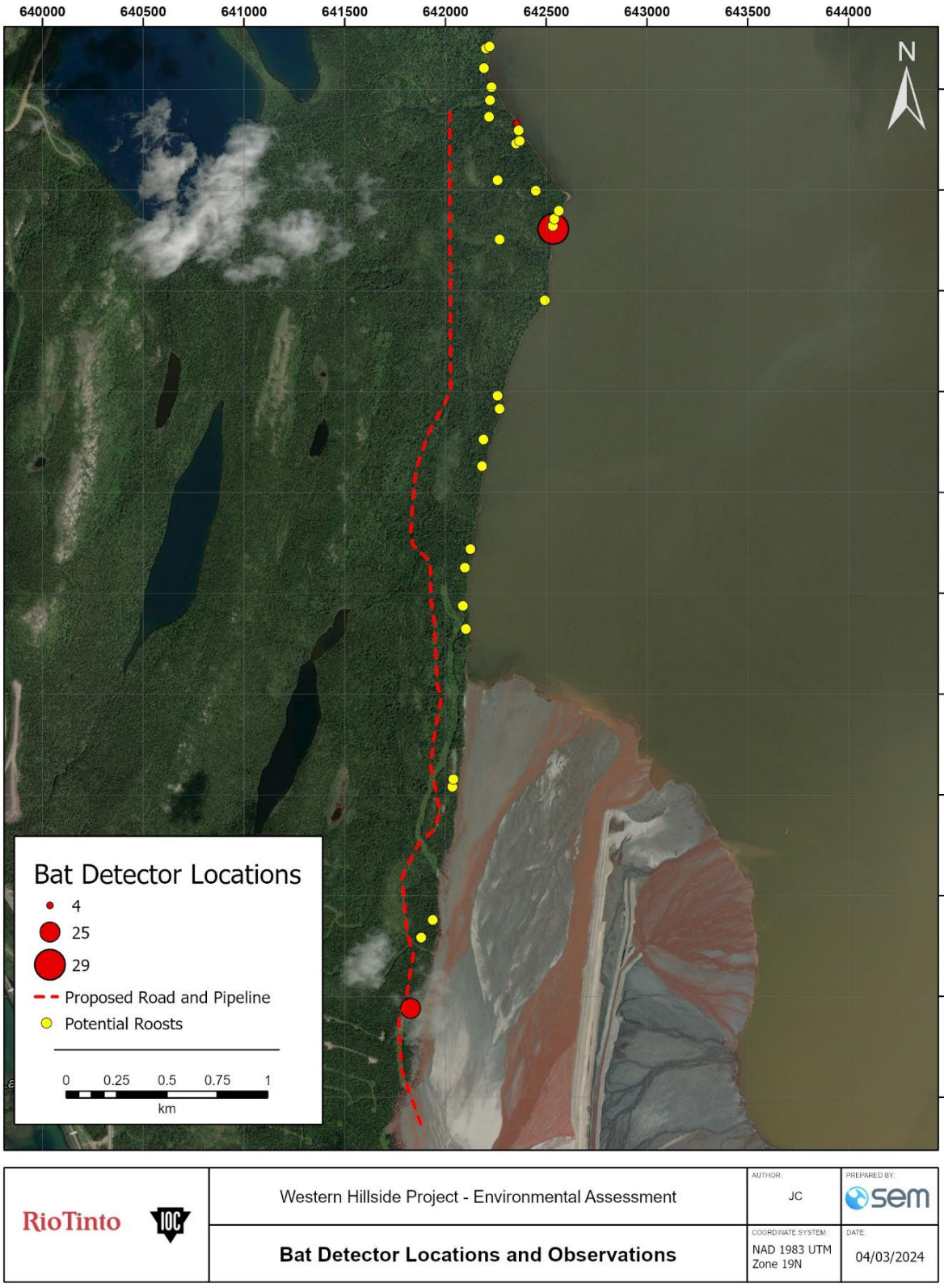

Figure 4.8: Bat Detector Locations and Observations

4.1.2.6 Amphibians

During ground surveys for avifauna and mammals, biologists noted the presence of amphibian habitat and probable amphibian habitat. During terrestrial surveys, SEM personnel surveyed shorelines of streams encountered, water-filled area of bogs, and forests to observe any amphibian along the transects but none (0) were observed.

Table 4.11 shows possible amphibian species occurring in the BASA based on surveys in other IOC areas, information from the Wildlife Division, and the NL Nature Atlas.

Table 4.11: Amphibians known to occur in the Labrador West area

Common Name	Scientific Name
American toad	*Anaxyrus americanus*
Wood frog	*Lithobates sylvaticus*
Mink frog	*Lithobates septentrionalis*
Northern leopard frog	*Lithobates pipiens*
Spring peeper	*Pseudacris crucifer*
Blue-spotted salamander	*Ambystoma laterale*
Northern two-lined salamander	*Eurycea bislineata*

4.2 Freshwater Environment

Fish habitat identification surveys were conducted by SEM in the Study Area (Figure 4.9) in August of 2021 (Appendix D). The study area included approximately 7 km of shoreline extending north from the current tailings outflow location to the northern boundary of the lease line limit and continued west to the top of the watershed. Potential stream locations within the study area were first identified through desktop exercises using high resolution aerial images, 1:50,000 topographic data and watershed modelling. Additional streams that were not identified using the desktop approach were identified *in situ* through both a shoreline traverse (via boat) and field investigation (via foot). A total of 18 potential sites (including NTS and non-NTS watercourses and waterbodies) were developed through the desktop exercises and further examined in the field for fish habitat (SEM, 2021). Field investigations in the Study Area positively identified five aquatic habitats, one of which exhibited a population of brook trout (Hillside Stream) (Figure 4.9). All other sites examined did not exist or were determined to not be fish habitat.

Figure 4.9: Identified Aquatic Habitat

Habitat characterization was completed on Hillside Stream in August of 2021 using the standard DFO methods (McCarthy *et al*., 2007). Stream habitat was classified, by reach, on a meso-habitat basis as riffle, run, pool, steady and "other" (rapids/cascade/chutes/falls). For each stream segment, the following information was collected:

- Water velocity;
- Chanel width;
- Meso-habitat type;
- Cover type;
- Substrate type; and
- Potential obstructions to fish migration.

Fish species (brook trout) presence was determined in representative stream habitats through index electrofishing using a Smith-Root LR-24 backpack electrofisher. Index electrofishing is a fishing method used when qualitative fish species utilization is the study's only objective. Standardized field fish data collection forms as per Scruton and Gibson (1995) were completed for fish collected. Fish captured were identified to species and age, weight (g) and fork length (mm) were measured. Remarks on fish condition and health were also noted.

IOC's tailings deposition plan involves pipeline advancement and an adjacent road construction along the Project. To complete the Project, IOC will require an additional authorization from DFO to remove any impacted fish habitat pursuant to paragraph 35(2)(b) and 36(3) of the *Fisheries Act*. The Project therefore required the completion of an aquatic baseline study of fish and fish habitat to support the necessary regulatory approvals, including population estimates of the brook trout present.

Aquatic habitat characterization, fish community, and fish population assessments were conducted in Hillside Pond between August 9th and August 18th, 2022 (Appendix E), to better understand the fish populations in the Study Area and to support fish habitat compensation measures. Unfortunately, due to the challenging terrain, natural barriers and low-flow conditions, completing population estimates of brook trout in Hillside Stream were deemed not possible. In order to satisfy the requirement to establish a baseline condition of the population of brook trout in the system, a population estimate of brook trout was completed in Hillside Pond. Migration of fish upstream from Wabush Lake into Hillside Stream is not possible due to the presence of natural barrier along the shoreline of Wabush Lake and a series of cascades that exist along several sections of the stream. It is, therefore, likely that any fish present in the stream are recruited from Hillside Pond. This is further explained by the fact that only brook trout are present in Hillside Pond and Stream where Wabush Lake is known to have upwards of nine different species of fish.

The key components of the aquatic baseline assessment for pond habitat consisted of:

- Shoreline and vegetation habitat mapping;
- Bathymetric survey;
- Secchi depth and littoral/profundal zone mapping;
- Water quality;
- Chlorophyll 'a';
- Sediment quality;
- Benthic invertebrate community;
- Fish community; and
- Fish population assessment using a mark and recapture program.

The key components of the aquatic baseline assessment for stream habitat consisted of:

- Habitat and substrate mapping;
- Stream bank and riparian vegetation assessment;
- Benthic invertebrate community;
- Flow characteristics and discharge;

- Water quality; and
- Fish community through index electrofishing efforts.

4.2.1 Hillside Pond Aquatic Survey

The shoreline of Hillside Pond is dominated by boulders and rubble with some sections of sand and muck. The pond is long, narrow with steep slopes (narrow littoral zone) and deep. The surface area of the lake was 132,893 m^2 and the lake volume was 876,304 m^3. The lake bottom has a relatively deep center with steep bathymetry contours with a max depth of 17.61 m and overall mean depth of 6.59 m. The lake was composed of both littoral (48,504 m^2) and profundal (84,389 m^2) zones which were delineated from the mean Secchi depth (4.25 m). The pond shoreline habitat was a combination of fine (31,323 m^2), medium (5,530 m^2) and coarse (11,651 m^2) substrate material with both emergent and submerged vegetation (2,697 m^2).

Water quality testing resulted in most metals in in Hillside Pond being below detection limits, while aluminum (20 µg/L), barium (5.4 µg/L), calcium (7,200 µg/L), magnesium (1,500 µg/L), manganese (4.7 µg/L), potassium (1,300 µg/L), sodium (400 µg/L), and strontium (16 µg/L) were detected. Phosphorus, iron, lead, and copper (among others) were undetected. Hillside Pond had pH near neutral (7.56), alkalinity (CaCO3) of 26 mg/L, conductivity of 52 µS/cm, turbidity of 1.8 NTU's and undetected levels of nitrate, nitrite, their sum (i.e., nitrate + nitrite). Total organic carbon (TOC) was 3.6 mg/L. Chlorophyll 'a', as an indicator of primary productivity, measured 0.331 µg/L and was typical of an oligotrophic lake. Total organic carbon in the sediment of Hillside Pond measured 150 g/kg. The sediment particle size was mainly silt (54%), with some clay (37%) and small amounts of sand (9.6%).

The fish community in Hillside Pond consisted entirely of brook trout (100%). During nine nights of fishing and across all fishing methods, 127 brook trout were captured with nine mortalities. The total number of brook trout recaptured was 12 fish (10%) with 75% of the recaptures from fyke netting efforts (Table 4.12). The locations of nets and minnow traps in Hillside Pond are shown in Figure 4.10. The length of brook trout captured ranged from 58 to 291 mm and averaged 164.8 mm (std. dev. = ± 51.9). Brook trout recaptured during fyke netting were slightly larger than the average for the population, and averaged 184.6 mm, with no fish less than 66 mm and a maximum length of 285 mm. Brook trout weight ranged from 1.0 to 284 g and averaged 57.8 g (std. dev. = ± 54.2). Similarly, the weights of brook trout recaptured were larger than the overall average, and averaged 84.5 g, with no recaptured fish weighing more than 284 g or less than 1.0 g. Condition factor (K) for brook trout captured in Hillside Pond ranged from 0.4 to 1.2, averaging 0.94 (std. dev. = ± 0.2). A fish population estimate for brook trout in Hillside Pond was determined from a mark-recapture census and calculated using the Schnabel method. The brook trout population estimate in August 2022 was 623 fish with upper and lower 95% confidence intervals of 1,459 and 396 fish, respectively.

Table 4.12: Summary of Meristic Data for Fish Caught by Fyke Nets in Hillside Pond

Species	Parameter	Mean	Min	Max	Std. Dev.
Brook trout (initial capture)	Length (mm)	162.9	58	291	51.0
	Weight (g)	55.2	1	245	50.6
	Condition (k)	0.94	0.4	1.2	0.2
Brook trout (recapture)	Length (mm)	184.6	66	285	60.8
	Weight (g)	84.5	1	284	82.5
	Condition (k)	0.91	0.4	1.3	0.2

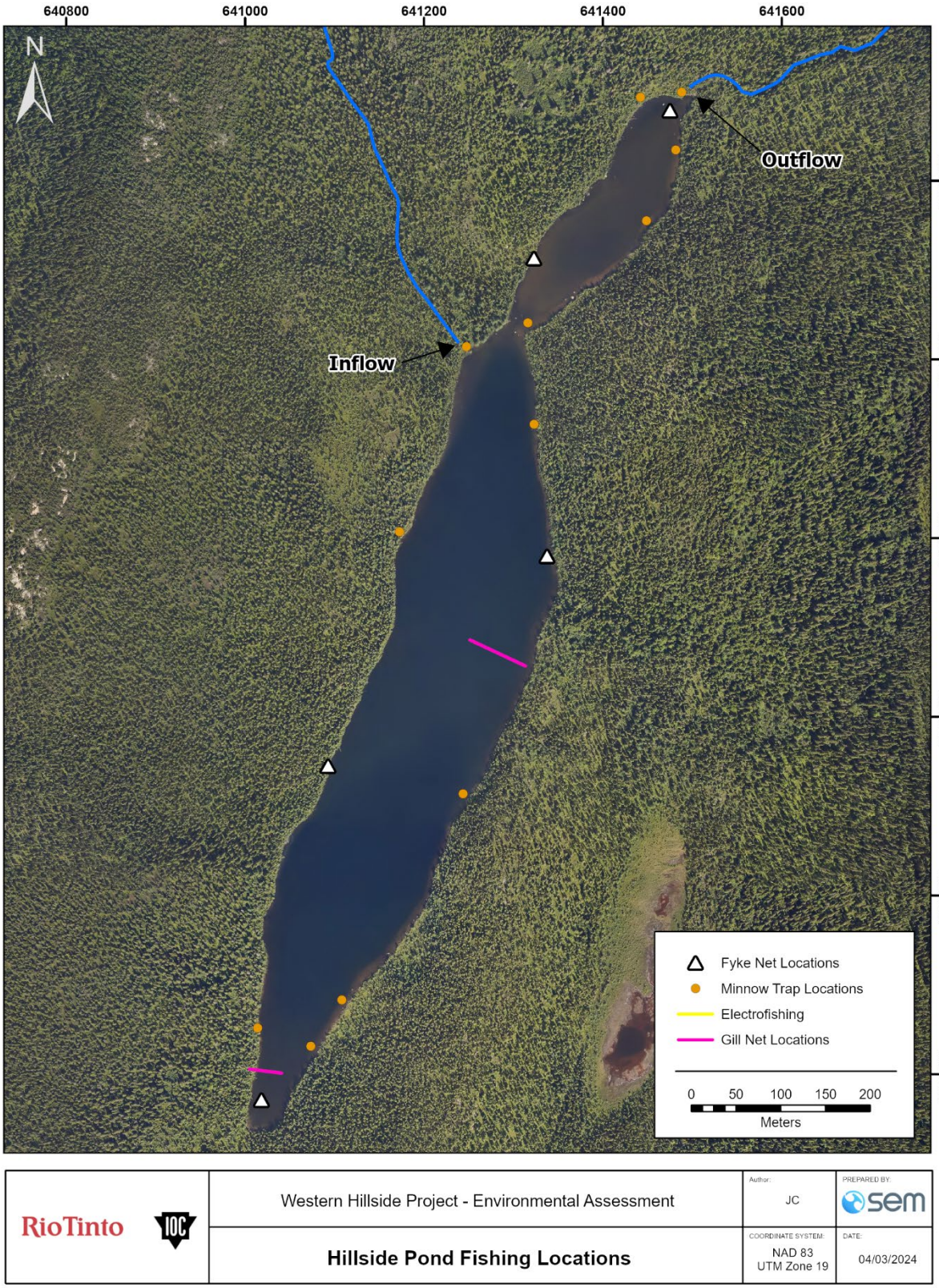

Figure 4.10: Hillside Pond Fishing Locations

4.2.2 Hillside Stream Aquatic Survey

Hillside Stream is approximately 866 m in length and on average 1.56 m in width. At the confluence with Hillside Pond, the stream is relatively wide (2.3 m) and narrows quickly (1.0 to 1.5 m) as the stream moves further downstream from the pond. The stream is densely covered with alder thickets and a canopy of mature black spruce forest along a steep hillside (Figure 4.11). The outlet of Hillside Stream is characterized by natural rocky substrate occurring at the shoreline of Wabush Lake that would not be conducive to fish attempting to migrate upstream.

Hillside Stream velocity was on average 0.15 m/s with an average depth and width of 11 cm and 1.75 m, respectively. The stream consisted mostly of boulders/rubble/cobble (90%) with some fines (sand/gravel). Overhanging vegetation accounted for most of the cover (50-70%) with some instream and canopy cover. Bank stability appeared to be good except for some minor erosion and undercut banks in sections 2 and 5 (Figure 4.12). Meso-habitat type consisted of riffle and cascade (up to 95%) with small amounts of pool (5%). Brook trout were observed/captured through all reaches of the stream with the exception of a section of steep cascades that were not accessible (Figure 4.13).

Many metals in the Hillside Pond inflow and outflow stream were below detection limits, but aluminum, barium, calcium, copper, iron, magnesium, manganese, and potassium were detected. Both streams had a near neutral pH, and low alkalinity, conductivity, turbidity, and colour. Nitrogen, nitrite, and dissolved chloride were all undetected in the inflow stream, while nitrogen (ammonia) was detected at low levels in Hillside Stream (0.066 mg/L).

Index electrofishing was conducted at two reaches in Hillside Stream (Figure 4.13). Electrofishing was performed along most of the stream with a total fishing effort of 1,197 seconds. Brook trout was the only species caught in Hillside Stream. The length, weight, and condition factor (K) of brook trout captured by electrofishing in Hillside Stream are summarized in
Table 4.13. Fish ranged in length from 51 to 139 mm and averaged 95.2 mm (std. dev. = ± 31.8) while weight ranged from 1 to 45 g and averaged 14.1 g (std. dev. = ± 14.6). Condition factor of fish ranged from 0.84 to 1.68 and averaged 1.16 (std. dev. = ± 0.28), with 63% of the catch having a condition factor equal or greater than 1.0. The total number of fish caught in Hillside Stream was nine and total biomass was 127 g.

Table 4.13: Summary of Meristic Data for Fish Caught by Electrofishing in Hillside in 2021 and 2022

Parameter	Min	Max	Mean	Std. Dev.
Length (mm)	51.0	139.0	95.2	31.8
Weight (g)	1.0	45.0	14.1	14.6
Condition (K)	0.84	1.68	1.16	0.28

Figure 4.11: Hillside Stream cascades presenting a natural barrier to upstream migration.

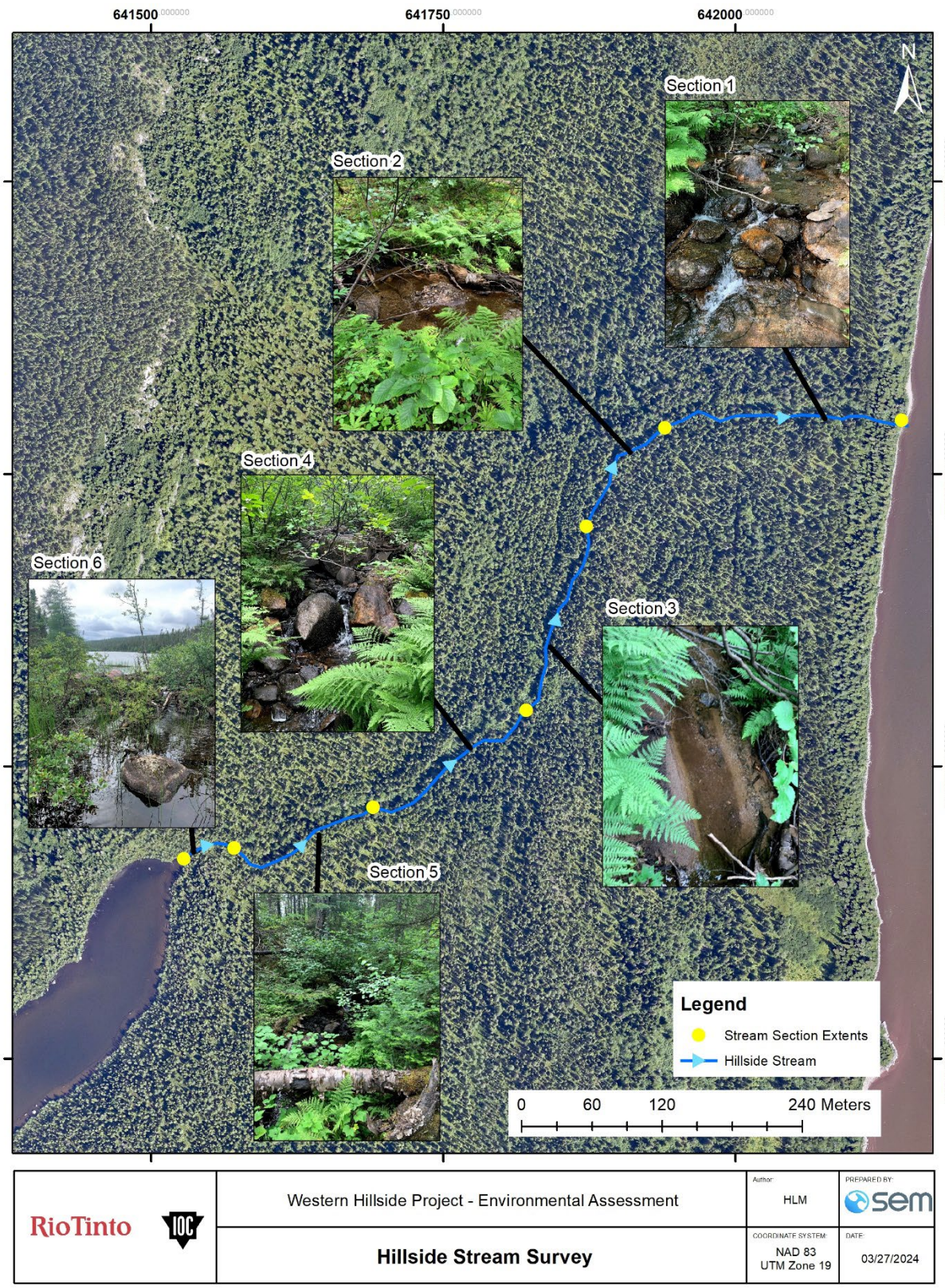

Figure 4.12: Hillside Stream Survey

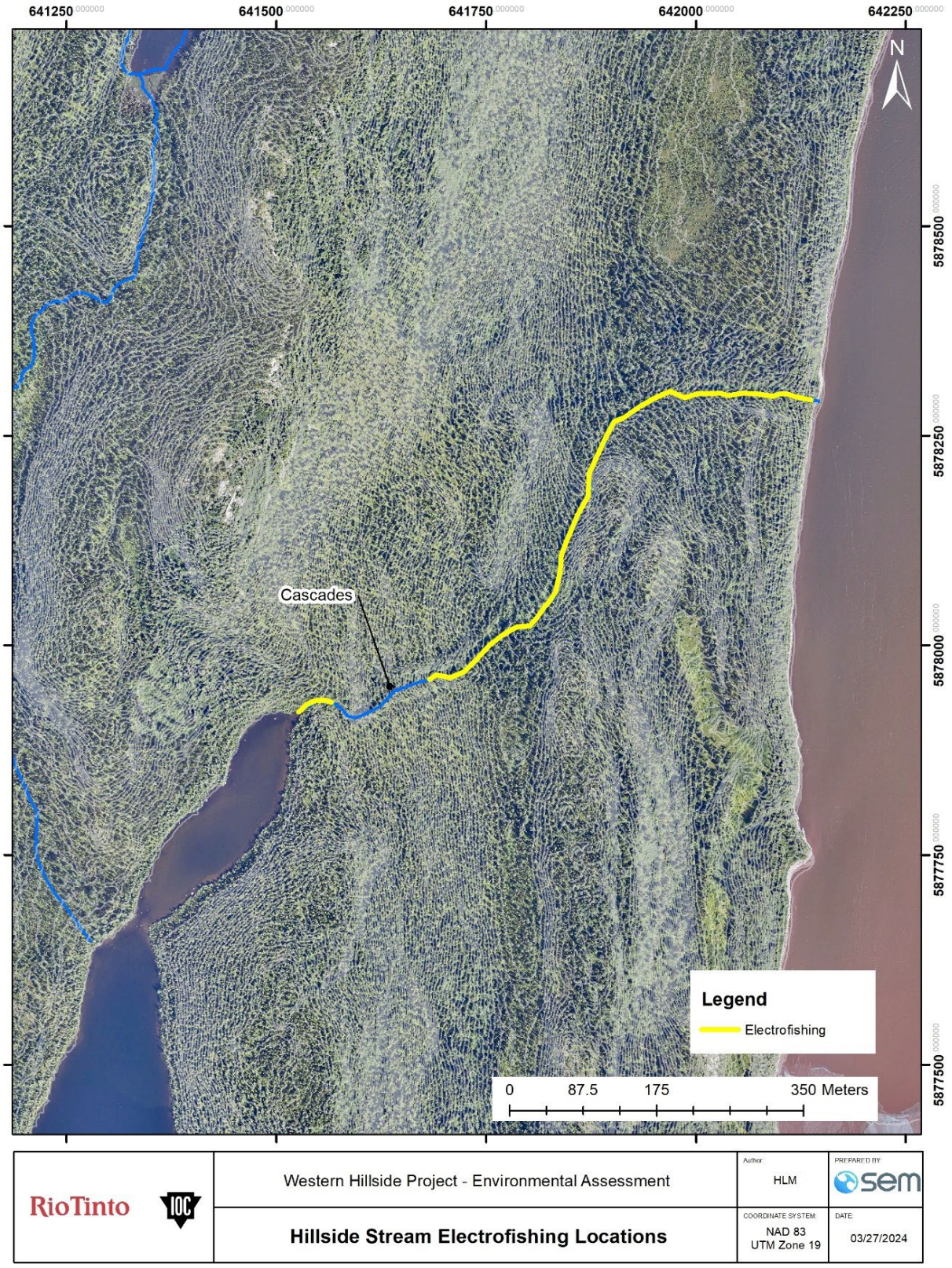

Figure 4.13: Hillside Stream Electrofishing Locations

4.2.3 Hydrology

The Wabush Lake watershed is located on the eastern side of IOC's property (Figure 4.14). Wabush Lake has a drainage area of 1,600 km². The Hillside Pond drainage area is approximately 1.35 km². Hillside Pond flows east into Wabush Lake. Environment and Climate Change Canada (ECCC) established a real-time hydrometric gauge at the outlet of Wabush Lake (03OA005, Wabush Lake at Lake Outlet) in 2000. This real-time hydrometric gauge has a published period of record from 2007 to 2022 and this dataset was extracted from the ECCC real-time hydrometric data website to determine 5th percentile, 50th percentile, and 95th percentile monthly flows at the outlet of Wabush Lake (Figure 4.14). Flow at the outlet of Wabush Lake increases due to snowmelt in May and peaks in June. The open-water season in Labrador is generally from the beginning of May until the end of October. After flows peak in July, they generally recede gradually until snowmelt during May. (ECCC, Historical Hydrometric Data, n.d.).

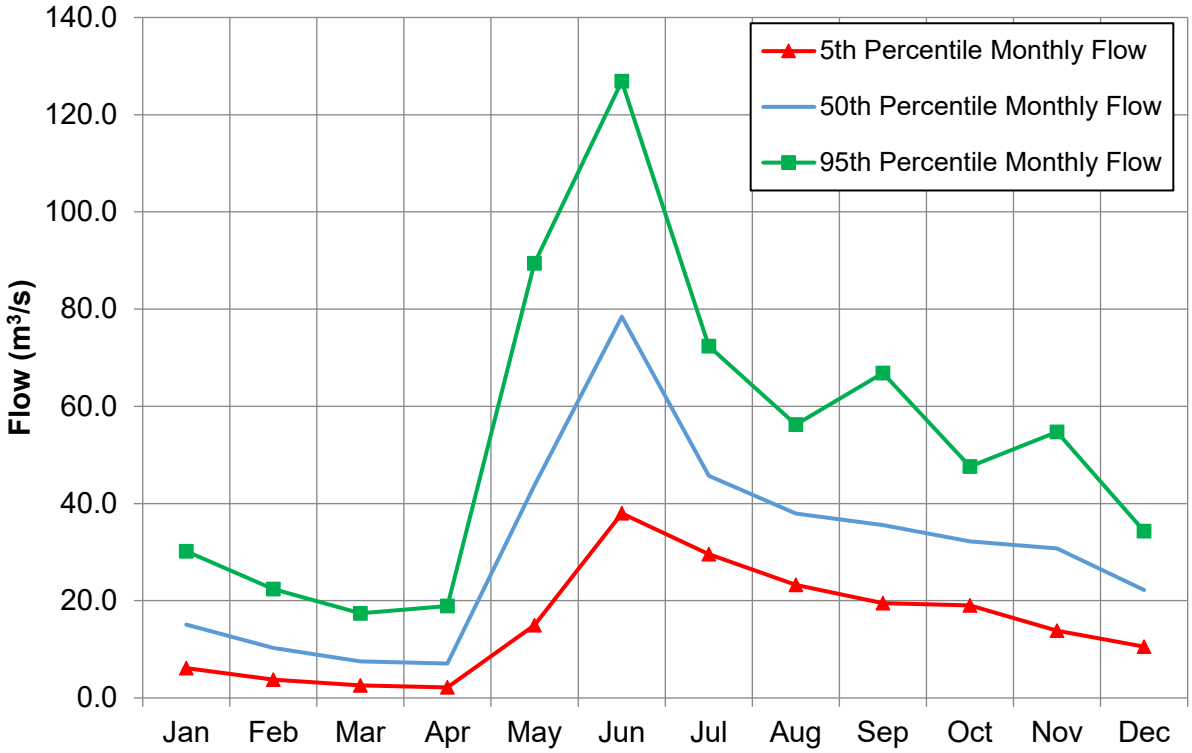

Figure 4.14: Monthly Flow Percentiles for Wabush Lake Outlet (03OA005; 2007 to 2022)

4.2.4 Hydrogeology

In 2002, Piteau Associates Engineering Ltd. undertook a review of the hydrogeology of current and historic operations of the IOC Carol Operation in the area of the Project (Piteau Associates Engineering Ltd., 2002). That review provided information on the basic hydrostratigraphy that occurs at the existing and historic IOC mine operations to the north of Labrador City. An important aspect of the hydrostratigraphy is the occurrence of deep pre-glacial weathering that occurs at depths of 100 meters below ground surface (mbgs). The most permeable hydrostratigraphic unit is the Lower Iron Ore Formation (LIF), which has the highest content of carbonate materials. The relatively high hydraulic conductivity of this unit is caused by weathering associated with leaching of silica and carbonate and/or oxidation of iron minerals (magnetite and specularite) to goethite and limonite. The weathering is noted to be strong along fractures in the LIF and is more prevalent in open pits operating at lower elevation (e.g., Humphrey Main) where the weathering has not been removed by glacial action. The hydraulic conductivities of the weathered zones are noted as being as high as 1 x 10^{-4} to 1 x 10^{-3} m/s, which suggests that the LIF and possibly the base of the Middle Iron Ore Formation (MIF) is a reasonable aquifer capable of providing baseflow to local streams/rivers and supporting flows to lakes. In addition to the relatively highly permeable weathered strata commonly found

in the Carol Lake project area, fracture dominated groundwater flow has also been noted which, depending upon the location and setting, can show reasonably permeable characteristics.

4.2.5 Geology and Topography

The topography of the Project area is typical of the larger, surrounding region, and largely consists of bedrock with rolling hills and valleys.

The Project falls within the Labrador Trough which is an 1,100-km-long Proterozoic metalliferous basin with thick sequences of iron formation. Three types of iron ores are known to exist along the Labrador Trough: high-grade ores locally with supergene enrichment, weakly metamorphosed magnetite iron formation or taconite, and metamorphosed coarse-grained iron formation.

The location of this Project is part of the Grenville Orogeny and has undergone medium to high-grade metamorphism and extensive multi-phase deformation to form a terrain that is characterized by thrusting and non-cylindrical folding. Like the other iron ore deposits at IOC, this area is referred to as a meta-taconite and may be classified as a metamorphosed version of the “Lake Superior-Minnesota Type”.

All of IOC’s reserves and resources lie within the Sokoman Iron formation, which consists of a lower waste unit, the LIF, overlain by a middle ore-bearing unit, the MIF, which is, in turn, overlain by an upper waste unit, the Upper Iron Ore Formation (UIF) (Table 4.14). The MIF unit is also cut by internal waste units of quartz-carbonate, fibre, limonite, and metagabbro.

Table 4.14: Bedrock Geology of the Carol Lake Operation, Stratigraphically Upwards

Formation		Primary Rock Types
Shabagomo		Metagabbro gneiss dykes and sills with lesser amphibolite schist
Menihek		Youngest formation of Knob Lake Group comprising mainly quartz-feldspar-mica-graphite schist
Sokomon (Previously Wabush)	Upper Iron Ore Fm (UIF)	Light brown/white quartz-carbonate (siderite) gneiss with variable amounts of magnetite, hematite, grunerite, tremolite, and actinolite
	Middle Iron Ore Fm (MIF)	Quartz-magnetite, and/or quartz-specular hematite-magnetite, and/or quartz-specular hematite-magnetite-carbonate, and/or quartz-specular hematitite-magnetite-anthophyllite gneiss and schist units
	Lower Iron Ore Fm (LIF)	Light brown/white quartz-carbonate (siderite) gneiss with variable amounts of magnetite, hematite, grunerite, tremolite, and actinolite-quartz-carbonate, and/or quartz-carbonatemagnetite, and/or quartz-carbonate-silicate, and/or quartzcarbonate-silicate-magnetite, and/or quartz-magnetitespecular hematite units
Wishart (previously Carol)		White massive to foliated quartzite
Attikamagen (previously Katsao)		The oldest formation of the Knob Lake Group comprising medium to coarse grained quartz-feldspar-biotite-muscovite schist and lesser gneiss

4.3 Socioeconomic Environment

The Labrador West region includes the communities of Labrador City (38.83 km^2) and Wabush (46.25 km^2). The 2021 census showed a combined population of 9,376 persons, with a net gain of 250 persons since 2016 (StatCan 2023b, 2018). Wabush had a small population gain of 58 individuals (3%), while Labrador City gained 192 residents (2.7%).

The Socioeconomic Environment consists of components of the human and cultural environments that may directly or indirectly be affected by Project activities. Key components identified for this document include:

- Historic and heritage resources;
- Human health and wellbeing;
- Economy and Employment;
- Community Services; and
- Land and Resource Use, (e.g., commercial, municipal, traditional, recreational).

4.3.1 Historic and Heritage Resources

Historic and heritage resources include sites, objects, or other materials of historic and archaeological, paleontological, architectural, cultural and/or spiritual importance. In NL, such resources are protected under provincial legislation. Construction activities and associated ground disturbance have the potential to disturb or destroy archaeological sites and other historic and heritage resources.

In 2019, IOC undertook steps to identify known archaeological sites within its operational areas in Labrador and Québec through the development of its Cultural Heritage Management Plan (CHMP). Summaries of relevant studies conducted in 2012 and 2018 are included in the CHMP.

The 2012 study conducted relative to the planning process for the Moss Pit determined that there was low risk of encountering archaeological sites within the operational area and vicinity (Wood, 2019).

The 2019 study included the extents of IOC and Labrador Iron Ore Royalty Corporation (LIORC) mining leases and exploration licenses within a radius of no more than 25 km from the center of the mining operation (Figure 4.15).

Two sites were identified in the general area of White Lake, the Heath Lake site, and the Drum Lake Camp site. The Heath Lake site is about 3.5 km north of White Lake and the Drum Lake Camp site is about 2 km to the southeast of White Lake, both sites are about 6 km from the Western Hillside. There is no evidence that either area has ever been assessed by an archaeologist (Wood, 2019).

During project construction, standard precautionary and reporting procedures will be implemented. Should an accidental discovery of historic resources occur, all work will cease in the immediate area of the discovery until authorization is given for the resumption of the work. Archaeological materials encountered will be reported to the Provincial Archaeology Office, including information on the nature of the material discovered and the location and date of the find.

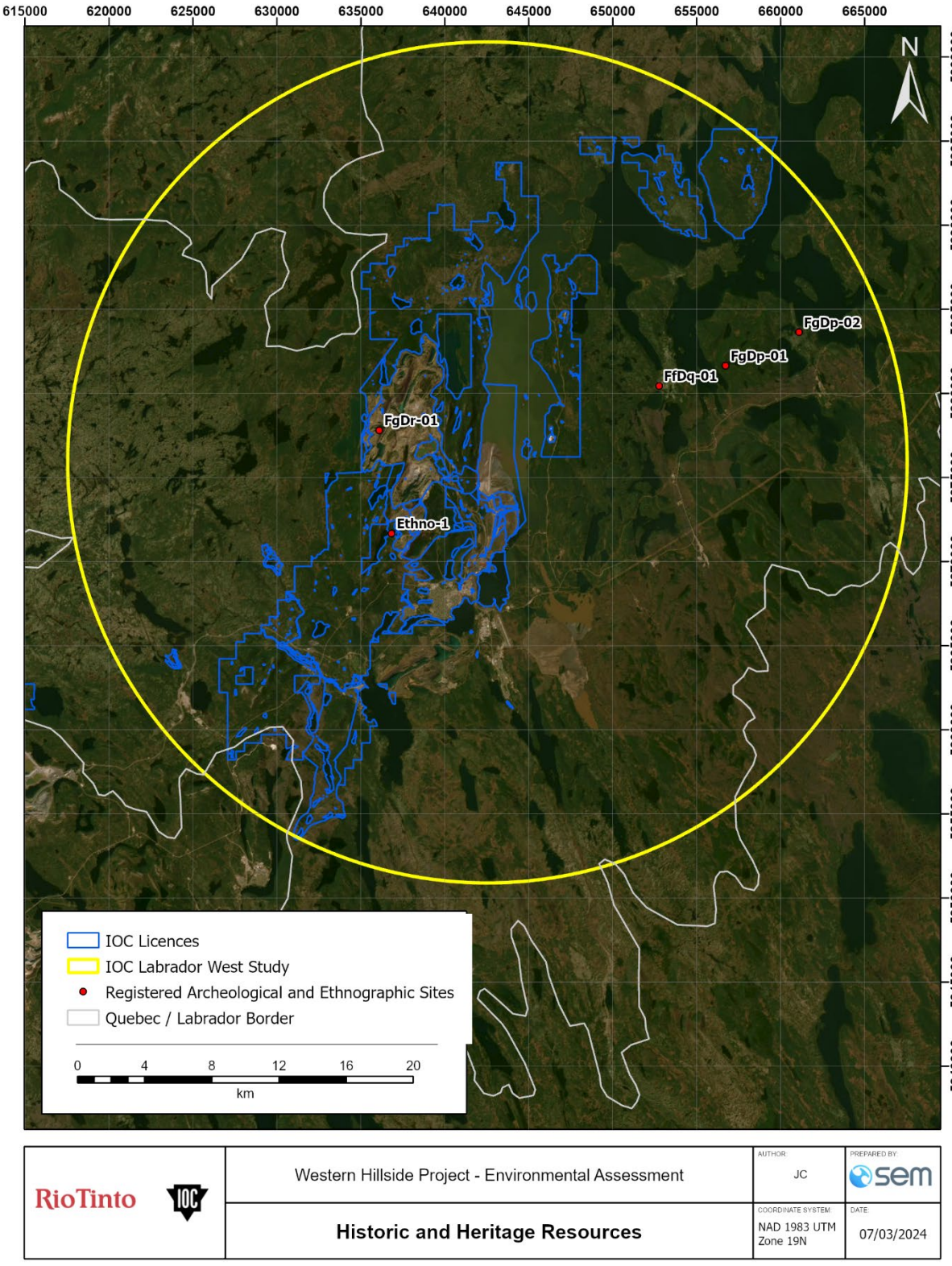

Figure 4.15: Registered Historic Resources in the Labrador West Study Area

4.3.2 Human Health and Wellbeing

Newfoundland and Labrador Health Services (NLHS) is the current health authority which operates the Labrador West Health Centre (LWHC), which falls under the Labrador-Grenfell Health Zone. The Centre is an acute-care facility with 28 beds, 14 of which are for long-term care. The facility offers inpatient and outpatient services, along with diagnostic and treatment services. A wide range of community health services are also available Community health services include home care, health promotion, occupational therapy, health education, child health clinics, childbirth education, post-natal follow-up, adult immunization, communicable disease control, audio-visual testing services, preschool health checks, school health program, wellness clinics and mental health / addictions services.

Ambulance services for Labrador West are provided by the health authority, with IOC providing back-up services if needed. An air ambulance service is also provided with fixed wing and rotary wing transports stationed in Happy Valley-Goose Bay and St. John's.

One of the indicators of human health and wellbeing comes from hospital usage statistics. There were 24,368 recorded visits in 2021, and 25,308 visits in 2022. In 2023, there is only partial data, which reports 19,290 visits recorded, but is on par with recent historical rates and numbers. The number of visits include emergency room visits and mental health and addictions services. In 2021, 39% of visits were for Mental Health and Addictions services, decreasing in 2022 to 34%, which remained the same in 2023.

In 2021, the median age of mortality in Labrador West was reported to be 73 years of age, as compared to 77 years of age for the province average. The leading causes of death in Labrador West is cancer, which is also consistent for the average cancer mortality rates of the entire province of Newfoundland and Labrador.

4.3.3 Economy and Employment

Labrador West economy is mostly dependant on the mining of the resources of the Labrador Trough and the processing and shipping of iron ore. In 2021, IOC produced 16.6 million tonnes of iron ore concentrate, which is only 6.5% less than the previous year. Between 2021 and 2023, general iron ore prices have been fluctuating between $121 per tonne to a price high of $269 per tonne. The current price is settling at $164 per tonne as of September 2023.

Other projects noted within the Western Labrador region include:

1. The Scully mine, which was reactivated by Tacora Resources with a processing facility in Wabush, in 2018-2019, continues to ramp up to 6.5 million tonnes per year, however in October of 2023 filed for creditor protection after the lose of an investor.
2. ArcelorMittal Mining Canada continues to operate the Mont-Wright mining complex and in Fermont, Québec close to the Labrador border, and a second mine at Fire Lake and have produced over 26 mtpa of iron ore concentrate and is projected to have a life of mine of 30 years.
3. In 2016 Champion Iron Limited purchased the Bloom Lake mine and reopened the facilities in 2018. Québec Iron Ore operates the project in Québec, and ore concentrate is shipped to the port facilities in Sept-Îles for export, and in 2019 a feasibility study proposed production could ramp up to 15 Mtpa. Champion Iron purchased the Kami Project in Labrador West in 2021 and were updating the feasibility study. To improve the product production, the Québec government announced that Québec Iron Ore will be given an additional block of 25 MW.
4. Tata Steel Minerals Canada continue to operate it's $700 million wet processing facility north of Schefferville, Québec since 2020, where it shifted from a seasonal operation to a full-scale year-round production. In November of 2022, a fire in the FIFO camp led to the loss of the cafeteria and infirmary and cause a temporary shut-down. The operation was finally reopened in February of 2023.
5. Joyce Lake DSO project near Schefferville, Québec is currently in the environmental assessment and feasibility study stage with Century Global Commodities. The planned project would produce 2.5 Mtpa over a seven-year period from a planned open pit operation. A crushing and screening plant facility would process the high-grade iron product, and stockpile lower grade ore to process towards the end of the mine pit.

The Government of NL listed planned or underway major capital projects for the province in 2023 totalling over $18 billion (minimum criteria is any project over $1 million). Only one major project was outlined for Western Labrador for the Churchill Falls (Labrador) Corporation capital expenditures for improvements and upgrades totaling over $91 million (NLF 2023).

Census and employment statistics updates were conducted in 2021. The census showed that Labrador City and Wabush had an influx of population, to a combined total of 9,376 persons, showing a net gain of 250 persons since the 2016 census, equating to a 2.7% increase for Labrador City, and a 3% increase for Wabush.

Due to the increasing number of projects in the area, the 2021 census data demonstrates that for the population over 15 years of age, there was an increase to the Participation Rate, Employment Rate, and a decrease to the overall unemployment rate for both Labrador City and Wabush.

Table 4.15 below illustrates the comparisons from 2006, 2011, 2016 and the most current data from 2021.

Table 4.15: Labour Force Characteristics

Indicators (population 15 years of age and older)	Labrador City				Wabush				NL	Canada
	2006	2011	2016	2021	2006	2011	2016	2021	2021	
Participation Rate (%)	72.9	77.5	71.3	72.6	71.6	68.5	72.2	76.7	56.1	63.7
Employment Rate (%)	66.4	73.6	65.2	68.6	65.4	64.9	64.2	73.3	47.5	57.1
Unemployment (%)	8.9	5.2	8.5	5.5	8.1	5.8	11.1	4.5	15.2	10.3

As of 2022, IOC was the third largest private-sector employer in NL, and the largest employer in the Labrador West region and has contributed to 1.9% of NL's GDP. IOC has generated 2,164 and 2,908 full-time equivalents (FTE) in NL and Canada, with 74% of the labour force come directly from NL. From 2010 to 2021, IOC hired an average of 169 employees per year in Labrador West alone. 2022 saw an increase of 115 employees, while partial data from 2023 indicates 73 new employees.

Of the 15,592 registered businesses in NL, 272 were registered in West Labrador as of December 2022. This accounts for 2% of the total registered businesses, mostly within the Retail Trade sector (17% of businesses), followed by wholesale trade (10%), construction (9%), accommodation and food services (9%), health care and social assistance (8%), as well as real estate and rental leasing (8%). Between 2019 and 2022, Western Labrador saw an increase of 5% in the number of businesses (13), while the province as a whole saw a decrease by 2%.

4.3.4 Community Services and Infrastructure

Two fire departments service Labrador West, one in Wabush, and another department in Labrador City. Fire and police services, provided by the Royal Constabulary of Newfoundland and Labrador, are connected to the local 911 service. Local air and ground ambulance services are also provided through NL Health Services.

Access to the region from other parts of Labrador, the island of Newfoundland and the province of Québec through rail, road, and air. Québec is connected by Route 389, while route 500 connects the region to central and coastal Labrador, which connects to a ferry service to the island of Newfoundland.

Air travel is primarily provided by the Wabush Airport, which is owned and operated by Transport Canada. Multiple commercial and charter carriers operate through the airport, and flight availability is tied to passenger activity, which has been known to cause issues during periods of high volumes. In 2020, due to the pandemic, passenger activity was reduced to 71% from 2019 numbers. In 2022, airport activity had increased by 96% over 2021 and recovered to 75% of 2019 activity (NLTCAR 2023). In December 2022, passenger movements were 24% higher than for December 2021, which was 80% of December 2019 levels (GHD 2024).

The Québec North Shore and Labrador Railway (QNS&L) is a federally regulated railway system connecting Schefferville, Québec to Sept-Îles, Québec. The rail was originally constructed in 1954 to connect new IOC operations in Schefferville, to an export terminal in Sept-Îles for final product shipment. The railway operates directly as its own network and is not connected to the national rail network. Multiple side rails and spurs have been added to the line since the 1960's. A spur was added to Labrador City to connect Wabush Mines, and later the Scully Mine added a short spur to connect to the main line, as examples. The system can accommodate approximately 40 million tonnes of shipments.

IOC sold the railway between Schefferville and Labrador City in 2005 to the Tshiuetin Rail Transportation Inc. (TRT), a Québec based joint company between the three First Nations of the area, namely the Innu and Naskapi. TRT operates passenger and freight trains between Emeril Junction and Schefferville, and further to Sept-Îles.

The Labrador West region has telephone, internet, satellite, and cable television services available. Cell and internet service reliability can be an issue and no cell phone connectivity exist on the Trans Labrador Highway (TLH). The Governments of Canada and NL announced funding in 2022 for the Community Recreation Rebroadcasting Service which will provide high-speed internet to 664 households in Wabush and Labrador City in 2023 (NL Industry, Energy and Technology 2023).

Newfoundland and Labrador Hydro have invested in upgrades to its substations in Labrador West, but the region still requires increased power supply and transmission infrastructure to accommodate any growth or potential new mining projects.

Both Labrador City and Wabush offer a range of infrastructure for recreational activities. The region has ice arenas, a curling facility, a bowling alley, a golf course, softball fields, a skateboard park, soccer fields, an indoor swimming pool and a trap and skeet / rod and gun club. Facilities are also available for downhill skiing, snowboarding, cross-country skiing and snowmobiling. Public and private fitness facilities offer equipment and programs for various programs (GHD 2024).

4.3.5 Land and Resource Use

The Project area is located within the municipal boundary of the Town of Labrador City, within IOC's current existing mining property. In 1965 the Town of Labrador was established, and the Labrador City Municipal Planning Area was created and expanded in the 1980's to a current area of 446 km^2 from land concessions from IOC. The majority of the town is zoned as Mining Reserve – Rural, which allows for the exploration of minerals and other natural resources, and for other industrial uses. Majority of the area contains the Beverly Lake Protected Public Water Supply watershed, which is Provincially protected, and the Dumbell Lake watershed, identified as a potential future water supply area. Alternatively, the Town of Wabush was incorporated in 1967 and borders its twin community of Labrador City to the north. The municipal planning zone is 428 km^2 and is zoned based on current and planned land use including residential zones, cabin development areas, commercial and industrial use areas, public recreational use areas, some open space and conservation areas within the rural zones, and mineral workings zones. The municipal planning area also includes the Wahnahnish Lake watershed and provincially managed Protected Public Water Supply area.

Figure 4.16 below shows the both the municipal boundaries and the municipal planning areas for Labrador City and Wabush.

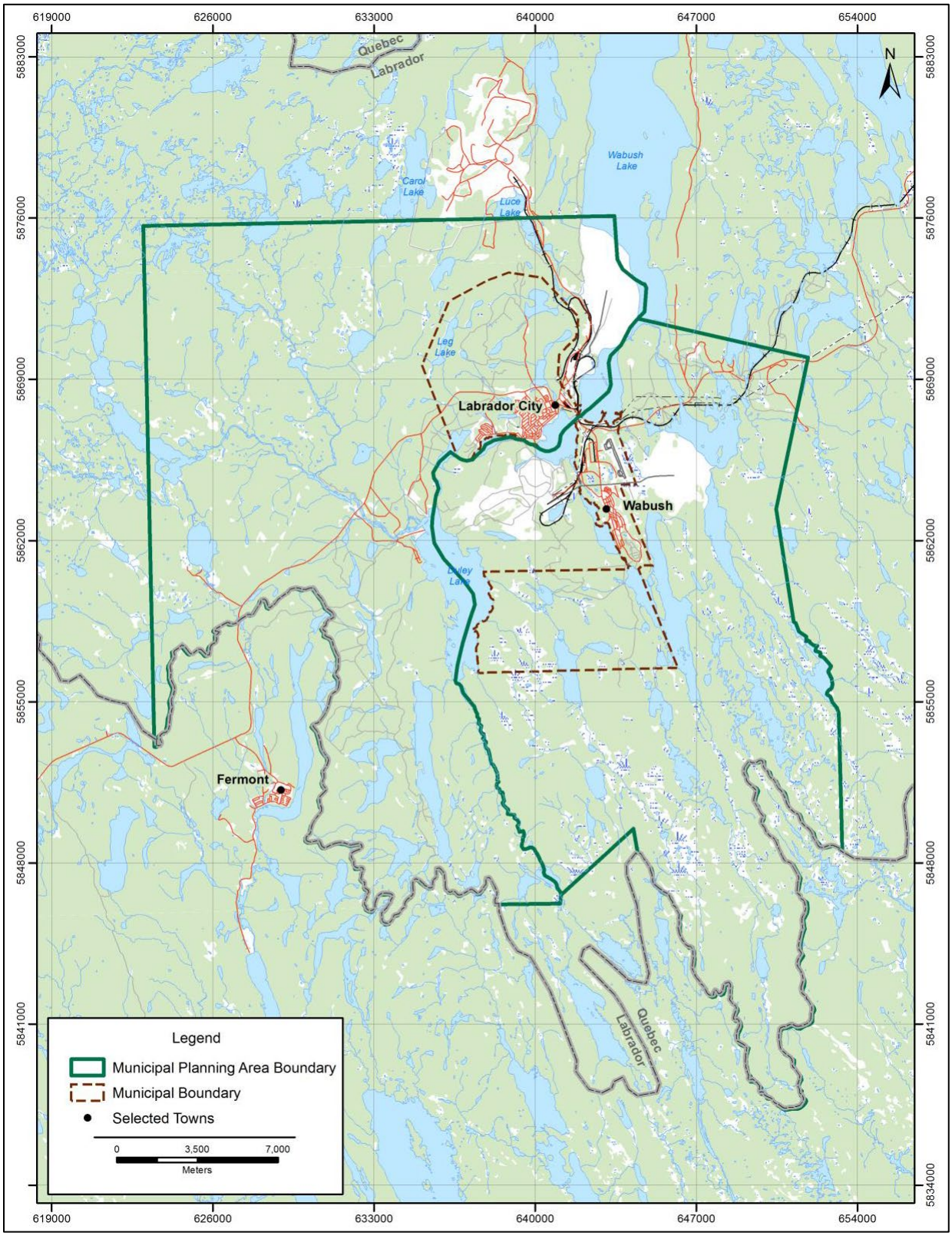

Figure 4.16: Labrador City and Wabush Municipal Boundaries and Planning Areas (GHD 2024)

The prevalence of mineral exploration licences and mining leases have created constraints and challenges with the lack of land for municipal planning growth. A Joint Planning Committee are seated by both IOC and the Town of Labrador City to identify partnership opportunities for both the Town and the mine, and to

discuss mutual interests in future developments. Periodically, portions of land have been released to both towns by the local mining operators. Other potential lands within both municipal planning areas have been identified with assistance and cooperation from the Provincial government, the Towns and the local mining operators. Most of this land has been identified for industrial, commercial and residential uses and currently planned within the Wabush municipal zones, however, the regional growth plan, Plan BIG, was created in 2014 but has since not been implemented or updated.

There are 29 outfitter lodges and camps reported in 2021, in the Labrador West region, however no outfitter locations or activities are conducted with the Town of Labrador City or Wabush (GHD 2024). Recreational and subsistence activities are an important part of the culture and lifestyle of the people of Labrador West, however there is no public access to the Project area.

4.3.6 Indigenous Organizations and Traditional Activities

IOC is committed to engaging and consulting with Indigenous Peoples who claim and/or assert Indigenous rights and/or other interests in the regions where we operate (Figure 4.17). We are committed to sustainability, diversity and supporting Indigenous Peoples with training, education, employment, and business opportunities. We engage in a variety of ways with the following Indigenous groups in Labrador and Quebec:

- Innu Nation (IN) - Sheshatshiu and Natuashish, Labrador;
- NunatuKavut Community Council (NCC) - Labrador;
- Innu of Uashat mak Mani-Utenam (ITUM) - Québec;
- Innu of Matimekush-Lac John (MLJ) - Québec; and
- Naskapi Nation of Kawawachikamach (NNK) - Québec.

Indigenous traditional uses typically refer to the practices, traditions and customs that distinguish the distinctive culture of an Indigenous organization, and which were practiced prior to European contact. These uses can include hunting and fishing for either food or ceremonial purposes. Section 35 of the *Canadian Constitution Act* (1982) recognizes and affirms the existing Indigenous and treaty rights of the First Nations, Inuit, and Métis peoples of Canada. This legislation also recognizes the nature, scope of these rights, which have been further defined through various legal decisions as well as through Land Claims and other agreements (treaties) between governments and particular Indigenous organizations in specific areas. The following sections provide an overview of these Indigenous organizations.

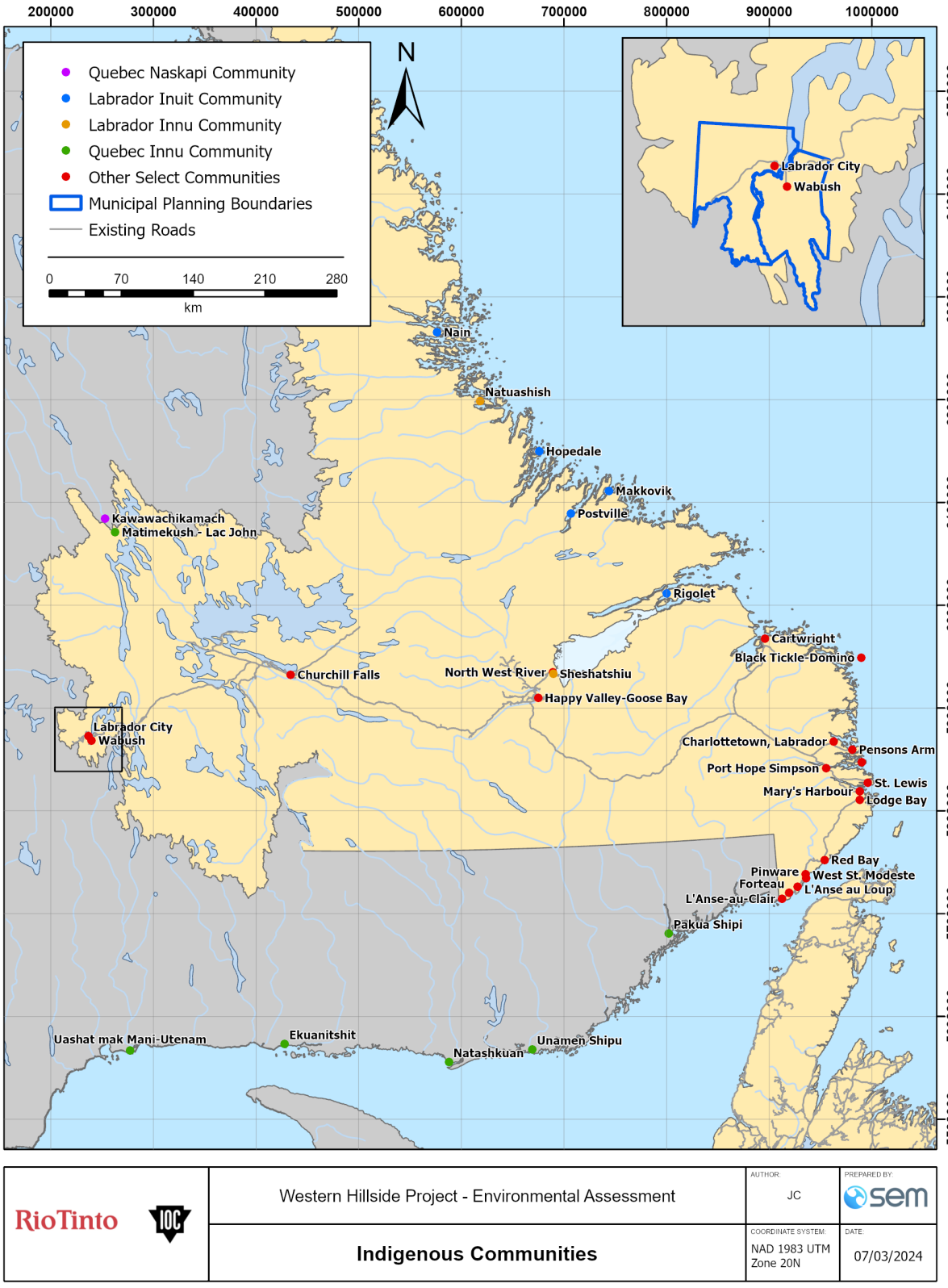

Figure 4.17: Indigenous Communities in Labrador and Québec

4.3.6.1 Labrador Innu

The Labrador Innu are Indigenous inhabitants of an area they refer to as Nitassinan, an area which comprises much of the Québec-Labrador Peninsula. The Labrador Innu were traditionally a nomadic people, whose movements reflected the seasons and the migrations of the animals they relied upon.

As of May 2021, Sheshatshiu Innu First Nation had a registered population of 1,822 and Mushuau Innu First Nation (Natuashish) had 1,093 for a total of 2,915 (INAC, 2021). In 2016, both First Nations had a small proportion of population (Sheshatshiu 5.9% and Natuashish 7.5%) identified as not a registered Indian (Statistics Canada, 2016). The Labrador Innu population is growing at a faster rate than the rest of the province. Small numbers of Labrador Innu also reside in other parts of Labrador and on the island portion of the province. The Sheshatshiu Innu and the Mushuau Innu of Natuashish are separate Bands, and each community is a Reserve with an elected Chief and Council. Both communities are represented by Innu Nation (IN) in land claims negotiations and on other matters of common interest.

4.3.6.2 NunatuKavut Community Council

The NunatuKavut Community Council (NCC) reports a membership of over 6,000 persons who reside primarily in southeastern and central Labrador and who are descendants of Inuit and Europeans who traveled to Labrador in the 1700-1800s (NCC, 2019).The NCC's membership live throughout Labrador, particularly in the communities along the southeast coast from Hamilton Inlet south to the Labrador Straits, including the towns of Cartwright, Charlottetown, Port Hope Simpson, St. Lewis and Mary's Harbour, and the communities of Paradise River, Black Tickle-Domino, Norman Bay, Pinsent's Arm, Williams Harbour and Lodge Bay, as well as in central and western Labrador.

The NCC has asserted a land claim that covers much of Central and Southeastern Labrador – including Labrador West – but this has not been accepted for negotiation by the federal or provincial governments (Aboriginal and Treaty Rights Information System, 2019). On July 12, 2018, the Government of Canada and the NCC announced the initiation of discussions on recognition of Indigenous rights and self-determination and was outlined officially with the signing of an MOU on September 5th, 2019 (NCC, 2024).

4.3.6.3 Québec Innu and Naskapi Groups

A number of Québec Indigenous organizations, including Innu and Naskapi communities in the Schefferville area and along the Québec North Shore, claim Indigenous rights and/or title to parts of Labrador, including several groups that claim lands and/or assert such rights in or near the areas of western Labrador.

4.3.6.4 Matimekush - Lac John First Nation

Matimekush and Lac John had a combined population of 1,041 registered Innu as of August 2021, 81% of whom lived on those reserves, with practically equal proportions of men and women (INAC, 2021b). The Matimekush Reserve, located on the shore of Lac Pearce, covers an area of approximately 0.68 km^2, and the Lac John Reserve is approximately 0.23 km^2 in size and located about 3.5 km from Matimekush. The reserves are administered by Conseil de la Nation Innu Matimekush-Lac John (MLJ). The Innu of MLJ are descendants of an Indigenous population that traditionally occupied much of the Québec-Labrador Peninsula (Nalcor Energy, 2016) (Wood 2019).

4.3.6.5 Innu of Uashat mak Mani-Utenam

Uashat Mak Mani-Utenam (ITUM) are First Nations peoples, with a total population of 4,848 registered Innu as of August 2021, 74% of whom lived on those reserves. There were slightly more women than men (INAC, 2021a). The Uashat Reserve, a 1.77 km2 area located on the western outskirts of Sept-Îles, at the mouth of Sainte-Marguerite River, was constituted in 1906. The Mani-Utenam Reserve, located 16 km east of Sept-Îles and covering an area of 5.27 km2 at the mouth of Moisie River, was created in 1949. The

traditional language spoken by members of the Uashat Mak Mani-Utenam is Innu-aimun. Both Reserves constitute a single Band governed by Innu Takuaikan Uashat mak Mani-Utenam (ITUM).
The Innu of Uashat mak Mani-Utenam are the descendants of an Indigenous population that has occupied parts of the Québec-Labrador Peninsula for centuries. The traditional territory of this First Nation encompasses much of eastern Québec and western Labrador and extends along the rivers from the coast of the Québec North Shore into the Québec-Labrador interior (Hydro-Québec, 2007). Traditionally, this group was involved in nomadic hunting and fishing.

The land claims asserted by the Uashat mak Mani-utenam nation for territory in Labrador, land claims associated with the Churchill Falls project, have not been accepted for negotiation by the Government of Newfoundland and Labrador.

4.3.6.6 Naskapi Nation of Kawawachikamach (NNK)

The Naskapi Nation of Kawawachikamach (NNK) has a registered First Nations population of 795, most of whom reside in the community of Kawawachikamac. The community is located approximately 12 km northeast of the Town of Schefferville on the Québec-Labrador border, which is only accessible by plane, or by train from Sept-Îles. Claims of the Naskapi in Québec have been resolved, but NNK members continue to assert Indigenous rights and title to a large portion of Labrador including Labrador West. In 1995, the NKK submitted a Statement of Claim for the area, which remains unresolved (Aboriginal and Treaty Rights Information System, 2019).

The NNK traditionally followed the migration patterns of the George River Caribou Herd across the Québec-Labrador Peninsula (Weiler, 1992). Land and resource use activities such as hunting, trapping and fishing remain important to the culture and economy of the NNK, whose members continue to pursue these activities near Kawawachikamach, along the TLH and Québec North Shore and Labrador (QNS&L) Railway, and occasionally at outpost camps (CAM 1983; Weiler 1992; 2009).

4.3.6.7 Summary

The area that encompasses the Project has seen on-going mining activity since the 1960s. As a result of the long-standing industrial activity surrounding the Project area, and the public site access restrictions that have been in place on IOC’s mining property since that time, traditional land and resource use activities do not occur in this area.

5 Consultation

The following section provides and overview of the previous and on-going consultation efforts on behalf of IOC with regards to the Project. IOC commits to proactively engaging with key stakeholders associated with the Project.

5.1 Regulatory Consultation

Due to the nature of the Project involving tailings deposition in fish and fish habitat (Hillside Stream) a large portion of the regulatory consultation efforts have historically been and will continue to involve Environment and Climate Change Canada (ECCC) and Fisheries and Oceans Canada (DFO). Other key regulatory consultations involved meetings and other communications with the provincial stakeholders including the Department of Environment and Climate Change (Environmental Assessment Division, Water Resource Management Division and Pollution Prevention Division) and the Department of Fisheries, Forestry and Agriculture. This section provides and overview of the major regulatory consultation completed prior to registering the project, the on-going and upcoming regulatory consultation efforts of IOC regarding the Project.

5.1.1 Environment and Climate Change Canada (ECCC)

IOC first engaged with ECCC on the Western Hillside Project on November 1st, 2022. At the time IOC notified ECCC of preventative measures (fish barrier installation and fish removal), being implemented to protect Hillside Stream and to prevent the deposition of a deleterious substance into fish bearing waters. ECCC responded on November 15th, 2022, and requested to meet with IOC. This meeting occurred on December 2nd, 2022, and the topic of discussion was focused on how tailings infilling would impact Hillside Stream and whether this area of the stream would need to be listed on the MDMER Schedule 2. ECCC followed up on this meeting on December 15th of 2022 and requested further information about the pipeline and access road alignment to be constructed as part of the Western Hillside Project and the predicted extent of tailings infilling. IOC responded to this request with further details on the project on January 9th, 2023. ECCC responded stating that they were collaborating with DFO and would reach out when they had more information.

On March 22nd, 2023, ECCC responded to IOC and stated that they were still collaborating with DFO to determine the next steps and their departments determination as to whether or not the Hillside Stream needed to be listed to Schedule 2 of the MDMER. IOC followed up on May 15th to see if any information was available and was informed that ECCC had not decided yet. In June 2023, it was determined by DFO that a Schedule 2 listing would be required as changes to the landscape would not be permitted (i.e., fish barrier installation) without the Hillside Stream being subject to Section 36 of the *Fisheries Act*. On July 5th, 2023, IOC and ECCC had a meeting to discuss the next steps on how to proceed with the Schedule 2 listing of Hillside Stream.

IOC informed ECCC on July 31st, 2023, that they would be seeking an exemption from the Alternatives Assessment process that is required as part of the Schedule 2 listing process. On October 27th, 2023, IOC and ECCC met to discuss the Alternatives Assessment exemption requirements and ECCC recommended that IOC prepare a document to provide justification for the use of Hillside Stream as a TIA in lieu of a full tailings alternatives assessment. On December 14th, 2023, IOC submitted an Alternatives Assessment Justification report, and ECCC confirmed receipt of the report on December 18th.

5.1.2 Fisheries and Oceans Canada (DFO)

To assess how the advancement of the tailings pipeline along the Western Hillside will trigger Sections 35 and 36 of the *Fisheries Act*, the modelled footprint of the future tailings at TSF capacity in 2038 and the boundaries of the planned pipeline extension and road, were overlain with the Hillside Stream (Figure 5.1). A total of 183 m length of stream will be impacted by tailings encroachment (328.5 m^2) which is solely covered under Section 36 of the *Fisheries Act* and the only area in which is being requested to be listed under Schedule 2 of the MDMER. Pipeline and access road construction will directly impact 217 m^2 of Hillside Stream, which will be accounted for under Section 35. The remaining 509 m^2 of productive habitat

in Hillside Stream will not be directly impacted by the Western Hillside Project, but will be covered under Section 35 as well, for a total of 10.5 habitat units (1,055 m^2) that need to be compensated for.

IOC first engaged with DFO on the Western Hillside project in December 2022, when they submitted a Request for Review pertaining to the predicted impacts of tailings expansion in Wabush Lake on the fish-bearing waterway, Hillside Stream, which is located on the western shoreline of the lake. In January 2023, ECCC and DFO responded to IOC and stated that they were reviewing the documents together and working up to come up with a regulatory approach for the project. On March 22nd, 2023, ECCC and DFO reiterated that they were still reviewing the project.

On June 15th, 2023, IOC presented an outline of the project in-person to DFO. The feedback from this presentation was that the changes to the landscape involved in the project are not permitted, and therefore Section 36 of the *Fisheries Act* would be applied, and a Schedule 2 listing would be required. Changes to the landscape that are not permitted included the installation of a fish barrier at the outlet of Hillside Pond and removal of fish from Hillside Stream leading to it being considered a fish-less waterway. From this point onward, IOC has worked with ECCC on the Schedule 2 MDMER process. On January 23rd, 2024, IOC submitted an updated Request for Review to DFO including updated figures showing the areas of the stream to be impacted by tailings and listed under Schedule 2.

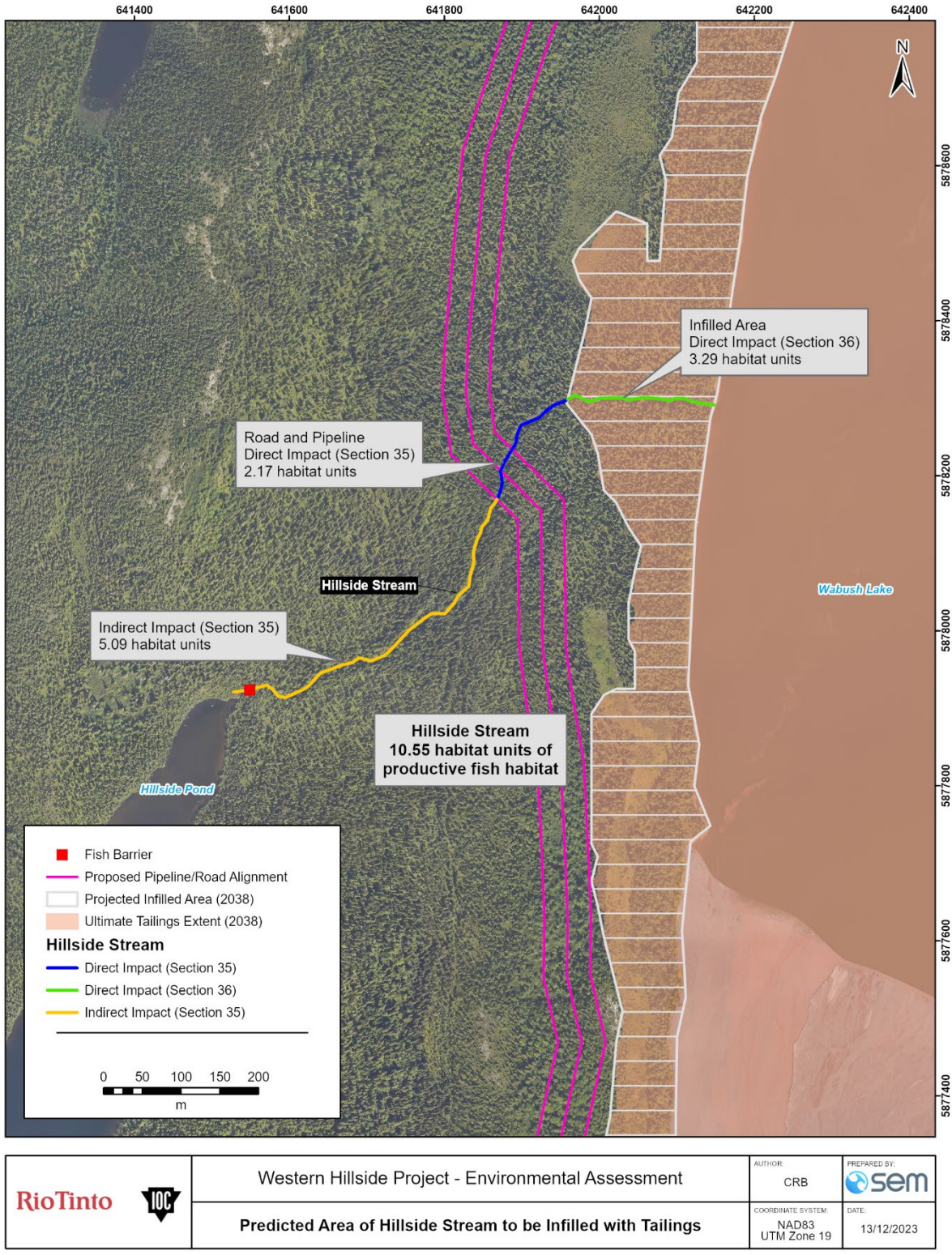

Figure 5.1: Hillside Stream Impacts Subject to Section 35 and 36 of the *Fisheries Act*

5.1.3 Newfoundland and Labrador Provincial Government

IOC first engaged with several departments of NLDECC on June 14th, 2023, including: Environmental Assessment Division (EAD), Water Resource Management Division (WRMD) and Pollution Prevention Division (PPD). At this session IOC presented in-person on the Western Hillside Project and the various components involved in its construction. EAD requested that a project description be submitted to determine whether the project would be considered a designated undertaking under the *Environmental Protection Act*. On June 28th, 2023, IOC submitted a summary of the project to EAD for review. On July 24th, 2023, IOC received confirmation from EAD that an EA would be required for the Western Hillside Project subject to Environmental Assessment Regulations, 2003, Section 35(1)(b). No other questions or concerns were provided by other departments at the time.

A second engagement session was conducted between IOC, EAD, WRMD and PPD on February 20th, 2024 to provide an update on the progression of the Environmental Assessment Registration. EAD had suggested that consultation with Indigenous Partners take place prior to Project registration. IOC typically consults with all of their Indigenous Partners once the EA is registered; however, they were completed from March 13th – 26th, 2024 (pre-registration) and details from those consultations are presented in Section 5.2.

IOC attempted to consult with Fisheries, Forestry and Agriculture ahead of registration, however, initial feedback indicated that the department would prefer to review all materials under mandated timelines through the registration process.

5.2 Indigenous Consultation

Indigenous consultation requirements (and appropriate processes) are determined following consultation with appropriate Government departments and group-, area- and/or issue / project – specific and may range from simple notification to information disclosure and review and comment processes, to full participation and accommodation (including compensation, such consultation agreements) in decision-making.

While the legal requirement to consult with Indigenous groups rests primarily with the Crown, in practice it is often delegated at least partially to proponents. The provincial and federal governments have placed significant emphasis on Indigenous communities and issues (especially as part of the Environmental Assessment (EA) processes for projects).

The Province of NL has provided substantive guidance to proponents via the Government of Newfoundland and Labrador's Aboriginal Consultation Policy on Land and Resource Development Decisions ("The Policy") April 2013- consultation on required EA, project construction and/or operational permits.

Rio Tinto's Community and Social Performance (CSP) Standard commits us to 'demonstrate progress towards or achievement of FPIC of affected Indigenous Peoples'. FPIC supports Indigenous Peoples' human right to self-determination as expressed in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) IOC makes considerable efforts to engage with the Indigenous peoples in Quebec and Labrador with asserted rights, to provide and receive information on development projects and other initiatives. The key objectives and elements of Indigenous engagement include:

- Providing Indigenous peoples with information on proposed initiatives, including purpose, location, activities and schedule;
- Identifying and documenting any questions or concerns about initiatives and potential environmental and socioeconomic effects;
- Collecting and sharing information on contemporary land use activities by Indigenous peoples in Labrador West, as well as relevant Indigenous knowledge about the area and its environment;
- Discussing potential approaches and mitigation measures to avoid or reduce any likely effects of initiatives on Indigenous peoples, their interests and activities and on the environment in general;
- Supporting requests from the Indigenous peoples for consultation agreements to review plans and permit applications;
- Establishing a positive working relationship and open communications;

- Responding to questions and comments about developments posed by Indigenous peoples; and
- Continuing to encourage Indigenous peoples to engage in the consultation process.

IOC recognizes that Indigenous consultation is an integral part of the EA process. As such, this Registration document will be made available by the EA Division of the NLDECC to five Indigenous organizations and governments, for their information, review, and comment. IOC will strive to support the efforts of the EA Division as they communicate with relevant Indigenous organizations regarding the Registration document and to address comments or concerns specific to the Project that may arise. Table 5.1 summarizes the Indigenous consultations that have taken place to date. Additionally, during the post-EA permitting process, major permit applications may also be subject to Indigenous consultation.

Table 5.1: Summary of Indigenous Consultation

Indigenous group	Date	Subject	Details/ actions	Follow ups
NCC	March 13, 2024	IOC and SEM presented the Project scope and components to NCC and received their feedback.	The NCC representative stated that they appreciate IOCs proactive approach towards communicating about the project and consulting before the submission of the EA. It was requested that the presentation be shared after the meeting.	The presentation slides were sent to NCC for internal consultation with their leadership, as requested.
NNK	March 13, 2024	IOC and SEM presented the Project scope and components to NNK and received their feedback.	Due to data deficiencies for the commonality of rare plants, specifically in Labrador, NNK asked whether or not Quebec standards for rare plants could be adopted for the Lab West region.	The presentation slides were sent to NNK for future reference, if needed. The question by NNK to adopt Quebec listings for plants is a good suggestion which will be considered for future Projects. For the purposes of the two rare plants identified in the BASA, one does not interact with any project activities and the other has been noted to be common in the Lab West region (which is shown by the number of observations seen in the BASA).

Table 5.1: Summary of Indigenous Consultation (continued)

Indigenous group	Date	Subject	Details/ actions	Follow ups
Innu Nation (IN)	March 26, 2024	IOC and SEM presented the Project scope and components to IN and received their feedback.	It was very informative for IN and they appreciated the detail and explanation of the Project. There were no follow up comments or concerns. The only question that arose was whether IOC implements the Bat Roosting Houses throughout the Mine site as a precautionary measure or if it under any specific requirement by government.	The presentation slides were sent to IN for future reference, if needed. IOC provided clarity that the Bat roosting Housing is part of their Biodiversity Conservation Strategy, which is a program that is not required by IOC under any law or regulation.
ITUM / MLJ	March 21, 2024	IOC presented the Project scope and components to ITUM and MLJ during the same meeting and received their feedback.	There were no concerns or follow up comments. Basic questions surrounding the operations of IOC's Tailings, as many do not know the regulatory complexities and operating methods.	All questions were addressed during the session.

5.3 Town of Labrador City

Table 5.2 summarizes the additional consultation that have taken place to date with the Town of Labrador City (TLC) with regards to the Project. Communications with TLC have been ongoing since 2022 regarding many aspects of the fish and fish habitat offset and compensation potion of the project in hopes for future collaboration and partnership.

Table 5.2: Summary of Additional Consultation

Organization	Date	Subject	Details
Town of Labrador City	March 25, 2024	IOC and SEM presented the Project scope and components to the Town and received their feedback.	Town of Labrador City did not voice immediate concerns.

6 Environmental Effects & Analysis

6.1 Natural Environment

The Natural Environment is comprised of relevant components of the biophysical environment that may interact with the Project, including air quality, noise and vibration levels, vegetation, wetlands, avifauna, wildlife, species at risk, fish and fish habitat and water resources.

6.1.1 Construction

Subsequent to release from the EA process, and once all required regulatory approvals and permits are obtained, construction activity will commence. Construction activities will not disrupt ongoing mining operations in any way. Standard construction methods will be used which will be carried out in accordance with environmental regulations, permits and applicable standards.

Clearing and site preparation activities would begin in Q2 2026 to begin construction of a road which will provide space and access for coarse tailings pipeline extensions along the Western Hillside. As stated previously, the road and pipeline will advance incrementally over the course the project lifetime. In addition to road construction and pipeline extensions, the erection of transmission lines and the construction of pump houses will take place to support the delivery of coarse tailings to the TSF and commissioning would be completed soon after.

The following sections provide an overview of the anticipated environmental effects of phases of the project on the biophysical components already described in Section 4.0 of this report.

6.1.1.1 Air Quality

Air quality monitors will be in operation during the construction phase of the Project and the results analysed to determine if these activities are contributing to a reduction in air quality for the area. Given the distance and routine nature of the activities associated with the construction phase, it is not anticipated that there will be additional, beyond baseline increases in emissions at the mine site due to construction activities.

Vehicles and heavy equipment used during construction will be maintained in good working order and will be equipped with effective exhaust systems. In addition, vehicles and equipment are to be turned off when stationary for extended periods. The idling of engines will be avoided whenever possible. Dust generation from vehicle use and construction activities will be managed using water and other approved agents. Dust suppression measures will include spraying water on access roads and work sites during dry conditions.
IOC has a Standard Operating Procedure (SOP) in place relative to fugitive dust management, which applies to all Labrador City operations. Implementation of the SOP includes continued efforts to carry out progressive rehabilitation and revegetation of inactive sections tailings, resulting in reductions of fugitive dust. Mitigations such as regular road watering also contribute to substantially reducing fugitive dust levels on Tailings sites and in the neighboring communities. All applicable mitigations will be implemented as necessary during development and operation of the Project.

Given the distance of the Project from both Labrador City and Wabush, there are unlikely to be additional adverse effects to the air quality data during construction due to road dust or from operation of the various Project components. Air quality monitoring will continue as normal, and the data analyzed to verify predictions. No new or modified air quality monitoring or modeling is planned given the results of on-going air quality monitoring and given the distance of the Project from residential areas.

6.1.1.2 Noise and Vibration Levels

Noise and vibration monitors will remain in operation during the construction period of the Project. These monitors will record data from IOC's Labrador City operations and the results analysed to determine if these activities are contributing to an increase in noise and vibration levels in the area. However, given the distance of the Project from recreational and residential areas, it is unlikely that adverse effects will be felt

at these locations because of activities at the Project site. There is also no anticipated blasting activities associated with the Project.

6.1.1.3 Vegetation and Rare Flora

The Project area is within IOC's existing lease and the surrounding areas have been subject to previous development and disturbance related to mining for several decades. Fieldwork in 2023 did identify several rare plants in the BASA and a complete list of vegetation encountered is presented in Appendix C. Vegetation clearing and other ground disturbance activities will be confined to those areas where it is required, and limits of clearing will be marked in advance. Clearing for the Project will be completed in compliance with relevant permits and regulations.

Construction sites will be kept clear of garbage and debris. Waste and debris will be collected and stored in appropriate containers on-site and disposed of off-site at an approved facility. Waste management will occur in accordance with relevant federal, provincial, and municipal regulations and standards. Sensitive areas (e.g., wetlands and rare plant occurrences) will be identified prior to construction and appropriate buffers will be flagged and maintained around these areas, where feasible. In addition, seed collection or transplant of rare plants will be taken into consideration if avoiding disturbing rare plants is not feasible.

6.1.1.4 Wetlands

Wetlands are common outside the Project area thus providing highly functioning wetland habitat near the Project area. It is therefore unlikely that the removal, if necessary, of any wetland areas within the Project area would be considered limiting to wildlife currently living in or moving through the Project area.
Vehicles, heavy equipment, and machinery will be properly maintained to reduce the risk of fuel/fluid leaks. Routine preventative maintenance and inspection of the machinery will be performed to prevent contaminant discharge to the environment. Vehicle maintenance and fueling will occur at least 30 meters away from wetlands and waterbodies. As appropriate, secondary containment will be used to store any potential contaminants in designated areas.

Erosion and sediment control measures will be implemented prior to construction near wetlands and waterbodies to prevent siltation and disturbance. Stockpiled materials will be stored at least 30 meters away from wetlands and waterbodies.

6.1.1.5 Avifauna

IOC anticipates initial clearing of the site for pipeline and access road construction to begin soon after Project release. IOC will endeavour to schedule construction activities relative to each stage of Project development outside the bird breeding season. As such, IOC does not anticipate adverse interactions between Project construction activities and avifauna during the several construction phases. If clearing within the bird breeding season is required, IOC will follow the mitigations specific to avifauna outlined below:

- Monitoring for bird nests will be conducted in advance of site clearing during the breeding season (May 1 to August 15) and efforts will be made to avoid trees with nests during that time. Non-intrusive surveys for nests will be conducted, in accordance with the Specific Considerations Related to Determining the Presence of Nests (Environment & Climate Change Canada 2012).
- The *Migratory Birds Convention Act* (MBCA) protects most bird species and their nests, with the exception of the following groups: certain game birds (grouse, quail, pheasants and ptarmigan), raptors (hawks, owls, eagles and falcons), cormorants, pelicans, crows, jays and kingfishers, and some species of blackbirds (starlings, mynas).
- Should a nest of a migratory bird be found, the following steps will be taken (in accordance with guidelines outlined in the MBCA):
    - All activities in the nesting area will be halted until nesting is completed (i.e., the young have left the vicinity of the nest).

    - Any nest found should be protected with a buffer zone appropriate for the species and the surrounding habitat until the young have left their nest and,
    - Nests should not be marked using flagging tape or other similar material as these increase the risk of nest predation.
- Raptors, although not protected under the MBCA, are protected under NL's *Wildlife Act*. In accordance with provincial guidelines, should a nest of a raptor be found, the following steps will be taken:
    - A buffer zone of 800 m should be maintained while the nest is active.
    - After the young have left their nest, a buffer zone of 250 m should be maintained and
    - If work within the appropriate buffer zone cannot be avoided, the NL Department of Forestry, Fisheries and Agriculture (FFA) should be contacted for advice on how to limit disturbance to the nest.

In addition, project lighting will be limited to that which is necessary for safe and efficient project activity. The discovery of any bird nests by staff will be reported to the Environmental Advisor at site and appropriate action or follow-up will be guided by IOC's Site-Wide EPP.

6.1.1.6 Mammals

Mining activity has been occurring around the Project area for the past five decades. Recent studies have confirmed that the area is not within the current range of the migratory and sedentary caribou populations that occur in Western and Central Labrador and Québec, and therefore the Project will not likely result in adverse effects to caribou.

Baseline studies have shown that several wildlife species do travel through the area via trails and on the tailings topset (or beach). Given the Project's proximity to industrial mining activity, it is unlikely that this is an area of key importance for many species. Wildlife, including avifauna that use the area, have likely habituated to on-going human activity. The potential for interactions between the Project and regional wildlife is therefore limited.

The SAR that were found to utilize the Project Area includes the little brown bat, Northern myotis and hoary bat (all of which are listed as endangered according to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC)). During the construction of the project, the discovery of bats or roosts by staff will be reported to the Environmental Coordinator at site and appropriate action or follow-up will be guided by the Project EPP. To avoid disturbing bats in the area, lighting will be limited to that which is necessary for safe and efficient project activity. IOC does not anticipate 24-hour shift, therefore eliminating nightshift. In addition, construction work must stop immediately within 10 m of a SAR observation until a qualified biologist can confirm the species has vacated the construction disturbance footprint. If the species is not present within the vicinity of the previous observation after a 24-hour period, work can resume.
A number of measures will be implemented during the construction phase of the Project to further reduce the potential for interactions between Project activities and wildlife that may occur in the area of each staged development:

- Construction areas will be kept clear of garbage;
- Construction personnel will not hunt of harass wildlife while on site;
- There will be no feeding of wildlife;
- Equipment and vehicles will yield the right-of-way to wildlife; and
- Nuisance animals will be dealt with in consultation with the NL Wildlife Division.

6.1.1.7 Species at Risk

Of the SAR possible for the Study Area, only Bank Swallow was observed during avifauna surveys. This species burrows into sandy or clay banks with slopes over 70 degrees and are found commonly on the tailings revegetation area where suitable banks form from the erosion of tailings (ECCC, 2021). The Study Area provides no breeding habitat for this species, though the lake provides foraging habitat for flying insects. Wetlands in the Western Hillside area may provide some foraging habitat as well. All mitigation

measures described in Section 6.1.1.5. will be employed to avoid Project interactions with the Bank Swallow, in addition to grading slopes to reduce the likelihood of burrowing.

All three bat species detections and results were discussed in the mammal section above. All three species detected are protected under federal and provincial SAR regulations; Little brown bat, and Northern myotis are listed Endangered under NL ESA 2021 and as Endangered under SARA in 2013. In 2023, Hoary bat was listed as Endangered under SARA and are a migratory species known to occur in Labrador West. In previous bat monitoring at IOC for the Biodiversity Conservation Strategy (BCS), SEM recorded this species in areas of similar foraging habitat (i.e., lacustrine habitat). It is likely the species uses larger waterbodies as stopovers on migration to forage. IOC will continue to monitor the bat populations on site as part of their site wide BCS.

For the Project, bat roost surveys will be completed to determine the potential use of any of the potential roost sites prior to construction and buffered accordingly. Bat roosting houses will be deployed in neighbouring habitats away from the project area prior to construction to provide additional roosting sites. On-going monitoring of the effectiveness of the bar roosting houses will continue throughout the Project construction and operation phases.

6.1.1.8 Fish and Fish Habitat

Fish habitat in Hillside Stream will be impacted by access road and pipeline construction as well as infilling by tailings in the area close to the shore of Wabush Lake. IOC will follow all protocols relative to fish and fish habitat compensation, as set out by DFO prior to the start of any construction activities. A fish barrier will be constructed at the outlet of Hillside Pond prior to any other construction activity to prevent fish from travelling from Hillside Pond to Wabush Lake via Hillside Stream. The fish barrier design is actively being reviewed by both ECCC and DFO. All fish in Hillside Stream will then be relocated to Hillside Pond where they will be outside the Project Area and will not be further impacted by ongoing operations. The mitigation measures mentioned under the wetlands section 6.1.1.4 also apply for all watercourses and waterbodies identified in the Study Area regardless of whether or not they are fish habitat.

6.1.1.9 Water Resources

During construction, IOC will continue all required monitoring of effluent discharges and water quality as required under the federal (MDMER, Canadian Council of Ministers of the Environment (CCME) guidelines) and provincial Certificate of Approval (CoA) criteria. There is one permanent watercourse within the footprint of the proposed Project, in addition to Wabush Lake, an approved TIA.

Any instream construction work will be undertaken in compliance with government regulations, permits, and applicable IOC and DFO guidelines. Construction activities will be carried out in a manner that ensures no deleterious substances (e.g., sediment, fuel, oil, etc.) enter any waterbodies. Tools and equipment will not be washed in any waterbody, and wash water will not be discharged directly into any waterbody. A designated cleaning area for tools will be established.

Water management activities during construction will be focused on managing mostly surface runoff from clearing and pipeline development. As required, ditching will be used to direct surface water away from mine infrastructure and natural waterbodies, and to a discharge area in a nearby undisturbed forest. Erosion and sediment control procedures will be implemented as required during construction to prevent runoff from impacting nearby waterbodies. If required, sumps created from surface water collection will be filtered and dewatered via pumps or gravity feed in undisturbed forest.

6.1.2 Operations

Operations of the Project will include the normal tailings deposition into Wabush Lake as already outlined in Section 3.6. During the operation phase of the Project, it is unlikely there will be an increase in interactions with components of the biophysical environment, i.e., air quality, noise and vibration levels, vegetation and soils, wetlands, wildlife, avifauna, Species at risk (SAR) and water resources. Operations will use existing equipment and personnel and will be characterized primarily by travel to and from the site for inspection

and maintenance activities. The activities will not produce more noise compared to baseline, closer to communities nor otherwise more disruptive than normal in this area of long-standing and on-going industrial activity.

6.1.2.1 Air Quality

The Project involves a change in deposition strategy, not deposition practices. Therefore, it is not anticipated that there will be a net increase in operational activities and thus no corresponding cumulative increase in GHG or particulate matter as a result of operational activities related to the Project. Therefore, no additional CAC or GHG emissions or negative effects to air quality are anticipated during the operation of the Project.

However, existing air quality monitoring will continue to be operated and the results analysed to monitor changes over time to the air quality in the vicinity of IOC's Labrador City operations.

6.1.2.2 Noise and Vibration Levels

Noise and vibration monitors will remain in place during the operation period of the Project. The monitors will record data from IOC's Labrador City operations and the results analysed to determine if these activities are contributing to an increase in noise and vibration levels in the area. However, given the distance of the Project from recreational and residential areas, it is unlikely that adverse effects will be felt at these locations as a result of activities at the Project site.

6.1.2.3 Vegetation and Rare Flora

During operation of each Stage of the Project, there will be an incremental infilling of shoreline habitat which could have potential impacts to vegetation and rare flora in the area. IOC will mitigate impacts through measures discussed in Section 6.1.1.3 for areas that are predicted to be infilled by tailings along the shoreline of Wabush Lake.

6.1.2.4 Wetlands

It is unlikely that operation activities will lead to direct or indirect loss of wetlands outside of the Project area due to changes in drainage and local hydrology. The wetland habitat identified in the Project Area is primarily located at a higher elevation than the area that will be impacted by operations, therefore drainage of the wetland area is not a concern in relation to operations.

6.1.2.5 Avifauna

As indicated above, as the construction area is progressively cleared during construction, it is expected that avifauna and avifauna species at risk will avoid these areas of major disturbance and relocate to adjacent undisturbed areas.

6.1.2.6 Mammals

The area will be progressively cleared during construction, and it is expected that wildlife species will avoid these areas of periodic disturbance and relocate to adjacent undisturbed areas.

6.1.2.7 Species at Risk

As indicated above, there is no identified bank swallow habitat associated with the project area and do not foresee this being an issue. As stated in Section 6.1.1.7. IOC will endeavour to grade areas that could be favourable burrowing habitat for bank swallow during operations.

Bat roosting houses will be deployed prior to clearing in adjacent undisturbed areas to relocate the bat species to a location where they won't be affected. It is also expected that bat species will avoid these areas of major disturbance.

6.1.2.8 Fish and Fish Habitat

Once the fish barrier has been installed at the outlet of Hillside Pond and all fish from Hillside Stream have been relocated to Hillside Pond, there will be no further impacts of the project on fish or fish habitat.

6.1.2.9 Water Resources

During operation, IOC will continue all required monitoring of effluent discharges and water quality as required under the federal (MDMER, CCME guidelines) and provincial (CoA) criteria. No conflicts associated with fishing or other water resource use are anticipated because the proposed Project will not impact local access. Tailings will gradually infill approximately 183 m of Hillside Stream, which will not have a significant impact on drainage patterns for Wabush Lake. The stream will continue to drain into Wabush Lake as normal during operations. No additional interactions or adverse effects to Water Resources are anticipated during the operations phase of the proposed Project. Additionally, water management activities associated with the operation of the Project are not anticipated to result in significant adverse effects on the natural environment.

6.1.3 Accidental Events

Spills or releases of hazardous substances, e.g., fuels, oils and lubricants, from accidents or malfunctions of vehicles and equipment are possible during all Project phases. Such accidental events have the potential to result in adverse environmental effects to the atmospheric environment, soil and/or water.

The likelihood of occurrence of an accidental spill or release of hazardous substances, and extent of resulting environmental effects, is minimized through adherence to applicable mitigation measures throughout all Project phases. Fuel and other hazardous materials will be securely stored, and vehicles and equipment will be refueled at designated areas. In addition, equipment and vehicles will be inspected and maintained in good working order, and any leaks will be addressed immediately. Emergency spill kits are onsite at all times. Mitigation measures to avoid collisions such as adhering to posted speed limits, and respecting established radio communication protocols will reduce the likelihood of an accidental spill or release.

Potential accidental events or malfunctions during Project construction and/or operations such as a fire or a spill of fuel or other chemicals could affect the atmospheric environment, vegetation, soils and/or other aspects of the Natural Environment in or around the Project area. The resulting environmental effects of such an incident would depend on the nature and magnitude of the event.

As indicated above, IOC has various measures, plans and procedures in place to prevent potential accidents and malfunctions, such as a fire, spill, or other associated event, as well as to respond to such an accident should one occur. These measures will be applied, and refined as required, to the Project, and will be further reinforced through the various regulatory government permits, authorizations and regulations, and compliance standards that will be relevant to the construction and operation of the Project.

IOC currently has procedures in place for the management of solid and hazardous wastes at its Labrador City operations, which will apply to the construction and operations phases of the Project. Waste materials generated through construction activities that cannot be reused or recycled will be removed from the area and disposed of at an approved site. Non-hazardous construction refuse will be stored in covered metal receptacles and will be disposed of on an as needed basis at an approved landfill site, as per IOC's on-going operations and practices. Under no circumstances will solid wastes be buried onsite.

Hazardous wastes will be stored in sealed, labelled containers and disposed of according to applicable regulations and standard IOC practice. These practices include procedures for the characterization, identification, storage, inspection, labelling and transportation of hazardous wastes produced at the facility,

as well as emergency preparedness, prevention, and training. It is not anticipated therefore that there will be adverse interactions between construction waste materials and the environment.

6.1.4 Summary of Environmental Effects Analyses - Natural Environment

A summary of potential environmental interactions, identified mitigation measures, and predicted residual environmental effects of the Project on the Natural Environment is provided in Table 6.1. IOC's Site-Wide EPP will also provide many applicable mitigation measures and can found in Appendix B.

Table 6.1: Environmental Effects Analysis – Natural Environment

Environmental Component	Project Stages and Potential Interaction			Key Considerations and Proposed Mitigations	Residual Effects
	Construction	Operation	Potential Interactions		
Air Quality			It is not anticipated that there will be additional, beyond baseline effects to air quality at the mine as a result of construction or operational activities associated with this project. The Project involves a change in deposition strategy, not deposition practices. Therefore, it is not anticipated that there will be a net increase in operational activities, and thus no predicted increases in GHG emissions.	Air quality monitoring will however continue, and the data analyzed to verify predictions.	N
Noise and Vibration			Given the distance of the Project from recreational and residential areas, it is unlikely that adverse effects will be felt at these locations because of activities at the Project site. In addition, there are no anticipated blasting required for the construction of operations of the Project.	Noise and vibration monitors will remain in operation during the construction period of the Project	N
Vegetation & Rare Flora	X	X	Clearing and grubbing required for access road and pipeline alignment construction. Tailings deposition and infilling along the shoreline of Wabush Lake during operations.	Rare plants will be flagged and disturbances to their habitat will be minimized, where possible. Rare plant transplants or seed transfers can be attempted to reduce potential impacts from the Project.	NS

Environmental Component	Project Stages and Potential Interaction			Key Considerations and Proposed Mitigations	Residual Effects
	Construction	Operation	Potential Interactions		
Wetlands	X		Potential change in hydrology of wetlands (fens) within Project footprint. Potential loss of portion(s) of functioning wetland(s). Excavation of organic material may be required.	Avoidance of development on wetlands, where possible. Refueling of machinery to occur at least 30 m from waterbodies and wetlands. If removal is necessary, obtain necessary permits and consult with the NL government. Avoid or reduce interaction with wetlands outside the Project area. Compliance with regulations and permits. Accident event prevention and response procedures and plans in place.	NS
Avifauna & Avifauna SAR	X		Loss of habitat due to vegetation clearing. If site preparation occurs during bird breeding season, there may be adverse impacts.	Where possible, construction will occur outside the bird breeding season. Mitigations in place should disturbance activities occur in breeding season. Avifauna observations to be recorded, including raptors, waterfowl and other avifauna. Should activities occur during critical bird nesting season, qualified ornithologists will inspect the area prior to activities to ensure no active nests are present. Should nests occur, appropriate buffers will be established, and no activities will take place until birds have fledged the nest. Observations of SAR will be recorded, and appropriate mitigations determined in consultation with appropriate regulators.	NS

Environmental Component	Project Stages and Potential Interaction			Key Considerations and Proposed Mitigations	Residual Effects
	Construction	Operation	Potential Interactions		
Wildlife & Wildlife SAR	X	X	Loss of habitat due to vegetation clearing and operations in the area. Potential interactions with Project personnel and equipment during Project activities	Construction areas will be kept clear of garbage. Construction personnel will not hunt of harass wildlife while on site. There will be no feeding of wildlife. Equipment and vehicles will yield the right-of-way to wildlife. Nuisance animals will be managed in consultation with the NL Wildlife Division. Lighting will be limited to what is needed during construction to avoid disrupting bats. Bat Roosting Houses will be installed along the Western Hillside outside of the proposed Project to provide alternative roosting habitats.	NS
Fish and Fish Habitat	X	X	Construction of the road crossing and installation of culverts/cross drains. Infilling of fish habitat in the lower reaches of Hillside Stream.	All applicable mitigation measures as outlined in permits associated with stream or watercourse crossings will be adhered to. A fish barrier will be installed at the outlet of Hillside Pond and a fish removal will be completed on Hillside Stream prior to impacts occurring. Fish habitat in Hillside Stream will be offset through a Fish Habitat Compensation Plan.	NS

Environmental Component	Project Stages and Potential Interaction			Key Considerations and Proposed Mitigations	Residual Effects
	Construction	Operation	Potential Interactions		
Water Resources	X		Surface runoff from clearing and pipeline development. Deleterious substances (e.g., sediment, fuel, oil, etc.) enter any waterbodies.	IOC will continue all required monitoring of effluent discharges and water quality as required under the federal (MDMER, CCME guidelines) and provincial (CoA) criteria. Construction activities will be undertaken in compliance with government regulations, permits, and applicable IOC and DFO guidelines. Ditching will be used to direct surface water away from natural waterbodies, and to a discharge area in a nearby undisturbed forest. Erosion and sediment control procedures will be implemented as required during construction to prevent runoff from impacting nearby waterbodies. If required, sumps created from surface water collection will be filtered and dewatered via pumps or gravity feed in undisturbed forest.	NS

X - Potential Project Interaction (by Phase)
N - No likely adverse residual environmental effect
NS - No significant adverse residual environmental effect
S - Significant adverse residual environmental effect
P - Positive residual environmental effect

6.1.5 Cumulative Effects Assessment

The cumulative effects assessment (CEA) relative to the Natural Environment can be defined as changes to the natural environment because of an action, project, or activity in combination with other existing or future projects and activities. The CEA considers potential environmental effects associated with the Project.

Although the proposed Project will influence vegetation and soils within the construction footprint because of clearing and excavation activities during the construction phase, any such disturbances will not overlap or interact cumulatively with those of other projects and activities in the area.

The operation of the Project will not result in an increase in overall production of iron concentrate or pellets. Therefore, the discharge of tailings to the TSF will not increase or change in metallurgical or chemical composition and thereby not contribute to any cumulative environmental effects.

The water quality of runoff from the Project will be controlled with proper geometric and geotechnical engineering of roads, ramps and ditches, construction, and maintenance of settling ponds, also a regime of inspections and planned maintenance of roads and ditches. No significant negative impacts on the aquatic environment or associated species are expected because of the Project.

The Project will not significantly impact listed or rare species, and will not affect overall biodiversity in the region, nor will it affect caribou populations or other wildlife. The Project is unlikely to contribute measurably to adverse cumulative environmental effects to wildlife, SAR or avifauna in the region.

Overall, the Project is intended to reduce the cumulative effects of the mining operations through the optimization of the current TSF and, therefore, reduce the need to seek alternative tailing storage options in the near-term.

6.2 Human Environment

The Human Environment includes relevant components of the human and cultural environments, including historic and heritage resources, human health and well-being, land and resource use, community services, communities, and the economy.

6.2.1 Construction

6.2.1.1 Historic and Heritage Resources

Historic and heritage resources include sites, objects, or other materials of historic and archaeological, paleontological, architectural, cultural and/or spiritual importance. In Newfoundland and Labrador, such resources are protected under provincial legislation and valued by Indigenous and other people in the province. Construction activities and associated ground disturbance have the potential to disturb or destroy archaeological sites and other historic and heritage resources.

AMEC's 2019 report identifies two heritage sites located on IOC property, the Heath Lake site (FgDr-01) and the Drum Lake Camp ethnographic site (23B/15 Ethno). Both sites are approximately 6 km from the Project area. The Heath Lake site is located 3.5 km north of White Lake and contains a portion of a ground slate tool. Due to the imprecision of data related to the site and that a single pre-contact artifact had been identified; the Provincial Archaeology Office (PAO) has listed the site as destroyed. The Drum Lake ethnographic site, located approximately 7 km to the southwest of the Project, was identified in a 2012 survey and was determined to be the structural footprint of a post-1960 collapsed camp and various associated debris. The PAO lists this site as unlikely to require further assessment. Thus, neither of these sites are likely to provide important cultural heritage resources (AMEC 2019).

During Project construction however, IOC's Chance Find Process (included as part of the new land disturbance internal permit) will be applied, and standard precautionary and reporting procedures will be

implemented. Should an accidental discovery of historic resources occur, all work will cease in the immediate area of the discovery until authorization is given for the resumption of the work. Archaeological materials encountered will be reported to the PAO, including information on the nature of the material discovered and the location and date of the find.

6.2.1.2 Land and Resource Use

The Project area is located within IOC's existing mining leases in Labrador City and on IOC mining property. There is no public access of the Project area (i.e., location of the pipeline/road). There is public access to Wabush Lake (TIA) where recreational fishing does occur. Access to Wabush Lake will not be interrupted during the construction or operation of the Western Hillside Project. No negative interactions with, or adverse effects upon land and resource use, e.g., municipal, traditional, or recreational, in the area are anticipated beyond what is normal for the Project area.

6.2.1.3 Human Health and Well-Being

Since the Project will be located approximately 6 km from residential areas, it is not anticipated that the Project will have adverse effects on human health and well-being for the local communities or elsewhere beyond the baseline conditions.

Construction activities will be guided by established practices and applicable sections of the provincial *Occupational Health and Safety Regulations* (OHS). IOC will support requirements relative to ensuring the health of company personnel and contractors working on the Project.

6.2.1.4 Communities and Economy

The Project will contribute in a positive way to the local communities and their economies through direct and indirect employment and other procurement opportunities. This Project will allow IOC to maintain operations without interruption and maximize the capacity and operating lifetime of the Wabush Lake TSF, which will positively affect the socioeconomic environment of the region and the province.

6.2.2 Operation

6.2.2.1 Historic and Heritage Resources

Development of the TSF will take place in stages as the five coarse tailings pipelines are advanced along the Western Hillside. However, once the development and construction of the access road, pipeline and pumphouses have been completed, there will be no additional ground disturbance. Therefore, the potential for further negative effects to historic and heritage resources are not anticipated. The precautionary and reporting and monitoring procedures implemented during construction will be maintained throughout the life of the Project.

As during Project construction, standard precautionary and reporting and monitoring procedures will be implemented during the operations period. Should an accidental discovery of historic resources occur, all work will cease in the immediate area of the discovery until authorization is given for the resumption of the work. Archaeological materials encountered will be reported to the PAO, including information on the nature of the material discovered and the location and date of the find.

6.2.2.2 Land and Resource Use

The Project is entirely on IOC property, with restricted public access. It is not anticipated that the Project will have adverse interactions with local, commercial, or municipal activities are anticipated during the operations period.

6.2.2.3 Human Health and Well-Being

Similar to predicted effects during the construction phase, effects on human health and wellbeing during the operation phases will be comparable. The Project will be located approximately 6 km from residential areas, it is not anticipated that the Project will have adverse effects on human health and well-being for the local communities or elsewhere.

Operations activities will be guided by established practices and applicable sections of the provincial *Occupational Health and Safety Regulations* (OHS) and IOC will support requirements relative to ensuring the health of company personnel and contractors working on the Project.

Given that the Project will allow the life of the mine to be maximized, therefore providing long-term valuable employment to members of the local community, IOC predicts neutral effects on human health and wellbeing as a result of Project operations.

6.2.2.4 Communities and Economy

The Project will ensure that operations at IOC will be able to continue without interruption by maximizing the tailings storage in the current TSF. Consistent operations at IOC's Labrador City facility provides ongoing employment and ongoing economic benefits for the region as a whole. Therefore, the Project will make positive contributions to the socioeconomic environment of the region and province.

6.2.3 Accidental Events

An accidental event or malfunction during any stage of the Project could affect the Human Environment through, for example, an effect on human health and well-being or through an increased demand for local safety and health services. The probability of such events occurring is low, and potential effects would depend upon the specific nature and magnitude of the event.

IOC has various emergency measures, plans and procedures in place to prevent and respond to fire, explosions or other accidental event at its Labrador City operations.

6.2.4 Summary of Environmental Effects Analyses – Human Environment

A summary of potential environmental interactions, identified mitigation measures and residual environmental effects of the Project on the Human Environment is provided in Table 6.2.

Table 6.2: Environmental Effects Analyses – Human Environment

Environmental Component	Project Stage & Potential Interaction			Key Considerations and Proposed Mitigations	Residual Effects
	Con	Ops	Potential Interactions		
Historic and Heritage Resources	X		Ground Disturbance	Localized and short-term ground disturbance during construction. Standard precautionary and reporting procedures	N
Land and Resource Use	X		No interruptions to access to Wabush Lake is anticipated.	The project site is located within a restricted area, on IOC mining property. There is public access to Wabush Lake, which will not be impacted. IOC will complete DFO HADD assessment and carry out compensation work as required.	N
Human Health and Wellbeing	X		Air quality and dust impacts. Possible accidents affecting human health. Continued regional prosperity.	At a distance from, and minimal interaction with communities. Accidental event prevention and response plans in place. Will follow provisions of OHS Regulations applicable to Project.	N
Communities and Economy	X		Continued operation of the Carol Mine with minimal interruptions and maximized TSF lifetime	Can contribute to an improved sense of wellbeing, support the local economy and services. Positive effects on prosperity of the community in terms of jobs and economy.	P

Key:
X - Potential Project Interaction (by Phase)
N - No likely adverse residual environmental effect
NS - No significant adverse residual environmental effect
S - Significant adverse residual environmental effect
P - Positive residual environmental effect

6.2.5 Cumulative Effects Assessment

The cumulative effects assessment (CEA) relative to the Human Environment can be defined as changes to the socio-economic environment as a result of an action, project, or activity in combination with other existing or future projects and activities.

Given the scale and timing of this Project, it is unlikely that the Project will negatively affect the socio-economic environment of the region, rather, it will contribute positively to the local economy by ensuring that the mine life is maximized. It is not anticipated that additional strain will be added to the health care system or housing availability in the area as a result of the Project.

7 Environmental Monitoring and Follow-up

IOC has strong environmental, health and safety management systems and associated plans, practices, and procedures in place for their Labrador City operations. Potential environmental or human health effects associated with the Project will be addressed and mitigated through the application of these established practices and procedures. Potential effects can be further addressed through specific permitting requirements and compliance standards and guidelines that will apply to the Project.

During the on-going construction and operational phases, the Project will be subject to regular inspections and maintenance as required and the existing monitoring, measuring, and auditing processes will be extended to include the Project. IOC will obtain all required authorizations for the proposed Project, and will comply with all applicable federal, provincial, and municipal regulations.

In addition, there have been several monitoring programs proposed (e.g., fish removals, bird nest surveys, bat roosting surveys, denning surveys etc.) throughout this document and IOC commits to completing such surveys under the guidance of qualified professionals and through the support provided by ongoing consultations with the applicable regulators and IOC's Indigenous Partners. Such guidance may be through specific methodologies, monitoring frequency and follow-up reporting requirements.

8 Summary and Conclusion

The scope of the Project includes the development of an access road and pipeline alignment, transmission lines, pumps and pumphouses as part of the implementation of a modified deposition strategy for IOC's deposition of tailings into Wabush Lake. The objective of the Project is to optimize the space available in the TSF so that mine operations can continue as long as possible without disruptions and to reduce environmental impacts outside the already approved area. The Project will not result in any changes to production but will increase the efficiency of tailings storage and management.

The construction of the pipeline alignment will occur in stages as the tailing's deposition continues toward the northern end of the TSF. The operation of the Project will not result in an increase in the labour force at IOC's Labrador City operations; rather the operational plan will be to redeploy existing equipment and personnel to the Project from other current operational areas.

The Project will be planned and implemented in accordance with IOC's environmental and health and safety policies, plans and practices that promote safe and responsible construction and operation practices. IOC has a comprehensive environmental management system including various associated plans and procedures designed to avoid or reduce negative environmental effects of its activities. All of which have been outlined throughout this document.

Rio Tinto has a number of established community policies and standards within its Communities and Social Performance Framework that each of its operating companies, including IOC, must follow. As a member of the Mining Association of Canada (MAC), IOC follows MAC's social policies and guidelines, performance measures and protocols.

The Project will be constructed and operated in accordance with applicable provincial legislation and regulations and in compliance with IOC policies, procedures, and standards. IOC is committed to complying with all relevant legislation and regulations, and conditions associated with EA release.

IOC will continue to consult as required with all relevant government, community, and Indigenous organizations throughout the EA process, and will continue as required through all stages of mine life.

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