1. Introduction

Champion Kami Partner Inc. (Champion), is submitting this Environmental Impact Statement (EIS) for the proposed development of a new iron ore mining and milling operation in Labrador West, called the Kamistiatusset (Kami) Mining Project (the Project), in the Province of Newfoundland and Labrador (NL). The Project site is located entirely in Labrador, approximately 7 km southwest of the Town of Wabush, 10 km southwest of the town of Labrador City, and 5 km northeast of the Town of Fermont, Québec.

Champion has prepared this EIS in support of the environmental assessment (EA) for the Project, establishing an experienced team of subject matter experts and qualitied professionals to conduct technical studies; engage with Indigenous communities, local communities, regulators, and public stakeholders; and prepare the EIS. The EIS satisfies requirements of the *Environmental Assessment Regulations, 2003*, under the Newfoundland and Labrador *Environmental Protection Act* (NLEPA). The EIS also satisfies the requirements outlined in the Environmental Impact Statement Guidelines for Kami Iron Ore Mine, Labrador West, NL, Champion Iron Mines Ltd. (EIS Guidelines) issued by the NL Minister of Environment and Climate Change (the Minister) on December 19, 2024 (Government of NL 2024a).

This chapter of the EIS provides information on Champion and the EIS team, as well as an overview of the proposed Project, regulatory framework for the Project, and structure of the EIS as required by the EIS Guidelines.

1.1 Background

The Project was originally proposed by the Alderon Iron Ore Corporation (Alderon) and underwent a provincial and federal EA, under the framework of the provincial NLEPA and the former federal *Canadian Environmental Assessment Act* (CEAA). The EA process was initiated with the submission of the registration/project description (Alderon 2011) to the former NL Department of Municipal Affairs and Environment (NLDMAE) and the former Canadian Environmental Assessment Agency (CEA Agency, now the Impact Assessment Agency of Canada [IAAC]). The Registration/Project Description was made available to the public and to government agencies for review. On December 8, 2011, following the provincial review, the Minister of NLDMAE determined that an EIS was required for the Project under the NLEPA. Similarly, the CEA Agency determined that a comprehensive study was required under the CEAA's *Comprehensive Study Regulations*. The Ministers appointed a joint EA Committee (EAC), composed of provincial and federal government agency representatives to review the Registration/Project Description and supporting documentation, develop EIS Guidelines for the Project, and provide advice to the Minister regarding the Project. The EAC jointly prepared EIS Guidelines for the Project that addressed the requirements of both jurisdictions and identified the nature, scope, and minimum information and analysis required in the EIS.

Alderon submitted an EIS (the previous EIS) to the EAC in 2012. The previous EIS underwent review by the EAC and was also made available for public and Indigenous review. Comments from the EAC, the public, and Indigenous communities and organizations were considered prior to the federal and provincial governments making a determination about the potential environmental impacts of the Project. Following additional rounds of comments and amendments to the previous EIS, the Project was released from the EA process in 2014 and both levels of government advised that the Project could proceed. The former provincial Minister of Environment and Conservation stated that under the authority of Section 67(3) (a) of the NLEPA, the Lieutenant-Governor in Council had released the Project, subject to several conditions. The former federal Minister of the Environment issued a decision statement that, pursuant to subsection 22(2) of CEAA, the Minister was of the following opinions:

- The Project is not likely to cause significant adverse environmental effects, considering the implementation of the mitigation measures described in the Comprehensive Study Report.
- The mitigation measures and follow-up program described in the Comprehensive Study Report are appropriate for the Project.

In addition to the decision statement, the CEA Agency prepared a Comprehensive Study Report, which summarized the outcomes of the EIS, mitigation and monitoring requirements and the CEA Agency's recommendation regarding the Project for the former federal Minister of Environment (CEA Agency 2013). Alderon updated its feasibility study for the Project in 2018; however, the Project was not undertaken by Alderon. In 2021, Champion completed the acquisition of the Project from Alderon.

Champion submitted a Project Registration document (WSP 2024) to the NL Department of Environment and Climate Change (the Department) in April 2024 to restart the EA process for the Project. On June 13, 2024, the Minister issued a Decision Letter to Champion concluding that an EIS would be required for the Project (Government of NL 2024b). Additional information on the regulatory framework for the Project is provided in Section 1.4.

1.2 Proponent

The Kami Iron Mine Partnership is comprised of Champion Kami Partner Inc. (Champion) and the partnership members of Nippon Steel Corporation and Sojitz Corporation, for joint ownership and development of the Project. While the Partnership will hold ownership of the Project, Champion will retain operatorship of the Project and will oversee the potential development and future operations of the Project. Champion is leading the EIS Submission and all permit applications for the Project.

Champion, through its wholly-owned subsidiary Quebec Iron Ore Inc., owns and operates the Bloom Lake Mining Complex located on the south end of the Labrador Trough, approximately 13 km north of Fermont, Québec. Bloom Lake is an open-pit operation with two concentration plants that primarily source energy from renewable hydroelectric power, having a combined nameplate capacity of 15M wet metric tonne (wmt) per year that produce low contaminant high-grade 66.2% Fe iron ore concentrate with a proven ability to produce a 67.5% Fe direct reduction quality iron ore concentrate. Benefiting from one of the highest purity resources globally, Champion is investing to upgrade half of Bloom Lake's mine capacity to a direct reduction quality pellet feed iron ore with up to 69% Fe. Bloom Lake's high-grade and low contaminant iron ore products have attracted a premium to the Platts IODEX 62% Fe iron ore benchmark. Champion ships iron ore concentrate from Bloom Lake by rail, to a ship loading port in Sept-Îles, Québec, and has delivered its iron ore concentrate globally, including in China, Japan, the Middle East, Europe, South Korea, India and Canada.

In addition to Bloom Lake, Champion owns the Kamistiatusset mining properties, a project with an estimated annual production of 9M wmt per year of direct reduction quality iron ore grading above 67.5% Fe, located near available infrastructure and only a few kilometres south-east of Bloom Lake. In December 2024, Champion entered into a binding agreement with Nippon Steel Corporation and Sojitz Corporation to form a partnership to evaluate the potential development of the Project, including the completion of a definitive feasibility study. Champion also owns a portfolio of exploration and development projects in the Labrador Trough, including the Cluster II portfolio of properties, located within 60 km south of Bloom Lake.

One of the other joint ownership partners, Nippon, is Japan's largest steelmaker and one of the world's leading steel manufacturers. Nippon has a global crude steel production capacity of approximately 66 million tonnes and employs approximately 110,000 people in the world. Nippon's manufacturing base is in Japan and the company has presence in 15 countries or more worldwide including the United States, India, Thailand, Indonesia, Vietnam, Brazil, Mexico, Sweden, China and others. As the 'Best Steelmaker with World-Leading Capabilities', Nippon pursues world-leading technologies and manufacturing capabilities and contributes to society by providing excellent products and services.

The other joint partner is Sojitz, which was formed out the union of Nichimen Corporation and Nissho Iwai Corporation, both companies that boast incredibly long histories. For more than 160 years, their business has helped support the development of countless countries. Today, the Sojitz group consists of approximately 400 subsidiaries and affiliates located in Japan and throughout the world, developing wide-ranging general trading company operations globally.

1.2.1 Vision, Mission, and Values

Champion diligently strives to positively impact its stakeholders, while deploying industry best sustainability practices. The company prides itself on cultivating strong, mutually beneficial partnerships, including with local Indigenous communities, and providing nearly 1,300 direct jobs in a remote area of Québec. Champion continues to be the largest employer of Indigenous communities in its host region.

Vision

Leverage the force of responsible materials to decarbonize and brighten the future.

Mission

Produce responsible materials with ingenuity to reduce the carbon footprint with and for those who seek change.

Values

Champion's commitment to responsible mining is reflected in its values. The following four core values are the cornerstone of Champion's beliefs and guide daily operations:

- **Pride:** develop a collective sense of belonging in all spheres of iron ore mining.
- **Ingenuity:** Leverage employee creativity and expertise to achieve and maintain efficient practices aimed at operational excellence.
- **Respect:** Respect for people, resources, the environment, safety standards, partnerships, and equipment.
- **Transparency:** Promote transparent communications through active listening and open dialogue.

1.2.2 Approach to Sustainability

Champion's dedication to sustainability is deeply anchored in company culture. Its vision, strategy, and values guide Champion's approach to sustainability. Champion strives to enable its customers to produce steel more sustainably by innovating and producing high-purity iron ore products. The company continuously works to provide a safe and inclusive working environment, avoiding social inequities, embracing cultures, respecting human rights, and protecting the environment and biodiversity. Its commitment is articulated in company sustainability policies, including its Environmental Policy.

Environmental Policy

Champion adheres to four pillars in its environmental policy:

Continuous improvement of environmental performance

Champion's environmental performance is achieved through an effective and efficient environmental management system. The implementation of this system aims to ensure the following:

- Strict obedience to compliance obligations.
- Achievement of ever higher environmental performance objectives and continuous monitoring, measurement, analysis, and evaluation of environmental performance.
- Responsible and proactive management of environmental risks associate with operations, including management of tailings, mine rock, and water.
- Development of opportunities for improvement.

Advocacy for respect of environmental values

Champion's environmental performance is closely linked to the commitment of all hierarchy levels of the company. This results in:

- Leadership oriented towards the development and maintenance of a responsible environmental culture and
- Commitment and dedication of all employees to achieve the highest environmental standards of the Canadian mining industry

Respect for local communities

The environmental and socio-economic issues of stakeholders occupy a key place in defining Champion's success. Land use continues to be a privilege, and from this perspective Champion aims to develop and maintain a successful collaboration with local communities, including Indigenous communities, in an approach based on listening, mutual understanding, trust, transparency and respect.

Environmental protection

Environmental protection and pollution prevention are essential to a profitable business strategy. Therefore, Champion aims to minimize the environmental, biodiversity, and social impacts of our current and future activities throughout the life cycle of Champions operations. This commitment is reflected in the implementation of measures to reduce the following:

- Champion's emissions into the air, water, and land
- Champion's footprint, including deforestation
- Cumulative impacts on other watershed users

1.2.3 Management Structure

As noted above, the Kami Iron Mine Partnership is comprised of Champion Kami Partner Inc. (Champion), and the partnership members of Nippon Steel Corporation and Sojitz Corporation, for joint ownership and development of the Project. While the Partnership will hold ownership of the Project, Champion will retain operatorship of the Project and will oversee the potential development and future operations of the Project. There will be reporting structures to communicate between the Kami Iron Mine Partnership organizations to plan and implement the Project, including fulfilment of the environmental management, monitoring and follow-up programs identified as part of this EIS.

Champion's corporate governance structure is composed of a Board of Directors and its committees, as well as the Champion management team. The Board of Directors is tasked with management oversight and maintains general oversight of the company's principal risks and opportunities, including those that relate to sustainability matters. The Chief Executive Officer is responsible for leading the company in meeting its short-term operational and long-term strategic goals. Information on Champion's management team is available on their website (Champion 2025).

1.2.4 Project Contact Information

The Project's principal contacts for Champion, including the representatives responsible for the Project operation, EA and permitting process, are provided in Table 1-1.

Table 1-1: Proponent Information

Proponent Information	Description
Name of the undertaking	Kami Iron Ore Mine Project (referred to in the EIS as the Kami Mining Project)
Type/Sector	Mining
Name of corporate body	12364042 Canada Inc. Champion Kami Partner Inc.
Chief Executive Officer	David Cataford
Address of the Proponent	1155 René-Lévesque Blvd. West Suite 3300 Montréal, QC H3B 3X7
Proponent principal contact	Michel Groleau Principal Director, Sustainable Development Email: mgroleau@championiron.com
Principal contact person for the purpose of the Environmental Assessment	Sharlene Baird Manager, Sustainable Development Email: sbaird@championiron.com

1.2.5 Environmental Impact Statement Team

The EIS and its supporting studies were prepared by Champion, WSP Canada Inc., GHD, AtkinsRéalis Group Inc., Ecometrix Consulting Services, Lorax Environmental, and Okane Consultants. The qualifications of all EIS Core Team members, including survey or technical study leads, is identified in Table 1-2 and further detail is provided in Appendix 1A.

Table 1-2: Environmental Impact Statement Team

Company	Core Team Members
Champion	— Michel Groleau – Principal Manager, Sustainable Development — Benoit Bigué – Strategic Engagement & Stakeholder Relations — Sharlene Baird – Manager, Sustainable Development, Kami Mining Project — Kevin Foley – General Manager, Kami Mining Project — Katherine Jacobs – HSE Coordinator
WSP Canada Inc.	— Tamara Skillen – EIS Project Director — Jean-Marc Crew – EIS Lead and Project Manager — Katherine Bibby – EIS Senior Support and Project Manager — Ana Rincon-Gomez – EIS Senior Support — Alex Frayne – EIS Coordinator — Spencer Roth – EIS Coordinator — Christina Condarcuri – EIS Coordinator — Uchenna Uju – Management Plans Lead — Julia Trautmann – Air Quality Lead — Russell Polack – Greenhouse Gas Lead — Stefan Cicak – Noise Lead — Daniel Corkery – Vibration Lead — Shira Daltrop – Light Lead — Steve Hales – Hydrogeology Lead — Craig De Vito – Surface Water Lead — Shaun Garland – Vegetation Lead — Garrett Bell – Wetlands Lead — Krista Patriquin – Wildlife Lead — James McCarthy – Fish and Fish Habitat and Offsetting Plan Lead — Daniel Russell – Mine Waste Multiple Accounts Analysis Lead — Alexandra Brossard – Indigenous and stakeholder consultation support — Vijanti Ramlogan Murphy – Indigenous and stakeholder consultation support — Amanda Van Wychen – Effects of the Environment Lead — Paul McDowell – GIS and Information Management Lead
Ecometrix Consulting Services	— Brian Fraser – Principal, Senior Consultant, Accidents and Malfunctions Lead — Mehran Moabbati – Accidents and Malfunctions Support
GHD	— Nancy Griffiths – Land Use and Socio-Economic Lead — Brigiette Masella – Land Use and Socio-economic Lead — Chloe Sullivan – Land Use and Socio-economic reviewer

Company	Core Team Members
AtkinsRéalis Group Inc.	— Marie-Hélène Paquette – Senior Engineer in Mining Tailings and Water Management — Emmanuelle Millet – Hydrogeologist
Lorax Environmental Services Ltd.	— Justin Stockwell – Senior Hydrogeochemist and Site Wide Water Balance and Water Quality Lead — Okan Aygun – Senior Hydrologist
Okane Consultants	— Gillian Allen – Closure Plan and Adaptive Management Lead — Kelsey Hewitt – Intermediate Engineer — Katherine Raymond – Intermediate Geochemist

1.3 Overview of the Undertaking

1.3.1 Purpose of the Project

The purpose of the Project is to develop the high-purity iron ore deposits of the Kami Iron Ore Mine. Once mined, the high-purity iron ore will be refined to produce high-purity iron ore concentrate suitable for export to international steel markets.

In June 2024, the Government of Canada announced the addition of high-purity iron to its list of critical minerals. This decision followed those of Newfoundland and Labrador (November 2023) and of Quebec (January 2024) which have also identified high-purity iron ore on their respective lists.

This recognition highlights that high-purity iron is a rare solution for decarbonizing the steel industry, which accounts for nearly 10% of global carbon emissions. The Labrador Trough hosts one of the largest resources of high-purity iron globally, creating an exceptional opportunity for Newfoundland and Labrador to become a global sustainable leader in the green steel supply chain.

Champion's objective for the Project is to produce Direct Reduction (DR) quality iron ore which enables the steelmaking transition towards direct reduced iron and electric arc furnaces, which produce steel without the use of coal and can contribute to reduced emissions of approximately 50% when compared to traditional blast furnace or basic oxygen furnace production.

This Project will have a substantial positive impact on global green steel supply chain. Green steel is anticipated to have a critical role in the required infrastructure and applications to decarbonize our economies. The necessity of this critical material needed to support the green energy transition highlights the need for the Project.

Additional details on the purpose of the Project are provided in **Chapter 2, Project Description** and **Chapter 3, Project Alternatives**.

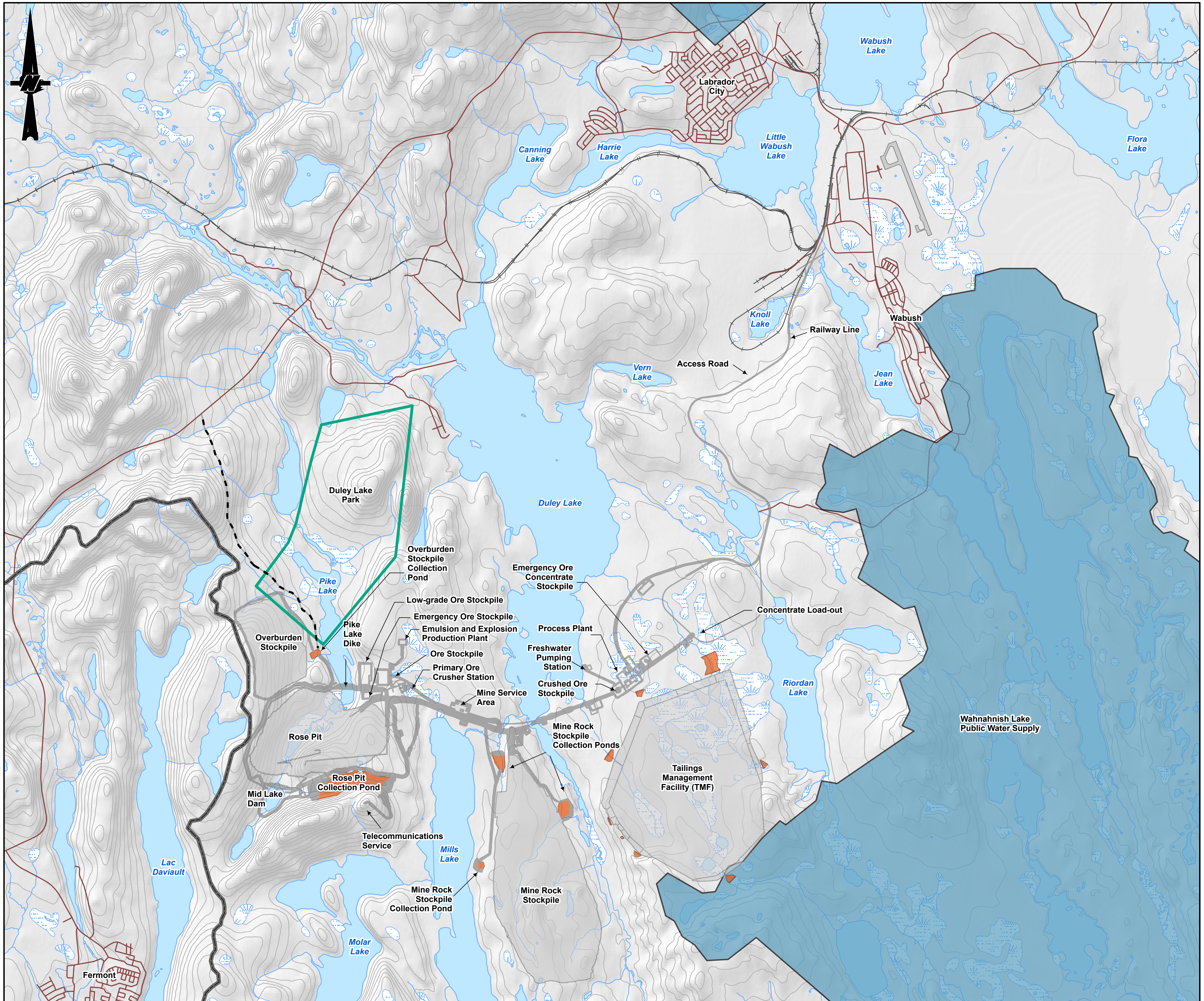
1.3.2 Project Summary

The Project will involve the construction, operation, and eventual closure of an open pit high-purity iron ore mine and supporting infrastructure. The mine operation is expected to produce an average of 8.6 million tonnes (wet) of iron ore concentrate annually over a 26-year mine life. High-purity iron ore concentrate will be transported by rail to the deep-water industrial docks in Pointe-Noire in Sept-Îles, Québec, for international shipping. The Project site is located wholly within Labrador; no activities associated with the Project Site will take place in Québec. The proposed Project location and site layout are shown in Figure 1-1.

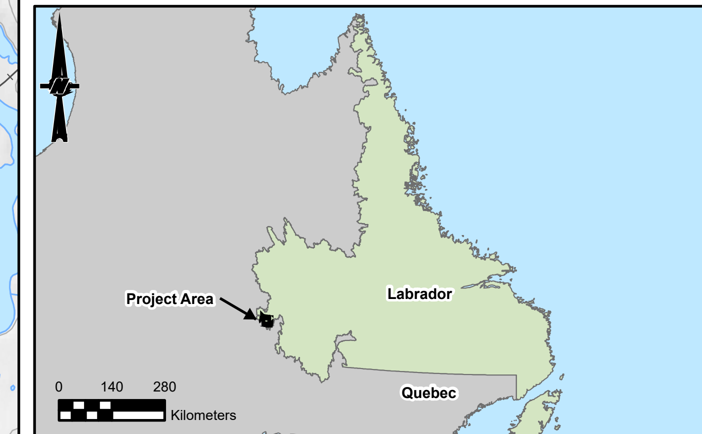
The Project includes construction, operation, and closure of the following components (Figure 1-1):

- an open pit (referred to as the Rose Pit)
- ore processing infrastructure, including the crusher, conveyors, ore stockpiles, the process plan, and a concentrate load-out
- waste management infrastructure, including an overburden stockpile, mine rock stockpile, and tailings management facility (TMF)
- water management infrastructure proposed to collect contact and non-contact water, including dams, dikes, and collection ponds
- supporting infrastructure, including access roads, workforce accommodations, a mine service area, freshwater pumping stations, an emulsion and explosion production plant and explosive storage, a crushing plant, transmission lines for local site distribution and telecommunications services
- transportation corridors, including access roads and a railway corridor that includes a spur line to connect the mine site to the Québec North Shore & Labrador Railway

All Project components will be constructed, operated, and closed in accordance with governing federal, provincial, and municipal regulations, as well as industry regulations and standards. A more detailed description of the Project is provided in Chapter 2.



KEY MAP



SCALE 1:20,000,000

Legend

PROJECT DATA

- Proposed Project Infrastructure
- Proposed Sediment Pond
- Potential Access Road

BASEMAP INFORMATION

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

0 1,000 2,000 4,000

1:71,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

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

CLIENT
CHAMPION IRON MINES LTD.

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

TITLE
PROJECT LOCATION AND SITE LAYOUT

CONSULTANT

Kami

YYYY-MM-DD	2025-02-27
DESIGNED	----
PREPARED	GM
REVIEWED	AF
APPROVED	--

PROJECT NO.	CONTROL	REV.	FIGURE
CA0038713.5261	0001	B	1-1

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1.3.3 Commitments and Conditions of Environmental Assessment Release of the Previous Environmental Impact Statement

Since acquisition of the Project in 2021, Champion has completed a thorough review of the proposed mitigation measures; monitoring requirements, commitments, and conditions outlined in the previous EIS; the CEA Agency Comprehensive Study Report; and the conditions outlined in the Lieutenant-Governor in Council's 2014 EA release. Champion prepared an updated PFS for the Project in March 2024, which included several design optimizations for the Project (Champion 2024).

Through the development of the 2024 PFS, Champion has optimized and improved the design of the Project, addressing several of the aforementioned commitments and conditions. For example, the Comprehensive Study Report recommended that Alderon update and refine the hydrogeological model of the proposed open pit to better understand the existing hydrogeological environment and to better predict and mitigate potential effects. Champion has completed additional field investigations and developed an updated conceptual hydrogeological model, which predicted increased hydraulic conductivity estimates and groundwater inflows to the Rose Pit. This predicted increase in groundwater inflows requires Champion to propose additional infrastructure to effectively manage contact water, improve pit stability, and mitigate Project effects to groundwater and surface water resources. The proposed Project design optimizations are presented in greater detail in Chapter 2.

Table 1-3 summarizes the conditions or commitments that Champion has completed through the PFS, this EIS or is planning to advance as part of this stage of planning for the Project. Where Champion has addressed a previous EIS commitment or condition, a reference is provided to indicate where more information is presented in this EIS. The table focuses on key commitments and does not list all mitigation measures and monitoring requirements from the previous EIS, Comprehensive Study Report or Conditions of EA Release. Commitments associated with the terminal facilities proposed with the previous project are not included in Table 1-3 as upgrades to the terminal facilities are outside the scope of the current Project.

A complete list of mitigation measure and monitoring commitments for the Project is presented in **Chapter 20, Environmental Management, Monitoring and Follow-up**, and all project commitments are outlined in **Chapter 23, Commitments Made in the Environmental Impact Statement**.

Table 1-3: Summary of Previous Environmental Impact Statement Commitments and Conditions that Champion has Completed or Included as Part of the Environmental Impact Statement or is Committed to Complete

Source	Commitment or Environmental Assessment Condition Outlined in the Alderon EIS[a]	Summary of Updates in the Champion EIS	Reference in the EIS
Completed or included as part of the Environmental Impact Statement			
Previous EIS	Design surface drainage to prevent flooding of stockpile areas.	Additional drainage and water management infrastructure has been developed and incorporated into the design of the Project.	— Chapter 2: Project Description
Previous EIS	Alderon is committed to blast design and monitoring the air blast and ground vibration levels from blasting activities at the mine and limiting the mass of explosives that are instantaneously initiated so that vibrations are minimized.	Air blast and ground vibration monitoring is included as part of Champion's Environmental Effects Monitoring Program submitted with this EIS.	— Annex 5E: Environmental Effects Monitoring Program
Previous EIS	Alderon will consult as necessary with local emergency response personnel in both provinces during the development of the Emergency Response Plan notification procedures.	Champion has included applicable notification requirements in the Emergency Response Plan submitted with this EIS.	— Annex 5C: Emergency Response Plan
Previous EIS	Alderon will utilize 'best practice' design and progressive rehabilitation techniques to limit dust generation from the Waste Rock Dumps.	Champion has updated the design of the waste rock dumps (referred to in the EIS as the mine rock stockpile and overburden stockpile) and will incorporate applicable progressive rehabilitation techniques to limit dust generation for the overburden stockpile.	— Chapter 2: Project Description
Previous EIS	Concrete, steel or plastic composite ties will be used instead of creosote ties in the sections of the rail route within the protected water supply area.	Champion has shifted the alignment of the railway line to be outside of the protected water supply area.	— Chapter 2: Project Description
Previous EIS	Alderon will incorporate particle composition in its ambient air quality monitoring where appropriate.	Particle composition monitoring will be included as part of Champion's Environmental Effects Monitoring Program submitted with this EIS.	— Annex 5E: Environmental Effects Monitoring Program
Previous EIS	Model Project emissions during operation following the development of the final mine design plan.	Champion has updated the air quality dispersion model to reflect the current mine design plan. As further explained in Chapter 5, the characterization of residual Project effects incorporates a number of conservative assumptions to increase the confidence that the modelled predictions will not underestimate the effects of the Project.	— Chapter 5: Air Quality and Climate — Appendix 5A: Air Quality Dispersion Modelling Report
Previous EIS	The Proponent is committed to treating the Pit discharge to meet MDMER discharge criteria if required.	All effluent discharge from the Project will meet discharge criteria per the current Metal and Diamond Mining Effluent Regulations.	— Chapter 8: Surface Water — TSD VI: Site-Wide Water Balance and Water Quality Modelling Report — Annex 5E: Environmental Effects Monitoring Program
Previous EIS	An Environmental Protection Plan (EPP) for construction within the protected water supply area will be developed as part of the overall Environmental Management System and Sustainability Management Framework for the Project. The EPP will include mitigation measures to protect Wahnahnish Lake from impacts from construction activities including: — silt fences to control dust and sediment from entering the lake — storm water management at drainage locations to minimize flow disruptions caused by construction and, — spill prevention protocols	Champion has shifted the alignment of the access road and railway line to be outside of the protected water supply area. Where infrastructure is located within or close proximity of the protected water supply area, mitigation measures will be implemented to mitigate effects to the protected water supply area. An annotated table of contents for the construction EPP is included with the EIS.	— Annex 5D: Environmental Protection Plan Annotated Table of Contents
Previous EIS	The rail line will be operated as safely as possible to reduce the risk of a derailment. Below are examples of measures which will be implemented: — transport fuel and consumables separately from the main iron ore cars — reduce the speed of the shipment — move fuel and consumable railcars by daylight — send an inspection vehicle (hi-rail pick-up truck) ahead of the fuel cars to inspect the line for damage and obstructions so that the train can be stopped well in advance of any problems on the route and, — the movement of fuel to the site will employ new, double-jacketed tank cars that are designed to withstand certain types of roll-overs and not spill	Fuel and other consumables will be transported by truck instead of rail. Other measures listed will be implemented into the design and operation of the Project's railway.	— Chapter 2: Project Description

Source	Commitment or Environmental Assessment Condition Outlined in the Alderon EIS[a]	Summary of Updates in the Champion EIS	Reference in the EIS
Previous EIS	To address the unlikely event that there is a spill at the rail and road corridor through the protected water supply area, the following mitigation measures will be implemented: — corridor will be designed as a spill containment area with lined ditches and berms along both sides of the corridor to capture spills — oil/water separators (OWS) will be installed that will capture fuels so that they do not enter Wahnahnish Lake and, — sluice gates, which would stop flow in the event of a spill within the protected water supply area, will be installed	Champion has shifted the road and rail corridors to be outside of the protected water supply area. Applicable mitigation measures will be implemented to mitigate effects in the unlikely event that there is a spill.	— Chapter 2: Project Description
Comprehensive Study Report	As part of ongoing Project design, continue field work and analyses to update and refine the current model of the existing hydrogeological environment around the proposed open pit, and the potential impacts of the open pit development. Present the results of the advanced hydrogeological work for review by regulators. Refine and update hydraulic conductivity estimates when additional investigation of soil and bedrock hydraulic properties is carried out during the detailed engineering and design phase of the Project.	In 2023, Champion completed a desktop review of Project data, undertook new site investigations, and developed an updated conceptual hydrogeological model, including updated hydraulic conductivity estimates. The investigations and updated model provide a better understanding of the hydrogeological conditions at the site.	— Chapter 7: Groundwater — Appendix 7A: Conceptual Hydrogeological Modelling Report — TSD V: Hydrogeology Modelling Report
Comprehensive Study Report	Implement additional mitigation measures, as required, if further test work, groundwater, and surface water modelling and design, conducted as part of the detailed design phase of the project, indicate that there is a potential impact to groundwater or surface water resources.	Champion is proposing additional water management infrastructure to mitigate the predicted increases in dewatering rates and effects on groundwater and surface water resources, as a result of updating the hydrogeological model.	— Chapter 2: Project Description
Comprehensive Study Report	Confirm environmental assessment predictions related to acid rock drainage by basing future characterization of waste rock acid-generating potential on the results of direct measurement of total carbonate and sulphide content.	Champion undertook an updated geochemical characterization study to characterize metal leaching/acid rock drainage risk of units identified as future mine rock, building from the previously completed study for the 2012 EIS. Additional samples were also analyzed for static and kinetic testing. Source terms have been updated and incorporated into the water quality modelling and incorporated into the effects assessment.	— Chapter 2: Project Description — Chapter 8: Surface Water — TSD VI: Site-Wide Water Balance and Water Quality Modelling Report
Comprehensive Study Report	Develop a Waste Management Plan to ensure that waste (hazardous and non-hazardous) generated through all phases of the Project is managed and disposed of in an approved manner.	A preliminary Waste Management Plan is included with the EIS.	— Annex 5H: Waste Management Plan
Comprehensive Study Report	Use best practices and comply with provincial and federal regulations with respect to the handling, storage, disposal and transportation of waste and hazardous materials.	A preliminary Waste Management Plan that outlines best practices and applicable provincial and federal regulations is included with the EIS.	— Annex 5H: Waste Management Plan
Comprehensive Study Report	Develop and implement an Emergency Response Plan and Spill Contingency Plan for all potential accidents and malfunctions.	An Emergency Response Plan is included with the EIS, focused on bounding scenarios identified within the Accidents and Malfunctions assessment.	— Chapter 18: Accidents and Malfunctions — Annex 5C: Emergency Response Plan
Comprehensive Study Report	Cover or enclose conveyors at the mine site to reduce dust.	All conveyors proposed for the mine site will be covered or enclosed.	— Section 2: Project Description
Comprehensive Study Report	A Noise Management Plan will be included and part of the Project's Environmental Protection Plan to be revised by appropriate regulatory authorities prior to construction.	An annotated table of contents for the construction EPP is included with the EIS, which includes a Noise Management Plan.	— Annex 5D: Environmental Protection Plan Annotated Table of Contents
Comprehensive Study Report	Develop and implement an invasive species management plan outlining the potential invasive species likely to occur and procedures to prevent their introduction and/or spread, as part of the Environmental Protection Plan.	An annotated table of contents for the construction EPP is included with the EIS, which includes an Invasive Species Management Plan.	— Annex 5D: Environmental Protection Plan Annotated Table of Contents
Comprehensive Study Report	Develop a wetland mitigation and monitoring plan as part of the Environmental Protection Plan based on the mitigation hierarchy of avoidance, minimization, and compensation.	Wetland mitigation and monitoring requirements and a wetland monitoring plan are included in the EIS and the Environmental Effects Monitoring Program submitted with this EIS, where applicable.	— Chapter 10: Vegetation, Wetlands and Protected Areas — Annex 5E: Environmental Effects Monitoring Program
Comprehensive Study Report	Develop a wetland compensation and rehabilitation strategy, in conjunction with the wetland mitigation and monitoring plan as part of the Environmental Protection Plan.	Wetland mitigation and monitoring requirements and a wetland monitoring plan are included in the EIS and the Environmental Effects Monitoring Program submitted with this EIS, where applicable.	— Chapter 10: Vegetation, Wetlands and Protected Areas — Annex 5E: Environmental Effects Monitoring Program
Comprehensive Study Report	Compensate for loss of fish habitat or production.	A fish and fish habitat offsetting and compensation plan is submitted with this EIS.	— TSD IX: Fish and Fish Habitat Offsetting Plan
Comprehensive Study Report	Develop and implement an Avifauna Management Plan (e.g., to address incidental take).	An annotated table of contents for the construction EPP is included with the EIS, which includes an Avifauna Management Plan.	— Annex 5D: Environmental Protection Plan Annotated Table of Contents
Comprehensive Study Report	Survey cabins and caves prior to construction. If bat colonies are identified, contact the Newfoundland and Labrador Department of Environment and Conservation and follow advice of provincial regulators.	Additional bat surveys have been conducted as part of Champion's baseline program and is included as part of this EIS. An annotated table of contents for the construction EPP is included with the EIS, which will include mitigation for species at risk bats.	— Chapter 11: Wildlife — Annex 3C: Wildlife Baseline Report — Annex 5D: Environmental Protection Plan Annotated Table of Contents

Source	Commitment or Environmental Assessment Condition Outlined in the Alderon EIS[a]	Summary of Updates in the Champion EIS	Reference in the EIS
Comprehensive Study Report	Develop a noise monitoring plan in consultation with regulatory authorities prior to the start of Project construction. Monitor sound quality by measuring sound pressure levels in specific noise sensitive areas and/or along the site perimeter. Develop a noise complaint follow-up and response procedure.	A noise monitoring plan and complaint follow-up procedure is included as part of Champion's Environmental Effects Monitoring Program submitted with this EIS.	— Annex 5E: Environmental Effects Monitoring Program
Comprehensive Study Report	Conduct a country food sampling program to evaluate any changes in the environment that may occur as a result of the project.	A country foods sampling program was completed, and the results were incorporated into the human health risk assessment.	— TSD XI: Human Health Risk Assessment Modelling Report
Conditions of Previous Environmental Assessment Release	Kami Mine Limited Partnership shall adhere to all mitigation, monitoring and commitments stated in the Environmental Impact Statement (EIS) submitted October 1, 2012, and the additional Amendments submitted February 15, 2013, and June 27, 2013, and any other supporting documentation derived through the environmental assessment process.	Applicable mitigation measures and monitoring requirements will be implemented. Additional environmental design features have been incorporated into the Project. Where new interactions between the Project and the environment were identified, additional mitigation measures are proposed. Mitigations, monitoring and commitments that are no longer applicable to the project due to the proposed or future optimization will not be renewed as part of this process.	— Chapter 20: Environmental Management, Monitoring and Follow-up — Chapter 23: Commitments Made in the Environmental Impact Statement
Conditions of Previous Environmental Assessment Release	Kami Mine Limited Partnership shall prepare a general Environmental Protection Plan for all applicable construction and operation activities and submit the Environmental Protection Plan to the Minister of Environment and Conservation, and receive the minister's approval for the Environmental Protection Plan, prior to the start of construction.	An annotated table of contents for the construction EPP is included with the EIS. The EPP will be developed prior to construction for review and Ministerial approval.	— Annex 5D: Environmental Protection Plan Annotated Table of Contents
Conditions of Previous Environmental Assessment Release	Kami Mine Limited Partnership shall prepare an Environmental Protection Plan for the following Project Valued Ecosystem Components and submit the Environmental Protection Plan to the Minister of Environment and Conservation, and receive the Minister's approval for the Plan, prior to the start of construction. The Environmental Protection Plan will be developed in order to minimize disturbance and mitigate potential effects on Valued Ecosystem Components during project construction and operation. The Environmental Protection Plan will cover the following Valued Ecosystem Components: — wetlands — avifauna (including listed species that occur within western Labrador) — other wildlife — species of conservation concern (including Lac Joseph Caribou, George River Caribou, Bats and rare and uncommon plants)	An annotated table of contents for the construction EPP is included with the EIS, which will include mitigation for applicable Valued Ecosystem Components. The EPP will be developed prior to construction for review and Ministerial approval.	— Annex 5D: Environmental Protection Plan Annotated Table of Contents
Conditions of Previous Environmental Assessment Release	Kami Mine Limited Partnership shall prepare Environmental Effects Monitoring Plans for the following Valued Ecosystem Components, in consultation with the Wildlife Division and submit them to the Minister of Environment and Conservation and receive the minister's approval for the Environmental Effects Monitoring Plans, prior to the start of construction. The Environmental Effects Monitoring Plans will be developed to monitor effects as a result of the project and to ensure that any changes to existing baseline as a result of project effects are documented and mitigated against: — wetlands — avifauna (including listed species that occur within western Labrador) — other wildlife — species of Conservation Concern (including Lac Joseph Caribou, George River Caribou, Bats and rare and uncommon plants)	An Environmental Effects Monitoring Program is included with the EIS, which will include monitoring plans for applicable Valued Ecosystem Components.	— Annex 5E: Environmental Effects Monitoring Program
Ongoing or Planned			
Previous EIS	Ongoing engagement with Aboriginal communities and organizations.	Since acquiring the Project, Champion has and will continue to engage with representatives from each Indigenous group.	— Chapter 22: Engagement — Annex 5G: Kami Engagement Plan
Previous EIS	Engage in ongoing discussions with the Towns of Labrador City and Wabush.	Since acquiring the Project, Champion has and will continue to engage with representatives from each town, as well as representatives from the Town of Fermont.	— Chapter 22: Engagement — Annex 5G: Kami Engagement Plan
Previous EIS	Rehabilitation and Closure planning will be further advanced through the detailed design stage, prior to submission as a component of the required submissions to obtain construction approval for the Project.	The Rehabilitation and Closure Plan will be submitted to the province if the Project is deemed approved and will be updated every five years until Closure.	— Chapter 23: Commitments Made in the Environmental Impact Statement
Previous EIS	Alderon commits to joining the Mining Association of Canada following EA release and Project sanction.	Champion commits to joining the Mining Association of Newfoundland and Labrador (MINL) following EA release and Project sanction.	— Chapter 23: Commitments Made in the Environmental Impact Statement

Source	Commitment or Environmental Assessment Condition Outlined in the Alderon EIS[a]	Summary of Updates in the Champion EIS	Reference in the EIS
Comprehensive Study Report	Conduct groundwater sampling as part of the detailed engineering phase of the project and incorporate this baseline (existing) groundwater data into the Project monitoring and follow-up program for groundwater quality.	Additional groundwater sampling is planned as part of ongoing field investigations. These results will be incorporated into the Project monitoring and follow-up program for groundwater quality.	— Chapter 7: Groundwater — Chapter 20: Environmental Management, Monitoring and Follow-up — Chapter 23: Commitments Made in the Environmental Impact Statement — Annex 5E: Environmental Effects Monitoring Program
Comprehensive Study Report	Undertake long-term pumping tests when site access is approved to assess the role and impact of geological features such as faults and fractures.	Champion undertook additional hydrogeological site investigations in 2024/2025, including the completion of long-term pumping tests to better estimate bedrock parameters at a larger scale and confirm conceptual hypotheses, such as the continuity of the faults and their hydraulic connection to the lakes surrounding the Project. Results from this planned testing are not yet available for integration into the EIS. Results will be shared with applicable regulatory authorities, prior to the construction phase.	— Chapter 23: Commitments Made in the Environmental Impact Statement
Comprehensive Study Report	Update the 3D numerical groundwater flow model for the Project to include data from pumping tests that focuses on dewatering of the open pit prior to and during operation.	The results of the 2024/2025 hydrogeological site investigation will be incorporated into a 3D numerical groundwater flow model to refine dewatering predictions. Results will be shared with applicable regulatory authorities, once available.	— Chapter 23: Commitments Made in the Environmental Impact Statement
Comprehensive Study Report	Conduct humidity cell and batch cell tests to confirm drainage interaction within the waste rock disposal areas.	Champion is currently completing humidity cell testing of additional units identified as future mine rock. Results from these analyses are not yet available for integration into the EIS. Results will be shared with applicable regulatory authorities, once available.	— Chapter 23: Commitments Made in the Environmental Impact Statement
Comprehensive Study Report	Undertake targeted dusk surveys for Common Nighthawk (*Chordeiles minor*). Integrate results into the avifauna management plan.	Targeted avifauna surveys are planned for completion in 2025. Results of the surveys will be incorporated into the follow-up and monitoring program.	— Chapter 11: Wildlife — Chapter 20: Environmental Management, Monitoring and Follow-up — Chapter 23: Commitments Made in the Environmental Impact Statement — Annex 5E: Environmental Effects Monitoring Program
Conditions of Previous Environmental Assessment Release	Kami Mine Limited Partnership shall prepare a Real-Time Monitoring Network Agreement in consultation with the Water Resources Management Division and submit the Real-Time Monitoring Network Agreement to the Minister of Environment and Conservation and receive the minister's approval for the Real-Time Monitoring Network Agreement prior to the start of construction.	An Environmental Effects Monitoring Program is included with the EIS, which will include a surface water and groundwater monitoring plan. Champion will consult with the provincial Water Resources Division to develop a Real-Time Monitoring Network Agreement prior to construction.	— Chapter 20: Environmental Management, Monitoring and Follow-up — Chapter 23: Commitments Made in the Environmental Impact Statement — Annex 5E: Environmental Effects Monitoring Program

Source	Commitment or Environmental Assessment Condition Outlined in the Alderon EIS[a]	Summary of Updates in the Champion EIS	Reference in the EIS
Conditions of Previous Environmental Assessment Release	Kami Mine Limited Partnership shall prepare a Benefits Plan in consultation with the Department of Natural Resources and the Department of Finance and submit it to the Minister of Natural Resources and the Minister of Finance and receive the approval of both ministers prior to construction.	Champion is committed to fostering an inclusive work environment dedicated to promoting diversity, equality, and inclusive practices within its organization. These values will be integrated into all aspects of the Project's operations, from construction through to mine closure. Champion acknowledges a Benefits agreement which includes a Gender Equity and Diversity Plan was signed between the Government of Newfoundland and Labrador and the Kami mine Limited Partnership in 2014. Champion is determined to fulfill the commitments within the agreement to the best of its abilities. It is a strong belief for Champion that the updated Gender Equity, Diversity and Inclusion Plan shall address access to training, employment, and procurement opportunities for women, Indigenous peoples, and other underrepresented groups. This Plan will apply to both Champion and its contractors, and it will be reinforced by corporate policies that promote diversity and inclusivity. To make sure it respects current standards and expectations, an assessment of the 2014 Gender Equity and Diversity plan is currently underway to inform the new and up to date Gender Equity, Diversity and Inclusion Plan Champion is developing. Following this assessment, the Workforce and Employment Plan will be updated and issued prior to the construction phase. Champion remains committed to firmly establish local benefits in employment, training and business opportunities as stated in the 2014 Provincial Benefits agreement. Champion will work in collaboration with industry, various levels of government, educational and training institutions, Indigenous groups, communities and stakeholders to develop strategies aimed at creating local benefits and promoting diversity and inclusion throughout the project. We strongly believe that a collaborative and inclusive approach is required to unlock the full potential of the Labrador Trough and to maximize the benefits of the Project. The Labrador West Alliance will play a key role in leveraging the strengths of all involved parties in achieving those objectives. Both the Benefits Agreement and the Gender Equity, Diversity and Inclusion Plan will provide the opportunity for ongoing collaboration with industry, government, educational and training institutions, Indigenous groups, communities, and stakeholders to formulate strategies directed at local benefits creation and diversity and inclusion during the life of the Project. The Plans will outline the goals and initiatives that will be implemented throughout the Project and the measures that will be implemented to ensure, to the extent possible, that there is fair and equitable access to the benefits associated with the Project. Champion strives to create value in a sustainable manner in all the communities where it operates. The Project is fully aligned with this objective and with our vision to develop a mining project that future generations of Labradorians will want to contribute to.	— Chapter 23: Commitments Made in the Environmental Impact Statement — Annex 5A: Benefits Agreement/Gender Equity, Diversity and Inclusion Plan

TSD = technical support document; EIS = Environmental Impact Statement; n/a = not applicable.

Notes:

(a) Mitigations, monitoring and commitments that are no longer applicable to the project due to the proposed optimization will not be renewed as part of this process.

1.4 Regulatory Framework

Section 17 of the *NL Environmental Assessment Regulations, 2003*, indicates that there is a three-year term within which an undertaking release remains in force. After the expiration of the three-year period, if a released undertaking has not commenced, the release is void unless an extension is made by the Minister or Lieutenant-Governor in Council for up to three additional periods of one year each. No such extensions were requested or granted for the Project; therefore, the previous release was voided, and the provincial EA process was restarted for the Project.

The federal assessment process has changed substantially since the 2014 decision statement was issued for the Project. The previous EA for this Project began under the CEAA before the *Canadian Environmental Assessment Act, 2012* (CEAA 2012)—the more recent *Impact Assessment Act* (IAA) then came into force, replacing the CEAA. On June 19, 2024, IAAC confirmed that the IAA does not apply to the Project because it had previously undergone a federal comprehensive study and received a determination under the CEAA; therefore, it is included in the transition provision in subsection 185.1(1) of the IAA, which indicates that the Act does not apply. To this end, the Project will follow the provincial EA process only.

1.4.1 Provincial Environmental Assessment Process

Champion initiated the provincial EA process through the submission of a new Project Registration document (WSP 2024). Copies of the Project Registration document were made available to Indigenous communities, stakeholders, and members of the public with an opportunity to submit written comments to the Minister within a 35-day comment period. The Department also coordinated the review of the Project Registration document with interested government departments and agencies, then prepared a recommendation about the assessment of the Project for the Minister (Government of NL 2024c). On June 13, 2024, following the review of the Project Registration by the Department's EA screening committee, the Minister issued a Decision Letter to Champion concluding that an EIS would be required for the Project (Government of NL 2024b). Following this decision, an EAC was appointed to provide scientific and technical advice to the Minister and draft guidelines for Champion in preparing the EIS. The EAC includes representatives from the following provincial and federal government agencies:

Provincial

- Department of Environment and Climate Change
  - Environmental Assessment Division – Chair
  - Climate Change Branch
  - Pollution Prevention Division
  - Water Resources Management Division
- Executive Council
  - Office of Indigenous Affairs and Reconciliation
  - Office of Women and Gender Equality
- Department of Fisheries, Forestry and Agriculture
- Department of Health and Community Services
- Department of Jobs, Immigration and Growth
- Department of Industry, Energy and Technology
  - Mines Branch
  - Energy Branch
- Department of Labrador Affairs
- Department of Municipal and Community Engagement
- Department of Tourism, Culture, Arts and Recreation

Federal

- Environment and Climate Change Canada
- Fisheries and Oceans Canada
- Transport Canada

The Draft EIS Guidelines were issued by the Minister on August 23, 2024, and were made available for public review until October 2, 2024. After considering the comments received through the Draft EIS Guidelines review period, the Final EIS Guidelines for the Project were issued by the Minister on December 19, 2024. A table of concordance between the EIS and the EIS Guidelines is provided in the Executive Summary. The concordance table identifies each of the EIS Guideline requirements and identifies the EIS Chapter, Annex or TSD where the requirement has been addressed.

The submission of the EIS is an important step in the EA review process. The EIS is a careful and detailed consideration of how the Project could affect the residents, communities, and natural environment surrounding the Project site. This EIS addresses the EIS Guidelines and concerns raised by Indigenous groups, stakeholders, and the public through Champion's consultation process for the Project.

Section 11 of the *NL Environmental Assessment Regulations, 2003*, defines the EIS approval process:

Environmental Impact Statement

11. (1) Upon receipt of an environmental impact statement the minister shall give that statement to the committee for examination.

(2) The minister shall announce his or her receipt of an environmental impact statement not more than 7 days after that receipt and shall make copies of the statement available to interested members of the public.

(3) A person who wishes to make responses to or comments on an environmental impact statement made available under subsection (2) shall submit those responses or comments to the minister, in writing, not more than 50 days after the announcement is made under that subsection.

(4) The committee shall make a recommendation to the minister indicating whether or not the

(a) environmental impact statement is deficient; or

(b) undertaking may be released.

(5) Where the minister has a requirement under section 61 of the Act, he or she shall give notice of that requirement to the proponent not more than 70 days after he or she has received the environmental impact statement.

(6) Subsections (1) to (4) and section 60 of the Act apply to requirements of the minister under section 61 of the Act.

(7) Where, under section 60 of the Act, the minister determines that an environmental impact statement complies with the Act and the guidelines and requires no further work, he or she shall, not more than 70 days after his or her receipt of an environmental impact statement or an amended or revised environmental impact statement that requires no further work advise the proponent, in writing, that the statement complies with the Act and the guidelines and that no further work is required.

(8) The minister shall announce his or her decision under section 60 of the Act not more than 10 days after advising the proponent under subsection (7).

Should the Minister decide that the EIS is deemed deficient, the proponent can amend the EIS based on the feedback provided by the public, Indigenous Groups, and the EA Committee. The amended EIS would follow the same review and approval process.

1.4.2 Other Applicable Federal, Provincial, and Municipal Legislation, Regulations, Permits, and Approvals

Other federal, provincial, and municipal legislation and regulations will be applicable to the Project, and will be administered by the responsible regulatory agency, department, division, or municipality. Numerous approvals, permits, and authorizations are required from federal, provincial, and municipal regulators prior to Project initiation. In addition, throughout Project construction and operation, compliance with terms and conditions of approval, various standards contained in federal and provincial legislation, and regulations and guidelines will be required. Permits, approvals, and authorizations generally contain conditions that, combined with other regulatory requirements and environmental constraints, make up commitments that Champion will need to address through Project design and during the Construction, Operations, and Closure phases. A summary of potentially applicable legislation, regulations, and preliminary permits, authorizations, and approvals for the Project is provided in Table 1-4.

Table 1-4: Potentially Applicable Federal, Provincial and Municipal Legislation and Regulations

Act	Regulations	Permit, Approval, or Authorization Activity	Regulatory Agency
Federal			
Fisheries Act	*Metal and Diamond Mining Effluent Regulations*	Amendment to the Metal and Diamond Mining Effluent Regulations	ECCC and DFO
	Authorizations Concerning Fish and Fish Habitat Protection Regulations	*Fisheries Act* Authorization	DFO
	Deposit Out of the Normal Course of Events Notification Regulations	n/a	
	Wastewater Systems Effluent Regulations	Authorization to Deposit Effluent Containing Deleterious Substances	
Species at Risk Act	Aquatic species listed under *Species at Risk Act* and protected by *Fisheries Act*	Permits authorizing an activity affecting protected aquatic species listed on Schedule 1 of SARA	
	Terrestrial species listed under *Species at Risk Act*	Permits authorizing an activity affecting listed wildlife species regulations	ECCC
Canadian Environmental Protection Act, 1999	*Environmental Emergency Regulations, 2019*	n/a	
Migratory Birds Convention Act, 1994	*Migratory Birds Regulations, 2022*	— A scaring or killing permit — An egg or nest destruction permit — A relocation permit	
Explosives Act	*Explosives Regulations, 2013*	Licence for the manufacture and storage of explosives	Natural Resources Canada
Transportation of Dangerous Goods Act, 1992	*Transportation of Dangerous Goods Regulations*	n/a	Transport Canada
Canadian Navigable Waters Act	No specific regulations related to this Act	— Approval for works in navigable waters — Application for Exemption	
Provincial			
Endangered Species Act	*Endangered Species List Regulations*	Permits under Endangered Species Legislation	Department of Fisheries, Forestry and Agriculture

Act	Regulations	Permit, Approval, or Authorization Activity	Regulatory Agency
Environmental Protection Act	*Environmental Assessment Regulations, 2003*	Release from EA Process	Department of Environment and Climate Change, Environmental Assessment Division
	Air Pollution Control Regulations, 2022	— Certificate of Approval for Construction and Operations Industrial Facility — Certificate of Approval for Diesel Generators	Department of Environment and Climate Change, Pollution and Prevention Division
	Storage and Handling of Gasoline and Associated Products Regulations, 2003	— Approval of Storage and Handling Gasoline and Associated Products Registration — Approval of Application for the Establishment of Fuel Caches at Remote Sites	
	Used Oil and Used Glycol Control Regulations	Certificate of Approval	
	Waste Management Regulations, 2003	Environmental Approval for Waste Management System	
	Pesticide Control Regulations, 2012	Pesticide Operators Licence	
Forestry Act	*Cutting of Timber Regulations*	Operating Permit to Carry out an Industrial Operation During Forest Fire Season on Crown Land	Department of Fisheries, Forestry and Agriculture
		Permit to Cut Crown Timber	
		Permit to Burn	
	n/a	Permit to Destroy Problem Animals	
Lands Act	No specific regulations related to this Act	Crown Land Lease	
Management of Greenhouse Gas Act	*Management of Greenhouse Gas Regulations* *Management of Greenhouse Gas Reporting Regulations*	n/a	Department of Environment and Climate Change, Pollution Prevention Division
Mining Act	*Mining Regulations*	Approved Development Plan, Rehabilitation and Closure Plan, and Financial Assurance	Department of Industry, Energy and Technology, Mineral Lands Division
	Mineral Regulations	— Mining Lease — Surface Lease — Mineral Licence — Approved Quarry Permit or Lease	

Act	Regulations	Permit, Approval, or Authorization Activity	Regulatory Agency
Occupational Health and Safety Act	*Occupational Health and Safety Regulations, 2012*	n/a	Digital Government and Service Newfoundland
Water Resources Act	*Environmental Control Water and Sewer Regulations, 2003*	— Water Use Licence — Approval for Septic or Water System Greater Than 4546 L per Day — Permit to Construct Drinking Water and Wastewater Infrastructure — Permit for Development Activity in a Protected Public Water Supply Area — Permit for Constructing a Non-Domestic Well — Permits for Alterations to a Body of Water, including: – Schedule A: Culverts – Schedule B: Bridges – Schedule C: Dams – Schedule D: Fording – Schedule E: Pipe Crossing – Water Intake – Schedule F: Stream Modification or Diversion – Schedule G: Small Bridges – Schedule H: Infilling, Dredging and Debris Removal	Department of Environment and Climate Change, Pollution and Prevention Division
	Well Drilling Regulations, 2003	Well Drilling Licence	
Rail Service Act	No specific regulations related to this Act	Approval to Purchase, Operate or Construct a rail service	Department of Transportation and Infrastructure
Municipal			
Urban and Rural Planning Act, 2000	*Labrador City Development Regulations, 2017*	Building and/or Development Permit	Town of Labrador City
Municipalities Act, 1999	*Labrador City Open Air Burning Regulations, 2012*	Open Air Burning Permit	
Urban and Rural Planning Act, 2000	*Wabush Development Regulations, 2018*	Building and/or Development Permit	Town of Wabush
Urban and Rural Planning Act, 2000	Wabush Municipal Plan, 2018 to 2028 Labrador City Municipal Plan, 2018 to 2028	— *Municipal Plan & Development Regulation* Amendment — Habitat Management Unit Development Proposal	-

ECCC = Environment and Climate Change Canada; DFO = Fisheries and Oceans Canada; SARA = *Species at Risk Act*; n/a = not applicable.

1.4.3 Standards and Guidelines

A summary of the standards and guidelines used in the EIS to assist in the evaluation of predicted environmental effects are provided in Table 1-5.

Table 1-5: Standards and Guidelines

Standard/Guideline	Applicable EIS Chapter
Newfoundland and Labrador Ambient Air Quality Standards	Chapter 5: Air Quality and Climate
Canadian Ambient Air Quality Standards	Chapter 5: Air Quality and Climate
Guidance for Evaluating Human Health Effects in Impact Assessment: Noise. Health Canada. 2023	Chapter 6: Noise, Vibration and Light
ISO 9613-1 and 9613-2 Acoustics. 2024	Chapter 6: Noise, Vibration and Light
Commission Internationale de L'Eclairage (CIE). 2017. Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations, 2nd Edition	Chapter 6: Noise, Vibration and Light
Canadian Council of Ministers of the Environment (CCME) Water Quality Guidelines for the Protection of Aquatic Life – Freshwater	Chapter 8: Surface Water Chapter 9: Fish and Fish Habitat
Health Canada Canadian Drinking Water Quality Aesthetic Guidelines	Chapter 8: Surface Water TSD VI: Site-Wide Water Balance and Water Quality Modelling Report
CCME Sediment Quality Guidelines for the Protection of Aquatic Life Freshwater and Marine Interim Sediment Quality Guidelines (ISQG)/Probable Effect Level (PEL)	Chapter 8: Surface Water
Environment and Climate Change Canada (ECCC) Federal Environmental Quality Guidelines for Selenium and Cobalt	Chapter 9: Fish and Fish Habitat TSD VII: Selenium Site-Specific Water Quality Objectives Modelling Summary TSD VIII: Cobalt Site-Specific Water Quality Objectives Modelling Summary
Guidelines for the Use of Explosives in or near Canadian Fisheries Waters. Department of Fisheries and Oceans. 1998	Chapter 9: Fish and Fish Habitat
Federal Policy on Wetland Conservation	Chapter 10: Vegetation, Wetlands and Protected Areas
Newfoundland and Labrador Policy for Development in Wetlands	Chapter 10: Vegetation, Wetlands and Protected Areas
Wetland Stewardship (Eastern Habitat Joint Venture and Municipalities)	Chapter 10: Vegetation, Wetlands and Protected Areas
COSEWIC Management and Recovery Plans	Chapter 10: Vegetation, Wetlands and Protected Areas Chapter 11: Wildlife and Wildlife Habitat
Species Status Advisory Committee	Chapter 10: Vegetation, Wetlands and Protected Areas Chapter 11: Wildlife and Wildlife Habitat
Atlantic Canada Conservation Data Centre Status Rankings	Chapter 10: Vegetation, Wetlands and Protected Areas Chapter 11: Wildlife and Wildlife Habitat
Environmental Code of Practice for Metal Mines Environment Canada. 2009	All EIS Chapters
Guidance for Evaluating Human Health Effects in Impact Assessment: Air Quality. Health Canada. 2023	TSD XI: Human Health Risk Assessment
Guidance for Evaluating Human Health Effects in Impact Assessment: Human Health Risk Assessment. Health Canada. 2023	TSD XI: Human Health Risk Assessment
Guidance for Evaluating Human Health Impacts in Environmental Assessment: Country Foods. Health Canada. 2023	TSD XI: Human Health Risk Assessment
Guidance for Evaluating Human Health Effects in Impact Assessment: Drinking and Recreational Water Quality. Health Canada. 2023	TSD XI: Human Health Risk Assessment

1.5 Environmental Impact Statement Purpose, Objective, and Structure

The purpose of the EIS is to provide a comprehensive assessment that will identify, evaluate, and mitigate potential adverse effects or enhance benefits to the environmental, health, social, and economic components associated with the Project.

The objective of the EIS is to provide the EA Committee sufficient detail to confirm the following:

- The key issues raised through engagement on the Project have been addressed.
- Where Project-environment interactions are similar to what was assessed in the previous EIS, appropriate mitigation measures and monitoring requirements are recommended.
- Where new interactions and potential for new adverse effects to the environment are identified compared to the previous EIS, additional mitigation measures are recommended to mitigate adverse environmental effects.
- The follow-up monitoring program described in the EIS to verify effect predictions and effectiveness of mitigation is appropriate for the Project.
- The Project is not likely to cause significant adverse environmental effects.

Confirming these details would allow for the EA Committee to proceed with recommending to the Minister that the Project can be released from the EA process. To achieve this objective, the EIS will do the following:

- Provide sufficient detail regarding the proposed Project to allow for identification of all Project adverse effects and benefits for each Project phase.
- Present an analysis of alternatives to the Project and alternative means of carrying out the Project with rationale for selecting the Project proposed.
- Identify and assess precited residual Project and cumulative effects on selected valued environment components (VECs), considering the effective implementation of mitigation measures.
- Determine whether there is potential for significant residual effects from the Project on the selected VECs.
- Identify and describe the potential accidents and malfunctions related to all components of the Project and assess potential consequences, including the potential environmental effects on selected VECs.
- Identify and describe the potential effects of the environment on the Project.
- Summarize consultation activities, key issues, and concerns as well as how these were addressed through the EIS.
- Provide a list of commitments made in the EIS, including proposed monitoring and an EA follow-up program.

Table 1-6 presents a structure of the EIS. The EIS will include the main EIS report, composed of 24 chapters. Management plans, baseline reports, and technical support documents (TSDs) included in this EIS submission are intended to address the EIS Guidelines and meet the EIS objective. The EIS will also include supporting appendices to the EIS chapters, which are not presented in Table 1-6, but are listed in the EIS Table of Contents.

Table 1-6: Structure and Content of the Environmental Impact Statement

Document Type	Chapter, Annex or Technical Support Document
Environmental Impact Statement Main Report	Cover Page and Table of Contents
	Executive Summary
	Abbreviations, Units and Glossary: — Units of measure — Abbreviations List — Glossary List
	Chapter 1: Introduction
	Chapter 2: Project Description
	Chapter 3: Project Alternatives
	Chapter 4: Effects Assessment Methodology
	Chapter 5: Air Quality and Climate
	Chapter 6: Noise, Vibration, and Light
	Chapter 7: Groundwater
	Chapter 8: Surface Water
	Chapter 9: Fish and Fish Habitat
	Chapter 10: Vegetation, Wetlands, and Protected Areas
	Chapter 11: Wildlife
	Chapter 12: Heritage and Historical Resources
	Chapter 13: Indigenous Land and Resource Use
	Chapter 14: Other Land and Resource Use
	Chapter 15: Economy and Employment
	Chapter 16: Services and Infrastructure
	Chapter 17: Community Health and Well-Being
	Chapter 18: Accidents and Malfunctions
	Chapter 19: Effects of the Environment on the Project
	Chapter 20: Environmental Management, Monitoring, and Follow-Up
	Chapter 21: Summary of Significance of Residual Effects
	Chapter 22: Engagement
	Chapter 23: Commitments Made in the Environmental Impact Statement
	Chapter 24: Assessment Summary and Conclusions
Baseline Reports	**Annex 1: Atmospheric Environment Baseline Reports** — 1A: Ambient Air Quality Baseline Report — 1B: Noise Baseline Report — 1C: Light Baseline Report
	Annex 2: Aquatic Environment Baseline Reports — 2A: Surface Water Baseline Report — 2B: Fish and Fish Habitat Baseline Report
	Annex 3: Terrestrial Environment Baseline Reports — 3A: Terrain and Soils Baseline Report — 3B: Vegetation and Wetlands Baseline Report and Baseline Addendum — 3C: Wildlife Baseline Report — 3D: Avifauna Baseline Report
	Annex 4: Human Environment Baseline Reports — 4A: Historic Heritage Resources Baseline Report — 4B: Cultural Heritage Screening Report — 4C: Land Use and Socioeconomic Baseline Report

Document Type	Chapter, Annex or Technical Support Document
Management Plans	**Annex 5: Management Plans** — 5A: Benefits Agreement / Gender Equity, Diversity and Inclusion Plan — 5B: Dam Safety Plan — 5C: Emergency Response Plan — 5D: Environmental Protection Plan Annotated Table of Contents — 5E: Environmental Effects Monitoring Plan — 5F: Erosion and Sediment Control Plan — 5G: Kami Engagement Plan — 5H: Waste Management Plan
Technical Support Documents	TSD I: Tailings Management Facility Pre-feasibility Level Design Report
	TSD II: Water Management Infrastructure Design Report
	TSD III: Mine Waste Multiple Accounts Analysis Report
	TSD IV: Best Available Controls and Technology Study Report
	TSD V: Hydrogeology Modelling Report
	TSD VI: Site-Wide Water Balance and Water Quality Modelling Report
	TSD VII: Selenium Site-Specific Water Quality Objectives Modelling Summary
	TSD VIII: Cobalt Site-Specific Water Quality Objectives Modelling Summary
	TSD IX: Fish and Fish Habitat Offsetting Plan
	TSD X: Visual Aesthetics Impact Assessment
	TSD XI: Human Health Risk Assessment Modelling Report
	TSD XII: Geochemical Characterization Report Phase II Static Testing
	TSD XIII: Geochemical Source Terms for the Water Balance and Water Quality Model
	TSD XIV: Economic Impact Analysis

Appendix 1A: Qualifications Table

Table 1A-1:Project Team Key Members

EIS Component	Personnel
EIS Management, Senior Direction, and Review, Planning Chapters	**Michel Groleau (MFQ)** Project Role: Principal Manager, Sustainable Development Years of Experience: 15
	Sharlene Baird (Champion) Project Role: Manager, Sustainable Development Years of Experience: 28
	Benoit Bigué (MFQ) Project Role: Strategic Engagement and Stakeholder Relations Years of Experience: 10
	Kevin Foley (Champion) Project Role: General Manager, Kami Mining Project Years of Experience: 26
	Katherine Jacobs (Champion, on secondment from SEM) Project Role: HSE Coordinator Years of Experience: 10
	Tamara Skillen, MPA, BES, PMP Project Role: Project Director Years of Experience: 24
	Jean-Marc Crew, H. B.Sc., PMP Project Role: EA Lead/Project Manager Years of Experience: 10
	Ana Rincon-Gomez, MES, B.Sc. Project Role: EA Senior Support/Project Alternatives Lead Years of Experience: 12
	Katherine Bibby, MCIP, RPP Project Role: EA Senior Support Years of Experience: 12
	Alex Frayne, B.E.S. Hons. Project Role: EA Coordination Years of Experience: 6
	Christina Condarcuri, B.Sc. Project Role: EA Coordination Years of Experience: 5
	Spencer Roth Project Role: EA Coordination Years of Experience: 9
	Uchenna Uju Project Role: Management Plans - Lead Years of Experience: 14
	Amanda Van Wychen, B.Sc. Project Role: Effects of the Environment on the Project - Lead Years of Experience: 10
	Janya Kelly, Ph.D. Project Role: Effects of the Environment on the Project - Senior Reviewer Years of Experience: 14

EIS Component	Personnel
EIS Management, Senior Direction, and Review, Planning Chapters	**Brian Fraser, M.Sc. (Ecometrix)** Project Role: Accidents and Malfunctions – Lead and Senior Reviewer Years of Experience: 27
	Mehran Monabbati, Ph.D. (Ecometrix) Project Role: Accidents and Malfunctions – Technical Lead Years of Experience: 32
Atmospheric Environment	**Julia Trautmann** Project Role: Air Quality Scientist – Lead Years of Experience: 13
	Linda Lattner Project Role: Principal Air Quality Engineer Years of Experience: 25
	Russel Polack Project Role: Greenhouse Gases – Lead Years of Experience: 18
	Stefan Cicak, P.Eng. Project Role: Noise – Lead Years of Experience: 18
	Daniel Corkery, B.Sc. Project Role: Vibration – Lead Years of Experience: 35
	Joe Tomaselli, M.Eng., P.Eng. Project Role: Noise and Vibration – Senior Reviewer Years of Experience: 24
	Shira Daltrop, M.A.Sc. Project Role: Light – Lead Years of Experience: 13
	Andrew Faszer, P.Eng. Project Role: Light – Senior Reviewer Years of Experience: 25
	Rachel Wyles Project Role: Greenhouse Gas Reduction Plan – Lead Years of Experience: 24
Aquatic Environment	**Craig DeVito** Project Role: Surface Water – Lead Years of Experience: 17
	Mohsin Siddique, Ph.D., P.Eng. Project Role: Surface Water – Lead Years of Experience: 13
	Hashim Javed, P.Eng., PMP Project Role: Surface Water – Lead Years of Experience: 12
	Maira Mendes, Ph.D. Project Role: Selenium SSWQO – Lead Years of Experience: 11

EIS Component	Personnel
Aquatic Environment	**Connor Pettem, MSc., RPBio.** Project Role: Cobalt and Selenium SSWQO – Lead Years of Experience: 8
	Gary Lawrence, MRM, RPBio. Project Role: Cobalt and Selenium SSWQO – Senior Reviewer Years of Experience: 28
	Steve Hales, B.Sc., P.Geo. (ON, AB) Project Role: Groundwater – Lead, Senior Reviewer Years of Experience: 18
	Candace Bocking, M.Sc., P.Geo. (ON) Project Role: Groundwater Specialist – Reporting Years of Experience: 3
	Matthew Gosse Project Role: Biologist – Fish and Fish Habitat Years of Experience: 19
	Blake McNeely, B.A Project Role: Intermediate Environmental Scientist – Fish and Fish Habitat Years of Experience: 5
	James McCarthy, M.Sc. Project Role: HADD and Offsets/Aquatic Environment – Senior Reviewer Years of Experience: 25
	Daniel Russell Project Role: Biologist/MAA and Scheduling II Permitting – Lead Years of Experience: 25
	Dale Klodnicki, MESc., CET, PMP Project Role: Fish and Fish Habitat Offsetting Plan – Senior Reviewer Years of Experience: 24
	Dermot Kenny, NRT **Project Role:** Senior Technician – Fish and Fish Habitat Offsetting Plan Years of Experience: 26
	Okan Aygün Ph.D., EIT (Lorax) Project Role: Site Specific Water Balance and Water Quality Modelling – Water balance and water quality modelling Years of Experience: 10
	Scott Jackson, M.Sc., P.Geo. (Lorax) Project Role: Input to Water Balance Model and watershed model setup and calibration, and water balance senior review. Years of Experience: 20
	Justin Stockwell, M.Sc., P.Geo. (Lorax) Project Role: Site Specific Water Balance and Water Quality Modelling – Overall lead and water quality senior review Years of Experience: 23
	Emmanuelle Millet, P.Geo., M.Sc. (AtkinsRealis) Project Role: Hydrogeologist - Lead Years of Experience: 13
	Luis Bayona, P.Geo., M.Sc. (AtkinsRealis) Project Role: Hydrogeologist – Senior Reviewer Years of Experience: 16

EIS Component	Personnel
Aquatic Environment	**Marie-Hélène Paquette, P.Eng., M.Env. (AtkinsRealis)** Project Role: Water Management Infrastructure Design – Lead Years of Experience: 30
	Soufiane Nachet, P.Eng., M.Sc. (AtkinsRéalis) Project Role: Water Management Infrastructure Design – Interdisciplinary Coordination Years of Experience: 10
	Katherine Raymond (Okane) Project Role: Geochemistry – Lead Years of Experience: 8
	Jared Robertson (Okane) Project Role: Geochemistry – Senior Reviewer Years of Experience: 10
Terrain and Soils	**Laura McFarlan, AIT** Project Role: Soil Scientist Years of Experience: 6
	Anne Sommerville, Ph.D., P.Ag. Project Role: Terrain Scientist Years of Experience: 16
	Christiane Brouwer, P. Ag. Project Role: Soil and Terrain Scientist – Senior Reviewer Years of Experience: 17
Biological Environment	**Shaun Garland** Project Role: Vegetation – Lead Years of Experience: 19
	John Gosse, M.Sc. Project Role: Wildlife – Senior Reviewer Years of Experience: 12
	Garrett Bell, C.E.T. Project Role: Vegetation and Wetlands – Senior Reviewer Years of Experience: 27
	Krista Patriquin, Ph.D Project Role: Senior Biologist – Wildlife Lead Years of Experience: 25
	Michelle Bacon, M.Sc., RPBio. Project Role: Senior Biologist – Wildlife Lead Years of Experience: 18
	Sarah-Jean Zettel, M.EnvSc. Project Role: Intermediate Biologist – Wildlife Years of Experience: 5
	Trysta Bastien, M.Sc. Project Role: Intermediate Biologist – Wildlife Years of Experience: 7
	Steven Beery, M.Sc., BIT Project Role: Intermediate Biologist – Wildlife Years of Experience: 13

EIS Component	Personnel
Human Environment	**Darryl Kelman** Project Role: Archaeology – Lead Years of Experience: 24
	Darcy J. Dingnam Project Role: Archaeology – Senior Reviewer Years of Experience: 30
	Paul Ritchie, M.A. Project Role: Lead Archaeologist Years of Experience: 17
	Heidy Schopf Project Role: Cultural Heritage – Senior Reviewer Years of Experience: 15
	Robert Pinchin Project Role: Cultural Heritage Specialist Years of Experience: 4
	Nancy Griffiths (GHD), BDEP, MCIP Project Role: Other Land and Resource Use and Community Health and Well-Being – Lead Years of Experience: 31
	Brigitte Masella (GHD), MES Project Role: Indigenous Land and Resource Use, Economy and Employment – Lead, Infrastructure and Services EA – Reviewer Years of Experience: 32
	Chloe Sullivan (GHD) Project Role: Land Use and Socio-Economic – Reviewer Years of Experience: 10
	Andrew Thomson Project Role: Mine Waste Alternatives Assessment – Lead Years of Experience: 15
	Dan Russell, P.Geo Project Role: Mine Waste Alternatives Assessment – Senior Reviewer Years of Experience: 25
	Sharon Guin, M.Sc., RPBio. Project Role: Human Health - Lead Years of Experience: 14
	Ruwan Jayasinghe, M.Sc., DABT, QPRA Project Role: Human Health – Senior Reviewer Years of Experience: 25
	Lindsay Furtado, M.Sc., RPBio. Project Role: Human Health – Environmental Risk Assessor Years of Experience: 11
	Chelsea Brecher, MES, EPt Project Role: Human Health (Country Foods) - Environmental Risk Assessor Years of Experience: 3
	Kelly Johnson, Ph.D. Project Role: Human Health (Country Foods) - Senior Reviewer Years of Experience: 25
Information Management	**Paul McDowell** Project Role: Geographic Information System (GIS) Lead Years of Experience: 26

EIS Component	Personnel
Visual Aesthetics	**Vijanti Ramlogan Murphy** Project Role: Visual Aesthetics Impacts – Lead Years of Experience: 22
	Paul McDowell Project Role: Visual Aesthetics Impacts – Lead Years of Experience: 20
	Alexandra Brossard Project Role: Visual Aesthetics Impacts – Support Years of Experience: 2
Indigenous and Public Consultation	**Elize Becker** Project Role: Indigenous and Public Consultation – Senior Reviewer Years of Experience: 14
	Vijanti Ramlogan Murphy Project Role: Indigenous and Public Consultation Lead Years of Experience: 22
	Alexandra Brossard Project Role: Indigenous and Public Engagement - Support Years of Experience: 2
Project-Specific Studies	**Gillian Allen Zazula (Okane)** Project Role: Closure Plan – Lead Years of Experience: 14
	Aynsley Neufeld, P.Eng., (ON, BC), M.Eng. Project Role: Best Available Control Technology (BACT) Study – Decarbonization Lead Years of Experience: 15
	Russell Polack, M.Sc., H.B.Sc. Project Role: Best Available Control Technology (BACT) Study – Senior Reviewer Years of Experience: 15

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Kami

Kamistiatusset
Mining
Project

2. Project Description

Chapter 2, Project Description, of the Environmental Impact Statement (EIS) presents the proposed Kami Mining Project (the Project), including information on the setting, design, schedule, components, and activities. The purpose of this chapter is to provide the Project details necessary to support the assessment of potential effects on components and attributes of the atmospheric, aquatic, terrestrial, and social environments. This chapter meets the requirements of the EIS Guidelines issued on December 19, 2024, by the Newfoundland and Labrador Department of Environment and Climate Change.

The conceptual Project design information provided in this chapter has been informed by the completion of a Pre-feasibility Study (Champion 2024). The Pre-feasibility Study design improved upon the previous design of the Project by fulfilling conditions of the previous EIS release and integrating feedback received through consultation on the Project. Through the continued planning and design of the Project. Additional technical studies and analyses are planned based on the recommendations of the Pre-feasibility Study, and the design of the Project may be subject to further refinements through the planned Feasibility Study to reflect the results of those studies and analyses. Section 2.6 highlights the changes to the Project since originally proposed in the Project Registration, and Section 2.11 describes Champion Iron Ltd. (Champion's) approach to managing Project optimizations and refinements post submission of the EIS.

2.1 Project Overview

The proposed Project would include an open pit mine and surface infrastructure to support the extraction of iron ore from the Kami deposit and the production of high-purity iron ore concentrate. The Project includes construction, operation, and closure of the following components:

- an open pit (referred to as the Rose Pit)
- ore processing infrastructure, including conveyors and transfer stations, stockpiles, the process plant, and load-out facilities
- waste management infrastructure, including an overburden stockpile, mine rock stockpile, and tailings management facility (TMF)
- water management infrastructure that will collect, convey, store, treat, and discharge contact and non-contact water, including dams, dikes, and collection ponds
- supporting infrastructure, including site roads, workforce accommodations, a mine service area, fresh water pumping stations, fuel storage, an emulsion and explosion production plant and explosive storage, a crushing plant, transmission lines for local site distribution, and telecommunication services
- transportation corridors, including access roads and a railway corridor that includes a spur line to connect the mine site to the Québec North Shore & Labrador (QNS&L) Railway

All mining and processing operations will take place within Newfoundland and Labrador provincial boundaries. All Project components will be constructed, operated, and closed in accordance with governing federal, provincial, and municipal regulations, as well as industry regulations and standards. A detailed description of Project components and activities are provided in Section 2.6 and Section 2.7.

2.2 Geographic Setting

The proposed Project area is situated on the western border of Labrador, approximately 7 km southwest of the Town of Wabush and 5 km northeast of the Town of Fermont, Québec. The area surrounding the Project is heavily industrialized with several existing mining operations, including Tacora's Scully Mine (approximately 6 km north), Rio Tinto's Iron Ore Company of Canada Mine (approximately 20 km north), Champion's Bloom Lake Mine (approximately 14 km west), and ArcelorMittal's Mont-Wright mine (approximately 20 km west) located within the general vicinity of the Project. No Indigenous communities are present within close proximity to the Project (i.e., within 200 km), and there are no treaties or settled land claims overlapping the Project area. However, the Project is located within the asserted traditional territory of five Indigenous groups: Innu Takuaikan Uashat mak Mani-Utenam, La Nation Innu Matimekush-Lac John, Innu Nation, Naskapi Nation of Kawawachikamach, and NunatuKavut Community Council. Identifying members of each group may live within the local municipalities of Wabush, Fermont, and Labrador City, which surround the Project.

The Project site is underlain by folded, metamorphosed sequences of the Ferriman Group and includes (from oldest to youngest): Denault (Duley) Formation dolomitic marble (*reefal carbonate*) and Wishart Formation quartzite (sandstone) as the footwall to the Sokoman Formation. The Sokoman Formation includes iron oxide, iron carbonate, and iron silicate facies; it also hosts iron oxide deposits. The overlying Menihek Formation resulted from clastic pelitic sediments derived from emerging highlands into a deep-sea basin and marks the end of the chemical sedimentation of the Sokoman Formation.

The climate in the region of the Project is typical of sub-arctic climatic conditions characterized by climate composed of long, cold winters (average mid-winter temperature of -15°C) and short, cool summers (average mid-summer temperature of 17°C). Typically, winters are harsh, lasting approximately six to seven months with heavy snow from December through April. Freezing temperatures and snowfall persist from January to mid-April at the start of the year and from late October through December at the end of the year. Summers are generally cool and wet, with mean annual air temperature of -2.0°C and mean annual precipitation of 1,000 mm for the 2002 to 2022 period (Annex 2A: Surface Water Baseline Report). The prevailing winds are from the west and have an average speed of 14 km/h, based on 30 years of records at the Wabush A station (Annex 1A: Ambient Air Quality Baseline Report).

The Project is located in the Lake Plateau division of the James Bay region, which is part of the Canadian Shield Physiographic Region (Bostock 1970), and the broader regional area is located within the Boreal Shield ecozone. At a local level, the Project falls within the Wabush eco-district. This eco-district covers a small portion of western Labrador (1,339 km^2 or 0.5% of Labrador's landmass) with elevations ranging from 524 to 904 m (mean 631 m). Due to a short growing season, frequent forest fires, and acidic soils, the area is primarily composed of several adaptable tree species such as black spruce (*Picea mariana*) and balsam fir (*Abies balsamea*) stands on lower hillslopes, while upper hillslopes are dominated by open black spruce stands interspersed with white spruce (*Picea glauca*) and birch (*Betula spp.*). There are numerous lakes, ponds, rivers, streams, and wetlands (bogs, fens, swamps, and marshes) found in the lowlands. Drainage across the Project area is generally directed north and east through a series of wetlands, lakes, and connecting streams that form part of the headwaters of the Churchill River watershed. The Project site intersects with the Pike Lake South, Rose Lake, Mills Lake, Waldorf River, and Duley Lake watersheds.

The wildlife species present within the regional area of the proposed Project are typical of the Boreal Shield ecozone. Commonly harvested wildlife and plant species include snowshoe hare (*Lepus americanus*), porcupine (*Erethizon dorsatum*), partridge (*Erethizon dorsatum*), waterfowl, blueberries (*Vaccinium spp.*), and Labrador tea (*Rhododendron groenlandicum*). Large-bodied fish species captured or previously documented in waterbodies and watercourses surveyed in the area of the proposed Project are typical of northern temperate waterbodies and watercourses in Labrador; they include brook trout (*Salvelinus fontinalis*), lake trout (*Salvelinus namaycush*), northern pike (*Esox lucius*), lake whitefish (*Coregonus clupeaformis*), round whitefish (*Prosopium cylindraceum*), and ouananiche (*Salmo salar*). These fish species are commonly targeted by recreational anglers.

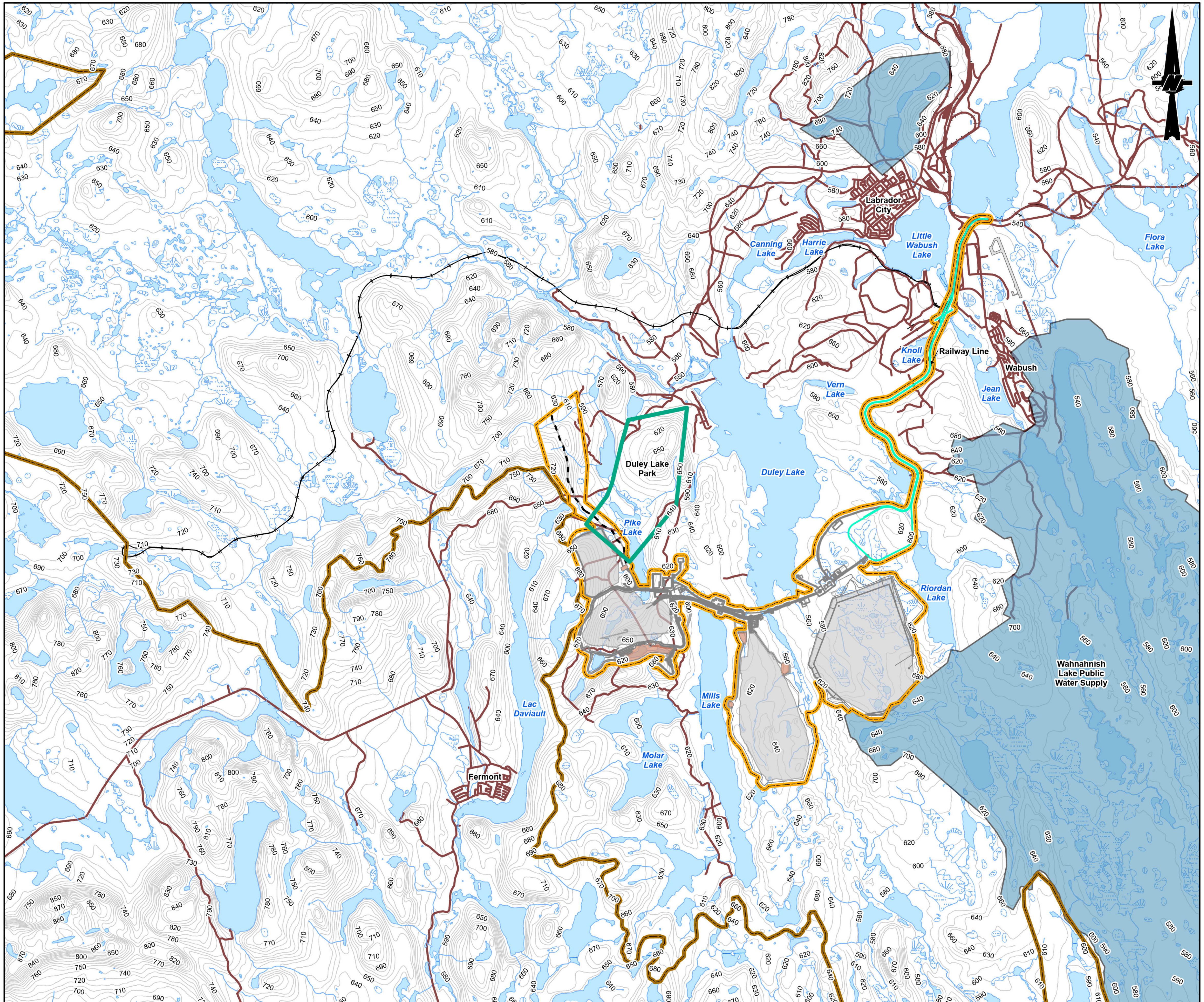
Duley Lake Provincial Park is located to the north of the proposed Project, with the southwest portion of the provincial park intersecting with the proposed Project site. There are several lakes that are either crossed by the Project or adjacent to the Project with established cabins and cabin owner associations, including Mills Lake, Duley Lake, and Riordan Lake. The proposed Project site also intersects with existing snowmobile trails that are maintained by the White Wolf Snowmobile Club, and the Tamarack Golf Course is located on the northern end of Duley Lake. It is also adjacent to the Wahnahnish Lake Public Water Supply Area.

The proposed Project is situated in the planning area boundaries of both Labrador City and Wab**us**h. Table 2-1 shows the planning area boundaries and relative zoning designations by town. Each zoning designation has permitted and discretionary land uses. Development standards are to be determined by each council.

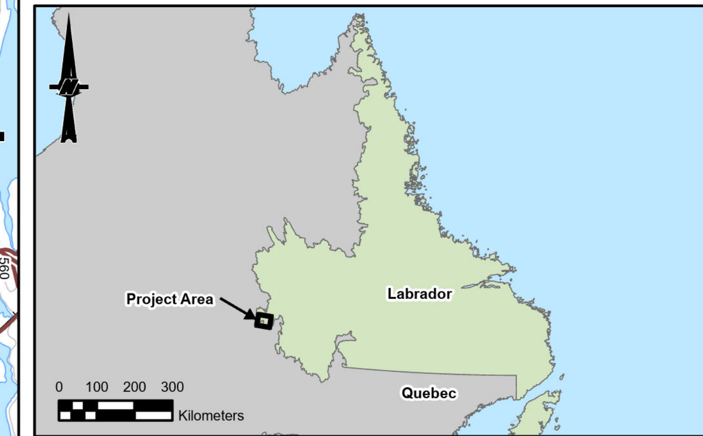
Table 2-1: Land Use Zoning within the Vicinity of the Project

Labrador City	Wabush
— Mineral workings — Mining reserve – rural — Open space	— Mineral workings — Cabin development — General industrial — Airport industrial — Conservation — Open space — Rural

Source: Town of Labrador City 2018; Town of Wabush 2018.



KEY MAP



SCALE 1:20,000,000

LEGEND

- Proposed Project Infrastructure (Linear)
- Potential Access Road
- Proposed Access Road and Railway Corridor
- Public Water Supply
- Duley Lake Park
- Labrador/Quebec Boundary
- Proposed Project Infrastructure
- Proposed Sedimentation Pond
- Site Study Area (SSA)

0 1 2 4
1:110,000 KILOMETRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

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

CLIENT
CHAMPION IRON MINES LTD.

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

TITLE
GEOGRAPHIC SETTING

CONSULTANT
Kami

YYYY-MM-DD	2025-06-30
DESIGNED	----
PREPARED	JMA/PJM
REVIEWED	JC
APPROVED	TS

PROJECT NO.	CONTROL	REV.	FIGURE
CA0038713.5261	0013	0	2-1

2.3 Known Existing Contaminated Sites

On February 25, 2025, Champion submitted an Application for Property Environmental Search to the Pollution and Prevention Division of the Department of Environment and Climate Change. On March 21, 2025, Champion received a letter that summarized the completed file review that was completed by the Pollution and Prevention Division, which included review of the Environmental Sites Registry and Environmental Site Files (Appendix 2A). The letter identified the following:

- Report: Record of Site Condition for the remote area 8 km southwest of Wabush, NL. as the source property for impacted site 8 km southwest of Wabush. Unconditional closure report signed on October 11, 2013.
- Report: Site Remediation and Confirmatory Soil Sampling Lantech Drilling Services Inc. Hydraulic Oil Spill Wabush, NL. Prepared by Stantec Consulting Ltd. for Maltman Group International, dated September 14, 2012.
- Letter - Stantec Consulting Ltd. to Maltman Group International – Re: Summary of Emergency Response & Limited Soil Remediation, Lantech Drilling Services Inc. Hydraulic Oil Spill, Wabush.

In the letter and reports provided by the Department of Pollution Prevention, it was identified that on November 23, 2011, a hydraulic oil cooler on a drill rig ruptured and released approximately 100 to 120 litres of hydraulic oil onto the surface and surrounding snow/ice covered ground. An oil-stained area measuring approximately 2 m by 4 m was observed, extending down-gradient of the point of release following the spill. Emergency response and remediation efforts were enacted, and from November 23, 2011, to April 24, 2012, a total of approximately 35 tonnes of snow, ice, soil, oily water and absorbent materials were excavated and recovered from the site. Analytical results of confirmatory soil samples collected from the final limits of the remedial excavation indicated that concentrations of petroleum hydrocarbons (i.e., benzene, toluene, ethylbenzene and xylene [BTEX]) and total petroleum hydrocarbons that exceed federal guidelines did not exceed ecological-based federal guidelines levels.

2.4 Land Holdings, Mineral Lease, and Surface Lease

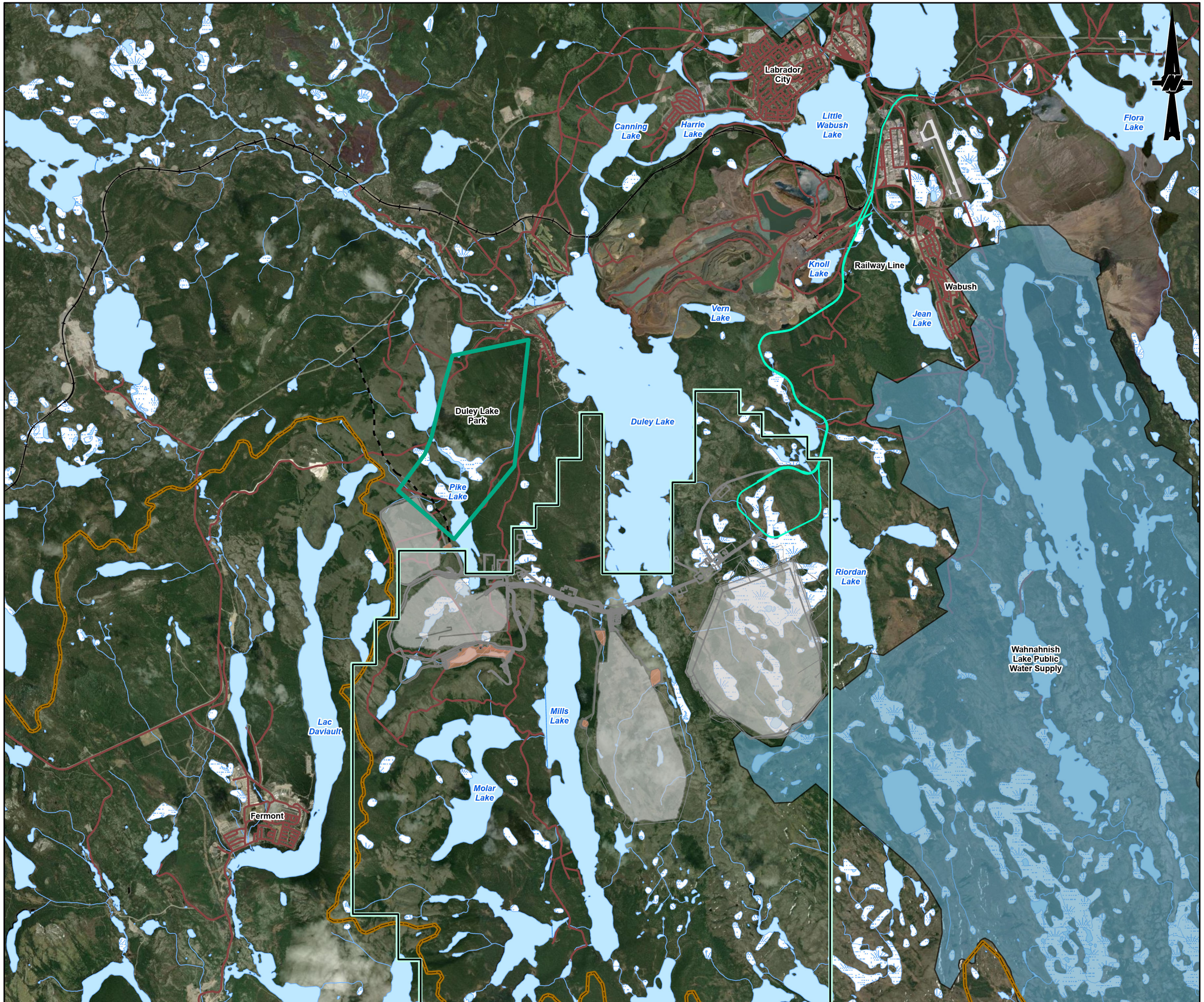
Champion's land holdings consist of four contiguous licences (015980M, 017926M, 034335M, and 036147M) totalling 283 claim units covering 11,175 ha (Table 2-2). The land holdings are partially marked as registered to Kami General Partner Limited and partially to Champion Iron Mines Limited. The claims and lease registered to Kami Iron Mine Partnership are currently held by 12364042 CANADA INC., which, like Kami Partner Inc., is a wholly owned subsidiary of Champion Iron Limited. These lands are all Crown lands, and their surface rights are held by the provincial government. The mining lease forms one block and spans an area that extends approximately 10.5 km east-west and 13.5 km north-south in National Topographic System map areas 23B/14 and 15 and is centred at approximately 52°49'N latitude and 66°59'W longitude. The property's perimeter is contiguous to Wabush Mine's mining lease (Lot #2 South) to the northeast, while the mining lease is 6 km from the boundary. The property land holdings are summarized in Table 2-2.

Table 2-2: Project Licences

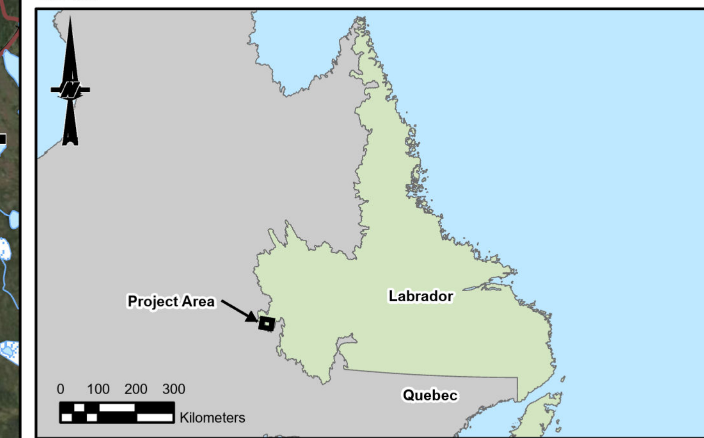
Licence	Claims	Area (ha)	National Topographic System Areas	Issuance Date	Renewal Date
015980M	191	4,775	23B14, 23B15	December 29, 2004	December 29, 2024
017926M	92	2,300	23B15	August 30, 2010	September 1, 2025
034335M	5	125	23B15	April 24, 2022	April 24, 2027
036147M	159	3,975	23B14, 23B15	June 18, 2023	June 18, 2028
Total	447	11,175	n/a	n/a	n/a

Notes:
ha = hectare; n/a = not applicable.

On February 17, 2014, Mining Lease #234 (15980M) and Surface Lease #142 were issued by the Newfoundland and Labrador Department of Natural Resources. The mining lease for mineral development and the surface lease covers the entire footprint of the proposed Project and related infrastructure. The mining lease gives Champion the exclusive rights to develop the mineral resource underlying the Project. The surface lease provides Champion with the surface rights covering the area of the mining lease and areas for siting the required infrastructure incidental to the development of the mine. The mining lease and surface lease, together referred to as the Project limits, are presented in Figure 2-2. Champion will engage with applicable government departments to discuss updating the surface lease for the Project to reflect the optimization of the Project for components currently outside of the surface lease such as the railway and access roads.



KEY MAP



SCALE 1:20,000,000

LEGEND

- Proposed Project Infrastructure (Linear)
- Potential Access Road
- Proposed Access Road and Railway Corridor
- Existing Railway
- River/Stream
- Kami Surface Lease Limit
- Waterbody
- Bog/Wetland
- Public Water Supply
- Duley Lake Park
- Labrador/Quebec Boundary
- Proposed Project Infrastructure
- Proposed Sedimentation Pond

0 0.75 1.5 3
1:85,000 KILOMETRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

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

CLIENT
CHAMPION IRON MINES LTD.

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

TITLE
KAMI PROJECT LIMITS

CONSULTANT
Kami

YYYY-MM-DD	2025-06-30
DESIGNED	----
PREPARED	JMA/PJM
REVIEWED	JC
APPROVED	TS

PROJECT NO.	CONTROL	REV.	FIGURE
CA0038713.5261	0013	0	2-2

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

2.5 Project Schedule and Phases

Champion has developed a schedule outlining the duration and timing of the Project stages, phases, and periods:

- Permitting and approvals stage
- Construction, Operation, and Decommissioning and Reclamation (Closure) phases
- Post-Closure period

The proposed schedule is presented in Table 2-3. Additional details on the Construction, Operations, and Closure phases activity sequencing and scheduling are presented in Section 2.9.

The duration of the permitting and approvals stage is a tentative estimate based upon Champion's current understanding of the federal and provincial approvals and permitting processes for the Project.

In November 2024, NL Hydro and the Government of Canada announced the plans to initiate and fund the Labrador West Transmission Study (Government of Canada 2024), which explores the feasibility of an expansion of the transmission system into Labrador West from Churchill Falls and the potential economic impact of future development. Of principal consideration in this transmission study is the development of a 735 kilovolt (kV) transmission line from Churchill Falls to the Flora Lake substation east of Wabush. The Project is dependent on the construction of this 735 kV transmission line as well as the subsequent 315 kV transmission line from the Flora Lake substation to the Project site to enable the operation of the Project. Delay to the construction and operation of the 735 kV transmission line from Churchill Falls to Flora Lake and/or the 315 kV transmission line from Flora Lake to the Project site would result in a delay to the construction start date. Therefore, the start date for the Construction phase has not been determined. The Project Construction, Operations and Maintenance, and Closure phases are anticipated to span approximately 40 years (Table 2-3). The Construction phase is anticipated to last four years. The Operations and Maintenance phase is 26 years, and it includes one year of ramp-up, referred to as pre-development mining.

Closure is from the end of active mining operations to the start of the Post-Closure period. The Post-Closure period was defined based on Section 17.7 of the *Rehabilitation and Closure Plan Guidance Document* from the Government of Newfoundland and Labrador's Mineral Development Division, which states that "the post closure monitoring period will begin when the flooding of the mined-out pits is complete, and the site has reached equilibrium." Equilibrium in this context refers to the state in which monitored physical or chemical constituents have no further tendency to change with time. It is currently assumed that pit flooding and equilibrium will take 10 years to complete from the initiation of the Closure phase. Monitoring of dams, specifically the TMF dam, is required for 50 years (Rehabilitation and Closure Plan Guidance Document, Section 17.7 h) following the completion of the Operations and Maintenance phase. Therefore, the Post-Closure period is currently estimated to extend for another 40 years following the Closure phase. At this time, the length of Project phases and the Post-Closure period are an estimate based on pre-feasibility study design detail, which will be refined as the design process progresses.

Table 2-3: Project Schedule

Schedule Stage, Phase or Period	Description	Duration
Permitting and approvals stage	The permitting and approvals stage includes release from the provincial EA process from the Government of NL and receipt of permits from applicable provincial and federal regulatory agencies.	3 years
Construction phase (referred to as Construction)	Includes site preparation; mine, process plant and site infrastructure development; and commissioning the structures, systems, and components.	4 years
Operations and Maintenance phase (referred to as Operations)	Includes the mining and milling of iron ore, production and shipment of iron ore concentrate, tailings management, management of mine rock, waste management, water management, release of treated effluent, site maintenance and transportation of staff and materials to and from the site. Operations includes one year of pre-development mining (i.e., ramp-up).	26 years
Decommissioning and Rehabilitation phase (referred to as Closure)	Includes accelerated flooding of the Rose Pit, re-establishment of passive surface water drainage following the pit-flooding period, recontouring and revegetating disturbed areas. Physical infrastructure that is not required during post-closure monitoring and for other activities required to achieve the Project's decommissioning criteria and to return the Project site to a safe and stable condition will be removed.	10 years

Schedule Stage, Phase or Period	Description	Duration
Post-Closure period	The transition from Closure to Post-Closure involves ongoing dam safety monitoring, water treatment, and environmental monitoring to verify that water quality is achievable for passive discharge and decommissioning criteria have been met. The length of the Post-Closure period could be further refined through the completion of additional analysis as part of the Feasibility Study.	40 years

Notes:

EA = Environmental Assessment; NL = Newfoundland and Labrador.

2.6 Project Design Considerations

This section presents Champion's overall design objectives as well as environmental features and considerations that were incorporated into the design of the Project.

2.6.1 Philosophy and Design Objectives

Champion's philosophy through the redesign of the Project was to reduce the level of uncertainty and incorporate input received through engagement with the objectives of improving design confidence, environmental performance, and social acceptability to achieve a sustainable and responsible approach to mining. Champion identified areas of uncertainty through a detailed review and analysis of the previous pre-feasibility studies, feasibility studies, and EIS of the previous owner (Alderon 2012, 2018), and considered the recommendations for future studies, mitigation measures, commitments, and conditions of the previous Environmental Assessment (EA) release. Champion has also reviewed the issues and concerns previously raised through the EIS and has been engaging with Indigenous groups and local stakeholders since the acquisition of the Project to validate whether previously raised issues and concerns about the Project remained and if new issues or concerns were identified. Operational experience gained from resuming mining operation of the Bloom Lake Project are also included within the redesign of the Project.

Following the completion the detailed analysis of previous studies and engagement, Champion identified the following as the components of the Project where design improvements would be most beneficial:

- hydrogeological and hydrological environment
- water management approach, due to level of uncertainty in hydrogeological and hydrological environment
- waste management approach, including tailings and mine rock management

These areas of uncertainty associated with the Project are also reflected in the conditions of release of the previous EIS. For example, the Canadian Environmental Assessment Agency Comprehensive Study Report (CEA Agency 2013) recommended updating and refining the hydrogeological model to better understand the existing hydrogeological environment and to better predict and mitigate potential effects.

Table 2-4 summarizes the areas of uncertainty, recommendations, commitments, or conditions presented in the EIS release, issues and concerns raised through engagement and Champion's approach to addressing these uncertainties, issues or concerns and the changes to the Project design as an outcome of this approach.

Area of Uncertainty	Recommendation, Commitment, or EIS Condition	Approach to Addressing Uncertainty and Recommendation, Commitment, or EIS Condition	Design Outcome
Hydrogeological and hydrological environment Water management	Continue field work and analyses to update and refine the current model of the existing hydrogeological environment around the proposed open pit, and the potential impacts of the open pit development. Present the results of the advanced hydrogeological work for review by regulators.	Champion completed a desktop review of Project data, undertook new site investigations, and developed an updated conceptual hydrogeological model, including updated hydraulic conductivity estimates. The investigations and updated model provide a better understanding of the hydrogeological conditions at the site, and effects of the Project to groundwater and surface water resources.	The analysis generated updated dewatering estimates, which were used to inform site water management infrastructure capacity requirements, resulting in an updated water management infrastructure design. Water management infrastructure is described in Section 2.8.6.
	Refine and update hydraulic conductivity estimates when additional investigation of soil and bedrock hydraulic properties is carried out during the detailed engineering and design phase of the Project.		
	Undertake long-term pumping tests when site access is approved to assess the role and impact of geological features such as faults and fractures. Update the 3D numerical groundwater flow model for the Project to include data from pumping tests that focus on dewatering of the open pit prior to and during operation.	Following the update to the conceptual model, pumping tests are planned as part of Champion's 2024/2025 field campaign.	The results of the 2024/2025 hydrogeological site investigation will be incorporated into a 3D numerical groundwater flow model to refine dewatering predictions and optimize water management infrastructure capacity requirements and design.
Water management Waste management	Confirm EA predictions related to acid rock drainage by basing future characterization of waste rock (i.e., mine rock) acid-generating potential on the results of direct measurement of total carbonate and sulphide content.	Champion undertook an updated geochemical characterization study to characterize metal leaching/acid rock drainage risk of units identified as future mine rock, building from the previously completed study for the previous EIS. Additional samples were also analyzed for static and kinetic testing.	Additional water management infrastructure has been designed and is proposed to manage contact water on site. The approach to mine rock blending was modified to further reduce risk of metal leaching and acid rock drainage. Waste management infrastructure is described in Section 2.8.3.
	Conduct humidity cell and batch cell tests to confirm drainage interaction within the waste rock disposal areas.	Champion is currently completing humidity cell testing, shake-flask extraction, and X-ray diffraction analysis on additional units identified as future mine rock. Results from these analyses are not yet available for integration into the EIS.	Humidity cell and batch cell tests will further inform Champion's waste management approach and waste management plan.

Area of Uncertainty	Recommendation, Commitment, or EIS Condition	Approach to Addressing Uncertainty and Recommendation, Commitment, or EIS Condition	Design Outcome
Not applicable	Ongoing engagement with Indigenous communities and organizations. Engage in ongoing discussions with the Towns of Labrador City and Wabush.	Champion has engaged with Indigenous groups and local stakeholders since the acquisition of the Project in 2021.	Several changes to the design have been updated to address concerns raised by Indigenous groups and local stakeholders. This includes, but is not limited to: – environmental design features to reduce effects on air quality – modifications to the access roads to reduce sensory disturbance

Note:
EIS= Environmental Impact Statement; 3D = three dimensional; EA = Environmental Assessment.

2.6.2 Site Study Area

To establish the assessment boundaries for the EIS, spatial boundaries were defined to outline the geographical extent to which the Valued Environmental Components (VECs) are studied. As further described in **Chapter 4, Effects Assessment Methodology**, the Project Site Study Area (SSA) was defined to include the Project components and buffer area, and the local study area (LSA) and a regional study area (RSA) were defined to consider effects of the Project at the local or regional scale. The SSA boundaries are shown in Figure 2-3.

Specifically, the SSA was defined to include all infrastructure required for the Kami Mining Project, including access roads and rail connections, and a buffer was included to address uncertainty for the final design. The SSA was constrained to certain features, including major lakes, the Quebec-Labrador provincial border and sensitive features, like the Wahnahnish Lake Protected Public Water Supply Area.

The SSA has a total area of 4, 370 ha, which includes more lands than required for the Project. In fact, the SSA is twice as large as the anticipated Kami Mining Project infrastructure. For example, a larger area has been included along the west access road which connects to the Trans Labrador Highway, providing an opportunity to select the access road alignment based on environmental and design requirements. It is important to note that portions of the SSA will not be utilized as part of the final design. The intent is to provide flexibility for the future design phase, by having a larger buffer to accommodate for design changes or project optimizations (Section 2.12).

2.6.3 Environmental Considerations

2.6.3.1 Climate

Monthly hydrologic parameters, including temperature, precipitation, and wind speed, were calculated based on historical data from the nearby Environment Canada weather station "WABUSH LAKE A" (Environment Canada 2023). These parameters were used to calculate evaporation and evapotranspiration, which were essential for determining the Project's water balance. The annual water balance describes the flow of water into and out of a system and allows us to understand the behaviour of hydraulic structures such as storages and pumps, to manage the flow of water in a year with normal precipitation.

Hydrology parameters from Wabush Lake A station were also instrumental in calculating long-term rain-on-snow events of various durations and return period (TSD I: Tailings Management Facility Pre-Feasibility Level Design Report). These rain-on-snow events were necessary for verifying the capacity and sizing the TMF and site water infrastructure, including site water collection basins and ponds and the pumping rates between basins, ponds, and the water treatment plant (WTP).

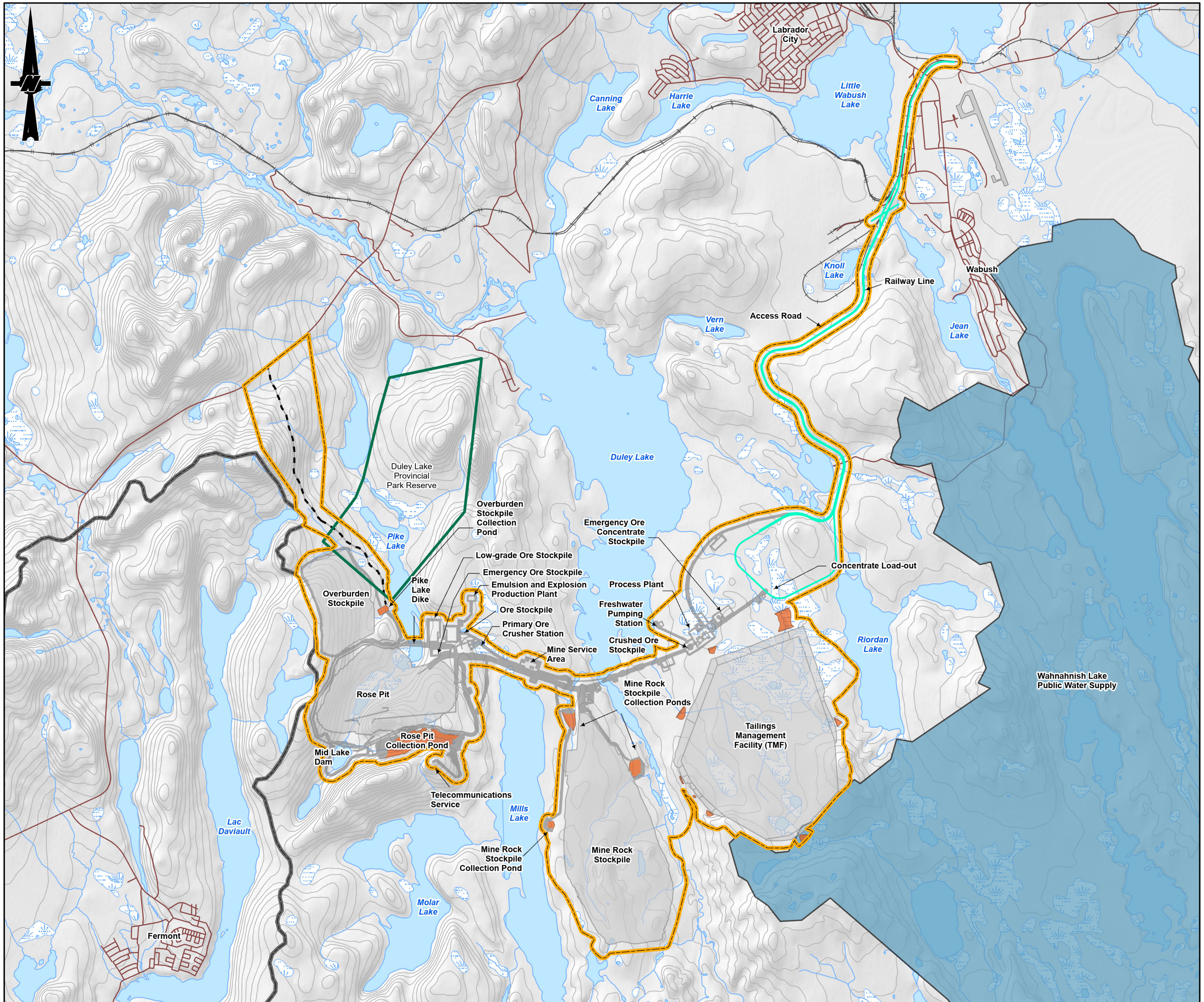
2.6.3.2 Climate Change

Observations of various climate variables since the mid-19th century, using direct measurements, satellites, and other platforms, as well as climate reconstructions and model simulations, have demonstrated variability and changes in the climate system. Atmospheric and oceanic temperatures are rising, snow and ice quantities are decreasing, sea levels are increasing, and greenhouse gas (GHG) concentrations are also rising (IPCC 2013).

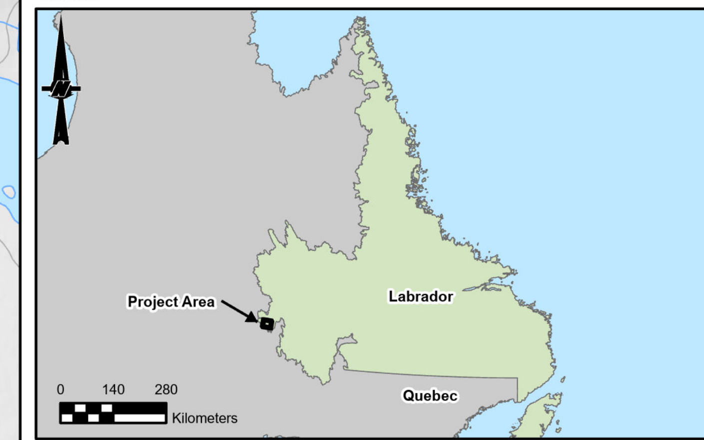
Canada has experienced warming at approximately twice the global average (1.0°C) over the past century, with higher rates observed in northern regions (Lulham et al. 2023). Future climate projections indicate that air temperatures will continue to rise throughout the current century (CRA 2015).

In the Atlantic region of Canada, the annual temperature has increased by 0.7°C, primarily during the summer season, while annual precipitation has increased by 11% (Dietz and Arnold 2021). In Newfoundland and Labrador, air temperature increases are expected to be most pronounced in winter, with smaller increases in summer and autumn (CRA 2015). One consequence of climate change in Newfoundland and Labrador is the anticipated increase in annual stream flows, which will affect the frequency and magnitude of floods caused by events such as rain combined with snowmelt and ice jams.

To account for the effects of climate change, the sizing of water management infrastructure (i.e., the TMF, water collection basins, and ponds) for the Project were developed considering the increase in design rainfall. Intensity-Duration-Frequency curves for future climate conditions were obtained from the report "Intensity-Duration-Frequency Curve Update for Newfoundland and Labrador" issued by the Government of Newfoundland and Labrador (CRA 2015). The Intensity-Duration-Frequency curves were generated using the Changing Climate tool (IDF_CC), developed at Western University. A statistical modelling approach was employed to calculate the IDF curves. Future climate Intensity-Duration-Frequency curve projections were based on the representative concentration pathway 4.5 scenario (an intermediate GHG mitigation scenario) developed by the Intergovernmental Panel on Climate Change in Assessment Report 5 (IPCC 2014). Hydrologic modelling for the Project is based on the 2041-to-2070-time horizon.



KEY MAP



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Legend

PROJECT DATA
- Proposed Project Infrastructure
- Proposed Sediment Pond
- Potential Access Road
- Proposed Access Road and Railway Corridor
- Site Study Area (SSA)

BASEMAP INFORMATION
- Road
- Railway
- Watercourse
- Contour
- Bog/Wetland
- Waterbody
- Duley Lake Park
- Labrador/Quebec Boundary
- Public Water Supply

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

CLIENT
CHAMPION IRON MINES LTD.

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

TITLE
SITE ASSESSMENT AREA

CONSULTANT

Kami

YYYY-MM-DD	2025-06-30
DESIGNED	----
PREPARED	MS
REVIEWED	JC
APPROVED	TS

PROJECT NO.	CONTROL	REV.	FIGURE
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25mm

2.6.3.3 Geochemical

To meet conditions of the previous EA release and improve understanding of water quality risks associated with the Project, Champion is actively conducting a geochemical characterization program to assess the metal leaching and acid rock drainage (ML/ARD) risks associated with future mine rock during the Operations phase of the Project. This program aligns with updated best practice guidelines and involves additional geochemical sampling and analysis of existing core samples.

The Phase I report (Okane 2024a) evaluated the availability of sufficient neutralization potential (NP) to counteract potential acidity. Following Price (2009) guidelines, a neutralization potential ratio (NPR) greater than 2 indicates sufficient NP to classify mine rock as non-potentially acid generating (NPAG), while less than 1 is considered potentially acid generating (PAG). An NPR between 1 and 2 is classified as Uncertain. The current geochemical sampling and analysis build upon previous characterization work (WorleyParsons 2014; Stantec 2013). Phase I of the current geochemical sampling plan involved statistical comparisons of static test results, including acid-base accounting and whole rock analysis, from the latest samples collected compared to previous geochemical characterization tests. Phase I results are generally consistent with analyses from 2013, though statistically significant differences were observed between the distribution of NPAG samples, indicating potential differences in total carbon measurements and carbonate buffering potential between datasets, likely due to the presence of graphite primarily associated with the Menihek graphitic schist lithology. While PAG samples were present in all mine rock units except for the Denault Formation, the Menihek Formation was the only formation that is characterized overall as PAG.

After accounting for NPAG mine rock required for the TMF dam embankment, the remaining rock in the mine rock stockpile has average and median NPR values of 5.0 and 7.2, respectively, indicating adequate NP to neutralize potential acidity from sulphide oxidation (Okane 2024a). To assist the buffering materials to neutralize acidity generated (i.e., that buffering minerals are physically present where potential acid is generated), Champion will crush and blend mine rock stored in the mine rock stockpile using the in-pit crusher and conveyor (IPCC). Following the Phase I geochemical characterization report, Mineralis Services-Conseils Inc. was retained by Champion to develop an acid-base accounting block model, which was then used by Champion and Okane to evaluate NPR over the planned mine life. Results showed that after considering the mine rock removal required for construction materials over the mine life, the weighted NPR is expected to be between 4.7 and 7.0 over the entire mine life; therefore, the blended management strategy is expected to be successful at maintaining neutral conditions throughout the mine rock stockpile, provided adequate blending is achieved.

Ore, iron ore concentrate, and tailings have been previously classified as NPAG with low metal-leaching potential based on static tests (Stantec 2013). Similar to mine rock, while the overburden contains some PAG mine rock samples, overburden is classified as NPAG with high NPR values (median of 13, and an NPR of 2 at the 5th percentile). Therefore, overburden is not a concern for acidic drainage.

The Phase II report (Okane 2024b) reported on additional static tests, including shake flask extraction (SFE), mineralogy (X-ray diffraction and scanning electron microscopy) and tailings supernatant chemistry received to date from both Okane and Stantec characterization studies. Though the Menihek Formation has been identified previously as the highest risk material for ML/ARD (Stantec 2013; Okane 2024a), all formations except for the Denault had some parameters in SFE leachate measured above water quality guidelines, though it is noted that all exceedances were measured in outlier samples. Leachate from SFE testing of mine rock contained concentrations of parameters that sometimes-exceeded Council of Ministers of the Environment (CCME) and *Metal and Diamond Mining Effluent Regulations* water quality guidelines, including Cd, Cr, Cu, F, Fe, Ni, NH_3, Se, U, and Zn. These are generally consistent with what had been identified by Stantec (2013), except for F and NH_3 which were not identified or measured previously (Stantec 2013). Correlations of metal(loid)s measured from SFE leachate compared to paste pH showed that higher concentrations of some metals (Cd, Cr, Cu, Ni, and Zn) occur at lower pH, while concentrations of other possible parameters of concern (As, Se, F, NH_3, and U) are still elevated under neutral pH conditions.

In the overburden, results from SFE leachate indicate multiple samples with concentrations of Fe, Se, NH_3 above Chronic Freshwater Aquatic Canadian CCME water quality guidelines, with some instances of As, Cd, Cr, Cu, Ni, U, and Zn also measured above CCME and *Metal and Diamond Mining Effluent Regulations* guidelines. Although SFE results are compared to CCME and *Metal and Diamond Mining Effluent Regulations* water quality guidelines to determine leachability of parameters of interest, these concentrations do not represent effluent quality expected in the field. Kinetic tests (such as humidity cell tests) are better indicators of metal leachability over time and their relationships to pH. Kinetic test results from Stantec (2013) are incorporated into development of source terms provided by Okane for the water balance water quality model work completed by Lorax Environmental Services Ltd. (TSD VI: Site-Wide Water Balance and Water Quality Modelling Report). Additionally, a blended humidity cell test, incorporating different geological formations with an average planned mine rock stockpile NPR, is ongoing to assess the influence of blending on maintaining neutral conditions and controlling metal release. Results from this blended kinetic test will be incorporated into the design of future mine plans as the Project progresses through successive stages of engineering.

Though ore and tailings have low risk of ML/ARD, some SFE samples also had some samples that exceeded CCME water quality guidelines for Fe, Cr, and NH_3, while F and NH_3 exceeded CCME guidelines in several supernatant samples. These parameters will continue to be monitored during the kinetic column testing ongoing for tailings.

In addition to the ML/ARD risk assessment, Okane tested 27 samples of mine rock, overburden, and tailings samples for naturally occurring radioactive materials (NORM) risks at Saskatchewan Research Council Environmental Analytical Laboratories. Samples were selected aiming to prioritize at least one sample from each mine rock formation with higher (greater than 75th percentile) sulphide content shown in acid-base accounting results, based on availability of samples after geochemical characterization tests were complete, as some correlation was observed between SO_4 and U in SFE results. Findings were that weighted median NORM results for each mine rock formation had no individual radionuclide exceedances in Table 5.1 of the Canadian Guidelines for the Management of NORM (Government of Canada 2013). However, using the weighted median of NORM results, the sum of ratios is exceeded in both the Menihek and Sokoman formations, which result in the final mine rock stockpile sum of ratios equalling 1.1, which exceeds the sum of ratios guideline of 1 indicated in Table 5.1 of the Canadian Guidelines for the Management of NORM. Due to the low number of samples overall and biasing of sample collection to be sure some of the “worst” samples (i.e., higher SO_4 associated with higher U) were analyzed, it’s possible that these results are not representative of the NORM risk as a whole. Additional NORM testing of samples from the Menihek and Sokoman formations are planned as part of the ongoing geochemical commitment to further characterize NORM risk and inform the waste management strategy for Project operations.

2.6.3.4 Geotechnical

Building on the field investigations completed by the previous owner, Champion conducted field investigations within the proposed TMF and location of water management infrastructure to advance understanding of subsurface conditions and inform geotechnical design requirements.

According to the Seismic Hazard Map of Canada (Geological Survey of Canada), the property area is located in a relatively low seismic hazard region, known as the stable central region. Regional faults have been observed or inferred in the open pit area that is west of the TMF, but not within the proposed TMF area.

The subsurface stratigraphy within the TMF is generally consistent with a thin layer of topsoil/rootmat/organics. Low-lying areas, predominantly located in the middle of the TMF, have a layer of peat on surface. The topsoil/peat is typically underlain by a layer of loose to compact sandy silt to silty sand before encountering a layer of dense to very dense sandy silt to silty sand (till). Cobbles and boulders encountered generally increased with depth in the loose to compact silty sand layer and the dense to very dense silty sand (till). Bedrock, predominantly metamorphic in origin, is encountered near to surface at the elevated bedrock knobs around the southeast and southwest regions of the TMF and dips down considerably deeper (i.e., typically greater than 20 m), in the low-lying valleys. The groundwater table across the TMF site is shallow, with measured water table depths ranging from the ground surface to approximately 9 m below the ground surface. Artesian conditions were found at a few locations.

Prior to the completion of the EIS, site investigations have been completed only within the area of the TMF, and no field investigations have been conducted for remaining water management infrastructure. Stantec completed field investigations in 2010 and 2011 within the areas of the proposed water management infrastructure but only the 2011 campaign provided information on the overburden. Conservative assumptions based on these data were used for the design. Based on information from these campaigns, soils generally consist of the following within the areas of the proposed overburden stockpile, mine rock stockpile, and Rose Pit:

- organic soils
- loose to compact sandy silt to silty sand with gravel
- dense to very dense sandy silt to silty sand with gravel (till); occasionally, a loose to compact layer was noted more in depth; cobbles and boulders were encountered in this layer
- overburden thickness ranges approximately from less than 1 to 60 m; thicker overburden areas are generally associated with topographic depressions, such as in the Rose Lake/Pike Lake location, whereas a surface bedrock is found on topographic heights

Additional field investigations have been carried out in the alignment of major water management infrastructures in winter 2024 and are currently ongoing. At the conclusion of the 2024 campaigns, 20 boreholes will have been drilled in the proposed alignment of proposed water management infrastructure. These investigations will provide a better assessment of the soil and bedrock conditions for the water management infrastructures, and optimizations to the current design will be made based on the new field data.

2.6.3.5 Hydrogeological

Champion completed a desktop review of Project data and work completed by the previous owner and also undertook new site investigations and developed an updated conceptual hydrogeological model, including updated hydraulic conductivity estimates, which fulfilled conditions of the previous EA release (Table 2-4). The investigations and updated model provide a better understanding of the existing hydrogeological conditions around the proposed open pit as well as the potential effects of the open pit development. Additional details on the updated hydrogeological model can be found in TSD V: Hydrogeology Modelling Report.

Based on the borehole information, the bedrock in the eastern part of the Rose Pit is of good quality, while that in the western part is of good to poor quality. The most considerable area of weathering was noted in the western part of the pit within the Wishart and the Sokoman formations, where the bedrock appeared to be weathered to poorly consolidated sand. The intense fracturing and alteration of this area is linked to the presence of a major fault interpreted on a regional scale and formed by the contact between the Katsao and Wishart formations.

This fault zone was represented in the hydrogeological model as a zone of higher permeability that could be a preferential flow path. The proximity of surrounding lakes could lead to considerable dewatering flow rates and potential drying up of the lakes, without sufficient mitigation measures in place.

During the fall of 2023, hydrogeological and geotechnical field campaigns were simultaneously completed to characterize the hydraulic conductivity of the fracture zones present in the Rose Pit area. Based on the field information available at this point and the hydrogeological modelling completed, a conservative expected dewatering rate of 40,000 m^3/d has been defined for the purpose of water management infrastructure design at a prefeasibility level.

Champion is planning to undertake additional hydrogeological site investigations, including the completion of long-term pumping tests to better estimate bedrock parameters at a larger scale and confirm conceptual hypotheses, such as the continuity of the faults and their hydraulic connection to the lakes surrounding the Project. The results of hydrogeological site investigation will be incorporated into a 3D numerical groundwater flow model to refine dewatering predictions.

Additional information on hydrogeological conditions in the area of the Project can be found in **Chapter 7, Groundwater**.

2.6.3.6 Hydrological

The proposed Project would be situated within the existing Rose Pond, south of Pike Lake within the Churchill River watershed headwaters. The drainage pattern within the vicinity of the Project is directed north and east through a network of watercourses, lakes and wetlands that are part of the Churchill River watershed headwaters (Figure 2-1). The west portion of the proposed Project site drains into Pike Lake, which then is collected by several lakes and streams connected to the Walsh River and discharging into Duley Lake from the north. The south portion of the proposed Project site follows an in-line lake pattern in the following order: Molar Lake, Mills Lake, and Duley Lake. The Waldorf River and several streams from the south and southeast drain into Duley Lake. One of these streams in the east connects Riordan Lake into Duley Lake. Finally, Duley Lake drains into Canning Lake and northwest into Harrie Lake.

To improve Champion's understanding of hydrological conditions, a hydrological baseline characterization study of the Project and regional areas was completed to understand the variability of water levels and flows for local and regional lakes and streams (Annex 2A: Surface Water Baseline Report). This study was conducted to collect information on the surface water quality and quantity to characterize the baseline conditions in the watersheds within the Project site. The hydrological assessment included the following:

- review of previous hydrological baseline studies and assessments
- climate and precipitation review (Wabush Lake Airport)
- water column profiling (six lakes in 2023 [August and October] and 2024 [June and August], as well as at select locations in 2023 [June] and 2024 [March])
- water level and stream flow monitoring (6 lakes and 12 watercourse stations)
- water and sediment quality sampling at 25 stream and lake sampling stations, in 2023 (June, August, and October) and 2024 (March, June and August)

In addition to the hydrological baseline study, bathymetric mapping was completed for targeted lakes within the vicinity of the Project (Annex 2B: Fish and Fish Habitat Baseline Report). Understanding of hydrological conditions is necessary to support the proposed Project design and EIS, including site water balance and hydrological modelling that was undertaken to predict potential effects of proposed Project water withdrawals, diversions, and discharges on local and regional waterbodies.

Additional information on hydrological conditions in the area of the Project can be found in **Chapter 8, Surface Water**.

2.7 Changes to the Project Since It Was Proposed in Project Registration

Champion is continuing to refine and optimize the Project to reduce adverse effects and operational risks, maximize benefits, fulfill EIS commitments and EA conditions of release from the previous owner, and incorporate feedback received through engagement with local stakeholders and Indigenous groups. The following changes have been made to the proposed Project since submission of the Project Registration in May 2024:

- The Rose Pit has been redesigned to improve pit wall stability, enhance ore production, and reduce the amount of mine rock generated.
- The design of the overburden stockpile has been updated to increase storage capacity.
- The design of the mine rock stockpile has been updated to reduce the slope of the stockpile to meet closure objectives for rehabilitation.
- The alignment of the western access road has been changed to reflect feedback from local cabin owners and stakeholders.
- The alignments of the eastern access road and railway have been updated to avoid the Wahnahnish Lake Public Water Supply Area.
- The water management approach has been updated to reduce the number of discharges and improve overall environmental performance during all Project phases.
- Sources of potable water and approach to sewage management have been updated.

Table 2-5 provides an overview of the proposed changes and the rationale for the change. Details on each of these Project components are presented in Section 2.8. Where applicable, a comparative analysis of alternatives for several of the proposed changes is presented in **Chapter 3, Project Alternatives**.

Table 2-5: Summary of Changes to the Proposed Project Since Submission of the Project Registration

Project Component	As Described in the Project Registration	Design Change	Rationale for Change	Reference
Rose Pit	The surface area of the pit footprint will be approximately 2.80 km^2 (280 ha). A 70 m buffer zone around Pike Lake was left as a safety measure.	The revised pit design incorporates a larger footprint and surface area, 2.98 km^2 (298 ha), moving the pit rim closer to Pike Lake.	The updated design of the Rose Pit improves pit wall stability, reduces mine rock generated, and increases the ore quantity available for mining. The modified design results in an estimated increase in ore (5.3%) and overburden (4.5%), but it also estimates a reduction in mine rock (6.5%) generated from the Project.	Section 2.8.1
Overburden stockpile	The overburden stockpile was designed with a 59 Mm^3 capacity having a footprint of approximately 1.44 km^2 (144 ha) and maximum height of 125 m.	The change to the Rose Pit design results in an increase in the expected overburden material produced by the Project. To accommodate this predicted increase, the overburden stockpile has been redesigned to increase its capacity to 71 Mm^3, which results in an approximately 30 ha increase to the footprint size of the overburden stockpile. The stockpile now overprints the southwestern portion of Duley Lake Provincial Park. There has been no change to the height of the overburden stockpile. This change also resulted in modifications to the collection basin and overall ditching and road alignments around the stockpile.	By increasing the size of the Rose Pit, a larger overburden stockpile is required to store the anticipated increase in overburden generated. Additional storage capacity has been included in the design of the new overburden stockpile to provide additional waste management flexibility as planning progresses.	Section 2.8.3.1
Mine rock stockpile	The mine rock stockpile was designed with a 27.5° overall slope angle.	The mine rock stockpile was redesigned to reduce the steepness of the slopes (3:1). The flatter slopes will meet reclamation requirements for Closure. This has resulted in a slightly larger mine rock stockpile footprint with the same capacity. This change also resulted in modifications to the collection basins and overall ditching and road alignments around the stockpile.	The mine rock stockpile slope and design has been updated to support reclamation requirements for Closure.	Section 2.8.3.2

Project Component	As Described in the Project Registration	Design Change	Rationale for Change	Reference
Water management infrastructure	Four water management dams are planned with their associated pumping stations and pipelines: – Elfie and End Lake dam to form the Rose Pit collection pond – Mid Lake dam to be used as a diversion dam upstream of Rose Pit – Pike dike to seclude Pike Lake water farther from Rose Pit walls Five collection ponds are planned at the perimeter of the overburden stockpile (1) and the mine rock stockpile (4). The Pike Lake WTP would treat the contact water on the west side of the site (west of the Waldorf River) from spring to fall and divert it to Pike Lake. Contact water and non-contact water on the east side of the site (east of Waldorf River) would collect and be pumped to the TMF pond before pumping to the Duley Lake WTP for treatment and either re-use or discharge to Duley Lake. Sumps, pumps, and pipelines are planned for the Rose Pit water management. Collection and diversion ditches are planned at the perimeter of the Rose Pit and the stockpiles.	Following an update to the site water management approach, the Pike Lake WTP has been eliminated, and all water collected for the site will be routed to the Duley Lake WTP for treatment and discharge year-round. To maintain water levels in Pike Lake, pumping infrastructure has been added to divert water from Duley Lake to Pike Lake. Collection ponds for the mine rock stockpile and the overburden stockpile have increased capacity to accommodate for the change in the stockpile capacity and design. Non-contact water diverted and collected in Mid Lake will be routed directly to Pike Lake.	These modifications were made as outcomes of the site wide water balance and water quality modelling to optimize water re-use and treatment.	Section 2.8.6
Western access road	The western access road would be located east of Duley Lake Provincial Park with upgrades to meet the requirements for construction.	The access road was moved to the west side of Duley Lake Provincial Park based on input received from local residents and cabin owners through consultation.	The new alignment reduces interactions between the Project and local residents and cabin owners.	Section 2.8.8
Eastern access road	Road access to the Project site during operations will be through a new road from Highway 500 south, passing east of the Town of Wabush to the Kami site. This preliminary routing alignment was selected so that traffic can bypass the Town of Wabush and is a similar alignment to the access road that was defined and assessed in the 2012 EIS.	The access road was moved north of the site and west of the Town of Wabush.	The access road was moved farther north to avoid the Wahnahnish Lake Public Water Supply Area.	Section 2.8.8

Project Component	As Described in the Project Registration	Design Change	Rationale for Change	Reference
Kami railway alignment	The proposed Kami railway line will be single track, connecting the QNS&L line to the Project. The railway alignment will pass east of the Town of Wabush to the Kami site. This preliminary routing alignment was selected so that railcars can bypass the Town of Wabush and is a similar alignment to the railway that was defined and assessed in the 2012 EIS.	The access road was moved north of the site and west of the Town of Wabush.	The railway alignment was moved farther north to avoid the Wahnahnish Lake Public Water Supply Area.	Section 2.8.9
Potable water supply	The water pumped from Duley Lake will be used for fresh water requirements for various facilities, occasional make-up water, and potable water for the concentrator area. A small pumping station located at Mills Lake provides service water for the crusher and mine service area.	It is assumed that the four main components that require potable water (worker accommodations, mine office and garage, concentrator, and crusher) will source their potable water from groundwater wells. A pumping station at Mills Lake is no longer proposed. A water intake from Duley Lake will be maintained, but water sourced from Duley Lake will support processing activities only.	The potable water supply has changed to reduce water requirements from Duley Lake and instead draw potable water from groundwater wells.	Section 2.8.13
Sewage management	Sewage generated by the Project will be similar to what was proposed by Alderon in the 2012 EIS. Sewage will be treated on site using either a septic tank system or a commercial sewage/wastewater treatment system.	Sewage will be treated on site at the worker accommodations. All sewage will undergo tertiary treatment prior to discharge to the environment. Inert sludge generated as a by-product of the treatment of sewage will be collected and deposited in the TMF.	The approach to managing sewage generated from the Project has changed following the completion of an initial technical report on wastewater treatment.	Section 2.8.14

Notes:

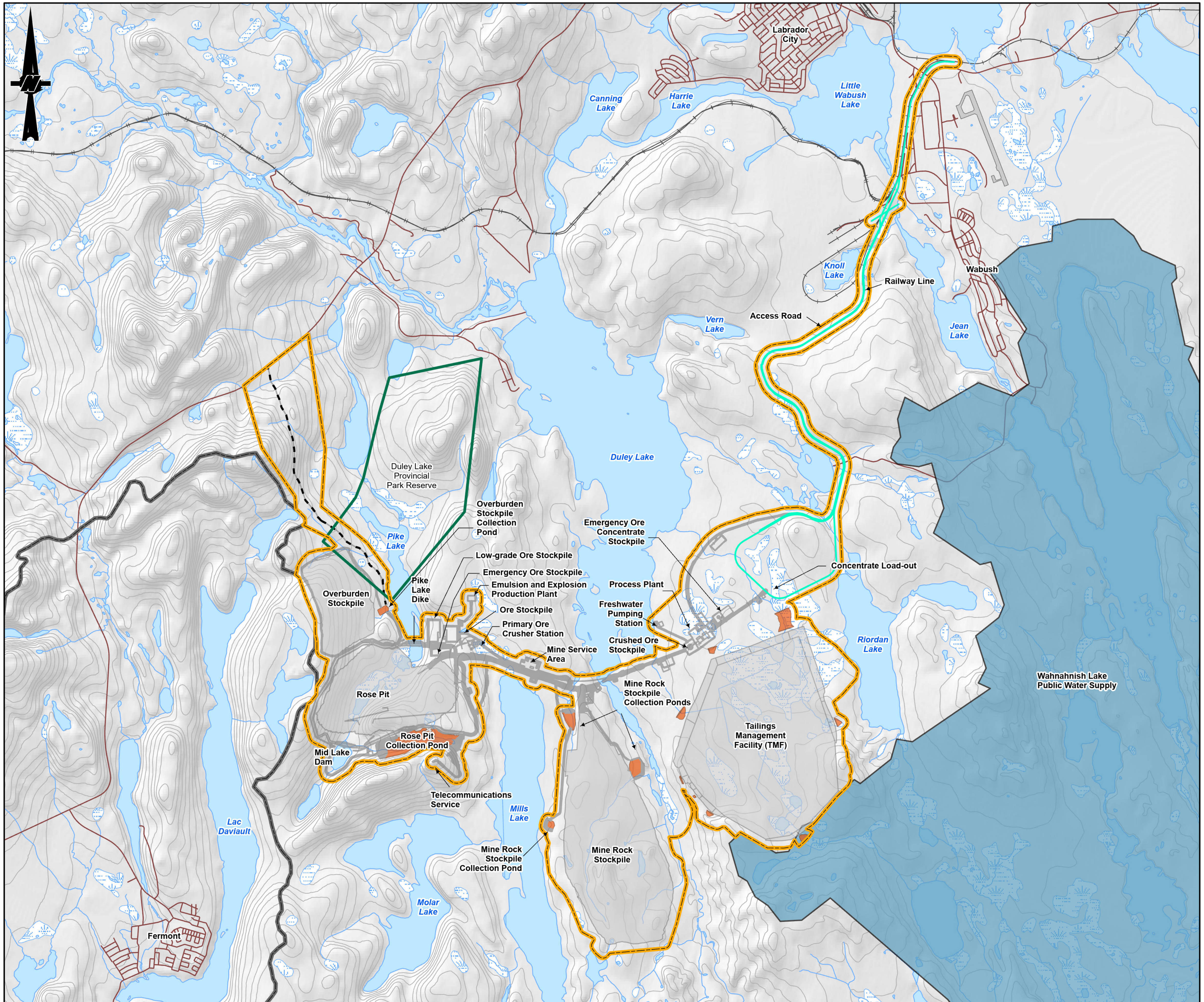
km² = square kilometre; ha = hectare; m = metre; % = percent; Mm³ = million cubic metres; ° = degree; TMF = tailings management facility; WTP = water treatment plant; QNS&L = Québec North Shore & Labrador Railway.

2.8 Project Components

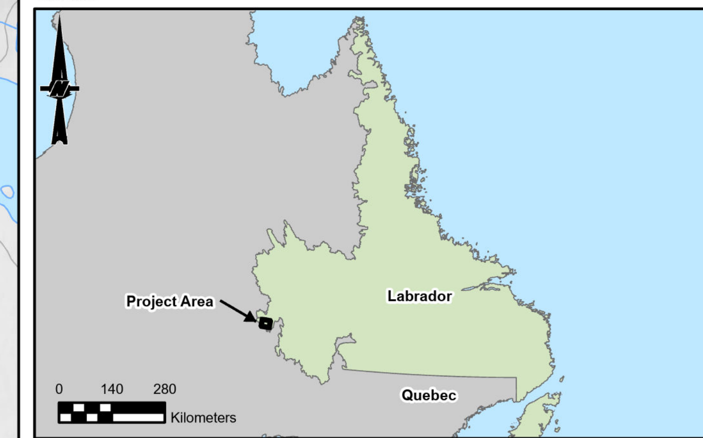
The section provides a summary of the Project components. The key components of the Project are as follows:

- Rose Pit (Section 2.8.1)
- ore handling, storage and processing infrastructure (Section 2.8.2)
- mine waste management, including the overburden and mine rock stockpiles (Section 2.8.3)
- the process plant (Section 2.8.4)
- TMF (Section 2.8.5)
- water management infrastructure (Section 2.8.6)
- borrow source material (Section 2.8.7)
- roads (Section 2.8.8)
- railway line (Section 2.8.9)
- water crossings (Section 2.8.10)
- power supply and distribution (Section 2.8.11)
- worker accommodations (Section 2.8.12)
- potable water supply (Section 2.8.13)
- wastewater treatment (Section 2.8.14)
- explosives production and storage (Section 2.8.15)
- supporting infrastructure (Section 2.8.16)

Key Project components are presented on the site layout (Figure 2-4) and further described in this section.



KEY MAP



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PROJECT DATA

- Proposed Project Infrastructure
- Proposed Sediment Pond
- Potential Access Road
- Proposed Access Road and Railway Corridor
- Site Study Area (SSA)

BASEMAP INFORMATION

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

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

CLIENT
CHAMPION IRON MINES LTD.

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

TITLE
PROJECT LOCATION AND SITE LAYOUT

CONSULTANT

Kami

YYYY-MM-DD	2025-06-30
DESIGNED	----
PREPARED	MS
REVIEWED	JC
APPROVED	TS

PROJECT NO.	CONTROL	REV.	FIGURE
CA0038713.5261	0015	0	2_4

2.8.1 Rose Pit

The Rose Pit is a proposed open pit, located south of Pike Lake and west of the planned crusher, mill, and concentrator location. The pit is located east of the Québec-Labrador provincial border, and approximately 10 km southwest from the Town of Wabush. The Rose Pit would be mined as a single pit and has a roughly ellipsoidal shape with a west-east orientation. It is approximately 2.6 km long by 1.5 km wide and reaches an average depth of 550 m. The Project is planned as a mix of a conventional open pit mine for ore processing combined with a modern IPCC system for the management of mine rock. Mining will be done with the use of drills, haul trucks coupled with hydraulic shovels, and the semi-mobile IPCC system.

Details on the geology and mineralization, pit design, and mining methods are presented in the following sections.

2.8.1.1 Geology and Mineralization

Mineralization of economic interest for the Project is oxide iron formation. The Project is situated in the highly metamorphosed and deformed metasedimentary sequence of the Grenville Province, Gagnon Terrane of the Labrador Trough. The Labrador Trough is composed of a sequence of Proterozoic sedimentary rocks, including iron formation, volcanic rocks, and mafic intrusions. Labrador Trough rocks in the Grenville Province are highly metamorphosed and complexly folded. Iron deposits in the Gagnon Terrane (the Grenville part of the Labrador Trough) include those within the Project limits (Rose Lake and Mills Lake), those in the Manicouagan-Fermont area (Lac Jeannine, Fire Lake, Mont-Wright, Mont-Reed, and Bloom Lake), as well as deposits in the Wabush-Labrador City area (Luce, Humphrey, and Scully).

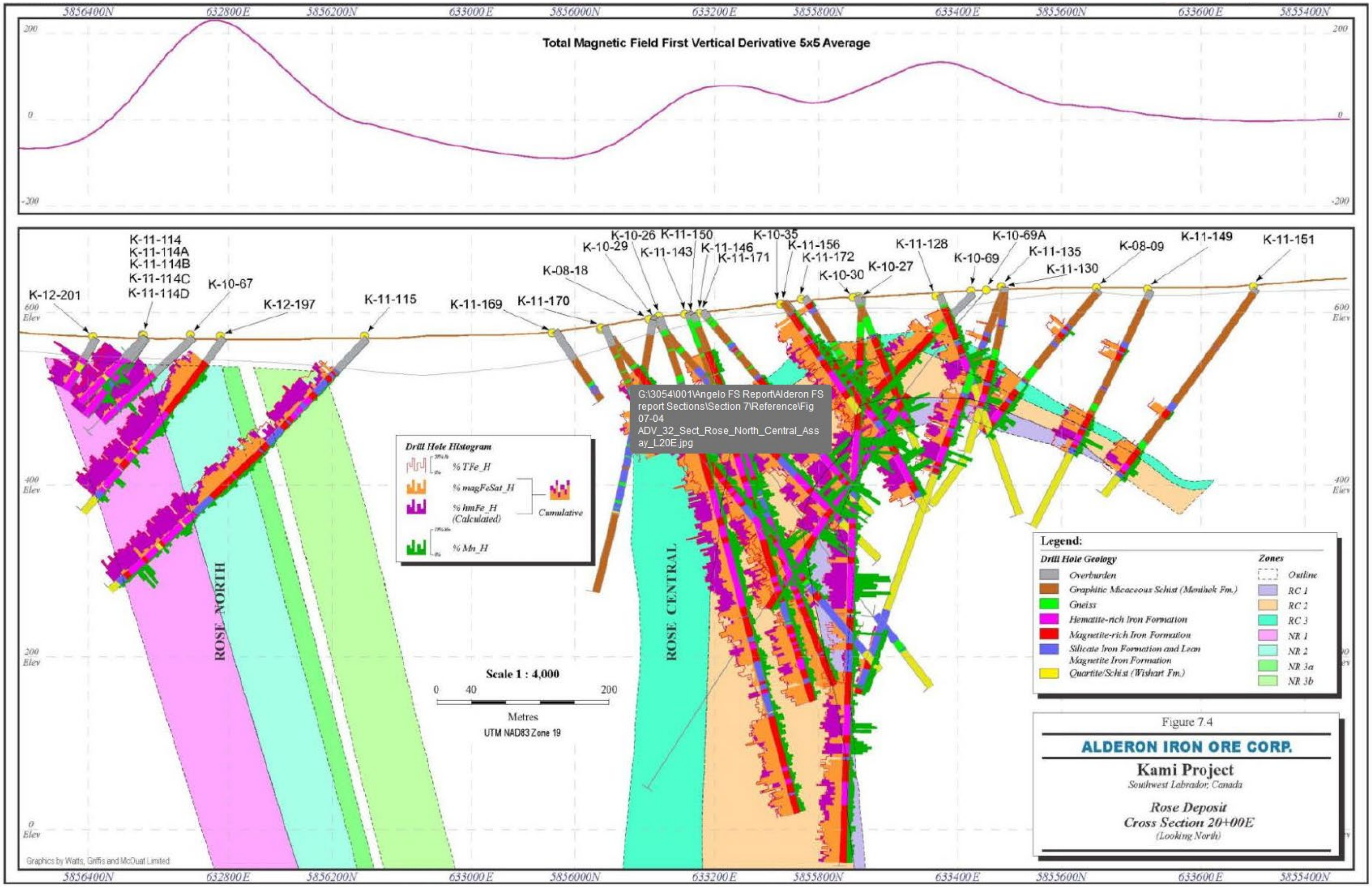
The Project site is underlain by folded, metamorphosed sequences of the Ferriman Group and includes—from oldest to youngest—Denault (Duley) Formation dolomitic marble (*reefal carbonate*) and Wishart Formation quartzite (sandstone) as the footwall to the Sokoman Formation. The Sokoman Formation includes iron oxide, iron carbonate, and iron silicate facies and hosts iron oxide deposits. The overlying Menihek Formation resulted from clastic pelitic sediments derived from emerging highlands into a deep-sea basin and marks the end of the chemical sedimentation of the Sokoman Formation (Alderon 2018). The Project site includes two iron oxide hosting basins juxtaposed by thrust faulting. The principal basin, named the Wabush Basin, contains the majority of the known iron oxide deposits on the Project site. Its trend continues north-northeast from the Rose Lake area for 9 km to Rio Tinto’s Wabush 3 Open Pit Mine and beyond the Town of Wabush. The second basin, named the Mills Lake Basin, lies south of the Elfie Lake thrust fault and extends southwards, parallel with the west shore of Mills Lake. Each basin has characteristic lithological assemblages and iron formation variants. In some areas of the Project site, the Sokoman Formation is underlain primarily by Denault (Duley) Formation dolomite. In other areas of the Project site, both Denault (Duley) Formation dolomite and Wishart Formation quartzite units are present (Alderon 2018).

The Project site is seeking to mine the Rose Central deposit and the Rose North deposit; both are situated in the Wabush Basin. These deposits represent different components of a series of gently plunging north-northeast-south-southwest upright to slightly overturned anticlines and synclines with parasitic smaller-scale folding. The stratigraphy ranges from Katsao gneiss, north of the Rose syncline, up to the Menihek Formation mica schist. The Rose anticline exposes the Wishart Formation, which includes muscovite and biotite-rich schist and variations in quartzite textures.

The true width of the Rose Central deposit, as shown by the interpretation in Figure 2-5, is varying between 60 m and 240 m on the western limb. The true width of the Rose North deposit is in the order of 230 to 350 m. The Rose North and the Rose Central deposits appear to represent, respectively, the NW and SW limbs of the same tight syncline. There is also another narrow, highly attenuated, and perhaps tightly folded limb of Sokoman Formation between the main Rose Central zone and the Rose North zone. The entire Rose system also appears to attenuate along strike to the south-southwest.

Figure 2-5 shows a typical cross-section of the Rose Central and Rose North deposits. The magnetic profile from the ground magnetic survey shows peaks that correlate with magnetite-hematite mineralization intersected in the drillholes. Each of these zones are interpreted as limbs of a series of NE-SW trending, upright to slightly overturned shallow NE plunging anticlines and synclines. Wishart Formation quartzite forms the core of the fold (intersected towards the bottoms of drillholes K-10-09, K-08-18, K-10-30, and K-10-35) and Menihek Formations mica-graphitic schist is the stratigraphic hanging wall above the Sokoman Formation iron formation.

Figure 2-5: Cross-section of Rose North and Rose Central Deposits (Champion 2024)



2.8.1.2 Pit Design

The proposed pit design has one exit to the east to facilitate the access to the primary ore crushing station and mine rock stockpile. There are two internal pits within the final pit (one targeting the Rose North deposit and one targeting the Rose Central deposit), and these internal pits join at 275 m depth. The IPCC is planned to move once from its initial position to its final location at 275 m depth, where it will become a fixed crusher to allow for mining the combined internal pits. The pit designs were configured on 10 m vertical bench heights with an average catch berm of 8.5 m for the overburden and 20 m vertical bench heights with an average catch berm of 10 m for the footwall, thrust zone, and hanging wall.

2.8.1.3 Mining Methods

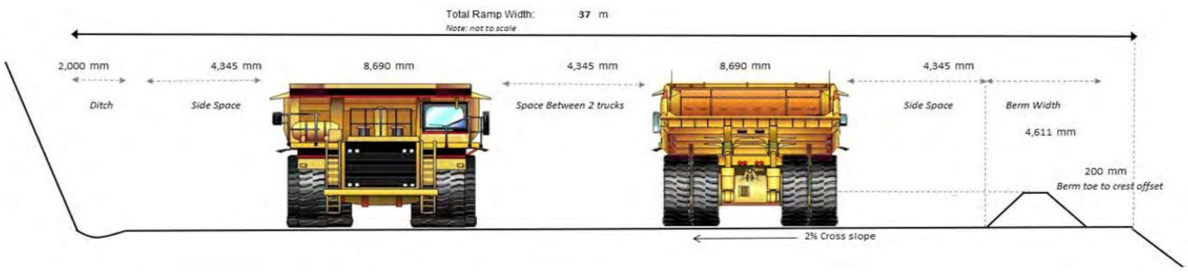
Standard surface mining techniques (drill, blast, load, haul) will be used to create the open pit. Drill and blast specifications are established according to material type and whether the rock is ore or mine rock. The ore drill pattern is proposed with a 5.5 m burden and 6.25 m spacing with 1.5 m of subdrill. The mine rock drill pattern is proposed with a 6.5 m burden and 7.5 m spacing with 1.5 m of subdrill. These drill parameters combined with a high energy bulk emulsion with a density of 1.25 kg/m^3 result in a powder factor of 0.4 kg/t for ore and 0.34 kg/t for mine rock. Ore will be loaded and hauled out of the pit with 320 t haul trucks.

A modern IPCC system will be used to transport mine rock from Rose Pit to the mine rock stockpile. The IPCC system is a semi-mobile structure that can be moved as the mining progresses through operations. Implementation of the IPCC system will reduce the number of haul trucks needed to transport mine rock. Mine rock will be crushed by the IPCC system in the Rose Pit. Once crushed, mine rock will be conveyed up the pit ramp to surface, at which point it will be transferred to a conveyor. This overland conveyor will run for 2.5 km east to reach the mine rock stockpile. Mine rock will be placed on the mine rock stockpile using a system of relocatable conveyors mounted on skids, cross-belt feeders, index conveyors, bridge conveyors, and a mobile stacker. Dozers will be used to push the mine rock and level the lifts. It is anticipated that the implementation of the IPCC will occur within the first few years of Operations, once the pit and ramps are sufficiently developed.

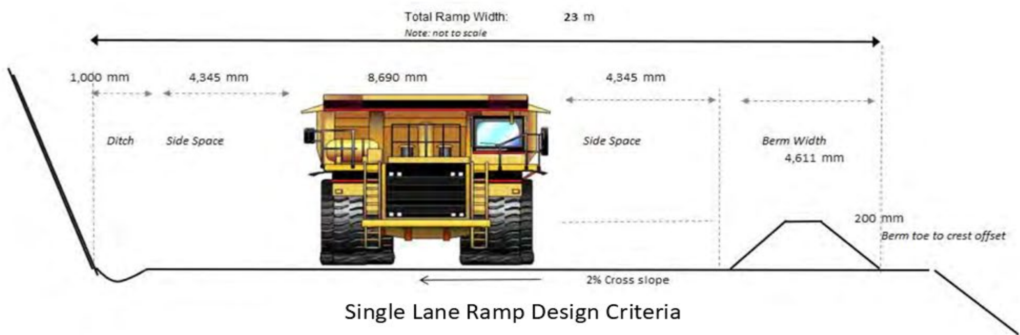
The mine was designed to meet the Part XXVIII (General Mining Requirements) of the Newfoundland and Labrador *Occupational Health and Safety Regulations*, *2012* under the *Occupational Health and Safety Act*. The pit ramps were designed as long and straight as possible to minimize transfer stations and maximize straight conveyors as their turning radius is limited. The ramps and haul roads were designed for the largest equipment being a 320 t haul truck with a canopy width of 8.7 m. Ramp gradients were established at 10%. A shoulder barrier or safety berm on the outside edge would be constructed of crushed rock to a height equal to the rolling radius of the largest tire using the ramp (1.35 m). These shoulder barriers are required wherever a drop-off greater than 3 m exists. A ditch planned on the highwall will capture run-off from the pit wall surface and help ensure proper drainage and water management. The ditch will be 2 m wide. To facilitate drainage of the roadway, a 2% cross-slope on the ramp is planned.

The main ramp to the primary ore crushing station has a width of 53 m to allow space for the IPCC, while the ramps to the bottom of the pit are 37 m for double-lane and 23 m for single-lane. Single-lane ramps are introduced in the pit bottom when the benches start narrowing and when the mining rates will be substantially reduced. Double- and single-lane ramp configurations (those without the IPCC) are presented in Figure 2-6.

Figure 2-6: Double and Single Lane Ramp/Haul Road Design Criteria



Double Lane Ramp Design Criteria

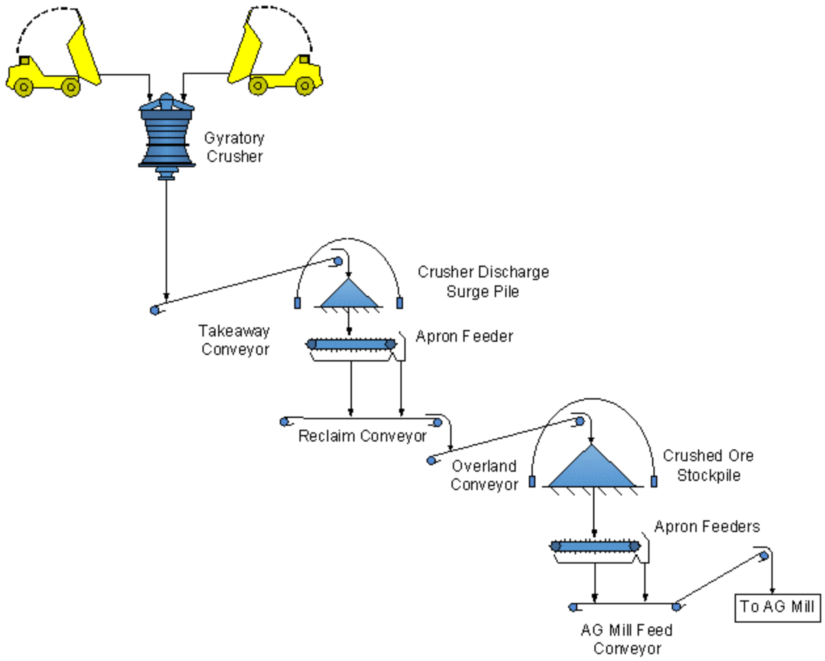


Single Lane Ramp Design Criteria

2.8.2 Ore Crushing, Handling, and Storage

Figure 2-7 presents a block flow diagram of the primary crushing operations from the crusher to the autogenous grinding (AG) mill located in the concentrator. Additional detail on the key components involving ore crushing, conveyors and storage prior to the concentrator is provided in the following sections.

Figure 2-7: Primary Crushing Block Flow Diagram



2.8.2.1 Primary Ore Crushing Station

The ore crushing station (Figure 2-8) consists of the primary crusher building, conveyors, and a transfer tower that will be located adjacent to the primary crusher building. The primary crusher building is in close proximity to the Rose Pit, approximately 640 m from the projected final pit shell boundary.

Ore delivered from the pit by haul trucks will be dumped directly into a 1,175 kW gyratory crusher. A hydraulic rock breaker operated from the crusher control room is provided adjacent to the crusher to break up and manipulate oversized or improperly positioned rocks. Once crushed, crushed ore will be collected on a takeaway conveyor below the crusher and sent to a covered surge pile having a capacity of 1,640 t. Crushed ore from the surge pile is collected on an apron feeder below the pile and fed onto a reclaim conveyor. This reclaim conveyor discharges onto the main overland conveyor, which conveys crushed ore to the crushed ore stockpile.

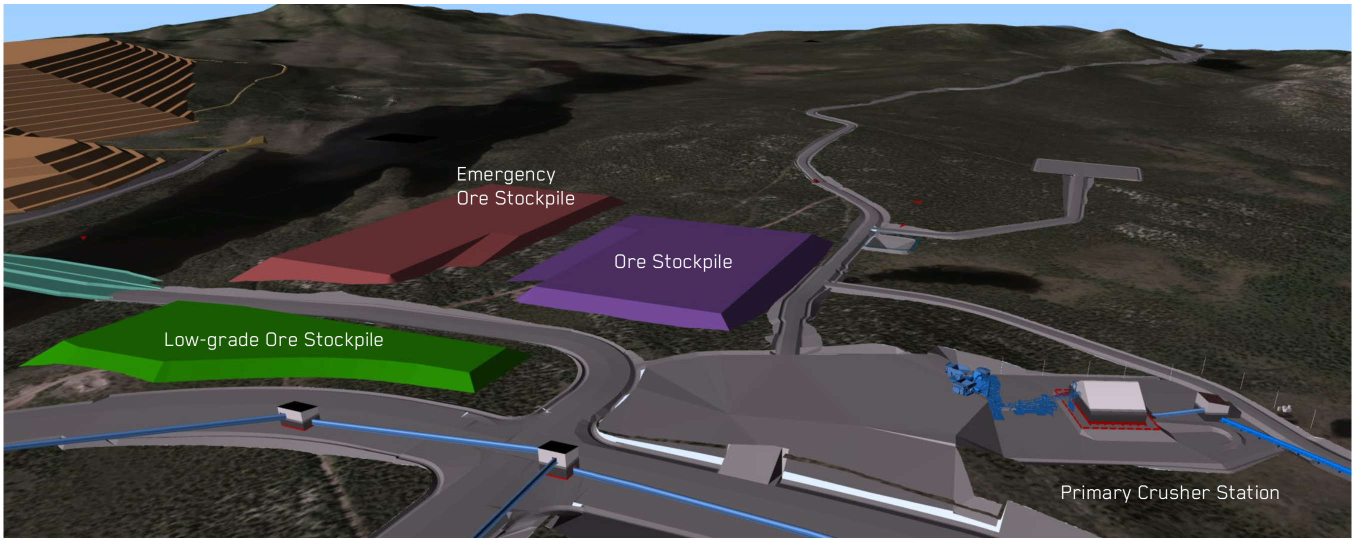
The main overland conveyor will transport crushed ore over a distance of approximately 4 km from the transfer tower to the crushed ore stockpile. The main overland conveyor will run along the site access road, before passing over a separate bridge at the Waldorf River to reach the crushed ore stockpile. The main overland conveyor will include support structures, hood covers, drives, electrical components, and instrumentation. An enclosed gallery will be installed where the conveyor crosses Duley Lake at the outlet of the Waldorf River.

2.8.2.2 Ore Stockpiles

Ore will be stockpiled in one of three ore stockpiles located to the north of Rose Pit to facilitate crushing operations (Figure 2-8): the ore stockpile (purple), the low-grade ore stockpile (green), or the emergency ore stockpile (red).

The ore stockpile has a capacity of 2.0 Mt and will be used for blending of ores to facilitate daily crusher feeding and to maintain an adequate feed grade to the process plant located to the east of Duley Lake. The low-grade ore stockpile has a capacity of 3.3 Mt and will be used to store lower-grade material until it can properly blend and feed ore to the primary ore crushing station. The emergency ore stockpile has a capacity of 0.9 Mt and will be used during periods when the mine cannot feed ore to the primary crusher due to inclement weather or other reasons.

Figure 2-8: Ore Stockpile and Primary Ore Crushing Station

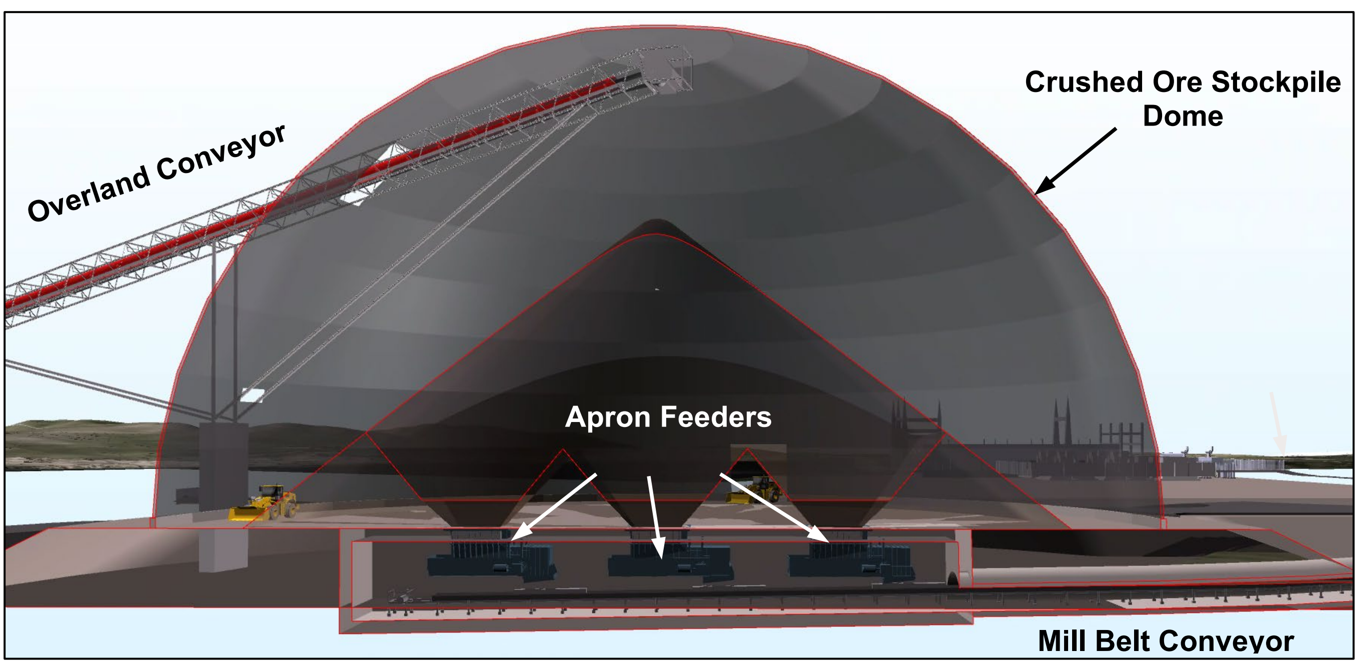


2.8.2.3 Crushed Ore Stockpile

The crushed ore stockpile would be located near the process plant and would provide a live capacity of 54,000 Mt, which provides sufficient capacity to sustain approximately 17 hours of process plant operation at nominal throughput to the mill. The crushed ore stockpile has a total capacity of 140,000 Mt.

The crushed ore stockpile would be covered by a geodesic dome that would have a diameter of 95 m and height of 27 m. Crushed ore would be reclaimed from the stockpile using three apron feeders through an underground tunnel housing the mill belt conveyor, which in turn feeds crushed ore to the process plant. The mill belt conveyor would be approximately 230 m in length. Figure 2-9 presents a conceptual drawing of the crushed ore stockpile dome and associated infrastructure.

Figure 2-9: Crushed Ore Stockpile



2.8.3 Mine Waste Management

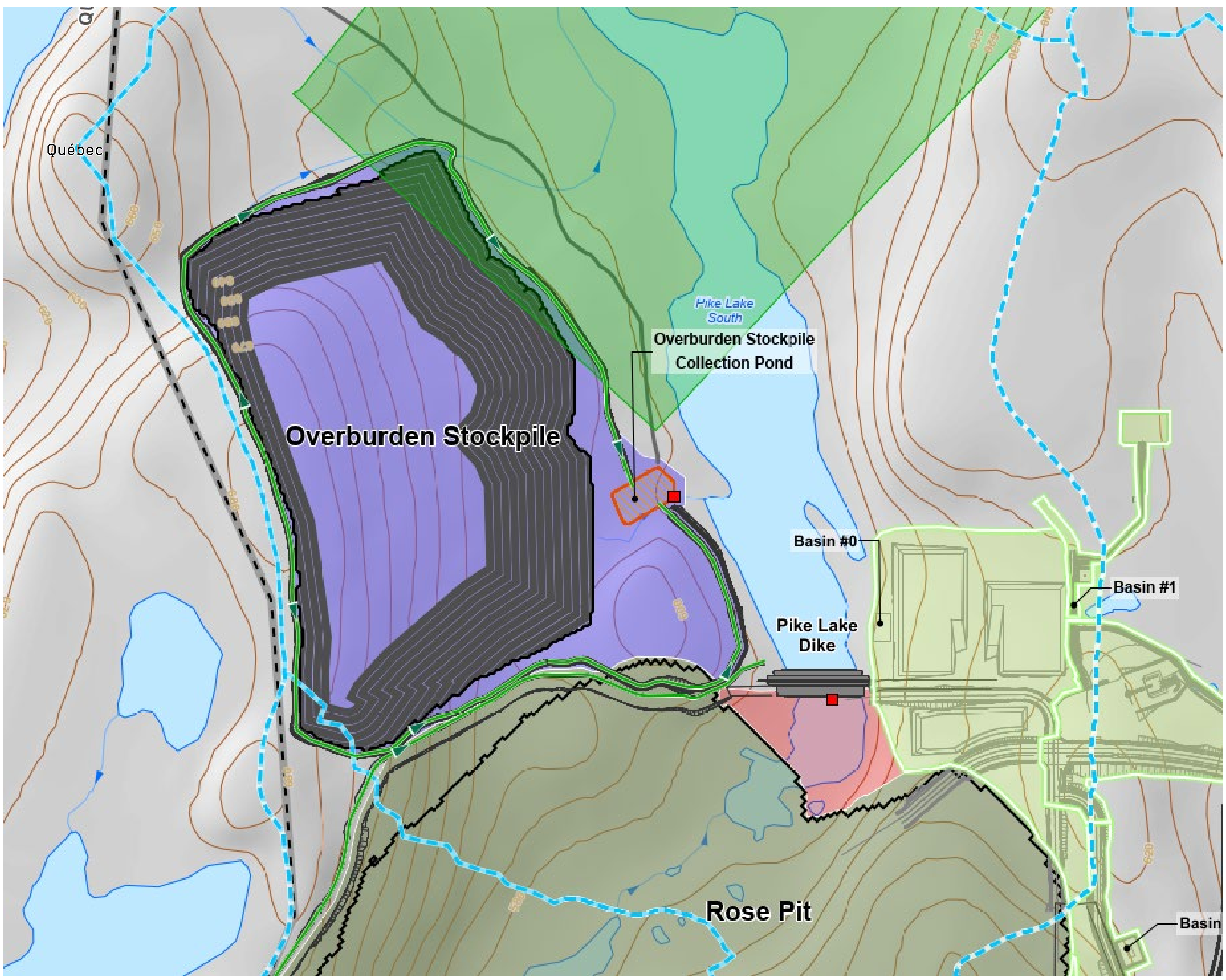
Mine waste management infrastructure includes the Project components required to manage and store material waste generated from mining activities, specifically mine rock and overburden.

2.8.3.1 Overburden Stockpile

Overburden, which is the soil or rock layer overlying mineral deposits, will be stripped at Rose Pit during the construction and operations phases and transported via haul trucks to the overburden stockpile. A total of 117 Mt of overburden will be produced over the mine's life, which is a reduction from the total of 151 Mt previously projected in the 2012 EIS and an increase from the total of 106 Mt described in the Project Registration. The proposed overburden stockpile can contain up to 126 Mt should increased capacity be needed during future phases of the Project.

The overburden stockpile is located northwest of Rose Pit, offset 50 m from the provincial border (Figure 2-10). The overburden stockpile will be built in 10 m high lifts, with an overall slope of 19°. The overburden stockpile has a maximum elevation of 700 m and a surface area of approximately 175 ha. The northeast portion of the overburden stockpile overlaps with approximately 10 ha of Duley Lake Provincial Park.

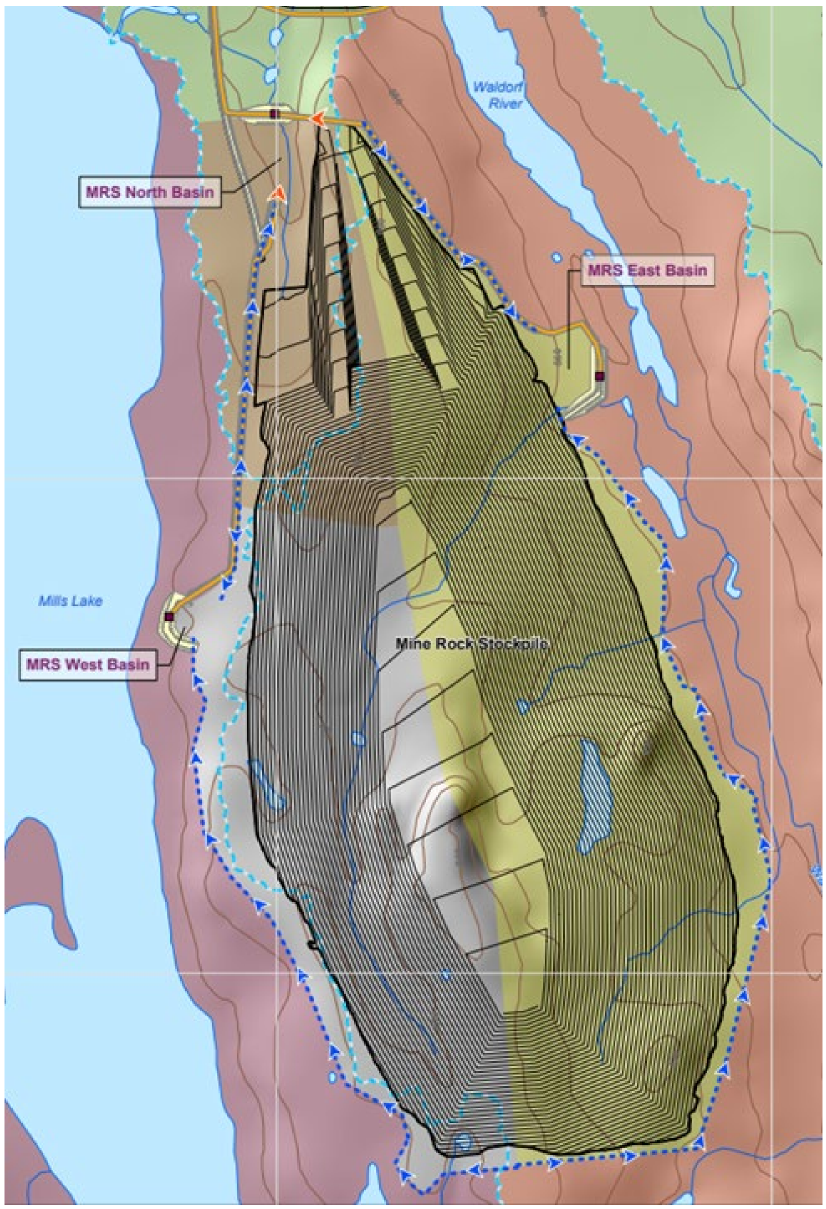
Figure 2-10: Overburden Stockpile



2.8.3.2 Mine Rock Stockpile

Mine rock extracted during mining operations is composed of mine rock within Rose Pit and ore that does not meet quality criteria for processing. Mine rock will be stored in the mine rock stockpile, which will be located east of Mills Lake, in the same location (referred to as the Rose South Disposal Area) as the previously proposed stockpile in the 2012 EIS (Figure 2-11). A total of 914 Mt of mine rock will be produced over the mine's life, a reduction from the total of 1,081 Mt previously projected in the 2012 EIS. Mine rock will be placed on the mine rock stockpile using a system of relocatable conveyors mounted on skids, cross-belt feeders, index conveyors, bridge conveyors, and a mobile stacker. Track dozers will be used to push the mine rock and level the lifts. The mine rock stockpile will be built in layers in the north-south and west-east axes. The external slopes of the mine rock stockpile will be constructed with a 3.5H:1V slope to avoid re-sloping at reclamation. The proposed mine rock stockpile could be optimized by adding capacity during future phases of the Project.

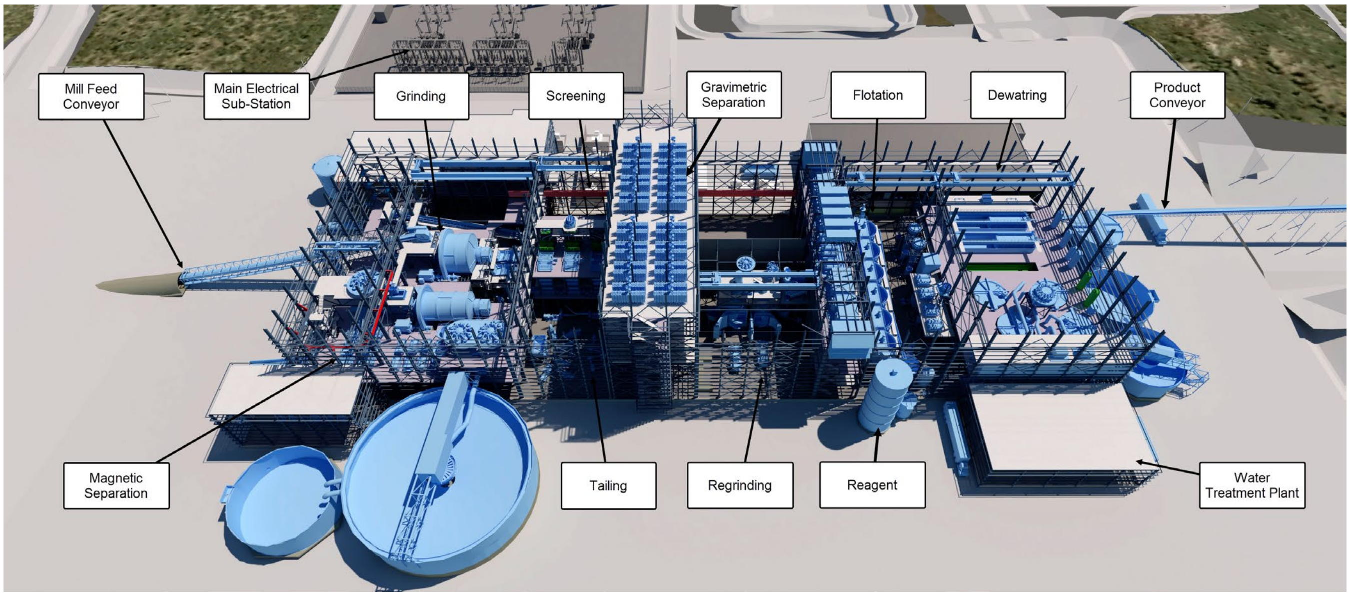
Figure 2-11: Mine Rock Stockpile



2.8.4 Process Description

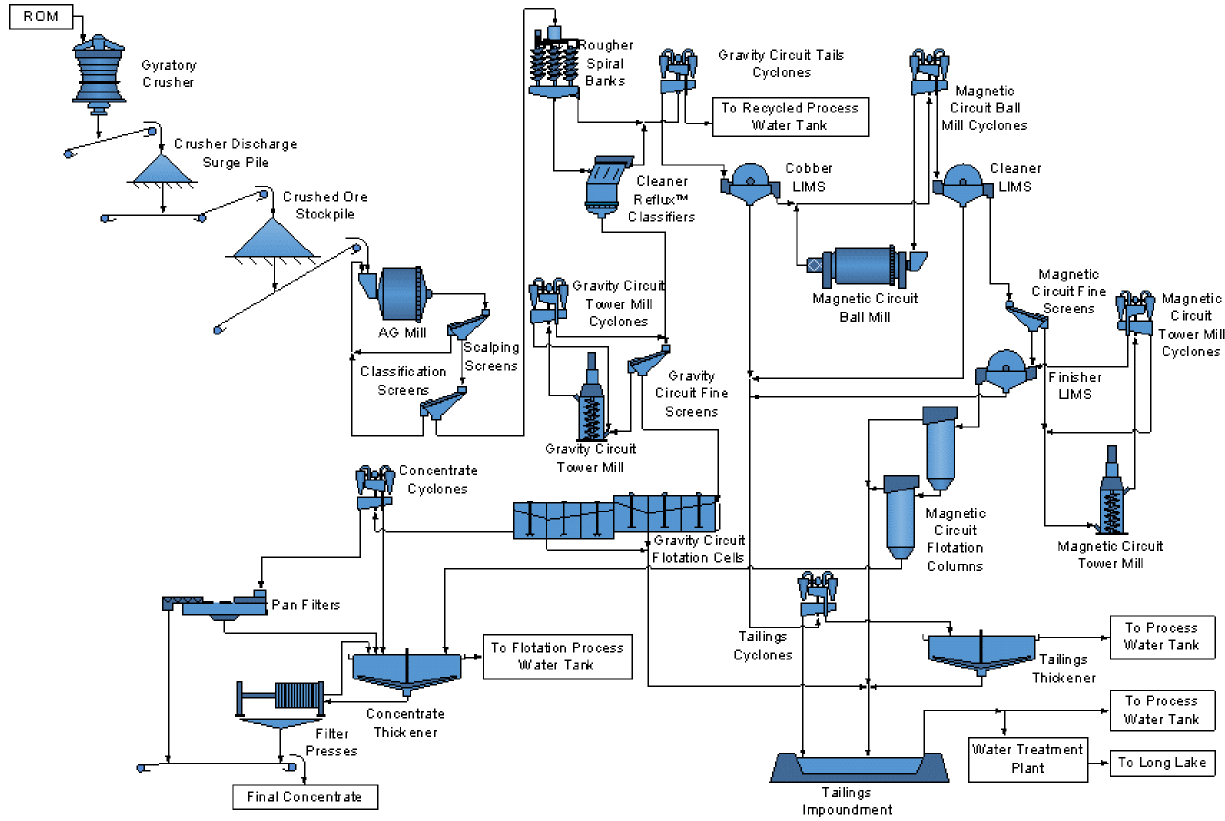
The process plant also referred to as the concentrator in the EIS, will be located to the east of Duley Lake and will consist of the AG mill, a gravity circuit using spirals and Reflux® Classifier, magnetic separation circuits, flotation circuits, dewatering processes, WTP and ancillary process areas. A conceptual diagram of the concentrator and its components is presented in Figure 2-12.

Figure 2-12: Conceptual Diagram of Process Plant – Interior View



Each circuit and supporting infrastructure are described further in the following sections. Figure 2-13 shows the general process flow diagram for the concentrator.

Figure 2-13: General Process Flow Diagram



2.8.4.1 Concentrator

The concentrator focuses on crushing materials in the AG mill to break larger and coarser materials into smaller pieces, making these easier to process in the subsequent stages. The concentrator involves the following circuits:

- Grinding and screening circuit
- Gravity separation circuit
- Magnetic separation circuit
- Gravity concentrate regrind and flotation
- Magnetic concentrate regrinding and flotation
- Concentrate dewatering and storage
- Tailing Thickening

Slurry generated from the grinding and screening circuit are subjected to gravity concentration using rougher spirals and cleaner Reflux® Classifier that produce tailings and a gravity concentrate. The gravity concentrate is further reground in a tower mill closed-circuit and processed through an iron ore reverse flotation circuit that produces a low-silica-grade final gravity concentrate. Tailings from the gravity separation circuit are subjected to a magnetic separation process, which produces magnetic concentrate. The magnetic concentrate is regrounded and magnetite is recovered gradually through the finisher low intensity magnetic separators (LIMS).

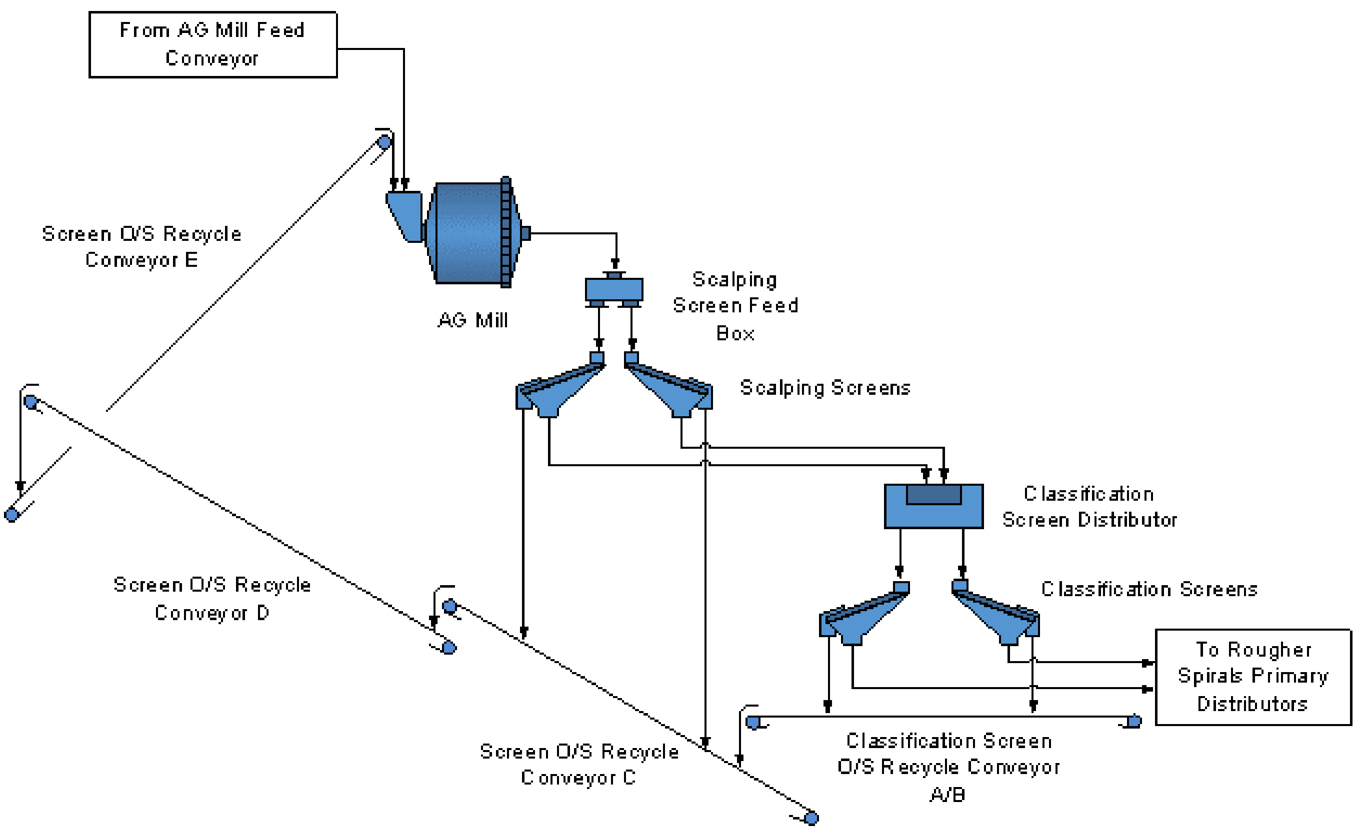
The finisher LIMS concentrate is processed through flotation columns that remove liberated silica through iron ore reverse flotation and produce a low-silica-grade final magnetic concentrate. Gravity concentrate is processed through cyclones to generate a coarser underflow with high density, which is dewatered using pan filters with steam injection. The cyclone overflow is combined with the magnetic concentrate and is dewatered by thickening and press-filtration. Filtered concentrates are combined on a belt conveyor, which directs the product to the concentrate load-out. Additional details on each concentrator circuit are described below.

2.8.4.1.1 Grinding and Screening Circuit

This step focuses on reducing the size of the ore particles to extract the iron minerals and separating ore particles based on size. This stage is essential for the efficient liberation of valuable minerals and ensure a suitable material size, which enhances the effectiveness of subsequent refinement and extraction processes. This stage begins with grinding the crushed materials, followed by classification screen. Afterwards, the materials are classified based on their size. The grinding and screening circuit are shown in Figure 2-14.

- **Grinding**–Crushed material from the feed conveyer is fed into the AG mill. Recycled process water is added to the feed chute to control the mill slurry density. The material is ground to P80 of 300 microns, which is the size required to achieve sufficient liberation for effective gravity concentration.
- **Screening**–The screening processes involve two stages:
  - **Stage 1**–The slurry from the AG mill is transported into a scalping screen feed box, which distributes the slurry to two horizontal scalping screens with a screen opening of 4.0 mm. Materials larger than the dimensions of the scalping screen are returned to the AG mill by belt conveyor for further grinding. The passing fraction from the scalping screen is collected into two pump boxes.
  - **Stage 2**–The classification screen separates particles based on their size. Oversized material from the classification screen is conveyed back to the AG mill through the belt conveyors while the passing fraction are collected into two pump boxes. Collected material is fed to two primary rougher spiral distributors. Recycled water is added to ensure stable rougher spirals feed density.

Figure 2-14: General Process Flow Diagram of the Grinding and Screening Circuit

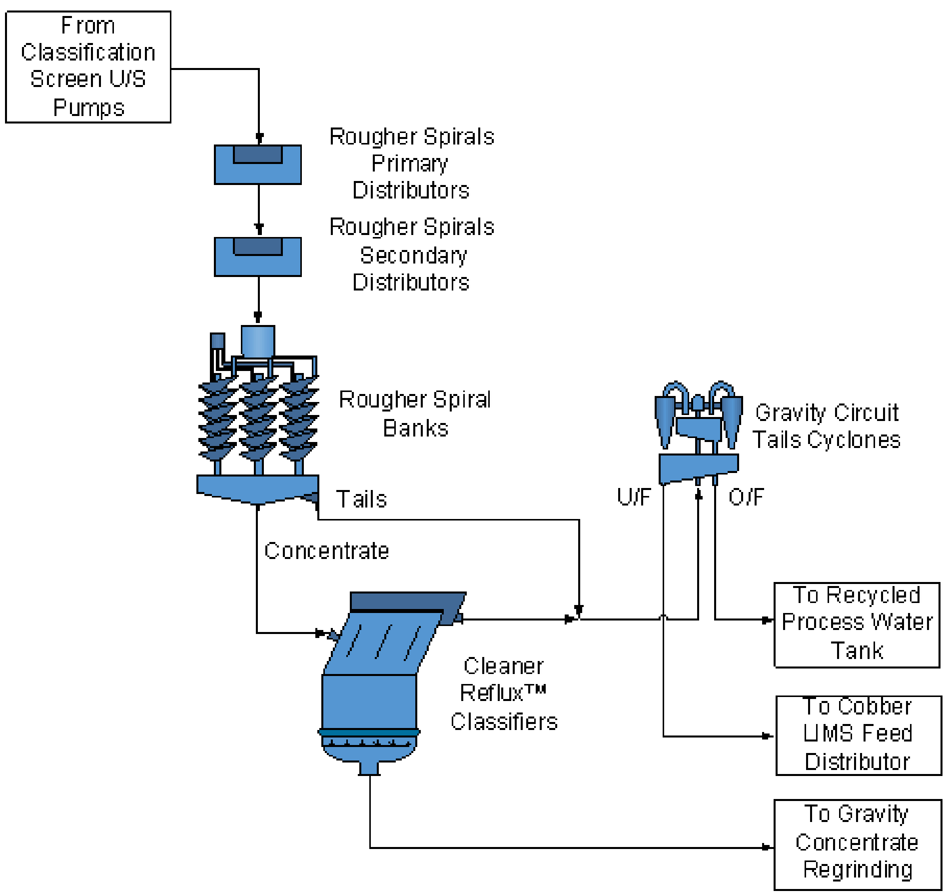


2.8.4.1.2 Gravity Separation Circuit

The gravity separation circuit focuses on separating iron from other minerals present in the ore based on difference in their specific gravity. The gravity separation circuit layout consists of rougher spirals and cleaner Reflux® Classifiers, divided into two production lines. The rougher spirals are the first stage of gravity separation circuit and produce concentrate and tailings streams. Cleaner Reflux Classifiers are advanced gravity-based separators used to increase efficiency in separation, cleaning and refining of concentrates. The gravity separation circuit is summarized below and presented as a process flow diagram in Figure 2-15:

- Screened slurry is pumped to the rougher spiral distributors, where it is separated into primary and secondary production lines prior to the spiral banks.
- The rougher spirals produce two different streams: concentrate and tailings. The rougher spiral banks have wash water added to promote a better selectivity and separation of the iron rich particles from the lighter silica particles.
- The concentrate is collected and directed to cleaner Reflux® Classifiers. The tailings are directed to dewatering cyclones.
- Fluidization water is added to each Reflux® Classifier to transport the tailings to the overflow and iron ore concentrate is retrieved at the cleaner Reflux® Classifier underflow. This concentrate (referred to as gravity concentrate) is collected in boxes, diluted with water, and then gravity fed to the gravity concentrate regrinding circuit (Section 2.8.4.1.4).
- The tailings overflow from the cleaner Reflux® Classifiers is merged with the rougher spirals tails and transported to a cluster of dewatering cyclones.
- The underflow of each cluster is collected into a pump box and pumped to the magnetic separation circuit (Section 2.8.4.1.3). The overflow from the cyclones is sent to the recycled water tank. Since this water has higher concentration of solids compared to process water, it is then recycled for use at the AG mill, scalping screens and classification screens underflow pump boxes to maximize water re-use and minimize the thickener size.

Figure 2-15: General Process Flow Diagram of the Gravity Separation Circuit

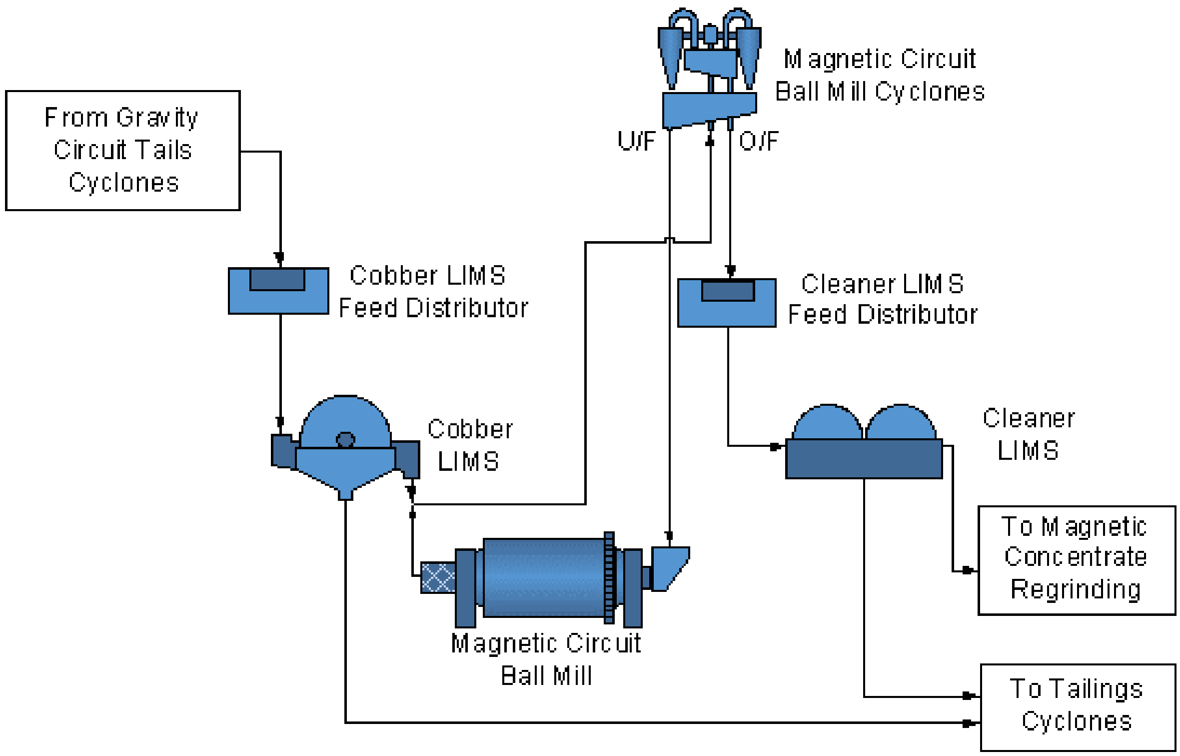


2.8.4.1.3 Magnetic Separation Circuit

The magnetic separation circuit focuses on separating magnetic from non-magnetic ore to increase recovery. The objective of these units at this stage is to recover liberated and partly liberated magnetite from the rougher spirals and cleaner Reflux® Classifier tailings in the previous stage. The magnetic separation circuit is summarized below and presented as a process flow diagram in Figure 2-16.

- The dewatered rougher spirals and cleaner Reflux® Classifier tailings are transported to the magnetic separation circuit cobber LIMS through the feed distributor. The concentrate produced consists mainly of non-liberated magnetite that requires regrinding, and unretrieved fine liberated magnetite from the spirals. This concentrate is channelled to the magnetic circuit ball mill cyclone clusters. The cobber LIMS tailings are transported to the tailings cyclone clusters.
- The cyclone underflow is sent to a 17 MW ball mill. The overflow is channelled to the cleaner LIMS through the feed distributor. This concentrate (referred to as magnetic concentrate) is pumped to the magnetic concentrate regrinding circuit and the tailings are transported to the tailings cyclone clusters.

Figure 2-16: General Process Flow Diagram of the Magnetic Separation Circuit

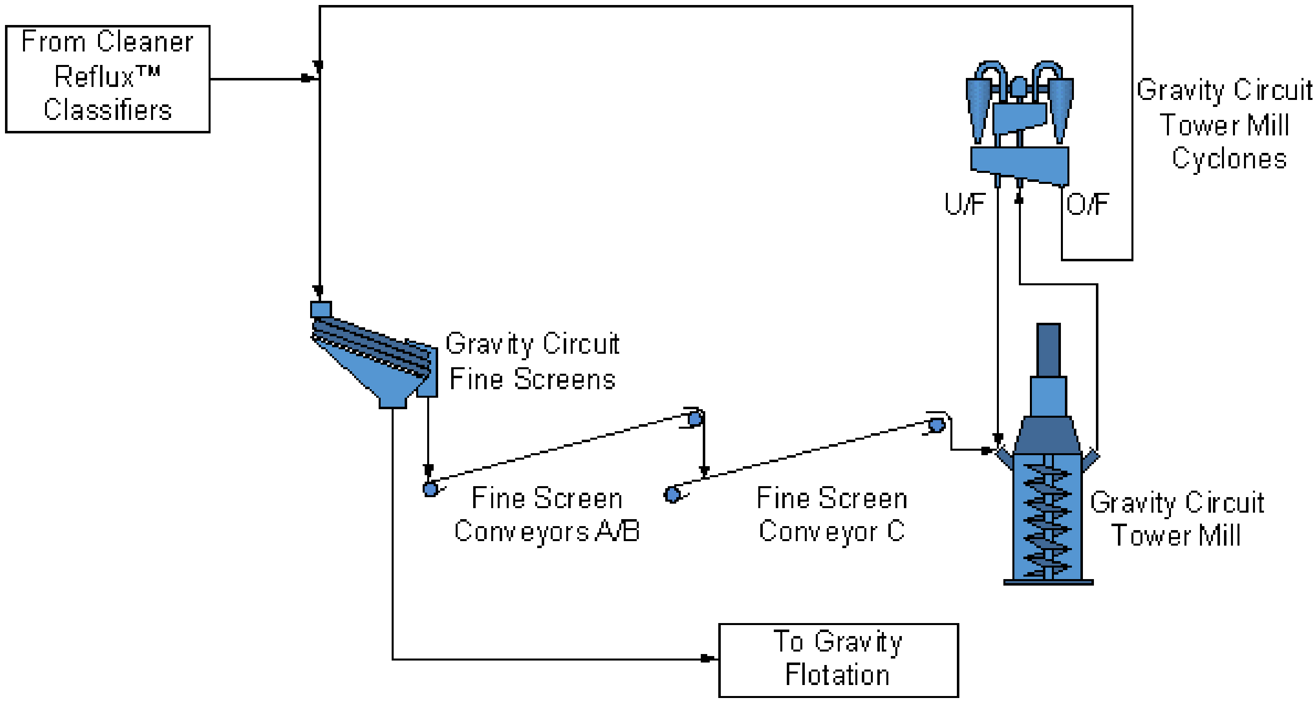


2.8.4.1.4 Gravity Concentrate Regrinding and Flotation

Gravity concentrate generated from the cleaner Reflux® Classifiers is classified and reground based on size until it passes the fine screens. The gravity concentrate regrinding circuit is summarized and presented as a process flow diagram in Figure 2-17:

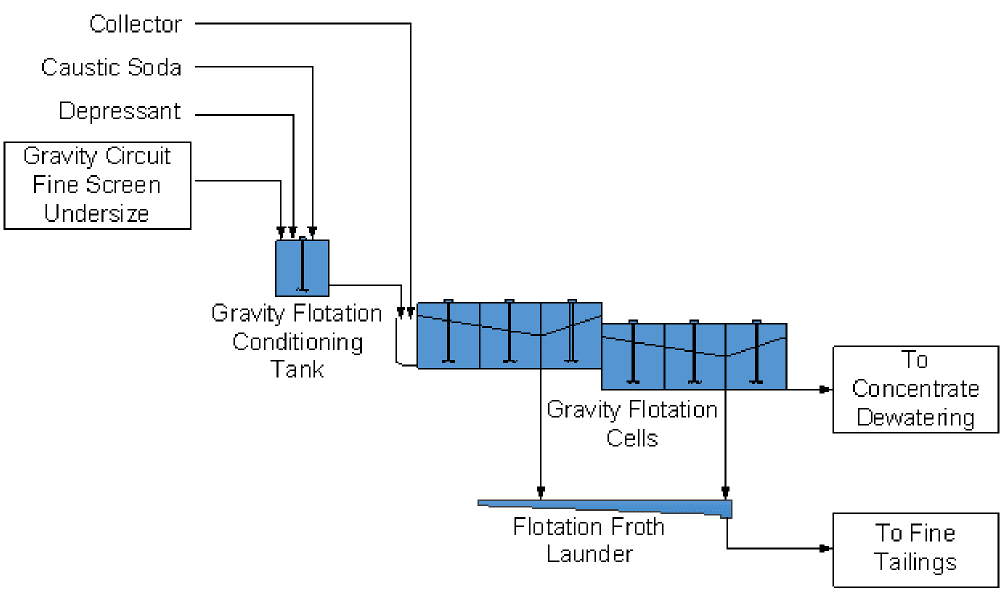
- The concentrate from the cleaner Reflux® Classifiers (Section 2.8.4.1.2) is gravity-fed to the gravity circuit fine screens, which have a screen opening of 212 microns. The oversized concentrate from the screens is conveyed to the gravity circuit tower mill for further regrinding. The undersized materials are collected and fed to the gravity flotation circuit.
- The gravity circuit tower mill operates in closed loop with cyclones to regrind the oversized concentrate. Concentrate from the mill is fed into the tower mill cyclone for particle size classification. The cyclone underflow (i.e., concentrate with coarser particles) is reprocessed back to the gravity circuit tower mill for further regrinding. The overflow (i.e., concentrate with finer particles) is redirected to the fine screens for classification.

Figure 2-17: General Process Flow Diagram of the Gravity Concentrate Regrinding Circuit



The flotation process further purifies concentrates from the gravity concentrate regrinding circuit by separating concentrate based on their hydrophobic properties (Figure 2-18). Concentrate from the gravity concentrate regrinding circuit is transported into the gravity flotation conditioning tank where iron ore depressant is incorporated into the slurry and caustic soda is added to adjust the pH. Flotation collector is added to the slurry, which makes targeted minerals hydrophobic. The reverse-flotation of the iron ore takes place in six flotation tank cells, with a nominal flotation time of 16 minutes. Silica tails are collected in the froth launder and flow by gravity in the froth pump box to the fine tailings pump box. All concentrate collected is pumped to the concentrate dewatering circuit.

Figure 2-18: Simplified Block Flow Diagram of Gravity Concentrate Flotation

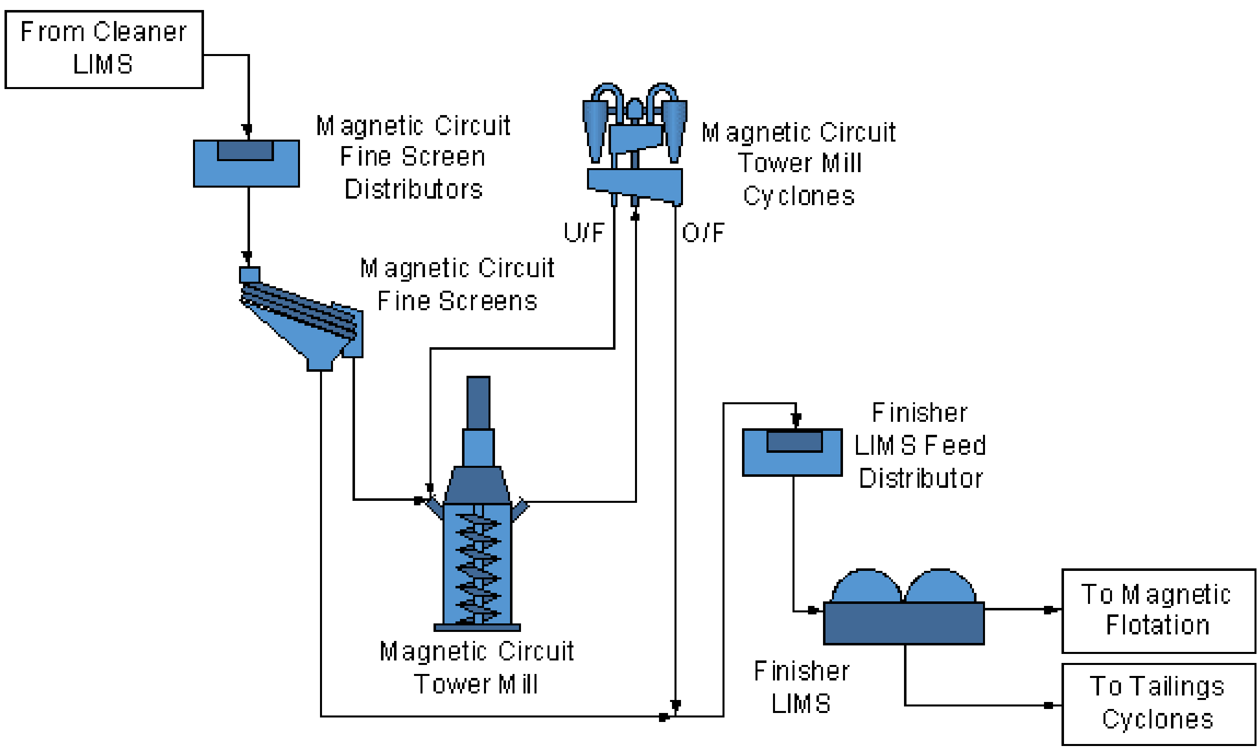


2.8.4.1.5 Magnetic Concentrate Regrinding and Flotation

Magnetic concentrate from the cleaner LIMS is classified and if required, regrounded. The magnetic concentrate regrinding circuit is summarized and presented as a process flow diagram in Figure 2-19:

- The concentrate from the cleaner LIMS (Section 2.8.4.1.3) is pumped to the magnetic circuit fine screens, which have a screen opening of 53 microns. The oversized concentrate from the fine screens is gravity-fed to the magnetic circuit tower mill for further regrinding. The undersize fraction is collected and fed to the LIMS feed distributor and finisher LIMS.
- The tower mill operates in closed loop with cyclones to regrind the cleaner magnetic concentrate. The ground concentrate is fed into the magnetic circuit tower mill cyclone cluster for particle classification. The tower mill cyclone cluster has six cyclones (five operating and one standby). The cyclone underflow (i.e., coarser materials) is sent back to the magnetic circuit tower mill for additional grinding. The overflow (i.e., finer materials) is mixed with the fine screen undersize and sent to the finisher LIMS.
- The finisher LIMS consist of four double-drum units. The concentrate is transported to the magnetic flotation circuit and the tailings are sent to the tailings cyclone cluster.

Figure 2-19: General Process Flow Diagram of the Magnetic Concentrate Circuit



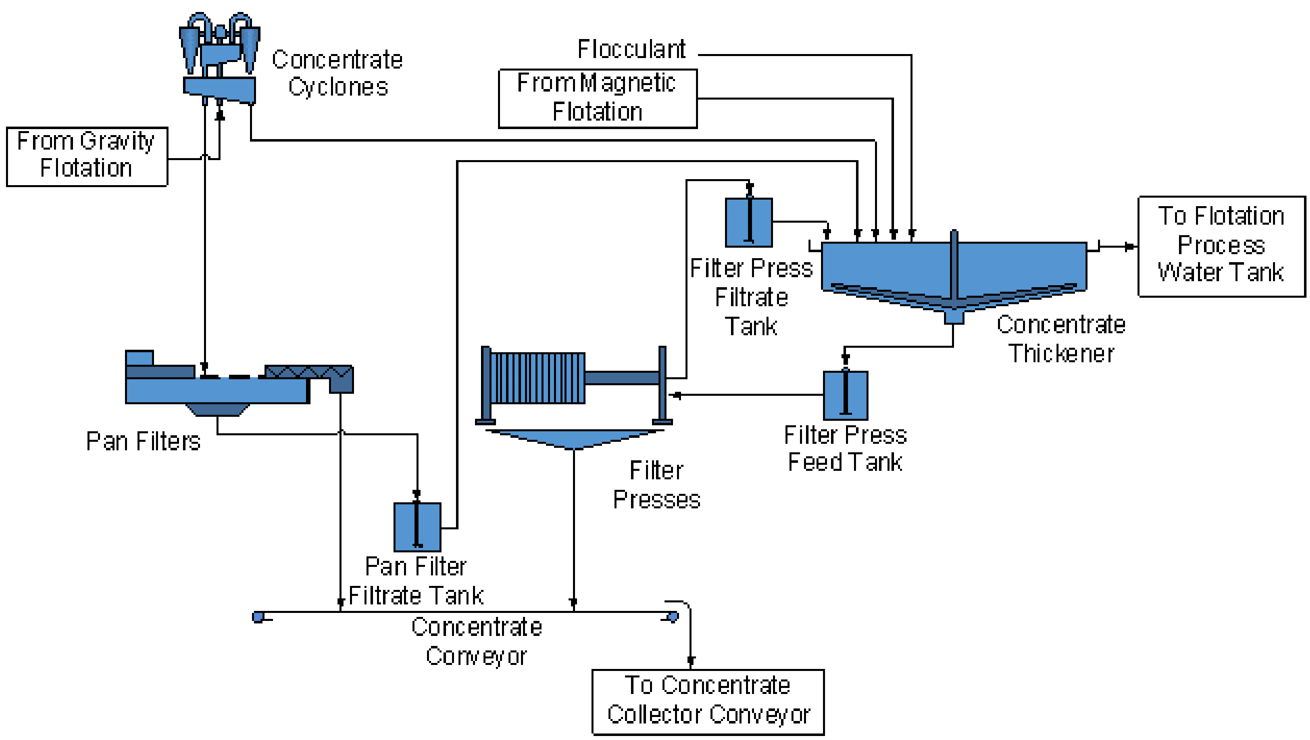
The flotation process for magnetic concentrate is similar to gravity concentrate, where concentrate processed from the magnetic concentrate regrinding circuit is further separated based on their hydrophobic properties. The finisher LIMS concentrate is gravity fed to the magnetic flotation conditioning tank, where iron ore depressant is incorporated into the slurry and the pH is adjusted with the addition of caustic soda. Flotation collector is added to the slurry, which makes targeted materials hydrophobic. The reverse-flotation of the iron ore takes place in two flotation columns arranged in series. Fine silica tails are collected in the forth launder and flow by gravity to the froth pump box and are pumped to the tailings cyclone cluster. All concentrate collected is pumped to the concentrate thickener in the concentrate dewatering circuit.

2.8.4.1.6 Concentrate Dewatering

This stage focuses on dewatering the gravity and magnetic flotation concentrates to produce a final concentrate of 4.5% moisture with steam addition and 6% moisture without steam addition. This is accomplished with cyclones, a thickener, pan filters, and filter presses. The process for concentrate dewatering is summarized and presented as a process flow diagram in Figure 2-20:

- The gravity flotation concentrate is directed to the concentrate cyclones to create an underflow (i.e., concentrate with coarser particles at a high density) for filtration with pan filters. The cyclone overflow (i.e., concentrate with finer particles) is combined with the magnetic flotation concentrate to be thickened in the concentrate thickener.
- The cyclone underflow launder is separated in four sections, with each section feeding by gravity one horizontal pan filter. Each pan filter is provided with a steam hood for steam injection during the winter months. Each pan filter has a filtrate tank to collect the filtrate. The filtrate is brought back to the concentrate thickener, which allows recovery of the concentrate in case of a filter cloth failure.
- The overflow from the concentrate dewatering cyclones and the magnetic flotation concentrate is sent to the concentrate thickener, which thickens the concentrate to 65% solids. Thickener underflow is pumped to a filter press feed tank prior to being filtered. Flocculant is added in the thickener feed box to assist the thickening process and to reduce the loss of solids to the overflow stream.
- The two filter presses further dewater the slurry to a target residual moisture content of 10%. The filter presses operate in batch conditions and filtrates flow to their respective filtrate tank before being pumped back to the concentrate thickener. This allows concentrate recovery in case of a cloth failure in the filter press.
- The final concentrate from the pan filters and filter press is accumulated on the concentrate conveyor at an average 4.5% moisture and transferred to the concentrate load-out.

Figure 2-20: General Process Flow Diagram of Concentrate Dewatering and Storage

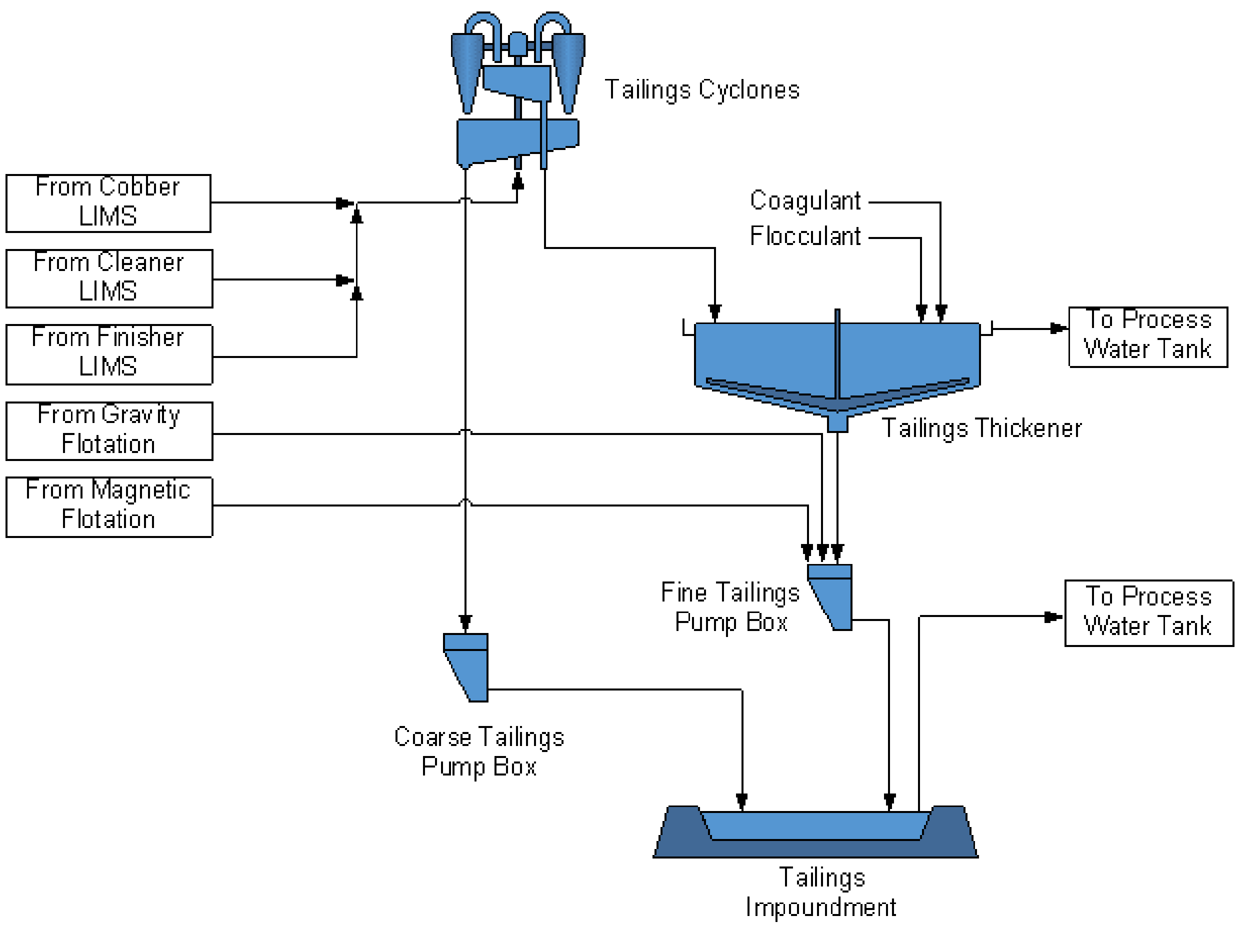


2.8.4.1.7 Tailings Thickening and Pumping Circuit

The tailings thickening and pumping circuit includes processes that help separate wastewater from solid tailings, making it easier to handle and transport for appropriate waste management. Tailings from the magnetic separation circuit are combined and treated through cyclones where they are dewatered, and coarse and fine tailings are separated. The coarse tailings (cyclones underflow) are pumped to the TMF and used for progressive dam construction. The fine tailings (cyclones overflow) are directed to a thickener where they are dewatered and subsequently pumped to the TMF and deposited based on the tailings deposition plan. The process for tailings thickening and pumping is summarized and presented as a process flow diagram in Figure 2-21.

- Tailings produced from the magnetic concentrate separation circuit (i.e., the cobber, cleaner, and finisher LIMS; Section 2.8.4.1.3) are collected in two pump boxes that are transferred to two cyclone clusters. The tailings cyclones produce an underflow (i.e., coarse tailings) that are transported to the coarse tailings pump box via gravity, before traversing through a series of pumps to aid in its transportation to the TMF.
- The overflow produced from the tailings cyclones goes through the tailings thickener, which dewaters the tailings to the desired percent solids. Flocculant and coagulant are added as part of the thickening process to reduce loss of solids to the overflow and maintain process water clarity. The thickened slurry is pumped to the fine tailings pump box and combined with gravity and magnetic flotation tailings (Sections 2.8.4.1.4 and 2.8.4.1.5). A series of fine tailings pumps transport the thickened fine tailings to the TMF. The clarified overflow from the tailings thickener is transported via gravity to the process water tank for re-use for processing.

Figure 2-21: General Process Flow Diagram of Tailings Thickening and Pumping Circuit



2.8.4.1.8 Concentrate Load-Out

Following the dewatering process (Section 2.8.4.1.6), iron ore concentrate will be conveyed over a distance of approximately 900 m from the concentrator to a concrete load-out silo with a capacity of 30,000 Mt. Iron ore concentrate from the load-out silo will be conveyed to a 550 Mt capacity surge bin, which will discharge directly into railcars. Track scales will be used to control the weight of the concentrate.

To allow operations to continue in case of full load-out silo, railway, or other problems preventing shipment, iron ore concentrate can be diverted to an emergency ore concentrate stockpile with a capacity of375,000 Mt. A concentrate reclaim system will return iron ore concentrate from the emergency ore concentrate stockpile to the load-out silo.

2.8.4.1.9 Reagents used in Concentrator

The following list includes the reagents anticipated to be used for the processes listed in the concentrator (Champion 2024):

- collector: Diamine supplied in bulk liquid
- pH modifier: Caustic soda supplied in bulk liquid
- depressant: Dextrin, supplied in bulk solids
- flocculant: Anionic supplied in bulk solids
- coagulant: PolyDADMAC supplied in bulk solids

These reagents will be prepared in a containment area containing separate reagent preparation and storage areas. Liquid reagents will be stored in the appropriate holding tanks and will be added to various circuits undiluted. Solid reagents will be mixed with fresh water to achieve required solution concentration and stored in a separate holding tank. The depressant will be prepared on site from a bulk storage silo and causticized with a mixture of water and caustic soda in a mixing tank. This will produce a gelatinized starch that will be added to respective holding tanks (Champion 2024).

2.8.4.2 Additional Processing Surface Infrastructure

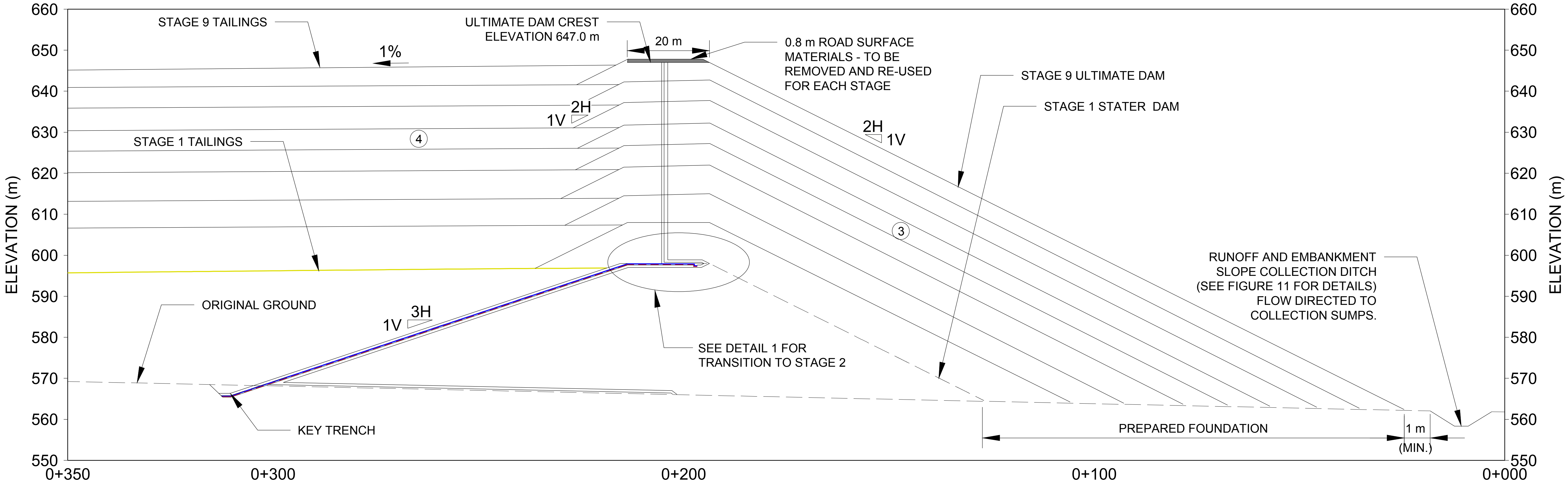
In addition to the facilities mentioned above, additional surface infrastructure associated with the concentrator includes the following:

- **Steam boiler room**–This facility will be located on the northwest corner of the concentrator. This facility will contain equipment for steam generation and other mechanical equipment (e.g., heat exchangers, pumps, air handling units and/or fire protection equipment).
- **Electrical rooms**–These facilities will be used to deliver and manage electricity to select indoor/outdoor areas of the Project site. The areas include the primary crusher, mine garage, load-out emergency stockpile, load-out silo, and train load-out.
- **Generator sets**–These generators will serve as back up power of the concentrator for select areas and critical components requiring power in case of power failure. Two 2,500 kW generator sets will be provided for the concentrator, whereas one 2,500 kW generator set will be provided for the mine garage.
- **Air compressors**–The process plant will have the proposed air compressors for the different areas of the facility:
  - three air compressors (two operating and one standby; 2,760 Nm^3/h capacity) to provide flotation process, service, and instrumentation air required for the concentrator
  - three air compressors (two operating and one standby; 3,550 Nm^3/h capacity) to provide compressed air for blowing and drying of filter presses
  - two air compressors (one operating and one standby; 110 Nm^3/h capacity) to provide compressed air for cake squeezing operations
  - three additional air compressors will also be used to supply compressed air to the crusher, mine garage, concentrate load-out, and other areas of the site, as required
- **Fresh water tank**–This tank will be used as water storage for gland seal water and service water. Fresh water for the process plant will be pumped from Duley lake, and a separate tank will be used for cooling water.
- **Process water tanks** – One process tank and a second tank for the flotation circuit to help maximize re-use of water with mixed reagents within the circuit.
- A security gate house along the east access road near the concentrator whereas one will be located in the west access road.
- A warehouse, which will be built after five years of operation to replace temporary facilities.

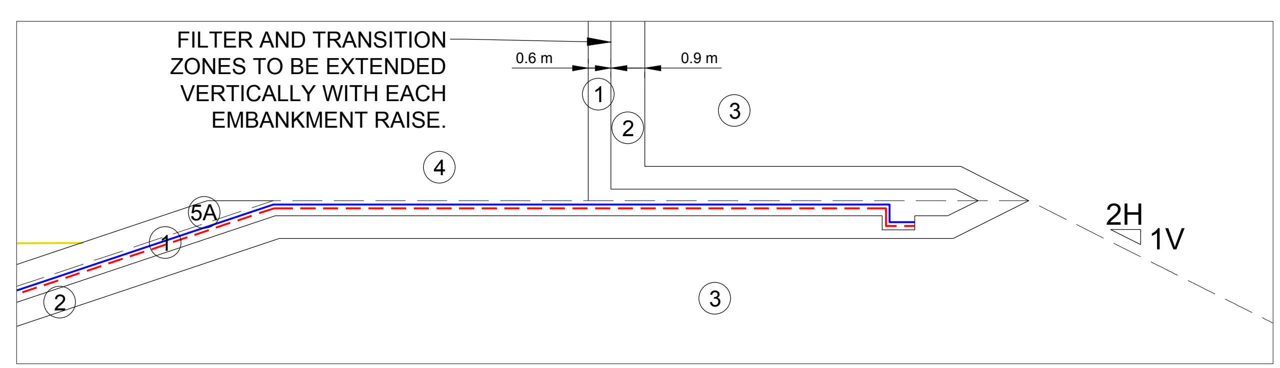
2.8.5 Tailing Management Facility

The TMF will be located east of Duley Lake, south of the process plant, and will store tailings generated during ore processing (Figure 2-4). It is estimated that the Project will produce approximately 16.6 Mt of tailings per year for a total of 420.4 Mt of tailings at the end of operations, which corresponds to a storage volume requirement of 280.3 million cubic metres (Mm^3).

The preliminary TMF design has the TMF embankments being raised in nine stages, with a starter dam representing Stage 1 for the facility (Figure 2-22). The embankments will be raised over the life of the facility with eight centreline embankment raises to accommodate tailings solids containment and water management throughout the life of mine. Embankment raises will consist of the centreline raise with the upstream shell constructed of coarse tailings. The advantages of raising by the centreline method is that it helps in effective risk management for the TMF compared to other types of dam raises. Additionally, the centreline method aligns with recent industry practices and standards, requiring more robust engineering guidelines for the TMF design. A centreline raise will also optimize materials usage. It uses coarse tailings as part of the construction fill that reduces fill placement costs and risks associated with borrow source identification for the upstream shell material. The filter and transition zones will be extended vertically, and the downstream shell will be constructed of non-acid generated mine rock. The crest of the dam will be finished with road topping material to provide vehicle access to the dam while protecting the internal zones of the dam. Based on studies and testing performed to date (Okane 2024a), the tailings have been classified as NPAG with low metal leaching potential. However, some mine rock, particularly from the Menihek Formation, are PAG. It is proposed to use NPAG mine rock in the construction of the dams for the TMF, subject to meeting physical and chemical properties specified in technical specification. Additional detail on the design of the TMF is available in TSD I: Tailings Management Facility Pre-Feasibility Level Design Report.



SCALE 1:1,000 m
VERT. SCALE 1:1,000 m
A / 11 TYPICAL TAILINGS DAM CROSS-SECTION



SCALE 1:200 m
1 / 11 TRANSITION TO STAGE 2

CONSTRUCTION MATERIALS

1. SAND (FILTER)
2. SAND & GRAVEL (TRANSITION)
3. WASTE ROCK (SHELLS)
4. COMPACTED COARSE TAILINGS
5A. WASTE ROCK (EROSION ROTECTION)
6. ROAD SURFACE
7. BACKFILL - TILL
8. 60 mil HDPE LINER
9. NON-WOVEN GEOTEXTILE

NOTE(S)

1. TYPICAL SECTION APPLICABLE TO STAGES 2 TO 9.
2. EMBANKMENT RAISES BY CENTER LINE METHOD.
3. SOUTH EMBANKMENT ESTABLISHED AT STAGE 4.
4. FOUNDATION PREPARATION TO CONSIST OF GRUBBING AND REMOVAL OF UNSUITABLE MATERIALS AND PROOF ROLLING.
5. ZONE 4 TO BE OBTAINED FROM TAILINGS BEACH.
6. WASTE ROCK TO BE PROVIDED FROM MINING OPERATIONS TO CONSIST OF HARD, DURABLE NAG ROCK.

CLIENT
CHAMPION IRON LTD.

CONSULTANT

YYYY-MM-DD	2023-12-08
DESIGNED	BP/AG
PREPARED	JG
REVIEWED	BP
APPROVED	SF

PROJECT
KAMI IRON ORE PROJECT
TAILINGS MANAGEMENT FACILITY PRE-FEASIBILITY LEVEL DESIGN

TITLE
STAGE 9 TYPICAL DAM CROSS-SECTION AND DETAILS

PROJECT NO.	CONTROL	REV.	FIGURE
22538752	0004	0	2-22

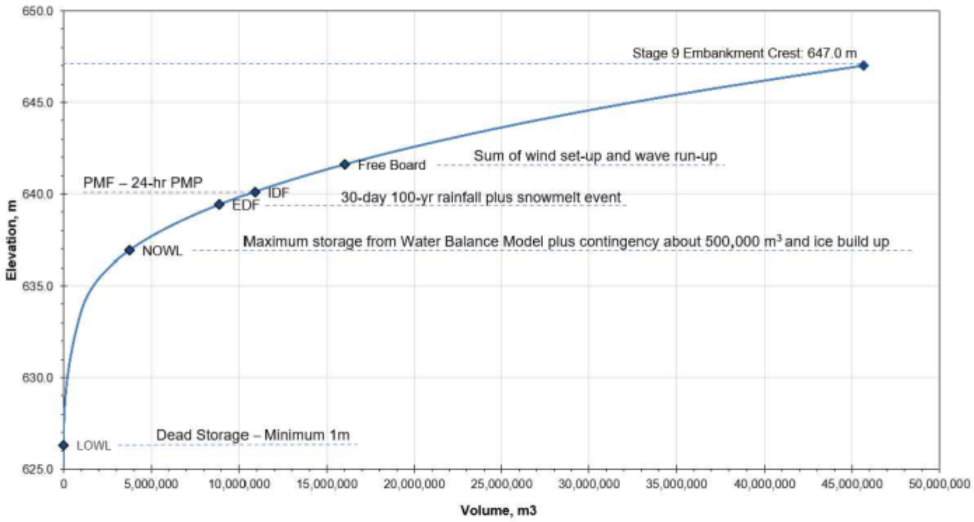
2.8.5.1 Tailings Management Facility Pond and Water Management

A supernatant pond (i.e., water that sits above solids that have settled), will be operated within the TMF for operational and stormwater management. Water will be recycled from the TMF pond to the process plant for use in the ore processing or will be discharged to the environment after treatment. Minimizing the volume of water in the TMF pond reduces risk of dam instability and seepage; however, consideration of seasonal influences and contingencies for processing water demands are required for pond sizing to ensure optimizing of water demands.

A monthly water balance was completed to identify the operational water management requirements for the TMF. The water balance was used to calculate the normal operating water level in the TMF pond. The normal operating water level volume was estimated in the water balance based on the maximum monthly water volume accumulated in the TMF pond under the average climate conditions considering pumping from sumps, the seasonal treatment pumping rates, the reclaim water requirements of about two weeks at the process plant throughout the year and an allowance for ice build-up of 2 m. The environmental design flood refers to the most severe flood that is to be managed within the facility without the release of untreated water to the environment (CDA 2013). The environmental design flood is defined as the volume of water retained between the normal operating water level and the invert of the emergency spillway for each stage. The environmental design flood event selected for the TMF Pond was the 100-year freshet (rain on snowmelt) event with a duration of 30 days. The inflow design flood is defined as the most severe inflow flood for which the facility is designed (CDA 2019). The minimum freeboard is defined as the vertical distance between the inflow design flood and the dam crest and was calculated as the sum of wind set-up and wave run-up caused by the most critical wind when the reservoir is at its maximum extreme level during the inflow design flood. Figure 2-23 presents each of the elevation and volume of the TMF pond key design levels for the facility at the end of operations.

Emergency spillways for the TMF will be commissioned, decommissioned, and re-established for each of the nine embankment stages. These emergency spillways provide increased stability protection by preventing water from overtopping the dam. The spillway for the TMF pond for each stage were designed to route storm flows resulting from the 24-hour probable maximum flood through the facility without overtopping the dam. The spillways will be established on the east side of the TMF and will be located at the south abutment for each embankment stage. Spillways will transition to an outlet channel that will direct flows away from the downstream toe of the dam. Outlet channels will discharge into a stilling basin (i.e., energy dissipation pad) to reduce flow velocities and erosion potential. In the unlikely event that a spillway becomes active, water discharging from the stilling basin will flow towards Riordan Lake as overland flow. Run-off and seepage collection ditches will be constructed along the toe of the perimeter dam in the TMF. The water collected in the ditches will be directed to sumps strategically established at topographic low areas around the perimeter of the TMF alignment. The water collected in the sumps will be pumped back to the TMF with a pump and pipeline system. The ditches will be established downstream of the downstream toe of the ninth stage so that relocation of the ditches is not required as part of the dam raising.

Figure 2-23: TMF Pond – Key Design Levels End of Stage 9



STAGE 9 STORAGE
SCALE N.T.S.

NOTE(S)

1. DEAD STORAGE REQUIRED FOR PUMP OPERATIONS OR SEDIMENT STORAGE.
2. NOWL: BASED ON AVERAGE WATER BALANCE RESULTS + CONTINGENCY WATER SUPPLY OF 500,000 m3 (ABOUT 2 WEEKS OF WATER REQUIREMENTS) + ALLOWANCE FOR ICE BUILD UP OF 2 m.
3. EDF LEVEL: 30-DAY 100-yr RAINFALL PLUS SNOWMELT EVENT.
4. IDF LEVEL: PMF - 24-hr PMP
5. MINIMUM FREEBOARD: SUM OF WIND SET-UP AND WAVE RUN-UP.

CLIENT
CHAMPION IRON LTD.
CHAMPION IRON

CONSULTANT
wsp

YYYY-MM-DD	2023-12-08
DESIGNED	BP/AG
PREPARED	JG
REVIEWED	BP
APPROVED	SF

PROJECT
KAMI IRON ORE PROJECT
TAILINGS MANAGEMENT FACILITY PRE-FEASIBILITY LEVEL DESIGN

TITLE
TMF POND - KEY DESIGN LEVELS END OF STAGE 9

PROJECT NO.	CONTROL	REV.	FIGURE
22538752	0004	0	9

2.8.5.2 Dam Classification

The dam safety program established in Newfoundland and Labrador requires that dams must be designed, operated, and maintained to meet the requirements of the Canadian Dam Association (CDA) Dam Safety Guidelines (CDA 2013). In accordance with the dam classification methodology presented in the CDA Dam Safety Guidelines (CDA 2013), the proposed TMF dams are classified as having a "Very High" consequence of failure to ensure proper classification for operations and to meet potential closure conditions. The design of the TMF was carried out to meet the minimum allowable factors of safety under static and pseudo-static loading conditions recommended in the CDA Dam Safety Guidelines (CDA 2013). The Dam Safety Plan (Annex 5B) presents dam classifications based on the CDA, a proposed dam management plan, a preliminary map of potential zones affected by dam break, and a preliminary assessment of potential credible failure modes of each water and tailings management infrastructure involved in the Project.

2.8.6 Water Management Infrastructure

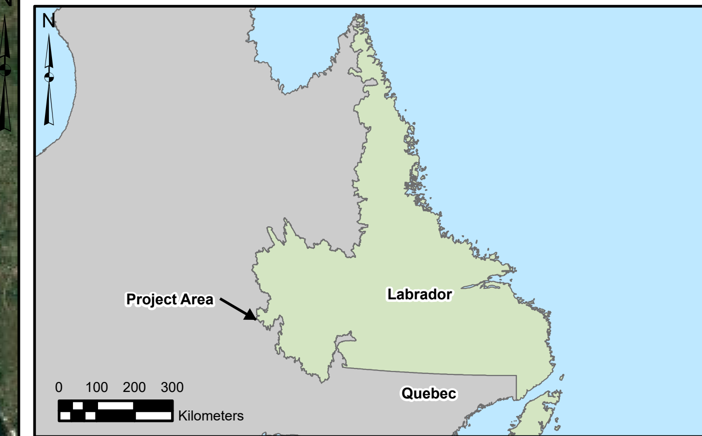
2.8.6.1 Overview

The proposed water management infrastructure for the Project includes the following key components:

- A collection pond (referred to as the Rose Pit collection pond) south of the Rose Pit within End Lake and Elfie Lake. Two dams will be built to support the Rose Rit collection pond.
- A diversion dam upstream of Rose Pit (referred to as the Mid Lake Dam) to facilitate the diversion of clean non-contact water around the Rose Pit and to Pike Lake.
- A dike to maintain separation between Pike Lake and the Rose Pit, referred to as the Pike Lake dike.
- Contact water collection ponds surrounding the overburden stockpile and mine rock stockpile with pumping stations to facilitate the collection and diversion of contact water from the stockpiles to the Rose Pit collection pond.
- Clean non-contact water perimeter diversion ditches around the Rose Pit collection pond.
- Perimeter contact water collection ditches around the overburden stockpile, mine rock stockpile, TMF and other Project facilities.
- TMF and associated infrastructure, including dam embankment seepage collection and TMF pond pump back systems, and process plant water reclaim systems within the TMF pond.
- Process plant and associated infrastructure including the fresh water intake from Duley Lake and the WTP.
- Effluent discharge pipeline and diffuser within Duley Lake to manage discharge from the Rose Pit collection pond and the WTP
- Pumping system to convey water from Duley Lake to Pike Lake to maintain water levels in Pike Lake during operations.
- Ten collection basins scattered along the main road to manage contact water related to roads and material storage on site.

Water management infrastructure is presented in Figure 2-24 and described in greater detail in the following sections. Details on the WTP are presented in Section 2.8.6.9. Additional design details on all water management infrastructure are available in TSD II: Water Management Infrastructure Design Report.

KEY MAP



SCALE 1:20,000,000

LEGEND

- PROPOSED PUMPING STATION
- PROPOSED INFRASTRUCTURE
- LABRADOR/QUEBEC BOUNDARY
- PROPOSED SEDIMENTATION POND
- PROPOSED BASIN
- PROPOSED DAM/DIKE
- PROPOSED PROJECT INFRASTRUCTURE
- SITE STUDY AREA (SSA)

0 0.75 1.5 3

1:85,000 KILOMETRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

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

CLIENT

CHAMPION IRON MINES LTD.

PROJECT

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

TITLE

WATER MANAGEMENT INFRASTRUCTURE

CONSULTANT

Kami

YYYY-MM-DD	2025-06-30
DESIGNED	----
PREPARED	MS
REVIEWED	JC
APPROVED	TS

PROJECT NO.	CONTROL	REV.	FIGURE
CA0038713.5261	0025	0	2-24

2.8.6.2 Rose Pit Sump Pumps and Diversion Ditches

A pumping system will be installed at the bottom of Rose Pit for pit dewatering, management of pit wall run-off and pit infiltration. Two permanent sump pumps located within Rose Pit are proposed to manage the contact water before it is pumped to the Rose Pit collection pond. Diversion ditches will be excavated at the perimeter of Rose Pit, adjacent to the on-site access road. The ditches will be lined with geotextiles and will convey clean (i.e., non-contact) water towards Mills Lake, Mid Lake, and Pike Lake South.

2.8.6.3 Rose Pit Collection Pond

The Rose Pit collection pond will be built within the existing Elfie Lake and End Lake. Two dams will be built for this purpose; a 19 m high dam will be built on the west side of Elfie Lake, and a 12 m high dam will be built on the east side of End Lake. Both dams will be constructed with compacted NPAG mine rock and the upstream slope will be sealed with a high-density polyethylene (HDPE) geomembrane. The pond created with the construction of the two dams will have a 4 Mm^3 capacity. Diversion ditches will be built on the north side of Elfie Lake and End Lake so that any non-contact run-off water will be diverted towards Mid Lake to the west and Mills Lake to the east. A pumping system will be used to pump water over a 6.5 km distance to the WTP, located within the Process Plant. This system will be in function continually for 12 months a year to transfer run-off and infiltrated water from the Rose Pit.

2.8.6.4 Mid Lake Dam

A 5.5 m high dam will be constructed at the outlet of Mid Lake to stop and divert non-contact water run-off from the Rose Pit upstream. The dam will be constructed with compacted NPAG mine rock and the upstream slope will be sealed with an HDPE geomembrane. A pumping system will be used to pump water over a 3.7 km distance to transfer the non-contact water to Pike Lake South.

2.8.6.5 Pike Lake Dike

The Pike Lake dike will be built at the southern end of Pike Lake South to empty the most southern part of the lake that is situated adjacent to Rose Pit. The Pike Lake dike will improve pit wall stability, mitigate risk of overflow from Pike Lake into Rose Pit and will function as a buffer to mitigate potential inflows from Pike Lake to the pit.

The pumping system used for dewatering Rose Lake during construction will be relocated and used to maintain dewatered conditions on the south side of the Pike Lake dike. The Pike Lake dike will be built with compacted NPAG mine rock. An above ground HDPE pipeline will be used to return non-contact water from the Pike Lake dike to Pike Lake.

2.8.6.6 Overburden Stockpile Collection Pond

The overburden stockpile collection pond will be constructed with a 5 m deep excavation and 2 m high dike. The dike will be constructed with compacted till from the excavation, and the upstream slope of the dike and bottom of the pond will be sealed with an HDPE geomembrane. Catchment ditches will be built on the perimeter of the overburden stockpile to direct contact run-off and seepage to the collection pond. A pumping system will be used to pump contact water through an above ground HDPE pipeline over a 4.2 km distance to the Rose Pit collection pond.

2.8.6.7 Mine Rock Stockpile Collection Ponds

Three collection ponds have been designed to manage run-off contact water from the mine rock stockpile. Collection ponds will be constructed in cut and fill with dike varying from 7 to 10 m, using compacted till from excavation and compacted NPAG mine rock. The upstream slope of the dams and bottom of the ponds will be sealed with an HDPE geomembrane. Catchment ditches will be built on the perimeter of the mine rock stockpile to direct contact run-off and seepage to the collection ponds.

A pumping system will be used to pump contact water from the collection ponds to the Rose Pit collection pond. The pipelines will report to the collection pond located north of the mine rock stockpile, and water will be pumped from this collection pond using above ground HDPE pipelines into the Rose Pit collection pond for management and treatment. Contact water from the mine rock stockpile may also be sent to the process plant for reclaim and/or treatment.

2.8.6.8 Site Run-off Collection Basins

Ditches have been designed along the edges of all mine facilities, access roads, and around building pads to allow rainwater to flow via gravity into the closest site run-off collection basin, where it would eventually be pumped into the closest collection pond or into the TMF for treatment and further discharge. Each collection basin would be located in a natural low point to minimize the number of pumps required to manage precipitation and run-off into the treatment plant. Each collection basin is summarized below:

- Basin #0 collects run-off from the ore stockpiles (Section 2.8.2.2) on the east shore of Pike Lake.
- Basins #1 and #2 collect run-off from the primary ore crushing station, ore stockpiles, and the surrounding roads into the Rose Pit collection pond.
- Basin #3 drains the mine service area, while Basin #4 drains the aggregate plant and the haul road west of Waldorf River bridge into the northern mine rock collection pond to then be pumped into the Rose Pit collection pond.
- Basins #5 and #6 drain the road between Waldorf River bridge and the concentrator.
- Basins #7 and #8 drain the crushed ore stockpile, process plant and emergency ore concentrate stockpile.
- Basin #9 drains the road between the concentrator pad and the rail line. These basins are then pumped into the TMF.

2.8.6.9 Water Treatment Plant and Effluent Discharge

A WTP may be required to treat water coming from the Rose Pit collection pond and TMF. Total suspended solids are the parameters of interest that may require treatment to achieve compliance, prior to discharge into Duley Lake. Mitigation of total suspended solids may also be achieved within the Rose Pit collection pond. It is assumed that water received from the TMF for re-use in the process will not need any treatment before being returned to the process plant.

Excess water from the Rose Pit collection pond and TMF will discharge as effluent into Duley Lake via a diffuser. All effluent will be tested to meet MDMER requirements prior to discharge. The proposed diffuser location and design is expected to be similar to the diffuser location and design presented in the EIS of the previous owner (Alderon 2013). The location of the diffuser is estimated to be 625 m from shore with a local water depth of 14 m. This location was selected to ensure enough water column depth is available for effective dilution of effluent discharge and to minimize the length and cost of an outfall pipe. The selected diffuser configuration is summarized in Table 2-6.

Table 2-6: Summary of Diffuser Parameters

Parameter	Values
Port diameter (mm)	125
Port exit velocity (m/s)	0.98 to 7.9
Number of ports	6
Length of the diffuser (m)	75
Port spacing (m)	15
Port height (m)	1.0
Vertical angle of port (°)	30

Notes:
mm = millimetre; m = metre; ° = degree.

The effluent discharged from the WTP to Duley Lake shall comply with the following regulations:

- *Newfoundland and Labrador Environmental Control Water and Sewage Regulations* (NL Reg. 65/03)
- *Metal and Diamond Mining Effluent Regulations* (SOR/2002-222)
- *Wastewater Systems Effluent Regulations* (SOR/2012-139)

In terms of quantity, the WTP shall have the capacity to treat the maximum flowrate pumped from the Rose Pit collection pond during the life of mine, in addition to the maximum flowrate from the TMF. A capacity of 5,000 m^3/h for the WTP is currently estimated will be optimized through detailed design.

2.8.6.10 Duley Lake to Pike Lake Water Diversion

Water will be pumped from Duley Lake and discharged to Pike Lake to maintain water levels in Pike Lake during the Operations and Maintenance phase. A pumping system capable of operating 12 months a year will be installed in Duley Lake and 6.2 km of pipeline will be necessary to convey water to Pike Lake.

Champion is currently assessing the possibility of diverting water from Mills Lake to Pike Lake, rather than Duley Lake. This evaluation is in progress, and a decision on the water management strategy will be made as the Project's feasibility study advances.

2.8.7 Borrow Source Material

Glacial till will be used for construction of the TMF, and is the dominant surficial material mapped within the area of the Project, and much of the till is considered to be more than 3 m in thickness. The following three areas (Figure 2-25 and Figure 2-26) were identified as potential borrow sources of till within 5 km of the TMF:

- within the proposed TMF, with an area of approximately 722.4 ha
- west of the Waldorf River and Waldorf River esker, with an area of approximately 342.0 ha
- northeast of the proposed TMF and south of Elephant Head Lake, along the proposed access road/railway; an area of approximately 158.4 ha

Four areas of glaciofluvial/esker deposits (i.e., sand and gravel) have been mapped within the area of the Project. The following three areas (Figure 2-25) were identified as potential borrow sources for glaciofluvial/esker deposits:

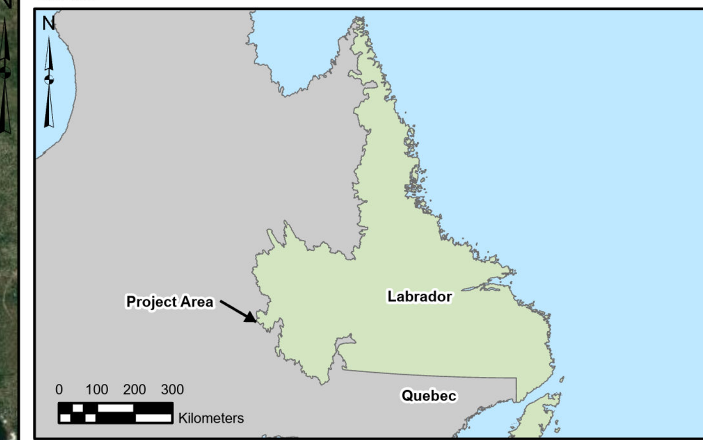
- within the Waldorf River esker on the west side of the Waldorf River, with an area of approximately 144.3 ha
- within a small area northwest of the proposed TMF and northeast of the Waldorf River, with an area of approximately 15.7 ha
- within the proposed Rose Pit, with an area of approximately 19.7 ha
- within the southwest of the proposed TMF and east of the Waldorf River. The confidence level in this area is lower as there is currently no borehole or field data to confirm the extent and texture of the material in this area. An area of approximately 49.5 ha has been identified

Bedrock outcrops for concrete and construction materials are not common within the study area but areas where the surficial sediments are considered to be less than 1 m in thickness overlying bedrock have also been included as potential quarry sources. The following areas (Figure 2-25 and Figure 2-26) were identified as potential quarry sources within the area of the Project:

- within the proposed Rose Pit and south of the proposed Rose Pit collection pond, with an area of approximately 16.8 ha
- at the western edge of the TMF, with an area of approximately 23.4 ha
- at the southwest edge of the TMF, with an area of approximately 7.2 ha
- at the southwest edge of the TMF, with an area of approximately 13.3 ha

Not all of these potentials borrow source areas will be developed for the Project, and it is currently anticipated that borrow source material located within proposed infrastructure (Rose Pit and TMF) will be sufficient for construction of the Project. Additional details on borrow source requirements for construction is presented in Section 2.9.1.3.

KEY MAP



SCALE 1:20,000,000

LEGEND

- PROPOSED PUMPING STATION
- PROPOSED INFRASTRUCTURE
- LABRADOR/QUEBEC BOUNDARY
- PROPOSED SEDIMENTATION POND
- PROPOSED BASIN
- PROPOSED DAM/DIKE
- PROPOSED PROJECT INFRASTRUCTURE
- SITE STUDY AREA (SSA)

0 0.75 1.5 3
1:85,000 KILOMETRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

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

CLIENT
CHAMPION IRON MINES LTD.

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

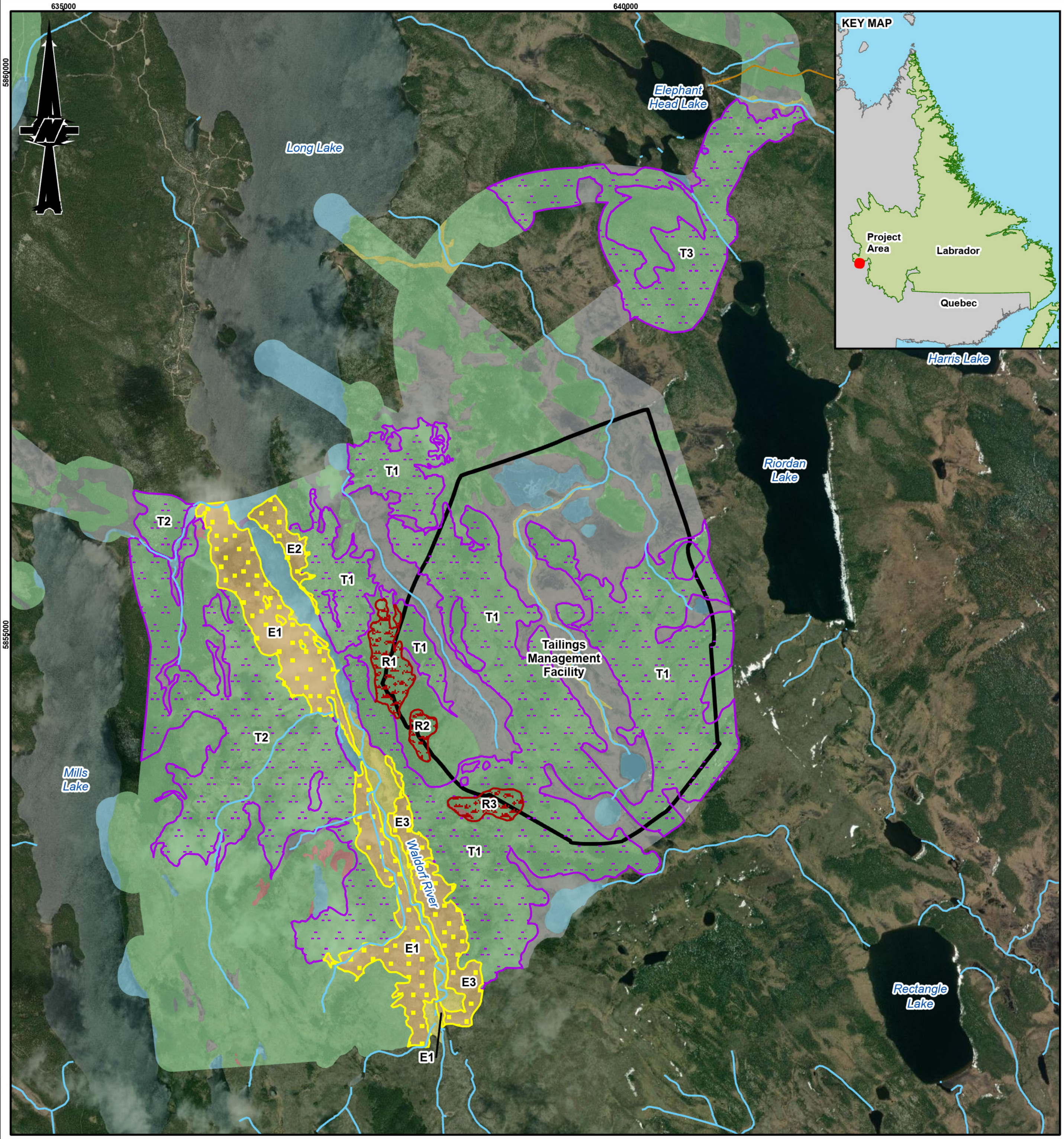
TITLE
WATER MANAGEMENT INFRASTRUCTURE

CONSULTANT

YYYY-MM-DD	2025-06-30
DESIGNED	----
PREPARED	MS
REVIEWED	JC
APPROVED	TS

PROJECT NO.	CONTROL	REV.	FIGURE
CA0038713.5261	0016	0	2-25

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



LEGEND

- ROAD
- WATERCOURSE
- GLACIOFLUVIAL SEDIMENT
- POTENTIAL BEDROCK QUARRY SOURCE
- TAILINGS MANAGEMENT FACILITY
- TILL OVERBURDEN DEPOSIT

DOMINANT SURFICIAL MATERIAL

- BEDROCK (R)
- FLUVIAL (F)
- GLACIOFLUVIAL (FG)
- LACUSTRINE (L)
- MORAINAL (TILL)(M)
- WATERBODY (N)
- ORGANIC (O)

0 1,000 2,000

1:50,000 METRES

REFERENCE(S)

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PROJECTION: UTM ZONE 19 DATUM: NAD 83

CLIENT
CHAMPION IRON MINES LTD.

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

TITLE
POTENTIAL BORROW SOURCE AREAS NEAR THE TAILINGS MANAGEMENT FACILITY

CONSULTANT

Kami

YYYY-MM-DD	2025-06-30
DESIGNED	----
PREPARED	AB
REVIEWED	JC
APPROVED	TS

PROJECT NO.	CONTROL	REV.	FIGURE
CA0038713.5261	0016	0	2-26

25mm

2.8.8 Roads

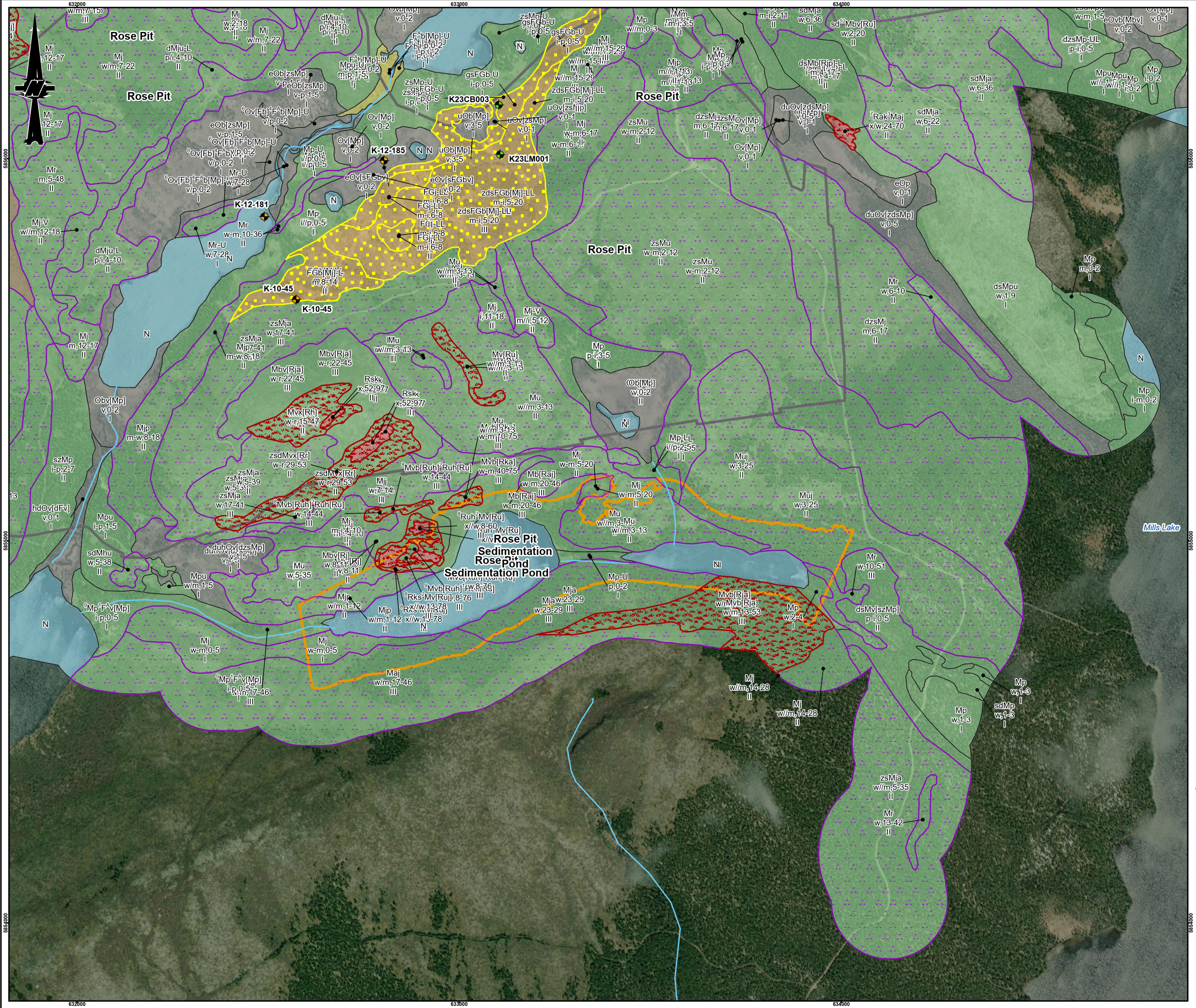
2.8.8.1 Access Roads

Access roads are those located outside of the mine site and facilitate access to the site from Labrador West communities. There are two new access roads proposed for the Project, the east access road and west access road. The west access road will facilitate initial access to the site at the initial stages of construction and will be maintained during the remaining Project phases to act as a secondary access point. Once built, the east access road will be used to provide the main access to the site during all Project phases.

The west access road will provide site access, specifically to the Rose Pit and overburden stockpile to facilitate the development of the Rose Pit quarry during construction. These borrow materials will be used for construction, including construction of the Waldorf River bridge and east access road. The west access road has a proposed length of 5.1 km and a width of 10.5 m from Highway 500 south and passing west of Pike Lake south within the existing boundary of the Duley Lake Provincial Park. This alignment differs from the alignment presented in the Project Registration, based on feedback received through consultation with Duley Lake cabin owners and residents (**Chapter 22, Engagement**).

The east access road will be a new road, which will have a proposed length of 8.9 km and width of 10.5 m, from Highway 500 south, passing west of the Town of Wabush to the Kami site. The access road will be within the same corridor alignment as the transmission line and railway line. This alignment differs from the alignment presented in the Project Registration, as the current alignment now avoids the Wahnahnish Lake Public Water Supply Area. Presently, only a potential area for the alignment has been determined; for the purposes of the EIS, the centreline of this assessment area has been assumed as the alignment of the access road. It is currently proposed that supplies such as diesel will be transported to site by truck, using this access road. Gated guardhouses are proposed to control access to the facilities from both access roads.

Preliminary route alignments for both roads are illustrated in Figure 2-27. Additional information on the selected alignments is presented in Chapter 3. Design of the access road alignments are preliminary, and Champion will further refine the access road alignments as the Project advances through subsequent stages of engineering.



LEGEND

- DRILL HOLE
- SOIL SITE
- CONTOUR (40m INTERVAL)
- PROPOSED POND
- WATERCOURSE
- GLACIOFLUVIAL SEDIMENT
- POTENTIAL BEDROCK QUARRY SOURCE
- TILL OVERBURDEN DEPOSIT
- PROPOSED INFRASTRUCTURE

DOMINANT SURFICIAL MATERIAL

- BEDROCK (R)
- FLUVIAL (F)
- GLACIOFLUVIAL (FG)
- MORAINAL (TILL)(M)
- WATERBODY (N)
- ORGANIC (O)

Terrain Polygon Label

szcMbv[Ru]-LV
m // i,6-8
II

- soil texture
- surficial material
- surface expression(s)
- underlying material
- underlying surface expression
- geomorphological process
- drainage
- drainage separator
- percent slope
- terrain stability class

INDEX MAP

0 250 500

1:10,000 METRES

REFERENCE(S)
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PROJECTION: UTM ZONE 19 DATUM: NAD 83

CLIENT
CHAMPION IRON MINES LTD.

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

TITLE
POTENTIAL BORROW SOURCES NEAR ROSE PIT

CONSULTANT

YYYY-MM-DD	2025-06-30
DESIGNED	----
PREPARED	AB
REVIEWED	JC
APPROVED	TS

PROJECT NO.	CONTROL	REV.	FIGURE
CA0038713.5261	0016	0	2-27

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

2.8.8.2 On-Site Roads

On-site roads consist of roads for light vehicle traffic (i.e., pick-up trucks), haul roads for heavy vehicle traffic (i.e., mining haul trucks and equipment) and multi-purpose roads which will be used by both light and heavy vehicles. Site access roads extend from the northeastern end of the mine site to the southwest portions, providing access to the various areas of the site.

Haul roads will connect the Rose Pit to the primary ore crusher station, the overburden stockpile, the mine services area, the mine rock stockpile and the TMF. A road around Rose Pit, referred to as the ring road, will be developed to facilitate access to the Mid Lake dam and Rose Pit collection pond. The ring road embankment will be constructed with NPAG rockfill. The road structure will have a 1 m thickness of mine rock, sand and gravel material.

2.8.9 Railway Line

A newly constructed railway, referred to as the Kami railway line, will be developed to connect the mine south of Wabush to the QNS&L Railway line, north of the Wabush Airport. The proposed Kami railway line will be 17.6 km single track that connects the QNS&L line to the Project and will include a 7.2 km loading loop at the mine site as well as additional tracks for train car storage. The loading loop is designed to accommodate 240-car trains, which will be loaded in the Concentrate Load-out (Section 2.8.4.1.8). It is currently proposed that the railway will not be used to transport supplies to the site, such as diesel and these supplies will be transported to site by vehicle.

The possible locations where the alignment crosses existing roads are expected to provide access to rail vehicles for inspections and maintenance. For the last 10.6 km of alignment towards the loading loop where no existing access is possible, the railway will align with the eastern access road until the road diverges to the worker accommodations and process plant while the railway continues on through the railway loop (Figure 2-28).

Loaded trains will travel south on the Kami railway line to connect directly to the QNS&L. Once the loaded trains reach the Chemin de fer Arnaud at the Arnaud Junction interchange near Sept-Îles, Québec, the Société Ferroviaire et Portuaire de Pointe-Noire (SFPPN) will take over the operation of conducting the loaded train to the Pointe-Noire Terminal. Once unloaded, the empty trains will return to the Project site, travelling northbound on the Chemin de fer Arnaud and QNS&L railways, back to the Kami railway line. Any additional infrastructure or track upgrades to the existing Chemin de fer Arnaud and QNS&L railway tracks will be assessed and managed by the SFPPN and QNS&L through a separate approval process and is, therefore, not included as part of the Project scope for this EIS. Our service providers are responsible to monitor and mitigate the effects of their activities and deploy an action plan to meet additional capacity required for the Project.

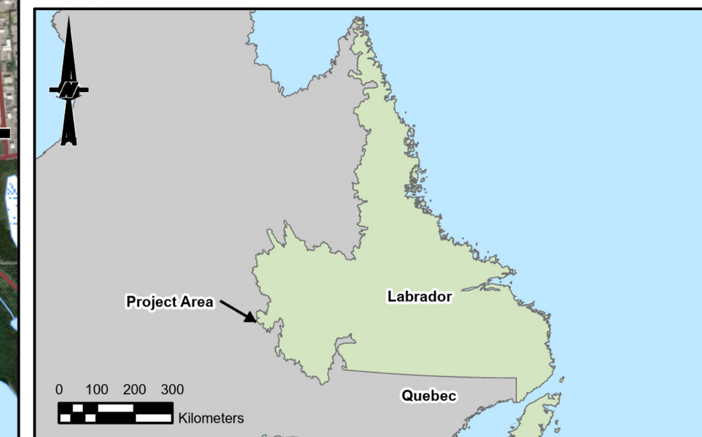
A Biodiversity Conservation Strategy has been developed by Rio Tinto IOC to address potential collisions with wildlife for their operation from the mine to port, including the main line of the QNS&L railway. The additional trains on this line will be addressed by the ongoing maintenance and mitigation measures employed to address wildlife collisions, including avoidance and response. Further details regarding the Biodiversity Conservation Strategy is provided in Appendix 2B (Rio Tinto IOC Biodiversity Conservation Strategy).

Moreover, the QNS&L is federally regulated by Transport Canada and the Canadian Transportation Agency), and as such, is designated a “common carrier” meaning they must accommodate new shipment requests even if they have to build extra capacity. A request to transport additional tonnages from the Project may trigger QNS&L to do another capacity review. Without this assessment being completed, Champion cannot assess the cumulative effects of the incremental traffic on the railway, including potential effects to species at risk such as caribou populations (migratory and boreal/woodland).

A preliminary route alignment is illustrated in Figure 2-28. This preliminary alignment was developed based on available information and considered factors such as topography of the area, access required for maintenance, visual impact, and construction cost of the Project. This alignment differs from the alignment presented in the Project Registration, as the current alignment now avoids the Wahnahnish Lake Public Water Supply Area. Design of the railway alignment is preliminary, and Champion will continue to refine and optimize the design of the railway as the Project advances through subsequent stages of engineering.

In 2011, the Government of Newfoundland and Labrador, Department of Natural Resources (DNR), retained Stassinu Stantec Limited Partnership (Stantec) to conduct an analysis of infrastructure constraints on the future development of iron resources in Labrador (Stantec 2011). Based on the anticipated future tonnes of iron ore concentrate expected to require shipment along the existing rail network, several required infrastructure upgrades were identified.

KEY MAP



SCALE 1:20,000,000

LEGEND

WATER CROSSING - ROADS

- WATER CROSSING (ROADS - PROPOSED)
- WATER CROSSING (ROADS - POTENTIAL)
- EXISTING RAILWAY
- EXISTING ROAD
- PROPOSED ACCESS ROAD AND RAILWAY CORRIDOR
- RIVER/STREAM
- POTENTIAL ACCESS ROAD
- PROPOSED ACCESS ROAD
- LABRADOR/QUEBEC BOUNDARY
- BOG/WETLAND
- WATERBODY

0 0.75 1.5 3

1:85,000 KILOMETRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

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

CLIENT

CHAMPION IRON MINES LTD.

PROJECT

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

TITLE

PRELIMINARY ACCESS ROAD ALIGNMENTS

CONSULTANT

YYYY-MM-DD	2025-06-30
DESIGNED	----
PREPARED	MS
REVIEWED	JC
APPROVED	TS

PROJECT NO.	CONTROL	REV.	FIGURE
CA0038713.5261	0016	0	2-28

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

25mm

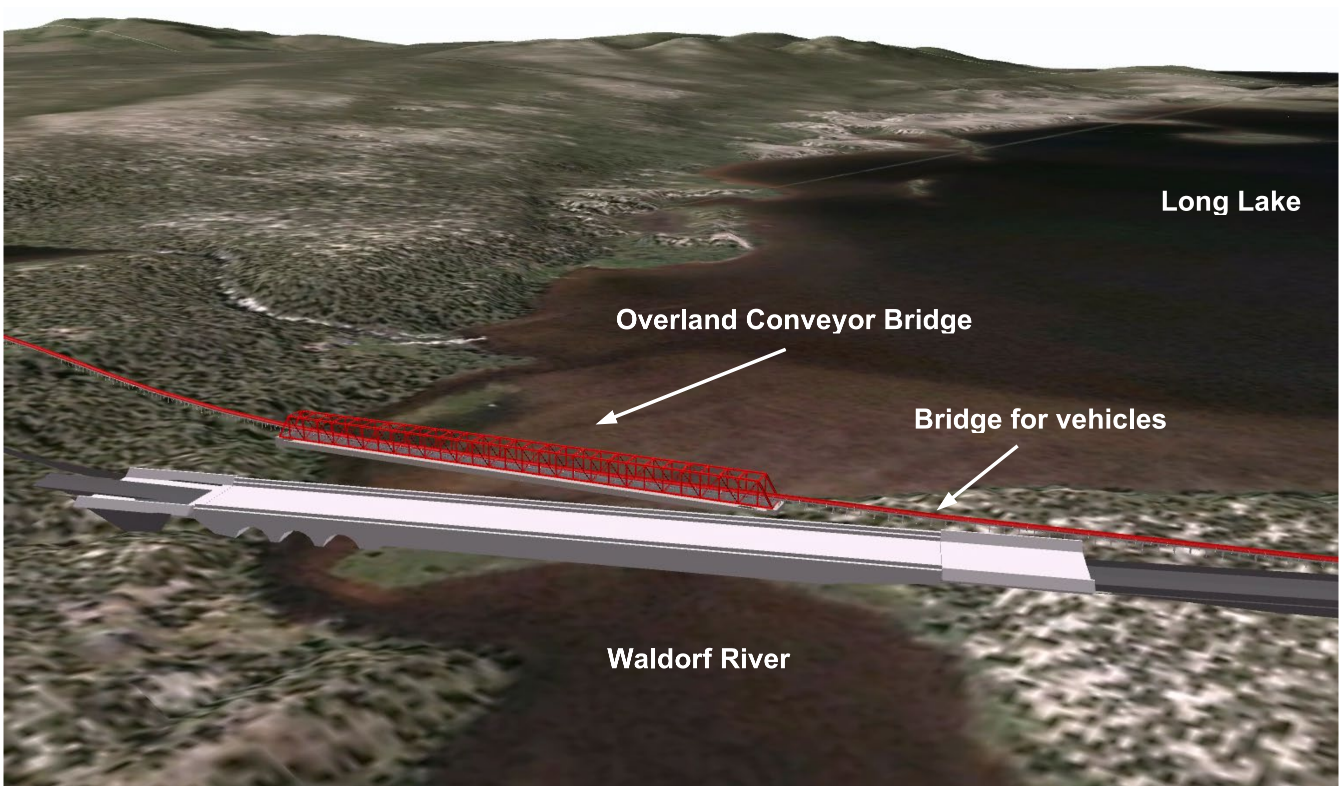
2.8.10 Water Crossings

The roads and railway line proposed for the Project will require the installation of water crossing features, depending on the planned span length and traffic volumes. As presented in Figure 2-27 and Figure 2-28, there are currently eight water crossings proposed for the access roads and nine water crossings for the railway line, as well as several water crossings within the mine site. The following information describes the types of water crossings that will be constructed.

2.8.10.1 Bridges

Two structurally independent bridges are required for the main overland conveyor and an access road to cross the Waldorf River (Figure 2-29). One bridge, referred to as the overland conveyor bridge, will provide structural support and spill containment for the main overland conveyor. The second bridge, referred to the Waldorf River bridge, is a proposed 25-m wide, single lane bridge for light and heavy on-site traffic. The bridge will be connecting the east and west portions of the site and allows mine trucks to transport mine rock to the TMF for the construction of the TMF starter dam. It is anticipated that piling will be required to support the bridge, including piles that will be installed below the high-water mark of the Waldorf River. During operations, this bridge will be used to service light vehicles and mine operation trucks.

Figure 2-29: Bridges Crossing the Waldorf River



2.8.10.2 Culverts

Culverts will be used to span small creeks and streams intersected by the access roads, on-site roads or the railway line to maintain flow and fish passage. A total of 17 culverts will be installed to cross existing water features intersected by the proposed east access road (3) west access road (5) and Kami railway line (9). Culverts will also be installed on site to allow for drainage and divert non-contact water run-off. All culverts proposed for the Project will be designed and sized to facilitate fish passage.

2.8.11 Power Supply and Distribution

Champion estimates that the electrical power needs of the Project are approximately 172 megawatts (MW). Presently, sufficient power capacity in the Labrador West region does not exist to power the Project. In November 2024, NL Hydro announced the plans to initiate the Labrador West Transmission Study (Government of Canada 2024), which explores the feasibility of an expansion of the transmission system into Labrador West from Churchill Falls and the potential economic impact of future development. The study is partially funded through Canada's Natural Resources Canada's Smart Renewables and Electrification Pathways Program. The Labrador West Transmission Study will cover several critical aspects including completion of EA requirements to assess the environmental impact of potential infrastructure developments.

Different distribution options are being analyzed by NL Hydro, but the construction and operation of a 735-kV transmission line and support infrastructure between Churchill Falls and Flora Lake is envisioned and would allow the Project to proceed. Should this Project proceed, a 315 kV transmission line would be proposed from the Flora Lake substation to the Kami substation located at the process plant to power the Project's operations. This transmission line would have a proposed length of 18.5 km and width of 100 m with a total of 57 self-supporting or guyed towers. The transmission line alignment would run from the Flora Lake transformer station, traversing west along Highway 500 before heading south, east of the airport and Wabush before traversing west to the Kami substation. The transmission line will follow existing corridors and disturbed areas, where feasible.

Through discussion with NL Hydro, it is currently proposed that both transmission lines would be considered in the scope of the EA requirements outlined in the Labrador West Transmission Study. To this end, neither transmission line is included as part of the scope of this Project and the transmission line alignment will be assessed and managed through a separate approval process. As presented in Appendix 2C (Letter from NL Hydro), additional information regarding the plans for power expansion in Labrador West will be provided to Champion following the completion of the Labrador West Transmission Study, currently planned for the second half of 2025.

2.8.11.1 Kami Substation and Local Site Distribution

The Kami substation is located on the north side of the process plant and hosts three transformers. These transformers will step-down the proposed 315 kV transmission line from the Flora Lake substation, in which the total electrical load is shared amongst the three transformers. The 34.5 kV will then be distributed using on-site transmission lines to various load centres within the Project site, where it will be further stepped down to 13.8 kV, 7.2 kV, 4.16 kV or 600 V for powering mining, process, and auxiliary loads. Three 2,500 kW generator sets will provide backup power to the plant and maintenance shop for selected process loads and critical components requiring emergency power in case of a power failure.

At the Kami site, the incoming 315 kV is stepped down to 34.5 kV using three transformers in an N-1 configuration, meaning the total load is shared among the three transformers during normal operations, but two transformers can take the whole load while one transformer is out for maintenance or repair. The 34.5 kV is collected onto an outdoor bus within the substation and is delivered to the site using outdoor circuit breakers. Power will be delivered from the main substation to the site through eight distinct feeders. Two will use buried cables to the process plant, while the other six will use 34.5 kV overhead lines.

The two cable feeders to the process plant will feed a 34.5 kV switchgear installed in the main electrical room of the concentrator. From there, the vast majority of process and auxiliary loads use 4.16 kV and 600 volts (V). The 4.16 kV is generally generated using outdoor 34.5/4.16 kV oil-type transformers of 21/28 megavolt ampere (MVA) while the 600 V comes from indoor 4.16/0.6 kV dry-type transformers of 2/2.6/3.6 MVA. Generator sets (gensets) provide backup power to the plant for selected process loads and critical components requiring power in case of a power failure. Two 2,500 kW gensets are planned for the process plant and one 2,500 kW genset is planned for the mine garage.

2.8.12 Worker Accommodations

Worker accommodations will be provided during construction and operation through the development of two on-site worker accommodations: a temporary construction camp and permanent operations camp. Both worker accommodations will be built during the Construction phase to house the peak construction and pre-development period workforce. The camps will accommodate a peak of 1,000 staff during construction and 600 during operations. A small portion of staff may be housed locally in nearby towns and will commute to the site.

2.8.12.1 Permanent Camp

In alignment with the Project Registration, the base case assumption used for the projects cost and operating models utilizes a permanent camp. Additional work is required on this assumption as the project advances towards a final investment decision. The permanent camp and its facilities will be built during Year 1 of the Construction phase. The permanent camp facilities will be built at approximately 1 km northeast of the process plant next to the main access road. The camp is designed to provide individual rooms for 600 workers and support staff. The camp will be provided with kitchen and cafeteria to fit 300 people. The camp will also be provided with its own potable and wastewater treatment systems. It is assumed that most of the operating employees will reside within the camp; however, some provisions will be made for alternate accommodation within the Towns of Wabush and/or Labrador City. Figure 2-30 presents a conceptual drawing of the permanent camp. The final design of the camp will be determined following consultation and collaboration with the local municipalities and provincial government. Design and construction of the camp will follow all applicable provincial and municipal permitting and regulatory requirements.

Figure 2-30: Concept of the Permanent Camp

2.8.12.2 Temporary Construction Camp

The temporary construction worker camp and its facilities are designed to provide an additional 400 individual rooms for workers and support staff to accommodate the peak workforce for the Project, which is expected between the last year of construction and first year of operations, when construction and operation staff overlap. It is currently anticipated that there will be a peak Project workforce of approximately 1,000 staff. The temporary construction camp will be located next to the permanent camp along the site access road. The camp will be provided with kitchen and cafeteria to fit up to 200 people at a time. The camp will also be provided with its own potable water and wastewater treatment systems.

2.8.13 Potable Water Supply

It is currently planned that there will be a peak of 600 permanent workers for the Operations and Maintenance phase, with an additional 400 workers for the Construction phase. At its peak, the camp will accommodate 1,000 workers. In addition to the camp, potable water will need to be supplied to the following buildings on site:

- **the mine service area**—115 workers on day shift/75 workers on night shift, for approximately 190 daily workers
- **the concentrator**—150 workers on day shift/100 workers on night shift, for approximately 250 daily workers
- **the crusher**—four workers on day shift and four workers on night shift, for approximately eight daily workers

Each site will draw water from their own wells and will follow requirements outlined in *NLR65/03 – Environmental Control Water and Sewage Regulations*, 2003 under the *Water Resources Act.* The following treatment chain is anticipated for potable water:

- feeding pumps
- multimedia filters for turbidity, iron and manganese removal

- UV reactors
- chlorination system
- drinking water storage tank (for all besides the crusher)
- distribution pumps

Water supply parameters for each site are summarized in Table 2-7. The very limited drinking water demand for the crusher, less than 1 m^3/d, does not require incorporation of a storage tank. The water demand will be served directly by the pump in the well. Currently, no site well drilling water characterization has been completed. For subsequent stages of engineering, professional underground research is planned to validate the characterization values and the proposed chain of treatment.

Table 2-7: Potable Water Supply Parameters

Parameters	Unit	Camp	Mine Service Area	Process Plant	Crusher
Number of users	# pers.	1,000	190	250	8
Consumption per user	L/(pers*d)	2,250	75	75	75
Average daily flow	m^3/d	250	14.25	18.75	0.6
Daily peak factor	n/a	1.5	1.5	1.5	1.5
Maximum daily flow	m^3/d (L/min)	375 (260)	21.4 (14.8)	28.1 (19.5)	0.9 (0.6)
Hourly peak factor	n/a	10	10	10	50
Hourly peak flow	L/min	1,750	100	130	31.3
Storage tank factor on daily	%	40	30	25	none
Storage tank volume	m^3	100	4.5	4.5	none

Source: BBA 2024

Notes:

= number; L/(pers*d) = litres per person per day; m^3/d = cubic metres per day; n/a = not applicable; L/min = litres per minute; % = percent.

2.8.14 Wastewater Treatment

Wastewater produced on the four sites will be treated at a wastewater treatment plant that will be constructed at the worker accommodation. Wastewater from the mine service area, concentrator and the crusher will be kept in their self assigned storage tanks to be vacuumed and transported to the worker accommodation wastewater treatment plant. In the design criteria, no volume has been estimated for the three non treated sites in addition of the allocated maximum daily flow per person because the number of persons on the total mining site will remain the same as the maximum of peak number of 1,000 workers. The capacity of the holding is anticipated to hold roughly a week at average flow. The vacuum trucks capacity is about 10 m^3, and an average of 24 trips per week will be required. Table 2-8 summarizes the wastewater flow and storage parameters.

Table 2-8: Wastewater Flow and Storage Parameters

Parameter	Unit	Values
Number of users	# pers	1,000
Consumption per user	L/(pers*d)	250
Average daily flow	m^3/d	250
Daily peak factor	n/a	1.5
Maximum daily flow	m^3/d (L/min)	375 (260)
Instantaneous peak factor	n/a	10
Instantaneous peak flow	L/min	1,750
Pumping station capacity	L/min	1,750
Vacuum truck unloading tank	m^3	30
Transfer pump (tank to pumping station)	L/min	150

Parameter	Unit	Values
Average daily flow	m^3	Mine service area: 14.25 Concentrator: 18.75 Crusher: 0.60
Weekly volume	m^3	Mine service area: 99.75 Concentrator: 131.25 Crusher: 4.20

Notes:

pers. = number of persons; L/(pers*d) = litres per person per day; m^3/d = cubic metres per day; n/a = not applicable; L/min = litres per minute.

The following treatment chain is anticipated for wastewater:

- a vacuum truck unloading headworks including a grinder, a screen, a compactor and a bagger system
- a 30 m^3 septic tank reservoir with its (1+1) 150 L/min pumps
- a 1,750 L/min pumping station including (2+1) 875 L/min pumps
- a 1,750 L/min (2 mm) screening system with a compactor, a bagger, an incorporated bypass/overflow manually raked screen of 13 mm (½ inch)
- a 75 m^3 trash tank for solids and oil & grease removal
- a 75 m^3 buffer tank
- three (2+1) trains of Bioreactors
- three (2+1) UF Membranes
- three trains of UV reactors
- a 75 m^3 sludge holding/thickening tank
- two (1+1) sludge dewatering systems; a dryness of 18% is expected

Wastewater treatment will meet the requirements of *NLR65/03 – Environmental Control Water and Sewage Regulations*, 2003 under the *Water Resources Act*. Champion has set the design criteria for wastewater effluent to meet the most restrictive standards to ensure that present and future Newfoundland and Labrador norms can be met. The high-quality discharge effluent will be discharged to a drainage ditch or channel that leads to a surface wetland or directly to a surface wetland around the worker accommodation within the site study area. Effluent design criteria are presented in Section 2.11.

2.8.15 Explosives Production and Storage

An emulsion and explosion production plant will be built and operated at a safe distance (approximately 500 m) from the mining operations. The plant will produce an estimated 30 kilotonne equivalent (kTe) of explosives per year at peak production. Raw materials for the manufacture of explosives will be transported by truck from the Town of Wabush to the plant. Explosives will be stored adjacent to the plant, at a safe distance north of the mine. Explosive accessories will be stored in a magazine located near the plant.

2.8.16 Supporting Infrastructure

The Project will also include the following supporting infrastructure:

- **The mine service area**—which will consist of a temporary megadome mine garage, workshop, warehouse, mine employee's facilities, five 79,000 L capacity diesel fuel tanks for mine operations (located near the mine garage) and one 50,000 L capacity diesel fuel tank for the 2.5 MW emergency generator. A permanent mine garage, employee facilities, workshop and warehouse will be built after five years of operation replacing the temporary facilities. The temporary megadome mine garage will be converted for use as a warehouse.
- **Two freshwater pumping stations**—one located southeast of Duley Lake, and one located at Mills Lake. The water pumped from Duley Lake will be used for freshwater requirements for various facilities, occasional make-up water, and potable water for the concentrator area. A pumping station located at Mills Lake provides service water for the crusher and mine service area.
- **The crushing plant**—will produce crushed materials to be used for blasthole stemming and road.

- **Telecommunication services**–will be provided with a 15 km fibre optic cable using the 34 kV construction and maintenance power transmission line. A satellite service will be installed and available for telecommunication services during the Construction phase and afterward as a communication link backup. Mobile communication for the mining activities will be based on a private long-term evolution in addition to public long-term evolution coverage available in this area.
- **Fire protection systems**–will be located across the mine site. Four fire protection systems will cover either the primary ore crushing station, mine service area, Process Plant and auxiliary buildings, or the concentrate load-out area. Each system contains a water tank and a diesel-powered fire water pump, except for the system covering the Process Plant, which contains an electrical pump with a diesel pump as backup.

2.9 Project Activities

The section provides a summary of the Project activities by each phase of the Project:

- Construction phase activities (Section 2.9.1)
- Operations and Maintenance phase activities (Section 2.9.2)
- Closure phase activities (Section 2.9.3)

2.9.1 Construction

The focus of the Construction phase would be to construct and commission all planned Project components required to support the commencement of production of iron ore concentrate. The construction and commissioning of the proposed Project would be completed over a four-year period utilizing up to an estimated peak of approximately 600 on-site workers (e.g., employees, consultants, contractors). Construction activities include:

- site preparation
- access road and on-site road development
- development of the Rose Pit quarry
- in-water works
- TMF construction
- construction power supply and distribution
- railway construction
- building and infrastructure construction
- transportation and storage of fuel, dangerous goods and hazardous materials

Further details on specific construction and development activities are provided below, including a summary of construction scheduling and sequencing. Construction activities will be conducted in accordance with a construction Environmental Protection Plan. An annotated table of contents for the Environmental Protection Plan is presented in Annex 5D.

2.9.1.1 Site Preparation

Site preparation involves the completion of activities to facilitate installation of mine infrastructure and includes vegetation clearing, earthworks and concrete works for the establishment of building foundations.

Vegetation clearing involves the cutting, removal and disposal of vegetation, including tress, shrubs, and plants to prepare for subsequent construction activities. All vegetation clearing will be completed in accordance with permits issued under the *Forestry Act* and *Cutting of Timber Regulations*. Vegetation will be selectively cleared in accordance with the construction sequencing. Vegetation removal will be planned to avoid sensitive migratory bird breeding seasons (May 1 to August 30) and recommended buffers around wetlands and waterbodies will be implemented, where feasible. However, if vegetation clearing is required during bird breeding season, experienced environmental monitors will conduct nest sweeps in accordance with the Avifauna Monitoring Plan (Annex 5E), inspecting areas to be cleared to avoid disturbing active nests. Where vegetation removal and tree clearing is completed within Domestic Cutting Block CC22503, Champion will consult with domestic wood cutters to evaluate opportunities to improve access to the harvested wood has presented in the Kami Engagement Plan (Annex 5G).

Earthworks involves stripping, grubbing, and excavation of unsuitable materials (e.g., organic and/or loose soils), placement of fill materials (e.g., mine rock, aggregate) and overburden and grading the land to prepare bases to support the development of infrastructure, including access roads, on-site roads, railway corridors, buildings, water management infrastructure and the TMF. Surficial organic materials (i.e., overburden) will be removed from the footprint of the Project structures before placing structural fills or concrete foundations. The Rose Pit will also be stripped of overburden material to support the development of the Rose Pit quarry (Section 2.8.1.3) and the first stage of the Rose Pit. All surficial material removed through earthwork activities that cannot be re-used during construction will be stored within the overburden stockpile.

Concrete will be required for building foundations and other elements of Project infrastructure (i.e., footings, piers, columns, walls, slab on grade, equipment foundation). Aggregate will be sourced and batched on site from a portable concrete batch plant. Concrete foundations will be built for all Project buildings and equipment storage and will consist of spread footings. Bridges for the road and conveyor crossings of the Waldorf River will require piled foundations to address the loose/soft sediment deposits within the river valleys. Ideally, concrete work in winter conditions will be minimized, preferentially with the majority of planned concrete works occurring in April or May in Construction Year 2 (Year -3).

2.9.1.2 Access and On-Site Roads

Construction of the east and west access roads will be initiated at the beginning of the Construction phase. In the first year of construction, the western access road will be built to provide access to the overburden stockpile and Rose Pit, to facilitate site preparation activities and development of the Rose Pit quarry (Section 2.8.1.3). The eastern road will continue to the Waldorf River, where the Waldorf River bridge will be constructed. The western access road will be built within the same corridor as the railway to facilitate access to the location of the proposed worker accommodation and connect with the eastern access road at the Waldorf River bridge. On-site roads will continue to be constructed as material is made available from the Rose Pit quarry and is anticipated to complete in Construction Year 3 (Year -2). Ditching and sedimentation and erosion control measures will be implemented through the development of all access and on-site roads during construction.

2.9.1.3 Aggregate and Borrow Source Material

A total of 7.4 Mm^3 of mine rock and 1.3 Mm^3 of structural fill and aggregate will be required for construction. These materials will be used for concrete production and to construct site laydowns, access roads, on-site roads, the railway and the TMF starter dam. The Rose Pit quarry will be advanced throughout the Construction phase and cover the extent of the surface footprint of the Rose Pit. A temporary aggregate plant will be built in the location of the primary ore crusher station to facilitate crushing of materials for construction, prior to the construction of the primary ore crushing station (Section 2.8.2.1) and permanent aggregate plant located just north of the mine rock stockpile (Section 2.8.3.2). A borrow pit will also be established within the TMF to support construction material needs.

It is currently anticipated that borrow source material located within proposed infrastructure (Rose Pit and TMF) will be sufficient for construction of the Project. Champion will continue to explore additional borrow source opportunities and refine quantity estimates through successive stages of engineering. A preliminary aggregate source assessment study was conducted—key findings include the following:

- Some of the mine rock from the open pit development that could be used as structural fill is PAG. These materials could be used as structural fill in the TMF, so long as sufficient and permanent water cover is provided to prevent development of poor-quality drainage.
- The near-surface bedrock, east of the Waldorf River and Duley Lake, is of poor quality with respect to its use as structural fill; however, it can be used for light structural loading conditions or for roadways, provided it is capped with a better-quality structural fill.
- A good quality rock source was encountered in a ridge northeast of the rail loop. The cost of developing rock from this quarry needs to be considered against the cost of transporting mine rock from the open pit.
- An aggregate source, an esker, was identified along the Waldorf River, south of the proposed site development. This esker formation is a source of sand and gravel that should be suitable for on-site concrete production.

2.9.1.4 In-Water Works

In-water works during construction include dewatering activities and the isolation of work areas to facilitate in-water construction of water crossing infrastructure and water management infrastructure such as bridges, dams, dikes and collection ponds. In-water works will be completed sequentially and will be managed using a combination of mitigation measures to reduce the duration of in-water works, minimize effects on the local aquatic environment and maintain conservation of lakes and rivers within the local watersheds. Mitigation measures for in-water works will include erosion and sedimentation measures including temporary settling ponds, which will be used to collect water and allow for suspended particles to settle prior to the discharge of water to the natural environment. Other measures such as sedimentation barriers, geotubes and/or silt fences will also be implemented. Planned in-water works for the Construction phase include following:

- Installation of access road of water crossing infrastructure—Isolation of work areas below the high-water mark will be required to support the installation of water crossing infrastructure along the access road, site roads and the railway.
- Waldorf River bridge—Isolation of work areas below the high-water mark and/or within Waldorf River will be required to support the installation of bridge footings and abutments.
- Mid Lake dam—Construction of the dam is needed to control surface water flow before the dewatering of Rose Lake. Mid Lake dam will require isolation of work areas below the high-water mark; however, Mid Lake itself does not need to be drained for the construction of the dam.
- Rose Lake dewatering—Water will be pumped to Pike Lake, using measures to minimize total suspended solid described above. Once the Rose Pit collection pond will be operational, dewatering will be directed to the pond.
- Rose Pit collection pond—A first stage of End Lake dam and Elfie Lake dam will be constructed before mining activities begin, to store contact water from other construction activities on the site.
- Pike Lake dike—Construction will be needed to secure the northern section of Pike Lake, which could be completed once the operation has started, depending on the mine plan sequence.

The Environmental Protection Plan (Annex 5D) will include water management strategies that are developed to meet all regulatory requirements. These water management strategies will aim to minimize the impact of construction works on the surrounding aquatic environment. The next engineering stages will better define the specific water management measures for each infrastructure.

2.9.1.5 Tailings Management Facility

The construction of the TMF will consist of a starter dam representing Stage 1 for the facility (Section 2.8.5). The TMF starter dam will comprise the northwest, west and east embankments. The south dam will be constructed as part of Stage 4 (approximately Year 10 of Operations) as the embankments are raised to accommodate tailings storage and water management, to prevent contact water from entering the Wahnahnish Lake Public Water Supply Area located to the south of the facility. Construction of the TMF will require clearing of all trees from the embankment footprints and from the extents of basin area. Foundation preparation activities will consist of stripping and grubbing, removal of unsuitable material and proof rolling.

The starter dam will use an HDPE geomembrane liner on the upstream side with zoned earthfill and non-woven geotextile to minimize seepage. The use of the geomembrane liner for the starter dam will ensure that seepage is controlled during the initial years of operations prior to establishing a tailings beach against the upstream slope. The geomembrane liner will be keyed at least 3 m into the glacial till foundation with a 2 m wide seepage cut-off key trench that will be backfilled with compacted glacial till. A transition zone and a sand bedding zone will be provided beneath the liner. Geotextile will be provided under the geomembrane for protection. The transition and bedding zones extend laterally as a filter blanket beneath the rockfill shell to prevent the migration of foundation soils into the upstream shell. A layer of road surfacing will be placed along the dam crest to allow for vehicle traffic during operations. Approximately 380,000 m^2 of geomembrane liner and 430,000 m^2 of geotextile will be required for the construction of the Stage 1 starter dam.

Vegetation clearing and earthworks or the TMF starter dam is planned for completion in Construction Year 2 (Year -3). Starter dam construction will be initiated in Construction Year 2 and will begin to store tailings starting in the first year of the Operations and Maintenance phase (Year 0).

2.9.1.6 Power Supply and Distribution

Champion will construct a 34.5 kV transmission line from the planned Flora Lake transformer station to the Project site to support construction. The transmission line will be built from the Flora Lake substation and conclude at the temporary aggregate plant following completion of the Waldorf River Bridge at the end of the first year of construction. Additional 34.5 kV transmission lines will be built on site to distribute power to site infrastructure as they are developed. For the first year of construction as the Waldorf River Bridge and 34.5 kV transmission line from Wabush are being developed, seven diesel gensets will be used to power construction and construction activities.

The permanent 315 kV transmission and Kami substation that will be used to support power requirements for operations are expected to be built prior to the completion of the last year of construction. Once the permanent 315 kV transmission line and Kami substation are built, the 34.5 kV transmission line from Flora Lake transformer station to the site will be decommissioned, while the 34.5 kV transmission lines on site will be used to support on-site power distribution.

2.9.1.7 Buildings and Infrastructure

Erection of mine buildings (i.e., process plant, mine services area) and infrastructure, including the overland conveyor and in-pit crusher and conveyor are anticipated to start near the end of Construction Year 2 (Year -1). The crusher and process plant buildings are anticipated to be erected by the middle of Construction Year 2 (Year -3), with most of the equipment installation inside the process plant and the crusher takings place in Construction Year 3 (Year -2). Mechanical installation of the overland conveyor will be start in construction Year 3 (Year -2) and will be completed and commissioned prior to pre-development mining. The remaining mechanical installation will be for the in-pit crusher and conveying system, which is anticipated to be completed by the end of pre-development mining (Year 0).

2.9.1.8 Railway

The railway between the connection point in Wabush and the Kami site will use most of the same corridor cleared for the access road and transmission line. Vegetation clearing, earthworks and construction of the railway loop are anticipated to start and be completed within Construction Year 3 (Year -2). For the purposes of the EIS, it is assumed that all fuel, hazardous materials and other consumables will be delivered to site by truck; however, Champion will explore the opportunity to provide certain materials by rail during the Construction phase as part of future stages of engineering. No fuel, dangerous goods or hazardous materials will be transported by rail.

2.9.1.9 Transport and Storage of Fuel, Dangerous Goods, and Hazardous Materials

Fuel and materials required for Project construction will be shipped to site by truck via the access road. During construction, an average of approximately 20 delivery vehicles per day on the access road is anticipated. Materials will be sourced locally where practicable. Some specialized equipment will need to be sourced from outside the province/country.

Diesel for construction will be stored within the mine services area, where the diesel fuelling station will be located. Separate diesel tanks may be located at the process plant or TMF to support their construction. A gasoline filling station with a tank capacity of 50,000 L will be installed near the process plant for light vehicles. Champion will follow all applicable requirements for waste management in Newfoundland and Labrador and will implement best management practices from the Department of Environment and Climate Change, Pollution Prevention Division guidance document titled Best Management Practice for the Storage of Waste Dangerous Goods/Hazardous Waste (WDG/HW) at Business Sites. Additional details on the approach to waste management is available in Champion’s preliminary waste management plan (Annex 5H).

2.9.1.10 Workforce

The Construction phase workforce will consist of contractor crews of different disciplines. Each crew will be composed of foreman, journeymen, apprentices, and general labour roles. It is anticipated that the Construction phase workforce will roster two weeks on and one week off (2/1) schedule, with an anticipated seventy-hour work week (7 hours x 10 days). The Construction phase workforce is anticipated to peak during Year 2 and Year 3 of construction. Table 2-9 provides a preliminary breakdown of the construction workforce by discipline.

Table 2-9: Projected Construction Phase Workforce

Discipline	Year-4	Year-3	Year-2	Year-1
Civil works	160	128	n/a	n/a
Concrete	n/a	75	124	50
Structural	n/a	22	53	13
Architectural	n/a	17	41	10
Mechanical	n/a	32	78	100
Piping	n/a	15	61	68
Tailings pipelines	n/a	n/a	n/a	30
Electrical	n/a	24	41	47
Transmission line to Flora Lake substation	90	10	n/a	n/a
Automatic/Telecom/Information technology	n/a	4	11	21
Professionals	n/a	209	232	224
Projected number of positions during construction phase	250	408	641	563

Note:
n/a = not applicable

2.9.1.11 Worker Accommodations

At the initiation of construction, the construction workforce is expected to reside in Wabush or Labrador city. Construction of the permanent camp will begin at the end of Construction Year 1 (Year -4), with rooms progressively made available starting by the middle of Construction Year 2 (Year -3) and is expected to be fully operational with its 600 rooms by the middle of Construction Year 3 (Year -2).

An additional 400 rooms will be made available through the rental of a temporary construction camp for the last two years of construction, allowing for a peak of direct, indirect and owner personnel to reach 1,000 rooms on site. Following the ramp-up period (Year 0), and reduction in staff below 600 for the Operations and Maintenance phase, the temporary construction camp will be decommissioned. In alignment with the Project Registration, the base case assumption used for the projects cost and operating models utilizes a permanent camp. Additional work is required on this assumption as the project advances towards a final investment decision.

2.9.1.12 Construction Schedule and Sequencing

The overall construction sequence would generally follow the order of activities presented in Table 2-10. Table 2-11 provides an illustrative representation of the approximate duration and sequencing of the construction activities, including the overlap occurring between some activities. Figure 2-31 to Figure 2-34 present the progression of construction and on-site infrastructure through the four years of construction.

Table 2-10: Construction Activity Sequence

Construction Year	Activities
Year-4 (Construction Year 1)	– Vegetation clearing, earthworks and construction of the access roads and on-site roads to facilitate access across the site and to key facilities, including the Rose Pit and overburden stockpile on the west side of the site and the temporary construction camp location on the east side of the site. – Commissioning of the Rose Pit quarry and temporary aggregate plant, which will generate aggregate and construction material for the Project. – Construction of the Waldorf River bridge to connect the east and west sides of the site. – Vegetation clearing, earthworks and construction of the 34.5 kV transmission line from Wabush to the temporary construction camp and process plant to facilitate power requirements for the remaining years of construction.
Year-3 (Construction Year 2)	– Vegetation clearing of the TMF and TMF starter dam. – Commissioning of the borrow pit within the TMF and expansion of the west borrow pit (at the Rose Pit) to generate aggregate and construction material for the Project. – Continue earthworks to support construction of haul roads, on-site roads and buildings. – Initiate construction of the permanent camp, process plant, TMF starter dam and water management infrastructure.
Year-2 (Construction Year 3)	– Vegetation clearing, earthworks and construction of the railway loop and railway line. – Continued advancement of the borrow pits to generate aggregate and construction material for the Project. – Completion of all earthworks. – Complete construction of the process plant and permanent camp. – Continued construction of TMF starter dam and water management infrastructure. – Initiate construction of temporary camp and overland conveyor.
Year-1 (Construction Year 4)	– Expansion of borrow pit to full extent. – Complete construction of the TMF starter dam, all site buildings, and water management infrastructure. – Dewater Rose Pit by pumping water to the Rose Pit sedimentation pond. – Initiate and complete construction of the in-pit crusher and conveyor.

Notes:

kV = kilovolt; TMF = tailings management facility.

Table 2-11: Sequencing of Construction Activities

Construction Activities	Y-4				Y-3				Y-2				Y-1			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Vegetation removal	■	■		■	■	■		■	■	■		■	■	■		
Build access roads	■	■	■	■												
Build haul roads and on-site roads			■	■	■	■	■	■	■	■						
Build electrical power distribution	■	■	■	■												
Earthworks and concrete works			■	■	■	■	■	■	■	■	■	■				
Borrow source and aggregate material extraction			■	■	■	■	■	■	■	■	■	■				
Build permanent camp					■	■	■	■	■	■						
Build temporary camp									■	■	■	■				
Build tailings management facility starter dam							■	■	■	■	■	■	■	■	■	■
Build and commission process plant					■	■	■	■	■	■	■	■	■	■	■	■
Install water management infrastructure							■	■	■	■	■	■	■	■	■	■
Other buildings and infrastructure										■	■	■				
Construct railway									■	■	■	■				
Construct overland conveyor											■	■	■	■	■	■
Implement in pit crusher and conveyor													■	■	■	■
Build and commission crusher station													■	■	■	■
Mine rock extraction														■	■	■
Dewatering Rose Lake															■	■

Figure 2-31: Construction Phase Year 1 (Year -4)

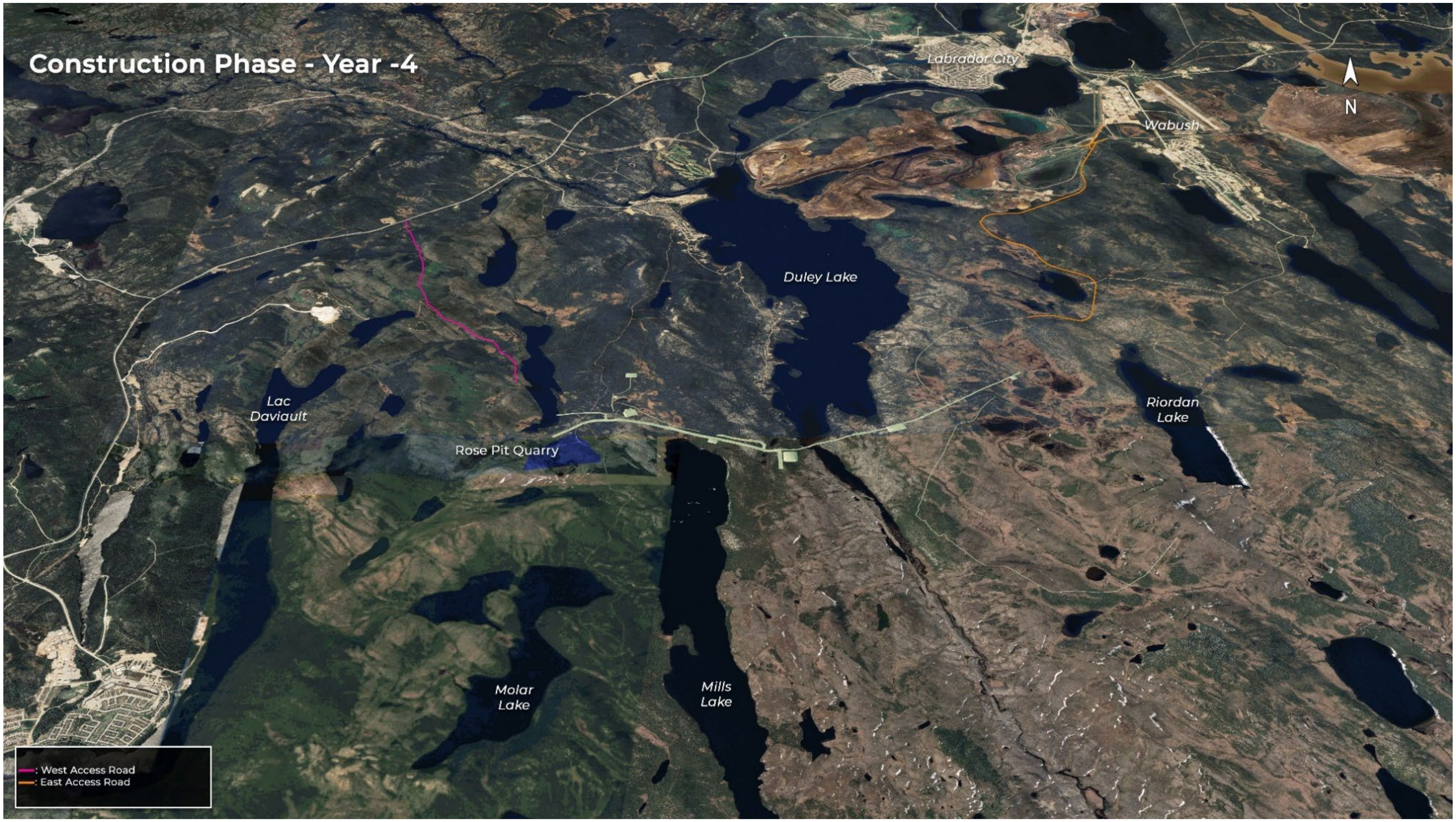


Figure 2-32: Construction Phase Year 2 (Year -3)

Figure 2-33: Construction Phase Year 3 (Year -2)

Figure 2-34: Construction Phase Year 4 (Year -1)

2.9.2 Operation and Maintenance

The focus of the Operations and Maintenance phase is to complete all mining, processing and shipment of iron ore concentrate. The Operations and Maintenance phase would be completed over a 26-year period, with one year of predevelopment mining to ramp up operations. The operation activities include:

- mining
- ore processing
- tailings management
- mine waste management
- water management
- transportation and storage of fuel, dangerous goods and hazardous materials

Further details on activities during the Operations phase are provided below. Figure 2-35 through Figure 2-40 present the progression of the Project through the Operations and Maintenance phase in five-year increments, starting from the end of predevelopment mining (Operations Year 0) through the end of Operations (Year 25).

Figure 2-35 : Operations Phase – Year 0

Figure 2-36: Operations Phase – Year 5

Figure 2-37: Operations Phase – Year 10

Figure 2-38: Operations Phase – Year 15

Figure 2-39: Operations Phase – Year 20

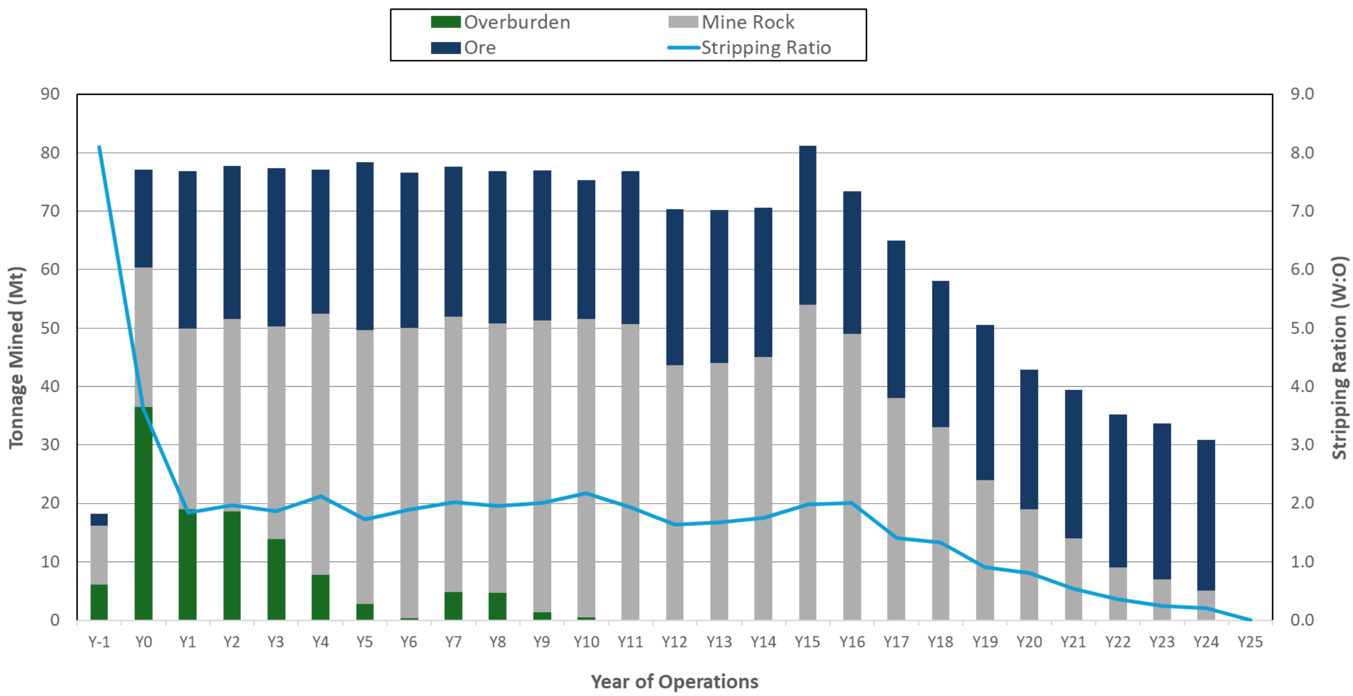
Figure 2-40: Operations Phase – Year 25

2.9.2.1 Mining

2.9.2.1.1 Mining Schedule

The open pit operations are planned for 26 years, which includes one year of pre-production. The last year of production (Year 25) will not include any mining and will involves approximately 2.8 Mt of stockpile rehandling to feed the mill. The mining rate will remain between 77 and 79 Mt for 11 years, peaking at approximately 81 Mt in Year 15, and then start ramping down until the end of the life of the mine. Figure 2-41 presents the mining schedule by material type.

Figure 2-41: Mine Production by Material Type



Mine production details with the stripping ratio and iron grade are presented in Table 2-12. The production schedule assumes a pre-production period as well as a reduced mill feed requirement during the first full year of production (Year 0). The current production schedule will be modified as the Project progresses through the Feasibility Study and as the mining progresses. The sequencing of pit development will be further reviewed through the Feasibility Study, taking into account mine planning, materials movement and environmental considerations. The open pit mine operation will operate 24 hours per day, seven days a week, on a 12-hour shift basis. Mining operations are based on 365 operating days per year, with an allowance of ten days without mine production built into the mining schedule, to allow for adverse weather conditions, scheduled outages and other potential interruptions.

Table 2-12: Mine Production by Material Type, Stripping Ratio and Iron Grade

Material Type	Unit	Total	Y-1	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11
Overburden	Mt	116	6	36	19	19	14	8	3	0	5	5	1	0	0
Mine Rock	Mt	905	10	24	31	33	36	45	47	50	47	46	50	51	51
Total Waste	Mt	1021	16	60	50	52	50	52	50	50	52	51	51	52	51
Total Ore	Mt	643	2	17	27	26	27	25	29	26	26	26	26	24	26
Total Waste and Ore	Mt	1663	18	77	77	77	77	77	79	77	77	77	77	75	77
Stripping Ratio	W:O	1.6	8.1	3.6	1.8	2.0	1.9	2.1	1.7	1.9	2.0	2.0	2.0	2.2	1.9
Iron Grade	%	29	27	27	29	29	29	29	30	30	30	29	29	29	29
Material Type	**Unit**	**Y12**	**Y13**	**Y14**	**Y15**	**Y16**	**Y17**	**Y18**	**Y19**	**Y20**	**Y21**	**Y22**	**Y23**	**Y24**	**Y25**
Overburden	Mt	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Mine Rock	Mt	44	44	45	54	49	38	33	24	19	14	9	7	5	0
Total Waste	Mt	44	44	45	54	49	38	33	24	19	14	9	6	5	0
Total Ore	Mt	27	26	26	27	24	27	25	26	24	25	26	27	26	0
Total Waste and Ore	Mt	70	70	71	81	73	65	58	51	43	39	36	33	31	0
Stripping Ratio	W:O	1.6	1.7	1.8	2.0	2.0	1.4	1.3	0.9	0.8	0.5	0.4	0.2	0.2	n/a
Iron Grade	%	29	29	29	29	29	29	29	29	29	29	29	29	30	0

Notes:

Mt = metric tonnes; - = 0 metric tonnes; n/a = not applicable; % = percent: W:O = waste to ore ratio.

2.9.2.1.2 Drilling and Blasting

Production drilling is planned on 10 m benches using 251 mm diameter holes. Electric production drills capable of single-pass drilling, specifically designed for 10 m benches with a hole range from 215.9 to 300 mm are selected and are capable of either rotary drilling or down-the-hole drilling.

Drill and blast specifications are established according to material type and whether the rock is ore or mine rock. The ore drill pattern is proposed with a 5.5 m burden and 6.25 m spacing with 1.5 m of subdrill. The mine rock drill pattern is proposed with a 6.5 m burden and 7.5 m spacing with 1.5 m of subdrill. These drill parameters combined with a high energy bulk emulsion with a density of 1.25 kg/m^3 result in a powder factor of 0.4 kg/t for ore and 0.34 kg/t for mine rock. Blast holes are planned to be initiated with electronic detonators and primed with boosters.

Controlled blasting techniques will be used including buffer blasts and pre-splits. The pre-split consists of closely spaced holes along the design excavation limit. The holes are loaded with a light charge and detonated simultaneously or in groups separated by short delays. Firing the pre-split row creates a crack that forms the excavation limit and helps to prevent wall rock damage by venting explosive gases and reflecting shock waves. A pre-split drill rig was selected for this application.

2.9.2.1.3 Loading

The primary loading fleet consists of four, 29 m^3 capacity electric hydraulic shovels and one 21.3 m^3 capacity diesel front end loader. The shovels will be used in ore, overburden and mine rock while the loader will supplement the overburden and mine rock loading and some of the stockpile rehandling when needed. The shovels and front-end loader will both load 100 and 320 t mining haul trucks.

2.9.2.1.4 Hauling and Conveying

Haulage will be performed by 100 t and 320 t mining haul trucks. Overburden will be stripped and stockpiled near the pit area, loaded and hauled 1.84 km from the Pit to the Overburden Stockpile using 100t haul trucks. During peak periods, it is anticipated that 755 trips to and from the Pit and Overburden Stockpile will be completed daily. Ore material from the Pit will be loaded and hauled 8.2 km from the Pit to the Ore Stockpiles using 320t haul trucks. During peak periods, it is anticipated that 371 trips to and from the Pit and ore stockpiles will be completed daily. The maximum speed of 100 t and 320 t haul trucks is 40 km/hr, with a maximum loaded and downhill speed of 30 km/h. Table 2-13 summarizes the proposed ore and overburden hauling during peak periods of the Operations and Maintenance phase.

It is anticipated that the implementation of the IPCC will occur within the first few years of the Operations, as the pit and ramps are sufficiently developed, and so mine rock will also need to be hauled during the initiation of the Operations. The implementation of the IPCC and associated hauling requirements are currently being evaluated and are not presented in Table 2-13.

Table 2-13: Summary of Ore and Overburden Haul Road Trips and Lengths

Trip Description	Daily Full 100 t Haul Trucks Trips	Daily Empty 100 t Haul Trucks Trips	Daily Full 320 t Haul Truck Trips	Daily Empty 320 t Haul Truck Trips	Length/Trip (km)
In pit road	755	755	371	371	7.2
Pit to ore stockpiles	0	0	371	371	1.0
Pit to overburden stockpile	755	755	0	0	1.8

Notes:

t = tonne; km = kilometre.

2.9.2.2 Mining Equipment Requirements

Table 2-14 summarizes the mining equipment list for operations. The mine is expected to be operational 24 hours a day, 365 days a year. However, to account for shift changes, maintenance shutdowns and weather delays, the EIS estimates equipment to be in operation 22 hours per day, 355 days per year.

Table 2-14: Mining Equipment Summary

Equipment Requirement	Maximum Number of Equipment
Major Equipment	
Production drill (8.5-12”)	6
Auxiliary pre-split drill (4.5-8”)	1
Electric hydraulic shovel (29 m^3)	4
Wheel loader (30 m^3)	1
Mining haul truck (320 t)	8
Track dozer (850 HP)	2
Motor grader (18 ft)	3
Water/Sand truck (76 kL tank)	2
Wheel Dozer (752 HP)	2
Overburden haul truck (100 t)	12
Support Equipment	
Cable handling wheel loader 271HP	2
Stemming loader	2
Excavator (49t)	2
Excavator (90t)	1
Hydraulic hammers for excavator 49 t	1
Wheel loader 271 HP	1
Boom truck 28t	1
Mechanic service truck and attachments	3
Tire handler loader	1
Fuel and lube truck (10-wheel)	1
Tow haul truck 150 t	1
Trailer lowboy 150 t	1
Pick-up	17
Pit bus	1
Mobile air compressor 185 CFM	1
Welding machine electric	2
Welding machine diesel 400 A	2
Light plant	10

Equipment Requirement	Maximum Number of Equipment
Genset 6 kW	3
Genset 60 kW	2
Water pump 3" – gasoline	4
Diesel-powered air heaters	4
Snow blower	2
Pipelayer dozer	1
Water pump 6" – diesel	1
6" pipe – 280 psi	1,500
10" pipe – 230 psi	4,800

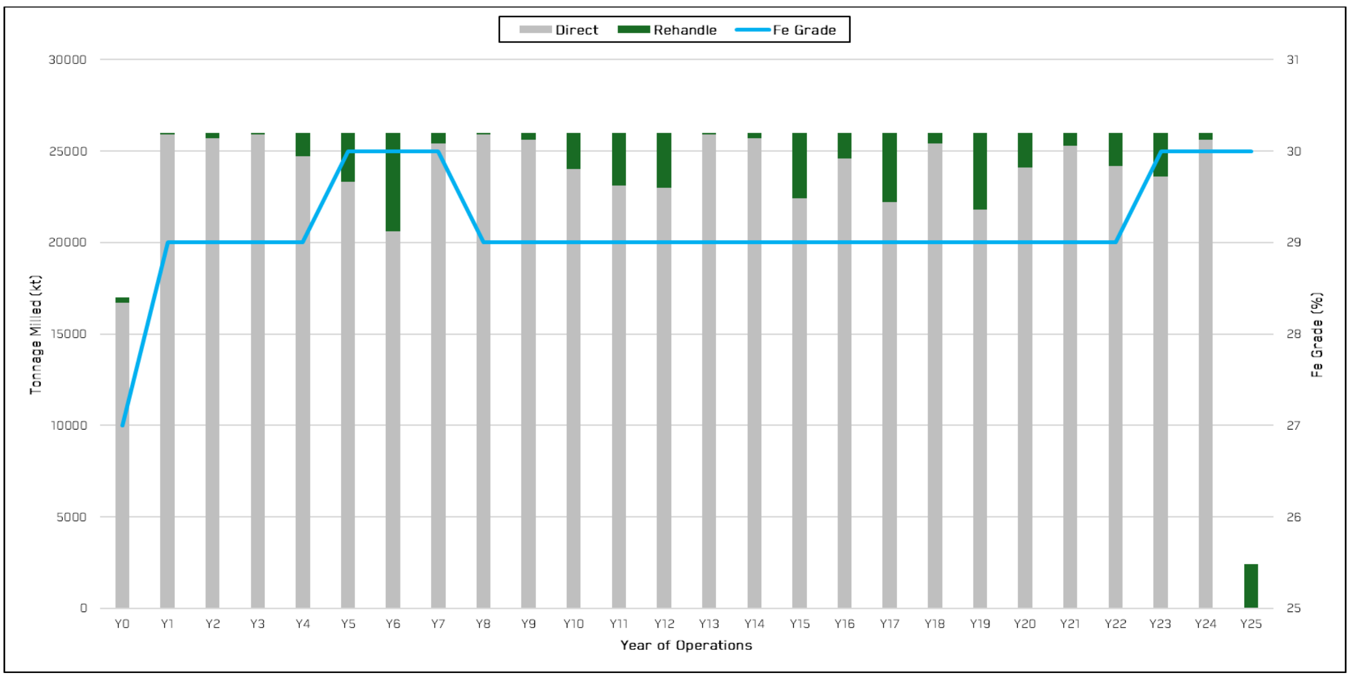
Notes:

" = inch; m^3 = cubic metre; t = tonne; HP = horsepower; ft = feet; kL = kilolitre; CFM = ?; A = ?; kW = kilowatt; psi = pound per square inch.

2.9.2.3 Ore Processing

The mill schedule includes a ramp-up in the first year of operations (pre-production mining) of approximately 66% throughput after which a throughput of 26 Mt/yr is achieved for 24 years, followed by a ramp-down in the final year of operations. Mill throughput is optimized with direct feed from the pit or through rehandling of stockpiled ore. Figure 2-42 depicts the milled tonnage and the average total iron grade during operations.

Figure 2-42: Mill Throughput and Iron Grade



Concentrate production averages 8.6 Mt/year (wet) with an expected total of approximately 212.4 Mt of concentrate produced over the 26 years of operations. Stockpile inventory peaks at Year 6 for a total of 5.9 Mt. Table 2-15 depicts the mill schedule from the mine and stockpiles.

Table 2-15: Milling Production Schedule Summary

Milling Parameter	Unit	Total	Y-1	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11
Ore Milled	Mt	643	–	17	26	26	26	26	26	26	26	26	26	26	26
Iron Grade	%	29	–	27	29	29	29	29	30	30	30	29	29	29	29
Concentrate Produced	Mt	212	–	5.4	8.2	8.5	8.5	8.7	8.6	8.5	8.5	8.4	8.5	8.6	8.6
Stockpile Inventory	Mt	n/a	2.1	1.8	3.2	2.9	4.0	2.7	5.4	5.9	5.3	5.2	4.9	2.9	3.0
To Stockpile	Mt	n/a	2.1	–	1.5	–	1.2	–	5.4	5.9	–	–	–	–	3.0
From Stockpile	Mt	n/a	–	0.3	0.1	0.3	0.1	1.3	2.7	5.4	0.6	0.1	0.4	2.0	2.9
Milling Parameter	**Unit**	**Y12**	**Y13**	**Y14**	**Y15**	**Y16**	**Y17**	**Y18**	**Y19**	**Y20**	**Y21**	**Y22**	**Y23**	**Y24**	**Y25**
Ore Milled	Mt	26	26	26	26	26	26	26	26	26	26	26	26	26	2
Iron Grade	%	29	29	29	29	29	29	29	29	29	29	29	30	30	30
Concentrate Produced	Mt	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.7	8.6	8.6	8.8	9.0	0.8
Stockpile Inventory	Mt	3.4	3.8	3.6	5.2	3.8	4.8	4.2	4.4	2.5	1.8	2.4	2.8	2.4	–
To Stockpile	Mt	3.4	0.4	–	5.2	–	4.8	–	4.4	–	–	2.4	2.8	–	–
From Stockpile	Mt	3.0	<0.1	0.3	3.6	1.4	3.8	0.6	4.2	1.9	0.7	1.8	2.4	0.4	2.4

Notes:

Mt = metric tonne; – = 0 metric tonnes; % = percent; < = less than.

2.9.2.4 Mine Waste Management

2.9.2.4.1 Overburden Stockpile

The development of the overburden stockpile will be initiated during the Construction phase and completed by Year 10 of the Operations and Maintenance phase. Construction and preparation of the overburden stockpile will commence with site clearing activities in the first year of construction (Year -4). Haul trucks will begin to deposit overburden in the last year of construction (Year -1) and continue through the first 10 years of operations. Once overburden collection activities have concluded, Champion will initiate progressive reclamation of the overburden stockpile. Table 2-16 summarizes the activities and progression of the overburden stockpile. Progression of the overburden stockpile is presented in Figure 2-31 through Figure 2-40.

Table 2-16: Summary of Overburden Stockpile Deposition and Stockpile Development

Year	Activity Description	Deposition Volume (Mm^3)	Cumulative Deposition Volume (Mm^3)	Elevation (masl)
-4 to -2	– Site preparation on the entire footprint limited by the ditches and pond – Construction of the sedimentation pond and collection ditches	0.0	0.0	574 to 674[(a)]
-1	– Start of deposition of overburden on the eastern side (lowest elevations) of the stockpile footprint	3.4	3.4	602
0 to 5	– Deposition of overburden on entire footprint of stockpile. The entire base and initial benches of the stockpile are complete by Year 5.	60.3	63.6	692
6 to 10	– Continued deposition of overburden. Overburden deposition is anticipated to be completed by Y10 of operations.	6.8	70.4	700
11 to 25	– Progressive reclamation of the overburden stockpile, where applicable	0.0	70.4	700

Notes:

(a) the natural ground elevation within the overburden stockpile footprint ranges in elevation. For subsequent years, the elevation of the stocked overburden is presented.

Mm^3 = million cubic metres; masl = metres above sea level.

2.9.2.4.2 Mine Rock Stockpile

The development of the mine rock stockpile will be initiated during the Construction phase, with deposition of mine rock continuing until Y24 of operations when mining activities conclude. Construction and preparation of the mine rock stockpile will commence with site clearing activities in the first year of construction (Year -4). Deposition of mine rock will initiate following the commissioning of the IPCC in the last year of construction. It is currently planned to develop the eastern portion of the mine rock stockpile within the first five years of operations before advancing the western portion of the stockpile. Table 2-17 summarizes the activities and progression of the mine rock stockpile. Progression of the overburden stockpile is presented in Figure 2-31 through Figure 2-40.

Table 2-17: Summary of Mine Rock Stockpile Deposition and Stockpile Development

Year	Activity Description	Deposition Volume (Mm^3)	Cumulative Deposition Volume (Mm^3)	Elevation (masl)
-3 to -2	– Site preparation for the mine rock stockpile, access roads, collection ditches and collection ponds. – Construction of access roads. – Construction of north and east pond and associated collection ditches.	0	0	553 to 671[(a)]
-1	– Start of deposition of mine rock on the northeastern corner of the stockpile footprint. – Extension of the collection ditch associated with east pond.	4.9	4.9	600
0 to 5	– Deposition of mine rock on the eastern side of the stockpile footprint. – Site preparation on the western half of stockpiles footprint and of west pond and associated collection ditch.	101.2	106.2	672
6 to 10	– Deposition of mine rock on the western side of the stockpile footprint, starting at the northwestern corner in Year 6. All initial benches of the stockpile have been established by Year 10. – Construction of west pond and the remaining collection ditch in Year 6.	111.6	217.8	672
11 to 15	– Continued deposition of mine rock through completion of the Operations phase.	107.6	325.4	712
16 to 20		74	399.4	752
21 to 25		16	415.4	790

Notes:

(a) the natural ground elevation within the mine rock stockpile footprint ranges in elevation. For subsequent years, the elevation of the stocked mine rock is presented.

Mm^3 = million cubic metres; masl = metres above sea level.

2.9.2.5 Tailings Management

Following the construction of the starter dam (Section 2.9.1.5), the TMF will undergo eight centreline embankment raises throughout the Operations and Maintenance phase, representing a total of nine embankment stages. Table 2-18 provides a summary of the embankment stages and associated volume and crest elevation of the TMF.

Table 2-18: Summary of Tailings Management Facility Development

Embankment Stage	Year of Operations	Tailings Volume (Mm^3)	Crest Elevation (masl)
Stage 1 (Starter Dam)	Year 0 (Pre-production) to Year 3	23.4	598.0 to 604.0
Stage 2	Year 5	51.0	608.0 to 609.5
Stage 3	Year 8	84.2	615.0 to 617.5
Stage 4	Year 11	117.5	622.0
Stage 5	Year 14	151.8	627.0
Stage 6	Year 17	182.9	632.0
Stage 7	Year 20	218.0	637.5
Stage 8	Year 23	251.3	642.5
Stage 9 (ultimate embankment configuration)	Year 25	280.3	647.0

Notes:

Mm^3 = million cubic metres; masl = metres above sea level.

All stages of the TMF dam raises are designed with a crest width of 20 m. The starter dam upstream slope will be 3H:1V to accommodate installation of the liner, and the downstream slope will be 2H:1V. The upstream and downstream slopes for the embankment subsequent raises will be 2H:1V. Embankment raises, consisting of the centreline raise, will continue to use rockfill (Zone 3) in the downstream shell and will be maintained at 2H:1V. The internal filter (Zone 1) and transition (Zone 2) will be extended vertically. The upstream shell zone will be constructed of coarse tailings (Zone 4) with a minimum zone width of 6.0 m and an upstream slope of 2H:1V. The coarse tailings will be harvested from the upstream tailings beach and will require compaction to provide competent foundation.

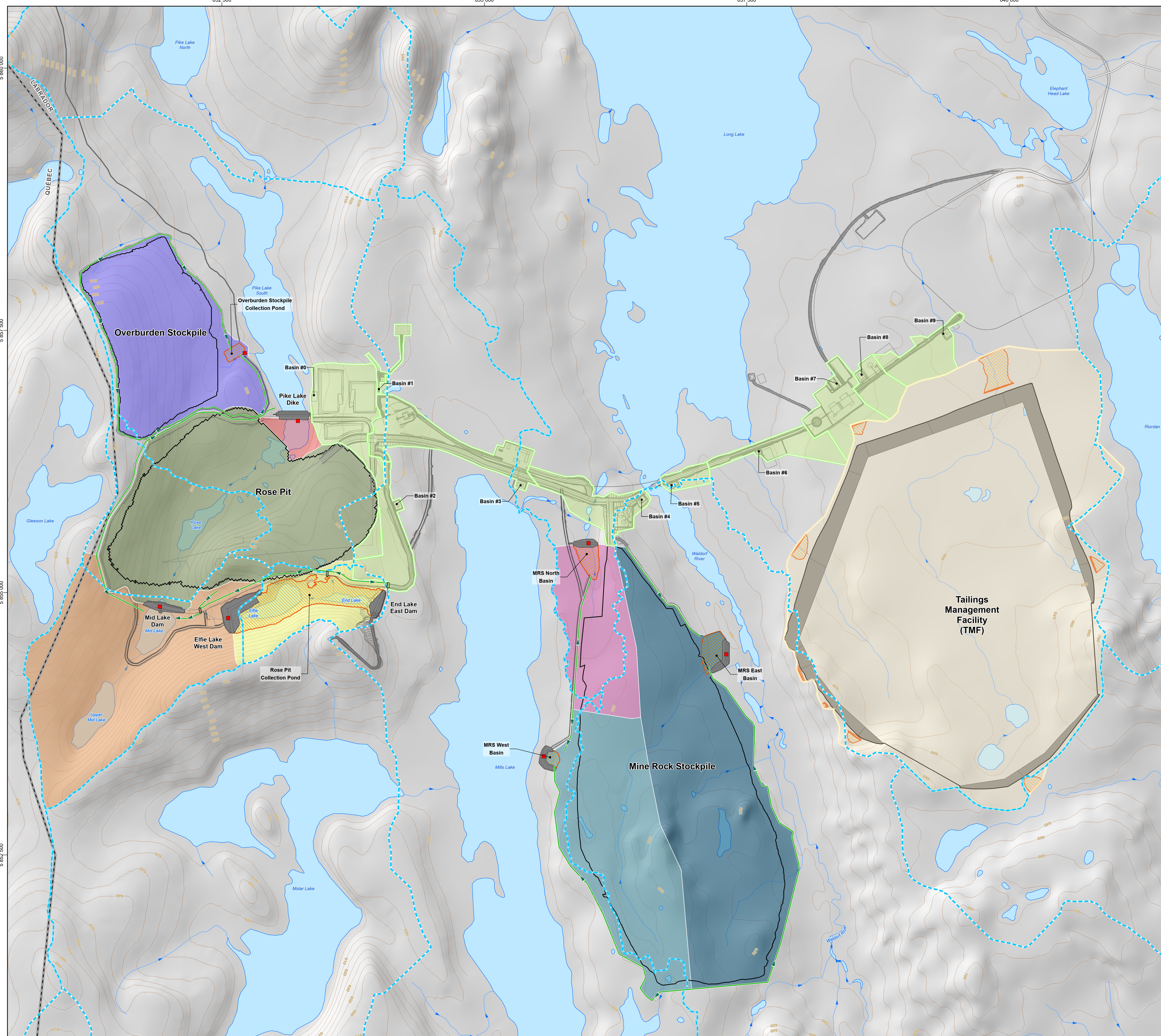
Tailings would be pumped from the process plant to various deposition points in accordance with the TMF phase development plan. Deposition will consist of spigotting of two coarse tailings lines from the dam's crest. One coarse tailings line supplies each side of the dike (west and east) and will operate in turn to always have a backup line. Two fine tailings lines will also be provided to discharge the fine tailings into the basin at one single point. One line is needed for the operation; the second line will serve as a backup. The pipelines will be lengthened over the life of the mine and two booster stations (one on each side of the dike) will be installed to compensate for pressure loss as height and distance increase.

Process water pumped with the tailings (slurry), as well as surface water, will collect in the TMF pond. The TMF pond changes over the course of the TMF development and its water level (height) also increases. Hence, to return this water back to the process plant, a water reclaim system consisting of a pump accessed by a causeway is located in the TMF pond.

Excess water not required in the process water balance is directed to the WTP prior to discharge to the environment. Figure 2-35 presents the layout and tailings storage configuration during Stage 1 (Starter Dam) and Figure 2-40 presents the TMF Stage 9, which is the ultimate embankment configuration.

2.9.2.6 Site Water Management

The Project intersects several natural watersheds, including Duley Lake, Waldorf River, Mills Lake, Rectangle Lake, Riordan Lake, Pike Lake South, Mid Lake, Rose Lake, and Elfie and End Lakes. This overlap necessitates the implementation of comprehensive water management infrastructure, such as ponds, dams, dikes, and ditches to control water flow as described in Section 2.8.6. The water management infrastructure has been developed to prevent flooding and manage water quality to ensure that mining activities do not adversely affect surface water and groundwater resources. Figure 2-43 illustrates the Project's footprint, the catchment area of these natural watersheds, and the modification of the natural watershed catchment area with the implementation of water management infrastructure proposed for the Project.



PROJECT SITE

- Proposed Pit, Stockpile and Tailings
- Proposed Dam
- Proposed Collection Pond
- Proposed Ditch
- Proposed Pumping Station

NATURAL ENVIRONMENT

- Road Network
- Québec-Labrador Border
- Natural Watershed Limit
- Watercourse
- Waterbody

MODIFIED NATURAL WATERSHED	ORIGINAL AREA (ha)	MODIFIED AREA (ha)	VARIATION (ha)
Long Lake	7274	6066	-1208
Waldorf River	7054	6473	-581
Mills Lake	3629	3505	-124
Rectangle Lake	1807	1804	-3
Riordan Lake	980	976	-4
Pike Lake South	917	483	-434
Mid and Upper Mid Lakes	285	0	-285
Rose Lake	165	0	-165
Elfie and End Lakes	80	0	-80
NEW INFRASTRUCTURE WATERSHED			
Mid Lake Dam	0	267	267
MRS East Basin	0	357	357
MRS North Basin	0	104	104
MRS West Basin	0	219	219
Overburden Stockpile Collection Pond	0	205	205
Pike Lake Dike	0	14	14
Rose Pit	0	346	346
Rose Pit Collection Pond	0	79	79
Basin #0	0	52	52
Basin #1	0	5	5
Basin #2	0	37	37
Basin #3	0	47	47
Basin #4	0	32	32
Basin #5	0	8	8
Basin #6	0	23	23
Basin #7	0	32	32
Basin #8	0	17	17
Basin #9	0	26	26
Tailings Management Facility	0	1014	1014

Kami Unlocking Labrador's Full Potential

Environmental Impact Study of the Kamistiatusset (Kami) Iron Ore Property Hydrogeology and Water Management

Kami Project Watershed Definition

Source:

Project 700668 Kami Mine Environmental Impact Study
Topographic Data of Canada - CanVec Series, Government of Canada, 2019

Map:
L01-C02-02-infraBVPropose-250516

Projection UTM, zone 19, NAD83
Contour interval : 10 m

0 250 500 m
1/20 000

May, 2025

AtkinsRéalis

V:\Projets\692696_Kami_Mine_Conceptual_Study\GEOMATIQUE\interne\diffusion\produits\APRX\snc692696_produits.aprx

The management and conveyance of site water is centralized around the Rose Pit collection pond and the TMF (Figure 2-44). The Rose Pit collection pond manages water from the Rose Pit, overburden stockpile, mine rock stockpile, and adjacent site run-off collection basins. The TMF and associated water management infrastructures are designed to support process plant operation as well as tailings slurry management, embankment seepage, and adjacent site run-off collection basins. Excess water from the Rose Pit collection pond is pumped to the process plant for discharge to a diffuser within Duley Lake. Excess water from the TMF is also directed to the diffuser. A WTP is located within the process plant for total suspended solids removal, as required. Additional notable water management infrastructure includes a water intake within Duley Lake to provide fresh water to the process plant and to mitigate potential water withdrawal effects on Pike Lake associated with pit dewatering. Estimated monthly water transfer rates at the end of operations are provided in Table 2-19.

Table 2-19: Monthly Summary of Site Water Management Transfers at the End of Operations

Month	Rose Pit Dewater	Overburden Stockpile Water Transfer	Mine Rock Stockpile Water Transfer	Rose Pit Collection Pond Discharge (to Duley Lake)	Tailings Management Facility Discharge (to Duley Lake)	Duley Lake Intake (to Process Plant)	Duley Lake Transfer (to Pike Lake)
Unit	Mm^3	Mm^3	Mm^3	Mm^3	Mm^3	Mm^3	Mm^3
January	1.3	0.10	0.33	1.7	0.33	0.34	1.0
February	1.1	0.07	0.31	1.5	0.21	0.31	0.9
March	1.3	0.09	0.35	1.7	0.09	0.32	1.0
April	1.3	0.08	0.37	1.8	0.07	0.29	1.0
May	1.9	0.17	0.68	3.0	0.44	0.34	1.3
June	1.5	0.13	0.54	2.3	0.45	0.33	1.3
July	1.5	0.11	0.45	2.1	0.47	0.34	1.3
August	1.5	0.11	0.43	2.1	0.47	0.34	1.3
September	1.4	0.10	0.44	2.0	0.45	0.33	1.3
October	1.5	0.11	0.41	2.1	0.47	0.34	1.3
November	1.4	0.11	0.41	2.0	0.45	0.33	1.3
December	1.3	0.09	0.36	1.7	0.47	0.34	1.0
Total	**16.8**	**1.3**	**5.1**	**24.1**	**4.3**	**4.0**	**13.9**

Notes:

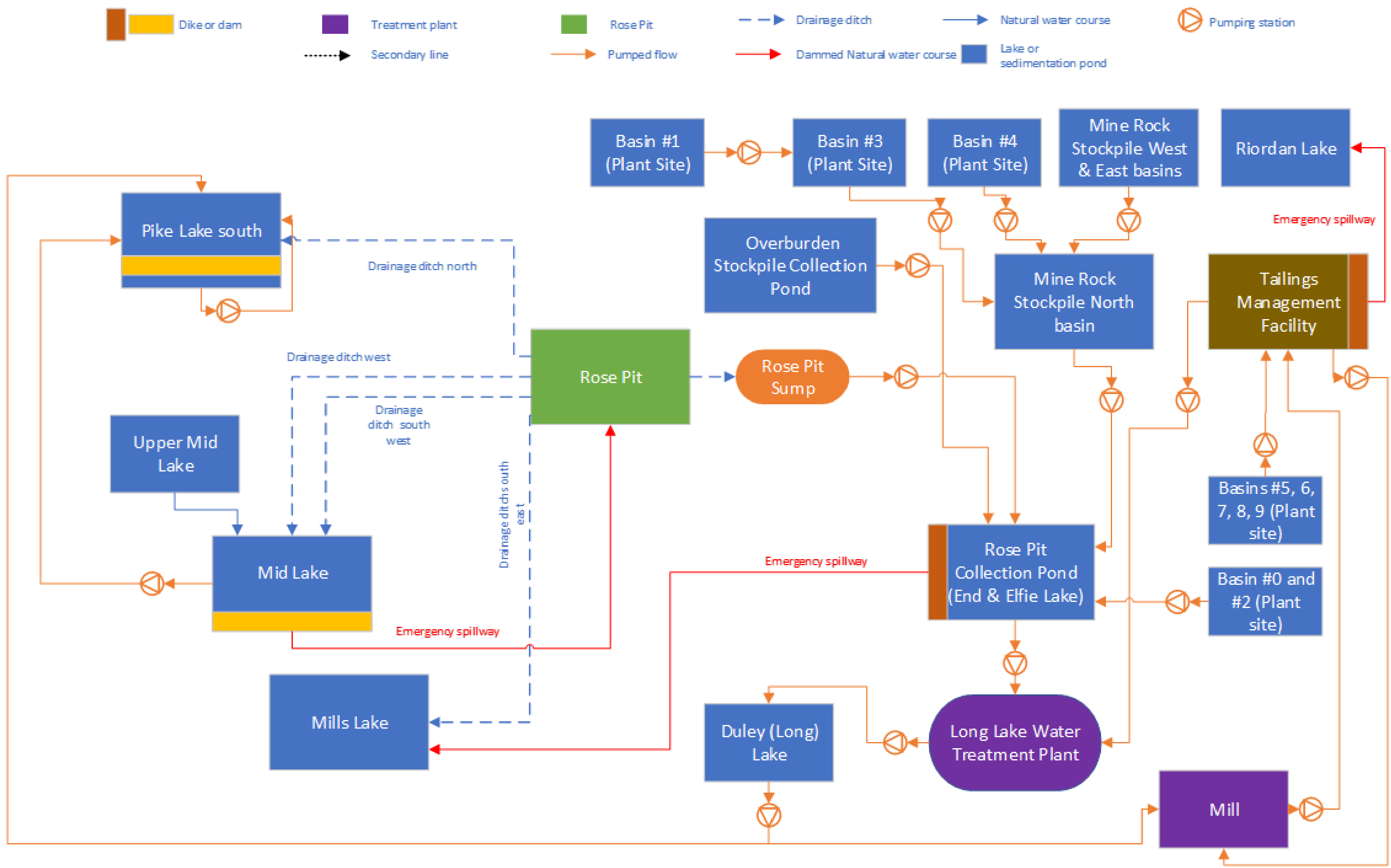
Mm^3 = million cubic metres.

A pumping system located at the bottom of Rose Pit will be used for pit dewatering and management of site run-off and pit infiltration. The pumping system nominal capacity will be 4,680 m^3/h. Two permanent sumps are planned to manage the water. Temporary pumping using diesel pumps at the complete bottom of the pit and following mining sequence will also be necessary. Maximum pumping will occur during spring freshet. Pumping infrastructures will be geared to run 12 months a year to be able to manage the infiltration flow into the pit. Due to this infiltration rate, constant pumping activities should be required, with a peak occurring at spring and during rain events.

Based on an annual operational prospective, collection ponds and pumping systems associated with the overburden stockpile and mine rock stockpile will be brought to their minimal level at fall, will be shut down during winter and will be started before spring thaw. They will be used intensively during the spring period, and pumping will occur for punctual periods during summer and fall. Mid Lake dam and Pike Lake dike pumping infrastructures will follow the same pattern.

The Rose Pit collection pond will also be geared to run 12 months a year. The yearly pattern will be to bring the Rose Pit collection pond to its minimum level at fall, keep this level minimal throughout the winter while managing Rose Pit infiltration, use the pumping system intensively during spring thaw and keep the pond to a normal or minimal level during summer and fall.

Figure 2-44: Site Water Management Flow Diagram



2.9.2.7 Transport and Storage of Fuel, Dangerous Goods, and Hazardous Materials

Fuel and materials required for Project construction will be shipped to site by truck via the access road. During operations, an average of approximately 20 delivery vehicles per day on the access road is anticipated. Materials will be sourced locally where practicable. Some specialized equipment will need to be sourced from outside the province/country.

Diesel for operations will be stored within the mine services area, where the diesel fuelling station will be located. A gasoline filling station with a tank capacity of 50,000 L will be installed near the process plant for light vehicles. Champion will follow all applicable requirements for waste management in Newfoundland and Labrador and will implement best management practices from the Department of Environment and Climate Change, Pollution Prevention Division guidance document titled Best Management Practice for the Storage of Waste Dangerous Goods/Hazardous Waste (WDG/HW) at Business Sites. Additional details on the approach to waste management are available in Champion's preliminary waste management plan (Annex 5H).

2.9.2.8 Workforce

The workforce during the Operations and Maintenance phase will be divided into different departments, such as operations, maintenance, engineering, and geology. The operations team is responsible for achieving production targets in a safe manner. The engineering and geology teams will provide support to the operations team by providing short-term and long-term planning, grade control, surveying, mining reserves estimation and all other technical functions. Hourly positions will be in a roster schedule of 14 days on/14 days off. Staff positions (i.e., management, supervision, and technical services) will also be on roster schedule. In some cases where 24-hour support in the staff role is necessary, the staff position is planned to be on the same 14 days on/14 days off schedule as the hourly positions. Based on business needs, there may also need to be some positions on 5 days on/2 days off schedule. Table 2-20 provides a preliminary breakdown of the projected number of positions during the peak of the Operations and Maintenance phase, organized by department. The projected number of positions is 677, 600 of those workers will reside at the permanent camp and the other 77 people will be workers at the Champion Office or will be housed locally in nearby towns and will commute to the site.

Table 2-20: Projected Peak Annual Operation and Maintenance Phase Workforce

Department	Projected Number of Positions
Mining	327
Processing	210
Tailing and water management	61
Minesite general and administrative	79
Total projected number of individual positions during Operations and Maintenance phase	677

2.9.3 Closure

Champion is developing a Rehabilitation and Closure Plan in accordance with the Newfoundland and Labrador *Mining Act* (SNL 1999 M-15.1 Sections 8, 9, and 10), and *Mining Regulations* (42/00 Section 7). The intent of the Rehabilitation and Closure Plan is to ensure long-term physical and chemical stability at the operation's ultimate closure while ensuring maximum benefits to the local area surrounding the mine site and the Province of Newfoundland and Labrador. The intent of the Rehabilitation and Closure Plan is to limit long-term potential effects of the mining operation and associated facilities on the surrounding environment. The Rehabilitation and Closure Plan will be aligned with the EA process.

The Rehabilitation and Closure Plan is being developed to support future land use of accessible environmental, recreational, and future development opportunities where possible across the rehabilitated site, and to return the landscape, as close as possible to its undisturbed condition. Key activities in achieving this future land use include:

- accelerated flooding of the Rose Pit with limited recontouring to support stability and vegetation establishment, while maintaining surface flow rates in surrounding water bodies
- temporary access control measures in place during the flooding period (anticipated to be approximately ten years)
- re-establishment of passive surface water drainage following the pit-flooding period
- progressive regrading, soil cover and revegetation of the overburden and mine rock stockpile
- soil cover and revegetation of the TMF

- dismantling and removal of buildings, equipment and electrical infrastructure not required for monitoring or support of future land use purposes
- grading, scarification and revegetation of pads and roads not required for monitoring or support of future land use purposes
- dismantling and removal of railway infrastructure
- on-site treatment of contaminated soil or off-site disposal in accordance with regulations

Additional interim care and maintenance and monitoring activities are expected during the Closure phase and Post-Closure period. These additional activities include interim care and maintenance during the anticipated ten-year pit flooding period and 40 years of long-term post-closure monitoring. Short-term monitoring and maintenance is anticipated to include water quality, air quality, wildlife effects, and vegetation monitoring, as well as cover system and vegetation maintenance. Long-term monitoring is associated with monitoring tailings dam structures (*Rehabilitation and Closure Plan Guidance Document*, Section 17.7 h.).

2.9.3.1 Water Management

At the beginning of the Closure phase, dewatering of the Rose Pit will cease and accelerated pit flooding will commence. Pike Lake, Mills Lake, Daviault Lake, and Molar Lake are expected to contribute to flooding the Rose Pit through groundwater flow paths. While accelerated flooding occurs, surface flow rates in surrounding water bodies will be maintained (e.g., water transfers from Duley Lake to Pike Lake will continue as required). Water will also be pumped from Duley Lake to facilitate accelerated flooding. Contact waters from the overburden stockpile, mine rock stockpile, and TMF will be pumped to the Rose Pit (Figure 2-45).

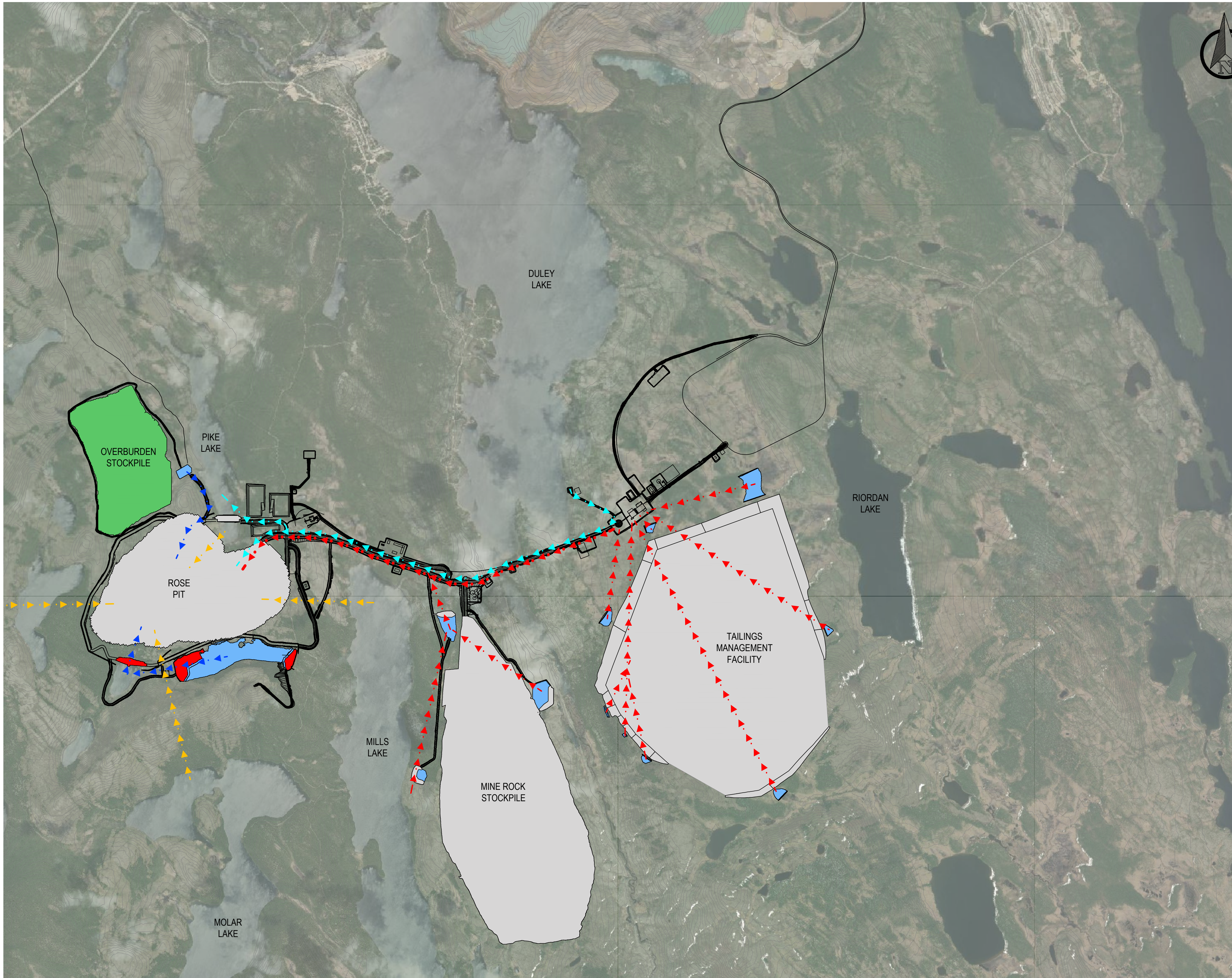
The TMF will be decommissioned, recontoured as needed and covered to facilitate long-term passive surface water drainage and reconnection with existing water bodies such that the tailings impoundment no longer retains ponded water, or liquifiable tailings. Drain down and seepage water quality will be monitored using the seepage and run-off collection ditches constructed along the toe of the perimeter of the TMF. Long-term treatment of water affected by the TMF is not anticipated as the tailings are categorized as NPAG. The WTP will be decommissioned and removed when the process plant building is removed. Until seepage meets water quality criteria, or until Rose Pit flooding is complete.

Surface water run-off from the overburden stockpile will be collected in the ditches surrounding the landform. It is anticipated that run-off from the overburden stockpile will not require treatment. In the Closure phase, water will be directed to the Rose Pit via drainage channels to facilitate pit flooding.

Run-off and seepage water will be collected in drainage ditches around the mine rock stockpile and directed to the four collection ponds (north, east, west, and southwest collection ponds). Water collected in the west collection pond, east collection pond and southwest collection pond will be pumped to the north collection pond, then ultimately pumped to the Rose Pit to facilitate pit flooding.

Surface and seepage water will be routinely tested during the Closure phase. The pumping system and pipeline transferring the non-contact water from Mid Lake to Pike Lake will be maintained until the Rose Pit is flooded and water quality in the Rose Pit has reached acceptable discharge quality.

The pumping system and pipeline transferring water from the south side of the Pike Lake dike to Pike Lake will be maintained until the Rose Pit is flooded and water quality in the Rose Pit has reached acceptable discharge quality.



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Cadfile Name:923-222 Kami Closure Scenario_002_RevB.dwg

okane

Integrated Mine Closure and Relinquishment Solutions

PRELIMINARY
NOT FOR CONSTRUCTION

Legend/Notes

NOTE

1. ALL UNITS IN METRES U.N.O.
2. IMAGERY OBTAINED VIA MICROSOFT BING.
3. SHAPEFILES PROVIDED BY WSP.

LEGEND

- EXISTING CONTOUR (1100)
- PUMPED WATER CONTACT)
- PUMPED WATER (NON-CONTACT)
- GROUND WATER FLOW
- PASSIVE SURFACE DRAINAGE
- SITE INFRASTRUCTURE
- REMOVED INFTRASTRUCTURE
- REVEGETATED AREA

500 0 500 1000 1500 2000 25000m

SCALE 1:50000

Revision	Description	Date
2		
1		
0		
B	UPDATED CLOSURE FOOTPRINT	2025/03/14
A	ISSUED FOR CLIENT REVIEW	2024/03/21

Client/Project

Kami

KAMISTATUSSET IRON ORE MINE PROJECT
CONCEPTUAL CLOSURE PLAN

Drawn by: B. HAY

Designed by: OKANE

Approved by: G. ALLEN

Drawing title

KAMISTIATUSSET IRON ORE
ACTIVE CLOSURE
WATER MANAGEMENT

Project no.	Drawing no.	Sheet	Revision
923-222	923-222-002	ANSI B	B

Figure 2-45

2.9.3.2 Rose Pit

Final closure of the Rose Pit includes accelerated flooding from the TMF, overburden stockpile collection ponds, mine rock stockpile collection ponds, and Duley Lake, as well as recontouring along the pit rim where possible to a maximum of 2H:1V to support stability and vegetation establishment. Temporary access control measures will be in place during the flooding period, which is anticipated to be approximately ten years with permanent NPAG rock berm construction to limit general public access in areas where recontouring to less than 30° is not possible.

2.9.3.3 Overburden Stockpile

The overburden stockpile does not require a cover system as the material is NPAG/non-metal leaching (NML) and is expected to successfully revegetate without a soil cover system. The overburden is mainly till, though topsoil and peat containing organic matter was highlighted in the few samples that were noted to contain some acidic risk.

Where appropriate the overburden material will be used for rehabilitation of mine infrastructure (process plant, mine offices, TMF or mine rock stockpile cover systems) prior to final rehabilitation and closure. The slopes will be regraded to an appropriate slope for revegetation and final land use. It is anticipated that some regrading and revegetation activities will be initiated during the Operations and Maintenance phase as overburden stockpiling activities are complete by Operations Year 10.

2.9.3.4 Mine Rock Stockpile

Most of the mine rock is anticipated to be NPAG/NML. Some PAG/ML is expected to be encountered during Operations.

Acid-base accounting results support that there is sufficient NP in the mine rock stockpile to neutralize acid generation if the stockpile has sufficient blending of PAG/ML and NPAG/NML material to limit ML/ARD generation. However, there is still potential risk for metals to be released from sulphide oxidation, though maintaining high pH from available buffering carbonate minerals could potentially attenuate some of these metals released from sulphide oxidation before seeing their release into the environment. The Menihek Formation is classified as PAG with the highest risk of producing ML/ARD and may be associated with exceedances for Cd, Co, Cr, Cu Ni, Se, Fe, Zn, and U. The Katsao Formation has the potential to be PAG with a risk of producing ML/ARD and may be associated with exceedances for Cd, Co, Ni, and Se.

Where appropriate, the mine rock material will be used for rehabilitation of mine infrastructure (pit berms, drainage material) prior to final rehabilitation and closure. Where feasible, Champion will manage the use of NPAG mine rock to meet aggregate needs of local third-party contractors. A mine rock management plan will be developed to ensure both that PAG/ML mine rock is not made available for use as construction aggregate and that removal of NPAG/NML mine rock does not compromise the overall ML/ARD management strategy. The slopes of the mine rock stockpile will be regraded to an appropriate slope for revegetation and final land use.

2.9.3.5 Tailings Management Facility

Rehabilitation of the TMF begins during the Closure phase with dewatering of any remaining ponded water to the Rose Pit, re-grading and landforming where necessary, and placement of a soil cover system to promote positive passive drainage, limit ponding, and support revegetation. The objective of the cover system is to encourage run-off and reduce the net infiltration into the TMF, reducing the potential for the tailings to remain liquifiable long term. Eliminating the tailings' ability to flow is one condition that must be met for the dam to be reclassified to a mine waste structure (CDA 2019). Cover system placement and revegetation activities are expected to be completed in four years once commenced.

Based on static testing performed to date, the tailings are considered NPAG with low metal leaching potential. Kinetic testing is ongoing for tailings materials; however, stabilized loading rates from the kinetic test program are not yet available.

2.9.3.6 Mining Infrastructure

Mine infrastructure not required to support future land use and site monitoring purposes will be dismantled and removed from site. Once the Operations and Maintenance phase is completed, the process plant and ore stockpile areas will be evaluated for residual mine waste. Identified material will be moved to appropriate storage areas on site such as the mine rock stockpile or the TMF or disposed off site at an appropriate disposal location. Railway infrastructure on site will be removed and dismantled for final closure. Rehabilitation for the railways includes grading of sub-surface, placement of a soil cover, revegetation, and fertilization. Electrical infrastructure not required to support future land use purposes will be dismantled and removed from site. Mine roads not required for future land purposes will be graded, scarified, and revegetated at closure. The surface water and ground water supply to support mining infrastructure will also be decommissioned with the facilities.

2.9.3.7 Waste Infrastructure

Areas of the site may be identified at the end of Operations as having the potential to contain hazardous waste and materials. The hazardous waste and materials may either be in storage or in the ground from normal activities and/or accidental spills. Material in ground will be identified and inventoried for removal from site, provided clean-up and disposal at the time of identification is not feasible. Stored hazardous materials will be removed from site, transported, and disposed of according to the safety data sheets and Newfoundland and Labrador best management practices (Department of Environment and Climate Change 2015). Sewage facilities not required to support future land use purposes will be dismantled and removed from site by a licensed disposal company.

2.10 Post-Closure

The objective of the Post-Closure period is to reclassify the TMF dams to mine waste structures or landforms. To achieve this, several criteria must be met as outlined in the CDA guidelines. The criteria for a dam to become a mine waste structure includes the following (CDA 2019):

- Ponded water will not propagate a failure or uncontrolled release of tailings.
- Tailings do not and cannot flow and do not rely on a barrier to prevent an uncontrolled release.
- Tailings do not and cannot migrate or pipe through the dam or foundation.
- Conditions will not develop in the future that could violate the previous criteria.

If feasible, the TMF will be substantially drained with the aim to meet the criteria for the dam to be reclassified as a landform.

During the Post-Closure period, monitoring of the tailings dam will be performed for 50 years with dam safety reviews performed every five years, or until the above criteria can be successfully met. Geotechnical inspections will be performed annually. Signage will be used during the post-closure monitoring period of the TMF to alert the public and site visitors to the risks associated with the TMF prior to reclassification.

Environmental post-closure monitoring programs will continue after final closure activities are completed for an estimated six to ten years noting that final closure for some key components will be closed and rehabilitated prior to the end of operations. The monitoring period could also be shortened based on the satisfaction of regulators that physical and chemical characteristics of the site are acceptable and stable. When the Project is deemed physically and chemically stable, it is currently anticipated that the site will be relinquished to the Crown, noting the requirements for relinquishment at the actual end of the Post-Closure period may be different from current requirements.

The post-closure and long-term monitoring plans have yet to be developed. These programs will be developed based on the experience gained through monitoring plans during construction and operations it is anticipated that the closure monitoring plans will mirror the operational monitoring program to provide continuity of data and a historical baseline. It is also anticipated that, as the post-closure monitoring program moves forward, the monitoring requirements will decrease until they will no longer be required.

2.11 Effluent, Emissions and Waste

Effluent, emissions and waste will result from Project activities during all Project phases. During initial design, Champion has employed design principles and plans for best available control technologies, as applicable, to manage and mitigate effluent, emissions and waste generated from the Project. During Project execution, Champion will adhere to mitigation measures based on industry standard best practices to reduce effluent and emissions concentrations and waste, as described in the applicable EIS Valued Environmental Component chapters (**Chapter 5** to **Chapter 15**) and summarized in **Chapter 20**. Champion is developing and employ a comprehensive environmental management program to mitigate and monitor effluent, emissions and wastes during all Project phases. Effluent, emissions and wastes from accidental events are addressed in **Chapter 18, Accidents and Malfunctions**.

2.11.1 Effluent

The assessment of Project-related effects on surface water, including details on sources of effluent, proposed mitigation measures and residual effects is provided in Chapter 8. Sources of effluent include treated effluent from the WTP, treated sewage and surface run-off. Once operational, water that contacts Project components will be collected and treated to ensure compliance with the provincial Environmental Control Water and Sewage Regulations*,* 2003 under the *Water Resources Act* and federal Metal and Diamond Mining Effluent Regulations, under the *Fisheries Act*. Details of the associated infrastructure (e.g., WTP), processes and requirements are provided in Section 2.8.6, Section 2.9.2.6, and Section 2.9.3.1.

Sources of sanitary sewage include the worker accommodation, mine service area, concentrator and crusher building (Section 2.8.14). Effluent from these sources will be collected and treated at the sewage treatment plant, located at the worker accommodations. During the Construction phase, a contractor will handle sewage waste for offsite disposal until the sewage treatment plant is constructed.

2.11.2 Emissions

Emissions from the Project to the atmospheric environment include air contaminants, GHGs, noise, vibration and light. Assessment of Project related effects on atmospheric environment are presented in **Chapter 5, Air Quality and Greenhouse Gases** and **Chapter 6, Noise, Vibration and Light**. A summary of the sources of Project-related emissions is presented in the following sections.

2.11.2.1 Air Quality and Greenhouse Gases

Project activities during the life of the Project will result in the release of several criteria air contaminants, including combustion gases such as carbon monoxide (CO), nitrogen oxides (NO_x) sulphur dioxide (SO_2) and generation of dust and particulate matter, including particulate matter less than or equal to 2.5 µm ($PM_{2.5}$), particulate matter less than or equal to 10 µm (PM_{10}), and total particulate matter. Project activities that are anticipated to result in the release of criteria air contaminants include, but are not limited to, site preparation and clearing, transportation of staff, mining activities such as drilling, blasting, crushing ore and mine rock, hauling, conveying, and stockpiling ore and mine waste, processing ore concentrate, and operation of the train rail cars through the shipment of iron ore concentrate.

Project activities will also result in the emissions of several GHGs, including carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). Greenhouse gases that will be emitted from the Project will be primarily through the combustion of fuel in construction and mining equipment. It is estimated that 17 million litres of diesel could be consumed on site during construction, up to 460 million litres during operations (average of 18 million annually, up to 50 million litres in a given year) and 1 million litres during closure. Based on the anticipated amount of fuel to be consumed, it is estimated that an average of approximately 51 kt CO_2e associated with fuel combustion could be emitted annually through the lifespan of the Project, with a lower average during construction and end of operations, and an average of approximately 60 kt during the remaining operating years. Select exhaust sources will be equipped with emission control technologies to reduce emissions of contaminants and greenhouse gases.

Champion has incorporated additional environmental design feature into the design of the Project that will reduce predicted emissions from the Project, including the implementation of the IPCC, which will reduce criteria air contaminants and GHGs through reduced hauling requirements for mine rock. The number of haul trucks needed is reduced by up to 85%, from a maximum of 50 presented in the EIS of the previous owner (Alderon 2013) during operations to eight trucks currently proposed for Operations. Additional details on the effects of the Project on air quality are provided in Chapter 5.

2.11.2.2 Noise, Vibration, and Light

Construction and operation activities will produce noise, vibration, and light. The main sources of Project noise and vibration will be from drilling and blasting activities during predevelopment mining (Construction phase), the development of the Rose Pit (Operations and Maintenance phase) and the operation of mine vehicles during all phases of the Project. The main sources of light emissions from the Project will be lighting on buildings, mine vehicles and equipment. The Project is anticipated to run for 24 hours a day, 7 days per week from initiation of the Construction phase to completion of the to Closure phase. Additional details on the effects of the Project on noise, vibration and light is provided in Chapter 6.

2.11.3 Waste

Mine waste management, including the management of overburden and mine rock during Operations are discussed in Section 2.8.2 and Section 2.8.2.3. Management of tailings is presented in Section 2.9.1.5 and Section 2.9.2.5. Throughout all phases of the Project, solid and hazardous waste management will adhere to Newfoundland and Labrador's provincial waste management strategy. No solid or hazardous waste will be disposed of on site. Champion's waste management plan will include the following components:

- **Waste receptacles**—Receptacles will be placed at various locations around the mine site for the regular collection and segregation of waste and domestic recyclable materials (e.g., cans, paper). Waste bins will include locks to mitigate activity from wildlife.
- **On-site waste sorting/storage areas**—Temporary storage will be present for non-recyclable, non-hazardous domestic and spoilable waste, as well as recyclable and reusable materials.
- **Transportation**—Non-reusable and non-recyclable wastes will be transported to the nearest waste management facility, while reusable/recyclable materials will be sent to the nearest appropriate facility.

- **Hazardous waste storage**—Secure areas will be present for the segregation and temporary storage of waste dangerous goods and hazardous wastes (e.g., waste oils, spent fuels, chemicals) before packaging and shipment by licensed contractors to certified waste management facilities, in compliance with federal and provincial regulations.

Champion has developed a preliminary waste management plan (Annex 5H) that will also incorporate corporate waste management and sustainability practices, including:

- integrating waste management into procurement contracts, where practicable, to ensure suppliers are contractually obligated to remove recyclable and reusable materials related to their products and services
- including waste management principles and practices in mandatory employee and contractor site orientations
- maintaining ongoing contracts with certified waste contractors to ensure regular removal of waste materials, preventing accumulation at the site

Champion has reviewed Schedule 1 of the Environmental Emergency Regulations, 2019 and does not expect that the Project will be required to report. This will be reevaluated prior to the Operations phase once a complete list of substances and quantities to be stored on site is available.

2.12 Project Optimizations and Refinements Post-Environmental Impact Statement

Environmental assessments follow a systematic consideration of how Project components, activities, and systems may interact with, and affect, the atmospheric, aquatic, terrestrial, and social environments. It is recognized that as the Project advances through subsequent stages of design and Champion continues to undertake Indigenous, stakeholder, and regulatory engagement, review and optimization of Project components and activities described within this Project description would occur, with identifying opportunities to further enhance the environmental, technical, economic, and social performance of the Project.

Project review and optimization would be proactively pursued following the precautionary principle, and with the intent that any potential design optimization and associated mitigations would be improvements on, and within the current considerations of, the conservative assumptions carried within the EIS. The precautionary principle states that "where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation" (IAAC 2021). Thus, the conservative application of the precautionary principle in the development of the proposed Project, and this EIS, allows continued Project optimization while providing confidence that any likely refinement would be conservatively captured as part of the assumptions carried within this assessment, and potential changes to the Project are not anticipated to alter the overall conclusions of the EIS with respect to the significance of effects. As an example of a conservative assumption carried forward into the EIS to manage Project design uncertainty is Champion's approach to assessing a site assessment area in the effects assessment, which is more than twice the size of the Project footprint infrastructure (Section 2.6.2) and Labrador Department of Environment and Climate Change.

Appendix 2A: Property Environmental Search Letter and Information Package

Government of Newfoundland and Labrador
Environment and Climate Change
Pollution Prevention Division

Date: March 21, 2025

Email: Champion Iron Mines

Attention: Katherine Jacobs

Re: Property Location: Western Border of Labrador. Approximately 5 km Northeast of the Ville de Fermont, Quebec, and 7 km Southwest of the Town of Wabush, Wabush NL

WE DO NOT GUARANTEE THE ACCURACY, COMPLETENESS, CURRENCY, OR RELIABILITY OF THE INFORMATION PROVIDED BELOW. Any reliance on the information is at the user's own risk.

Further to your request in relation to the referenced property, a file review at the Department of Environment and Climate Change office in St. John's has been carried out. The following information is provided as it relates to the Provincial Jurisdiction, subject to the above limitations.

Search of Environmental Sites Registry:

File # 851.5249.5:

- Closed, address.

Report: Record of Site Condition for the remote area 8 km southwest of Wabush, NL. as the source property for impacted site 8 km southwest of Wabush. Unconditional closure report signed on October 11, 2013. (See attached).

Search of Environmental Sites Files: (Electronic and Paper)

Western Border of Labrador. Approximately 5 km Northeast of the Ville de Fermont, Quebec and 7 km Southwest of the Town of Wabush, Wabush NL:

1. Report - Site Remediation and Confirmatory Soil Sampling Lantech Drilling Services Inc. Hydraulic Oil Spill Wabush, NL. Prepared by Stantec Consulting Ltd. for Maltman Group International, dated September 14, 2012. (See attached).
2. Letter - Stantec Consulting Ltd. to Maltman Group International – Re: Summary of Emergency Response & Limited Soil Remediation, Lantech Drilling Services Inc. Hydraulic Oil Spill, Wabush, Newfoundland & Labrador, dated December 20, 2011. (See attached).

To the best of our knowledge, there are no other records of past, pending, outstanding or ongoing orders or complaints related to compliance or any matter of environmental significance on file for this property. This information has been provided in consideration of your request and in view of available records.

It is highly recommended that your file search request also be sent to the Department of Digital Government and Service NL office by email to Chriswparsons@gov.nl.ca (Tel: 709-729-2008). That department may have records not held by this department.

As this request also involves mining activity, it is also highly recommended that your file search be sent to the Department of Industry, Energy and Technology office e-mail justinwlake@gov.nl.ca (Tel: 709 729-6437).

If you have any questions, contact me by email at envsearch@gov.nl.ca.

Cindy Churchill
Departmental Program Coordinator

STANTEC PROJECT NO. 121412070

RECORD OF SITE CONDITION
SITE REMEDIATION AND CONFIRMATORY SOIL SAMPLING
LANTECH DRILLING SERVICES INC. HYDRAULIC OIL SPILL
WABUSH, NL

September 14, 2012

Part 1 of 7: Source Property Information

Civic Address: N/A – Remote area 8 km southwest of Wabush, NL (Coordinate system: Zone 19 U, NAD 27, Easting: 637706, Northing: 5855825)

Person Responsible (name and address): John Robichaud,
Contract Manager – Geotechnical Division (Atlantic)
Lantech Drilling Services Inc.
398 Dover Road
Dieppe, NB
E1A 7L6

GSC / Provincial File Number: 851. 5249. 5

Part 2 of 7: List of Reports

- **Prepared by Others:** The following reports pertaining to the source property cited in Part 1 and/or any other related impacted properties have been prepared by others and reviewed under the supervision of the Site Professional. (expand the table as required)

Report Title	Prepared by	Date
N/A		

- **Prepared by and/or overseen by the Site Professional:** The following reports pertaining to the source property cited in Part 1 and/or any other related impacted properties have been prepared by and/or overseen by the Site Professional. (expand the table as required)

Report Title	Date
Site Remediation and Confirmatory Soil Sampling, Lantech Drilling Services Inc. Hydraulic Oil Spill, Wabush, NL. Stantec Report No. 121412070	September 14, 2012

Part 3 of 7: Remedial Action

- List the Chemicals of Concern (COC) identified on or originating from the source property:

  The following COCs were investigated: Petroleum hydrocarbons (i.e., benzene, toluene, ethylbenzene, xylene (BTEX), and total petroleum hydrocarbons (TPH)) in soil.

- Describe the elements of the Remedial Action Plan(s) with time periods, employed for the site:

  Between November 23, 2011 and April 24, 2012, a total of approximately 35 tonnes of petroleum hydrocarbon impacted of impacted snow, ice, soil, oily water and absorbent materials was excavated from the source area and removed from site. Analytical results of confirmatory soil samples collected from the final limits of the remedial excavation indicated that concentrations of BTEX and TPH did not exceed ecological-based federal guideline levels used to evaluate the site.

Note: This Record of Site Condition is only applicable for the portion of the site that was remediated in response to the fuel oil spill that was discovered on November 23, 2011. No other portion of the site was investigated as part of this study.

- Was a risk assessment completed as part of the Remedial Action Plan? ____ Yes _ X ___ No

  If yes, identify the risk assessment methodology and the resulting site-specific remedial criteria: (expand the table as required)

  If no, list the selected Tier I criteria: (expand the table as required)

Media	units	Benzene	Toluene	Ethylbenzene	Xylenes	C6-C10	>C10-C16	>C16-C34	>C34	Source
Soil	mg/kg	31	75	55	95	-	-	-	-	CCME
Soil	mg/kg	-	-	-	-	210	150	300	2,800	CWS

Notes:

CCME = Canadian Council of Ministers of the Environment (CCME) Soil Quality Guideline for Environmental Health (SQG_E) for BTEX in surface soil on a residential/parkland site with coarse soil (i.e., the most restrictive criteria) (2004);

CWS = CCME Canada Wide Standard (CWS) Tier I Levels for Petroleum Hydrocarbons in Surface Soil – Table 3 (coarse-grained soil, residential land use, eco soil contact – User Guidance, 2008). Note that the CWS hydrocarbon fraction ranges are not identical to the Atlantic RBCA fractions.

- If a peer review of the Remedial Action Plan and/or the Risk Assessment/Closure Report was requested by GSC or NLDEC, provide the following information:

Consultant Name: N/A

Part 4 of 7: Off-Site Impacts

- Precautionary duty of the Person Responsible; Based on the work completed, the following third party properties (identified by civic address) were identified by the Person Responsible, in accordance with section 5.8(1)d of the Environmental Protection Act, as being affected or threatened by the contamination originating from the source property. Where appropriate, indicate the type of impact and the corrective action taken: (expand the table as required)

Civic Address	Type of Impact	Corrective Action

Part 5 of 7: Site Activities

- Based on the work completed, the source property cited in Part 1 is suitable for the following site activity(s), subject to any conditions and assumptions stated in the report(s) listed in Part 2. Check appropriate box and provide comments if necessary.

IF LAND USE CHANGES – LEVEL OF RISK MUST BE RE-EVALUATED

☐ Agricultural ☒ Residential/Parkland ☐ Commercial ☐ Industrial

Comments (special considerations, site management issues, etc.):

Part 6 of 7: Summary Statement of Site Professional

The Minister considers the pre-checked statements below to be mandatory for submission of the Record of Site Condition. The signature of the Site Professional on this form indicates the fulfillment of these mandatory requirements as well as the requirements of all other checked statements.

Please check appropriate statements:

√ This Record of Site Condition form is identical to the one provided in the Province of Newfoundland & Labrador Guidance Document for the Management of Impacted Sites and the content of the form has not been altered.

√ All work on which this Record of Site Condition is based was prepared, overseen and/or reviewed by the Site Professional.

√ The site was managed in accordance with the current version of the Province of Newfoundland & Labrador Guidance Document for the Management of Impacted Sites.

√ The applicable quality criteria (Tier I, II or III) for the site as defined by the Site Professional and as cited in Part 3 have been achieved for the current or reasonably foreseeable future site activities as cited in Part 5.

√ A site plan with scale indicated, identifying the referenced properties is attached to this Record of Site Condition.

√ All reports cited in Part 2 and other related documents that have been prepared by the Site Professional have been delivered to the Person Responsible.

NA The Remedial Action Plan, Risk Assessment or Closure Report was peer reviewed by a qualified, independent Site Professional.

NA If peer reviewed, the results of the Peer Review were appropriately incorporated into the final Remedial Action Plan and/or Closure Report.

NA Based on the results of the site evaluation, the applicable quality criteria (Tier I, II or III) were not exceeded on the source property and therefore, remedial action and/or on-going site management is not required for the current or reasonably foreseeable future site activities.

NA Based on results of the site evaluation, the applicable quality criteria (Tier I, II or III) were not exceeded on the third party properties and therefore, remedial action and/or on-going site management is not required for the current or reasonably foreseeable future site activities.

√ The source property has been remediated to an acceptable level for the current or reasonably foreseeable future site activities as cited in Part 5.

NA The source property requires on-going site management to satisfy the current or reasonably foreseeable future site activities as cited in Part 5.

NA Third party properties affected by the contamination of the source property have been addressed and remediated to an acceptable level for the current or reasonably foreseeable future site activities as cited in Part 5.

NA Third party properties affected by the contamination of the source property have been addressed and require on-going site management to satisfy the current or reasonably foreseeable future site activities as cited in Part 5.

√ With respect to notification, the requirements of section 8(d) of the *Environmental Protection Act* have been fulfilled.

___ The source property is recommended for **Conditional Closure** and is subject to monitoring requirements specified in documents listed in Part 2.

√ The source property is recommended for **Final Closure**

Signature ______________

Name (Print)	Carolyn Anstey Moore	Date:	September 14, 2012
Professional Affiliation	M.Sc., M.A.Sc., P.Geo.	Membership No.	04085
Company	Stantec Consulting Limited		
Address	607 Torbay Road St. John's, NL	Tel.	576-1458

Part 7 of 7: Acknowledgement of Receipt by Newfoundland and Labrador Department of Environment and Conservation

The Department acknowledges receipt of this Record of Site Condition. The Department has processed the report(s) cited in Part 2 of this Record of Site Condition for the purpose of ensuring the site has been managed in accordance with the current version of the Newfoundland and Labrador Department of Environment and Conservation *Guidance Document for the Management of Impacted Sites.*

Based solely on the report(s) cited in Part 2 and on the conclusions of the Site Professional stated in Part 6 of this Record of Site Condition, the Department is satisfied, at this point in time, that the stated level of contamination remaining on the subject property, in the portions of the subject property addressed by the report(s), does not pose an unacceptable risk to human health or to the environment. Notwithstanding this opinion, the Department reserves the right to re-evaluate this decision should new information come to light, or should site activities, site uses or circumstances change which may result in an increase in contamination or in contaminant migration or which may cause changes in site conditions or site classification that may pose a risk to human health or to the environment.

The Department has not directly supervised the work undertaken at the site and does not assume any responsibility or liability for this work, or for notifying future owners, or for notifying present or future occupants of the property, of the work completed. In no way does this acknowledgement make any representation with respect to any environmental damage or liability that may have occurred at the above mentioned property due to contamination that was not discovered, reported or investigated. Any persons intending to purchase or occupy the property should make their own independent determination of the environmental condition of the property and the extent of responsibility and liability, if any, that may arise from taking ownership or occupancy. In addition, workers that are engaged in future sub-surface excavations on site must be made aware of the potential risks of exposure to the remaining contamination.

Unconditional Closure

SB ☑ It is understood from the information provided that the site has been managed in accordance with the current version of the Newfoundland and Labrador Department of Environment and Conservation *Guidance Document for the Management of Impacted Sites* and that **further remedial action and/or site-specific engineered or institutional controls are not required** to ensure compatibility with the current or reasonably foreseeable future site activities (as cited in Part 5).

Conditional Closure

☐ It is understood from the information provided that the site has been managed in accordance with the current version of the Newfoundland and Labrador Department of Environment and Conservation *Guidance Document for the Management of Impacted Sites* and that **site-specific engineered or institutional controls are required** to ensure compatibility with the current or reasonably foreseeable future site activities (as cited in Part 5).

[signature] Oct 11/2013

Department of Environment and Conservation Date

Site Remediation and Confirmatory Soil Sampling Lantech Drilling Services Inc. Hydraulic Oil Spill Wabush, NL

Stantec

Stantec Consulting Ltd.
607 Torbay Road
St. John's, NL A1A 4Y6
Tel: (709) 576-1458
Fax: (709) 576-2126

Prepared for

Maltman Group International
3550 Victoria Park Avenue
Suite 301
Toronto, ON
M2H 2N5

Final Report

File No. 121412070

Date: September 14, 2012

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1.0 INTRODUCTION

Acting at the request of Maltman Group International, Stantec Consulting Ltd. (Stantec) has monitored site remediation activities and carried out confirmatory soil sampling related to a release of hydraulic oil from a Lantech Drilling Services Inc. geotechnical drill rig located in a remote area approximately 8.5 km southwest of Wabush, Newfoundland and Labrador (NL), herein referred to as the "site" (refer to Drawing No. 121412070-EE-01 in Appendix A). The purpose of this work was to confirm that concentrations of petroleum hydrocarbon indicator parameters benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbons (TPH) in the underlying soil at the site did not exceed acceptable criteria.

At the time of the spill, a Lantech Drilling Services Inc. geotechnical drill rig was drilling a borehole (i.e., BH-GE-11B) under the supervision of Stantec. The spill occurred on November 23, 2011 when the hydraulic oil cooler on the drill rig ruptured and released approximately 100 to 120 L of hydraulic oil onto the surface of the surrounding snow/ice covered ground. The spill was discovered when hydraulically-operated equipment on the drill failed to function. An oil-stained area measuring approximately 2 m by 4 m was observed extending down-gradient of the point of release following the spill. From November 23, 2011 to November 27, 2011, emergency response and limited soil remediation activities were carried out at the site and are detailed in the current report and Stantec Report No. 121412070 "*Summary of Emergency Response & Limited Soil Remediation, Lantech Drilling Services Inc. Hydraulic Oil Spill, Wabush, Newfoundland and Labrador*" dated December 20, 2011.

don't have report, not listed in R.Sc

The current report is a follow-up to the Remedial Action Plan (RAP) proposed in the December 20, 2011 report to address residual petroleum hydrocarbon impacted soil present following the November 2011 limited remediation program. The current report documents additional remedial activities carried out at the site and summarizes the findings of the work. This report was prepared specifically and solely for the above mentioned project.

2.0 SITE DESCRIPTION

The subject property is located on Crown Land and is the site of the Alderon Iron Ore Corp. (Alderon) Kami Iron Ore project, which is situated next to the towns of Wabush and Labrador City, NL, and Fermont, Quebec. The property consists of approximately 7,625 hectares and straddles the Quebec-Labrador provincial border, but the majority of it is in Labrador (refer to Drawing No. 121412070-EE-01 in Appendix A).

The spill site (Photo 1) is located on a peat bog in a remote area of the property, approximately 8.5 km southwest of Wabush, NL (Coordinate system: Zone 19 U, NAD 27; Easting: 637706, Northing: 5855825). There is currently no access to the site, and transport to the site during the drilling program and subsequent site remediation programs was by helicopter. The staging area for the helicopter was located approximately 8.6 km northwest from the spill site (refer to


Photo 1 – Spill site on November 23, 2011

Drawing No. 121412070-EE-01 in Appendix A). No drinking water wells are reportedly present on site or in the immediate surrounding area.

Based on field borehole records for borehole BH-GE-11B and adjacent borehole BH-GE-11, located approximately 5 m northeast of borehole BH-GE-11B (refer to Drawing No. 121412070-EE-02 in Appendix A), the principal natural overburden material, beneath surficial peat material, is considered to be glacial till, which directly overlies bedrock. The characteristic permeability of these soils is considered moderate. Bedrock was encountered during drilling of borehole BH-GE-11B at approximately 48 m below ground surface (mbgs). The direction of local surface water runoff is towards the southwest and a small stream located approximately 15 m down gradient of the point of oil release. The small stream is a tributary of Long Lake, which is located approximately 680 m north of the spill site (refer to Drawing No. 121412070-EE-01 in Appendix A). Groundwater was encountered at approximately 0.9 mbgs to 1.2 mbgs. The direction of local groundwater flow is assumed to follow the general slope of the spill site to the southwest towards the stream.

3.0 REGULATORY FRAMEWORK

The spill site is currently undeveloped and is located in a remote wilderness area with limited human usage. Ecological receptors are thus considered to be the more sensitive receptor, and as such ecological-based criteria are considered more appropriate for use in evaluating concentrations of petroleum hydrocarbons impacts at the site. The Province of Newfoundland and Labrador has adopted the Atlantic Risk-Based Corrective Action (RBCA) approach for evaluation of petroleum hydrocarbon impacted sites. However, Atlantic RBCA Tier I Risk-Based Screening Levels (RBSLs) and calculated Tier II Pathway-Specific Screening Level (PSSLs) are human health based guidelines and are not designed to be protective of ecological receptors (refer to NLDEC document "*Guidance Document for the Management of Impacted Sites, Version 1.01*" dated September 2005 and Atlantic RBCA document "*Atlantic RBCA Version 2.0 for Petroleum Impacted Sites in Atlantic Canada, User Guidance*" dated March 2007). Alternatively, ecological based guidelines for the protection of plants and terrestrial vertebrates within the Canadian Council of Ministers of the Environment (CCME) Soil Quality Guidelines for Environmental Health (SQG_E) and CCME Canada-Wide Standards (CWS) for Petroleum Hydrocarbons (PHC) in Soil were used to evaluate concentrations of petroleum hydrocarbons in soil identified at the site as part of the current program. These guidelines are the most conservative of the CCME PHC CWS ecological-based guidelines and therefore are also protective of higher terrestrial species, as well as aquatic receptors. In addition, these guidelines are also considered protective of human health for the applicable exposure pathway present at the site (i.e., direct contact).

4.0 DESCRIPTION OF SITE WORK

Following discovery of the spill, the drill rig was immediately shut down and Alderon and Service NL, Government of Newfoundland and Labrador (via the Canadian Coast Guard) were notified of the incident. Initial emergency response efforts focused on recovery of approximately 10 to 15 L of free product present on snow and ice at the point of release using absorbent pads from two (2) on-site spill kits. Oil saturated absorbent material were replaced frequently and were stored in empty 20 L pails on site for disposal. In conjunction with free product recovery, two (2) trenches were excavated down gradient of the spill area, between the spill area and the stream. The trenches were spaced 2 m apart and each trench measured approximately 6 m long by 0.2 m deep. Groundwater was observed in the trench closest to the stream, however; no field evidence of petroleum hydrocarbon impacts was observed on groundwater in the trench. Absorbent booms were placed in both trenches to prevent potential migration of petroleum hydrocarbon impacts into the down gradient stream, and were replaced as required.

On November 24, 2011, an Alderon field crew returned to the site to carry out a limited soil remediation program. Later that day, an environmental engineer from Stantec arrived on-site and carried out a visual assessment of the site. No evidence of petroleum hydrocarbon impacts was observed on the surface of the stream at the time of the emergency response activities or the limited soil remediation program.

Given the frozen ground conditions at the time of the spill, and the lack of road access to the site for mechanical excavation equipment, soil remediation was limited to manual excavation of heaviest impacts in the immediate vicinity of the spill (Photo 2). From November 24 to 27, 2011 petroleum hydrocarbon impacted snow, ice, and surficial soil (peat) were manually excavated from an area measuring approximately 3 m wide by 5 m long, and extending to approximately 0.2 mbgs. Approximately 3.5 tonnes of impacted material was recovered and was placed in eleven (11) 200 L steel drums with sealed covers. The steel drums were stored at the staging area to await transport to a licensed soil treatment facility. In addition, since the remedial excavation was shallow and did not extend to the depth of groundwater, three (3) test pits were manually dug to the depth of groundwater in the spill area to further delineate the extent of subsurface petroleum hydrocarbon impacts at the site. The locations of these test pits are shown on Drawings No. 121412070-EE-02 and No. 121412070-EE-02 in Appendix A. No evidence of petroleum hydrocarbon impacts were observed in test pit TP3, located adjacent to the down gradient stream. An oily sheen was observed in test pits TP1 and TP2, with most notable impacts identified in test pit TP1, located along the northern limit of the remedial excavation.

Photo 2 – Manual excavation

On November 27, 2011, six (6) confirmatory soil samples were collected by bulk sample method, including two (2) confirmatory soil samples (i.e., TP1-BS1 and TP3-BS1) collected from the base of test pits and four (4) confirmatory soil samples (i.e., REM-BS1 to REM-BS4) collected from the base and sidewalls of the remedial excavation. With the exception of sheening on groundwater in test pit TP1, no field evidence of petroleum hydrocarbon impacts was observed in the areas of soil sample locations TP1-BS1, TP3-BS1 and REM-BS1 to REM-BS4 at the time of confirmatory soil sampling. The locations of confirmatory soil samples TP1-BS1, TP3-BS1, and REM-BS1 to REM-BS4 are shown on Drawing No. 121412070-EE-03 in Appendix A.

All confirmatory soil samples collected as part of site remediation activities were collected in clean glass jars with Teflon liners under the lids and placed on ice in coolers. All confirmatory soil samples were shipped to Maxxam Analytics in St. John's, NL for analysis of petroleum hydrocarbon indicator parameters BTEX and TPH comprised of both purgeable and extractable hydrocarbons (gas/diesel/lube oil ranges – C6 to C32).

The results of the laboratory analysis for petroleum hydrocarbons in confirmatory soil samples TP1-BS1, TP3-BS1, and REM-BS1 to REM-BS4 are presented in Table B.1 in Appendix B. Full analytical results are presented in certificates of analysis from Maxxam Analytics, which are also provided in Appendix B. Elevated concentrations of petroleum hydrocarbon fractions >C10-C16 were present in two (2) confirmatory soil samples (i.e., TP1-BS1 and REM-BS4) at concentrations ranging from 180 mg/kg in confirmatory soil sample TP1-BS1 to 270 mg/kg in confirmatory soil sample REM-BS4, which exceeded the applicable CCME CWS Tier I Level for petroleum hydrocarbon fractions >C10-C16 (i.e., 150 mg/kg). Elevated concentrations of petroleum hydrocarbon fractions >C16-<C32 were present in four (4) confirmatory soil samples (i.e., TP1-BS1 and REM-BS2 to REM-BS4) at concentrations ranging from 750 mg/kg in confirmatory soil sample REM-BS2 to 113,700 mg/kg in confirmatory soil sample REM-BS4, which exceeded the applicable CCME CWS Tier I Level for petroleum hydrocarbon fractions >C16-C34 (i.e., 300 mg/kg). Based on these results, residual petroleum hydrocarbon impacted soil was still present along the limits of the remedial excavation in the areas of confirmatory soil sample locations TP1-BS1 and REM-BS2 to REM-BS4 that required removal. Analytical results for confirmatory soil sample REM-BS1 collected in the center base of the excavation indicated a clean base in this area.

From April 13, 2012 to April 24, 2012 a subsequent site remediation program was carried out at the site as weather conditions (i.e., temperature, frozen ground condition, etc.) had improved enough since the November 2011 limited soil remediation program to allow further excavation using mechanized equipment. Site remediation activities were undertaken by Aivek Holdings Inc. of Nain, NL, under the direction of an environmental engineer from Stantec, who maintained a record of activities carried out at the site, and of the subsurface conditions encountered. Transport of personnel, equipment, and impacted materials between the spill site and a staging area located off of the Trans-Labrador Highway, approximately 12 km west of Labrador City (see Drawing No. 121412070-EE-01, attached), was provided by Canadian Helicopters Ltd. of Goose Bay, NL, using an AS 350 AStar Eurocopter B2 helicopter. On April 13, 2012, Stantec and Aivek personnel mobilized to Wabush, NL. Canadian Helicopters was already in Wabush, NL on standby after completing separate work in the area on April 10, 2012.

On April 14, 2012, an environmental engineer from Stantec arrived at the site and carried out a visual assessment. Approximately 0.5 m of snow and 0.1 m of ice covered the site at the time of the assessment. Water was not observed at the stream area immediately down gradient of the site, which was covered with approximately 1.5 m of snow at the time of the assessment. A small volume of running water was observed in the stream area approximately 20 m downstream of the site. No field evidence of petroleum hydrocarbon impacts was observed on the surface of the stream at the time of the assessment. A pool of free product measuring approximately 0.1 m wide by 0.3 m long and 0.01 m deep was observed adjacent to the east corner of the excavation ending on November 27, 2011 and absorbent pads were placed in the area. This area had previously been concealed by the drill rig and snow/ice covered ground conditions during the November 2011 limited soil remediation program.

The subsequent remedial program was carried out with the aid of a mini-excavator. In addition, excavation in the area of the pool of free product was carried out. To facilitate the excavation, snow was cleared from the site and ice and frozen soil were broken up using a jack-hammer. The excavation measured approximately 5.5 m wide by 8.5 m long, and extended to depths ranging from approximately 0.8 mbgs to 1.2 mbgs. Field evidence (i.e., small localized areas of sheening in the base of the excavation) of petroleum hydrocarbon impacts was observed at the time of excavating. Absorbent pads were placed on the surface of the sheening and the used pads were removed and disposed of together with impacted soil. Impacted material was placed in bulk bags with individual capacities of 0.93 m^3, each measuring 0.91 m x 0.91 m x 1.12 m, to await transport to the staging area (Photo 3). The limit of the remedial excavation ending on April 20, 2012 is shown on Drawing No. 121412070-EE-03 in Appendix A.

Photo 3 – Transport of impacted material in bulk bags by helicopter

Between April 15, 2012 and April 19, 2012, nine (9) confirmatory soil samples (i.e., BS-100 to BS-109), as well as duplicate samples, were collected from the base and sidewalls of the excavation by bulk sample method. The locations of confirmatory soil samples BS-100 to BS-109 are shown on Drawing No. 121412070-EE-03 in Appendix A.

The results of the laboratory analysis for petroleum hydrocarbons in confirmatory soil samples BS-100 to BS-109 are presented in Table B.1 in Appendix B. Full analytical results are presented in certificates of analysis from Maxxam Analytics, which are also provided in Appendix B. Elevated concentrations of petroleum hydrocarbon fractions >C10-C16 were present in three (3) confirmatory soil samples (i.e., BS-101, BS-103 and BS-108) at concentrations ranging from 260 mg/kg in confirmatory soil sample BS-103 to 1,500 mg/kg in confirmatory soil sample BS-108, which exceeded the applicable CCME CWS Tier I Level for petroleum hydrocarbon fractions >C10-C16 (i.e., 150 mg/kg). Elevated concentrations of petroleum hydrocarbon fractions >C16-<C32 were present in six (6) confirmatory soil samples (i.e., BS-101 to BS-103, BS-105, BS-106 and BS-108) at concentrations ranging from 410

mg/kg in confirmatory soil sample BS-102 to 6,300 mg/kg in confirmatory soil sample BS-101, which exceeded the applicable CCME CWS Tier I Level for petroleum hydrocarbon fractions >C16-C34 (i.e., 300 mg/kg). As a result, clean boundaries were achieved at the southwest base of the excavation and along the southeast sidewall in the vicinity of confirmatory soil sample location BS-104, and further excavation in the areas of BS-101 to BS-103, BS-105, BS-106 and BS-108 (i.e., the northeast, northwest, and southwest sidewalls of the excavation) was required.

On April 21, 2012, further excavation in the areas of soil sample locations BS-101 to BS-103, BS-105, BS-106 and BS-108 was carried out. The excavation ending on April 19, 2012 was extended in all directions, with the exception of the base and southwest sidewall, to final dimensions of approximately 6.5 m wide by 9.5 m long. Groundwater was encountered in manually excavated test holes at approximately 1.2 mbgs in the southern section of the excavation to 2.0 mbgs in the northern section of the excavation. No free product or sheening was observed on groundwater at these locations. The limit of the remedial excavation ending on April 21, 2012 is shown on Drawing No. 121412070-EE-03 in Appendix A.

any potential for dissolved phase?

On April 21, 2012, six (6) confirmatory soil samples (i.e., BS-110 to BS-115), as well as duplicate samples, were collected from the base and sidewalls of the excavation by bulk sample method. The locations of confirmatory soil samples BS-110 to BS-115 are shown on Drawing No. 121412070-EE-03 in Appendix A.

The results of the laboratory analysis for petroleum hydrocarbons in confirmatory soil samples BS-110 to BS-115 are presented in Table B.1 in Appendix B. Full analytical results are presented in certificates of analysis from Maxxam Analytics, which are also provided in Appendix B. TPH and BTEX were not detected in any of the soil samples analysed. As a result, no further remedial excavation was advised.

Once results of confirmatory soil samples indicated that the site had been remediated to applicable guidelines, the site was secured with snow fence, reflective markers, and silt fence (Photo 4). The site is scheduled to be fully reinstated once road access to the site is completed as part of the proposed Kami Iron Ore Project. A total of approximately 35 tonnes (i.e., forty-six (46) bulk bags and eleven (11) steel drums) of impacted snow, ice, soil, oily water and absorbent materials was excavated and removed from site. The bulk bags and steel drums of impacted material were taken to Universal Environmental Services Inc., a licensed contaminated soil treatment facility in Goose Bay, NL, for treatment, in accordance with Newfoundland and Labrador Department of Environment and Conservation requirements.

Photo 4 – Secured remedial excavation on April 24, 2012

On August 25, 2012, an environmental technician from Stantec carried out a follow-up site visit to confirm that no petroleum hydrocarbon impacts were observable at the site, as snow covered ground conditions may have limited observations during the April 2012 remediation program. No field evidence (i.e., visual or olfactory) of petroleum hydrocarbon impacts was present in or adjacent to the remedial excavation or the down gradient stream. Snow fence, reflective markers, and silt fence were re-secured. In addition, absorbent pads placed in the excavation at the end of excavation to collect any potential areas of residual sheening were removed and replaced.

5.0 ANALYTICAL RESULTS

Results of the laboratory analysis for petroleum hydrocarbons (i.e., BTEX and TPH) in soil are summarized in Table B.1 in Appendix B. Full analytical results are presented in certificates of analysis from Maxxam Analytics, which are also provided in Appendix B. Petroleum hydrocarbon analysis was conducted on a total of twenty-two (22) confirmatory soil samples, including two (2) bulk samples (i.e., TP1-BS1 and TP3-BS1) collected from test pits and twenty (20) bulk samples (i.e. REM-BS1 to REM-BS4 and BS-100 to BS115) collected from the base and sidewalls of the remedial excavation.

Following the limited soil remediation program in November 2011, TPH was detected in five (5) confirmatory soil samples (i.e., TP1-BS1 and REM-BS1 to REM-BS4) collected on November 27, 2011 at concentrations ranging from 210 mg/kg in confirmatory soil sample REM-BS1 to 110,000 mg/kg in confirmatory soil sample REM-BS4. The analytical results indicated that the petroleum hydrocarbon products impacting the confirmatory soil samples generally resembled lube oil. Elevated concentrations of petroleum hydrocarbon fractions >C10-C16 were present in two (2) confirmatory soil samples (i.e., TP1-BS1 and REM-BS4) at concentrations ranging from 180 mg/kg in confirmatory soil sample TP1-BS1 to 270 mg/kg in confirmatory soil sample REM-BS4, which exceeded the applicable CCME CWS Tier I Level for petroleum hydrocarbon fractions >C10-C16 (i.e., 150 mg/kg). Elevated concentrations of petroleum hydrocarbon fractions >C16-<C32 were present in four (4) confirmatory soil samples (i.e., TP1-BS1 and REM-BS2 to REM-BS4) at concentrations ranging from 750 mg/kg in confirmatory soil sample REM-BS2 to 113,700 mg/kg in confirmatory soil sample REM-BS4, which exceeded the applicable CCME CWS Tier I Level for petroleum hydrocarbon fractions >C16-C34 (i.e., 300 mg/kg). Additional impacted soil was removed from the areas surrounding confirmatory soil sample locations TP1-BS1 and REM-BS2 to REM-BS4 (i.e., the southeast, northwest and southwest sidewalls of the excavation) during subsequent site remediation activities.

During the subsequent soil remediation program in April 2012, TPH was detected in six (6) confirmatory soil samples (i.e., BS-101 to BS-103, BS-105, BS-106 and BS-108) collected between April 15, 2012 and April 19, 2012 at concentrations ranging from 410 mg/kg in confirmatory soil sample BS-102 to 7,400 mg/kg in confirmatory soil sample BS-101. The analytical results indicated that the petroleum hydrocarbon products impacting the confirmatory soil samples generally resembled a combination of lube oil and weathered fuel oil. Elevated concentrations of petroleum hydrocarbon fractions >C10-C16 were present in three (3) confirmatory soil samples (i.e., BS-101, BS-103 and BS-108) at concentrations ranging from 260 mg/kg in confirmatory soil sample BS-103 to 1,500 mg/kg in confirmatory soil sample BS-108, which exceeded the applicable CCME CWS Tier I Level for petroleum hydrocarbon fractions >C10-C16 (i.e., 150 mg/kg). Elevated concentrations of petroleum hydrocarbon fractions >C16-<C32 were present in six (6) confirmatory soil samples (i.e., BS-101 to BS-103, BS-105, BS-106 and BS-108) at concentrations ranging from 410 mg/kg in confirmatory soil sample BS-102 to 6,300 mg/kg in confirmatory soil sample BS-101, which exceeded the applicable CCME CWS Tier I Level for petroleum hydrocarbon fractions >C16-C34 (i.e., 300 mg/kg). Additional impacted soil was removed from the areas surrounding confirmatory soil sample locations BS-101 to BS-103, BS-105, BS-106 and BS-108 (i.e., the northeast, northwest, and southwest sidewalls of the excavation) during subsequent site remediation activities

Following further remedial excavation as part of the April 2012 remediation program, TPH was no detected in any of the soil samples (i.e., BS-110 to BS-115) collected from the final limits of the excavation. BTEX was not detected in any of the soil samples analysed as part of the entire site remediation program. As a result, no further site remediation was warranted at the time.

6.0 DISCUSSION AND RECOMMENDATIONS

Stantec has monitored site remediation activities and carried out confirmatory soil sampling in response to a hydraulic oil spill from a Lantech Drilling Services Inc. drill rig near Wabush, NL. All petroleum hydrocarbon impacted soil exceeding applicable guidelines, free phase petroleum hydrocarbon product, and oily water encountered within the excavation have been removed from the site. Concentrations of petroleum hydrocarbons (i.e., BTEX and TPH) in all confirmatory soil samples collected from the final boundaries of the remedial excavation did not exceed the ecological-based guidelines used to evaluate the site; therefore, it is recommended that no further investigative work or remediation be carried out at the site regarding the hydraulic oil spill that has been detailed in this report.

On behalf of the Maltman Group International, Stantec has forwarded a copy of this report along with the Record of Site Condition (provided in Appendix C) to Service NL, Government of NL in Happy Valley – Goose Bay, NL, for their review and consideration in providing closure in relation to the spill that has been detailed in this report.

7.0 CLOSURE

This report has been prepared for the sole benefit of Maltman Group International. The report may not be used by any other person or entity without the express written consent of Stantec Consulting Ltd. and Maltman Group International.

Any use which a third party makes of this report, or any reliance on decisions made based on it, is the responsibility of such third parties. Stantec accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with generally accepted engineering and scientific practices current at the time the work was performed. Conclusions presented in this report should not be construed as legal advice.

The conclusions presented in this report represent the best technical judgment of Stantec based on the data obtained from the work. The conclusions are based on the site conditions encountered by Stantec at the time the work was performed at the specific testing and/or sampling locations, and can only be extrapolated to an undefined limited area around these locations. The extent of the limited area depends on the soil and groundwater conditions, as well as the history of the site reflecting natural, construction and other activities. In addition, analysis has been carried out for a limited number of chemical parameters, and it should not be inferred that other chemical species are not present. Due to the nature of the investigation and the limited data available, Stantec cannot warrant against undiscovered environmental liabilities.

If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, we request that we be notified immediately to reassess the conclusions provided herein. This report was prepared by Michael Haverstock, M.Sc., E.I.T. and reviewed by Carolyn Anstey-Moore, M.Sc., M.A.Sc., P.Geo. We trust that this report meets your present requirements. If you have any questions or require additional information, please contact our office at your convenience.

Respectfully submitted,

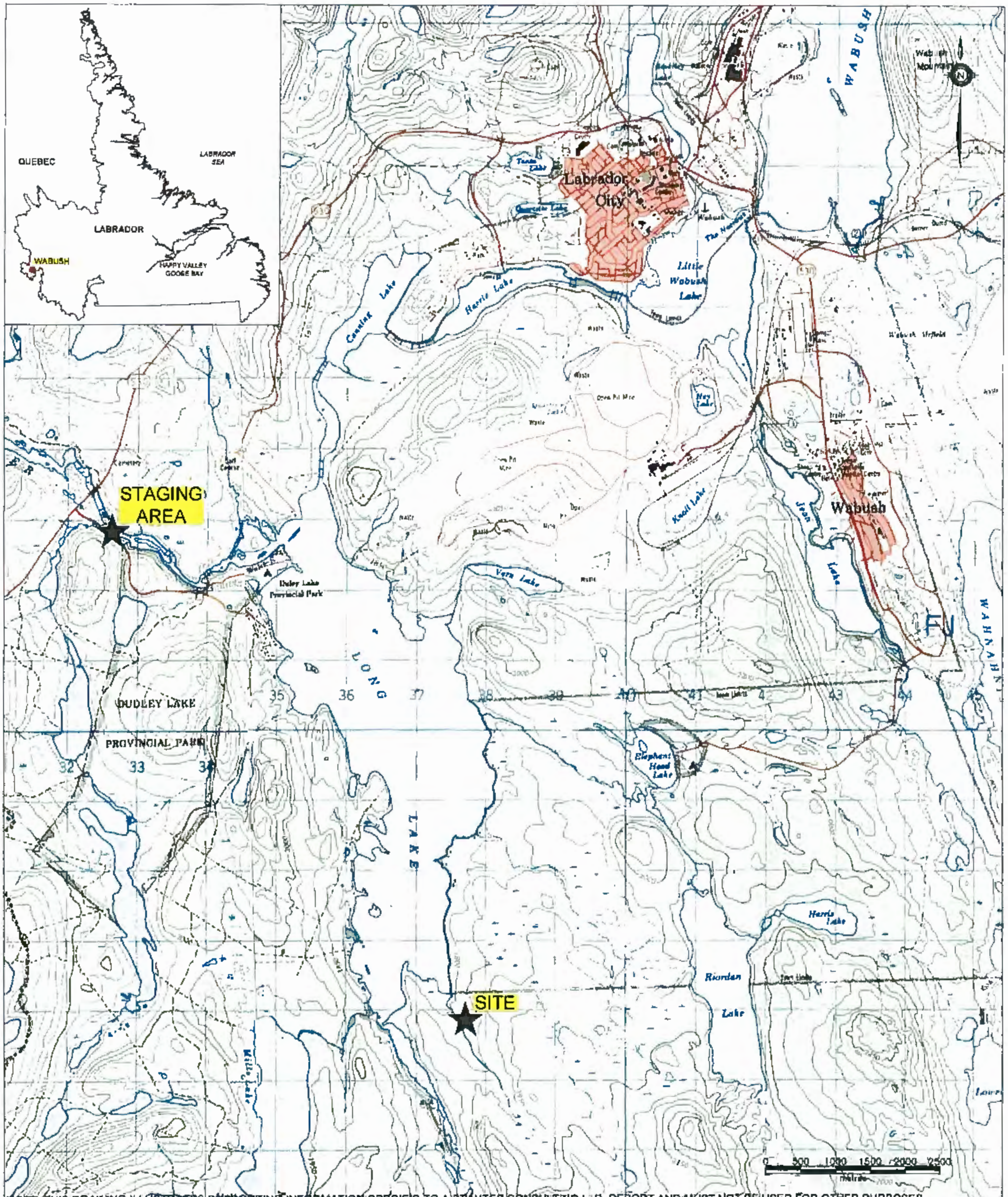
STANTEC CONSULTING LTD.

Michael Haverstock, M.Sc., E.I.T.
Environmental Engineer

Carolyn Anstey-Moore, M.Sc., M.A.Sc., P.Geo.
Senior Environmental Geoscientist

APPENDIX A

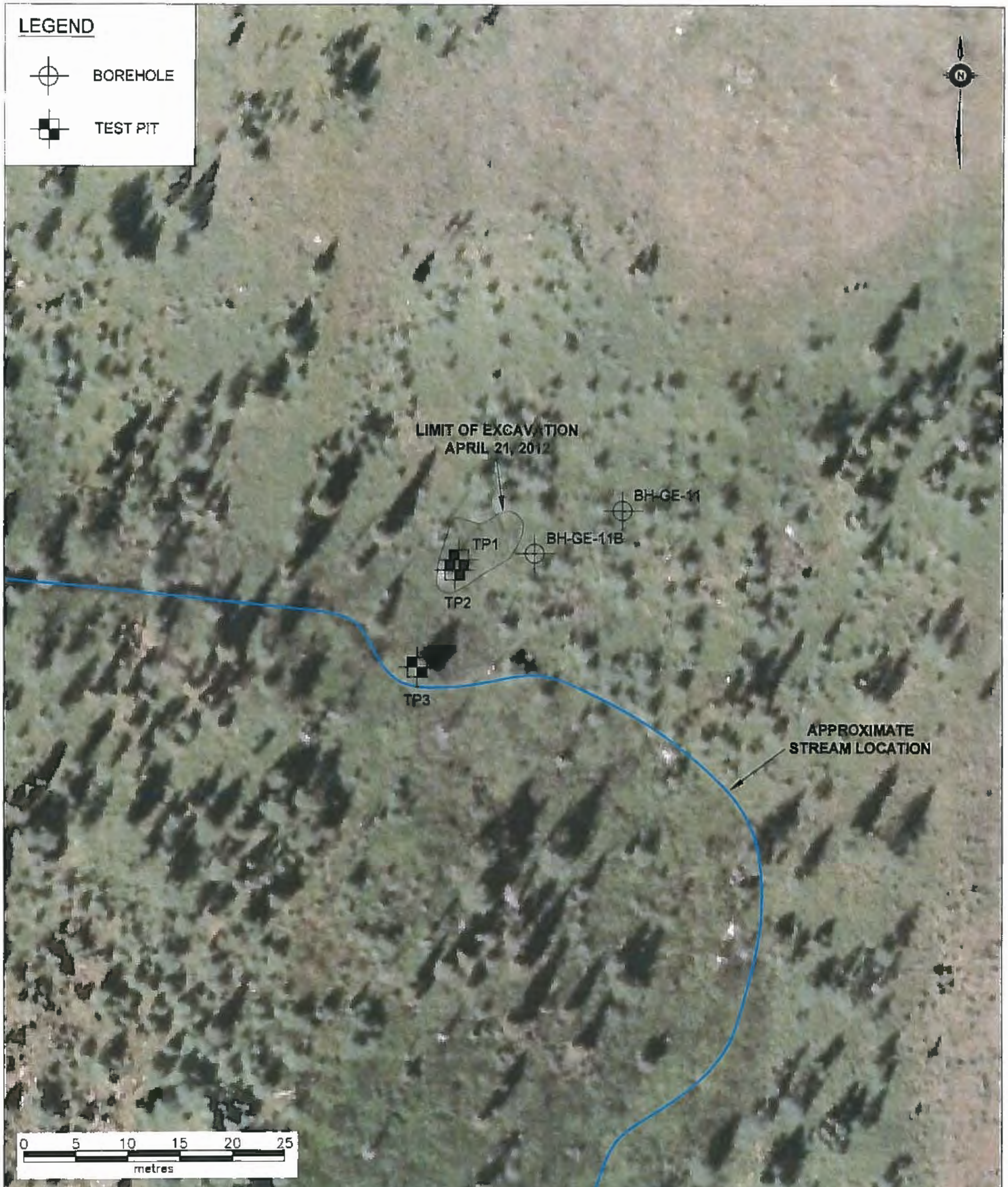
Drawings



NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

CLIENT: MALTMAN GROUP INTERNATIONAL	SCALE: 1:75,000	DATE: MAY 8, 2012	Stantec
	DRAWN BY: N.M	CHECKED BY:	
PROJECT TITLE: SITE REMEDIATION AND CONFIRMATORY SOIL SAMPLING, LANTECH DRILLING SERVICES INC. HYDRAULIC OIL SPILL, WABUSH, NL	EDITED BY: -	REV No.: 0	
	DRAWING No.: 121412070-EE-01		
DRAWING TITLE: SITE LOCATION PLAN	CAD FILE: 121412070-EE-01.DWG		

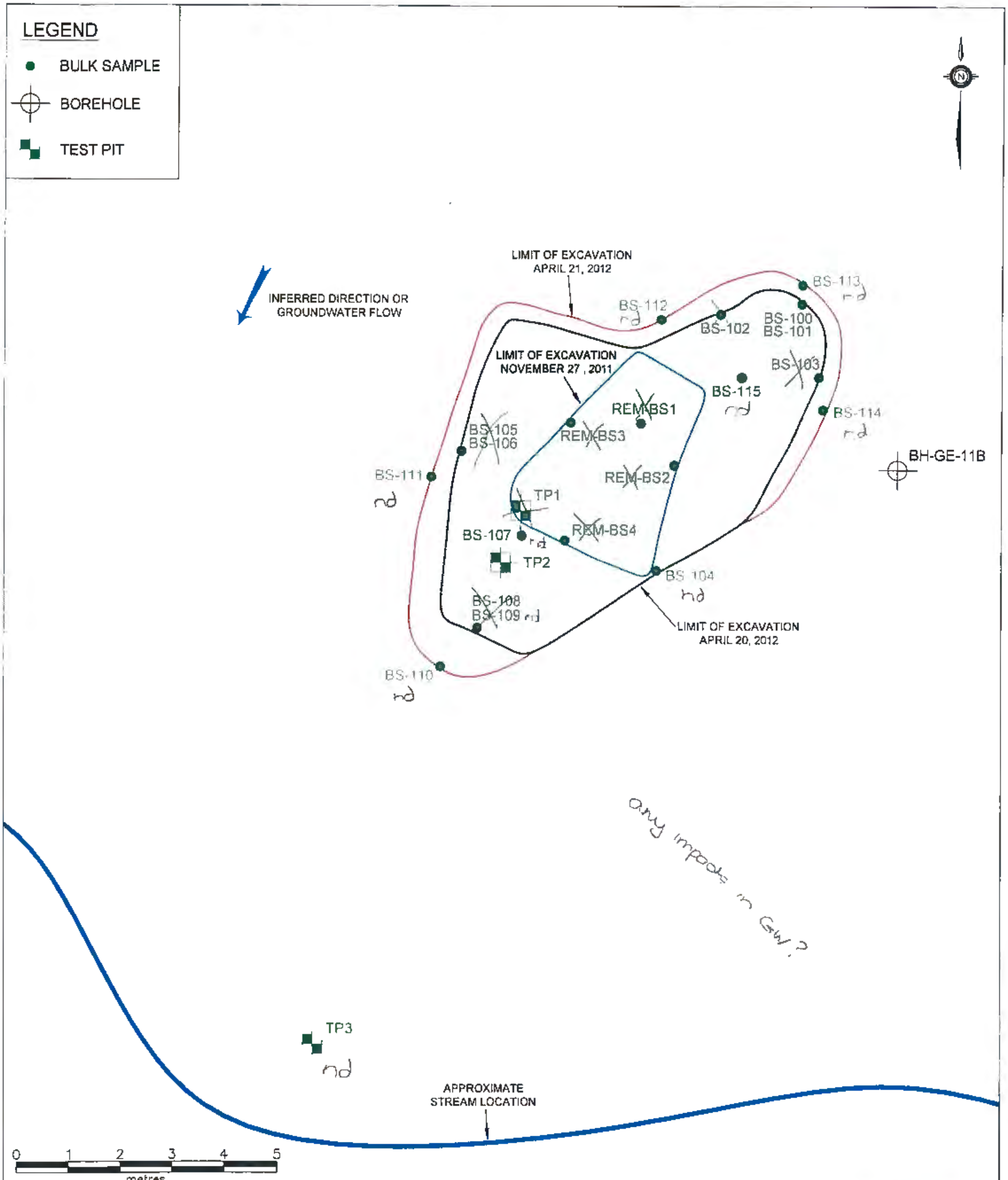
08MAY12 10:00AM



NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

CLIENT: MALTMAN GROUP INTERNATIONAL	SCALE: 1:500	DATE: MAY 9, 2012	Stantec
	DRAWN BY: N.M	CHECKED BY:	
PROJECT TITLE: SITE REMEDIATION AND CONFIRMATORY SOIL SAMPLING, LANTECH DRILLING SERVICES INC. HYDRAULIC OIL SPILL, WABUSH, NL	EDITED BY: R.L.	REV No.: 0	
DRAWING TITLE: MAGNIFIED SITE LOCATION PLAN	DRAWING No: 121412070-EE-02		
	CAD FILE: 121412070-EE-02.DWG		

25JUNE12 3:15PM



NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

CLIENT: MALTMAN GROUP INTERNATIONAL	SCALE: 1:100	DATE: MAY 8, 2012	Stantec
PROJECT TITLE: SITE REMEDIATION AND CONFIRMATORY SOIL SAMPLING, LANTECH DRILLING SERVICES INC. HYDRAULIC OIL SPILL, WABUSH, NL	DRAWN BY: N.M.	CHECKED BY:	
	EDITED BY: R.L.	REV. No: 0	
DRAWING TITLE: SITE PLAN	DRAWING No: 121412070-EE-03		
	CAD FILE: 121412070-EE-03.DWG		

26JUNE12 11:25AM

APPENDIX B

Analytical Summary Table

Laboratory Certificates of Analysis

Table B.1 - Results of Laboratory Analysis of Petroleum Hydrocarbons In Soil
Site Remediation and Confirmatory Soil Sampling, Lantech Drilling Services Inc. Hydraulic Oil Spill
Wabush, NL
Stantec Project No. 121412070

Sample ID	Sampling Date	Sample Depth (m bgs)	BTEX Parameters (mg/kg)				Total Petroleum Hydrocarbons (mg/kg)					Resemblance / Comments
			Benzene	Toluene	Ethylbenzene	Xylenes (Total)	C6-C10 (less BTEX)	>C10-C16 Hydrocarbons	>C16-<C32 Hydrocarbons	≥C32[1] Hydrocarbons	Modified TPH (Tier I)[2]	
REM-BS1	11/27/2011	0.25 - 0.35	ND	ND	ND	ND	ND	ND	210	-	210*	LO; Soil removed
REM-BS2	11/27/2011	0.25 - 0.35	ND	ND	ND	ND	ND	ND	**750**	-	750*	LO; Soil removed
REM-BS3	11/27/2011	0.25 - 0.35	ND	0.37	ND	ND	ND	85	**46,500**	-	46,000*	LO; Soil removed
REM-BS4	11/27/2011	0.25 - 0.35	ND	0.85	ND	ND	ND	**270**	**113,700**	-	110,000*	LO; Soil removed
TP1-BS1	11/27/2011	0.50 - 0.60	ND	ND	ND	ND	ND	**180**	**10,030**	-	10,000*	LO; Soil removed
TP3-BS1	11/27/2011	1.00 - 1.10	ND	ND	ND	ND	ND	ND	ND	-	ND	-
BS-100	4/15/2012	0.0 - 0.2	ND	ND	ND	ND	ND	ND	ND	-	ND	Soil removed
BS-101	4/15/2012	0.9 - 1.1	ND	ND	ND	ND	ND	**1,100**	**6,300**	-	7,400*	FO; LO; Soil removed
BS-102	4/18/2012	0.1 - 0.8	ND	ND	ND	ND	ND	ND	**410**	-	410*	LO; Soil removed
BS-103	4/18/2012	0.1 - 0.8	ND	ND	ND	ND	ND	**260**	**560**	-	810*	WFO, LO; Soil removed
BS-104	4/18/2012	0.1 - 0.9	ND	ND	ND	ND	ND	ND	ND	-	ND	-
BS-105	4/18/2012	0.1 - 0.3	ND	ND	ND	ND	ND	110	**540**	-	650*	WFO, LO; Soil removed
BS-106	4/18/2012	0.6 - 0.8	ND	ND	ND	ND	ND	ND	**1,400**	-	1,400*	LO; Soil removed
BS-107	4/19/2012	0.8 - 0.9	ND	ND	ND	ND	ND	ND	ND	-	ND	-
BS-108	4/19/2012	0.1 - 0.2	ND	ND	ND	ND	ND	**1,500**	**3,200**	-	4,700*	WFO; LO; Soil removed
BS-109	4/19/2012	0.7 - 0.8	ND	ND	ND	ND	ND	ND	ND	-	ND	- Soil removed
BS-110	4/21/2012	0.0 - 0.8	ND	ND	ND	ND	ND	ND	ND	-	ND	-
BS-111	4/21/2012	0.0 - 0.8	ND	ND	ND	ND	ND	ND	ND	-	ND	-
BS-112	4/21/2012	0.0 - 0.8	ND	ND	ND	ND	ND	ND	ND	-	ND	-
BS-113	4/21/2012	0.0 - 0.8	ND	ND	ND	ND	ND	ND	ND	-	ND	-
BS-114	4/21/2012	0.0 - 0.8	ND	ND	ND	ND	ND	ND	ND	-	ND	-
BS-115	4/21/2012	0.0 - 0.8	ND	ND	ND	ND	ND	ND	ND	-	ND	-
RDL			0.03	0.03	0.03	0.05	3	10	25	-	20	-
Guideline [3]			31	75	55	95	210	150	300	2,800	-	-

Notes:

[1] = Atlantic PIRI analytical method does not analyse for >C32. Laboratory certificate indicates (Yes or No) whether chromatogram for each sample returns to baseline after C32. Samples are considered to have returned to baseline if the area from C32-C36 is less than 10% of the area from C10-C32 (See * below)

[2] = Modified TPH = TPH C6 - C32 (excluding BTEX)

[3] = Canadian Council of Ministers of the Environment (CCME) Soil Quality Guideline for Environmental Health (SQG_E) for BTEX in surface soil on a residential/parkland site with coarse soil (i.e., the most restrictive criteria) (2004); and CCME Canada Wide Standards (CWS) Tier I Levels for Petroleum Hydrocarbons in Surface Soil - Table 3 (coarse-grained soil, residential land use, eco soil contact - User Guidance, 2008) for petroleum hydrocarbon fractions. Note that the CWS hydrocarbon fraction ranges are not identical to the Atlantic RBCA fractions

m bgs = meters below ground surface

Silica gel clean-up was conducted on all samples to remove any possible interference from organics in soil

- = not analysed, not applicable or no applicable guideline

* = Baseline not reached at C32; sample may contain carbon fractions >C32

Shaded and Bold = Value exceeds applicable criteria

ND = Not Detected above the RDL

RDL = Reportable Detection Limit (highest RDL listed on laboratory report is shown)

FO = Fuel Oil

LO = Lube Oil

WFO = Weathered Fuel Oil

Success Through Science®

Your P.O. #: 16300R-40
Your Project #: 121614000
Site Location: KAMI IRON ORE
Your C.O.C. #: ES433311

Attention: Carolyn Anstey-Moore
Stantec Consulting Ltd
St. John's - Standing Offer
607 Torbay Rd
St. John's, NL
A1A 4Y6

Report Date: 2011/12/01

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B1I8283
Received: 2011/11/30, 11:15

Sample Matrix Soil
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
TEH in Soil (PIRI) (1, 2)	6	2011/11/30	2011/12/01	ATL SOP-00197	Based on Atl. PIRI
Moisture	6	N/A	2011/11/30	ATL SOP-00196	MOE Handbook 1983
VPH in Soil (PIRI) (1)	6	2011/11/30	2011/11/30	ATL SOP 00199	Based on Atl. PIRI
ModTPH (T1) Calc. for Soil	6	2011/11/30	2011/12/01		Based on Atl. PIRI

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) Reported on a dry weight basis.
(2) Soils are reported on a dry weight basis unless otherwise specified.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

ROB WHELAN, Project Manager
Email: RWhelan@maxxam.ca
Phone# (709) 754-0203

==
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709 754 0203 Toll Free 888 492 7227 Fax 709-754 8612 www.maxxam.ca

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Maxxam Job #: B1I8283
Report Date: 2011/12/01

Stantec Consulting Ltd
Client Project #: 121614000
Site Location: KAMI IRON ORE
Your P.O. #: 16300R-40
Sampler Initials: MJH

RESULTS OF ANALYSES OF SOIL

Maxxam ID		LU8514	LU8515	LU8516	LU8517	LU8518	LU8519		
Sampling Date		2011/11/27	2011/11/27	2011/11/27	2011/11/27	2011/11/27	2011/11/27		
Received Temperature (°C)		4.7 C	4.7 C	4.7 C	4.7 C	4.7 C	4.7 C		
	Units	**REM-BS1**	**REM-BS2**	**REM-BS3**	**REM-BS4**	**TP1-BS1**	**TP3-BS1**	**RDL**	**QC Batch**
Inorganics									
Moisture	%	87	86	78	81	93	33	1	2697824

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		LU8514	LU8515	LU8516	LU8517	LU8518	LU8519		
Sampling Date		2011/11/27	2011/11/27	2011/11/27	2011/11/27	2011/11/27	2011/11/27		
Received Temperature (°C)		4.7 C	4.7 C	4.7 C	4.7 C	4.7 C	4.7 C		
	Units	**REM-BS1**	**REM-BS2**	**REM-BS3**	**REM-BS4**	**TP1-BS1**	**TP3-BS1**	**RDL**	**QC Batch**
Petroleum Hydrocarbons									
Benzene	mg/kg	ND	ND	ND	ND	ND	ND	0.03	2698196
Toluene	mg/kg	ND	ND	0.37	0.85	ND	ND	0.03	2698196
Ethylbenzene	mg/kg	ND	ND	ND	ND	ND	ND	0.03	2698196
Xylene (Total)	mg/kg	ND	ND	ND	ND	ND	ND	0.05	2698196
C6 - C10 (less BTEX)	mg/kg	ND	ND	ND	ND	ND	ND	3	2698196
>C10-C16 Hydrocarbons	mg/kg	ND	ND	85	270	180	ND	10	2698197
>C16-C21 Hydrocarbons	mg/kg	ND	ND	1500	3700	330	ND	10	2698197
>C21-<C32 Hydrocarbons	mg/kg	210	750	45000	110000	9700	ND	15	2698197
Modified TPH (Tier1)	mg/kg	210	750	46000	110000	10000	ND	20	2697854
Reached Baseline at C32	mg/kg	NO	NO	NO	NO	NO	YES	N/A	2698197
Hydrocarbon Resemblance	mg/kg	SEECOMMENT (1)	SEECOMMENT (2)	SEECOMMENT (2)	SEECOMMENT (2)	SEECOMMENT (2)		N/A	2698197
Surrogate Recovery (%)									
Isobutylbenzene - Extractable	%	62	75	65	72	80	73		2698197
Isobutylbenzene - Volatile	%	116	94	83	15 (3)	57 (3)	92		2698196
n-Dotriacontane - Extractable	%	117 (4)	114 (5)	100 (4)	17 (6)	119 (5)	116 (5)		2698197

N/A = Not Applicable
ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - Possible lube oil fraction.
(2) - Lube oil fraction.
(3) - Isobutylbenzene recovery not within acceptance limits; moisture exceeds 50%.
(4) - Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to silica gel cleanup.
Triple silica gel cleanup was used to remove organic interferences from sample extract as per client request.
(5) - Triple silica gel cleanup was used to remove organic interferences from sample extract as per client request.
(6) - Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to matrix/co-extractive interference. Triple silica gel cleanup was used to remove organic interferences from sample extract as per client request.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel 709 754 0203 Toll Free 888 492 7227 Fax 709 754 8612 www.maxxam.ca

Maxxam Job #: B1I8283
Report Date: 2011/12/01

Stantec Consulting Ltd
Client Project #: 121614000
Site Location: KAMI IRON ORE
Your P.O. #: 16300R-40
Sampler Initials: MJH

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
2697824	Moisture	2011/11/30							4.4	25
2698196	Isobutylbenzene - Volatile	2011/11/30			95	60 - 140	108	%		
2698196	Benzene	2011/11/30			77	60 - 140	ND, RDL=0.03	mg/kg	NC	50
2698196	Toluene	2011/11/30			78	60 - 140	ND, RDL=0.03	mg/kg	NC	50
2698196	Ethylbenzene	2011/11/30			78	60 - 140	ND, RDL=0.03	mg/kg	NC	50
2698196	Xylene (Total)	2011/11/30			76	60 - 140	ND, RDL=0.05	mg/kg	NC	50
2698196	C6 - C10 (less BTEX)	2011/11/30					ND, RDL=3	mg/kg	NC	50
2698197	Isobutylbenzene - Extractable	2011/12/01	102	30 - 130	108	30 - 130	99	%		
2698197	n-Dotriacontane - Extractable	2011/12/01	110	30 - 130	118	30 - 130	102	%		
2698197	>C10-C16 Hydrocarbons	2011/12/01	84	30 - 130	86	30 - 130	ND, RDL=10	mg/kg	NC	50
2698197	>C16-C21 Hydrocarbons	2011/12/01	90	30 - 130	93	30 - 130	ND, RDL=10	mg/kg	NC	50
2698197	>C21-<C32 Hydrocarbons	2011/12/01	96	30 - 130	107	30 - 130	ND, RDL=15	mg/kg	NC	50

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference
Spiked Blank: A blank matrix to which a known amount of the analyte has been added Used to evaluate analyte recovery
Method Blank: A blank matrix containing all reagents used in the analytical procedure Used to identify laboratory contamination
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave. Suite 101A, St.John's, NL Canada A1A 1W9 Tel 709-754-0203 Toll Free 888 492 7227 Fax 709 754 8612 www.maxxam.ca

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Validation Signature Page

Maxxam Job #: B1I8283

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

PAULA CHAPLIN, Project Manager

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Your P.O. #: 16300R-40
Your Project #: 121412070
Site Location: LANTECH SPILL
Your C.O.C. #: ES248311

Attention: Carolyn Anstey-Moore
Stantec Consulting Ltd
St. John's - Standing Offer
607 Torbay Rd
St. John's, NL
A1A 4Y6

Report Date: 2012/04/21

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B255521
Received: 2012/04/20, 10:12

Sample Matrix: Soil
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
TEH in Soil (PIRI) (1,2)	7	2012/04/20	2012/04/21	ATL SOP-00197	Based on Atl. PIRI
Moisture	7	N/A	2012/04/21	ATL SOP-00196	MOE Handbook 1983
VPH in Soil (PIRI) (1)	7	2012/04/20	2012/04/21	ATL SOP 00199	Based on Atl. PIRI
ModTPH (T1) Calc. for Soil	7	2012/04/20	2012/04/21		Based on Atl. PIRI

Remarks:

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) Reported on a dry weight basis.
(2) Soils are reported on a dry weight basis unless otherwise specified

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

ROB WHELAN, Project Manager
Email: RWhelan@maxxam.ca
Phone# (709) 754-0203

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Total cover pages: **1**

Maxxam Job #: B255521
Report Date: 2012/04/21

Stantec Consulting Ltd
Client Project #: 121412070
Site Location: LANTECH SPILL
Your P.O. #: 16300R-40
Sampler Initials: AR

RESULTS OF ANALYSES OF SOIL

Maxxam ID		NE0332	NE0333	NE0334	NE0335	NE0336	NE0337	NE0338		
Sampling Date		2012/04/19	2012/04/19	2012/04/19	2012/04/19	2012/04/19	2012/04/19	2012/04/19		
Received Temperature (°C)		5.3 C	5.3 C	5.3 C	5.3 C	5.3 C	5.3 C	5.3 C		
	Units	**BS100**	**BS101**	**BS102**	**BS103**	**BS104**	**BS105**	**BS106**	**RDL**	**QC Batch**
Inorganics										
Moisture	%	90	89	90	90	87	90	88	1	2825290

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B255521
Report Date: 2012/04/21

Stantec Consulting Ltd
Client Project #: 121412070
Site Location: LANTECH SPILL
Your P.O. #: 16300R-40
Sampler Initials: AR

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		NE0332	NE0333	NE0334	NE0335	NE0336	NE0337	NE0338		
Sampling Date		2012/04/19	2012/04/19	2012/04/19	2012/04/19	2012/04/19	2012/04/19	2012/04/19		
Received Temperature (°C)		5.3 C	5.3 C	5.3 C	5.3 C	5.3 C	5.3 C	5.3 C		
	Units	**BS100**	**BS101**	**BS102**	**BS103**	**BS104**	**BS105**	**BS106**	**RDL**	**QC Batch**
Petroleum Hydrocarbons										
Benzene	mg/kg	ND	ND	ND	ND	ND	ND	ND	0.025	2825573
Toluene	mg/kg	ND	ND	ND	ND	ND	ND	ND	0.025	2825573
Ethylbenzene	mg/kg	ND	ND	ND	ND	ND	ND	ND	0.025	2825573
Xylene (Total)	mg/kg	ND	ND	ND	ND	ND	ND	ND	0.050	2825573
C6 - C10 (less BTEX)	mg/kg	ND	ND	ND	ND	ND	ND	ND	2.5	2825573
>C10-C16 Hydrocarbons	mg/kg	ND	1100	ND	260	ND	110	ND	10	2825574
>C16-C21 Hydrocarbons	mg/kg	ND	300	ND	ND	ND	ND	ND	10	2825574
>C21-<C32 Hydrocarbons	mg/kg	ND	6000	410	560	ND	540	1400	15	2825574
Modified TPH (Tier1)	mg/kg	ND	7400	410	810	ND	650	1400	15	2825148
Reached Baseline at C32	mg/kg	YES	NO	NO	NO	YES	NO	NO	N/A	2825574
Hydrocarbon Resemblance	mg/kg		SEECOMMENT(1)	SEECOMMENT(2)	SEECOMMENT(3)		SEECOMMENT(3)	SEECOMMENT(2)	N/A	2825574
Surrogate Recovery (%)										
Isobutylbenzene - Extractable	%	98	103	98	101	106	98	100		2825574
Isobutylbenzene - Volatile	%	104	67	71	80	101	71	132		2825573
n-Dotriacontane - Extractable	%	107(4)	120(4)	108(4)	111(4)	115(4)	106(4)	110(4)		2825574

N/A = Not Applicable
ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - Fuel oil fraction. Lube oil fraction.
(2) - Lube oil fraction.
(3) - Weathered fuel oil fraction. Lube oil fraction.
(4) - Triple silica gel cleanup was used to remove organic interferences from sample extract as per client request.

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Maxxam Job #: B255521
Report Date: 2012/04/21

Stantec Consulting Ltd
Client Project #: 121412070
Site Location: LANTECH SPILL
Your P.O. #: 16300R-40
Sampler Initials: AR

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
2825290	Moisture	1899/12/30							TBA	25
2825573	Isobutylbenzene - Volatile	2012/04/21			92	60 - 140	108	%		
2825573	Benzene	2012/04/21			99	60 - 140	ND, RDL=0.025	mg/kg	NC	50
2825573	Toluene	2012/04/21			100	60 - 140	ND, RDL=0.025	mg/kg	NC	50
2825573	Ethylbenzene	2012/04/21			99	60 - 140	ND, RDL=0.025	mg/kg	NC	50
2825573	Xylene (Total)	2012/04/21			99	60 - 140	ND, RDL=0.050	mg/kg	NC	50
2825573	C6 - C10 (less BTEX)	2012/04/21					ND, RDL=2.5	mg/kg	NC	50
2825574	Isobutylbenzene - Extractable	2012/04/21	91	30 - 130	95	30 - 130	97	%		
2825574	n-Dotriacontane - Extractable	2012/04/21	106	30 - 130	115	30 - 130	99	%		
2825574	>C10-C16 Hydrocarbons	2012/04/21	80	30 - 130	75	30 - 130	ND, RDL=10	mg/kg	NC	50
2825574	>C16-C21 Hydrocarbons	2012/04/21	94	30 - 130	88	30 - 130	ND, RDL=10	mg/kg	NC	50
2825574	>C21-<C32 Hydrocarbons	2012/04/21	113	30 - 130	102	30 - 130	ND, RDL=15	mg/kg	NC	50

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
Duplicate Paired analysis of a separate portion of the same sample Used to evaluate the variance in the measurement.
Matrix Spike. A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference
Spiked Blank. A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank. A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency
NC (RPD): The RPD was not calculated The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation

Validation Signature Page

Maxxam Job #: B255521

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ROB WHELAN, Project Manager

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Maxxam Job #: B256009
Report Date: 2012/04/21

Stantec Consulting Ltd
Client Project #: 121412070
Site Location: LANTECH SPILL
Your P.O. #: 16300R-40
Sampler Initials: MH

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
2825290	Moisture	1899/12/30							TBA	25
2825573	Isobutylbenzene - Volatile	2012/04/21			92	60 - 140	108	%		
2825573	Benzene	2012/04/21			99	60 - 140	ND, RDL=0.025	mg/kg	NC	50
2825573	Toluene	2012/04/21			100	60 - 140	ND, RDL=0.025	mg/kg	NC	50
2825573	Ethylbenzene	2012/04/21			99	60 - 140	ND, RDL=0.025	mg/kg	NC	50
2825573	Xylene (Total)	2012/04/21			99	60 - 140	ND, RDL=0.050	mg/kg	NC	50
2825573	C6 - C10 (less BTEX)	2012/04/21					ND, RDL=2.5	mg/kg	NC	50
2825574	Isobutylbenzene - Extractable	2012/04/21	91	30 - 130	95	30 - 130	97	%		
2825574	n-Dotriacontane - Extractable	2012/04/21	106	30 - 130	115	30 - 130	99	%		
2825574	>C10-C16 Hydrocarbons	2012/04/21	80	30 - 130	75	30 - 130	ND, RDL=10	mg/kg	NC	50
2825574	>C16-C21 Hydrocarbons	2012/04/21	94	30 - 130	88	30 - 130	ND, RDL=10	mg/kg	NC	50
2825574	>C21-<C32 Hydrocarbons	2012/04/21	113	30 - 130	102	30 - 130	ND, RDL=15	mg/kg	NC	50

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added Used to evaluate sample matrix interference
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency
NC (RPD): The RPD was not calculated The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation

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Validation Signature Page

Maxxam Job #: B256009

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ROB WHELAN, Project Manager

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Your P.O. #: 16300R-40
Your Project #: 121412070
Site Location: LBNTECH OIL SPILL
Your C.O.C. #: ES437611

Attention: Carolyn Anstey-Moore
Stantec Consulting Ltd
St. John's - Standing Offer
607 Torbay Rd
St. John's, NL
A1A 4Y6

Report Date: 2012/04/23

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B256523
Received: 2012/04/23, 10:59

Sample Matrix: Soil
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
TEH in Soil (PIRI) (1,2)	6	2012/04/23	2012/04/23	ATL SOP-00197	Based on Atl. PIRI
Moisture	6	N/A	2012/04/23	ATL SOP-00196	MOE Handbook 1983
VPH in Soil (PIRI) (1)	6	2012/04/23	2012/04/23	ATL SOP 00199	Based on Atl. PIRI
ModTPH (T1) Calc. for Soil	6	2012/04/23	2012/04/23		Based on Atl. PIRI

Remarks:

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) Reported on a dry weight basis.
(2) Soils are reported on a dry weight basis unless otherwise specified.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

ROB WHELAN, Project Manager
Email: RWhelan@maxxam.ca
Phone# (709) 754-0203

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Total cover pages: 1

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Maxxam Job #: B256523
Report Date: 2012/04/23

Stantec Consulting Ltd
Client Project #: 121412070
Site Location: LBNTECH OIL SPILL
Your P.O. #: 16300R-40

RESULTS OF ANALYSES OF SOIL

Maxxam ID		NE5933	NE5934	NE5935	NE5936	NE5937	NE5938		
Sampling Date		2012/04/22	2012/04/22	2012/04/22	2012/04/22	2012/04/22	2012/04/22		
Received Temperature (°C)		16.0 C	16.0 C	16.0 C	16.0 C	16.0 C	16.0 C		
	Units	**BS-110**	**BS-111**	**BS-112**	**BS-113**	**BS-114**	**BS-115**	**RDL**	**QC Batch**
Inorganics									
Moisture	%	18	31	50	45	27	26	1	2826862

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		NE5933	NE5934	NE5935	NE5936	NE5937	NE5938		
Sampling Date		2012/04/22	2012/04/22	2012/04/22	2012/04/22	2012/04/22	2012/04/22		
Received Temperature (°C)		16.0 C	16.0 C	16.0 C	16.0 C	16.0 C	16.0 C		
	Units	**BS-110**	**BS-111**	**BS-112**	**BS-113**	**BS-114**	**BS-115**	**RDL**	**QC Batch**
Petroleum Hydrocarbons									
Benzene	mg/kg	ND	ND	ND	ND	ND	ND	0.025	2827092
Toluene	mg/kg	ND	ND	ND	ND	ND	ND	0.025	2827092
Ethylbenzene	mg/kg	ND	ND	ND	ND	ND	ND	0.025	2827092
Xylene (Total)	mg/kg	ND	ND	ND	ND	ND	ND	0.050	2827092
C6 - C10 (less BTEX)	mg/kg	ND	ND	ND	ND	ND	ND	2.5	2827092
>C10-C16 Hydrocarbons	mg/kg	ND	ND	ND	ND	ND	ND	10	2827094
>C16-C21 Hydrocarbons	mg/kg	ND	ND	ND	ND	ND	ND	10	2827094
>C21-<C32 Hydrocarbons	mg/kg	ND	ND	ND	ND	ND	ND	15	2827094
Modified TPH (Tier1)	mg/kg	ND	ND	ND	ND	ND	ND	15	2826978
Reached Baseline at C32	mg/kg	YES	YES	YES	YES	YES	YES	N/A	2827094
Surrogate Recovery (%)									
Isobutylbenzene - Extractable	%	96	102	103	99	96	101		2827094
Isobutylbenzene - Volatile	%	123	119	109	123	117	121		2827092
n-Dotriacontane - Extractable	%	105(1)	110(1)	113(1)	110(1)	108(1)	112(1)		2827094

N/A = Not Applicable
ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - Triple silica gel cleanup was used to remove organic interferences from sample extract as per client request.

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Success Through Science®

Maxxam Job #: B256523
Report Date: 2012/04/23

Stantec Consulting Ltd
Client Project #: 121412070
Site Location: LBNTECH OIL SPILL
Your P.O. #: 16300R-40

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
2826862	Moisture	2012/04/23							5.8	25
2827092	Isobutylbenzene - Volatile	2012/04/23			108	60 - 140	116	%		
2827092	Benzene	1899/12/30			84	60 - 140	ND, RDL=0.025	mg/kg	TBA	50
2827092	Toluene	1899/12/30			82	60 - 140	ND, RDL=0.025	mg/kg	TBA	50
2827092	Ethylbenzene	1899/12/30			80	60 - 140	ND, RDL=0.025	mg/kg	TBA	50
2827092	Xylene (Total)	1899/12/30			81	60 - 140	ND, RDL=0.050	mg/kg	TBA	50
2827092	C6 - C10 (less BTEX)	1899/12/30					ND, RDL=2.5	mg/kg	TBA	50
2827094	Isobutylbenzene - Extractable	2012/04/23	TBA	30 - 130	92	30 - 130	95	%		
2827094	n-Dotriacontane - Extractable	2012/04/23	TBA	30 - 130	105	30 - 130	98	%		
2827094	>C10-C16 Hydrocarbons	1899/12/30	TBA	30 - 130	79	30 - 130	ND, RDL=10	mg/kg	TBA	50
2827094	>C16-C21 Hydrocarbons	1899/12/30	TBA	30 - 130	88	30 - 130	ND, RDL=10	mg/kg	TBA	50
2827094	>C21-<C32 Hydrocarbons	1899/12/30	TBA	30 - 130	112	30 - 130	ND, RDL=15	mg/kg	TBA	50

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel (709) 754-0203 Toll Free: 888 492 7227 Fax (709) 754-8612 www.maxxam.ca

Validation Signature Page

Maxxam Job #: B256523

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

ROB WHELAN, Project Manager

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5 10 2 of ISO/IEC 17025 2005(E), signing the reports For Service Group specific validation please refer to the Validation Signature Page

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St John's, NL Canada A1A 1W9 Tel 709 754 0203 Toll Free 888 492 7227 Fax 709 754 8612 www.maxxam.ca

APPENDIX C

Record of Site Condition

STANTEC PROJECT NO. 121412070

RECORD OF SITE CONDITION
SITE REMEDIATION AND CONFIRMATORY SOIL SAMPLING
LANTECH DRILLING SERVICES INC. HYDRAULIC OIL SPILL
WABUSH, NL

September 14, 2012

Part 1 of 7: Source Property Information

Civic Address: N/A – Remote area 8 km southwest of Wabush, NL (Coordinate system: Zone 19 U, NAD 27, Easting: 637706, Northing: 5855825)

Person Responsible (name and address): John Robichaud,
Contract Manager – Geotechnical Division (Atlantic)
Lantech Drilling Services Inc.
398 Dover Road
Dieppe, NB
E1A 7L6

GSC / Provincial File Number:

Part 2 of 7: List of Reports

- **Prepared by Others:** The following reports pertaining to the source property cited in Part 1 and/or any other related impacted properties have been prepared by others and reviewed under the supervision of the Site Professional. (expand the table as required)

Report Title	Prepared by	Date
N/A		

- **Prepared by and/or overseen by the Site Professional:** The following reports pertaining to the source property cited in Part 1 and/or any other related impacted properties have been prepared by and/or overseen by the Site Professional. (expand the table as required)

Report Title	Date
Site Remediation and Confirmatory Soil Sampling, Lantech Drilling Services Inc. Hydraulic Oil Spill, Wabush, NL. Stantec Report No. 121412070	September 14, 2012

Part 3 of 7: Remedial Action

- List the Chemicals of Concern (COC) identified on or originating from the source property:

  The following COCs were investigated: Petroleum hydrocarbons (i.e., benzene, toluene, ethylbenzene, xylene (BTEX), and total petroleum hydrocarbons (TPH)) in soil.

- Describe the elements of the Remedial Action Plan(s) with time periods, employed for the site:

  Between November 23, 2011 and April 24, 2012, a total of approximately 35 tonnes of petroleum hydrocarbon impacted of impacted snow, ice, soil, oily water and absorbent materials was excavated from the source area and removed from site. Analytical results of confirmatory soil samples collected from the final limits of the remedial excavation indicated that concentrations of BTEX and TPH did not exceed ecological-based federal guideline levels used to evaluate the site.

Note: This Record of Site Condition is only applicable for the portion of the site that was remediated in response to the fuel oil spill that was discovered on November 23, 2011. No other portion of the site was investigated as part of this study.

- Was a risk assessment completed as part of the Remedial Action Plan? ____ Yes _ X ___ No

  If yes, identify the risk assessment methodology and the resulting site-specific remedial criteria: (expand the table as required)

  If no, list the selected Tier I criteria: (expand the table as required)

Media	units	Benzene	Toluene	Ethylbenzene	Xylenes	C6-C10	>C10-C16	>C16-C34	>C34	Source
Soil	mg/kg	31	75	55	95	-	-	-	-	CCME
Soil	mg/kg	-	-	-	-	210	150	300	2,800	CWS

Notes:
CCME = Canadian Council of Ministers of the Environment (CCME) Soil Quality Guideline for Environmental Health (SQG_E) for BTEX in surface soil on a residential/parkland site with coarse soil (i.e., the most restrictive criteria) (2004);
CWS = CCME Canada Wide Standard (CWS) Tier I Levels for Petroleum Hydrocarbons in Surface Soil – Table 3 (coarse-grained soil, residential land use, eco soil contact – User Guidance, 2008). Note that the CWS hydrocarbon fraction ranges are not identical to the Atlantic RBCA fractions.

- If a peer review of the Remedial Action Plan and/or the Risk Assessment/Closure Report was requested by GSC or NLDEC, provide the following information:

Consultant Name: N/A

Part 4 of 7: Off-Site Impacts

- Precautionary duty of the Person Responsible; Based on the work completed, the following third party properties (identified by civic address) were identified by the Person Responsible, in accordance with section 5.8(1)d of the Environmental Protection Act, as being affected or threatened by the contamination originating from the source property. Where appropriate, indicate the type of impact and the corrective action taken: (expand the table as required)

Civic Address	Type of Impact	Corrective Action

Part 5 of 7: Site Activities

- Based on the work completed, the source property cited in Part 1 is suitable for the following site activity(s), subject to any conditions and assumptions stated in the report(s) listed in Part 2. Check appropriate box and provide comments if necessary.

IF LAND USE CHANGES – LEVEL OF RISK MUST BE RE-EVALUATED

☐ Agricultural ☒ Residential/Parkland ☐ Commercial ☐ Industrial

Comments (special considerations, site management issues, etc.):

Part 6 of 7: Summary Statement of Site Professional

The Minister considers the pre-checked statements below to be mandatory for submission of the Record of Site Condition. The signature of the Site Professional on this form indicates the fulfillment of these mandatory requirements as well as the requirements of all other checked statements.

Please check appropriate statements:

√ This Record of Site Condition form is identical to the one provided in the Province of Newfoundland & Labrador Guidance Document for the Management of Impacted Sites and the content of the form has not been altered.

√ All work on which this Record of Site Condition is based was prepared, overseen and/or reviewed by the Site Professional.

√ The site was managed in accordance with the current version of the Province of Newfoundland & Labrador Guidance Document for the Management of Impacted Sites.

√ The applicable quality criteria (Tier I, II or III) for the site as defined by the Site Professional and as cited in Part 3 have been achieved for the current or reasonably foreseeable future site activities as cited in Part 5.

√ A site plan with scale indicated, identifying the referenced properties is attached to this Record of Site Condition.

√ All reports cited in Part 2 and other related documents that have been prepared by the Site Professional have been delivered to the Person Responsible.

NA The Remedial Action Plan, Risk Assessment or Closure Report was peer reviewed by a qualified, independent Site Professional.

NA If peer reviewed, the results of the Peer Review were appropriately incorporated into the final Remedial Action Plan and/or Closure Report.

NA Based on the results of the site evaluation, the applicable quality criteria (Tier I, II or III) were not exceeded on the source property and therefore, remedial action and/or on-going site management is not required for the current or reasonably foreseeable future site activities.

NA Based on results of the site evaluation, the applicable quality criteria (Tier I, II or III) were not exceeded on the third party properties and therefore, remedial action and/or on-going site management is not required for the current or reasonably foreseeable future site activities.

√ The source property has been remediated to an acceptable level for the current or reasonably foreseeable future site activities as cited in Part 5.

NA The source property requires on-going site management to satisfy the current or reasonably foreseeable future site activities as cited in Part 5.

NA Third party properties affected by the contamination of the source property have been addressed and remediated to an acceptable level for the current or reasonably foreseeable future site activities as cited in Part 5.

NA Third party properties affected by the contamination of the source property have been addressed and require on-going site management to satisfy the current or reasonably foreseeable future site activities as cited in Part 5.

√ With respect to notification, the requirements of section 8(d) of the *Environmental Protection Act* have been fulfilled.

__ The source property is recommended for **Conditional Closure** and is subject to monitoring requirements specified in documents listed in Part 2.

√ The source property is recommended for **Final Closure**

Signature ________

Name (Print) Carolyn Anstey Moore — Date: September 14, 2012

Professional Affiliation M.Sc., M.A.Sc., P.Geo. — Membership No 04085

Company Stantec Consulting Limited

Address 607 Torbay Road — Tel. 576-1458

St. John's, NL

Part 7 of 7: Acknowledgement of Receipt by Newfoundland and Labrador Department of Environment and Conservation

The Department acknowledges receipt of this Record of Site Condition. The Department has processed the report(s) cited in Part 2 of this Record of Site Condition for the purpose of ensuring the site has been managed in accordance with the current version of the Newfoundland and Labrador Department of Environment and Conservation *Guidance Document for the Management of Impacted Sites.*

Based solely on the report(s) cited in Part 2 and on the conclusions of the Site Professional stated in Part 6 of this Record of Site Condition, the Department is satisfied, at this point in time, that the stated level of contamination remaining on the subject property, in the portions of the subject property addressed by the report(s), does not pose an unacceptable risk to human health or to the environment. Notwithstanding this opinion, the Department reserves the right to re-evaluate this decision should new information come to light, or should site activities, site uses or circumstances change which may result in an increase in contamination or in contaminant migration or which may cause changes in site conditions or site classification that may pose a risk to human health or to the environment.

The Department has not directly supervised the work undertaken at the site and does not assume any responsibility or liability for this work, or for notifying future owners, or for notifying present or future occupants of the property, of the work completed. In no way does this acknowledgement make any representation with respect to any environmental damage or liability that may have occurred at the above mentioned property due to contamination that was not discovered, reported or investigated. Any persons intending to purchase or occupy the property should make their own independent determination of the environmental condition of the property and the extent of responsibility and liability, if any, that may arise from taking ownership or occupancy. In addition, workers that are engaged in future sub-surface excavations on site must be made aware of the potential risks of exposure to the remaining contamination.

Unconditional Closure

☐ It is understood from the information provided that the site has been managed in accordance with the current version of the Newfoundland and Labrador Department of Environment and Conservation *Guidance Document for the Management of Impacted Sites* and that **further remedial action and/or site-specific engineered or institutional controls are not required** to ensure compatibility with the current or reasonably foreseeable future site activities (as cited in Part 5).

Conditional Closure

☐ It is understood from the information provided that the site has been managed in accordance with the current version of the Newfoundland and Labrador Department of Environment and Conservation *Guidance Document for the Management of Impacted Sites* and that **site-specific engineered or institutional controls are required** to ensure compatibility with the current or reasonably foreseeable future site activities (as cited in Part 5).

______________________________ ________________

Department of Environment and Conservation   Date

Stantec Consulting Ltd.
607 Torbay Road
St. John's, NL   A1A 4Y6
Tel: 709-576-1458
Fax: 709-576-2126

December 20, 2011
File: 121412070

Maltman Group International
3550 Victoria Park Avenue, Suite 301
Toronto, ON   M2H 2N5

Attention: **Mr. Craig Walker**

Dear Mr. Walker:

Reference: **Summary of Emergency Response & Limited Soil Remediation, Lantech Drilling Services Inc. Hydraulic Oil Spill, Wabush, Newfoundland & Labrador**

The following is a summary of emergency response and limited soil remediation activities coordinated by Stantec Consulting Ltd. (Stantec) in response to the release of hydraulic oil from a Lantech Drilling Services Inc. geotechnical drill rig located in a remote area approximately 8.5 km southwest of Wabush, Newfoundland and Labrador (NL). In addition, based on results of confirmatory soil sampling completed as part of the current program, a remedial action plan is provided to address residual petroleum hydrocarbon impacts at the site following the initial clean-up efforts.

BACKGROUND & SITE DESCRIPTION

The spill occurred on November 23, 2011 when the hydraulic oil cooler on the drill rig ruptured and released approximately 100 to 120 L of hydraulic oil onto the surface of the surrounding snow/ice-covered ground. The spill was discovered when hydraulically-operated equipment on the drill failed to function. An oil-stained area measuring approximately 2 m by 4 m was observed extending down-gradient of the point of release following the spill (Photo 1).

Photo 1 – Spill site on November 23, 2011

The subject property is the site of the Alderon Iron Ore Corp. (Alderon) Kami Iron Ore project, which is situated adjacent to the towns of Wabush and Labrador City, Newfoundland and Labrador, and Fermont, Quebec. The property consists of approximately 7,625 hectares and straddles the Québec-Labrador provincial border, but the majority of it is in Labrador (Drawing No. 121412070-EE-01, attached).

The subject spill site is located on a peat bog in a remote area of the property, approximately 8.5 km southwest of Wabush, NL. The direction of local groundwater flow is assumed to follow the general slope of the site to the east towards a small stream located approximately 15 m down gradient of the point of oil

Reference: **Summary of Emergency Response & Limited Soil Remediation, Lantech Drilling Services Inc. Hydraulic Oil Spill, Wabush, Newfoundland & Labrador**

release. The small stream flows towards Long Lake, which is located approximately 680 m north of the spill site.

At the time of the spill, a Lantech Drilling Services Inc. geotechnical drill rig was drilling a borehole (i.e., BH-GE-11B) under the supervision of Stantec. There is currently no road access to the site, and transport to the site during the drilling program and subsequent emergency response and limited soil remediation programs was by helicopter. No drinking water wells are reportedly present on site or in the immediate surrounding area.

REGULATORY FRAMEWORK

The spill site is currently undeveloped and is located in a remote wilderness area with limited human usage. Ecological receptors are thus considered to be the more sensitive receptor, and as such ecological-based criteria are considered more appropriate for evaluation of petroleum hydrocarbon impacts at the site. The province of Newfoundland and Labrador has adopted the Atlantic Risk Based Corrective Action (RBCA) approach for evaluation of petroleum hydrocarbon impacted sites. However, Atlantic RBCA Tier I risk based screening levels (RBSLs) and Tier II pathway specific screening levels (PSSLs) are human health based guidelines and are not designed to be protective of ecological receptors. Alternatively ecological-based guidelines for protection of plants and terrestrial invertebrates within the Canadian Council of Ministers of the Environment (CCME) Canada-Wide Standards (CWS) for Petroleum Hydrocarbons (PHC) in Soil were used to evaluate concentrations of petroleum hydrocarbons in soil identified at the site as part of the current program. These guidelines are the most conservative of the CCME PHC CWS ecological-based guidelines and therefore are also protective of higher terrestrial species, as well as aquatic receptors. In addition, these guidelines are also considered protective of human health for the applicable exposure pathway present at the site (i.e., direct contact).

DESCRIPTION OF SITE WORK

Photo 2 – Recovery of free product using absorbent pads immediately following the spill.

Following discovery of the spill, the drill rig was immediately shut down and Alderon and Service NL, Government of Newfoundland and Labrador (via the Canadian Coast Guard) were notified of the incident. Initial emergency response efforts focused on recovery of approximately 10 to 15 L of free product present on snow and ice at the point of release using absorbent pads from two (2) on-site spill kits (Photo 2). Oil saturated absorbent material were replaced frequently and were stored in empty 20 L pails on site for disposal. In conjunction with free product recovery, two approximately 6 m long by 0.2 m deep trenches were excavated down gradient approximately 2 m apart between the spill area and the stream (Drawing No. 121412070-EE-02, attached). Groundwater was observed in the trench closest to the stream, but appeared to be free of petroleum hydrocarbon impacts. In addition, 75 mm diameter absorbent booms were placed in both trenches to prevent potential migration of petroleum hydrocarbon impacts in to the down gradient stream, and were replaced as required. No evidence of petroleum hydrocarbon impacts was observed in the stream at the time of the emergency response activities.

Reference: **Summary of Emergency Response & Limited Soil Remediation, Lantech Drilling Services Inc. Hydraulic Oil Spill, Wabush, Newfoundland & Labrador**

Photo 3 – Oily sheen on groundwater in test pit TP1.

On November 24, 2011, a field crew returned to the site to carry out limited remediation of petroleum impacted soil. Given the frozen ground conditions at the time of the spill, and the lack of road access to the site for mechanical excavation equipment, soil remediation was limited to manual excavation of heaviest impacts in the immediate vicinity of the spill. From November 24 to 27, 2011 petroleum hydrocarbon impacted snow, ice, and surficial soil (peat) were manually excavated from an area measuring approximately 3 m wide by 5 m long, and extending to 0.2 m below ground surface. Approximately 3.5 tonnes of impacted material was recovered and was placed in eleven (11) 200 L steel drums with sealed covers. These are currently being stored on site awaiting removal and transport to a licensed soil treatment facility. Four (4) confirmatory soil samples (i.e., REM-BS1 to REM-BS4) were collected from the sidewalls and base of the remedial excavation (see Drawing 121412070-EE-02, attached) and were submitted to Maxxam Analytics Inc. in St. John's, NL for laboratory analysis of petroleum hydrocarbons. In addition, since the remedial excavation was shallow and did not extend into groundwater, three (3) test pits were manually dug to the depth of groundwater in the spill area to further delineate the extent of subsurface petroleum hydrocarbon impacts at the site. The location of these are shown on Drawing No. 121412070-EE-02 (attached), and include test pit TP1 excavated along the northern, down-gradient boundary of the remedial excavation to the depth of groundwater at approximately 1.2 m below ground surface (mbgs); TP2 excavated approximately 1.0 m north and down-gradient of the remedial excavation to the depth of groundwater at approximately 1.2 mbgs; and TP3 excavated down-gradient of the remedial excavation approximately 1.0 m south of the adjacent stream to the depth of groundwater at approximately 1.0 mbgs. No evidence of petroleum hydrocarbon impacts were noted in test pit TP3, located adjacent to the down gradient stream. An oily sheen was noted in test pits TP1 and TP2, with most notable impacts identified in test pit TP1, located along the northern limit of the remedial excavation (Photo 3). Soil samples was collected from the base of test pits TP1 and TP3 and were submitted to Maxxam Analytics Inc. in St. John's, NL for analysis of BTEX and TPH content by the Atlantic PIRI protocol.

The results of laboratory analysis of the confirmatory soil samples collected from the limits of the remedial excavation, as well as the soil samples collected from test pits TP1 and TP3 are presented in Table 1 (attached along with the Maxxam Analytics Inc. laboratory reports), and indicate concentrations of F2 and F3 petroleum hydrocarbons in soil sample REM-BS2, REM-BS3, REM-BS4 and TP1-BS1 that exceed the applicable CCME PHC CWS.

ESTIMATED EXTENT OF IMPACTS AND REMEDIAL ACTION PLAN

Based on results of laboratory analysis of confirmatory soil samples, impacted soil that exceeds applicable guidelines and requires additional remediation is still present at the site extending from the northern limit of the remedial excavation down gradient towards test pit TP2. The area of remaining impacted soil requiring remediation at the site is estimated to be approximately 24 m^2 and extends to an average depth of 1 m for a total volume of 24 m^3 (as shown on Drawing No. 121412070-EE-02, attached). Assuming a density of 1.5 tonnes/m^3 for the impacted organic soil remaining at the site, it is estimated that approximately 36 tonnes of impacted soil require remediation.

Reference: **Summary of Emergency Response & Limited Soil Remediation, Lantech Drilling Services Inc. Hydraulic Oil Spill, Wabush, Newfoundland & Labrador**

Given the ecologically sensitive nature of the site and the close proximity of a stream 15 m down-gradient of the site, additional soil excavation and removal is considered the most appropriate method of remediation to address remaining petroleum hydrocarbon impacts impacts at the site. The recommendation for additional remedial excavation is further supported by the high concentrations of total petroleum hydrocarbons (TPH) identified in several confirmatory soil samples (i.e., soil samples REM-BS3 and REM-BS4) collected along the northern limit of the existing remedial excavation, which returned TPH concentrations of 46,500 mg/kg and 100,000 mg/kg, respectively. The concentrations of TPH identified in these soil samples exceed the solubility limit of hydraulic oil and suggest that residual free product is still present in soil at the site that is highly mobile and has the potential to migrate off-site towards the down-gradient stream.

Since the ground in the spill area is currently frozen it is unlikely that any significant migration of surface petroleum hydrocarbon impacts will occur in the short term. However, it is recommended that additional soil remediation at the site be carried out early in the new year prior to the onset of spring thaw conditions to prevent any further down gradient migration of impacts. Please note that additional soil remediation at the site will require use of mechanical excavation equipment, which will have to be transported to the site via helicopter. This limits the size of the excavation equipment that can be mobilized to the site to a mini-excavator, which may not be capable of excavation in the extreme frozen ground conditions characteristic of the area during the winter season. Therefore, an attempt can be made to complete remediation in the winter, but full remediation may not be possible until ground conditions improve in the spring.

Reference: Summary of Emergency Response & Limited Soil Remediation, Lantech Drilling Services Inc. Hydraulic Oil Spill, Wabush, Newfoundland & Labrador

I trust this meets your current needs. Please do not hesitate to contact me if you have any question or require additional information.

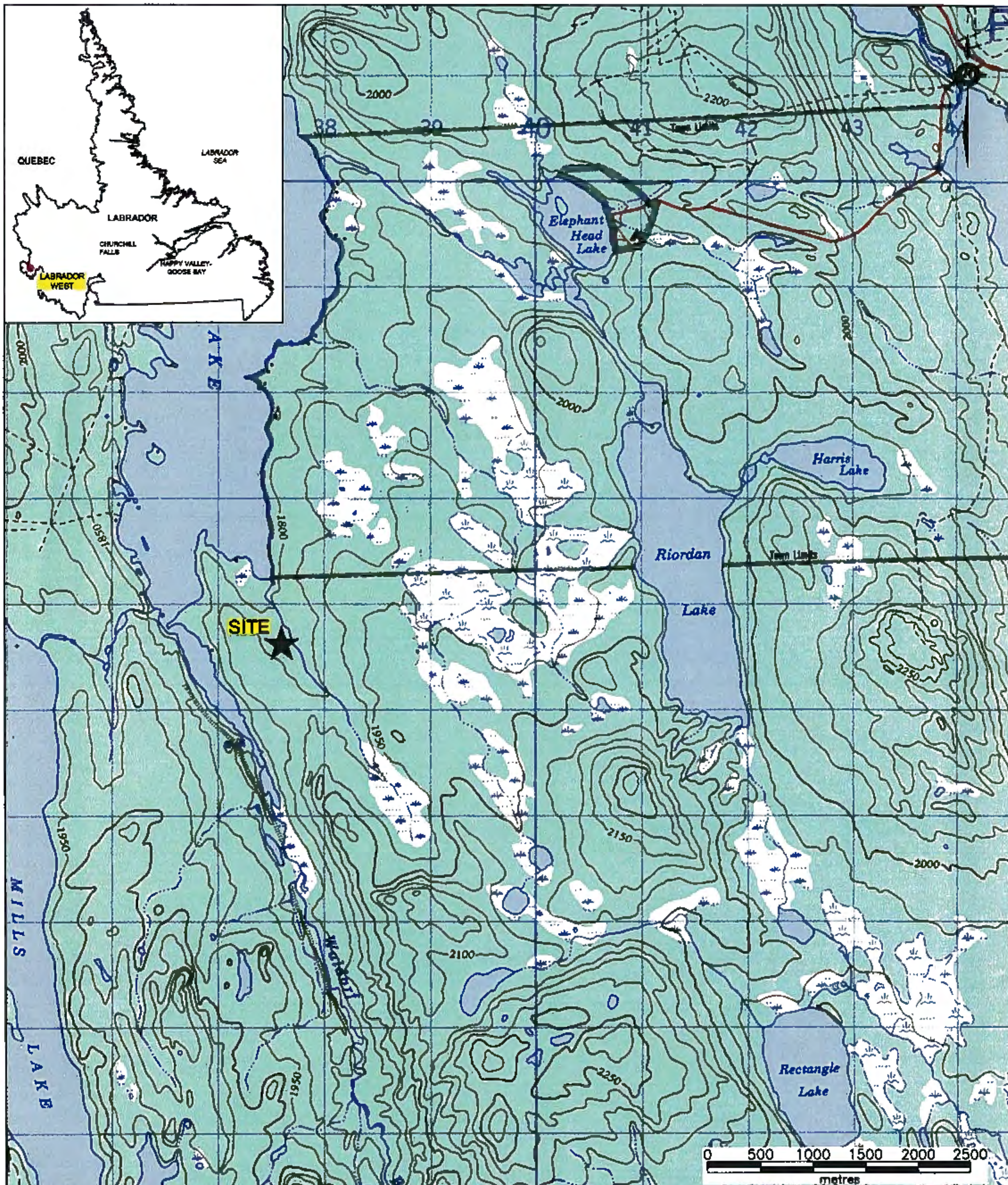
Sincerely,

STANTEC CONSULTING LTD.

Carolyn Anstey-Moore, M.Sc., M.A.Sc., P.Geo.
Senior Environmental Geoscientist

Attachments:

- Drawing No.121412070-EE-01 Site Location Plan
- Drawing No.121412070-EE-02 Site Plan
- Table 1. Results of Laboratory Analysis of Petroleum Hydrocarbons in Soil
- Maxxam Laboratory Analytical Reports
- Table 2. Cost Estimate to Complete Soil Remediation



NOTE: THIS DRAWING ILLUSTRATES SUPPORTING INFORMATION SPECIFIC TO A STANTEC CONSULTING LTD. REPORT AND MUST NOT BE USED FOR OTHER PURPOSES.

CLIENT: MALTMAN GROUP INTERNATIONAL	SCALE: 1:50,000	DATE: DEC. 20, 2011	Stantec
	DRAWN BY: R.L.	CHECKED BY:	
PROJECT TITLE: SUMMARY OF EMERGENCY RESPONSE & LIMITED SOIL REMEDIATION, LANTECH DRILLING SERVICES INC. HYDRAULIC OIL SPILL, WABUSH, NEWFOUNDLAND & LABRADOR	EDITED BY: -	REV. No. 0	
	DRAWING No: 121412070-EE-01		
DRAWING TITLE: SITE LOCATION PLAN	CAD FILE: 121412070-EE-01.DWG		

 20DEC11 10:00AM

CLIENT: MALTMAN GROUP INTERNATIONAL	SCALE: 1:300	DATE: DEC. 20, 2011	Stantec
	DRAWN BY: R.L.	CHECKED BY:	
PROJECT TITLE: SUMMARY OF EMERGENCY RESPONSE & LIMITED SOIL REMEDIATION, LANTECH DRILLING SERVICES INC. HYDRAULIC OIL SPILL, WABUSH, NEWFOUNDLAND & LABRADOR	EDITED BY: -	REV. No. 0	
	DRAWING No: 121412070-EE-02		
DRAWING TITLE: SITE PLAN	CAD FILE: 121412070-EE-03.DWG		

20DEC11 11:00AM

Table 1. Results of Laboratory Analysis of Petroleum Hydrocarbons in Soil
Summary of Emergency Response & Limited Soil Remediation, Lantech Drilling Services Inc. Hydraulic Oil Spill
Wabush, NL
Stantec Project No. 121412070

Sample ID	Sampling Date	Sample Depth (m)	BTEX Parameters (mg/kg)				Total Petroleum Hydrocarbons (mg/kg)					Resemblance / Comments
			Benzene	Toluene	Ethylbenzene	Xylenes	C_6-C_{10}	>C_{10}-C_{16}	>C_{16}-<C_{32}	>C_{31}[1]	Modified TPH[2]	
REM-BS1	27/11/2011	0.25 - 0.35	ND	ND	ND	ND	ND	ND	210	-	210*	LO
REM-BS2	27/11/2011	0.25 - 0.35	ND	ND	ND	ND	ND	ND	**750**	-	750*	LO
REM-BS3	27/11/2011	0.25 - 0.35	ND	0.37	ND	ND	ND	85	**46,500**	-	46,000*	LO
REM-BS4	27/11/2011	0.25 - 0.35	ND	0.85	ND	ND	ND	**270**	**113,700**	-	110,000*	LO
TP1-BS1	27/11/2011	0.50 - 0.60	ND	ND	ND	ND	ND	**180**	**10,030**	-	10,000*	LO
TP3-BS1	27/11/2011	1.00 - 1.10	ND	ND	ND	ND	ND	ND	ND	-	ND	-
RDL			0.03	0.03	0.03	0.05	3	10	25	-	20	-
Guideline [3]			31	75	55	95	210	150	300	2,800	-	-

Notes:

[1] = Atlantic PIRI analytical method does not analyse for >C_{32}. Laboratory certificate indicates (Yes or No) whether chromatogram for each sample returns to baseline after C_{32}. Samples are considered to have returned to baseline if the area from C_{32}-C_{36} is less than 10% of the area from C_{10}-C_{32} (See * below).

[2] = Modified TPH = total petroleum hydrocarbons excluding total BTEX

[3] = CCME Environmental Health Guidelines for Surface Soil (most restrictive SQG_E for soil contact, based on Agricultural and/or Residential/Parkland land use) for BTEX; and CCME Canada Wide Standard Tier I Levels for Petroleum Hydrocarbons in Surface Soil - Table 3 (coarse-grained soil, residential land use, eco soil contact - User Guidance, 2008) for petroleum hydrocarbon fractions.

* = Baseline not reached at C_{32}; sample may contain carbon fractions >C_{32}

Silica gel clean-up was conducted on all samples to remove any possible interference from organics in soil

RDL = laboratory's reportable detection limit; "-" = parameter not analyzed; ND = Not detected above standard RDL;

Shaded and Bolded = Value exceedes guideline

Maxxam

Success Through Science®

Your P.O. #: 16300R-40
Your Project #: 121614000
Site Location: KAMI IRON ORE
Your C.O.C. #: ES433311

Attention: Carolyn Anstey-Moore
Stantec Consulting Ltd
St. John's - Standing Offer
607 Torbay Rd
St. John's, NL
A1A 4Y6

Report Date: 2011/12/01

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B1I8283
Received: 2011/11/30, 11:15

Sample Matrix: Soil
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
TEH in Soil (PIRI) (1,2)	6	2011/11/30	2011/12/01	ATL SOP-00197	Based on Atl. PIRI
Moisture	6	N/A	2011/11/30	ATL SOP-00196	MOE Handbook 1983
VPH in Soil (PIRI) (1)	6	2011/11/30	2011/11/30	ATL SOP 00199	Based on Atl. PIRI
ModTPH (T1) Calc. for Soil	6	2011/11/30	2011/12/01		Based on Atl. PIRI

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
* Results relate only to the items tested.

(1) Reported on a dry weight basis.
(2) Soils are reported on a dry weight basis unless otherwise specified.

Encryption Key

Paula Chaplin

Paula Chaplin
01 Dec 2011 13:52:46 -03:30

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

ROB WHELAN, Project Manager
Email: RWhelan@maxxam.ca
Phone# (709) 754-0203

==

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

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Maxxam Job #: B1I8283
Report Date: 2011/12/01

Stantec Consulting Ltd
Client Project #: 121614000
Site Location: KAMI IRON ORE
Your P.O. #: 16300R-40
Sampler Initials: MJH

RESULTS OF ANALYSES OF SOIL

Maxxam ID		LU8514	LU8515	LU8516	LU8517	LU8518	LU8519		
Sampling Date		2011/11/27	2011/11/27	2011/11/27	2011/11/27	2011/11/27	2011/11/27		
Received Temperature (°C)		4.7 C	4.7 C	4.7 C	4.7 C	4.7 C	4.7 C		
	Units	**REM-BS1**	**REM-BS2**	**REM-BS3**	**REM-BS4**	**TP1-BS1**	**TP3-BS1**	**RDL**	**QC Batch**
Inorganics									
Moisture	%	87	86	78	81	93	33	1	2697824

ATLANTIC RBCA HYDROCARBONS (SOIL)

Maxxam ID		LU8514	LU8515	LU8516	LU8517	LU8518	LU8519		
Sampling Date		2011/11/27	2011/11/27	2011/11/27	2011/11/27	2011/11/27	2011/11/27		
Received Temperature (°C)		4.7 C	4.7 C	4.7 C	4.7 C	4.7 C	4.7 C		
	Units	**REM-BS1**	**REM-BS2**	**REM-BS3**	**REM-BS4**	**TP1-BS1**	**TP3-BS1**	**RDL**	**QC Batch**
Petroleum Hydrocarbons									
Benzene	mg/kg	ND	ND	ND	ND	ND	ND	0.03	2698196
Toluene	mg/kg	ND	ND	0.37	0.85	ND	ND	0.03	2698196
Ethylbenzene	mg/kg	ND	ND	ND	ND	ND	ND	0.03	2698196
Xylene (Total)	mg/kg	ND	ND	ND	ND	ND	ND	0.05	2698196
C6 - C10 (less BTEX)	mg/kg	ND	ND	ND	ND	ND	ND	3	2698196
>C10-C16 Hydrocarbons	mg/kg	ND	ND	85	270	180	ND	10	2698197
>C16-C21 Hydrocarbons	mg/kg	ND	ND	1500	3700	330	ND	10	2698197
>C21-<C32 Hydrocarbons	mg/kg	210	750	45000	110000	9700	ND	15	2698197
Modified TPH (Tier1)	mg/kg	210	750	46000	110000	10000	ND	20	2697864
Reached Baseline at C32	mg/kg	NO	NO	NO	NO	NO	YES	N/A	2698197
Hydrocarbon Resemblance	mg/kg	SEECOMMENT(1)	SEECOMMENT(2)	SEECOMMENT(2)	SEECOMMENT(2)	SEECOMMENT(2)		N/A	2698197
Surrogate Recovery (%)									
Isobutylbenzene - Extractable	%	62	75	65	72	80	73		2698197
Isobutylbenzene - Volatile	%	116	94	83	15(3)	57(3)	92		2698196
n-Dotriacontane - Extractable	%	117(4)	114(5)	100(4)	17(6)	119(5)	116(5)		2698197

N/A = Not Applicable
ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
(1) - Possible lube oil fraction.
(2) - Lube oil fraction.
(3) - Isobutylbenzene recovery not within acceptance limits; moisture exceeds 50%.
(4) - Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to silica gel cleanup.
Triple silica gel cleanup was used to remove organic interferences from sample extract as per client request.
(5) - Triple silica gel cleanup was used to remove organic interferences from sample extract as per client request.
(6) - Isobutylbenzene/n-Dotriacontane recovery(ies) not within acceptance limits due to matrix/co-extractive interference. Triple silica gel cleanup was used to remove organic interferences from sample extract as per client request.

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Maxxam Job #: B1I8283
Report Date: 2011/12/01

Stantec Consulting Ltd
Client Project #: 121614000
Site Location: KAMI IRON ORE
Your P.O. #: 16300R-40
Sampler Initials: MJH

QUALITY ASSURANCE REPORT

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
2697824	Moisture	2011/11/30							4.4	25
2698196	Isobutylbenzene - Volatile	2011/11/30			95	60 - 140	108	%		
2698196	Benzene	2011/11/30			77	60 - 140	ND, RDL=0.03	mg/kg	NC	50
2698196	Toluene	2011/11/30			78	60 - 140	ND, RDL=0.03	mg/kg	NC	50
2698196	Ethylbenzene	2011/11/30			78	60 - 140	ND, RDL=0.03	mg/kg	NC	50
2698196	Xylene (Total)	2011/11/30			76	60 - 140	ND, RDL=0.05	mg/kg	NC	50
2698196	C6 - C10 (less BTEX)	2011/11/30					ND, RDL=3	mg/kg	NC	50
2698197	Isobutylbenzene - Extractable	2011/12/01	102	30 - 130	108	30 - 130	99	%		
2698197	n-Dotriacontane - Extractable	2011/12/01	110	30 - 130	118	30 - 130	102	%		
2698197	>C10-C16 Hydrocarbons	2011/12/01	84	30 - 130	86	30 - 130	ND, RDL=10	mg/kg	NC	50
2698197	>C16-C21 Hydrocarbons	2011/12/01	90	30 - 130	93	30 - 130	ND, RDL=10	mg/kg	NC	50
2698197	>C21-<C32 Hydrocarbons	2011/12/01	96	30 - 130	107	30 - 130	ND, RDL=15	mg/kg	NC	50

N/A = Not Applicable
RDL = Reportable Detection Limit
RPD = Relative Percent Difference
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.
Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

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Validation Signature Page

Maxxam Job #: B1I8283

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Paula Chaplin

PAULA CHAPLIN, Project Manager

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Appendix 2B: Rio Tinto IOC Biodiversity Conservation Strategy

RioTinto | IOC

Rio Tinto IOC
Tour Deloitte,
1190 des Canadiens-de-Montréal av.,
Suite 400
Montréal,
H3B 0E3,
Canada
Tel: + 1 (514) 285-8423

Michel Groleau
Campion Iron
1155 René-Lévesque Ouest
Suite 3300
Montreal QC, H3B 3X7
Canada

21 May 2025

Dear Michel,

RE: Rio Tinto IOC Biodiversity Conservation Strategy

Rio Tinto IOC has developed a comprehensive Biodiversity Conservation Strategy (BCS) covering its whole operation from Mine to Port.

The underlying foundation for the BCS is the quantification of selected indicators called Priority Biodiversity Features (PBFs) which have ecological or cultural significance to IOC, Indigenous Partners or the people of Quebec and/or Newfoundland and Labrador. Boreal caribou, gray wolf, moose, and Black bear are included in this set of PBFs.

These Priority Biodiversity Features include:

- Species
- Habitats
- Communities
- Species of Conservations Priority
- Ecological & Cultural Heritage

Now entering its 6th year, the BCS is considered a comprehensive conservation project from its roots as an information-gathering initiative. From projects in previous years studying Priority Biodiversity Features (PBFs) such as bats, wolves, and Bank Swallow, to the creation of an immense biodiversity and land use database and online ArcGIS tool, the BCS has evolved into an exciting and dynamic flagship project for IOC. In 2023, IOC was awarded the Environmental Stewardship award for the BCS by the Canadian Institute of Mining, Metallurgy, and Petroleum NL Branch. IOC continues to pride itself on having one of the most comprehensive projects in the mining sector for tracking biodiversity. The BCS was also designed to be compatible with the Mining Association of Canada's Towards Sustainable Mining "Biodiversity Conservation Management Protocol" and "Mining and Biodiversity Conservation Framework", and with the standards of the International Council on Mining and Metals (ICMM).

QNS&L railway also has a Wildlife Management Procedure to ensure the management of wildlife involved in a train or locomotive strike, is properly carried out and reported to the appropriate authorities. (Caribou, Moose, Bear, Wolf, Lynx, Birds of Prey (Owl, eagle etc.)

Preventative measures are carried out by the operators to avoid collision with wildlife wherever possible:

- Whistle/Bell (full intensity)
- High Beam lights or warning lights (full intensity)
- Internal Report form must be completed in the event of an occurrence.

Finally, RT IOC has implemented Environmental committees with the five Indigenous groups which meet on a regular basis to discuss different projects, initiatives and potential issues with regards to land, biodiversity, and environmental management.

The RT IOC BCS and associated plan were presented and discussed with all our Indigenous partners. During these discussions, no concern nor need for an assessment of QNS&L rail operations impact on the migratory and boreal /woodland caribou has ever been raised.

We look forward to working collaboratively with Campion Iron. Please do not hesitate to contact the undersigned should you require further information.

Yours sincerely,

Patrick Lauziere
Director, Environment, RT IOC

Cc. Marsha Power, Manager Communities and Social Performance, RT IOC

Appendix 2C: Letter from NL Hydro

Newfoundland and Labrador Hydro
Hydro Place. 500 Columbus Drive
P.O. Box 12400. St. John's. NL
Canada A1B 4K7
t. 709.737.1400 I f. 709.737.1800
nlhydro.com

September 27, 2024

Michel Groleau
Corporate Director, Government Affairs
Champion Iron Mines Ltd.
1155 Rene-Levesque Blvd. West Suite 3300
Montreal, QC H3B 3X7
Email: mqroleau@mineraiferquebec.com

RE: Kami Iron Ore Mine – Power Supply and Transmission Infrastructure

Dear Mr. Groleau,

We acknowledge receipt of the Minister's June 13, 2024 EIS Decision Letter, and appreciate Champion Iron's ongoing engagement on the Kami Iron Ore Mine project. We understand the importance of providing additional project information, specifically related to the verification of power supply, transmission lines, substations, and the associated effects on ratepayers.

Hydro is currently assessing various power supply options to support new industrial developments in Labrador West. As part of this evaluation, we are focused on ensuring that industrial power needs, including those of Champion Iron, are met efficiently, while maintaining reliability and minimizing any impact on provincial ratepayers.

Summary of Legislative Context

The power policy of the Province, as stipulated in the *Electrical Power Control Act, 1994* (EPCA), is designed to promote industrial development in Labrador. Hydro is committed to aligning our actions with this policy. As you are aware, the Lieutenant-Governor in Council has the authority to direct the Public Utilities Board (PUB) on setting industrial rates in Labrador. It is important to note that the EPCA directs that the *Public Utilities Act* does not apply to the setting of electricity rates for industrial customers in Labrador, aside from the transmission components of these rates. This distinction ensures that the costs associated with power generation for industrial use in Labrador will not impact ratepayers in other parts of the province.

Cost Recovery for Transmission Expansion

To address cost recovery for new transmission assets, the PUB has approved the Network Additions Policy (NAP) for Labrador. The purpose of the NAP is to limit rate increases that could result from investment in new transmission assets for new load requests, while achieving a reasonable balance in the sharing of the benefits and costs between the applicant and existing customers.

The NAP provides a mechanism for determining the contribution requirements from applicants on the Labrador Interconnected System, covering:

- Transmission System Extensions: Contributions for new transmission system extensions required to connect applicants or non-utility generators.
- Demand Requirement Requests: Contributions from applicants whose demand requirements may lead to network extensions or upgrades, either immediately or over time.

This approach ensures that new transmission investments are fairly distributed between new industrial customers and existing ratepayers.

Transmission System Studies and Future Steps

In 2023, Hydro completed a System Impact Study (SIS) to explore transmission interconnection options for providing electrical service to a single customer in Labrador West. Since the completion of that study, Champion Iron and other potential customers have expressed interest in securing electrical services in the region. Given this increased demand, Hydro is in the process of updating the 2023 SIS to reflect the additional load requirements. Following the completion of the updated SIS, Hydro will also commission a Facilities Study for the preferred option. These studies are fully funded by the industrial applicants in Labrador West and will cover several critical aspects, including:

- Preliminary Design: Development of infrastructure upgrades necessary to ensure the continued reliable operation of Hydro's transmission system in Labrador West.
- Connection Facilities: Design and costing (AACE Class 5 estimate) for infrastructure to connect new industrial customers to Hydro's system.
- Environmental Assessment: Assessment of the environmental impact of potential infrastructure developments, along with an Environmental Assessment registration strategy, if required.
- Project Execution Strategy: A high-level strategy covering logistical challenges, risk analysis, and optimal construction timelines for the region.
- Hydro is also conducting further load flow, short circuit, and stability studies to evaluate potential impacts on the reliability of the grid. These evaluations will include an assessment of potential losses and an economic analysis to ensure that the preferred options align with both customer needs and grid stability.

Next Steps

Hydro remains committed to working with Champion Iron and other industrial stakeholders to advance these studies and facilitate the development of Labrador's industrial base. At this time, Hydro is forecasting that the studies will be completed in the second half of 2025. Once the studies are completed Hydro will be able to provide Champion Iron, other industrial customers and other stakeholders more specific information regarding the potential expansion cost of the Labrador Interconnected system.

Should you require any further information or clarification on the technical or regulatory aspects of this process, please feel free to contact us directly.

Sincerely,

Nancy Ann Hart, P. Eng, MBA
Senior Manager, Commercial
Newfoundland & Labrador Hydro

Kami

Kamistiatusset
Mining
Project

3. Project Alternatives

Chapter 3, **Project Alternatives**, identifies the purpose, rationale and need for the Project, and provides a comparative analysis of various identified alternatives to the Project and alternative methods of carrying out the Project. The Project alternatives are evaluated against environmental, technical, social and economic criteria, resulting in the selection of preferred Project alternatives with rationale to support the selected alternatives. This chapter meets the requirements as outlined in Sections 2.2, 3.1, and 3.2 of the EIS Guidelines issued by the Government of Newfoundland and Labrador on December 19, 2024.

3.1 Purpose, Rationale and Need for the Project

This section outlines the need for and the purpose of the Project with regard to underlying rationale and objectives of the Project, as well as anticipated socioeconomic benefits.

The purpose of the Project is to provide high-grade, low-impurity iron ore concentrate intended to directly support the steel industry's global transition toward low-carbon emissions production technologies, as well as to support global climate objectives. The Project's purpose will be fulfilled by developing the Rose Central and Rose North iron deposits and by processing the extracted ore to produce high-grade, low-impurity iron ore concentrate used in the direct reduction pelletizing processes. The Project's high-grade iron concentrate will enable cleaner, more efficient direct reduction iron (DRI) ore concentrate to be available on international markets for steelmaking.

Champion is the world's largest publicly listed company that solely produces high-grade iron ore. In 2021, Champion acquired the mining claim associated with the Kami Project from Alderon. The Project is located in southwestern Labrador near the Newfoundland and Labrador–Québec border, approximately 21 km southeast of Champion's existing Bloom Lake mining operation in Québec. In 2024, Champion issued a Pre-Feasibility Study (PFS) for the Project that evaluated and confirmed the feasibility of the construction of mining and processing facilities for a 26-year life of mine with production of DRI ore concentrate (i.e., high-grade, low-impurity iron ore) with a minimum grade of 67.5% iron by weight. In December 2024, Champion entered into a binding agreement with Nippon Steel Corporation and Sojitz Corporation (the Partners) for the joint ownership of the Project, wherein the Partners will initially contribute $245 million for an interest in the Project (Champion 2024a).

Steel is a foundational material for modern infrastructure and industrial development and is estimated to contribute between 8% and 10% of global carbon emissions annually (International Energy Agency 2023a). In response to global climate objectives such as the Paris Agreement and achieving net-zero greenhouse gas (GHG) emissions by 2050 (United Nations 2025), the steel industry is increasingly shifting away from the traditional coal-burning, basic oxygen furnace (BOF) steelmaking and towards decarbonized production pathways such as DRI and electric arc furnace (EAF) steelmaking (see, for example, Government of Canada 2021).

The high-grade, low-impurity iron ore concentrate produced by the Project is specifically designed to support an industrial transition to DRI. Whereas traditional BOF methods use coal as a reducing agent in steelmaking, the DRI process uses natural gas or, more efficiently, hydrogen as a reducing agent to considerably reduce carbon emissions (Champion 2023). By contrast, low-grade iron ore concentrate can be used in DRI steelmaking processes if additional costly and energy-intensive beneficiation processes are conducted to remove the ore concentrate's inherent impurities. The Project's concentrate will not require additional downstream processing for use in DRI steelmaking. Thus, by supplying a feedstock that is optimized for low-emissions steelmaking processes (e.g., DRI), the Project aligns with global efforts to reduce reliance on BOF, thereby reducing overall industrial emissions and supporting the long-term sustainability of the steel sector (Champion 2024b). It is estimated that the DRI process proposed for the Project emits approximately 50% less carbon emissions than traditional blast furnace processes (i.e., BOF) (Champion 2023).

In global markets, 62% iron by weight is the typical iron ore grade benchmark for pricing and premiums or discounts apply to ore with higher or lower iron content, respectively. Considering the relative scarcity of high-grade, low-impurity iron ore concentrate on global markets and the anticipated increase in demand for this type of concentrate (International Energy Agency 2023b), the Project's product is expected to achieve premium market rates (Champion 2024b).

An additional purpose for the Project is to supply a critical mineral (i.e., high-grade, low-impurity iron ore concentrate), which directly supports global efforts to decarbonize. Wood-Mackenzie's Accelerated Energy Transition 1.5-degree Pathway sets out a global strategy to support net-zero GHG emissions by 2050 through decarbonization and the transition to renewable energy. It is estimated that more than 3.5 billion additional tonnes of steel are required to construct the renewable energy infrastructure (e.g., wind turbines, solar panels) and electric vehicles needed to reach the net-zero GHG emissions target by 2050 (Wood-Mackenzie 2021). Given the current annual contribution of GHG emissions by the steel industry, the limited emissions-reduction potential of conventional BOF processes, and the anticipated increase in demand for steel, accelerated efforts must be made to produce low-emissions steel to reach net-zero GHG emissions (International Energy Agency 2023b). High-grade, low-impurity iron ore is also acknowledged as a critical mineral by the Government of Newfoundland and Labrador (2023) and the Government of Canada (2025) for its role in producing low-emissions (i.e., "green") steel, which is vital for the deployment of technologies necessary to decarbonize and meet global climate objectives.

The Project will support the steel industry's transition to low-emissions steelmaking processes and contribute to global efforts to reach net-zero GHG emissions by 2050. Additionally, the Project will supply the raw materials critically needed to construct renewable energy infrastructure, supporting global climate objectives to decarbonize across industry and infrastructure.

3.2 Alternatives to the Project

"Alternatives to" the Project are defined as functionally different options of achieving the purpose of and need for the Project that are technically and economically achievable (Impact Assessment Agency of Canada 2020).

To meet the requirements of Section 3.1 of the EIS Guidelines, this section:

- identifies functionally different Project alternatives to achieve the purpose of and need for the Project
- provides a summary of the advantages and disadvantages of the different Project alternatives
- summarizes the methods and information that were used to justify the selection of the preferred Project, as well as an explanation for rejecting other alternatives, including a comparative analysis of the environmental and social effects and technical and economic feasibility of alternatives that led to the selected Project alternative

3.2.1 Identification of Alternatives to the Project

To generate the steel needed to meet the purpose of the Project, there are two functional alternatives:

- **Alternative 1**—Produce lower-grade iron ore concentrate for use in BOFs (or, following downstream beneficiation, for use in DRI) to generate steel.
- **Alternative 2**—Produce high-grade, low-purity iron ore concentrate to feed DRI or EAF to generate green steel.

Not proceeding with the Project (i.e., "do-nothing" alternative) is not a functional alternative, as this will not meet the need and purpose of the Project. Therefore, the do-nothing alternative is not assessed further in the assessment of alternatives to the Project.

3.2.2 Summary of Advantages and Disadvantages

Table 3-1 summarizes the advantages and disadvantages associated with the two identified alternatives to the Project per Section 3.1 and discussed further in Section 3.2.3.

Table 3-1: Advantages and Disadvantages of Alternatives to the Project

Alternative	Advantages	Disadvantages
Lower-grade iron ore concentrate	— **Cost-effective**–Lower-grade iron ore is generally cheaper than higher-grade alternatives. — **Availability**–More abundant and accessible compared to high-grade ores.	— **Higher impurities**–Contains more impurities, such as silica and phosphorus, which can affect the quality of the steel. — **Energy intensive**–Requires more energy to process and remove impurities when used in the DRI process, resulting in greater downstream GHG emissions. There are limited opportunities to reduce carbon emissions when concentrate is used in the BOF process. — **Lower efficiency**–May result in lower steelmaking productivity due to the need for additional processing.
High-grade iron ore concentrate	— **Lower impurities**–Generally, contains fewer impurities, leading to better quality steel. — **Energy efficiency**–DRI and EAF are more energy-efficient compared to BOF. Opportunities for enhanced emissions reduction through hydrogen-reduced DRI. — **Limited supply**–High-grade ores are less abundant and are in increasing demand, which allows the product to be sold at a premium price and would position Canada as a leader in the global market.	— **Specialized equipment**–Requires specific equipment and technology to process the high-grade iron ore concentrate. — **Cost**–Specialized equipment has greater construction costs and CAPEX.

Notes:

DRI = direct reduction iron; GHG = greenhouse gas; BOF = basic oxygen furnace; EAF = electric arc furnace; CAPEX = capital expenditure.

3.2.3 Comparative Analysis of Alternatives to the Project

Alternatives to the Project were assessed against the criteria described in Table 3-2. This assessment framework provides the basis for an evaluation of each Project alternative when considering their environmental and social costs, as well as their technical and economic benefits.

Table 3-2: Description of Criteria for the Evaluation of Project Alternatives

Criteria	Description of Criteria
Environmental	Consideration of potential effects on ecosystems, including terrestrial, aquatic, and atmospheric environments, by assessing potential changes to habitats, biodiversity, and key ecological processes, and considers the Project alternative's capacity to maintain environmental quality, mitigate adverse effects, and reduce GHG emissions.
Technical	Consideration of the feasibility, reliability, and resilience of Project alternatives to varied operational and environmental conditions, including adaptability to climate risks and response to challenges associated with construction, maintenance, and decommissioning.
Economic	Consideration of Project costs and financial viability.
Social	Consideration of the interaction of the alternative with community health, well-being, land use, and equitable access to benefits, including considerations of public services, cultural practices, and local development needs.

Notes:

GHG = greenhouse gas.

Table 3-3 presents the comparative analysis of the alternatives to the Project. Each alternative was compared against environment, technical, economic, and social criteria to determine the preferred alternative. Colour coding is used in Table 3-3 to reflect the relative preferences for each alternative in consideration of the four criteria, with dark blue representing the more preferred alternative, light blue representing a neutral alternative (i.e., no advantage or disadvantage identified over other alternatives), and white representing the less preferred alternative. The identified preferences reflect how an alternative was evaluated against each criterion compared to the other alternatives.

High-grade iron ore concentrate was identified as the selected alternative, as it was the preferred alternative environmentally and socially compared to lower-grade iron. Although high-grade iron ore concentrate requires specialized processing equipment for its production, high-grade iron ore concentrate is more energy-efficient, as it contains fewer impurities and does not require energy-intensive downstream beneficiation processes compared to lower-grade iron ore concentrate used in DRI steelmaking (Section 3.1). Unlike lower-grade iron ore concentrate used in BOF processes, high-grade iron ore requires less energy-intensive refining and has reduced GHG emissions. High-grade iron ore concentrate is the costliest alternative; however, higher construction and operating costs are anticipated to be offset by the products' premium demand in the global market. The product is also the only alternative that is identified as a critical mineral by NL and Canada. Furthermore, high-grade iron ore deposits are relatively scarce globally (Champion 2023) and the emergence of this essential product could position Canada as a leader in the global market. The current circumstances of the global market (i.e., low yield and with increasing demand with regard to DRI concentrate) are not expected to considerably change since the steel industry is acknowledged to need accelerated decarbonization efforts to reach net-zero GHG emissions, and conventional BOF processes have limited potential to reduce emissions (International Energy Agency 2023b).

Therefore, high-grade iron ore concentrate was selected as the preferred alternative to meet the need and purpose of the Project.

Table 3-3: Comparative Analysis of the Alternatives to the Project

Criteria	Alternatives to the Project	
	Alternative 1: Lower-Grade Iron Ore Concentrate	**Alternative 2: High-Grade Iron Ore Concentrate**
Environmental	— Use of BOF (or DRI following beneficiation processes) to manufacture steel is energy intensive and results in greater GHG emissions.	— Use of DRI is more efficient due to lower impurities and higher iron content, and use of direct reduced iron and EAF are more energy-efficient and result in reduced GHG emissions compared to BOF.
Technical	— Generates a reliable source of raw material for steelmaking and has similar technical challenges in mining and processing as high-grade iron ore concentrate.	— Generates a reliable source of raw material for steelmaking, and has similar technical challenges in mining and processing as lower-grade iron ore concentrate.
Economic	— Lower cost to produce than high-grade iron concentrate.	— Higher cost to produce than lower-grade iron ore concentrate.
Social	— A mining project to produce lower-grade iron ore concentrate would generate considerable jobs, provincial and federal taxes.	— A mining project to produce high-grade iron ore concentrate would generate considerable jobs, provincial and federal taxes. — High-grade iron ore also supports global climate objectives through the production of low-emission steel and aligns with both provincial and federal critical mineral priorities.
Results	**Alternative Not Selected**	**Selected as Preferred Alternative**

Legend			
Legend	less preferred	neutral	more preferred

Notes:

DRI = direct reduction iron; GHG = greenhouse gas; BOF = basic oxygen furnace; EAF = electric arc furnace.

3.3 Alternative Methods of Carrying Out the Project

"Alternative means" of carrying out the Project (herein referred to as "alternative methods") are defined as different technically and economically feasible means of carrying out aspects of the Project, including through the use of best available technologies (Impact Assessment Agency of Canada 2020).

As presented in Section 3.2 of the final EIS Guidelines, the EIS must consider the environmental and social costs and benefits of design alternatives for the Project, including for design alternatives for which there are higher construction and/or operational costs, but which cause less harmful effects. This section identifies and evaluates the potential effects (including benefits) of alternative methods identified for the Project, and it identifies a preferred alternative method in consideration of potential effects.

The scope of the Project and the EIS Guidelines were considered to identify design alternatives (i.e., alternative methods) for which an analysis of effects may be applicable and for which design modifications may result in measurable effects. The following Project aspects were identified and evaluated in the analysis of alternative methods:

- Project phasing
- transportation and site access
- mining
- process plant size and type
- overburden, mine rock, and tailings management
- ore and mine rock hauling methods
- sources of energy
- effluent discharges and water sources

Alternative method categories considered for each Project aspect are presented in Table 3-4.

Table 3-4: Alternative Method Categories

Project Aspect	Alternative Method Category
Infrastructure and phasing	Construction phasing
	Operations phasing
Transportation and site access	Number of access roads
	East access road alignment
	West access road alignment
	Ore shipment methodology and route
Mining	Mining methods
	Open pit design
Process plant size and type	Process plant size and type
Overburden, mine rock, and tailings management	Location of overburden stockpile
	Location of mine waste stockpile
	Location of tailings management facility
Ore and mine rock hauling methods	Ore and mine rock hauling methods
Sources of energy	Sources of energy
Effluent discharges and water sources	Number and location of treated effluent discharges
	Management of seepage at water collection dikes
	Effluent treatment method
	Sewage treatment method and discharge location
	Potable water supply
	Process water supply

Alternative methods were assessed against the criteria described in Table 3-2 (i.e., environmental, technical, economic, and social criteria).

The following sections provide a comparative analysis of the alternative methods identified for each category presented in Table 3-4 in relation to environmental and social costs and technical and economic benefits. Where more than one alternative method was identified for a category, preference was assigned to each alternative method following the same colour-coding used for the analysis of the alternatives to the Project presented in Section 3.2.3 (i.e., dark blue for more preferred, light blue for neutral, and white for less preferred). Where only one alternative method was identified for a category, rationale was provided as to why only one alternative method is technically and/or economically feasible.

3.3.1 Project Phasing

3.3.1.1 Construction Phasing

The Project construction schedule is planned for four years with activities progressing in sequence to align with financial, technical, and environmental objectives for the Project. The phasing approach ensures that critical infrastructure components are developed in a manner that enables efficient resource allocation and mitigates environmental impacts. The timeline for construction is primarily driven by the availability of borrow pit materials, the need for power, and the subsequent sequencing of key access components (e.g., bridges). Construction phasing for the Project is described in detail in Section 2.8 (**Chapter 2, Project Description**) and overall includes the sequencing of construction described in Table 3-5.

Table 3-5: Construction Sequencing Activities by Year

Construction Year	Activities
Year -4 (Construction Year 1)	— Vegetation clearing, earthworks and construction of the access roads and on-site roads to facilitate access across the site and to key facilities, including the Rose Pit and overburden stockpile on the west side of the site and the temporary construction camp location on the east side of the site. — Commissioning of the Rose Pit quarry and temporary aggregate plant, which will generate aggregate and construction material for the Project. — Construction of the Waldorf River bridge to connect the east and west sides of the site. — Vegetation clearing, earthworks and construction of the 34.5 kV transmission line from Wabush to the temporary construction camp and process plant to facilitate power requirements for the remaining years of construction.
Year -3 (Construction Year 2)	— Vegetation clearing of the TMF and TMF starter dam. — Commissioning of the borrow pit within the TMF and expansion of the west borrow pit (at the Rose Pit) to generate aggregate and construction material for the Project. — Continue earthworks to support construction of haul roads, on-site roads and buildings. — Initiate construction of the worker accommodations, process plant, TMF starter dam and water management infrastructure.
Year -2 (Construction Year 3)	— Vegetation clearing, earthworks and construction of the railway loop and railway line. — Continued advancement of the borrow pits to generate aggregate and construction material for the Project. — Completion of all earthworks. — Complete construction of the process plant and worker accommodations. — Continued construction of TMF starter dam and water management infrastructure. — Initiate construction of temporary camp and overland conveyor.
Year -1 (Construction Year 4)	— Expansion of the borrow pits to full extent. — Complete construction of the TMF starter dam, all site buildings, and water management infrastructure. — Dewater Rose Pit by pumping water to the Rose Pit sedimentation pond. — Initiate construction of the in-pit crusher and conveyer system.

Notes:

kV = kilovolt; TMF = tailings management facility.

The Project is expected to have construction costs of approximately $4 billion with an 8% net present value (NPV). The construction sequencing proposed maximizes efficiency for overall Project construction and minimizes the overall duration of the Construction phase. Any extension to the schedule would not be financially feasible. Project financing supported through agreements with Partners (as described in Section 3.1) requires achieving investment and market expectations through efficient construction planning. Therefore, the current construction phasing is the only viable alternative method.

Site preparation and development of access roads is the most critical component of construction phasing, as this will work to provide efficient access to the aggregate and borrow source areas within the Rose Pit and tailings management facility (TMF) areas. The early commissioning of the borrow pits will provide the aggregate materials required early during construction for the continuation of site access road construction, the construction of the Waldorf River bridge, and for temporary works in subsequent construction stages. The location, size, and sequencing of the borrow pits have been selected to balance resource availability while minimizing land and water impacts associated with access. The construction of the Waldorf River bridge is also a critical step during early construction, as the bridge will facilitate access between the east and west portions of the site and will reduce travel distances within the Project site as construction of Project components progresses. Champion's sequencing also seeks to reduce environmental effects from construction, by optimizing material handling and managing potential sediment and erosion control effects through phased vegetation clearing and site development. Mitigation measures implemented during construction will be outlined in Champion's Environmental Protection Plan.

Through the feasibility study and detailed design, Champion will continue to explore opportunities to refine the construction phasing strategy for individual Project components.

3.3.1.2 Operations Phasing

The mine operation is expected to produce an average of 8.6 million tonnes of iron ore concentrate annually over a 26-year mine life. Operations phasing prioritizes maximizing financial and operational benefits while minimizing environmental and social effects. This approach ensures the Project is viable and will responsibly balance impacts with overall economic cost. Given the considerable construction cost (approximately $4 billion CAD), a throughput of 8.6 million tonnes per year of iron ore concentrate is needed to meet the financial targets set out in the PFS. To this end, mining will occur across the pit simultaneously to meet the Project's financial targets while minimizing inefficiencies generated from mining activities.

The current operations phasing is the only viable alternative method, as the Project's financial model is structured around a single-pit extraction strategy to ensure economic feasibility. Any deviation from this approach, such as multiple pit development or alternative phasing strategies, have been assessed and under current and projected market conditions are not technically or financially viable. Through the feasibility study and detailed design, Champion will continue to explore opportunities to optimize mining operations.

3.3.2 Transportation and Site Access Roads

3.3.2.1 Number of Access Roads

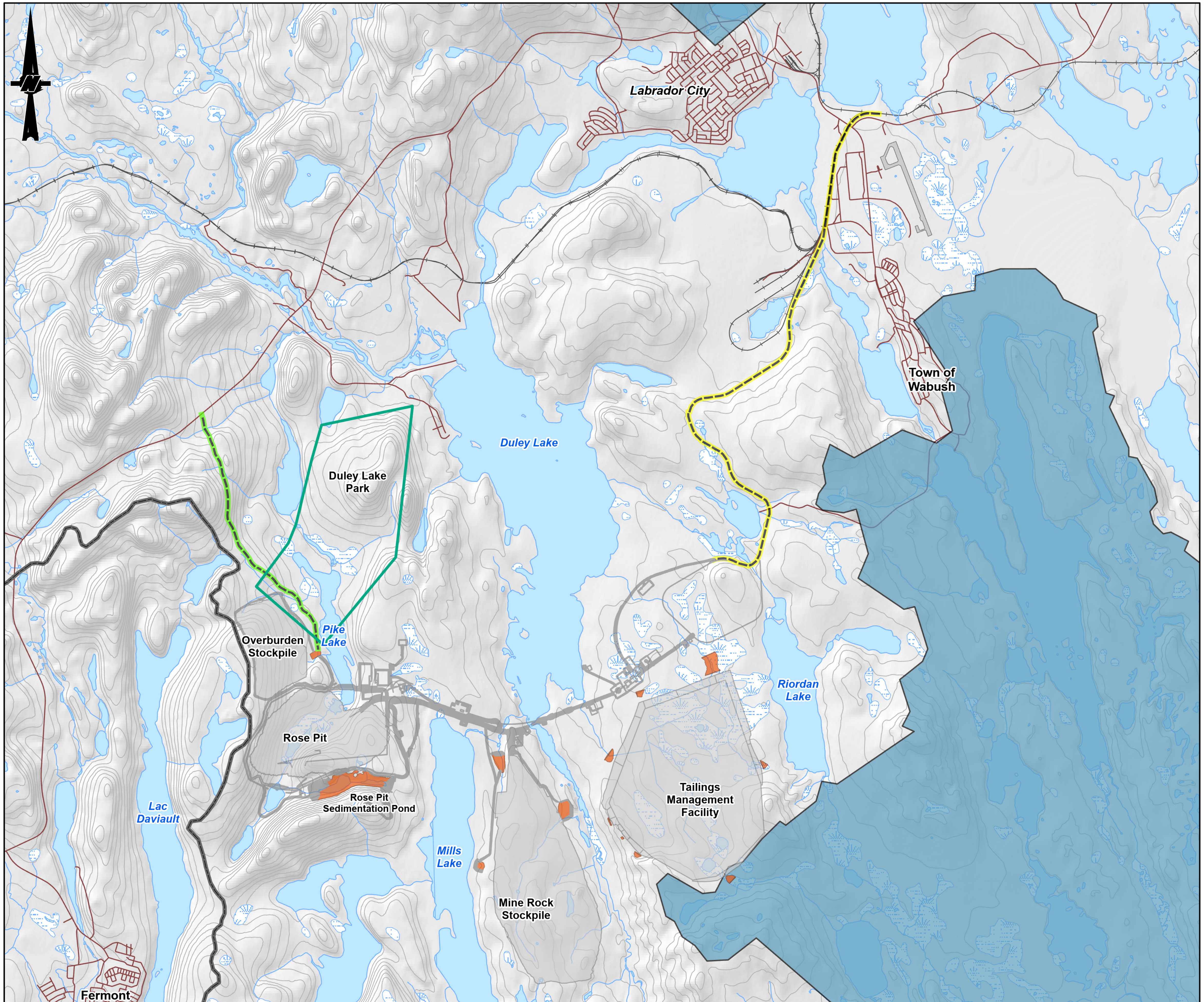
Three alternative methods for the number of access roads were considered for the Project, as shown in Figure 3-1:

- **Alternative 1**—A single road aligned several kilometres west of Wabush from the Trans Labrador Highway with a proposed length of approximately 12 km to access the site from the west (the west access road).
- **Alternative 2**—A single road aligned from the Trans Labrador Highway and passing within 500 m east of Wabush with a proposed length of approximately 18.5 km to access the site from the east (the east access road).
- **Alternative 3**—A dual-road option incorporating both east and west access roads.

The west access road is a critical component of the Project's construction sequencing by facilitating access to the Rose Pit quarry, which will be used to generate sufficient borrow source and aggregate materials essential for construction. Proposing the west road as the only access road into the site would result in construction challenges and delays, as development across the site and construction of the Waldorf River bridge would need to occur prior to initiating activities on the east side of the river (e.g., the TMF starter dam, process plant, camp). Proposing the west road only would also cause operational challenges, as traffic would need to travel across the site to key staging locations (i.e., process plant, camp) on the east side of the site, increasing travel distances and fuel consumption. This option would also result in maintenance challenges as it would not allow direct access to the railway to the east of the site, would result in greater long-term impacts on provincial infrastructure (e.g., the Trans Labrador Highway), and it would be located farther from supply chain infrastructure (e.g., the airport) and the local workforce in Wabush and Labrador City. From a physical disturbance standpoint, the west access road alignment has the smallest footprint compared to the east access road and crosses less mapped waterbodies and wetlands.

The east access road is essential for construction sequencing, as this road would provide direct access to the camp location, process plant, for TMF construction, the railway for construction and ongoing maintenance, and the eastern side of the Waldorf River bridge. The east access road is closer to Wabush and Labrador City, reduces long-term impacts on provincial infrastructure (e.g., the Trans Labrador Highway), and is in closer proximity to supply chain infrastructure (e.g., the airport) and the local workforce in Wabush and Labrador City. However, constructing only this road would not be feasible, as the potential borrow source material within the TMF has insufficient resources to construct the all-site infrastructure needed for the Project while maintaining the construction schedule. Additional borrow material would need to be accessed from the Rose Pit west of the bridge which would not be feasible without the west access road prior to construction of the Waldorf River bridge. This access road is greater in length when compared to the west access road and crosses more mapped waterbodies and wetlands. Operationally, proceeding with only the east access road would also pose potential challenges, as the west access road would offer a potential emergency exit from the site should a potential accident or malfunction occur that prevents the use of the east access road.

The dual-road option provides the greatest opportunity to balance construction efficiency, minimize construction costs and schedule risks, and minimize effects on the local community. Champion would use both roads during construction to facilitate material movement and logistics for site development. Following construction, the east road would become the primary route for operations, while the west access road would be maintained for emergency access or to complete specialized transportation to site such as moving oversized equipment. With this approach, Champion will streamline construction while ensuring direct access to the key facilities during construction and operation. This alternative also provides additional safety and resilience for Project operations by providing additional emergency access during Construction and Operations, should wildfires or other climate events affect the Project. Overall, the two-road option improves construction sequencing efficiency, minimizes risk for schedule delays, and provides greater long-term operational flexibility and enhanced site safety.



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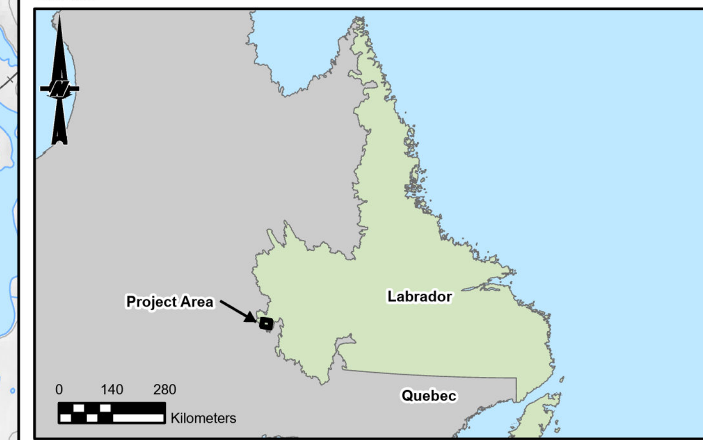

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PROJECT DATA

- Proposed Project Infrastructure
- Proposed Sediment Pond
- East Access Road
- West Access Road

BASEMAP INFORMATION

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

0 1,000 2,000 4,000

1:71,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

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

CLIENT

CHAMPION IRON MINES LTD.

PROJECT

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

TITLE

ALTERNATIVES FOR THE NUMBER OF ACCESS ROADS

CONSULTANT

wsp

YYYY-MM-DD	2025-06-24
DESIGNED	----
PREPARED	GM/MS
REVIEWED	AF
APPROVED	KB

PROJECT NO.	CONTROL	REV.	FIGURE
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The alternative methods for number of access roads were screened against the evaluation criteria provided in Table 3-2. The results of the alternatives assessment are provided in Table 3-6. The dual-road option incorporating both east and west access roads (i.e., Alternative 3) was selected as the preferred alternative method.

Table 3-6: Summary of the Alternatives Assessment for Number of Access Roads

Criteria	Alternative Methods		
	Alternative 1: One Access Road (East Road)	**Alternative 2: One Access Road (West Road)**	**Alternative 3: Two Access Roads (East and West Roads)**
Environmental	— Longer alignment; greater number of intersected mapped waterbodies and wetlands and greater overall footprint (i.e., less impact on surface waters) — Closer to existing nearby communities (e.g., Wabush and Labrador City), reducing distance for commuting and materials transported by truck	— Shorter alignment: fewer number of intersected mapped waterbodies (i.e., greater impact on surface waters) — Greater driving distance from Wabush and Labrador City for commuting and materials transported by truck	— Higher overall footprint from two road alignments.
Technical	— Offers access to the camp, process plant and railway for maintenance — Does not allow access to Rose Pit quarry, where borrow source and aggregate material are needed for construction	— Impacts on construction sequencing, which could delay construction and financial viability of the Project — Provides initial access to sufficient borrow sources to support efficient construction of Waldorf River crossing	— Allows for phased, efficient construction and operational safety
Economic	— Impacts on construction sequencing, which could delay construction and financial viability of the Project	— Impacts on construction sequencing, which could delay construction and financial viability of the Project	— Parallel development on both east and west sides of the site reduces schedule and delay risks — Overall lower CAPEX due to shorter construction timeline.
Social	— Closer to Wabush and Labrador City, leading to less impacts on the provincial highway network. — Does not allow for sufficient emergency access/egress.	— Farther from Wabush and Labrador City with greater impacts on provincial highway network. — Does not allow for sufficient emergency access/egress.	— Offers dual emergency egress routes for greater safety during Construction and Operation.+ — Operational flexibility to balance use of provincial highway network
Results	**Alternative Method Not Selected**	**Alternative Method Not Selected**	**Selected as Preferred Alternative Method**

Legend	less preferred	neutral	more preferred

Notes:

CAPEX = capital expenditure.

3.3.2.2 East Access Road Alignment

Two alignments were considered for the east access road, as presented in Figure 3-2. Alignment 1 is shorter (approximately 16.0 km in length) and crosses fewer mapped waterbodies and wetlands, while Alignment 2 (approximately 16.2 km in length) is slightly longer, crosses a greater number of mapped waterbodies and wetlands, intersects with the Wahnahnish Lake Public Water Supply Area (Figure 3-2), and is located closer to the residential areas of the town of Wabush. Alignment 2 is the east access road alignment that was presented in the Project Registration.

Alignment 1 offers a shorter route length with fewer environmental impacts due to fewer waterbody and wetland crossings. Alignment 1 is also farther from the residential areas of Wabush, which minimizes traffic and reduces interaction with Wabush community members. Alignment 1's proximity to the proposed rail infrastructure reduces overall land/footprint disturbance, and adds potential logistical advantages for material transport and opportunity for maintenance. However, Alignment 1 results in interactions with Tacora's existing property, which will result in negotiation to permit access/use, which will result in greater costs compared to Alternative 2.

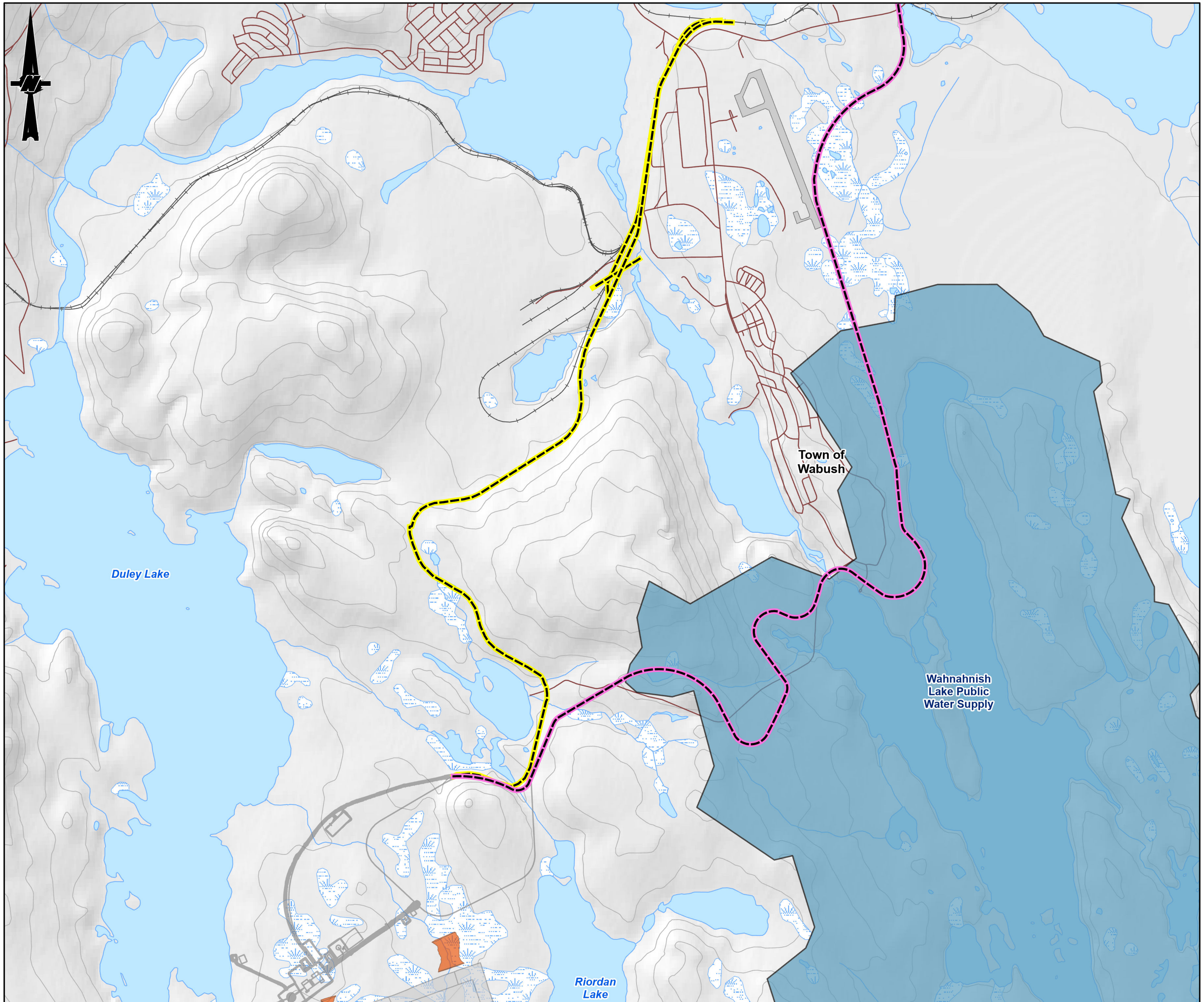
Alignment 2 follows a longer route and crosses more mapped waterbodies, which increases potential for environmental impacts and mitigation requirements. Its closer proximity to central Wabush would result in additional traffic and associated sensory disturbance (e.g., noise, light) to the town and its residents. Alignment 2 also intersects with the Wahnahnish Lake Public Water Supply Area, and would increase overall land/footprint disturbance. However, Alignment 2 does not interact with the existing surface leases or property limits of landowners, which overall results in a lower cost alternative compared to Alternative 1.

The alternative methods for the east access road alignment were screened against the evaluation criteria provided in Table 3-2. The results of the alternatives assessment are provided in Table 3-7. Alignment 1 was selected as the preferred alternative method.

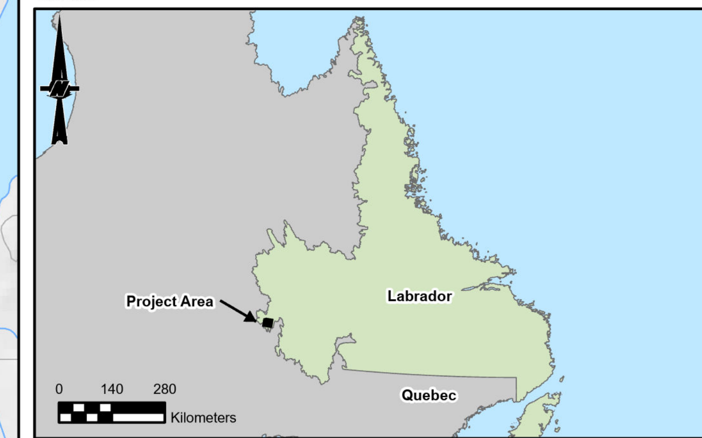
Table 3-7: Summary of the Alternatives Assessment for the East Access Road Alignment

Criteria	Alternative Methods	
	Alternative 1: Alignment 1	Alternative 2: Alignment 2
Environmental	— Shorter alignment with fewer intersected mapped waterbodies and wetlands — Does not intersect with the Wahnahnish Lake Public Water Supply Area	— Longer alignment with greater number of intersected mapped waterbodies and wetlands — Intersects with the Wahnahnish Lake Public Water Supply Area — Increased overall land/footprint disturbance
Technical	— Shorter route with fewer number of water crossings	— Longer route requires more extensive roadbed construction and has higher complexity due to higher number of water crossings
Economic	— Lower maintenance costs due to the shorter length and fewer crossings — Additional costs associated with interaction with Tacora property	— Higher construction and maintenance costs due to longer road length and more crossings, but overall lower cost, as this alignment avoids the Tacora property
Social	— Located farther from central Wabush, reducing potential disruptions from construction and traffic interactions with the community	— Alignment is closer to central Wabush, increasing potential social impacts from construction and traffic interactions with the community — Greater potential for public concerns due to the overlap with the Wahnahnish Lake Public Water Supply Area
Results	**Selected as Preferred Alternative Method**	**Alternative Method Not Selected**

Legend			
Legend	less preferred	neutral	more preferred



KEY MAP



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PROJECT DATA	BASEMAP INFORMATION
Proposed Project Infrastructure	Road
Proposed Sediment Pond	Railway
Alignment 1	Watercourse
Alignment 2	Contour
	Bog/Wetland
	Waterbody
	Public Water Supply

0 500 1,000 2,000
1:42,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

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

CLIENT
CHAMPION IRON MINES LTD.

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

TITLE
ALTERNATIVE ALIGNMENTS FOR THE EAST ACCESS ROAD

CONSULTANT

YYYY-MM-DD	2025-06-24
DESIGNED	----
PREPARED	GM/MS
REVIEWED	AF
APPROVED	KB

PROJECT NO.	CONTROL	REV.	FIGURE
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3.3.2.3 West Access Road Alignment

Two alignments were considered for the west access road, as presented in Figure 3-3:. Alignment 1 is the west access road alignment that was presented in the Project Registration. Through consultation completed by Champion following the submission of the Project Registration, Alignment 1 was raised as a concern by the Duley Lake Cabin Owners' Association due to the potential interaction between Project traffic, cabin owner traffic, recreational traffic to the Duly Lake Family Park, as well as concerns with noise generated from Project traffic. Champion committed to modifying the access road alignment to address concerns from the cabin and Family Park owners and to reduce potential effects on cabin owner/park traffic. As presented in **Chapter 22, Engagement**, Section 22.5.4, as a result of engagement with the Duley Lake Cabin Owners' Association, Champion identified Alignment 2 as the preferred alternative.

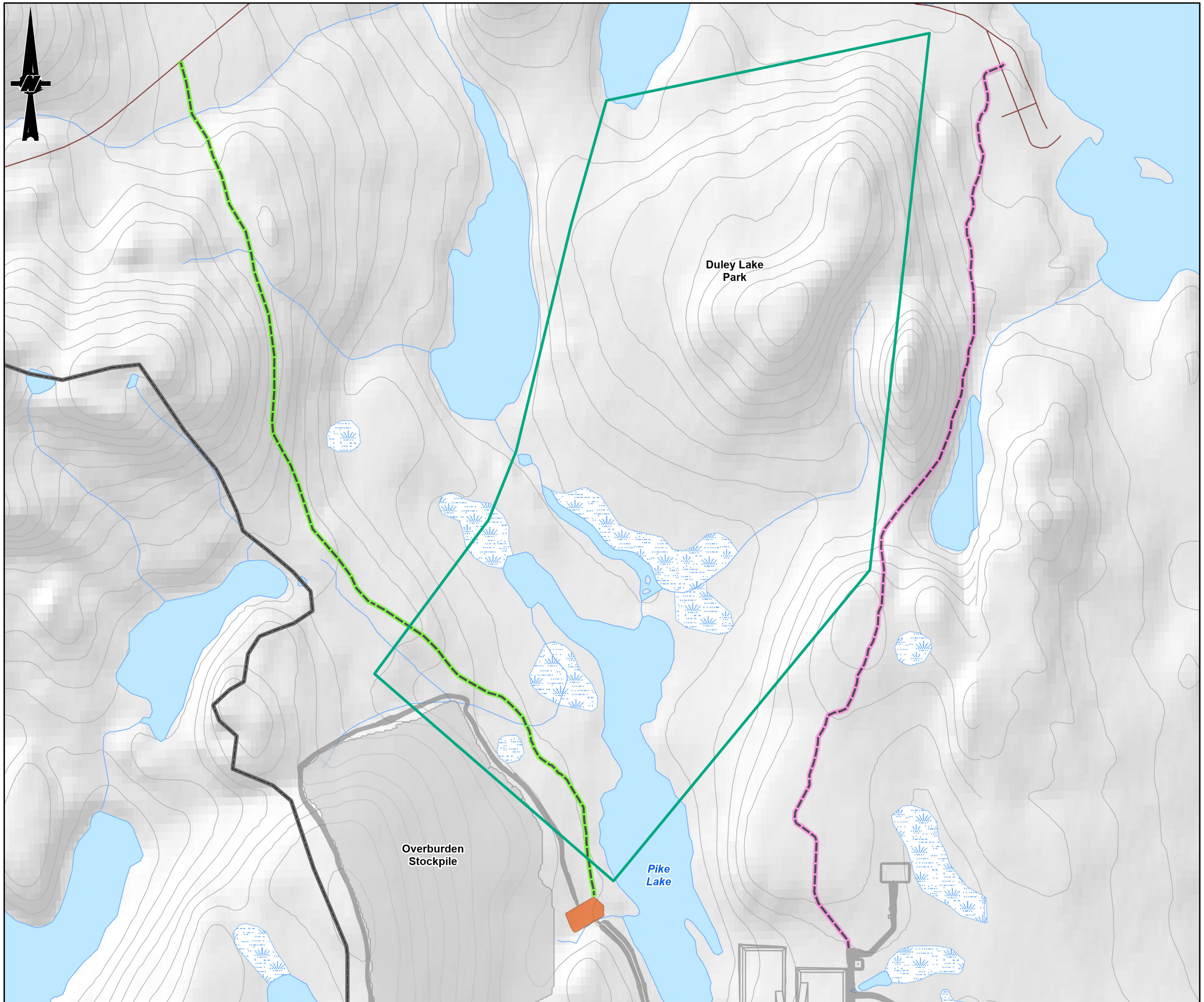
Alignment 1 is approximately 4.5 km in length, east of Pike Lake, does not intersect with any mapped waterbodies, and would upgrade access that is currently used by cabin owners of Duley Lake. Alignment 2 is approximately 5.1 km in length, lies west of Pike Lake, crosses several mapped waterbodies, and is closer to the overburden stockpile, which reduces material transportation costs and GHG emissions associated with transporting overburden material. Alignment 2 intersects with the southeastern portion of Duley Lake Provincial Park, while Alignment 1 is located approximately 100 m away from the park at its closest location to the park (Figure 3-3:).

The alternative methods for the west access road alignment were screened against the evaluation criteria provided in Table 3-2. The results of the alternatives assessment are provided in Table 3-8. Although Alignment 2 was more preferred in consideration of the environmental, technical, and economic criteria, Alignment 2 was selected as the preferred alternative method, as it avoids interaction with cabin owners and the Family Park traffic, and meets Champion's consultation commitments.

Table 3-8: Summary of the Alternatives Assessment for the West Access Road Alignment

Criteria	Alternative Methods	
	Alternative 1: Alignment 1	Alternative 2: Alignment 2
Environmental	— Shorter alignment with no intersected mapped waterbodies — Does not intersect with Duley Lake Provincial Park	— Longer alignment with greater number of intersected mapped waterbodies — Intersects with Duley Lake Provincial Park
Technical	— Shorter route with fewer number of water crossings	— Longer route requires more extensive roadbed construction and has higher complexity due to higher number of water crossings
Economic	— Less construction costs due to shorter alignment	— Higher construction costs due to longer alignment
Social	— Impacts on cabin owners and does not meet Champion's consultation commitments	— Avoids interactions with cabin owners and meets Champion's consultation commitments
Results	**Alternative Method Not Selected**	**Selected as Preferred Alternative Method**

Legend			
Legend	less preferred	neutral	more preferred



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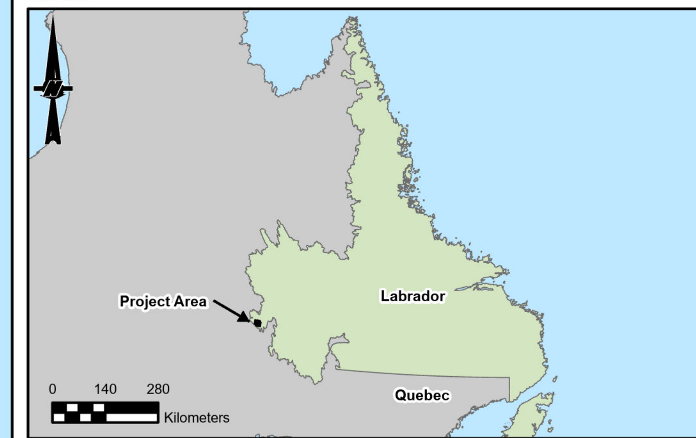

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PROJECT DATA	BASEMAP INFORMATION
Proposed Project Infrastructure	Road
Proposed Sediment Pond	Watercourse
Alignment 1	Contour
Alignment 2	Duley Lake Park
	Bog/Wetland
	Waterbody
	Labrador/Quebec Boundary

0 250 500 1,000
1:20,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

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

CLIENT
CHAMPION IRON MINES LTD.

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

TITLE
ALTERNATIVE ALIGNMENTS FOR THE WEST ACCESS ROAD

CONSULTANT
wsp

YYYY-MM-DD	2025-06-24
DESIGNED	----
PREPARED	GM/MS
REVIEWED	AF
APPROVED	KB

PROJECT NO.	CONTROL	REV.	FIGURE
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3.3.2.4 Ore Shipment Methodology and Route

Three alternative methods are being considered for shipping ore from the Project site to the port terminals in Sept-Îles for export markets, as follows:

- **Alternative 1**–Truck iron ore concentrate directly to Sept-Îles.
- **Alternative 2**–Construct and operate a rail line for iron ore concentrate shipping that connects directly to the publicly owned Québec North Shore and Labrador (QNS&L) rail line northeast of Wabush.
- **Alternative 3**–Construct and operate a rail line for iron ore concentrate shipping that is adjacent to the privately owned Tacora rail line located southwest of Wabush before merging with the QNS&L rail line.

The alternatives are shown in Figure 3-4; Alternative 1 would rely on the east access road to access Wabush and the Trans Labrador Highway.

Alternative 1 is the least favourable option due to its greater environmental and social effects and operational disadvantages. The high fuel consumption, higher GHG emissions, and higher dust generation from truck transport combined with increased traffic near Wabush result in negative impacts that outweigh the benefits of avoiding rail construction (e.g., avoid construction costs related to rail infrastructure).

Alternative 2 would intersect with the Wahnahnish Lake Public Water Supply Area and is closer to the residential areas of Wabush, which may introduce additional permitting requirements, social effects and the possibility for concerns to be raised through consultation regarding potential environmental impacts. Alternative 2 prioritizes operational independence and offers cost efficiencies by connecting to the publicly owned QNS&L rail line without needing to tie into Tacora's existing rail line via a rail cross-over, which may require Champion to compensate Tacora for its use. However, Alternative 2 is less favourable due to its overlap with the Wahnahnish Lake Public Water Supply Area.

Alternative 3 introduces interaction with Tacora's existing surface lease and the close proximity of its railway requires the need to build a rail-cross overpass which would increase costs for the Project. However, Alternative 3 would avoid the Wahnahnish Lake Public Water Supply Area and is located farther from the residential areas of Wabush. Through ongoing Project consultation, Champion has made commitments to Indigenous communities and public stakeholders to move the railway away from some areas of Wabush and outside of the Wahnahnish Lake Public Water Supply Area. Alternative 3 aligns with these commitments, and also improves Tacora's site access for their employees and emergency response capabilities.

The alternative methods for ore shipment methodology were screened against the evaluation criteria provided in Table 3-2. The results of the alternatives assessment are provided in Table 3-9. Alternative 3 was selected as the preferred alternative method.

Table 3-9: Summary of the Alternatives Assessment for Ore Shipment Methodology and Route

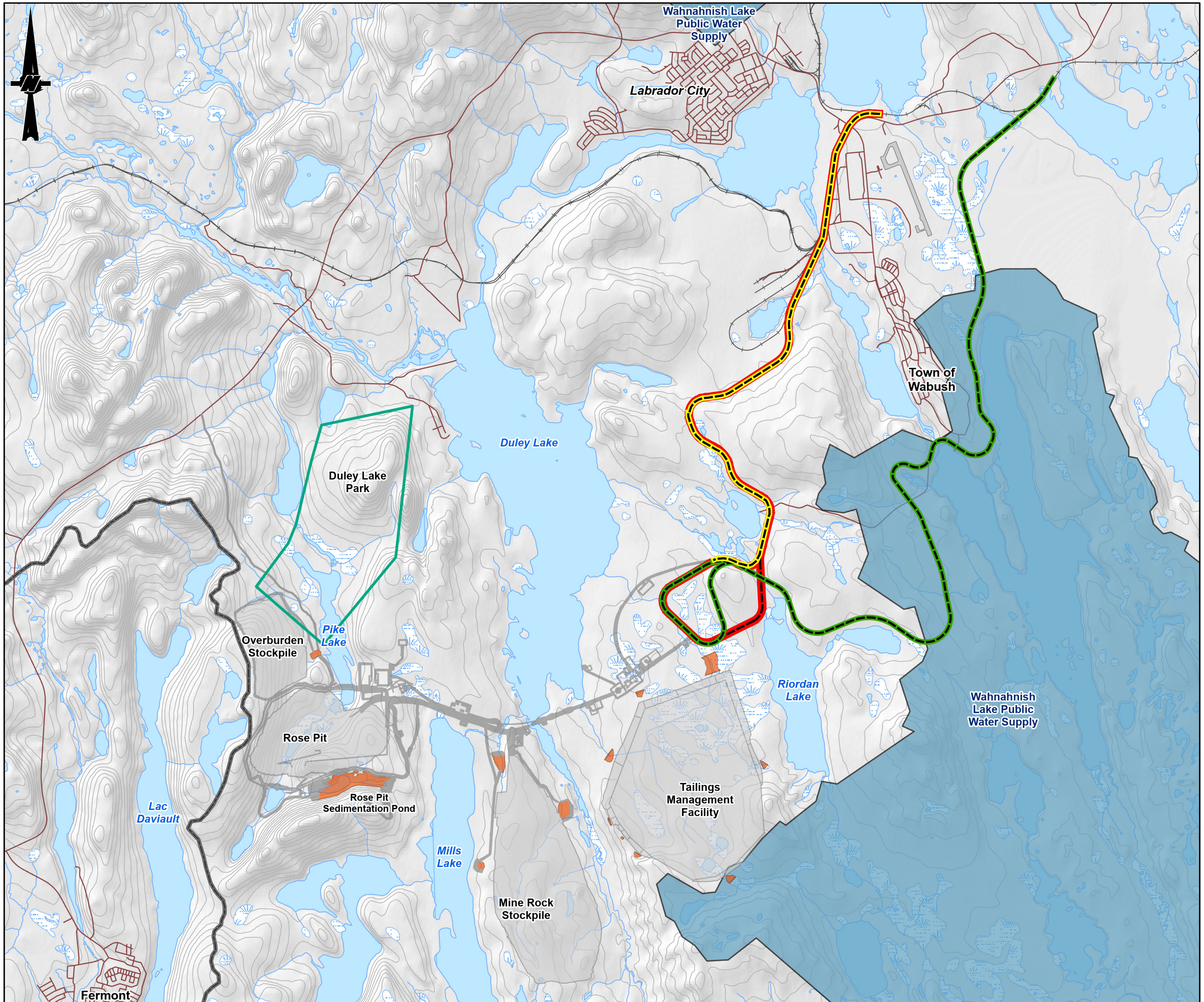
Criteria	Alternative Methods		
	Alternative 1: Trucking Ore Concentrate	Alternative 2: Rail Connection to QNS&L Rail Line	Alternative 3: Rail Connection to Tacora Rail Line and Merge with QNS&L Railway
Environmental	— Higher fuel consumption and generation of dust and GHG emissions — Greater dust and noise impacts on private landowners nearby the trucking route	— Less generation of dust and GHG emissions compared to trucking — Longer rail line alternative, which increases construction-related disturbances and environmental footprint — Overlaps the Wahnahnish Lake Public Water Supply Area	— Less generation of dust and GHG emissions compared to trucking — Shorter rail line alternative, which reduces overall environmental footprint — Use of existing Tacora infrastructure minimizes new land disturbances — Avoids the Wahnahnish Lake Public Water Supply Area
Technical	— Limited shipment capacity compared to rail	— High capacity for shipment — Lower potential for shipment disruptions, as this alternative would not connect to other private rail infrastructure	— High capacity for shipment — Sharing the Tacora rail loop may result in rail traffic disruptions

Criteria	Alternative Methods		
	Alternative 1: Trucking Ore Concentrate	Alternative 2: Rail Connection to QNS&L Rail Line	Alternative 3: Rail Connection to Tacora Rail Line and Merge with QNS&L Railway
Economic	— Anticipated highest operational costs from fuel, road and truck maintenance	— Greater construction costs compared to Alternative 3 due to increase in rail line and number of water crossings — Fewer costs anticipated due to independence from private agreements with Tacora	— Lower construction costs compared to Alternative 2 due to shorter length of rail line and use of existing infrastructure — Higher costs anticipated due to need to negotiate with Tacora on the use of rail loop
Social	— Heavy truck traffic near Wabush increases noise, dust, and safety risks for nearby private landowners and Wabush residents — Impacts on provincial highway network with increased haul truck traffic	— Proximity to Wabush raises noise and community disruption concerns — Greater potential for public concerns due to overlap with Wahnahnish Lake Public Water Supply Area	— Avoids residential areas of Wabush, reducing social impacts — Meets Champions consultation commitments to move the railway away from the residential areas of Wabush and outside the Wahnahnish Lake Public Water Supply Area — Improves Tacora's site access for their employees and emergency response capabilities
Results	**Alternative Method Not Selected**	**Alternative Method Not Selected**	**Selected as Preferred Alternative Method**

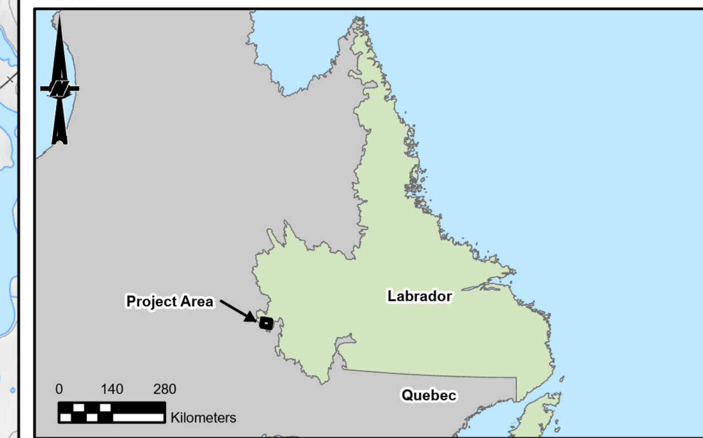
Legend	less preferred	neutral	more preferred

Notes:

QNS&L = Québec North Shore and Labrador; GHG = greenhouse gas.



KEY MAP



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PROJECT DATA	BASEMAP INFORMATION
Proposed Project Infrastructure	Road
Proposed Sediment Pond	Railway
Alternative 1	Watercourse
Alternative 2	Contour
Alternative 3	Duley Lake Park
	Bog/Wetland
	Waterbody
	Labrador/Quebec Boundary
	Public Water Supply

0 1,000 2,000 4,000
1:71,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

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

CLIENT
CHAMPION IRON MINES LTD.

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

TITLE
ALTERNATIVE METHODS FOR ORE SHIPMENT AND ORE SHIPMENT ROUTE

CONSULTANT

wsp

YYYY-MM-DD	2025-06-24
DESIGNED	----
PREPARED	GM/MS
REVIEWED	AF
APPROVED	KB

PROJECT NO.	CONTROL	REV.	FIGURE
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3.3.3 Mining

3.3.3.1 Mining Methods

Both conventional mining methods for iron ore mines (i.e., open pit and underground) were considered for the Project.

Open pit mining, also known as open-cast or open-cut mining, is a surface mining technique where rock or minerals are extracted from an open pit or borrow. This method involves removing large quantities of overburden (soil and rock covering the mineral deposit) to access the ore beneath. The pit is created in a series of benches or steps, which provide access to the ore and allow for the safe movement of equipment. Open pit mining is ideal for extracting minerals that are located near the surface, where the overburden is relatively thin. Open pit mining is also preferred for large ore bodies that are not economically viable to mine using underground methods. For the Project, open pit mining is the most technically and economically feasible option for extracting the near surface iron ore that have been defined at the Rose North and Rose Central deposits.

Underground mining involves the excavation of tunnels or shafts to access mineral deposits located deep below the surface. This method is used when the ore body is too deep to be economically viable to extract using surface mining techniques, and where surface mining would be impracticable due to the amount of overburden that would need to be removed. This method is often used for smaller, high-grade ore bodies that justify the higher costs associated with underground mining. Underground mining allows for more selective extraction of ore, which can minimize waste and improve ore recovery. For the Project, underground mining is not technically feasible for extracting the near surface iron ore that have been defined for the Rose North and Rose Central deposits.

The alternative mining methods were screened against the evaluation criteria provided in Table 3-2. The results of the alternatives assessment are provided in Table 3-10. Open pit mining was selected as the preferred alternative method due to the proximity of the iron ore deposits to the ground surface.

Table 3-10: Summary of the Alternatives Assessment for Mining Methods

Criteria	Alternative Methods	
	Alternative 1: Open Pit Mining	Alternative 2: Underground Mining
Environmental	– Larger surface disturbance and more mine waste generated	– Relatively smaller surface disturbance and less mine waste generated
Technical	– Technically feasible based on depth of the Project's iron ore deposits	– Not technically feasible since the Project's iron ore deposits are close to ground surface
Economic	– Economically feasible based on depth of the Project's iron ore deposits	– Would not produce the throughput required to make the Project financially viable
Social	– Both open pit and underground mining operations generate social effects (e.g., sensory disturbance, land use) and benefits (i.e., jobs, taxes, procurement)	– Both open pit and underground mining operations generate social effects (e.g., sensory disturbance, land use) and benefits (i.e., jobs, taxes, procurement)
Results	**Selected as Preferred Alternative Method**	**Alternative Method Not Selected**

Legend	less preferred	neutral	more preferred

3.3.3.2 Open Pit Design

The proposed Rose Pit is located southwest of Pike Lake and west of the planned processing facilities. In the Project Registration, the PFS pit design was presented (Figure 3-5). The PFS design includes a 70 m buffer zone around Pike Lake, which was included as a safety measure, as it was assumed that extending the pit closer to the lake could result in seepage volumes into the pit that could not be managed during Operations. This assumption was challenged afterwards for two reasons:

- Installing the dike farther north was shown to be feasible to minimize seepage into the pit and would ensure pit wall stability.
- The bullnose shape of the northern pit wall (Figure 3-5) was identified to be a geotechnical risk with potential safety impacts to people, equipment, and infrastructure.

A new pit design, referred to as the EIS pit design, was proposed to remove the bullnose shape of the northern pit wall and push the northern pit wall closer to the Pike Lake dike (Figure 3-5). The EIS pit design was proposed to reduce the geotechnical risk associated with the bullnose, while increasing the ore quantity potentially available for mining. The PFS and EIS pit designs are shown in Figure 3-5.

The EIS pit design would result in the same amount of total mine material generated for the Project, but would increase the amount of ore and overburden, while decreasing the amount of mine rock generated. Thus, less mine rock would need to be managed and stored at the mine rock stockpile. This material comparison is presented in Table 3-11.

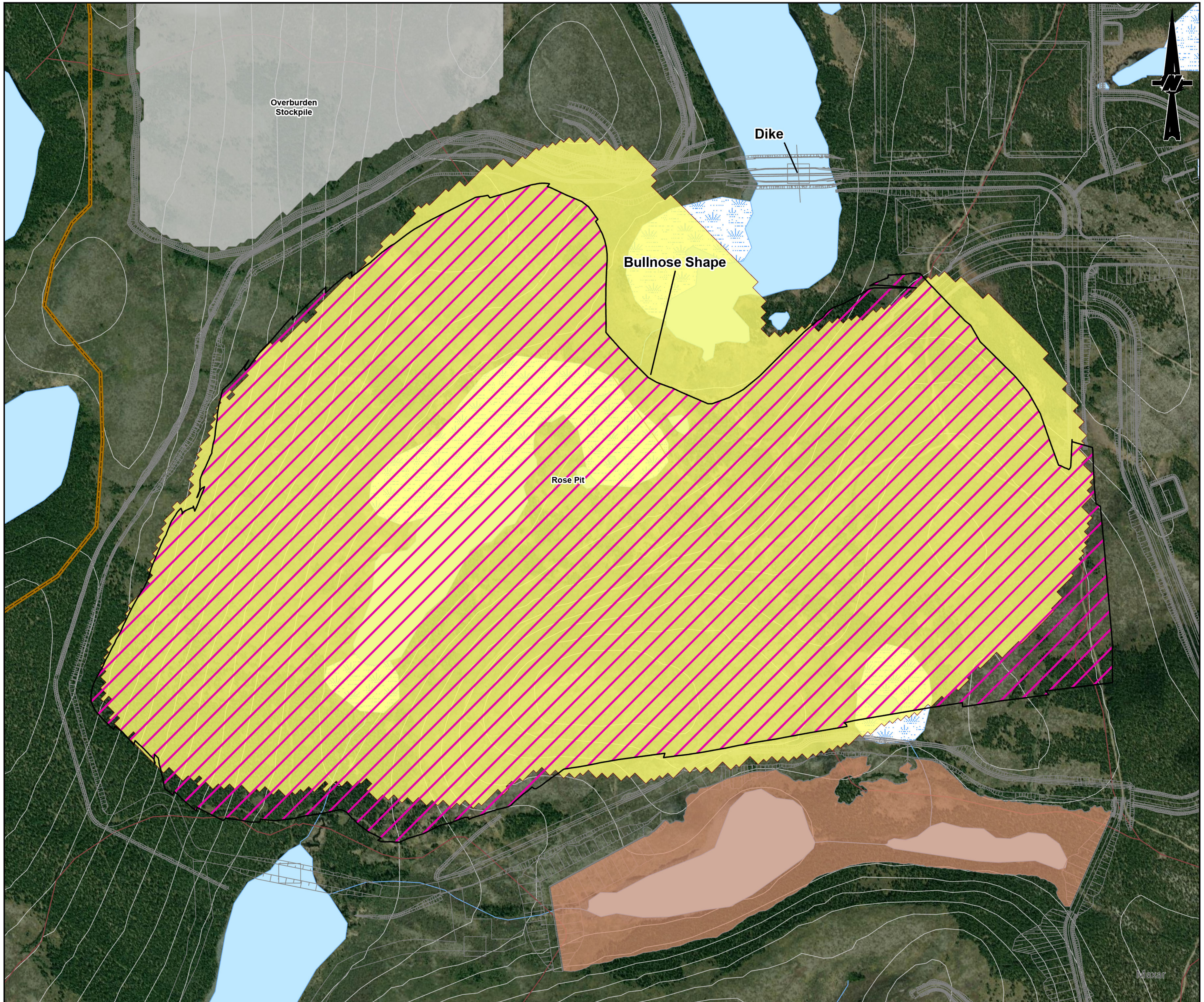
Table 3-11: Summary of Change in Mined Material between Open Pit Design Alternative Methods

Material	PFS Design	EIS Pit Design
Total material (Mt)	1,757	+0%
Overburden (Mt)	112	+4.5%
Waste rock (Mt)	1,002	-6.5%
Ore (Mt)	643	+5.3%
Total iron (%)	28.4	28.7
Strip ratio	1.73	1.56

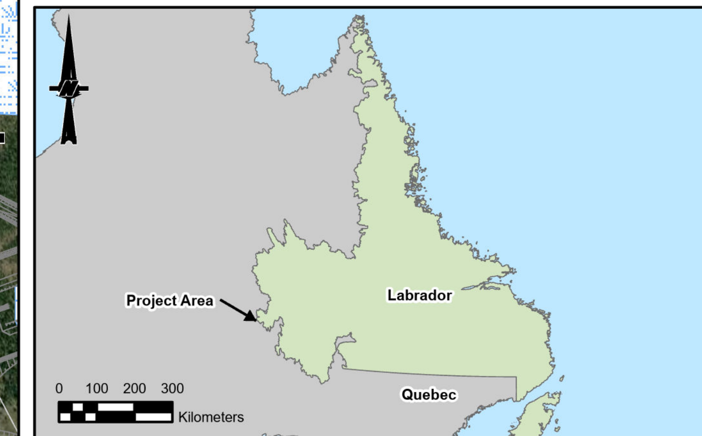
Notes:

Mt = metric tonne; % = percent; PFS = pre-feasibility study; EIS = environmental impact statement; + = plus; - = minus.

While both designs are financially feasible, the EIS pit design is more technically sound because it reduces the geotechnical risk of the bullnose. Although the spatial footprint of the EIS pit design is larger than the PFS pit design, less mine rock will be generated from the EIS pit design. Furthermore, both alternative methods will result in changes to the southern extent of Pike Lake and the draining of associated wetlands. While the EIS pit design will result in an additional surface area of 63,000 m^2 overlapping with Pike Lake compared to the PFS pit design, the impacted area of Pike Lake (i.e., portion of Pike Lake South that would be dewatered following installation of the Pike Lake dike) is not expected to change with implementation of the EIS pit design.



KEY MAP



SCALE 1:20,000,000

Legend

PROJECT DATA

- Proposed Project Infrastructure
- Proposed Sedimentation Pond
- Open Pit Design Alternative - Pre-Feasibility Study Pit Design
- Open Pit Design Alternative - Environmental Impact Statement Pit Design

BASEMAP INFORMATION

- Existing Road
- Contour
- Bog/Wetland
- Waterbody

0 0.07 0.15 0.3

1:10,000 KILOMETRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

CLIENT

CHAMPION IRON MINES LTD.

PROJECT

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

TITLE

ALTERNATIVE METHODS FOR OPEN PIT DESIGN

CONSULTANT

Kami

YYYY-MM-DD	2025-06-20
DESIGNED	SR
PREPARED	GM
REVIEWED	--
APPROVED	--

PROJECT NO.	CONTROL	REV.	FIGURE
CA0038713.5261	0015	1	3-5

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

The alternative methods for the Rose Pit design were screened against the evaluation criteria provided in Table 3-2. The results of the alternatives assessment are provided in Table 3-12. The EIS pit design was selected as the preferred alternative method based on its technical feasibility and economic improvements.

Table 3-12: Summary of the Alternatives Assessment for Open Pit Design

Criteria	Alternative Methods	
	Alternative 1: PFS Pit Design	Alternative 2: EIS Pit Design
Environmental	— Smaller surface disturbance footprint, but expected to have relatively similar impacts on Pike Lake (i.e., portion of Pike Lake South that would be dewatered following installation of the Pike Lake dike will be the same as Alternative 2) — Less overburden but more mine rock will be generated	— A larger surface disturbance footprint, however, is expected to have relatively similar impacts on Pike Lake (i.e., portion of Pike Lake South that would be dewatered following installation of the Pike Lake dike will be the same as Alternative 1) — More overburden but less mine rock will be generated
Technical	— Design includes geotechnical risk with bullnose design along the northern pit wall	— Geotechnical improvements address stability concerns along the northern pit wall
Economic	— Smaller quantity of ore available for mining and processing	— Increase in ore available for mining will improve Project economics
Social	— Larger mine rock stockpile but smaller overburden stockpile. Size of mine waste stockpiles may raise community concerns about long-term land use and visual impacts	— Larger overburden stockpile but smaller mine rock stockpile. Size of mine waste stockpiles may raise community concerns about long-term land use and visual impacts
Results	**Alternative Method Not Selected**	**Selected as Preferred Alternative Method**

Legend	less preferred	neutral	more preferred

Notes:

PFS = pre-feasibility study; EIS = environmental impact statement.

3.3.4 Process Plant Size and Type

The process plant design for the Project has been optimized to balance land use efficiency with economic feasibility. The layout was optimized to minimize its footprint while maintaining efficient material flow, reducing infrastructure costs, and maximizing operational efficiency. Similar to the previous Alderon EIS, the plant will be strategically located across the Waldorf River bridge, to the east, to minimize haul distances from the Rose Pit, while reducing heat loss in the concentrate during winter months by shortening the conveyor distance to loadout.

Two alternative methods for process plant type were considered for the Project, as depicted in Figure 2-13 (Chapter 2, Project Description):

- **Alternative 1**–Plant with process flow proposed in the Alderon EIS based on the test work completed by Alderon for the 2018 Updated Feasibility Study Technical Report for the Kami Project (Alderon 2018).
- **Alternative 2**–Plant with process flow proposed by Champion (2024b) based on additional work completed since its acquisition of the Kami Project.

Champion completed additional test work through the 2024 PFS to refine and optimize the processing flowsheet (Champion 2024b). The 2024 PFS built upon historical test work completed by Alderon which served to optimize the process flow (Champion 2024b). However, the updated Champion design still allows for the production of DRI ore concentrate (i.e., high-grade, low-impurity iron ore) compared to lower-grade iron ore concentration for the Alderon design.

Champion's revised process flow incorporates modifications to the gravity and magnetic separation circuits to improve silica rejection and maximize iron recovery in the ore concentrate. Flotation circuits were added to both the gravity and magnetic circuits to reduce the silica grade of the final concentrate. Simulations and mass balance modelling were used to validate recovery models and optimize the overall plant design (Champion 2024b). Additionally, the improved recovery model in the Champion plant design also reduces the estimate volume of tailings to be produced. The process plant capacity and throughput (i.e., 8.577 Mt/yr) was determined to ensure optimal recovery rates could be achieved; pre-feasibility and feasibility studies completed for the Project to date have determined that no alternative plant sizes (i.e., capacities) would achieve the same balance of minimal land disturbance, economic viability, and operational efficiency.

The alternative methods for the process plant type were screened against the evaluation criteria provided in Table 3-2. The results of the alternatives assessment are provided in Table 3-13. The Champion 2024 PFS design was selected as the preferred alternative method due to its environmental efficiency, improved recovery and expected production capacity.

Table 3-13: Summary of the Alternatives Assessment for the Process Plant Type

Criteria	Alternative Methods	
	Alternative 1: Alderon Feasibility Study Design (2018)	Alternative 2: Champion PFS Design (2024)
Environmental	— Features water recycling to reduce water-taking requirements — Results in greater volume of tailings generated	— Features enhanced water circulation to further minimize water-taking requirements — Results in lesser volume of tailings generated
Technical	— Process flow does not use flotation separation circuits to further reduce silica in the ore concentrate — Concentrate grade% iron = 65.2% — Concentrate grade% silica = 4.3%	— Both gravity and magnetic separation circuits include flotation circuits to further reduce silica in the ore concentrate — Concentrate grade% iron = 67.6% — Concentrate grade% silica = 2.1%
Economic	— Annual production of 7.844 Mt/yr — Lower cost to produce lower-grade (i.e., 65.2%) iron concentrate	— Annual production of 8.577 Mt/yr — Higher cost to produce higher-grade (i.e., 67.6%) iron concentrate; however, production of DRI ore concentrate (i.e., high grade, low impurity) is expected to achieve premium market rate
Social	— Expected to be similar	— Expected to be similar
Results	**Alternative Method Not Selected**	**Selected as Preferred Alternative Method**

Legend			
Legend	less preferred	neutral	more preferred

Notes:

PFS = pre-feasibility study; EIS = environmental impact statement; % = percent; Mt/yr = metric tonne per year; DRI = direct reduction iron.

3.3.5 Overburden, Mine Rock, and Tailings Management

A multiple accounts analysis (MAA) was completed following the method outlined by Environment and Climate Change Canada (Environment and Climate Change Canada 2016) to identify the preferred location of the overburden stockpile, mine rock stockpile, and TMF. The following diagram illustrates the stepwise assessment process that was followed for the MAA, as required by the MAA Guidelines.

Details on each of the steps and the results of the MAA are presented in TSD III: Mine Waste Multiple Accounts Analysis Report. This section summarizes and integrates the results of the MAA using the comparative analysis approach presented in Section 3.2.3.

3.3.5.1 Location of Overburden Stockpile

Seven candidate locations were initially identified for the overburden stockpile via Step 1 of the MAA (TSD III). Following the pre-screening step of the MAA, three of the seven candidate locations were identified for characterization and assessment within the MAA framework (i.e., Steps 3 to 6). The three candidate locations are shown in Figure 3-6, and include the following:

- **Alternative 1**– South of Rose Pit (Option B)
- **Alternative 2**– West of Pike Lake (Option D)
- **Alternative 3**– Northeast of Rose Pit (Option G)

The overburden stockpile will require the development of access roads to the facility and clearing of the footprint of the stockpile. The overburden will require management of runoff from its watershed using linear water management infrastructure. Overburden material will be placed within the stockpile during operations, and in the later stages of mine life the stored materials will be used in progressive reclamation. Any portion of the stockpile which remains above the existing grade will be revegetated and once the observed water quality in the former stockpile is suitable for discharge, natural drainage patterns will be re-established.

Alternative 1 is located approximately 4.2 km south of Rose Pit with a total footprint of 111 ha. Alternative 1 involves the placement of materials in the northwest basin of Molar Lake. The watershed area for Alternative 1 is estimated at 110 ha. This alternative uniquely requires dewatering of Molar Lake and the construction of water management infrastructure to hydraulically separate the northwest basin from the remainder of Molar Lake. Additionally, prior to cover and vegetation at closure, the Molar Lake basin will be allowed to reflood.

Alternative 2 is located west of Pike Lake, approximately 1.5 km from Rose Pit with a total footprint of 158 ha. Alternative 3 is located approximately 1.7 km northeast of Rose Pit with a total footprint of 172 ha. The watershed area for each of Alternatives 2 and 3 comprises 125 ha.

The alternative methods for the location of the overburden stockpile were screened against the evaluation criteria provided in Table 3-2. The results of the alternatives assessment are provided in Table 3-14 and in accordance with the assessment presented in the MAA (TSD III). Alternative 2 was selected as the preferred alternative method.

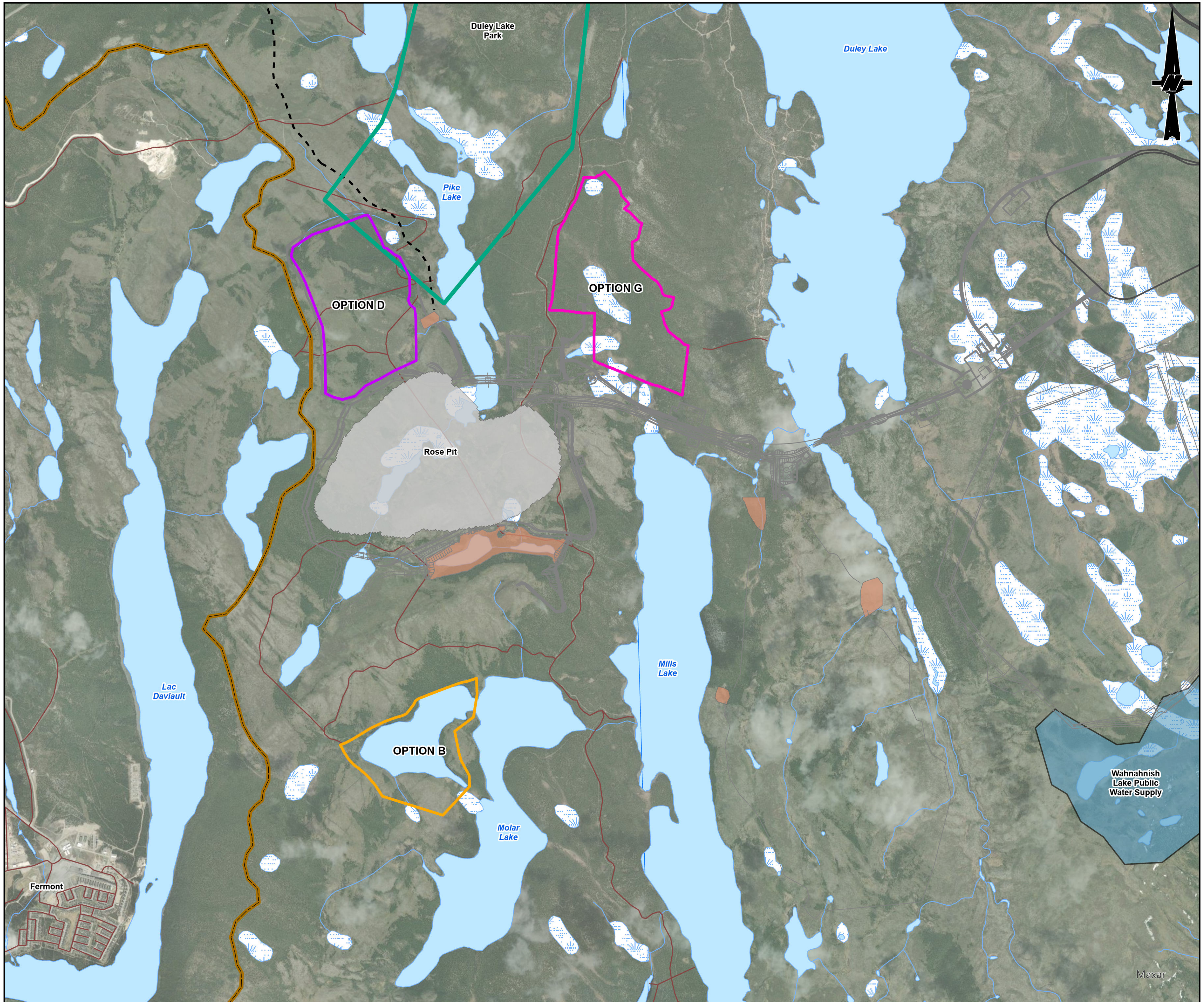
Table 3-14: Summary of the Alternatives Assessment for the Location of the Overburden Stockpile

Criteria	Alternative Methods		
	Alternative 1: South of Rose Pit (Option B)	Alternative 2: West of Pike Lake (Option D)	Alternative 3: Northeast of Rose Pit (Option G)
Environmental	— Smallest footprint (111 ha) with impact to both terrestrial and aquatic habitat — Higher air emissions due to distance from Rose Pit (4.2 km)	— Moderate footprint (158 ha) with impact to both terrestrial and aquatic habitat — Lowest air emissions due to closer distance from Rose Pit (1.5 km)	— Largest footprint (172 ha) with impact only on terrestrial habitat — Lowest air emissions due to closer distance from Rose Pit (1.7 km); slightly higher than Alternative 2.
Technical	— Smallest watershed area (110 ha) and associated smaller volume of runoff to be controlled with water management infrastructure	— Larger watershed area (125 ha) and associated larger volume of runoff to be controlled with water management infrastructure	— Larger watershed area (125 ha) and associated larger volume of runoff to be controlled with water management infrastructure
Economic	— Higher CAPEX due to need to dewater and construct hydraulic structure to separate northwest basin of Molar Lake — Higher OPEX due to transportation distance from Rose Pit (4.2 km)	— Relative to Alternative 1, lower CAPEX to establish the stockpile — Relative to Alternative 1, lower OPEX due to transportation distance from Rose Pit (1.5 km). Relative to Alternative 2, slightly lower OPEX due to closer transportation distance to Rose Pit.	— Relative to Alternative 1, lower CAPEX to establish the stockpile — Relative to Alternative 1, lower OPEX due to transportation distance from Rose Pit (1.7 km)
Social	— Relative to Alternative 2, greater potential for impacts to community health (e.g., dust, noise) due to closer proximity to Fermont	— Relative to Alternatives 1 and 3, less potential for impacts to community health (e.g., dust, noise) due to greater distance to Fermont, Labrador City and Wabush	— Relative to Alternative 2, greater potential for impacts to community health (e.g., dust, noise) due to closer proximity to Labrador City and Wabush
Results	**Alternative Method Not Selected**	**Selected as Preferred Alternative Method**	**Alternative Method Not Selected**

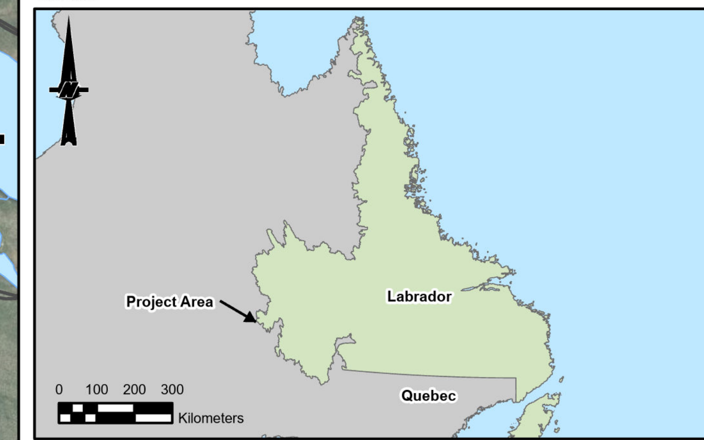
Legend	less preferred	neutral	more preferred

Notes:

CAPEX = capital expenditure; OPEX = operating expenditure.



KEY MAP



SCALE 1:20,000,000

Legend

- Proposed Project Infrastructure
- Potential Access Road
- Proposed Access Road and Railway Corridor
- Existing Railway
- Existing Road
- River/Stream
- Bog/Wetland
- Waterbody
- Public Water Supply
- Open Pit
- Duley Lake Park
- Proposed Sedimentation Pond
- Labrador/Quebec Boundary

Overburden Stockpile Alternative Locations

- Alternative 1: South of Rose Pit (Option B)
- Alternative 2: West of Pike Lake (Option D)
- Alternative 3: Northeast of Rose Pit (Option G)

0 0.38 0.75 1.5
1:40,000 KILOMETRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

CLIENT
CHAMPION IRON MINES LTD.

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

TITLE
ALTERNATIVE METHODS FOR OVERBURDEN STOCKPILE LOCATION

CONSULTANT
Kami

YYYY-MM-DD	2025-06-20
DESIGNED	SR
PREPARED	GM/MS
REVIEWED	AF
APPROVED	KB

PROJECT NO.	CONTROL	REV.	FIGURE
CA0038713.5261	0015	1	3-6

3.3.5.2 Location of Mine Rock Stockpile

Six candidate locations were initially identified for the mine rock stockpile (MRS) via Step 1 of the MAA (TSD III). Following the pre-screening step of the MAA, three of the six candidate locations were identified for characterization and assessment within the MAA framework (i.e., Steps 3 to 6). The three candidate locations for the MRS are shown in Figure 3-7 and include the following:

- **Alternative 1**–South of Rose Pit (Site 2)
- **Alternative 2**–Southeast of Rose Pit (Site 5)
- **Alternative 3**–Northeast of Rose Pit (Site 6)

The MRS will require the development of access roads to the facility and clearing of the footprint of the stockpile. During operations, mine rock will be placed within the stockpile and the MRS will store approximately 430 million cubic metres (Mm^3) of mine rock. The MRS will require management of seepage and runoff using collection ponds and linear water management infrastructure. At closure, the MRS will be covered and vegetated, and once the observed water quality in the stockpile is suitable for discharge, natural drainage patterns will be re-established.

Alternative 1 is located south of Rose Pit within Molar Lake, 8.5 km by road and conveyor from the process plant, and has a total footprint of 490 ha, the smallest of the three alternatives. Contact water and seepage management requires 11.5 km of collection ditches, three collection ponds, and 8.5 km of pipeline. Alternative 1 is located 2.5 km from Fermont and would result in a maximum elevation of 740 metres above sea level (masl). This alternative requires dewatering and removal of Molar Lake and may require the construction of additional water management infrastructure to hydraulically separate Molar Lake from nearby Mills Lake. Prior to cover and vegetation at closure, the Molar Lake basin will be allowed to reflood.

Alternative 2 is located southeast of Rose Pit, 4.1 km by road and conveyor from the process plant, and has a total footprint of 530 ha. Contact water and seepage management requires 11.1 km of collection ditches, three collection ponds, and 7.4 km of pipeline. Alternative 2 is located 5.3 km from Fermont and would result in a maximum elevation of 790 masl. Alternative 2 represents the MRS location that was previously selected as the preferred option in the Alderon EIS (2012) due to its distance from the community of Fermont.

Alternative 3 is located northeast of Rose Pit, 0.65 km from Fermont, and has a total footprint of 580 ha. Contact water and seepage management requires 11.6 km of collection ditches, three collection ponds, and 8.6 km of pipeline. Mine rock will be transported from the open pit to the stockpile via 1.7 km of road and conveyor. Alternative 3 would result in a maximum elevation of 780 masl.

The alternative methods for the location of the mine rock stockpile were screened against the evaluation criteria provided in Table 3-2. The results of the alternatives assessment are provided in Table 3-15 and in accordance with the assessment presented in the MAA (TSD III). Alternative 2 was selected as the preferred alternative method as it performed well in the evaluation (i.e., it does not represent the worst option for any criteria) and due to its distance from Fermont.

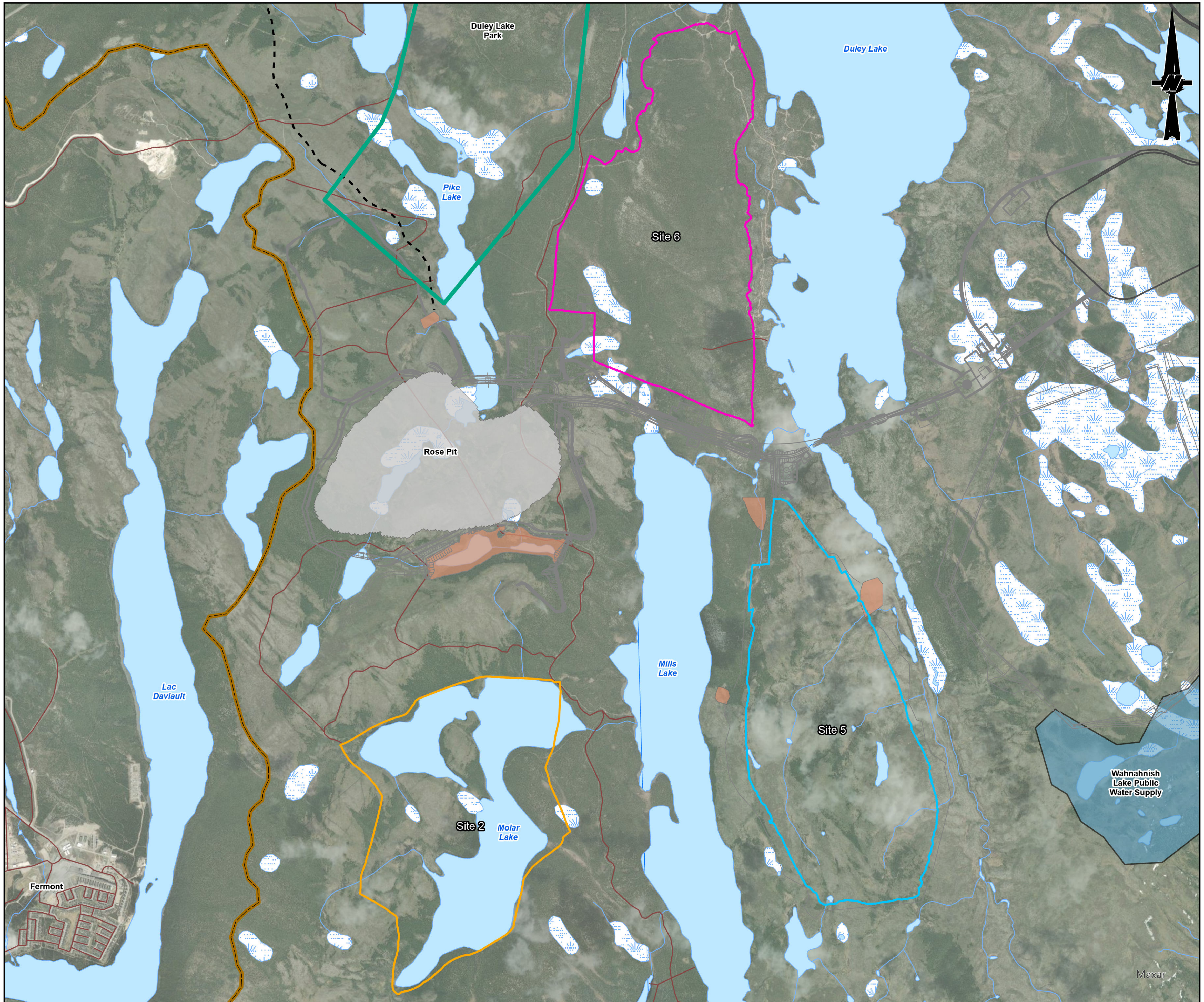
Table 3-15: Summary of the Alternatives Assessment for the Location of the Mine Rock Stockpile

Criteria	Alternative Methods		
	Alternative 1: South of Rose Pit (Site 2)	**Alternative 2: Southeast of Rose Pit (Site 5)**	**Alternative 3: Northeast of Rose Pit (Site 6)**
Environmental	— Smallest footprint (490 ha) with higher impact to both terrestrial and aquatic habitat	— Moderate footprint (530 ha) with impact to both terrestrial and aquatic habitat	— Largest footprint (580 ha) with impact only on terrestrial habitat
Technical	— Water management infrastructure includes 11.5 km of collection ditches and 8.5 km of pipeline	— Water management infrastructure includes 11.1 km of collection ditches and 7.4 km of pipeline	— Water management infrastructure includes 11.6 km of collection ditches and 8.6 km of pipeline
Economic	— Highest CAPEX required to establish the MRS in Molar Lake — Higher OPEX due to transportation distance from Rose Pit (4.2 km)	— Moderate CAPEX to establish the MRS — Moderate OPEX due to transportation distance from Rose Pit (4.1 km)	— Lowest CAPEX to establish the MRS — Lowest OPEX due to transportation distance from Rose Pit (1.7 km)
Social	— Moderately close to Fermont (2.53 km), resulting in potential nuisance from dust and noise — Least potential visual impact due to elevation of 740 masl	— Farthest from Fermont (5.34 km), resulting in less potential nuisance from dust and noise — Highest potential for visual impact due to elevation of 790 masl	— Closest to Fermont (0.65 km), resulting in greatest potential nuisance from dust and noise — High potential for visual impact due to elevation of 780 masl
Results	**Alternative Not Selected**	**Selected as Preferred Alternative**	**Alternative Not Selected**

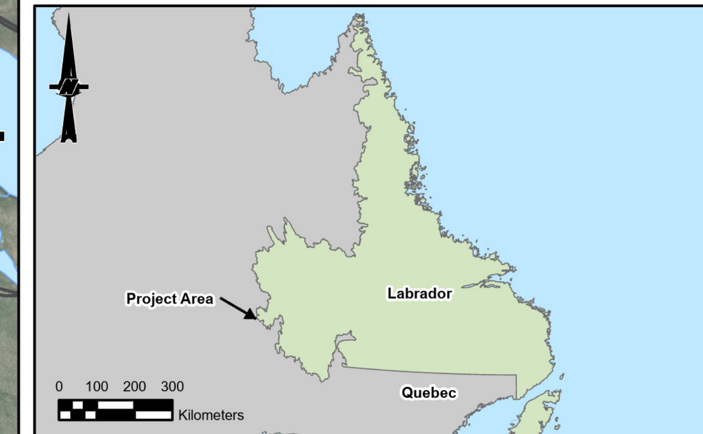
Legend			
Legend	less preferred	neutral	more preferred

Notes:

CAPEX = capital expenditure; OPEX = operating expenditure; masl = metres above sea level.



KEY MAP



SCALE 1:20,000,000

Legend

- Proposed Project Infrastructure
- Potential Access Road
- Proposed Access Road and Railway Corridor
- Existing Road
- River/Stream
- Bog/Wetland
- Waterbody
- Public Water Supply
- Open Pit
- Duley Lake Park
- Proposed Sedimentation Pond
- Labrador/Quebec Boundary

Mine Rock Stockpile Alternative Locations

- Alternative 1 - Site 2
- Alternative 2 - Site 5
- Alternative 3 - Site 6

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

CLIENT

CHAMPION IRON MINES LTD.

PROJECT

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

TITLE

ALTERNATIVE METHODS FOR MINE ROCK STOCKPILE LOCATION

CONSULTANT

Kami

YYYY-MM-DD	2025-06-20
DESIGNED	SR
PREPARED	GM/MS
REVIEWED	AF
APPROVED	KB

PROJECT NO.	CONTROL	REV.	FIGURE
CA0038713.5261	0015	1	3-7

3.3.5.3 Location of Tailings Management Facility

Eleven candidate locations were initially identified for the TMF via Step 1 of the MAA (TSD III). Following the pre-screening step of the MAA, four of the eleven candidate locations were identified for characterization and assessment within the MAA framework (i.e., Steps 3 to 6). The four candidate locations for the TMF are shown in Figure 3-8 and include the following:

- Alternative 1–Alternative C8
- Alternative 2–Alternative C10'
- Alternative 3–Alternative C12
- Alternative 4–Alternative C13

The initial TMF will require the development of access roads to the facility, clearing of the footprint of the dam, and dam construction. Tailings will be contained using natural topographic features and through the construction of a number of dam segments which will be raised throughout the Project lifecycle to increase the available storage volume. The TMF will require management of runoff from its watershed using linear water management infrastructure and each alternative has been designed for the deposition of tailings using a single pipeline. At closure, the TMF will be graded to promote drainage, covered with overburden and revegetated. Once the observed water quality in the closed facility is suitable for discharge, natural drainage patterns will be re-established.

Alternative 1 is located in the southeast of the site 7.6 km by road from the process plant and has been designed to utilize local topography to reduce the volume of fill material for each embankment raise. The final dam arrangement has a total embankment length of 7.8 km with an average embankment raise height of 15 m. The tailings storage footprint is 1,419 ha, the largest of the four alternatives. Alternative 1 requires water management infrastructure comprising of collection and diversion ditches with a total length of 19 km.

Alternative 2 is located in the south of the site 2.1 km by road from the process plant and, similar to Alternative 1, has been designed to utilize the topography in the southern extent of the TMF to reduce the volume of fill material for each embankment raise. The final dam arrangement has a footprint of 910 ha, a total embankment length of 8.2 km, and an average embankment raise of 25 m. The road distance from the process plant to the facility is 2.1 km. Alternative 2 requires water management infrastructure comprising of collection and diversion ditches with a total length of 8.1 km.

Alternative 3 is located in the south of the site 9.1 km by road from the process plant. The final dam arrangement has a footprint of 730 ha, a total embankment length of 10.3 km, and an average embankment raise of 26 m. Alternative 3 requires water management infrastructure comprising of collection and diversion ditches with a total length of 9 km.

Alternative 4 is located southeast of the plant site, near the western shore of Upper Loon Lake, 6.3 km by road from the process plant. The dam configuration results in a high volume of fill material required for each embankment raise. The final dam arrangement has a footprint of 710 ha, a total embankment length of 9.2 km, and an average embankment raise height of 29 m. Alternative 4 requires water management infrastructure comprising of collection and diversion ditches with a total length of 10 km.

Alternative 2 represents the TMF location that was previously selected as the preferred option in the Alderon EIS (2012) due to its proximity to the process plant and its embankment layout. Alternatives 1, 3, and 4 offer different configurations that vary in terms of starter dam dimensions (including length and footprint size), embankment raise height, and distances from the process plant. Further, some technical factors relating to the design of the dam have the potential to increase the risk or consequence of failure. This includes the embankment raise height and the total embankment length: dams that have higher embankment raises can have risk related to stability, and longer dams can have higher consequences of failure.

The alternative methods for the location of the tailings management facility were screened against the evaluation criteria provided in Table 3-2 and in accordance with the assessment presented in the MAA (TSD III). The results of the alternatives assessment are provided in Table 3-16. Alternative 2 was selected as the preferred alternative because it is the only alternative location that avoids the Wahnahnish Lake Public Water Supply Area.

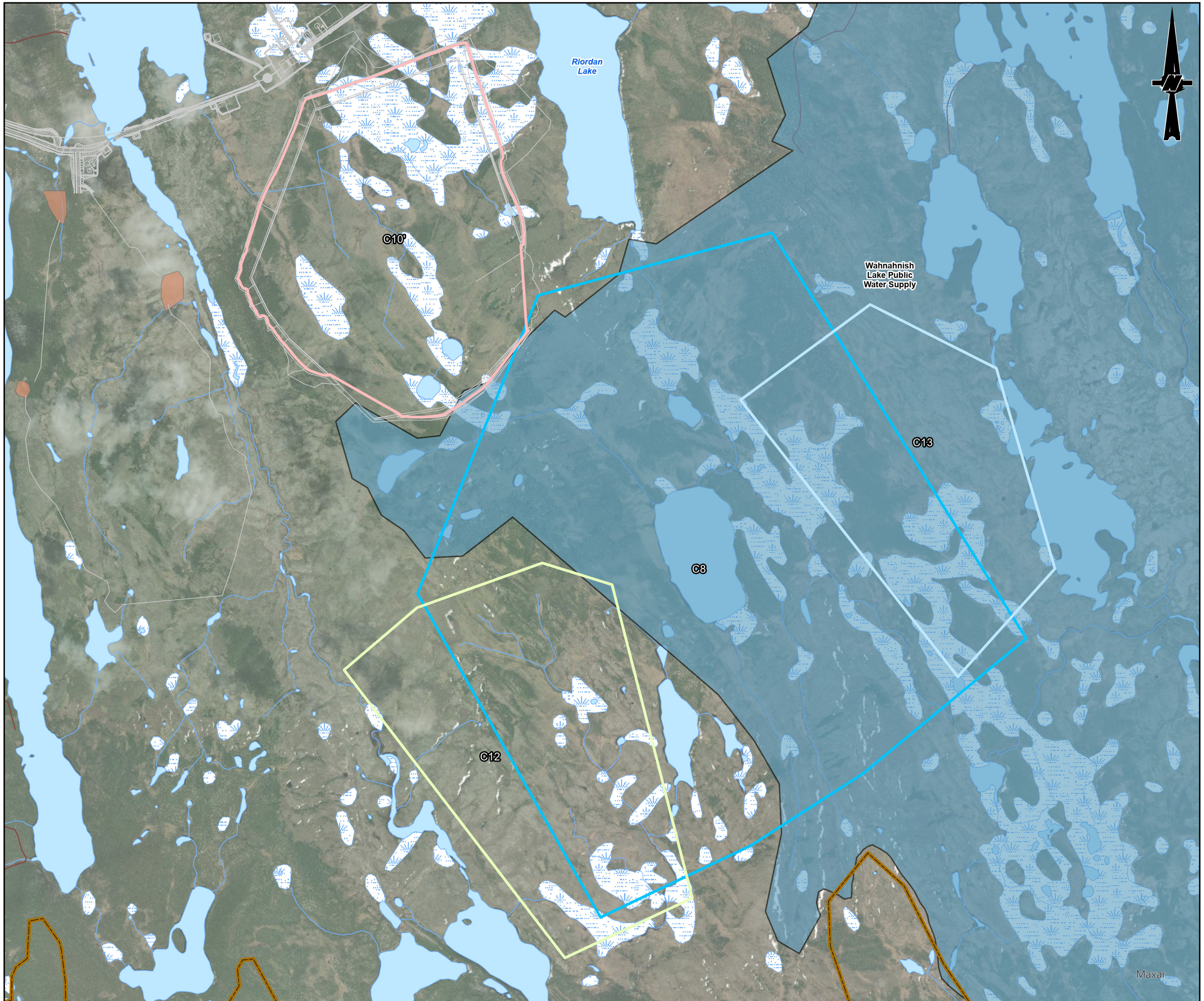
Table 3-16: Summary of the Alternatives Assessment of the Location of the Tailings Management Facility

Criteria	Alternative Methods			
	Alternative 1: Alternative C8	Alternative 2: Alternative C10	Alternative 3: Alternative C12	Alternative 4: Alternative C13
Environmental	— Largest footprint (1,419 ha), and requires longest runoff collection and diversion ditches — 7.6 km length of access road from process plant, with the least embankment fill volume requirements that overall result in less atmospheric emissions — Greatest impacts to aquatic habitat — Greatest potential impact to the Wahnahnish Lake Public Water Supply Area (1,934 ha)	— Moderate footprint (910 ha), and requires fewer runoff control requirements — 2.1 km length of access road from process plant, with less embankment fill volume requirements that overall result in less atmospheric emissions — Least impacts to terrestrial habitat — Avoids the Wahnahnish Lake Public Water Supply Area	— Moderate footprint (730 ha), and requires moderate runoff control requirements — 9.1 km length of access road from process plant, with greatest embankment fill volume requirements that overall result in greater atmospheric emissions — Least impacts to aquatic habitat — Minimal potential impact to the Wahnahnish Lake Public Water Supply Area (2 ha)	— Smallest footprint (710 ha), but requires moderate runoff control requirements — 6.3 km length of access road from process plant, with greater embankment fill volume requirements that overall result in greater atmospheric emissions — Greatest impacts to terrestrial habitat — Moderate potential impact to the Wahnahnish Lake Public Water Supply Area (28 ha)
Technical	— 7.8 km total embankment length with 15 m average embankment height — Greatest watershed area (1,530 ha) and requires most complex water management infrastructure (19 km in total length)	— 8.2 km total embankment length with 25 m average embankment height — Moderate watershed area (1,030 ha) and requires least complex water management infrastructure (8.1 km in total length)	— 10.3 km total embankment length with 26 m average embankment height — Small watershed area (740 ha) and requires moderately complex water management infrastructure (9 km in total length)	— 9.2 km total embankment length with 29 m average embankment height — Smallest watershed area (640 ha) and requires moderately complex water management infrastructure (10 km in total length)
Economic	— Lowest CAPEX due relative size of starter dam; lowest OPEX for embankment raises and water management, and greatest closure costs	— Moderate CAPEX due to relative size of starter dam; moderate OPEX for embankment raises and water management and moderate closure costs	— Moderate CAPEX due to relative size of starter dam; moderate OPEX for embankment raises and water management and lower closure costs	— Moderate CAPEX due to relative size of starter dam; greatest OPEX for embankment raises and water management and lowest closure costs
Social	— Moderate number of cabins (12) located downstream of facility	— Moderate number of cabins (11) located downstream of facility	— Fewest number of cabins (2) located downstream of facility	— Greatest number of cabins (28) located downstream of facility
Results	**Alternative Method Not Selected**	**Selected as Preferred Alternative Method**	**Alternative Method Not Selected**	**Alternative Method Not Selected**

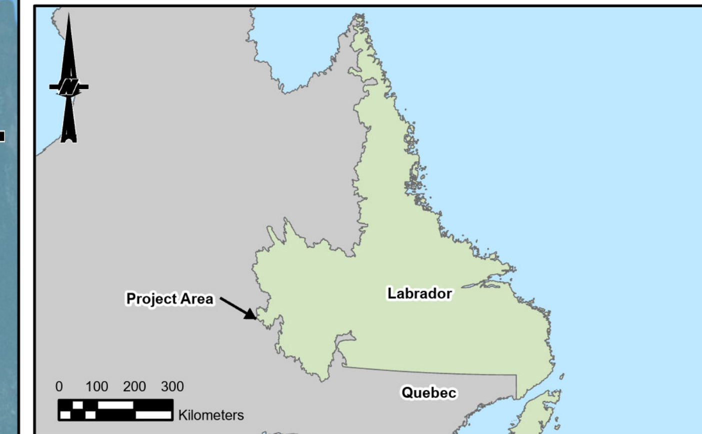
Legend			
	less preferred	neutral	more preferred

Notes:

CAPEX = capital expenditure; OPEX = operating expenditure.



KEY MAP



SCALE 1:20,000,000

Legend

- Proposed Project Infrastructure (Linear)
- Existing Road
- River/Stream
- Bog/Wetland
- Waterbody
- Public Water Supply
- Proposed Sedimentation Pond
- Labrador/Quebec Boundary

Tailings Management Facility Alternative Location

- Alternative 1 - Alternative C8
- Alternative 2 - Alternative C10'
- Alternative 3 - Alternative C12
- Alternative 4 - Alternative C13

0 0.38 0.75 1.5
1:40,000 KILOMETRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

CLIENT
CHAMPION IRON MINES LTD.

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

TITLE
ALTERNATIVE METHODS FOR TAILINGS MANAGEMENT FACILITY LOCATIONS

CONSULTANT
Kami

YYYY-MM-DD	2025-06-24
DESIGNED	SR
PREPARED	GM/MS
REVIEWED	AF
APPROVED	KB

PROJECT NO.	CONTROL	REV.	FIGURE
CA0038713.5261	0015	0	3-8

3.3.6 Ore and Mine Rock Hauling Methods

To determine the preferred alternative for hauling ore and mine rock from Rose Pit, ten different options were initially proposed. The ten options are detailed as follows:

- conventional truck hauling with either crewed trucks (Option 1) or autonomous trucks (Option 2)
- use of an in-pit crushing and conveyance (IPCC) system for mine rock, with hauling of ore to out-of-pit crushing and conveyance using crewed trucks (Option 3) or autonomous trucks (Option 4)
- use of an IPCC for ore and mine rock, with mining operations supported by crewed trucks (Option 5) or autonomous trucks (Option 6) as necessary
- use of an out-of-pit crushing and conveyance for mine rock, with hauling of ore using crewed trucks (Option 7) or autonomous trucks (Option 8)
- use of a trolley assist system on ramps supported by crewed trucks (Option 9) or autonomous trucks (Option 10)

Champion undertook a trade-off study to identify a short list of options that were financially and technically feasible and reduced GHG emissions for environmental benefits. It was determined that using autonomous trucks for conventional hauling (Option 2) offers greater economic and environment benefits when compared to conventional hauling with crewed trucks (Option 1). Combining autonomous hauling with an IPCC (Options 4 and 6) only resulted in marginal reductions in GHG emissions and increases in cost. Using an out-of-pit crushing and conveying system (Options 7 and 8) did not yield satisfactory economic results and minimal environmental benefit. Use of a trolley assist system (Option 9 and 10) did not result in material cost savings and involved greater amounts of fuel and electricity consumption. IPCC has the greatest potential to reduce GHG emissions and is more energy effective compared to conventional hauling.

Based on the results of the trade-off study, the three identified options for the short list of alternatives are as follows:

- **Alternative 1**—Conventional truck hauling with autonomous trucks (Option 2).
- **Alternative 2**—Use of an IPCC system for mine rock, with hauling of ore using crewed trucks (Option 3).
- **Alternative 3**—Use of an IPCC system for both ore and mine rock, with mining operations supported by crewed trucks as necessary (Option 5).

Alternative 2 has the lowest economic cost relative to the other options due to the reduced workforce required. Furthermore, Alternative 1 would require increased operating costs to achieve net-zero GHG emissions in the hauling fleet by 2050, and Alternative 3 would incur the highest capital costs to achieve the same emissions target.

The technical considerations for Alternative 1 are considered to not have relative advantages and disadvantages compared to Alternative 2; however, there is limited technical application experience in cold climates for Alternative 2 (i.e., IPCC). Alternative 3 would require the implementation of a more complex IPCC system (i.e., two crushers with additional splits and transfer towers) to maintain separate mine rock and ore processing streams. The IPCC requires a secure feed to the process plant. During periods of downtime or in the case of variation in ore composition, the process plant feed may need to be compensated (e.g., by blending different ore types to stabilize the process). In the case of Alternatives 1 and 2, feed compensation could be achieved by hauling additional ore to the process plant; however, in the case of Alternative 3, the IPCC ore feed would need to be disrupted to compensate at the process plant, which increases the operational complexity.

The alternative methods for the hauling of ore and mine rock were screened against the evaluation criteria provided in Table 3-2. The results of the alternatives assessment are provided in Table 3-17. Alternative 2 was selected as the preferred alternative method. Alternatives 1 and 2 were close in terms of scoring and depend on technological advancement regarding hauling truck electrification capacity (Alternative 1) and crushing capacity under cold climate conditions (Alternative 2).

Table 3-17: Summary of the Alternatives Assessment for Ore and Mine Rock Hauling Methods

Criteria	Alternative Methods		
	Alternative 1: Conventional Hauling with Autonomous Trucks	Alternative 2: IPCC System for Mine Rock, with Hauling of Ore Using Crewed Trucks	Alternative 3: IPCC System for both Ore and Mine Rock, with Crewed Trucks Supporting Mining Operations
Environmental	— Highest energy consumption and GHG emissions compared to Alternatives 2 and 3	— Reduced fleet compared to Alternative 1, but greater energy consumption compared to Alternative 3	— Smaller fleet of trucks, resulting in small reduction in GHG emissions compared to Alternative 2
Technical	— No relative technical advantages or disadvantages relative to other alternatives	— Less complex IPCC system compared to Alternative 3 — Limited technical application experience in cold climate — Crusher capacity is maximized	— More complex IPCC system than Alternative 2, since it requires additional splits and transfer towers to separate ore from mine rock — Two crushers would be required to have enough availability — Limited capacity to compensate feed of ore to process plant
Economic	— Higher OPEX relative to other alternatives — Lower initial CAPEX — Increased OPEX and CAPEX to achieve net-zero GHG emissions by 2050	— Lowest cost relative to the other alternatives due to least workforce requirements	— Highest CAPEX required to achieve net-zero GHG emissions by 2050
Social	— Expected to have similar social effects and access to benefits	— Expected to have similar social effects and access to benefits	— Expected to have similar social effects and access to benefits
Results	**Alternative Method Not Selected**	**Selected as Preferred Alternative Method**	**Alternative Method Not Selected**

Legend	less preferred	neutral	more preferred

Notes:

IPCC = in-pit crushing and conveyance; GHG = greenhouse gas; OPEX = operating expenditure; CAPEX = capital expenditure.

3.3.7 Sources of Energy

The Project will require a source of energy through its lifespan. Initially, multiple power source options were considered, such as diesel, solar, wind and the construction of a new transmission line connecting to the existing NL Hydro grid. While solar and wind power offer the opportunity for renewable power supply for the Project, these methods would require the installation of generation and transmission facilities by the regulator, NL Hydro. In November 2024, NL Hydro announced the plans to initiate the Labrador West Transmission Study (Natural Resources Canada 2024), which will explore the feasibility of an expansion of the transmission system into Labrador West from the Churchill Falls Generating Station. The power requirements for the Project are anticipated to exceed the current technological transmission capacities of either solar or wind facilities. Additionally, considering NL Hydro has an existing investment in the Churchill Falls Generating Station, it is understood that the installation of new solar and wind facilities is not economically feasible to NL Hydro (i.e., the party ultimately responsible for the transmission service).

Therefore, the following two alternatives for sources of energy to power the Project were assessed:

— **Alternative 1**–Using diesel generators for power generation.

— **Alternative 2**–Using transmission lines to connect to the existing NL Hydro grid, and transformers to convert to proper kV and distribute to various facilities on site.

Using diesel to power the site would be less economically and technically feasible due to the volume of diesel required to power the Project through its lifespan. Additionally, diesel power generation would not allow for the implementation of other preferred alternatives for the Project, including the use of an IPCC system for hauling and depositing mine rock due to IPCC machinery power source requirements. Diesel would also increase GHG emissions and oppose the Project's need to support low-carbon steel production and support Canada's transition to net-zero by 2025. The transmission line presents a valuable opportunity for the Project considering it will assess economic and infrastructure development opportunities in Labrador West, for which the Project represents an economic opportunity for the province.

The two alternative methods for sources of energy were screened against the assessment evaluation criteria provided in Table 3-2. The results of alternatives assessment are provided in Table 3-18. Alternative 2 was selected as the preferred alternative method.

Table 3-18: Summary of Alternative Assessment for Sources of Energy

Criteria	Alternative Methods	
	Alternative 1: Diesel Generators	**Alternative 2:** Transmission Line from NL Hydro Grid
Environmental	— Increased air and GHG emissions — Higher likelihood for an accident and malfunction due to potential for spills	— Less air and GHG emissions — Land disturbance associated with installation of the line
Technical	— Less feasible to power a mine site of this size over the lifespan of the Project — Inability to implement other preferred alternative methods (e.g., IPCC)	— More technically feasible for a Project of this scale
Economic	— Overall higher costs	— Overall lower costs (higher costs initially to build the transmission line infrastructure, but lower costs over the lifespan of the Project)
Social	— Higher potential for effects on community health and well-being due to increased air and GHG emissions — Greater potential for concerns from local community related to effects on community health and well-being	— Lower potential for effects on community health and well-being due to increased air and GHG emissions — Lower potential for concerns from local community related to effects on community health and well-being
Results	**Alternative Method Not Selected**	**Selected as Preferred Alternative Method**

Legend	less preferred	neutral	more preferred

Notes:

NL = Newfoundland and Labrador; GHG = greenhouse gas; IPCC = in-pit crushing and conveyance.

3.3.8 Effluent Discharges and Water Sources

3.3.8.1 Number and Location of Treated Effluent Discharges

Sources of effluent include treated effluent from the water treatment plant (WTP), treated sewage (which is sourced primarily from the worker accommodations and to a lesser extent the mine service area, concentrator and crusher building) and surface runoff (i.e., including contact and non-contact water). Considering the unique treatment needs of industrial effluent compared to treated sewage, treated effluent from the WTP and treated sewage require separate discharge strategies and are presented in Section 3.3.8.3 and Section 3.3.8.4, respectively.

Generally, contact surface runoff will be managed via engineered controls, pumps, and a pipeline system, which will redirect runoff to Project areas (including contact water from the TMF). This section discusses alternative methods for treated industrial effluent discharges. Alternative methods for non-contact water discharges are discussed in Section 3.3.8.2.

The Project Registration presented a treated effluent management strategy which was divided into two distinct management areas within the Project site mainly separated by the Waldorf bridge: infrastructure west of Duley Lake and infrastructure located east of Duley Lake. This strategy resulted in two points of effluent discharge after treatment: Pike Lake for the western infrastructure and Duley Lake for the eastern infrastructure.

This water management strategy was proposed following the completion of updated hydrogeological modelling that incorporated calibrated hydraulic conductivity values. These calibrated values were higher than the selected values used for hydrogeological modelling in the previous EIS, which in turn resulted in predicted increases of groundwater inflows from Pike Lake to Rose Pit during the Operations phase, as described in the Project Registration. By proposing a treated effluent discharge to Pike Lake, drawdown effects on lake water levels during Operations could be mitigated.

Following submission of the Project Registration, Champion continued to refine the water management strategy for the Project, seeking to reduce the number of discharges proposed for the Project. A new water management strategy was proposed which centralized treated effluent from the WTP to one discharge location at Duley Lake, aligning with the water management strategy presented in the previous EIS. To maintain water levels in Pike Lake, water transfer from Duley Lake to Pike Lake has been proposed. Champion completed a detailed site-wide water balance and water quality modelling which supported that hydrological effects in Pike Lake and Duley Lake would be minimized when applying this approach (**TSD VI, Site-Wide Water Balance and Water Quality Modelling Report**). Discharge to only Pike Lake was not considered a viable alternative as the assimilative capacity of the lake is not sufficient to receive the volume of treated effluent proposed for the Project. Further, discharging only to Duley Lake was also not considered a viable alternative, as it will require recycled process water from the process plant to be transferred to Duley Lake.

The two alternative methods for number and location of effluent discharge locations were screened against the evaluation criteria provided in Table 3-2. The results of alternatives assessment are provided in Table 3-19. The single discharge location at Duley Lake, with water transfer to Pike Lake was selected as the preferred alternative method.

Table 3-19: Summary of Alternatives Assessment for Number and Location of Treated Effluent Discharges

Criteria	Alternative Methods	
	Alternative 1: Discharge Locations at both Pike Lake and Duley Lake	**Alternative 2: Discharge Location at Duley Lake only, with Water Transfer to Pike Lake**
Environmental	— Two effluent discharge locations, including discharge to Pike Lake which has a low assimilative capacity — Discharge to Pike Lake is located within the Duley Lake Provincial Park	— Only one effluent discharge location — Greater assimilative capacity at Duley Lake — Avoids effluent discharge location within the Duley Lake Provincial Park
Technical	— Water quality objectives must be maintained for two treatment plants, increasing technical effort	— Less technical effort compared to Alternative 1
Economic	— Cost to maintain two treatment plants and discharge locations expected to be comparable to transferring recycled process water to the Rose Pit collection pond	— Cost to maintain two treatment plants and discharge locations expected to be comparable to transferring recycled process water to the Rose Pit collection pond
Social	— Perceived effects anticipated to be greater due to two effluent discharge locations and effluent discharge within the Duley Lake Provincial Park	— Perceived effects anticipated to be fewer with one effluent discharge within Duley Lake only
Results	**Alternative Method Not Selected**	**Selected as Preferred Alternative Method**

Legend			
	less preferred	neutral	more preferred

3.3.8.2 Management of Seepage at Water Collection Dikes

Water management infrastructure including dams, dikes and collection ponds will collect, convey, store, treat and facilitate discharge of non-contact and contact water within the Project site. The Mid Lake dam and the collection dike at Pike Lake dike are unique as their primary purpose is to manage associated with the overflow of natural waters into the Rose Pit (i.e., as compared to managing the collection of contact water), as described in Chapter 2 Section 2.7.6.4 and Section 2.7.6.5, respectively. Understanding that impounded water will seek a path of least resistance through a dike (or dam), the Mid Lake dam and the Pike Lake dike are expected to experience seepage volumes which must be managed to maintain their geotechnical stability as well as prevent overflow into Rose Pit.

This section discusses alternative methods to manage seepage water from the Mid Lake dam and the Pike Lake dike (i.e., the natural water collection dikes). To manage the seepage water through the natural water collection dikes, two alternative methods were considered for the Project:

- **Alternative 1**–Collect seepage from the Mid Lake dam and Pike Lake dike and transfer it (i.e., via gravity or pumps) to the Rose Pit collection pond.
- **Alternative 2**–Redirect seepage from the Mid Lake dam and Pike Lake dike to its originating water source.

The transfer of seepage water to the collection pond would recategorize the seepage water as contact water and would require the effluent to meet regulatory discharge limits. Alternative 1 would require the construction and maintenance of a longer network of linear infrastructure (e.g., pipes) and may require the operation and maintenance of pumps to maintain pressure to the collection pond. Alternative 2 would use a passive (i.e., gravity) transfer method to collect seepage water and discharge it close-by the water collection dike to its originating water source. Treatment would not be required for Alternative 2, as the water would be non-contact.

The alternative methods for the management of seepage at water collection dikes were screened against the evaluation criteria provided in Table 3-2. The results of the alternatives assessment are provided in Table 3-20. Alternative 2 was selected as the preferred alternative due to its economic and technical advantages.

Table 3-20: Summary of the Alternatives Assessment for the Management of Seepage at Water Collection Dikes

Criteria	Alternative Methods	
	Alternative 1: Collection of Seepage and Treatment at Rose Pit Collection Pond	Alternative 2: Redirect Seepage to Originating Water Source
Environmental	— Expected to be similar	— Expected to be similar
Technical	— Depending on topography and site servicing plans, may require the installation of pumps to maintain pressure to collection pond	— Passive (i.e., gravity) transfer method with no treatment required for non-contact water
Economic	— Greater CAPEX for linear infrastructure and may involve increased OPEX to operate and maintain pumping infrastructure	— Lower CAPEX and minimal OPEX
Social	— Expected to be similar	— Expected to be similar
Results	**Alternative Method Not Selected**	**Selected as Preferred Alternative Method**

Legend	less preferred	neutral	more preferred

Notes:
CAPEX = capital expenditure; OPEX = operating expenditure.

3.3.8.3 Effluent Treatment Method

The effluent treatment strategy for the Project includes a centralized WTP designed to treat water from the Rose Pit collection pond and TMF such that it meets regulatory water quality guidelines prior to its discharge to Duley Lake. Based on test work (Champion 2024b) and water quality modelling (TSD VI) completed by Champion to date and Champion's operational experience at Bloom Lake, total suspended solids and pH may be parameters of concern that require treatment to meet water quality parameter guidelines. Considering the potential parameters of concern, the following two treatment methodology alternatives are proposed:

- **Alternative 1**–Natural attenuation in the Rose Pit collection pond.
- **Alternative 2**–Water treatment by coagulation via dosing with a chemical coagulant.

Both Alternative 1 and Alternative 2 will require water quality monitoring during operations to evaluate the effectiveness of the treatment methodology. With regard to Alternative 1, the rate of natural attenuation may be variable based on seasonal and local conditions; however, seasonal changes to attenuation could be mitigated by adjusting contact times. However, as discussed in TSD III, it is anticipated that during spring freshet or high precipitation events that significant quantities of water maybe challenging to store and could result in difficulty achieving required contact times. While natural attenuation is expected to result in moderate water quality within regulatory requirements, the colour of the treated effluent is expected to remain red due to precipitated iron.

Alternative 2 is expected to have higher costs due to the additional CAPEX test requirements (i.e., to determine coagulant dosages) and due to OPEX (i.e., coagulant) costs. However, Alternative 2 would result in better water quality in the treated effluent, including the further reduction of metal contaminants (which are anticipated to be within regulatory requirements prior to treatment) and allow for the mitigation of environmental impacts at the discharge location.

The two alternative methods for the effluent treatment type were screened against the assessment criteria provided in Table 3-2. The results of alternatives assessment are provided in Table 3-21. Alternative 2 was selected as the preferred alternative method.

Table 3-21: Summary of Alternatives Assessment for Effluent Treatment Methodology

Criteria	Alternative Methods	
	Alternative 1: Natural Attenuation	Alternative 2: Water Treatment via Coagulation
Environmental	— Expected to result in moderate water quality, however, with impacts to colour	— Expected to result in better water quality compared to Alternative 1 — Greatest reduction of metal contaminants
Technical	— Passive treatment, although effectiveness may vary seasonally but can mitigated by adjusting contact times — Difficulty in achieving required contact times for treatment during high precipitation events	— Active treatment with effectiveness determined via additional testing to optimize coagulant dosage
Economic	— Lowest CAPEX, and no OPEX considering no chemical costs from coagulant use	— Higher CAPEX due to additional testing studies to optimize coagulant dosage and higher OPEX for coagulant supply
Social	— Expected to result in visual impacts at discharge location due to colour	— Expected to result in lower visual impacts at the discharge location
Results	**Alternative Method Not Selected**	**Selected as Preferred Alternative Method**

Legend	less preferred	neutral	more preferred

Notes:

CAPEX = capital expenditure; OPEX = operating expenditure.

3.3.8.4 Sewage Treatment Method and Discharge Location

Sewage Treatment Method

The Project will require treatment of domestic sewage and wastewater discharged from various facilities on the Project site such as the worker accommodations; buildings in the mine services area (i.e., mine office and garage); the concentrator; and the crusher (BBA 2024). The volume of sewage generated by the Project is anticipated to be similar to what was proposed by Alderon in the 2012 EIS (Alderon 2012).

Two alternative methods for sewage treatment for the Project are proposed:

- **Alternative 1**—Wastewater collected and treated on site and discharged at a waterbody/wetland on site.
- **Alternative 2**—Wastewater collected in septic tanks and transported off site via trucks to a treatment facility in Wabush or Labrador City.

Alternative 2 was not considered as a viable alternative means for sewage treatment, as neither community has the capacity to treat and manage the sewage volumes expected for the Project; therefore, it was not considered further for the alternatives analysis, and Alternative 1 was identified as the only viable alternative.

As presented in Chapter 2, Section 2.7.1.14 and Section 2.9.1, wastewater treatment will meet the requirements of *NLR65/03 – Environmental Control Water and Sewage Regulations* (2003) under the *Water Resources Act*. Champion has set the design criteria for wastewater effluent to meet the most restrictive standards to meet present and future Newfoundland and Labrador norms.

Discharge Location for Treated Sewage

Two alternative methods are proposed for treated sewage effluent discharge:

- **Alternative 1**—Discharge treated sewage effluent into Duley Lake.
- **Alternative 2**—Discharge treated sewage effluent into a wetland.

For both alternatives, inert sludge generated as a by-product of the treatment of sewage will be collected and deposited in the TMF.

The two alternative methods for sewage effluent treatment discharge location were screened against the evaluation criteria provided in Table 3-2. The results of alternatives assessment are provided in Table 3-22. Alternative 2 was selected as the preferred alternative method.

Table 3-22: Summary of Alternatives Assessment for Sewage Treatment

Criteria	Alternative Methods	
	Alternative 1: Discharge to Duley Lake	Alternative 2: Discharge to Wetland
Environmental	— The effluent quality is anticipated to be the same, regardless of discharge location — Additional in-water work needed to install effluent diffuser resulting in potential direct effects on fish habitat	— The effluent quality is anticipated to be the same, regardless of discharge location
Technical	— Requires design and installation of effluent diffuser (in-water infrastructure)	— Only surface infrastructure is required
Economic	— Expected to be similar	— Expected to be similar
Social	— Higher potential for perceived negative effects on community health and well-being by discharging to Duley Lake	— Lower potential for perceived negative effects on community health and well-being by discharging on site to wetland
Results	**Alternative Method Not Selected**	**Selected as Preferred Alternative Method**

Legend	less preferred	neutral	more preferred

3.3.8.5 Potable Water Supply

The Project will require clean, potable water to supply various facilities on the Project site such as the worker accommodations, buildings in the mine services area (i.e., mine office and garage), the concentrator, and the process plant (BBA 2024). The Project will also need to draw water to support Project processing, as described in Section 3.3.8.6.

Two alternative methods for potable water supply for the Project were considered:

- **Alternative 1**—Intake and treat surface water from Duley Lake (or another source) for potable water supply.
- **Alternative 2**—Pump and treat groundwater from deep groundwater wells for potable water supply.

Currently, no site well drilling water characterization has been completed; however, subsequent engineering work is planned by Champion to validate groundwater sources.

Alternative 1 would result in relatively greater impacts on fish and fish habitats in the water taking source (e.g., Duley Lake). Seasonal water quality variability and increased biological oxygen demand in surface water may result in the need for more complex treatment technologies for Alternative 1. Based on Champion's experience at Bloom Lake, groundwater sources are anticipated to have greater seasonal stability and therefore have less complex treatment requirements. While initial drilling of deep groundwater wells could have greater construction costs when compared to surface water intake infrastructure, the groundwater system would have relatively lower operating costs.

The two alternative methods for the water taking source were screened against the evaluation criteria provided in Table 3-2. The results of alternatives assessment are provided in Table 3-23. Alternative 2 was selected as the preferred alternative method.

Table 3-23: Summary of Alternatives Assessment for Potable Water Supply Source

Criteria	Alternative Options	
	Alternative 1: Surface Water	Alternative 2: Groundwater
Environmental	— More potential effects on fish and fish habitat in the source lake (e.g., Duley Lake)	— Less potential environmental effects on fish and fish habitat
Technical	— More complex treatment technologies for the anticipated surface water quality	— Less complex treatment technologies required based on anticipated groundwater quality
Economic	— High CAPEX and higher OPEX due to more complex treatment requirements	— Higher CAPEX due to deep groundwater wells that may be expensive to install and construct — Lower OPEX
Social	— Expected to be similar	— Expected to be similar
Results	**Alternative Not Selected**	**Selected as Preferred Alternative**

Legend			
Legend	less preferred	neutral	more preferred

Notes:

CAPEX = capital expenditure; OPEX = operating expenditure.

3.3.8.6 Process Water Supply

The process plant will require a water source to support material production, including the dilution of ore and the production of reagents (Section 2.7.4.2.6). While process water requirements will be optimized to enhance recirculation within the process plant, access to fresh water will still be necessary. Given anticipated volumes of process water needed sourcing process water via groundwater is expected to be unsustainable. Furthermore, while there are numerous surface water resources nearby, only the closest surface water sources were identified for alternatives for the process water supply to optimize the cost of linear and pumping infrastructure. Two alternative methods for potable water supply for the Project were considered:

- Alternative 1—Duley Lake
- Alternative 2—Mills Lake

Duley Lake is located in closest proximity to the process plant and would result in the shortest linear infrastructure requirements, reducing design complexity and construction costs associated with the pipelines. Mills Lake is a viable option, although it is situated farther from the process plant.

The two alternative methods for the potable surface water sources were screened against the evaluation criteria provided in Table 3-2. The results of alternatives assessment are provided in Table 3-24. Alternative 1 was selected as the preferred alternative method.

Table 3-24: Summary of Alternatives Assessment for Process Surface Water Source

Criteria	Alternative Options	
	Alternative 1: Duley Lake	Alternative 2: Mills Lake
Environmental	— Expected to be similar	— Expected to be similar
Technical	— Less complex linear and pumping infrastructure	— More complex linear and pumping infrastructure
Economic	— Lower construction costs associated with shorter length of linear infrastructure	— Higher construction costs associated with longer length of linear infrastructure
Social	— Expected to be similar	— Expected to be similar
Results	**Selected as Preferred Alternative Method**	**Alternative Method Not Selected**

Legend	less preferred	neutral	more preferred

3.4 Summary

Project alternative methods were considered for each Project aspect and were screened against the evaluation criteria provided in Table 3-2**.** The results of the alternatives assessment for each Project aspect are summarized in Table 3-25.

Table 3-25: Summary of Results from the Comparative Analysis of Project Alternatives

Project Aspect	Alternative Method Category	Results from Analysis of Alternative Methods
Infrastructure and phasing	Construction phasing	**Preferred alternative method:** Four-Year Construction Timeline
	Operations phasing	**Preferred alternative method:** 26-Year Mine Life
	Transportation and site access: Number of access roads	**Preferred alternative method:** Alternative 3 – Two access roads (east and west roads)
	Transportation and site access: East access road alignment	**Preferred alternative method:** Alternative 1 – Alignment 1
	Transportation and site access: West access road alignment	**Preferred alternative method:** Alternative 2 – Alignment 2
	Transportation and site access: Ore shipment methodology and route	**Preferred alternative method:** Alternative 3 – Rail connection to Tacora Rail Line and merge with QNS&L Railway
Mining	Mining method	**Preferred alternative method:** Alternative 1 – Open Pit Mining
	Open pit design	**Preferred alternative method:** Alternative 2 – EIS Pit Design
Process plant size and types	Process plant size and type	**Preferred alternative method:** Alternative 2 – Champion Pre-feasibility Study Design (2024)
Overburden, tailings, and mine waste stockpiles	Location of overburden stockpile	**Preferred alternative method:** Alternative 2 – South of Rose Pit (Option D)
	Location of mine rock stockpile	**Preferred alternative method:** Alternative 2 – Southeast of Rose Pit (Site 5)
	Location of TMF	**Preferred alternative method:** Alternative 2 – Alternative C10'
Ore and mine rock hauling methods	Ore and mine rock hauling methods	**Preferred alternative method:** Alternative 2 – IPCC system for mine rock, with hauling of ore using crewed trucks
Sources of energy	Sources of energy	**Preferred alternative method:** Alternative 2 – Transmission Line from NL Hydro Grid
Water supply and wastewater	Number and location of treated effluent discharges	**Preferred alternative method:** Alternative 2 – Discharge Location at Duley Lake only, with Water Transfer to Pike Lake
	Management of seepage at water collection dikes	**Preferred alternative method:** Alternative 2 – Redirect Seepage to Originating Water Source
	Effluent treatment method	**Preferred alternative method:** Alternative 1 – Water Treatment via Coagulation
	Sewage treatment method and discharge location	**Preferred alternative method (treatment method):** Alternative 1—Wastewater collected and treated on site and discharged at a waterbody/wetland on site **Preferred alternative method (discharge location):** Alternative 2 – Discharge to Wetland
	Potable water supply	**Preferred alternative method:** Alternative 2 – Groundwater
	Process water supply	**Preferred alternative method:** Alternative 1 – Duley Lake

Notes:

EIS = environmental impact statement; MAA = multiple accounts analysis; IPCC = in-pit crushing and conveyance.

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4. Effects Assessment Methodology

The purpose of **Chapter 4, Effects Assessment Methodology**, is to describe the approach and methods used to identify effects on the biophysical and socioeconomic environment from the Project, incorporate mitigation measures and enhancement measures to avoid, eliminate, reduce, or enhance effects and assess residual Project and cumulative effects with other past and present activities and reasonably foreseeable developments (RFDs) in the vicinity of the Project.

The methods used to prepare this Environmental Impact Statement (EIS) have been developed in consideration of the requirements under the provincial *Environmental Protection Act*, with specific consideration of the requirements set out in the provincial Environmental Impact Statement Guidelines (EIS Guidelines) for the Project issued by the Minister of Environment and Climate Change. A table of concordance to the EIS Guidelines is provided in the Executive Summary.

4.1 Approach to the Effects Assessment

The general approach to the Environmental Assessment (EA) involves a systematic consideration of whether and how Project components and activities may interact with the environment and result in effects on the biophysical, cultural, and socioeconomic environments. Where potential adverse effects are identified, feasible environmental design features and/or mitigation practices are identified to avoid or minimize these potential adverse effects. Where potential positive interactions or outcomes are identified (e.g., economic benefits of the Project), enhancement measures are proposed to maximize potential benefits from the Project. Residual Project effects are also carried forward to the assessment of the cumulative effects, where residual effects that are likely to interact cumulatively with other physical activities (previous, existing, and reasonably foreseeable) are identified and assessed. The environmental effects assessment approach is shown in Figure 4-1 and includes the following steps, where applicable:

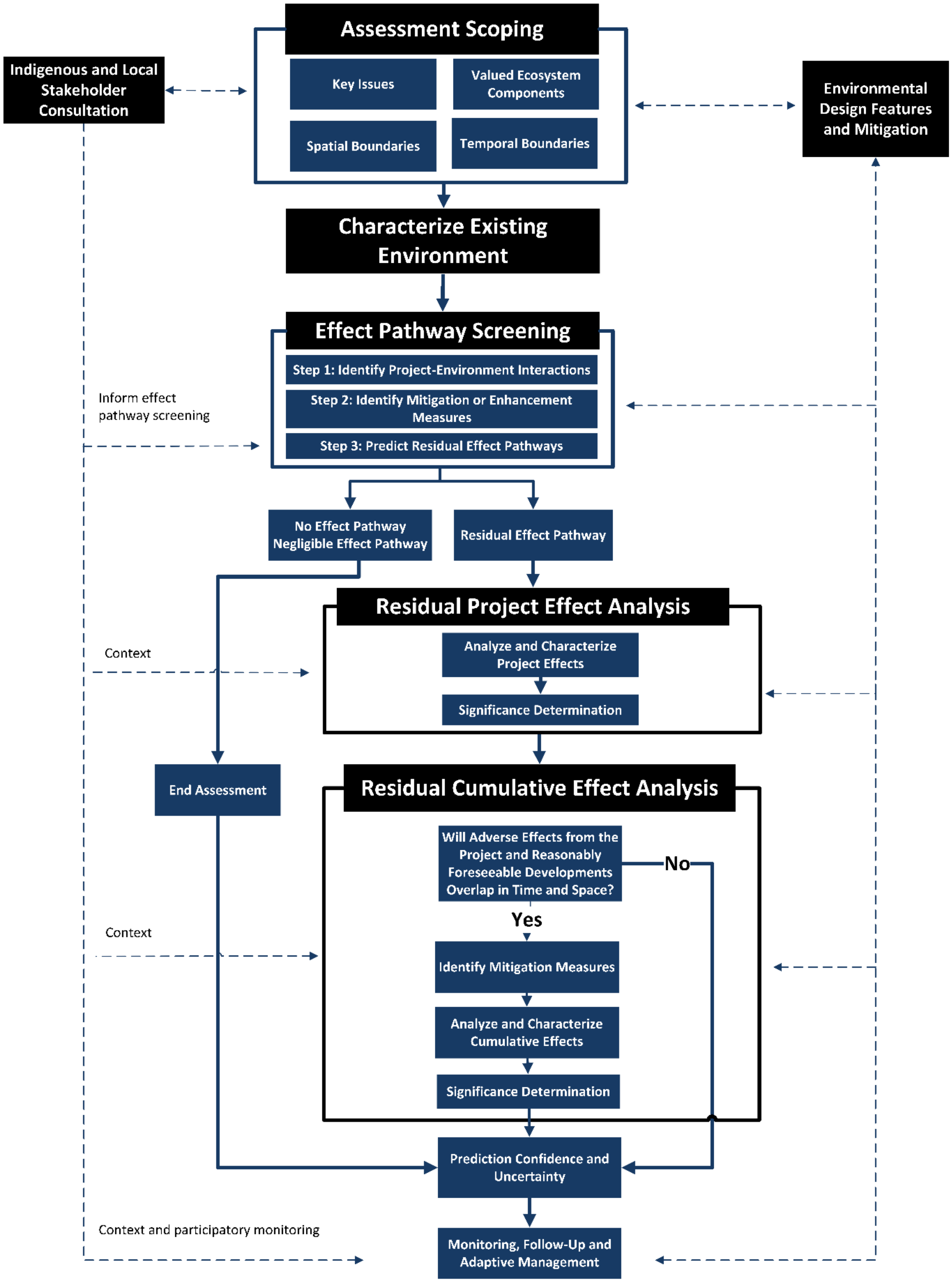
- Consult with Indigenous groups and local stakeholders throughout the planning process to collect input and incorporate key issues into the EIS (Section 4.2, Integrating Consultation from Indigenous Groups and Local Stakeholders).
- Scope the assessment by focusing on key issues, identifying and defining the valued environmental components (VECs), associated measurable parameters and assessment boundaries for the aspects of the environment that could be potentially affected by the Project (Section 4.3, Assessment Scoping).
- Describe the existing conditions, including the combined effects of previous and existing developments, to provide context for evaluating potential residual Project effects and cumulative effects (Section 4.4, Characterization of Existing Conditions).
- Complete the effect pathway screening (Section 4.5, Effective Pathway Screening), by identifying Project-environment interactions (Step 1), proposing environmental design features, mitigation or enhancement measures (Step 2), and identifying residual effect pathways (Step 3).
- Carry forward the residual effect pathways to the residual Project effect analysis (Section 4.6, Residual Project Effects Analysis). Complete the residual Project effects analysis by predicting and characterizing residual effects (adverse and positive) for each VEC using the following criteria: nature, magnitude, geographic extent, timing, duration, frequency, reversibility, probability of occurrence and ecological and socioeconomic context. Once residual adverse Project effects are characterized, provide a determination of significance for the VEC (Section 4.8, Significance Determination). Once residual positive effects are characterized, the assessment of residual positive effects is concluded as significance is not determined, and cumulative effects are not assessed for positive residual effects.
- Carry forward the residual adverse Project effects on the cumulative effects analysis. Determine the potential for cumulative adverse effects by determining if residual Project effects overlap in time and space with the effects of other RFDs. Once potential cumulative adverse effects are identified, predict and characterize residual adverse cumulative effects using the same criteria as the residual Project effects analysis. Where applicable, propose additional mitigation and enhancement measures. Once residual cumulative effects are characterized, provide a determination of significance for the VEC (Section 4.8).
- Identify key uncertainties and describe how these uncertainties were addressed to achieve a precautionary assessment. Discuss the implications of the approaches used to address uncertainties and the level of confidence in the residual Project and cumulative effects analyses (Section 4.8).
- Propose monitoring and follow-up activities to verify the predicted residual effects; evaluate the effectiveness of planned mitigation designs, policies, and practices; incorporate adaptive management and address key sources of uncertainty (Section 4.10, Follow-Up, Monitoring, and Adaptive Management).

The results of an effects assessment for each environmental discipline are presented in a separate chapter of this EIS. A Key Findings section within each chapter will identify if any new adverse effects are anticipated from the Project, compared with the Alderon EIS. Where interactions with the Project and VECs are similar to the previous EIS, predicted effects will be compared to determine if the predicted effects have changed and if additional mitigation measures are required. Where new interactions with the Project and VECs are identified, these new effects will be described with recommended mitigation measures. The effects assessment will also identify if new regulations have been introduced that were not addressed in the Alderon EIS, or if additional commitments are to be implemented prior to construction.

As outlined in Sections 6.1 and 6.2 of the provincial EIS Guidelines, each VEC assessment also considers the predicted future condition of the environment with respect to each VEC should the Project not proceed, and the capacity of renewable resources that are likely to be affected by the Project to meet the needs of the present and those of the future. The details related to these components of the assessment are provided in the technical assessment chapters of the EIS (**Chapter 5, Air Quality and Climate** to **Chapter 17, Community Health and Well-Being**).

Section 6.3 of the provincial EIS Guidelines also requires that the EIS identify and describe the potential accidents and malfunctions related to all components of the Project and provide an assessment of their effects on the environment. The approach for the assessment of accidents and malfunctions and the results of the assessment are presented in **Chapter 18, Accidents and Malfunctions**. A concordance table to the provincial EIS Guidelines is presented in the Executive Summary.

Figure 4-1: Environmental Effects Assessment Approach



4.2 Integrating Consultation from Indigenous Groups and Local Stakeholders

The documentation of issues and concerns raised through consultation with Indigenous groups and local stakeholders is a key component of the EA process. Documented issues and concerns, from both the Alderon EIS (2012) and the consultation undertaken by Champion were categorized and shared with the EA discipline leads (i.e., specialists leading the assessments for social and environmental disciplines such as hydrology, water quality, wildlife and wildlife habitat, Indigenous Land and Resource Use, community health and well-being, and others) for their review and incorporation into their respective assessments. Key issues and concerns are summarized within each of the discipline sections, along with a statement or reference as to how the issue or concern was addressed in the assessment (Section 4.3.1, Key Issues). Further information about the issues and concerns raised by Indigenous groups and local stakeholders is provided in **Chapter 22, Engagement**.

4.3 Assessment Scoping

Scoping the assessment was the initial step in the development of the EA and involved identifying key issues and selecting VECs and their associated measurable parameters and assessment boundaries to focus the assessment on attributes of the biophysical, cultural, and socioeconomic environments that are most important to people.

4.3.1 Key Issues

To initiate the process of identifying key issues, Champion reviewed and categorized issues that were raised through the consultation that was completed by Alderon with Indigenous groups and stakeholders between 2011 and 2014 during the completion of the previous EA. Since 2021, Champion has been consulting on these key issues with Indigenous groups and local stakeholders. Additional details on the process for identifying and consulting on key issues are presented in Chapter 22. In addition, the provincial EIS Guidelines identified a set of key issues based on the review of the Project Registration. Key issues identified through consultation and in the provincial EIS Guidelines are summarized in the list below.

- atmospheric environment, including air quality, dust, noise, vibration, and light
- groundwater and surface water resources, including Pike Lake and Duley Lake, protected public water supply areas and public drinking water systems
- fresh water fish, fish habitat, and fisheries
- species at risk, species of conservation concern, their habitat, and protected areas
- cabins and cabin owners
- land and resource use within the area of the Project, including effects on provincial parks
- communities of Fermont, Wabush, and Labrador City

4.3.2 Identification of Valued Environmental Components

VECs are aspects of the biophysical, cultural, and socioeconomic environments that are considered to have scientific, social, cultural, economic, historical, archaeological, or aesthetic importance (Beanlands and Duinker 1983). VECs are identified to be of concern by the proponent, scientists, government agencies, Indigenous Peoples, or the public (CEA Agency 2018). The selection of appropriate VECs allows an EA to be focused on those aspects of the biophysical, cultural, and socioeconomic environments that are of greatest importance, and facilitates decision making by regulatory agencies with respect to a project. The following factors were considered when identifying VECs for the Project:

- the Project-specific provincial EIS Guidelines
- regulatory requirements, standards, and guidelines
- consideration of key issues raised through consultation with regulatory agencies, Indigenous groups, and local stakeholders
- potential for interaction with the Project and degree of interaction, including presence, abundance, and amount of spatial overlap of a VEC with the Project
- sensitivity of a VEC to potential Project effects and level of damage or harm that could be realized should an adverse effect occur
- species conservation status or concern (e.g., rarity, sensitivity, uniqueness)
- ecological and socioeconomic/cultural value to communities, regulatory agencies, and the public
- recent experience with similar projects in Labrador and other jurisdictions in Canada
- avoidance of redundancy with another VEC (i.e., if two potential VECs represent the same issues, mitigation actions, and potential effects from the Project, only one was selected as a VEC for the assessment)

The following VECs were selected for the EIS:

- air quality
- climate
- noise
- vibration
- light
- groundwater quality and quantity
- surface water quantity and quality
- sediment quality
- fish habitat and productivity
- fish health
- vegetation
- wetlands
- protected areas
- species at risk birds and migratory birds protected by the *Migratory Birds Convention Act*
- bats
- woodland caribou
- other wildlife
- heritage and historical resources
- Indigenous land and resource use
- other land and resource use
- services and infrastructure
- economy and employment
- community health and well-being

This EIS provides separate technical chapters that describe each VEC, the rationale for the VEC selection, a summary of the VEC-related comments that have been raised through consultation, and linkages to other VECs. The assessment of VECs is provided in Chapters 5 to Chapter 17 of the EIS.

4.3.3 Measurable Parameters

Measurable parameters represent attributes of the biophysical, cultural, and socioeconomic environments that can be measured to help inform the assessment of VECs. Measurable parameters also provide the primary factors for discussing the uncertainty of effects on VECs and, subsequently, can be key variables for study in potential follow-up and monitoring programs. For each VEC, measurable parameters were assessed quantitatively where possible (e.g., changes in air contaminants with applicable provincial or federal ambient air quality criteria concentration thresholds), with qualitative parameters and units of measurement identified where the nature of the effect or available data do not allow for a quantitative assessment (e.g., changes in the quality of life and well-being). Measurable parameters have been selected based on review of recent EAs for mining projects in Newfoundland and Labrador and other parts of Canada, comments provided during consultation, and professional judgment. The rationale and description of measurable parameters for VECs are provided in each applicable technical chapter (i.e., Chapters 5 to 17).

4.3.4 Assessment Boundaries

Assessment boundaries define the spatial and temporal extents of the assessment for each VEC. Each is described in the following sections.

4.3.4.1 Spatial Boundaries

Spatial boundaries define the geographical extent within which baseline conditions are studied and environmental effects are assessed. To focus the EIS on different VECs with varying geographical distributions, spatial boundaries are set for each VEC or for related sets of VECs. Spatial boundaries were selected for VECs using the following criteria:

- physical extent of the Project footprint, which is also referred to as the site study area (SSA)
- spatial extent of expected Project-related effects, including those that extend beyond the SSA

- physical extent of key ecological and socioeconomic systems (e.g., watershed boundaries of potentially affected lakes and streams or jurisdictional boundaries of affected local communities)
- geographic distribution, movement, and spatial interaction of VECs

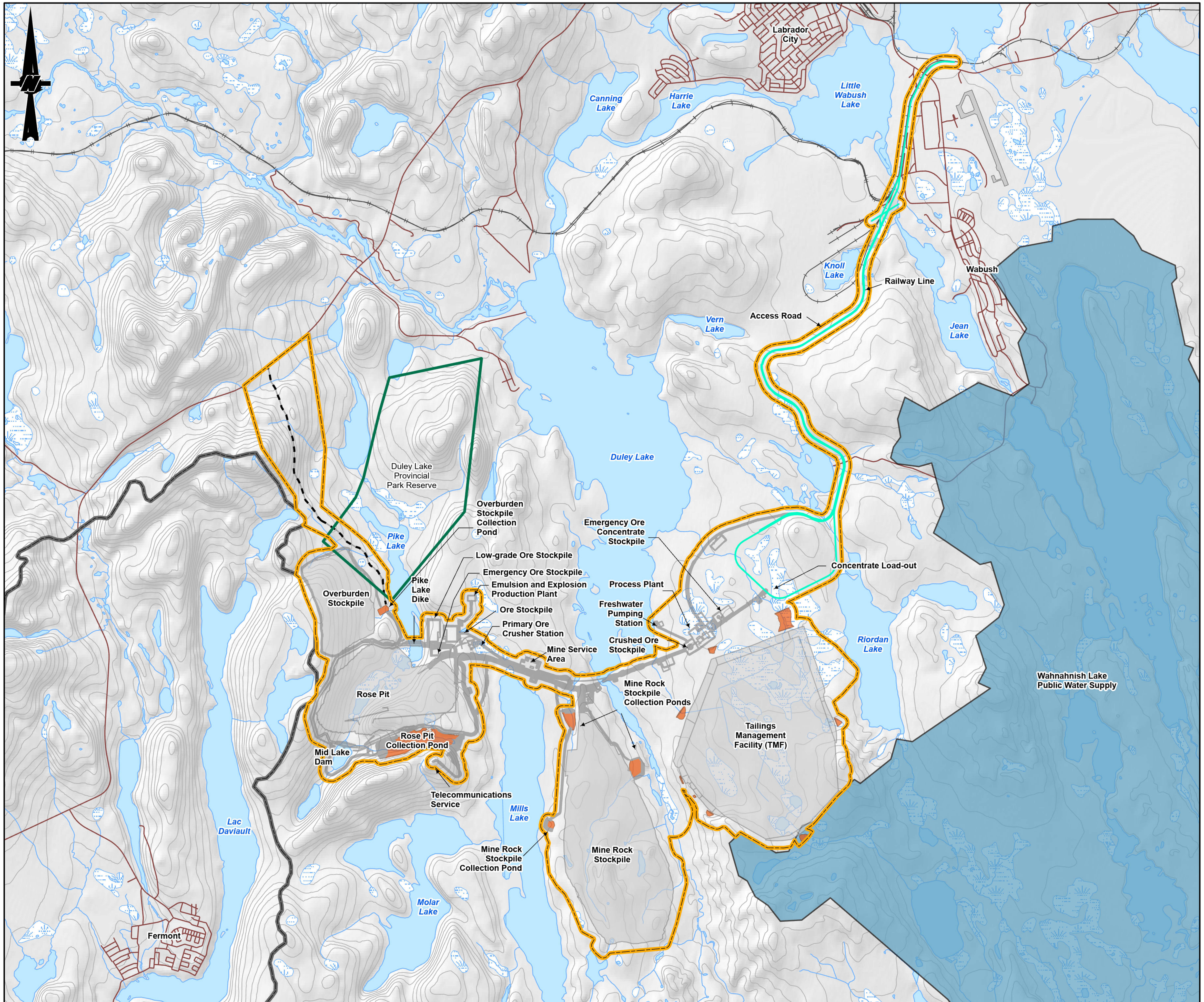
Although additional spatial scales are possible for individual VECs, spatial scales typically include a minimum of an SSA, a local study area (LSA), and a regional study area (RSA).

The SSA includes the proposed infrastructure for the Project (i.e., the Project footprint) and includes buffers applied to the outer edges of the Project footprint. It was constrained to certain features, including major lakes, the Québec-Labrador provincial border and sensitive features, like the Wahnahnish Lake Protected Public Water Supply Area. The SSA, which covers 4,323 ha, is consistent across all the VEC assessments. It represents the smallest scale of assessment and an area where the potential direct effects of the anticipated Project can be assessed accurately and precisely (Figure 4-2). The SSA was used to address uncertainty in the final design of the Project so that adverse effects on VECs were not underestimated (i.e., the SSA area is twice as large as the anticipated Project footprint).

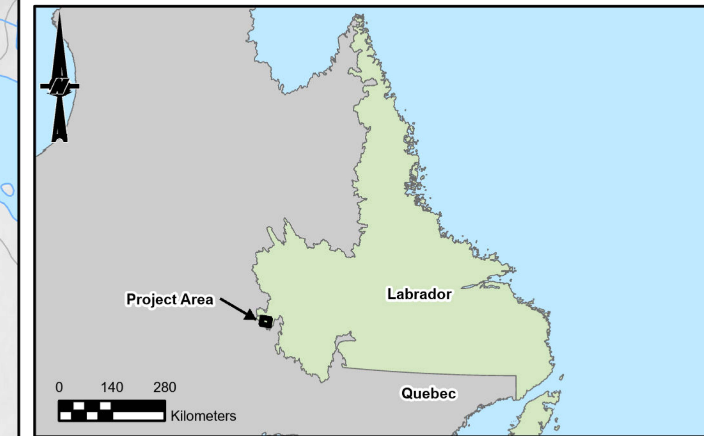
The LSAs were defined for each VEC at a scale that would contain most or all of the expected effects of the Project on the VEC. As such, detailed data were collected in the LSA to describe existing conditions.

The RSAs were defined for each VEC to include areas larger than the LSAs to provide broader context for the assessment of Project effects on VECs and at the appropriate scale to assess cumulative effects from the Project combined with existing conditions and other RFDs . For VECs with extensive distributions, such as fish that can move within a watershed and wildlife species that move within large seasonal ranges, effects from the Project have a higher likelihood of combining with effects from other human developments and activities at a larger geographical scale. RSA boundaries were defined to capture such potential interactions for each VEC.

The spatial boundaries considered for VECs and the rationale for the selection of these boundaries are identified in each technical chapter of the EIS (i.e., Chapters 5 to 17).



KEY MAP



SCALE 1:20,000,000

Legend

PROJECT DATA	BASEMAP INFORMATION
Proposed Project Infrastructure	Road
Proposed Sediment Pond	Railway
Potential Access Road	Watercourse
Proposed Access Road and Railway Corridor	Contour
Site Study Area (SSA)	Bog/Wetland
	Waterbody
	Duley Lake Park
	Labrador/Quebec Boundary
	Public Water Supply

0 1,000 2,000 4,000
1:70,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

CLIENT
CHAMPION IRON MINES LTD.

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

TITLE
SITE STUDY AREA

CONSULTANT
Kami

YYYY-MM-DD	2025-06-13
DESIGNED	----
PREPARED	MS
REVIEWED	AF
APPROVED	KB

PROJECT NO.	CONTROL	REV.	FIGURE
CA0038713.5261	0015	B	4-2

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

4.3.4.2 Temporal Boundaries

The temporal scope of the EA focuses on the 40-year period from the initial Construction phase to the end of the Decommissioning and Rehabilitation phase. The temporal scope of the EA is intended to evaluate the shorter- and longer-term changes from the Project and the associated Project-specific and cumulative effects on the biophysical, cultural, and socioeconomic environments. The minimum temporal boundary for the EA is defined by the following Project phases.

- **Construction phase (referred to as Construction)**—Includes site preparation, mine, process plant and site infrastructure development, and commissioning the structures, systems, and components. The duration of Construction is expected to be four years.
- **Operations and Maintenance phase (referred to as Operations)**—Includes the mining and milling of iron ore, production and shipment of iron ore concentrate, tailings management, management of mine rock, waste management, water management, release of treated effluent, site maintenance and transportation of staff and materials to and from the site. Operations includes one year of pre-development mining (i.e., ramp-up). The Operations and Maintenance phase concludes when processing is complete and is expected to be 26 years.
- **Decommissioning and Rehabilitation phase (referred to as Closure)**—Includes accelerated flooding of the Rose Pit, re-establishment of passive surface water drainage following the pit-flooding period, and recontouring and revegetating disturbed areas. Physical infrastructure that is not required during post-closure monitoring and for other activities required to achieve the Project's decommissioning criteria and to return the Project site to a safe and stable condition will be removed. Closure is expected to be ten years.

In certain circumstances, the duration of effects may extend beyond specific phases of the Project, including Closure, depending on the physical, biological, social, and/or cultural properties and resilience of the VECs. In these cases, effects from the Project that may occur beyond Closure were assessed using a post-closure period. The post-closure period is not a phase; it encompasses the long-term period post-closure, which involves ongoing dam safety monitoring, water treatment and environmental monitoring to verify that water quality is achievable for passive discharge and decommissioning criteria have been met. The length of the post-closure period is assumed to be 40 years. Where applicable to a VEC, effects during the post-closure period are identified and assessed.

The temporal boundaries used in the EIS were specific to the VECs and considered the identified Project phases. For some VECs, residual effects were assessed for all phases of the Project. For other VECs, residual effects were only relevant to specific Project phases. For example, Project effects on species at risk would begin during Construction with the removal and alteration of habitat and continue through Operations and for a period after Closure until effects are reversed or determined to be irreversible (i.e., permanent). In consideration of these factors, effects on species at risk were analyzed and predicted from Construction through post-Closure, which generated the maximum potential spatial and temporal extent of effects and provided confident and ecologically relevant effects predictions. Alternatively, for other VECs, the assessment was completed for those phases or periods (i.e., temporal snapshots) of the Project when adverse effects were predicted to be most pronounced (e.g., most surface water effects would occur during Operations and Closure). Where required, these snapshots were taken at several points within a Project phase or phases so that effects were not underestimated (i.e., a precautionary approach was applied). An example is evaluating surface water quality predictions at specific times that represent key milestones throughout the lifespan of the Project. For all VECs, the phase(s) or period(s) of the largest adverse effect were carried forward to the residual effects analysis (Section 4.7, Residual Project Effects Analysis).

4.4 Characterization of Existing Conditions

Each technical chapter of the EIS (i.e., Chapters 5 to 17) includes a subsection that describes and characterizes the existing conditions for the relevant VECs. The existing conditions generally formed the basis against which the residual Project and cumulative effects were assessed.

The existing conditions also represent the outcome of historical and current environmental and socioeconomic pressures that have shaped the observed condition of each VEC. Environmental and socioeconomic pressures or factors were either natural (e.g., weather, wildfire, predation, disease) or human related (e.g., industrial development, forestry, changing business models, fishing, hunting).

Baseline studies were conducted to support the characterization of the environment. Baseline studies identify temporal variation (e.g., annual or seasonal changes in water flow or habitat use, trends over time in populations and employment) and other conditions relevant to the assessment of a project. Baseline studies involved the collection of environmental field data and socioeconomic data.

Data collected during the previous EIS support the characterization of existing conditions as it was collected over a longer timescale and provides additional context for VECs baseline conditions. Additional field studies were conducted in 2023 and 2024 to further establish baseline conditions and address any data gaps or EIS guideline requirements. After comparing the data collected with the previous EIS, it was identified where baseline conditions were relatively similar to previous baseline studies. This reduced uncertainty in baseline conditions and allowed for Project to progress through effects assessment based on one additional year of data. Some data collection is still planned in 2025 to meet EIS Guideline requirements and inform VEC-specific management plans and inform detailed and site-specific mitigation.

The baseline studies were conducted within the SSA and VEC-specific LSAs and RSAs. Data collected in the anticipated Project footprint and in the immediate vicinity of the Project (i.e., within the SSA and LSA) were used to provide measures of environmental conditions prior to construction of the Project and to predict the direct and indirect changes from the Project on VECs. Data collected at larger scales (i.e., within the RSA) were used to measure broader-scale environmental conditions and provide regional context for the effects of the Project. The understanding of the existing conditions also informed Project design features and potential mitigation measures that may be required. The technical chapters of the EIS (i.e., Chapters 5 to 17) describe how baseline studies informed their characterization of existing conditions for each VEC.

4.5 Effect Pathway Screening

The effect pathway screening is a process that is used to develop an understanding of whether VECs may be affected by a project. Potential effect pathways were identified and mitigation or enhancement measures that could be incorporated into the Project to minimize adverse effects were reviewed to assess if, after implementation, there was still potential for the Project to cause residual effects. This process helps to focus further, more detailed, assessments on key interactions between the Project and the environment. This section describes how the potential effect pathways were identified and screened.

4.5.1 Step 1: Project-Environment Interactions

The first step in the effect pathway analysis was to identify all pathways by which Project components or activities could affect the environment (i.e., effect pathways). This was conducted by constructing a Project-environment interactions matrix that identified potential interactions among key Project components/activities and VECs for each Project phase (Appendix 4A, Project-Environment Interactions). A comprehensive list of effect pathways was then developed using the following information:

- review of the Project description (**Chapter 2, Project Description**) and potential effect scoping by subject matter experts within the EIS team (**Chapter 1, Introduction**, Section 1.2.5) for the Project
- input from Indigenous, regulatory, and public consultation (Chapter 22)
- results of baseline studies
- scientific knowledge
- previous experience with mining projects, including the previous Kami EIS
- consideration of potential effects identified from the EIS Guidelines and through the previous EIS for the Project (Alderon 2012)

For an effect to occur, there must be a source (i.e., a Project component, works, or activity) that interacts with the environment and results in a measurable change to at least one measurable parameter of the VEC (Figure 4-3).

Figure 4-3: Project-Environment Interaction

Table 4-1 provides examples of effects pathways related to certain Project activities for air quality, fish and fish habitat and land use and tenure VECs. The examples show the linkages from Project activities to changes in the environment and associated measurable parameters for the VECs.

Table 4-1: Examples of Effects Pathways

VEC	Project Components/Activities	Measurable Parameters	Effect Pathway Description
Air quality	Project components/activities that contribute to criteria air contaminant (CAC) emissions (e.g., land clearing, site preparation, and construction of facilities and infrastructure, transportation of personnel, equipment, and materials)	Ambient air concentrations of CACs (e.g., carbon monoxide and $PM_{2.5}$)	The CAC emissions can affect air quality.
Fish and fish habitat	Project components/activities that may increase soil erosion (e.g., land clearing, in-water construction)	Habitat availability	Release of sediment from soil erosion caused by ground disturbance can affect fish habitat quality in local waterbodies.
Land use and tenure	Project components/activities that disturb and develop land used for the Project footprint (e.g., land clearing, site preparation, construction of facilities and infrastructure)	Availability and access to land use and tenure	Development of the Project footprint will cause loss or restriction of access to land and resources.

VEC = valued environmental component; CAC = criteria air contaminant; $PM_{2.5}$ = particulate matter with a diameter of 2.5 microns or fewer.

4.5.2 Step 2: Environmental Design Features and Mitigation or Enhancement Measures

Following effect pathway identification, the second step of the pathway analysis involved the development of environmental design features and mitigation or enhancement measures that could be incorporated into the Project to remove, minimize or enhance the effects on VECs.

Applying mitigation follows the precautionary principle, which states that "where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation" (IAAC 2020).

Environmental design features include environmental considerations for Project design elements, environmental best practices, management policies, programs, plans, and procedures, and social programs. Examples of environmental design features include the following:

- limiting the area of the Project footprint (i.e., centralizing infrastructure)
- designing the Project to avoid or minimize effects (e.g., designing water management infrastructure to maximize water re-use and minimize effects on the receiving environment)
- implementing procedures, practices, and management policies to limit an effect (e.g., conducting nest searches prior to clearing activities during bird nesting periods)
- incorporating progressive reclamation of available disturbed areas and a Closure Plan at the end of mining operations

Environmental design features have been incorporated into the Project, including the design of water management infrastructure to maximize the amount of water re-use on the Project and re-alignment of the western access road to reduce disturbances to residents of Duley Lake. Concerns raised by local cabin owners through consultation regarding the alignment and use of the access road contributed to the decision to change the alignment (Chapter 22). Additional details on the environmental design features are presented in Chapter 2 and examples are provided in Table 4-2.

Table 4-2: Environmental Design Features Incorporated into Project Design

Component or Facility	Proposed in Previous EIS	Proposed Optimization	Rationale
IPCC system	Mine rock would be hauled from the Rose Pit and deposited in the Mine Rock Stockpile (referred to as the Rose South Disposal Area).	Using the IPCC system, mine rock will be crushed inside Rose Pit before being conveyed to the Mine Rock Stockpile.	Introduction of new technologies and mitigation and environmental practices: Incorporating the IPCC system will reduce the number of haul trucks by 85% (from 50 to 8) needed to haul mine rock from Rose Pit to the Mine Rock Stockpile. This Project design improvement will result in a reduction of particulate, greenhouse gases, noise and light emissions from the Project.
Crushed ore stockpile	Two uncovered crushed ore stockpiles	One crushed ore stockpile within a geodesic dome	Introduction of new technologies and improved mitigation and environmental practices: The geodesic dome will reduce dust emissions compared to the uncovered crushed ore stockpiles previously proposed.
Rose Pit and associated water management facilities and infrastructure	Water would be collected within in-pit sumps and pumped from the pit into an engineered settling basin to allow for treatment of suspended solids and residual chemistry from blasting operations. The total operational case open pit mine water balance was estimated to require an average dewatering rate of 433.9 m^3/h (10,413.6 m^3/day) under climate normal conditions (Alderon 2012). Any surface water flow upstream of Rose Pit would be diverted around the perimeter of the pit in diversion channels into Pike Lake South, preventing this water from entering the pit.	Updated hydrogeological modelling (Appendix 4A) has increased the assumed average dewatering rate to approximately 40,000 m^3/day. This increase has resulted in the need for additional and water management infrastructure, including the Rose Pit collection pond, Mid Lake dam, and the Pike Lake dike. Pit sumps and diversion ditches or channels to control surface run-off are also proposed.	Addressing commitments and conditions of the 2012 EIS: The Comprehensive Study Report (CEAA 2013) recommended that the model of the existing hydrogeological environment around the proposed open pit be updated to better inform the potential effects of Project. Champion has completed this additional modelling work, taking a conservative approach to inflow estimates. This conservative modelling approach has resulted in a Rose Pit dewatering rate estimate and overall increase to the predicted volume of water that needs to be managed during the Operations phase. This, in turn, has enabled the need to assess and design infrastructure with incremental storage capacity and effluent volume. Through the Feasibility Study, Champion will perform additional trade-off studies and evaluation to develop opportunities to manage water more efficiently.
Overburden and mine rock stockpile collection ponds	Run-off and drainage from these stockpiles would be controlled during operations using perimeter ditching/drains and small settling ponds, as required, prior to discharge to the receiving environment.	Run-off and drainage from these stockpiles will be diverted to collection ponds and conveyed to a water treatment plant before discharge into the receiving environment.	Improved mitigation and environmental practices and addressing commitments or conditions of the 2012 EIS: The Comprehensive Study Report (CEAA 2013) recommended that Alderon design surface drainage to prevent flooding of stockpile areas. Champion has advanced this commitment by incorporating these collection ponds into the design of the Project. Run-off and drainage from the Overburden and Mine Rock Stockpiles will now be collected and processed through a water treatment plant prior to discharge into the receiving environment.
Western access road	The western access road was proposed in the Project Registration to be located east of Duley Lake Provincial Park with upgrades to meet the requirements for construction.	The access road was moved to the west side of Duley Lake Provincial Park based on input received from local residents and cabin owners through consultation.	Change to the Project since the submission of the Project Registration: The new alignment reduces interactions between the Project and local residents and cabin owners.

EIS = Environmental Impact Statement; IPCC = in-pit crusher and conveyor; m^3/h = cubic metre per hour; m^3/day = cubic metre per day; CEAA = Canadian Environmental Assessment Agency.

Mitigation measures include measures to eliminate, reduce, control, or offset the adverse effects of a project, and includes restitution for damage caused by those effects through replacement, restoration, compensation, or other means (IAAC 2020). Examples of mitigation measures that have been implemented for the Project include the installation of emission control devices on mining equipment (reduce) or creating new recreational trails for local snowmobile operators to compensate for the loss or restriction of access to existing trails (offset). Mitigation measures proposed and approved through the previous EIS and/or Environmental Management Plans will be proposed to mitigate environmental effects. Proposed mitigation measures are identified in the VEC-specific effects assessment chapters and are summarized in **Chapter 20, Environmental Management, Monitoring and Follow-Up**.

Enhancement measures include measures or actions taken to maximize or enhance positive benefits from the Project or measures taken to generate net positive contributions to the environment. For example, this could include local hiring practices or measures to create new habitats to increase biodiversity.

Following their identification and development, environmental design features and mitigation or enhancement were then taken into account for each effect pathway to understand and predict the expected degree and extent of Project-related changes to the environment and the associated residual effects on VECs (i.e., to predict how much an adverse effect could be eliminated or reduced).

4.5.3 Step 3: Predict Residual Effect Pathways

The third and final step of the pathway effect analysis is to predict potential residual effect pathways, which focuses the residual Project and cumulative effect analyses on the most important and meaningful changes to the environment from the Project. Each potential effect pathway identified in Step 1 was evaluated using the proposed mitigation developed in Step 2 to predict whether the effect pathway had the potential to cause residual adverse or positive effects. The effectiveness of mitigation measures proposed for each effect pathway was assessed to determine whether the mitigation would address the potential Project effect such that the pathway was eliminated or would result in a negligible adverse effect on a VEC.

This effect pathway screening was a preliminary assessment that was intended to focus the effects analysis on effect pathways that required a more quantitative or comprehensive assessment of effects on VECs (Figure 4-1). Using scientific knowledge, feedback from consultation, logic, experience with similar developments, including the previous assessment of the Project (Alderon 2012), and an understanding of the effectiveness of mitigation (i.e., level of certainty that the proposed mitigation would work), each effect pathway was categorized as one of the following:

- **No effect pathway**—The effect pathway could be removed (i.e., the effect would be avoided) by avoidance measures and/or additional mitigation so that the Project would result in no measurable environmental change relative to existing conditions or guideline values (e.g., air, soil, or water quality guidelines), and therefore would have no residual effect on a VEC.
- **Negligible effect pathway**—With the application of mitigation, the effect pathway could result in a measurable but minor environmental change relative to existing conditions or guideline values, but the change is sufficiently small that it would have a negligible residual effect on a VEC (e.g., an increase in an air quality parameter that is negligible compared to the range of existing values and is well within *Air Pollution Control Regulations* standards for that parameter). Therefore, further detailed assessment of the residual effect is not warranted as the effect pathway would not be expected to result in a significant residual Project or cumulative effect on the VEC.
- **Residual effect pathway**—Even with the application of mitigation, the effects pathway is still likely to result in a measurable environmental change relative to existing conditions or guideline values that could cause a greater-than-negligible adverse or positive effect on a VEC and warrants additional assessment.

Effect pathways with no effect, either because there was no linkage initially or because environmental design features or mitigation would avoid or remove the effect pathway, were described with rationale but not advanced for further assessment. Effect pathways that were assessed and demonstrated to have a negligible residual effect on a VEC through simple qualitative or semi-quantitative evaluation were also described with rationale but not advanced for further assessment. Pathways that would result in changes to the environment and have the potential to cause a greater-than-negligible effect on a VEC were carried forward to the residual effects analysis (Section 4.8). When determining the effectiveness of mitigation, the screening applied a precautionary approach. For example, if an effect pathway included mitigation that was considered new or unproven technology or challenging to implement under certain conditions, then an effect pathway was conservatively considered to result in a residual effect.

Within each technical chapter (i.e., Chapters 5 to 17), the results of the effect pathway screening are presented in table format and described. This information included Project facilities/activities and associated mitigation to be implemented during Project phases, as well as the potential effect pathways from each Project interaction and the associated categorization.

4.6 Residual Project Effects Analysis

Residual Project effects represent the combined predicted effects from existing conditions, which include effects from previous and existing projects/activities plus the effects from the Project. The residual effects analysis considered all residual effect pathways identified in the effect pathway screening (Section 4.5.3, Step 3: Predict Residual Effect Pathways, Figure 4-1). As part of the residual effects analysis, the predicted environmental changes for residual effect pathways were evaluated using methods appropriate for each VEC, which are described in the applicable technical chapters. Where possible and appropriate, each analysis was quantitative and included data from field studies, modelling results, scientific literature, government publications, monitoring reports, and personal communications.

For some VECs, the predicted residual effects were the result of more than one effect pathway that linked a Project component or activity to an interaction with the environment and a subsequent effect on a VEC or other VECs. For example, the pathways for effects on the ability of fish populations to remain self-sustaining and ecologically effective included consideration of alteration of both water quantity and water quality. Therefore, the residual effects assessment considered the combined effect of multiple pathways, where applicable.

Following the effect pathway screening (Section 4.7), residual Project effects were characterized using the following criteria:

- **Nature**—Classified as adverse (i.e., net loss or adverse effect), neutral (i.e., no change), or positive (i.e., net gain or beneficial effect). Nature may change over time; the Project could have adverse effects during some time periods and positive effects during other time periods.
- **Magnitude**—A measure of the intensity or the degree of change (i.e., effect size) caused by the Project and other developments, if applicable, relative to existing conditions. Established guidelines, thresholds, or screening values were considered where available. Magnitude is presented as a quantitative or qualitative expression of effect size or severity for a VEC relating to the respective measurable parameters. When categorical definitions were used, magnitude was classified as negligible, low, moderate, or high and supported by a reasoned narrative.
- **Geographic extent**—Refers to the area, distance covered, or zone of influence of the effect on VECs. The geographic extent of effects can occur at several different scales within the spatial boundary of the assessment and is specific to the VEC. Categorical classifications included effects that were confined to the SSA, effects that may extend beyond the SSA but are confined to the LSA, effects that may extend beyond the LSA but are confined to the RSA, and effects that may extend beyond the RSA (e.g., air emissions that contribute to atmospheric accumulation or climate change effects).
- **Duration**—Has two aspects: (1) the amount of time between the start and end of a Project activity and is related to Project phases; and (2) the time required for the effect on the VEC to be reversed. When duration was classified categorically, it was typically expressed as short term, medium term, long term or permanent, relative to Project activity periods or phases.
- **Timing**—Considers when residual effects are anticipated to occur, with a focus on seasonality. This criterion is defined categorically as applicable where seasonal aspects may affect a VEC or not applicable, where seasonal aspects are unlikely to affect a VEC.
- **Reversibility**—After removal of the Project activity or component, reversibility describes whether the Project would no longer influence a VEC at a future predicted time. This criterion usually has one of two alternatives: reversible or irreversible. Residual effects that are short term, medium term, or long term in duration are reversible. Permanent residual effects were considered irreversible. For instances where the duration of a residual effect may not be known but is expected to last beyond the temporal boundary of the Project (e.g., many decades after Closure is completed) and where science and logic indicated that the likelihood of reversibility is very low or uncertain, the residual effect was considered permanent and therefore irreversible, following a precautionary approach.
- **Frequency**—Refers to how often a residual effect would occur during the temporal boundary of the assessment. Occasional residual effects occur once (e.g., once during the installation of a culvert) or a few times (e.g., predicted maximum precipitation events during lifespan of the Project). Continuous effects occur constantly over a specified duration. Periodic effects occur at regular intervals or in association with temporal events (e.g., during breeding or spawning season, spring freshet, low flows, growing season, and plant harvest season).
- **Probability of occurrence**—Defined categorically as unlikely, possible, probable, or certain.
- **Ecological and socioeconomic context**—Takes into consideration the sensitivity and resilience of VECs (ecological context), and the cultural and social significance placed on certain VECs and the unique values, customs or aspirations of local communities or Indigenous groups that influence the perception of an effect (socioeconomic context) (IAAC 2024).

For each VEC, the characterization of Project effects was conservatively completed for the phase or period (i.e., temporal snapshot) when adverse effects from the Project were predicted to be largest or positive effects were predicted to be smallest. A summary or characterization of the residual effects analysis is provided in tabular form for VECs in each technical chapter and is intended to provide structure and comparability across all VECs assessed for the Project. The residual effects characterization was then used to support significance determinations for VECs (Section 4.8).

Section 6.2 (Predicted Environmental Effects of the Undertaking) of the EIS Guidelines requires the EIS to consider the extent to which biological diversity is affected by the Project. The biophysical VECs (i.e., fish and fish habitat, vegetation, and wildlife) and their measurable parameters were selected in a manner that allowed potential effects on biodiversity to be evaluated. Biodiversity can be defined as the abundance and variety of living organisms and ecosystems on Earth, and it includes life at all levels of biological and ecological organization such as species, communities, habitats, ecosystems, and their interactions as well as the ecosystem services they provide (SCBD 2000).

Project-specific and cumulative effects on biodiversity were evaluated for the biophysical VECs in **Chapter 9, Fish and Fish Habitat** to **Chapter 11, Wildlife** of the EIS, respectively. The effects assessment for biodiversity was completed through the assessment of changes in measurable parameters for the fish and fish habitat, vegetation and wildlife VECs. Combined, these technical chapters provide a holistic coarse- and fine-filter assessment of the potential effects of the Project on biodiversity.

4.7 Residual Cumulative Effects Analysis

Cumulative effects represent all natural and human-induced influences or activities that have or could result in changes to the biophysical, cultural, and socioeconomic environments through space and over time. Cumulative effects can be greater than the sum of individual effects due to their interaction and accumulation with each other. Some changes may be human related, such as increasing industrial and mineral development. Other changes may be associated with natural phenomena, such as extreme rainfall events, intensity and frequency of forest fires, insect outbreaks, floods, and periodic harsh and mild winters, which may also be related to climate change. The cumulative effects assessment predicts the contribution of effects from the Project and RFDs on VECs in the context of natural and climate-related changes.

The cumulative effects assessment builds on the results of the residual Projects effects assessment and considers the incremental changes that were predicted to have a likely residual adverse effect on VECs. This would include the effects of past and current projects or past climate-related changes (i.e., forest fires), which contribute to existing conditions upon which residual Project effects are assessed. For the EIS, the description of the existing environment characterizes the environment already affected by past and current projects and activities; therefore, the cumulative effects assessment focused on analyzing the effects of other RFDs in combination with the Project. Although positive residual effects are characterized in the residual Project effects analysis, they are not carried forward to the cumulative effects analysis, as the Project benefits from other past, present and RFDs or activities are unlikely to be known or publicly disclosed (e.g., Benefit Agreements with Indigenous groups or local community stakeholders).

The cumulative effects assessment followed a three-step process:

1) Identify RFDs and potential cumulative effects that overlap in time and space with residual effects.
2) Identify and describe any additional mitigation measures, if applicable.
3) Characterize residual cumulative effects.

4.7.1 Identification of RFDs and Potential Cumulative Effects

Cumulative effects are described as those resulting from residual Project effects combined with the effects of RFDs and their activities. Future developments that are reasonably foreseeable are those that fit any of the first three and both of the last two criteria from the list below:

- future physical projects or activities that have obtained the necessary approvals to proceed, are currently under regulatory review or have officially entered a formal regulatory application process
- have been publicly disclosed by other proponents
- may be induced by the Project
- have the potential to change the Project or the effects predictions
- occur in the spatial assessment boundary defined by the VECs

A key criterion for selecting other projects to include in the cumulative effects assessment for a VEC is that those projects must cause similar effects on the same VECs influenced by the Project (Hegmann et al. 1999). Figure 4-4 provides a list of known RFDs and physical activities that could overlap spatially and temporally with the Project's residual environmental effects. These projects are also presented spatially in Figure 4-4. The following sources were used to identify active or planned Projects within the vicinity of the Project:

- The Department of Environment and Climate Change's list of Environmental Assessment Projects
- The Québec Ministère de l'Environnement, de la Lutte Contre les Changements Climatiques, de la Faune et des Parcs Registre des Évaluations Environnementales

Following the identification of applicable RFDs for consideration in the assessment of cumulative effects on a VEC, residual Project effects were evaluated for temporal and spatial overlap with the effects of RFDs to identify potential cumulative effects. The evaluation was completed qualitatively based on publicly available information (e.g., EA reports) describing the environmental effects of RFDs. Accordingly, a cumulative effects assessment was not required for all VECs as it depended on whether or not effects from the RFDs would have the potential to overlap with the residual Project effects of the selected VECs within the spatial and temporal assessment boundaries defined for the Project (Section 4.5).

The construction and operation of a 735-kV transmission line and support infrastructure between Churchill Falls and Flora Lake is required for the Kami Project to proceed. Should this Project proceed, a 315 kV transmission line would be proposed from the Flora Lake substation to the Kami substation located at the process plant to power the Project's operations. Through discussions with NL Hydro, the Labrador West Transmission Study will address the EA requirements for this infrastructure and is not included in the scope of this Project. This transmission line would have a proposed length of 18.5 km and width of 100 m with a total of 57 self-supporting or guyed towers. The transmission line alignment would proceed from the Flora Lake transformer station, traversing west along Highway 500 before heading south, east of the airport and Wabush before traversing west to the Kami substation. The transmission line will follow existing corridors and disturbed areas, where feasible. The transmission line would address electricity needs for both this Project, as well as the local electricity deficiencies, supporting future development in the surrounding area. The study is partially funded through Natural Resources Canada's Smart Renewables and Electrification Pathways Program.

In addition to human activities, climate change and related effects (e.g., extreme weather, increased frequency and intensity of extreme weather events, and wildfires) may contribute to cumulative effects. Where applicable, climate change was considered in the context of the cumulative effects assessment for certain VECs.

Identification of Additional Mitigation Measures

Based on the assessment of potential cumulative effects, an assessment was made of whether additional mitigation measures, beyond those proposed for the Project, were required to address potential cumulative effects. Where applicable, additional mitigation measures were identified.

Characterize Residual Effects

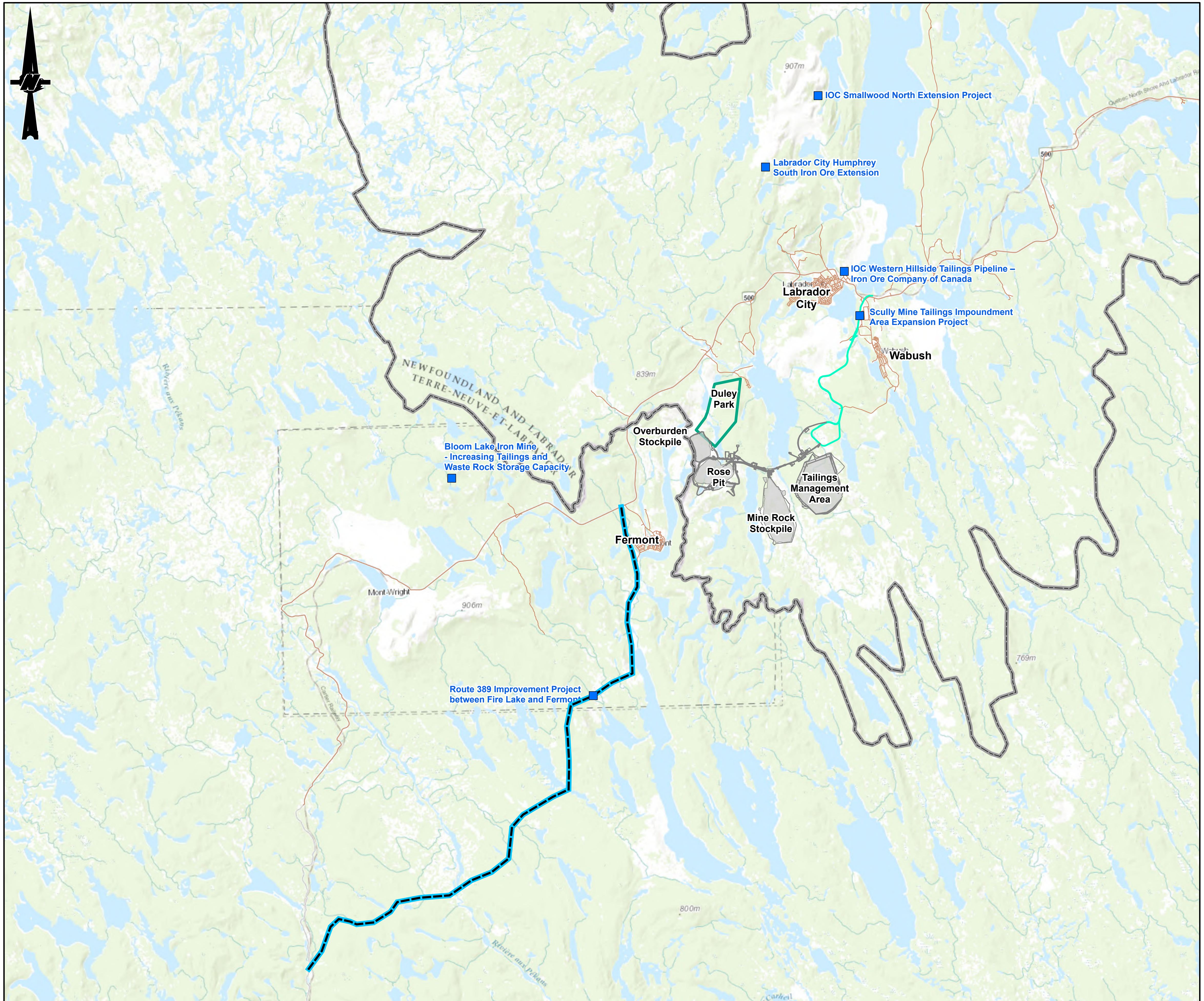
Residual cumulative effects (i.e., those remaining after the implementation of mitigation) were characterized using the same criteria assessed for residual Project effects (Section 4.6). For each VEC, the characterization of cumulative effects was conservatively completed for the phase or period (i.e., temporal snapshot) when adverse effects from the Project were predicted to be largest. The cumulative effects assessment for each VEC is provided in the technical chapters (i.e., Chapters 5 to 17).

Table 4-3: Project and Activities Considered in the Assessment of Residual Cumulative Effects

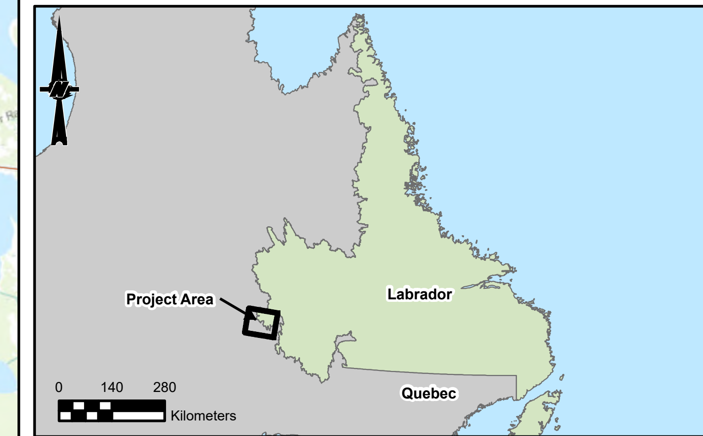
Project Name or Physical Activity	Approximate Distance from Kami Project	Project Details	Schedule	Status
Bloom Lake Iron Mine – Phase II Expansion	17 km	Québec Iron Ore Inc (QIO) owns the Bloom Lake mining complex. QIO is a subsidiary of Champion. The Bloom Lake mining complex is an existing open pit iron ore mining located in the northeastern part of the province of Québec, Canada adjacent to the Newfoundland and Labrador border, in Normanville Township, Caniapiscau County. The nearest community is the municipality of Fermont, Québec, located 13 km east of the mine site. The Phase II expansion project aims to double the iron ore concentrate production of the Bloom Lake mining complex, increasing the existing nameplate capacity of 7.5 Mtpa (Phase I) to 15 Mtpa, with operations continuing until 2040. During the first quarter of 2023, Champion successfully commissioned the Phase II process plant, doubling Bloom Lake's expected nameplate capacity to 15 Mt of concentrate/year. The Project will also expand the tailings and waste rock storage areas at the Bloom Lake mine site as the areas currently authorized for tailings and waste rock storage do not have the capacity to accommodate the quantities estimated in the mining plan. Due to the planned expansion, 195 million cubic metres (Mm^3) of waste rock and 213 Mm^3 of coarse tailings will have to be stored in new facilities. QIO received the Schedule 2 Amendment to the *Metal and Diamond Mining Effluent Regulations* in July 2024.	2023 to 2040	Ongoing, in operation
Scully Mine Tailings Impoundment Area Expansion Project	13 km	TACORA Resources Inc. is proposing to expand the tailings impoundment area of the Scully Mine, an iron ore mine located in Wabush, Newfoundland and Labrador. As proposed, the Scully Mine Tailings Impoundment Area Expansion Project would expand the existing tailings impoundment area by up to 1,411 ha, allowing for the full use of the mine's ore reserves and for operations to continue until 2047. The existing tailings impoundment area is expected to reach full capacity around 2025. The Minister of Environment and Climate Change determined that the project does not require an EA in April 2022.	2025 to 2047	Construction not yet initiated
Route 389 Improvement Program – Project A between Fire Lake and Fermont	6 to 93 km	Improving Route 389 between Fire Lake and Fermont (kilometres 478 to 564) to increase the flow and safety of the road and, in addition, improve the link with Newfoundland and Labrador as well as facilitate access to natural resources. The project is divided into three sections: — Segment 1 – between kilometres 478 and 496: new alignment — Segment 2 – between kilometres 496 and 507: major road rehabilitation — Section 3 – between kilometres 507 and 566: new 45-km route Construction of Section 3 began in late summer 2023 and construction of Segments 1 and 2 in summer 2024. The three sections are scheduled to be complete by 2028.	2023 to 2028	In construction

Project Name or Physical Activity	Approximate Distance from Kami Project	Project Details	Schedule	Status
Rio Tinto IOC Western Hillside Tailings Pipeline	15 km	Rio Tinto IOC is constructing a new tailings management plan at the IOC mine that would include optimizing available space of the existing Wabush Lake tailings storage facility and utilizing the Western Hillside Tailings Pipeline. The Project would include the development of an access road and pipeline alignment, transmission lines, pumps and pumphouses, and a modified strategy for deposition of tailings into Wabush Lake. Construction would occur from 2024 to 2033, with normal operation of tailings deposition from 2033 to 2038.	2024 to 2038	In construction
Rio Tinto IOC Smallwood North Extension Project	25 km	Rio Tinto IOC is expanding the boundaries of the existing Smallwood Pit to support ongoing operations at the Rio Tinto IOC mine in Labrador City. The proposed extension of Smallwood Pit is located within Rio Tinto IOC's existing mining leases and encompasses approximately 160 ha. The proposed project includes extending the Smallwood North pit to the north, development of a new waste dump, construction of new power lines, construction of new pit dewatering wells and the development of surface water-handling systems. Project activities include vegetation and tree clearing/mulching; removal and stockpiling of overburden, organic material and topsoil; road construction; drilling and blasting; waste rock removal and storage; construction and installation of surface and ground water management and infrastructure; and transportation of ore to existing on-site facilities for processing. Rio Tinto IOC plans to begin Project construction in the summer of 2024 with the development of the Central West Dump. Construction activities associated with the development of the open pit are planned to follow in 2029 and 2030.	2024, then 2029 to 2030	In construction
Labrador City Humphrey South Iron Ore Extension	20 km	A 370 ha extension to the Humphrey South Pit iron ore deposit that will include development into the White Lake area to support its existing operations in Labrador City. The project includes an extension of the Humphrey South Pit to the east and south, development of a waste dump south of White Lake, extension of the Carol waste dump, power lines, dewatering wells, and surface water-handling systems. Construction is anticipated to start in 2024 and be complete by 2026. Open pit mining operations would follow as soon as pit construction activities are completed. The Operations phase is split into four stages, with Stage 2 anticipated to be longest of the four stages and planned to last approximately 30 years. Stages 1, 3 and 4 operations will be staged and will overlap to a certain extent with Stage 2 mining activities. Development activities for Stage 4 of the Project are scheduled to begin in 2048 with mining beginning in 2052 and lasting through to the early 2070s.	Construction: 2024 to 2026 Operations: 2026 to 2070s	In construction

VEC = valued environmental component; X = interaction is anticipated; n/i = no interaction is anticipated, or interaction is avoided by Project design or mitigation; QIO = Québec Iron Ore Inc.; Mtpa = million tonnes per annum; Mm^3 = million cubic metres; EA = environmental assessment; IOC = Iron Ore Company of Canada; EIS = Environmental Impact Statement.



KEY MAP



SCALE 1:20,000,000

LEGEND

PROJECT INFRASTRUCTURE

- Proposed Project Infrastructure
- Proposed Project Infrastructure (Linear)
- Proposed Access Road and Railway Corridor
- Reasonably Foreseeable Developments

BASEMAP INFORMATION

- Duley Lake Park
- Labrador/Quebec Boundary
- Existing Road
- Proposed Road 389 Between Fermont and Fire Lake

0 2,500 5,000 10,000

1:250,000 METRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - NEWFOUNDLAND AND LABRADOR
2. IMAGERY CREDITS: WORLD TOPOGRAPHIC MAP: ESRI, © OPENSTREETMAP CONTRIBUTORS, HERE, GARMIN, USGS, NGA, EPA, USDA, AAFC, NRCAN
3. COORDINATE SYSTEM: NAD 1983 UTM ZONE 19N

CLIENT

CHAMPION IRON MINES LTD.

PROJECT

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

TITLE

REASONABLY FORESEEABLE DEVELOPMENTS

CONSULTANT

Kami

YYYY-MM-DD	2025-04-21
DESIGNED	----
PREPARED	GM
REVIEWED	CC
APPROVED	CC

PROJECT NO.	CONTROL	REV.	FIGURE
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

4.8 Significance Determination

The predicted changes in measurable parameters and associated residual effects classification of residual effect pathways provided the foundation for determining the significance of adverse effects from the proposed Project and other from previous and existing projects/activities and RFDs, and natural factors on VECs.

Following the residual effects analyses of the Project and cumulative effects, a determination of significance was completed for VECs based on defined significance thresholds. Significance thresholds (i.e., significance definitions) were informed by the interaction between the residual effects criteria (Section 4.6). Significance determination was binary, such that adverse Project and cumulative effects were either deemed significant or not significant for each VEC. Although the positive residual effects associated with the Project are reported in the EIS, these residual effects were not assessed for significance. Significance definitions are provided for each VEC within the technical chapters (i.e., Chapters 5 to 17) of the EIS.

4.9 Prediction Confidence and Uncertainty

A key element of a comprehensive EA is the prediction of future conditions of the environment as a result of the Project from previous and existing projects/activities and RFDs. Given that environments change naturally and continually through time and across space, assessments of effects and predictions about future conditions embody some degree of uncertainty (CEA Agency 2018).

The purpose of the Prediction Confidence and Uncertainty sections presented in each technical chapter of the EIS is to identify the key sources of uncertainty and qualitatively describe how uncertainty was addressed to increase the level of confidence that effects would not be larger than predicted, including the potential need for monitoring and adaptive management that can reduce uncertainty over time (Section 4.10).

Confidence in effects analyses can be related to many elements, including the following:

- adequacy of the baseline data for providing an understanding of the existing conditions
- the nature, magnitude, and spatial extent of future fluctuations in ecological, cultural, and socioeconomic variables, independent of effects from the Project and other developments (e.g., climate change, fire, flood)
- assumptions, conditions, and constraints of quantitative model inputs
- understanding of Project-related effects on complex social-ecological systems that contain interactions across different scales of time and space (e.g., how and why the Project would influence wildlife and Indigenous Land and Resource Use)
- knowledge and experience with the type of effect in the system
- knowledge of the effectiveness of proposed Project environmental design features or mitigation for avoiding or minimizing effects
- uncertainties associated with the exact location, physical footprint, activity level, and the timing and rate of future developments

Uncertainty in these elements can decrease confidence in the residual effects analysis and determination of significance. The EIS applied a precautionary approach to address uncertainty by using the largest magnitude, duration, and geographic extent of potential adverse effects when a range of possible outcomes could be possible. Similarly, a conservative approach was implemented when information was limited so that effects were typically overestimated (e.g., defining the key input variables in a model to produce a conservatively high effect prediction). Consequently, uncertainty is addressed in a manner that increases the level of confidence that residual effects would not be larger than predicted, especially because layers of uncertainty can accumulate throughout the assessment of any given VEC.

Uncertainty in the effectiveness of proposed mitigations was also incorporated into the assessment. If uncertainty was high, the analysis applied a precautionary approach and mitigation was not considered sufficient to remove an effect pathway. For example, if a mitigation was considered new or unproven technology or challenging to implement under certain conditions, then an effect pathway was conservatively considered to be primary. Each technical chapter includes a discussion of how uncertainty was addressed and provides a qualitative evaluation of the resulting level of confidence. The implications of uncertainty are also included in the residual effects analysis (i.e., probability of occurrence criterion) and the determination of significance. Where necessary, residual uncertainty is addressed by proposing additional mitigation, compliance monitoring programs, and/or follow-up monitoring programs.

4.10 Follow-Up, Monitoring, and Adaptive Management

Once a project is approved, environmental effects monitoring is used to verify the predicted effects and to measure compliance with future permit conditions. Monitoring is also used to identify any unanticipated effects and provide input into adaptive management to limit these effects.

Monitoring programs are proposed in each technical chapter and summarized in Chapter 20. The objectives of the proposed monitoring programs are to address uncertainties associated with the effects predictions and to evaluate the performance of the Project, including the applied mitigation and enhancement measures. The monitoring programs proposed in the EIS formulate the conceptual Environmental Effects Monitoring Program, which is presented in Annex 5E.

Adaptive management has also been proposed to address the uncertainties associated with the effects predictions and mitigation. The adaptive management approach allows for the continual review and analysis of uncertainties and risks for a project. Adaptive management provides a structured approach to decision making, but it also allows for flexibility to modify the approach to environmental protection during the lifespan of a project to continually improve the Project's environmental performance. Actions stemming from adaptive management may include more intensive or focused monitoring, specific studies focused on better understanding of a particular change in measurable parameters and associated environmental effects, improved or modified design features, or additional mitigation measures. The framework for adaptive management is presented in Chapter 20.

Appendix 4A: Project-Environment Interactions

Table 4A: Project-VEC Interactions Matrix

Project Phase or Post-Closure Period Scenario	Key Project Component/Activity[a]	Atmospheric Environment VECs					Aquatic Environment VECs			Terrestrial Environment VECs				Social Environment VECs				
		Air Quality	Climate	Noise	Vibration	Light	Hydrogeology	Surface Water	Fish and Fish Habitat	Vegetation	Wetlands	Species At Risk	Species of Conservation Concern	Indigenous Land and Resource Use	Other Land and Resource Use	Economy	Community Infrastructure and Services	Health and Community Well-Being
Construction	Site preparation and earthworks, including: ▪ Clearing vegetation, stripping and grubbing soil and excavating and grading for infrastructure construction ▪ Handling and storage of overburden ▪ Road and bridge development	X	X	X	X	X	X	X	X	X	X	X	X	X	X	n/i	n/i	X
	Quarry development and excavation of aggregate: ▪ Drilling holes in the site-prepped surface to place explosives ▪ Controlled blasting to break up the rock into aggregate ▪ Excavating and transporting the aggregate ▪ Handling and storage of the aggregate	X	X	X	X	X	X	X	X	X	X	X	X	X	X	n/i	n/i	X
	Installation and commissioning of Project infrastructure, including: ▪ The conveyor infrastructure, the crusher stations, mine service area, crushed ore dome, process plant, construction camp, concentration load-out and railway ▪ Site traffic, including transportation of personnel and materials to and from site ▪ Power generation	X	X	X	X	X	n/i	X	X	X	X	X	X	X	X	X	X	X
	Water management, including: ▪ Dewatering activities ▪ Handling, storage and discharge of non-contact water ▪ Handling, storage, treatment and discharge of contact water ▪ Water intake for fresh water and process water ▪ Sewage collection, treatment and surface discharge	X	X	X	n/i	X	X	X	X	n/i	X	X	X	X	X	n/i	n/i	X
	Employment and procurement	n/i	n/i	n/i	n/i	n/i	n/i	n/i	n/i	n/i	n/i	n/i	n/i	n/i	n/i	X	X	X
Operations	Open pit mining, including: ▪ Blasting and crushing ore and mine rock ▪ Operating mobile mining equipment	X	X	X	X	X	X	X	X	X	X	X	X	X	X	n/i	n/i	X
	Ore handling, storage and process, including: ▪ Crushing, handling and storage of iron ore ▪ Processing iron ore concentrate ▪ Railcar loading and transportation	X	X	X	X	X	n/i	X	X	X	X	X	X	n/i	n/i	n/i	n/i	X
	Mine waste management, including: ▪ Handling and storage of mine waste, including overburden, mine rock and tailings ▪ Operating mobile mining equipment	X	X	X	X	X	X	X	X	X	X	X	X	X	X	n/i	n/i	X
	Water management, including: ▪ Handling, storage and discharge of non-contact water ▪ Handling, storage, treatment and discharge of contact water ▪ Water intake for fresh water and process water ▪ Sewage collection, treatment and surface discharge	X	X	X	n/i	X	X	X	X	n/i	X	X	X	X	X	n/i	n/i	X
	Additional services and infrastructure, including: ▪ Site traffic, transportation of personnel and materials to and from the site ▪ Camp, mine services area, and office operation	X	X	X	n/i	X	n/i	X	X	n/i	n/i	X	X	X	X	X	X	X
	Employment and procurement	n/i	n/i	n/i	n/i	n/i	n/i	n/i	n/i	n/i	n/i	n/i	n/i	n/i	n/i	X	X	X
Closure	Accelerated pit flooding	X	X	X	n/i	X	X	X	X	n/i	X	X	X	X	X	n/i	n/i	X
	Site traffic, transportation of personnel and materials to and from the site	X	X	X	n/i	X	n/i	n/i	n/i	n/i	n/i	X	X	X	X	X	X	X
	Removal of infrastructure, restoration and revegetation of facilities and infrastructure	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Post-Closure Period[b]	Long-term monitoring	n/i	n/i	n/i	n/i	n/i	X	X	X	n/i	n/i	n/i	n/i	n/i	n/i	n/i	n/i	X

a) Project components or activities may combine to interact with VCs or intermediate components; as such, pathways identified in Section 7, Air Quality, Noise, and Climate Change, to Section 19, Community Well-Being, of the Environmental Impact Statement may include more than one of the key Project components/activities listed.
b) Not a Project phase
VEC = valued ecosystem component; X = interaction is anticipated; n/i = no interaction is anticipated, or interaction is avoided by Project design or mitigation.

Kami

Kamistiatusset
Mining
Project