PN5 Summary

OSISKO MINING

WINDFALL MINING PROJECT

SUMMARY OF THE ENVIRONMENTAL IMPACT ASSESSEMENT

MARCH 2023
201-11330-19

wsp

WINDFALL MINING PROJECT

SUMMARY OF THE ENVIRONMENTAL IMPACT ASSESSEMENT

OSISKO MINING INC.

PROJECT NO.: 201-11330-19
DATE: MARCH 2023

WSP CANADA INC.
1135 LEBOURGNEUF BOULEVARD
QUÉBEC, QUEBEC G2K 0M5
CANADA

PHONE: +1-418-623-2254
FAX: +1-418-624-1857
WSP.COM

SIGNATURES

PREPARED BY

Marie-Hélène Brisson, Biologist
Project Director, WSP

March 29, 2023
Date

REVISED BY

Vanessa Millette, geographer, M. Sc. Env.
Environment Director, Osisko Mining Inc.

March 29, 2023
Date

WSP Canada Inc (WSP) prepared this report solely for the use of the intended recipient OSISKO MINING INC., in accordance with the professional services agreement between the parties. In the event that a professional services agreement has not been executed, the parties agree that the WSP General Terms for Consultant, which were provided to you prior to the preparation of this report, shall govern their business relationship.

This report is intended to be used in its entirety. No excerpts may be taken to be representative of the findings in the assessment.

The conclusions presented in this report are based on work performed by trained, professional, and technical staff, in accordance with their reasonable interpretation of current and accepted engineering and scientific practices at the time the work was performed.

The content and opinions contained in the present report are based on the observations and/or information available to WSP at the time of preparation, using investigation techniques and engineering analysis methods consistent with those ordinarily exercised by WSP and other engineering/scientific practitioners working under similar conditions, and subject to the same time, financial, and physical constraints applicable to this type of project.

WSP denies and rejects any obligation to update the report if, after the date of this report, conditions appear to differ significantly from those presented in this report; however, WSP reserves the right to modify or supplement this report based on additional information, documentation, or evidence.

WSP makes no other representations whatsoever concerning the legal significance of its findings.

The disclosure of any information contained in this report is the sole responsibility of the recipient. If a third party uses, relies upon, or makes decisions or takes actions based upon this report, such third party is solely responsible. WSP accepts no responsibility for damages to any third party resulting from the use of this report or for damages that may result from any decision or action taken based on this report.

WSP has provided services to the intended recipient in accordance with the professional services agreement between the parties and in a manner consistent with that degree of care, skill, and diligence normally provided by members of the same profession performing the same or comparable services in respect of projects of a similar nature in similar circumstances. It is understood and agreed by WSP and the recipient of this report that WSP provides no warranty, express or implied, of any kind. Without limiting the generality of the foregoing, it is agreed and understood by WSP and the recipient of this report that WSP makes no representation or warranty whatsoever as to the sufficiency of its scope of work for the purpose sought by the recipient of this report.

In preparing this report, WSP has relied in good faith on information provided by third parties, as noted in the report. WSP has reasonably assumed that the information provided is correct and WSP is not responsible for the accuracy or completeness of such information.

The survey monuments and benchmarks used in this report are primarily for the purpose of establishing relative elevation differences between sample and/or sampling locations and cannot be used for any other purpose. In particular, they cannot be used for grading, excavation, construction, planning, development, etc.

The original of this digital file will be kept by WSP for a minimum of 10 years. As the digital file transmitted to the intended recipient is no longer under the control of WSP, its integrity cannot be assured. As such, WSP does not guarantee any modifications made to this digital file subsequent to its transmission to the intended recipient.

These limitations are considered part of this report.

CLIENT

OSISKO MINING INC.

Vice-President, Environment and Community Relations	Andréanne Boisvert, Geographer, M. A.
Environment Director	Vanessa Millette, Geographer, M.Sc. Env.
Director Community Relations & ESG	Èva Roy-Vigneault

PRODUCTION TEAM

WSP CANADA INC. (WSP)

Project Director	Marie-Hélène Brisson, Biologist
EIA Summary	Émilie Deschênes Dénommé, M.Env.
	Gilles Vaillancourt, MGP
Cartography and Geomatics	Christine Thériault, Cartographer, B.Sc.
Word Processing and Editing	Cathia Gamache

Reference to be cited:

WSP. 2023. *WINDFALL MINING PROJECT. SUMMARY OF THE ENVIRONMENTAL IMPACT ASSESSEMENT.* REPORT PREPARED FOR OSISKO MINING INC. 142 PAGES.

TABLE OF CONTENTS

TABLE OF CONTENTS (CONT.)

TABLE OF CONTENTS (CONT.)

TABLE OF CONTENTS (CONT.)

TABLE OF CONTENTS (CONT.)

TABLE OF CONTENTS (CONT.)

TABLES

FIGURES

TABLE OF CONTENTS (CONT.)

MAPS

1 INTRODUCTION AND CONTEXT OF THE ENVIRONMENTAL IMPACT ASSESSMENT

This document summarizes the Environmental Impact Assessment (EIA) for the Windfall gold mine project (Windfall project) of Osisko Mining Inc. (Osisko). Osisko intends to develop an underground gold mine 115 km east of Lebel-sur-Quévillon, in the Nord-du-Québec region of Eeyou Istchee James Bay territory. In addition to the underground mine, the mine complex will include an ore processing plant, a backfill plant, a tailings storage facility (filtered tailings), a waste rock stockpile, an industrial water treatment plant, and a mine effluent, as well as a workers' camp.

The Windfall project is 100% owned by Osisko and as such, no prior agreements with third parties will influence its completion.

The Windfall project is subject to the provincial environmental impact assessment and review process under section 153 of the Environment Quality Act (EQA, chapter Q-2) and Section 22 of the James Bay and Northern Quebec Agreement (JBNQA), which document the provisions applicable to the Eeyou Istchee James Bay territory. A Directive has been issued by the Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs (MELCCFP), for the Windfall project (MELCC, 2022, file 3214-14-059). Although not subject to a federal environmental assessment under the Impact Assessment Act (S.C., 2019, c. 28, s. 1), various federal authorizations will be required.

The summary, which follows the structure of the EIA, provides an overview of its various chapters. Chapter 1 presents the context of the Windfall project, including Osisko's corporate approach to sustainable development, the project integration context, and the regulatory context. Chapter 2 presents an analysis of the location and technology alternatives that were considered in order to reduce environmental impacts. A description of the project and its main components is provided in Chapter 3. Chapter 4 discusses Osisko's efforts with local communities and presents the concerns raised by stakeholders, as well as the major issues involved. The methodology used for the impact assessment as well as the delineation of the study areas used are discussed in Chapter 5.

Chapters 6, 7, and 8 present the current conditions of the physical, biological, and social environments. The impacts of climate change on activities and infrastructure are then discussed in Chapter 9. Chapter 10 presents a summary of the project's residual impacts on the environment, as well as all the proposed mitigation measures. Cumulative impacts on the valued components of the receiving environment are discussed in Chapter 11. Chapter 12 identifies potential accident risks and summarizes the risk management approach that will be applied. Chapters 13 and 14 concludes with a presentation of the monitoring and follow-up program that will be implemented by Osisko and an assessment of the consideration of issues.

1.1 OSISKO'S ENVIRONMENTAL AND SUSTAINABLE DEVELOPMENT POLICIES, CORPORATE PROCEDURES, AND AGREEMENTS

Osisko is a Canadian corporation listed on the Toronto Stock Exchange (TSX:OSK), incorporated in 2010 under the Ontario Business Corporations Act (R.S.O. c. B.16). The corporation's head office is located in Toronto. Osisko also has an office in Montréal, in Lebel-sur-Quévillon, and at the Windfall site. Osisko is primarily engaged in the acquisition, exploration, and development of precious mineral deposits in Canada. Osisko projects are at the exploration stage and is subject to similar risks and challenges as other companies at a comparable stage.

Osisko has formulated a Corporate Responsibility Strategy aimed at minimizing environmental impacts and creating sustainable value for all its stakeholders, including host communities. This commitment materializes on a daily basis through the integration of social, environmental, and economic aspects into the company's decision-making processes, as well as through the resulting actions. Osisko reports on its sustainability performance through its annual sustainable development report.

In particular, the corporation has adopted its Environmental Policy, which sets out guidelines for reducing its impact on the environment and for ensuring sound management of its environmental practices. Osisko has also developed a Responsible Procurement Policy that supports local purchases and suppliers, and a Community Relations Policy that not only promotes ongoing dialogue with host communities, but also demonstrates the corporation's commitment to the socio-economic development of these communities. Its policies on the Diversity of the Board of Directors and Executives, on Human Resources, and on Harassment in the Workplace also promote inclusion and diversity in the workplace. The objective of the Professional Development Policy is to promote the development of employees' skills and qualifications, to facilitate the integration of the next generation of employees, and to ensure a qualified succession for management positions. Osisko also has a Health and Safety Policy based on five fundamental values: respect, passion, diversity, integrity, and efficiency for its workers, partners, and the general public. Finally, the Forest Road Access Procedure implemented by Osisko specifies the access road to be used to reach the Windfall site, as well as the rules to be followed when driving on this designated access road.

Its sustainable development reports and all its corporate policies and procedures are presented on its website (https://www.osiskomining.com/data-center/).

Osisko has also implemented and developed agreements for the Windfall project with local communities. It continues to honour the Advanced Exploration Agreement with the Cree First Nation of Waswanipi (CFNW), the Grand Council of the Crees, and the Cree Regional Authority that was signed by Eagle Hill in 2012, prior to Osisko's acquisition of the Windfall project. This agreement is aimed at promoting the employment and training of Cree workers and providing business opportunities for Cree businesses, particularly in the areas of road maintenance and food services. Osisko also signed a collaboration agreement with the town of Lebel-sur-Quévillon in 2017. The main objectives of this collaborative process are to ensure transparency and effective communication with the town, to promote social acceptability, and to maximize the socio-economic benefits of the Windfall project for Lebel-sur-Quévillon, all in a spirit of partnership.

1.2 PROJECT INTEGRATION CONTEXT

The Windfall project is located north of the 49th parallel in the Nord-du-Québec administrative region, on Category III lands in the Eeyou Istchee James Bay territory. The mine site is located approximately 270 km from the town of Val-d'Or and 115 km east of the town of Lebel-sur-Quévillon (Map 1-1). It is located on Crown land and is accessible by forest roads (Road R1050 [R1000] to kilometre 12, Road R0853 [R5000] to kilometre 66, then Road R1053 [R6000] to kilometre 112 - Windfall).

Mining exploration activities have taken place on the Windfall property since 1975. Gold mineralization in this area was discovered in 1994 by Murgor Resources. The Alto Fault was subsequently discovered in 1996 by Alto Minerals Inc. In 2008, Noront Resources Ltd. excavated an exploration ramp to take a bulk sample. Several vestiges of the work done for the 2008 bulk sample can still be seen on the site.

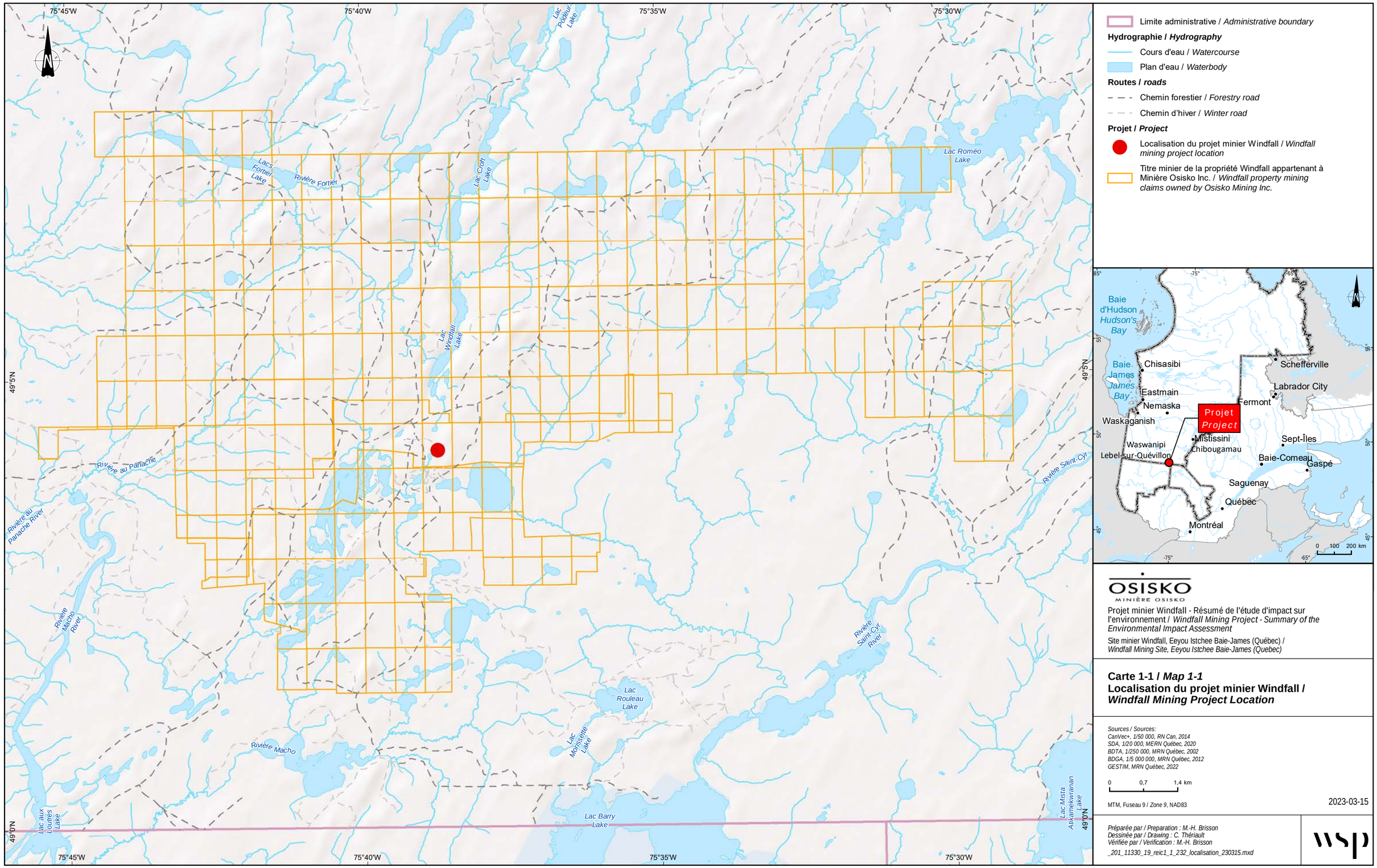
In 2015, Eagle Hill released the results of a preliminary economic assessment (PEA) for the Windfall project. Osisko, formerly Oban Mining Corporation, acquired Eagle Hill in 2015 and then initiated a drilling campaign at the site. In 2016, drilling led to the discovery of the Lynx zone, which would later become the cornerstone of the mineral resource estimation.

In 2017, Osisko undertook to continue the bulk sampling work started by Noront. Collection of a bulk sample of 5,567 tonnes of mineralized material was completed in the fall of 2018. At the end of 2017, Osisko continued exploration of the Lynx zone. Following permitting, the collection of a bulk sample of 5,716-tonne of mineralized material from the Lynx Zone was completed in September 2019.

Following the completion of the surface drilling program conducted in 2018–2019, and the discovery of the Triple Lynx zone, Osisko has received approvals to collect a third 5,000-tonne sample from this zone. As of 2020, exploration efforts have focused on the Lynx zone.

In the summer of 2021, Osisko applied for new permits to conduct a fourth bulk sampling in the Lynx 4 and Caribou sector. These were obtained in December 2022 and work on the surface infrastructure will begin in 2023.

Over the years, Osisko has published several technical studies on the Windfall project. In July 2018, Osisko finalized an initial PEA that included the Windfall and Osborne-Bell deposits. In April 2021, another PEA was finalized. Finally, the Windfall feasibility study was published on January 10, 2023 (effective date: November 25, 2022). It is based on the conclusions of the Mineral Resource Estimate (MRE) of August 2022 and reports 4.1 million ounces Au in measured and indicated resources (cut-off grade 3.5 g/t Au) at an average grade of 11.4 g/t Au, and 3.3 million ounces Au in inferred resources at an average grade of 8.4 g/t Au. Probable mineral reserves for the Windfall project total 3.159 million ounces Au.



OSISKO
MINIÈRE OSISKO

Projet minier Windfall - Résumé de l'étude d'impact sur l'environnement / *Windfall Mining Project - Summary of the Environmental Impact Assessment*

Site minier Windfall, Eeyou Istchee Baie-James (Québec) / *Windfall Mining Site, Eeyou Istchee Baie-James (Quebec)*

Carte 1-1 / *Map 1-1*
Localisation du projet minier Windfall / *Windfall Mining Project Location*

Sources / Sources:
CanVec+, 1/50 000, RN Can, 2014
SDA, 1/20 000, MERN Québec, 2020
BDTA, 1/250 000, MRN Québec, 2002
BDGA, 1/5 000 000, MRN Québec, 2012
GESTIM, MRN Québec, 2022

2023-03-15

Préparée par / Preparation : M.-H. Brisson
Dessinée par / Drawing : C. Thériault
Vérifiée par / Verification : M.-H. Brisson
_201_11330_19_reic1_1_232_localisation_230315.mxd

wsp

1.3 PROJECT RATIONALE

According to the November 2022 feasibility study, average annual production is expected to reach 294,234 ounces of gold, with an average grade of 8.1 g/t gold entering the ore processing plant. Total production will be 2,942,339 ounces of gold. The resource potential known to date for the Windfall project deposit is therefore promising. The anticipated head grade of 8.1 g/t Au makes the Windfall project one of the top 10 high-grade gold deposits in the world among operating mines.

The Windfall project will maximize the economic spinoffs in local (First Nation/non-First Nation) and regional communities. Expenditures will total $789 million for the construction phase, $2,722 million for the operation phase (over 10 years) and $83.3 million for the closure phase. The Windfall project capital expenditures will generate $65.3 million in tax revenues for the Government of Quebec and $42.6 million for the Government of Canada. These capital expenditures are expected to generate $579.3 million in GDP over the period. It is estimated that 53% of the value added ($305.7 million) will be generated in the Abitibi-Témiscamingue and Nord-du-Québec regions. The capital expenditures will support a total of 5,223 full-time equivalent (FTE) jobs throughout Quebec, including 2,800 in the Abitibi-Témiscamingue and Nord-du-Québec regions. Of the 2,800 jobs, 682 will be in the Nord-du-Québec region.

Between 2024 and 2035, the operation of the mine will contribute a total amount of $1,783 million to Quebec's GDP. Of this amount, $1,155 million will be directly generated in the Abitibi-Témiscamingue and Nord-du-Québec regions, representing 65% of the value creation. In addition, between 2025 and 2035, operating expenses will generate $711.5 million in tax benefits for the Government of Quebec. On average, a total of 1,017 direct and indirect jobs will be supported during the mine's operation. Of this number, 475 jobs will be directly supported by Osisko and indirect jobs will account for an average of 542 FTE jobs per year. The Abitibi-Témiscamingue and Nord-du-Québec regions will be able to count on an average of 635 jobs per year. According to the World Gold Council, the average annual demand for gold is 4,314 tons for the period 2012–2021. Of the average 2012–2021 supply, 74% of the gold used annually came from mining while 26% was recycled. The need for gold jewelry, global central bank reserves, and electronics, as well as the trend towards electrification, should support annual gold demand in the coming years. The gold market has seen many fluctuations over the past 50 years, but the price of gold has generally followed a growth curve.

1.4 ALIGNMENT WITH AGREEMENTS AND POLICIES

Several elements of the Windfall project are in line with certain agreements and policies in effect for the Nord-du-Québec region, as well as for the province:

- Section 22 of the JBNQA, the Cree Nation Mining Policy, and the Agreement on Governance in the Eeyou Istchee James Bay Territory:
  - The main objective of Osisko's consultation process with the Cree communities, particularly the Cree First Nation of Waswanipi (CFNW) and the affected tallymen, is to consider their interests, concerns, and traditional knowledge throughout the development of the Windfall project in order to ensure that traditional activities are protected. For example, members of the Waswanipi community have been involved in several wildlife inventories.
  - The assessment of the impacts on the physical, biological, and human environments, the proposed mitigation measures, as well as the monitoring and follow-up program were all designed with the objective of reducing the impacts on the First Nation population and on natural resources. In particular, Osisko consulted the tallymen concerned to identify which areas of the territory they value for their traditional activities.
- The Strategic Vision for Mining Development in Quebec and the Northern Action Plan:
  - The Windfall project contributes to the development of current mining sectors, namely the gold sector. As a result of the consultation process undertaken, the consideration of concerns and interests, and Osisko's commitments, the project also promotes harmonious coexistence with other land uses, as well as the creation of local jobs. The Windfall project will create approximately 1,100 direct and indirect jobs during the construction phase and approximately 670 permanent jobs during the operation phase.
  - The Windfall project fits well with the economic stimulus package that focuses on responsible community and natural resource development in the North. Osisko will continue to contribute to the development of training programs specific to the mining sector and adapted to the regional context.

The Windfall project and the EIA were also developed while considering the three pillars of sustainable development: maintaining environmental integrity, improving social equity, and enhancing economic efficiency. From the beginning of the project, Osisko has integrated the principles of continuous improvement into the various meetings to adopt sustainable practices, reduce environmental impacts, and consider "post-project" effects. Citizen participation was integrated into the planning and decision-making process, and alternatives were evaluated based on the interactions between the various ecosystem components and the satisfaction of people's needs, without compromising the needs of future generations.

1.5 REGULATORY CONTEXT

The Windfall project, which is located in the James Bay agreement territory (now called Eeyou Istchee James Bay), is subject to a specific authorization process under the JBNQA. In addition, the Windfall project will require provincial, federal, and regional approvals under applicable laws and regulations.

1.5.1 JAMES BAY AND NORTHERN QUEBEC AGREEMENT

Being located south of the 55th parallel, the Windfall project is governed by the provisions of Section 22 applicable to the Eeyou Istchee James Bay territory. Section 22 defines the environmental and social protection regime of the Cree people, their societies and communities, and their economy in relation to development activities affecting the territory. Schedule 1 of Section 22 also provides a list of projects subject to the environmental assessment process.

According to Section 22, two committees are responsible for the environmental and social assessment of projects in the Eeyou Istchee James Bay territory: the Environmental and Social Impact Evaluating Committee, or COMEV, determines whether a project is subject to an EIA and the scope of the EIA, while the Environmental and Social Impact Review Committee, or COMEX, reviews the EIA and recommends whether or not to authorize the project.

The Eeyou Istchee James Bay Regional Government (EIJBRG) is also involved in the authorization process. Following receipt of the ministerial authorization (formerly the certification of authorization) from the Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs (MELCCFP), additional applications for authorization will be filed, mainly under the James Bay Region Development Act (chapter D-8.0.1).

1.5.2 QUEBEC

The environmental and social impact evaluation and review process in Quebec is divided into two protection regimes, one for the southern part of the province and one for the northern part. The Windfall project is covered by the second environmental and social protection regime, applicable to the Eeyou Istchee James Bay territory. It is established under Section 22 of the JBNQA and is governed by sections 148 to 167 of the Environment Quality Act (EQA, Chapter II). Under this regime, any mine project, which includes the expansion, transformation, or modification of an existing mining operation, is subject to the environmental and social impact evaluation and review procedure. Therefore, the Windfall project is subject to the procedure.

Once the certificate of authorization for the construction and operation of the underground gold mine is obtained, ministerial authorizations (EQA, section 22), a mining lease (Mining Act), and other permits will be required to proceed with the construction of the planned infrastructure.

It should be noted that the development of the EIA is based on Directive 019 (D019) of the MELCCFP, which presents the basic requirements for the various types of mining activities.

1.5.3 CANADA

The Windfall project is not subject to a federal environmental assessment under the Impact Assessment Act (IAA) (S.C., 2019, c. 28, s. 1) pursuant to the Physical Activities Regulations (s. 18, subpara. c), as the anticipated production from this new gold mine is less than 5,000 tonnes of ore per day (t/day). It should be noted that the Windfall project was subject to the Canadian Environmental Assessment Act (2012) when it was originally submitted in 2017. Following the reform of this law, which was replaced by the IAA in 2019, Osisko received a letter from the Impact Assessment Agency of Canada (IAAC) confirming the closure of the federal environmental assessment procedure for the Windfall project.

A Fisheries Act authorization will be required from Fisheries and Oceans Canada (DFO) for the indirect effects of the project on fish habitat. Furthermore, considering that the final effluent will be discharged into a water body connected to water courses and lakes that are considered potential fish habitat, the Windfall project will be subject to the Metal and Diamond Mining Effluent Regulations (MDMER).

Also, the Canadian Navigable Waters Act will apply as navigable water bodies as defined in the Act will be indirectly affected by the construction of the mining infrastructure.

2 LOCATION AND TECHNOLOGY ALTERNATIVES

The identification and analysis of project alternatives is part of the environmental assessment process, which must highlight the objectives and criteria for selecting the proponent's preferred alternative.

The following sections present, for the major components of the project, the description of the infrastructure location and technology alternatives studied, the comparative analysis, and finally the selected alternative.

2.1 LOCATION OF THE MAIN INFRASTRUCTURE

2.1.1 PROCESS PLANT

In 2017, Osisko was considering two options for the location of the process plant, either on the Windfall site itself or near the municipality of Lebel-sur-Quévillon. The possibility of acquiring and converting plants to meet the project's needs has been studied in the area, namely at the process plants at the Langlois and Bachelor sites. However, the technical specifications did not meet the specific needs of processing the mineralization from the Windfall deposit.

Furthermore, the use of these existing plants or a plant near Lebel-sur-Quévillon would have required the transportation of the ore on existing logging roads, the equivalent of 21 to 26 heavy truck trips (75 to 90 tonnes) per day, 365 days a year (except if there are road closures). This transportation would have generated a significant amount of GHG due to diesel use in the trucks and would have resulted in additional impacts on land use in an area where there is no current activity by Osisko. The presence of mining trucks on these logging roads also raised concerns from both First Nation and non-First Nation users of the territory.

Between 2018 and 2021, Osisko continued its exploration efforts to estimate the mineral resources of the Windfall deposit. The updated geological interpretation of the Windfall deposit has redefined its footprint, which is much larger than the previously defined mineralized area. The larger size of the Windfall deposit allows it to support a processing plant on site.

2.1.2 TAILINGS STORAGE FACILITY

The assessment of the Windfall tailings storage facility siting alternatives was completed in April 2022 in accordance with the Guidelines for the assessment of alternatives for mine waste disposal. Two storage technologies were assessed for each of the potential sites: filtered tailings and thickened paste tailings.

To identify potential sites to include in the analysis of alternative tailings storage facility and waste rock stockpile locations, screening criteria were developed to consider encroachment on fish habitat and traditional land use, as well as the presence of drinking water sources, existing or projected protected areas, archaeological sites, and existing or proposed power line rights-of-way. Meetings were also held with land users to identify areas that are incompatible with mining activity on their traplines. The nine selected alternatives were then assessed according to environmental, socio-economic, technical, and economic criteria. According to the results of this analysis, the two highest-scoring sites used tailings filtration technology.

The selected site (alternative 8F) is located 950 m east-northeast of the site selected for the ore processing plant. It has the advantages of impacting a smaller watershed area, requiring less wood cutting, being closer to the proposed ore processing plant, having existing access roads, having favourable geotechnical conditions, and being further away from a watercourse or lake and from fish habitat. However, its main disadvantages are the presence of sensitive elements downstream from the site and the encroachment on a territory previously used by the father of the W25B trapline tallyman.

2.1.3 OTHER STOCKPILE AREAS

ORE

The ore stockpile had to be positioned close to the crusher and near the surface portal exits to minimize transportation distances, which is also positive in terms of reducing GHG emissions. The ore processing plant, conveyor, silo, and crusher also had to be placed on a solid rock foundation, so the depth and elevation of the rock were the determining factors. It was also possible to optimize the design of the ore stockpile by limiting its footprint to a single watershed. Technical considerations associated with water management and safety factors to account for climate change were incorporated into the analysis. The area was also partially impacted by exploration activities and was not used by land users.

OBERBURDEN

The positioning of the overburden stockpile is highly influenced by the location of the other infrastructure since it is typically among the last components to be placed on a mine site due to its fewer siting constraints. For this reason, the choice of site was made through an iterative process during which different sites were successively considered. The main selection criteria considered were storage capacity, proximity to the tailings storage facility (main area to be stripped), minimum distance of 60 m from lakes and watercourses, and areas already impacted by exploration activities. In total, four options were considered during the development of the project. The site selected was already partially stripped and impacted by previous exploration activities on the site. It was not used by the tallyman or his family members for traditional activities.

WASTE ROCK

At the outset, it was deemed optimal to continue using the existing waste rock stockpile during mining operations. It will be enlarged and elevated during the life of the mine. It was more efficient to concentrate the waste rock transfer activities in one location and to limit the footprint. The addition of a higher plateau, while respecting the stability criteria and minimizing the visibility of the structure, was an obvious advantage to the project. This option was also the most economically advantageous and allowed the use of areas already impacted by the mining infrastructure of advanced exploration, minimizing habitat loss.

2.1.4 WATER TREATMENT PLANT AND MINE EFFLUENT

Once the stockpile areas have large surfaces (and consequently large volumes of water), placement of the water treatment plant (WTP) close to the stockpile areas and the stormwater retention ponds is optimal. The location of the WTP was selected in an earlier phase of the project, during the advanced exploration phase, which is outside the scope of the current EIA.

Since the WTP is located approximately 300 m west of Lake SN2, it was initially suggested that the mine effluent be discharged into this lake. It was finally decided that the effluent be discharged into Pond 1, as is currently the case in the exploration phase. The main advantages of this alternative are the greater capacity to absorb the additional water volumes that will mix at the junction of Lake SN5 downstream of Pond 1, the reuse of existing infrastructure and facilities, and the lower quality of fish habitat compared to Lake SN2. Osisko considered the fact that Lake SN2 has the greatest biodiversity in the study area and is a place valued for fishing by land users. The main disadvantage of the selected alternative is that the anticipated flows will be higher at the outflow of Pond 1, which could cause bank erosion during the periods of the year when the discharge volumes will be higher. However, the effluent flow should remain fairly constant.

2.1.5 MINING CAMP

One of the key criteria in determining possible locations for the permanent camp was that it had to be close to the mine complex to make it easier for employees to get to work and to avoid the need to use vehicles to get around the site. Other criteria considered were the grouping of facilities to reduce encroachment and to limit foot traffic, the avoidance of wetlands and keeping 60 m away from watercourses, the distance from areas of archaeological potential, and the distance from noisy areas (continuous operations). Four alternative locations were studied, but only one of them met all the criteria. The selected site was presented to the tallyman of trapline W25B, who expressed no concerns about its location.

2.1.6 DRINKING WATER SUPPLY

As part of the Windfall project, water research was conducted by a team of hydrogeologists in 2021–2022 to assess the feasibility of supplying the new infrastructure through groundwater withdrawal. The water search area was determined based on constraints related primarily to property boundaries, accessibility, distance from proposed infrastructure, natural topography, and water requirements.

It was determined that Well P-5, located west of the future camp, is capable of supplying raw water of acceptable quality and in sufficient quantity to meet the needs of the project (only treatment for iron-manganese removal followed by disinfection will be required). No potential sources of contamination were identified within 200 m of Well P-5 and it is not anticipated that the dewatering of the mine will impact the aquifer tapped by Well P-5. Therefore, the potential to withdraw surface water to supply drinking water infrastructure was not assessed.

2.2 TECHNOLOGY ALTERNATIVES

2.2.1 ORE PROCESSING

In gold mining, the processing and extraction methods depend on the mineralogy of the ore. The mineralization of the Windfall deposit indicates that gravimetry, flotation, and cyanidation may be feasible processing options.

Based on the tests, it was determined that the gravimetry step would increase the efficiency of gold recovery. The main process alternatives considered for treating the gravimetric circuit tails are flotation, cyanidation using the coal-in-leach (CIL) method, and cyanidation using the coal-in-pulp (CIP) method.

Although the tests showed that the flotation process gave slightly better recoveries than direct leaching, it was not selected as it was more energy intensive, and would have required a larger plant with a larger footprint, more water management, and higher capital and operating costs.

Based on a comparative study of plant layout and operating efficiency, the CIP method was selected. This choice made it possible to install the leach tanks outside the ore processing plant and the CIP tanks inside the plant, reducing capital costs and energy consumption for heating.

2.2.2 TAILINGS MANAGEMENT METHOD

The three most commonly used tailings management and storage methods are slurry storage, paste or thickened tailings storage, and filtered tailings storage.

Osisko rejected the possibility of the slurry storage method due to the greater risk of dam failure using this technology. The other two methods were therefore analyzed as alternatives. The final choice was made for the filtered tailings technology, taking into account water management and water recirculation in the ore treatment process. Otherwise, the footprint would have been larger and the technological risks higher.

2.2.3 WATER TREATMENT

MINE WATER TREATMENT

The mine water treatment strategy was developed following a multi-criteria analysis of the various possible treatment options, based on the source of the water to be managed and the main contaminants anticipated in this water, i.e., metals and nitrogen compounds.

For the treatment of metals, two precipitation options were considered in the Osisko context: precipitation in the form of hydroxides and precipitation in the form of sulphides.

For the treatment of nitrogen compounds, three options were analyzed, namely the moving bed biological reactor (MBBR), the SAGR, or adsorption on zeolite combined with electro-oxidation.

Based on the results, the technology chosen for the treatment of metals was precipitation in the form of sulphides. Among the choices considered, it was found to be the most flexible process, allowing the precipitation of several metals over the same pH range and generally resulting in better water quality.

For the treatment of nitrogen compounds, the selected technology was MBBR with added heating. It was selected for its strength and resistance to load variations by temperature adjustment. Furthermore, it can treat thiocyanates, cyanates, and ammonia nitrogen.

DRINKING WATER TREATMENT

Different systems for drinking water supply were studied to find the best solution to meet the predefined design criteria. These criteria included raw water quality (iron and manganese exceedances), compliance with the Regulation respecting the quality of drinking water (design flow), and the capacity to produce drinking water as required (maximum of 600 workers at the camp during the construction period; flow rate of 350 m^3/d).

Based on these criteria, three treatment options were considered:

- H_2O Innovation's green sand treatment system;
- Puribec's filtration media and softeners;
- Ferazur and Mangazur biological filters by Suez.

Although the expected iron and manganese removal performance of the last option (biological filters) may be superior to other technologies, the complexity of installation, the numerous mechanical components required for operation, its more complex level of operation, as well as its higher capital costs mean that it offers few advantages over other options. For these reasons, Option 3 was rejected and not assessed further.

Based on the comparative analysis of the other two options, the green sand treatment system was selected because of its simple, one-step treatment process, lower quantities of consumables, and low risk of equipment failure.

DOMESTIC WASTEWATER TREATMENT

Various treatment options were studied for the management of domestic wastewater that will be generated by the new infrastructure. The design criteria used in the selection were sufficient treatment capacity and compliance with applicable regulations. Considering that the site's total wastewater flow to be treated is greater than 100 m^3/d (117.5 m^3/d), effluent infiltration may have an impact on groundwater hydraulic flow. Therefore, a surface effluent was favoured, and a discharge to Pond 2, a tributary of Windfall Lake, was assessed. To determine the required effluent water quality, the MELCCFP was consulted and the Environmental Discharge Objectives (EDOs) were obtained in October 2022.

Four alternatives were thus considered based on these criteria and the EDOs:

- H_2O Innovation's **S**ILO™ system (membrane bioreactor);
- Bionest's KAMAK℠ technology (biological reactors installed under prefabricated floating platforms);
- Ecoprocess MBBR™ technology (moving bed biological reactor);
- Enviroseptic technology with infiltrated discharge on two separate sites.

The second option (Bionest) was not selected as it would have required the construction of aerated lagoons, which would be costly and would have a significant footprint. The third alternative (MBBR) was also not chosen because of its complex installation, the many mechanical components required for it to function, its more complex level of operation, and the higher capital costs.

The comparative analysis therefore focused on two alternatives: the SILO™ system (surface discharge) and the Enviroseptic technology (infiltration on two sites). At first glance, Option 4 (infiltration) appears to be the most favourable in the long term. Its main advantages are ease of operation and maintenance (mostly passive), low risk, and negligible impact on the water environment and fish habitat. The main disadvantages are its large footprint and higher installation costs. It should be noted that Option 1 (bioreactor with effluent) is currently the preferred technology. However, Osisko will continue its geotechnical investigations in 2023 to find locations for infiltration sites that would respect the minimum required distances and present optimal permeability, at an acceptable distance from the infrastructure served.

2.2.4 MODE OF TRANSPORTATION

As part of the project feasibility study, a comparative study between electric and diesel equipment was conducted. The main criteria considered were cost, carbon footprint, air quality, workforce, and social acceptability.

Loaders and haul trucks were excluded from the study due to the new infrastructure required for battery charging or replacement, frequency of battery replacement and impacts on production, and battery life. As battery technology and range improve over time, the choice of diesel engine for this equipment may be reviewed during operations.

Based on the results of the comparative analysis, electric vehicles seem to provide more advantages due to their lower carbon footprint, lower air quality impacts, higher social acceptability, and similar costs to diesel. The option of acquiring a fleet of battery-powered vehicles from Epiroc and MacLean was therefore chosen.

2.3 ENERGY SUPPLY SOURCES

2.3.1 SOLAR AND WIND POWER

A high-level feasibility study was conducted for wind and solar power as part of the exploration project. Wind and solar power sources were not considered due to their high initial capital costs, low energy yield, variable and unpredictable output depending on weather conditions, and the need to increase the footprint around the mine property.

2.3.2 HYDROELECTRICITY, DIESEL, AND NATURAL GAS

Various power generation options were analyzed to meet the anticipated operating needs of the Windfall project. The main objective of this study was to target an economically viable solution while reducing greenhouse gas emissions. The main scenarios studied in the report were 1) a new overhead transmission line interconnected to the Hydro-Quebec (HQ) Lebel substation; 2) a stand-alone diesel plant; and, 3) a stand-alone liquefied natural gas (LNG) plant. As a result of this study and following discussions with the Cree First Nation of Waswanipi (CFNW), a new scenario of an overhead line connecting to the HQ network in Waswanipi has replaced that of the connection to Lebel substation.

Taking into account the main critical aspects of the project, a comparative analysis was performed. This analysis included criteria associated with the four major components (environmental, technical, economic, and social).

Based on the results, the 69 kV transmission line scenario from Waswanipi was the most advantageous and was therefore selected for the project. This scenario particularly stands out with regard to GHGs, which is the most important weighted criterion due to the current context of climate change. It also received the highest overall score for the social component. The transmission line is an infrastructure project for the Crees that will leave a legacy for their community.

3 PROJECT DESCRIPTION

CURRENT EXPLORATION SITE

Activities at the Windfall site are referred to as advanced exploration as bulk sampling has been conducted since 2007. As such, several infrastructures are currently present and some of them, as shown below, are still used by Osisko.

The Windfall site is currently divided into two areas: the camp and the portal. The camp area has accommodated 300 people since 2017. It includes rooms, a kitchen, a dining room, an infirmary, offices, as well as drinking water supply and domestic water management facilities. On the camp site, there are also core shacks, core racks, waste management facilities (including a composting unit) as well as workshops and warehouses (containers and canvas domes). There is a helicopter landing pad to the south of the existing exploration camp.

Two kilometres north of the exploration camp, the portal area, for which several ministerial authorizations have already been issued, includes the so-called Main portal, as well as a ramp that is currently 12.8 km long, with an authorization to be extended to 31.6 km. In addition to the ramp, the site contains:

- an overburden stockpile;
- a lined stockpile with water collection ditches to store ore and waste rock;
- sedimentation and polishing basins (CP, SP, polishing, A, D, and P);
- water treatment units (2) and a mine effluent;
- offices;
- sanitary facilities with showers and changing rooms;
- a garage for mechanical maintenance;
- a canvas dome warehouse and surface storage areas;
- a pad for generators with electrical transmission lines;
- fuel tanks;
- two borrow pits;
- a sorting area for residual materials.

In the project under study, the current major surface infrastructure (Map 3-1), i.e., the portal and the waste rock stockpile, will be kept in place and reused, while other elements will be moved or dismantled; the generators will be reused.

WINDFALL PROJECT

The Windfall project is intended to be an underground mine accessible by ramp, operated by drifts with conventional methods of drilling, blasting, loading and hauling of ore.

The process plant which will be located at Windfall site will have a nominal processing capacity of 3,400 tpd. According to the mine plan, approximately 12.2 Mt of ore and 8.5 Mt of waste rock is expected to be mined over a 10-year mine life.

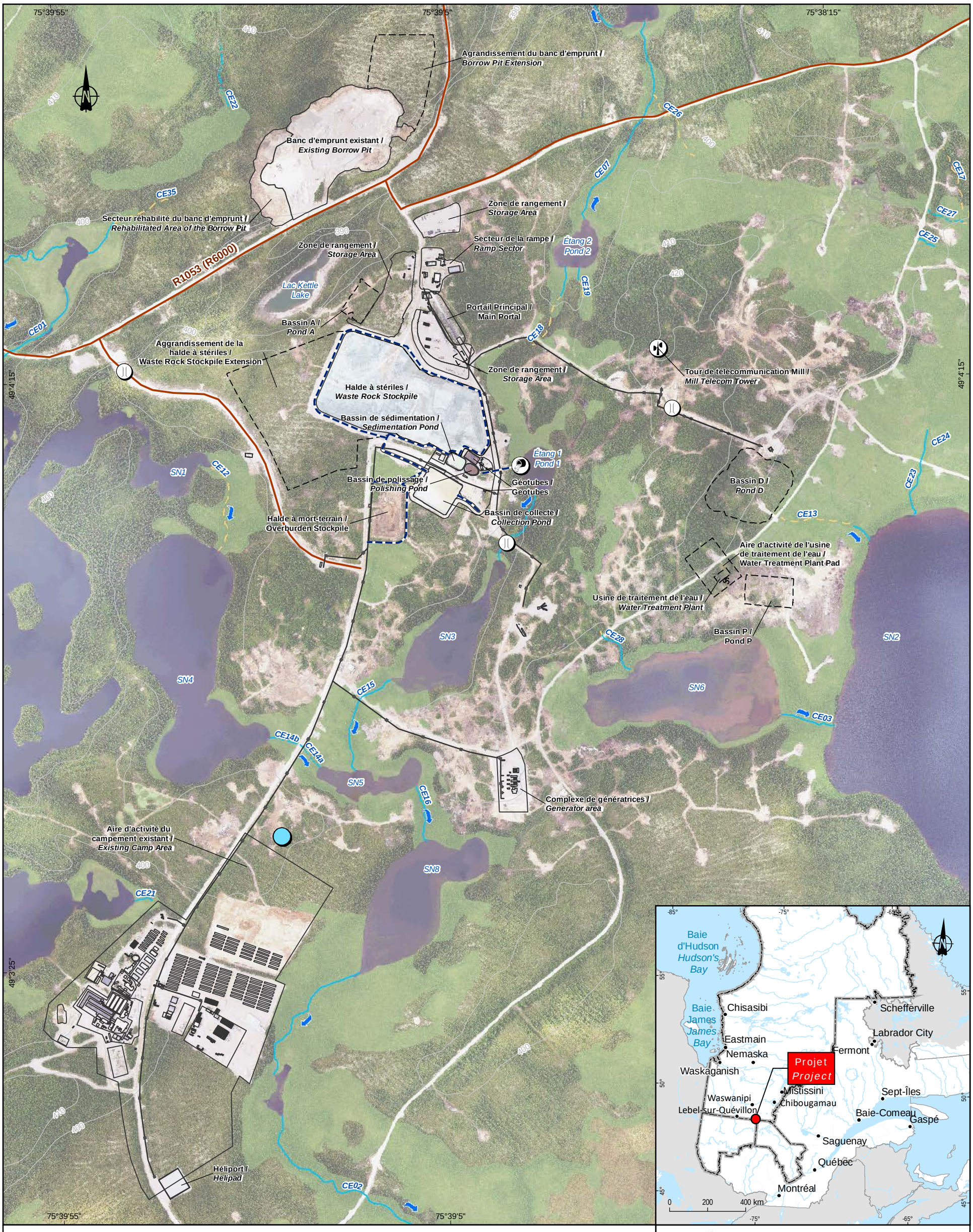
In addition to the mine and process plant, the planned infrastructure includes (Map 3-2) :

1. the addition of a portal, the Lynx portal;
2. a 9.0 Mt capacity tailings storage facility;
3. a 9.11 Mt capacity waste rock stockpile;
4. an overburden stockpile of approximately 638,000 m^3;
5. a 157,750 t capacity ore stockpile;
6. water management infrastructure (pipes, ditches, ponds and pumps);
7. a water treatment plant with a mine effluent;
8. a tailings filtration and paste backfill plant;
9. a mechanical workshop;
10. a core shack;
11. fuel storage and distribution systems;
12. underground explosives storage for each of the portals;
13. a 406-person capacity camp complex, including potable water and sewage management systems;
14. A domestic waste management storage area;
15. borrow pits;
16. a gatehouse;
17. a multi-service building where the process plant will be located. This building will house the administrative offices, the locker room and showers for the workers, the infirmary, the mine rescue room, the warehouse and the training rooms.

A 69 kV power line from Waswanipi to the Windfall project site to supply electricity will be constructed and managed by an entity independent of Osisko.

The new facilities were grouped together to ensure optimal development, minimizing encroachment on the natural environment, facilitating circulation between facilities, having better management of activities and ensuring better employee safety while maintaining safe distances between facilities.

The construction phase of the project is expected to last approximately 18 months, while the operations phase of the mine will last 10 years. The closure phase, decommissioning and reclamation activities, is expected to last approximately two years. It should be noted that environmental monitoring will continue following the closure of the project, notably for the monitoring of the final effluent and groundwater quality. A two-year post-closure program for effluent and groundwater monitoring will be updated and implemented where necessary. This monitoring will be carried out according to the provisions mentioned in section 2.10 of D019. Finally, a post-restoration monitoring program adapted to the sites to be restored, the restoration techniques in place and the contaminants present will be carried out according to the provisions mentioned in section 2.11 of D019.



Infrastructures connexes / *Related Infrastructures*

- Chemin d'accès principal / *Main access*

Infrastructures actuelles / *Actual Infrastructures*

- Effluent minier / *Mine effluent*
- Ponceau / *Culvert*
- Tour de télécommunication / *Telecommunication*
- Station météorologique / *Weather station*
- Ligne électrique / *Electric line*
- Infrastructure actuelle / *Current infrastructure*
- Autorisée pour l'échantillonnage en vrac 2023-2024 / *Autorized for bulk sampling purpose 2023-2024*

Hypsométrie / *Hypsometry*

- Courbe de niveau (10 m) / *Contour (10 m)*

Hydrographie / *Hydrography*

- Sens d'écoulement / *Flow direction*
- Cours d'eau permanent / *Permanent watercourse*
- Cours d'eau intermittent / *Intermittent watercourse*
- Cours d'eau souterrain / *Underground watercourse*

OSISKO MINIÈRE OSISKO

Projet minier Windfall - Résumé de l'étude d'impact sur l'environnement / *Windfall Mining Project - Summary of the Environmental Impact Assessment*

Site minier Windfall, Eeyou Istchee Baie-James (Québec) / *Windfall Mining Site, Eeyou Istchee Baie-James (Quebec)*

Carte 3-1 / *Map 3-1*
Infrastructures actuelles / *Current Infrastructures*

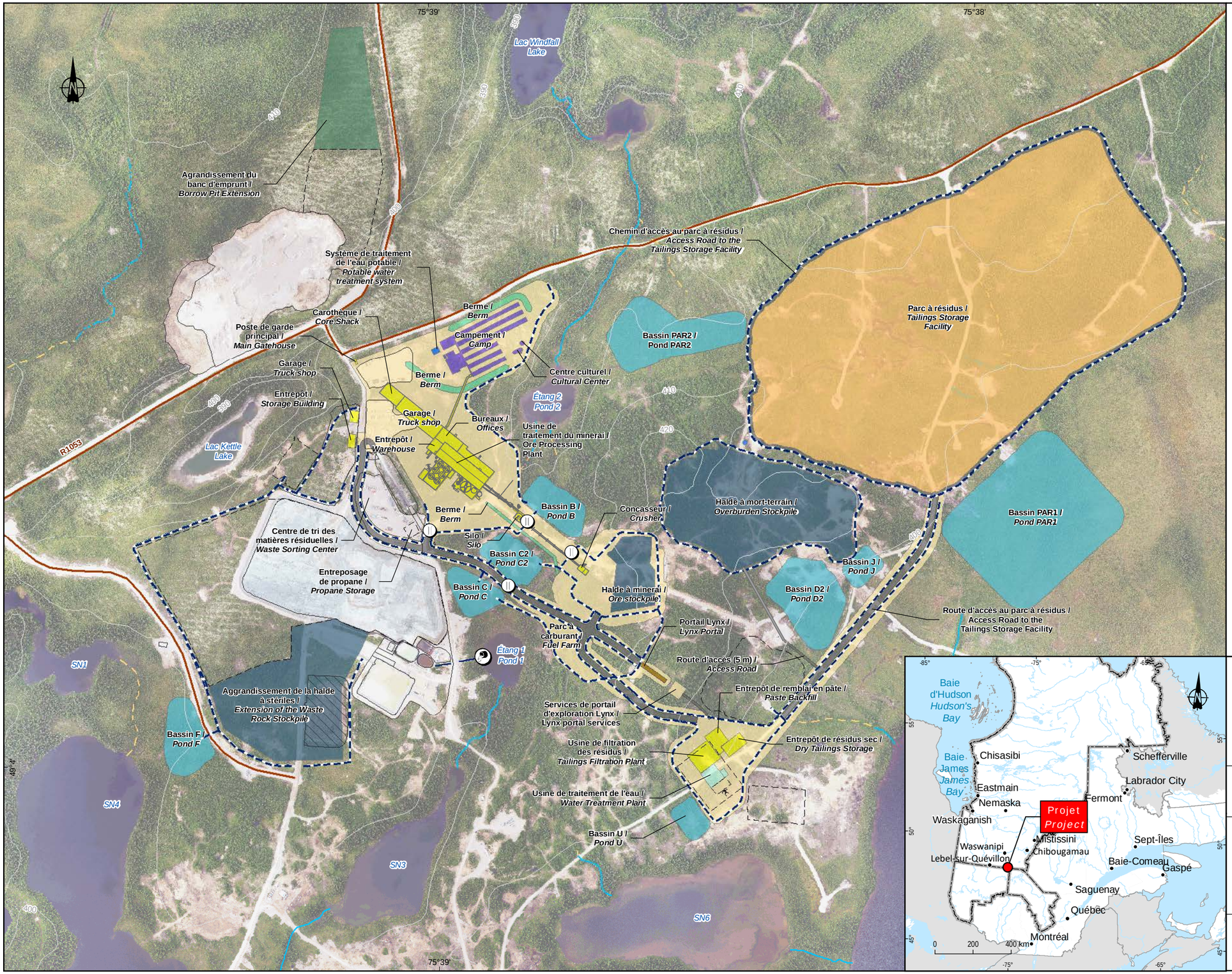
Sources :
BDAT, 1/250 000, MRN Québec, 2002
BDTQ, 1/20 000, MRNF Québec, 2007
CanVec, 1/1 000 000, RNCan, 2020
CanVec Plus, 1/50 000, RNCan, 2015
SDA, 1/20 000, MERN Québec, 2020
WSP, Infrastructures version CAWL-301-G-0602-ZJ, 2022-12-12

0 100 200 m
MTM, fuseau 9, NAD83

2023-03-23

Préparée par : M.-H. Brisson
Dessinée par : J. Roy
Vérifiée par : M.-H. Brisson
_201_11330_19_reic3_1_240_InfrasActu_230323.mxd

wsp



Infrastructures connexes / *Related Infrastructures*

- Chemin d'accès principal / *Main road*

Composantes du projet / *Project Components*

Infrastructure existante / *Existing Infrastructure*

- Infrastructure actuelle / *Current infrastructure*
- Autorisée pour l'échantillonnage en vrac 2023-2024 / *Autorized for bulk sampling purpose 2023-2024*
- Qui sera retirée / *To be removed*

Infrastructures projetées / *Planned Infrastructures*

- Ponceau / *Culvert*
- Effluent minier / *Mine effluent*
- Fossé / *Ditch*
- Aire d'activité / *Activity area*
- Banc d'emprunt / *Borrow pit*
- Bassin / *Pond*
- Bâtiment / *Building*
- Camp de travailleurs / *Workers camp*
- Halde / *Stockpile*
- Parc à résidus miniers / *Tailings storage facility*
- Route / *Road*
- Système de traitement de l'eau potable / *Potable drinking water treatment system*
- Souterrain / *Underground*
- Structure / *Structure*
- Usine de traitement de l'eau / *Water treatment plant*

Hypsométrie / *Hypsometry*

- Courbe de niveau (10 m) / *Contour (10 m)*

Hydrographie / *Hydrography*

- Cours d'eau permanent / *Permanent watercourse*
- Cours d'eau intermittent / *Intermittent watercourse*
- Cours d'eau souterrain / *Underground watercourse*
- Canal / *Canal*

OSISKO MINIÈRE OSISKO

Projet minier Windfall - Résumé de l'étude d'impact sur l'environnement / *Windfall Mining Project - Summary of the Environmental Impact Assessment*

Site minier Windfall, Eeyou Istchee Baie-James (Québec) / *Windfall Mining Site, Eeyou Istchee Baie-James (Quebec)*

Carte 3-2 / *Map 3-2*
Infrastructures projetées / *Planned Infrastructures*

Sources :
BDAT, 1/250 000, MRN Québec, 2002
BDTQ, 1/20 000, MRNF Québec, 2007
CanVec, 1/1 000 000, RNCan, 2020
CanVec Plus, 1/50 000, RNCan, 2015
SDA, 1/20 000, MERN Québec, 2020
WSP, Infrastructures version CAWL-301-G-0602-ZJ, 2022-12-12

0 85 170 m
MTM, fuseau 9, NAD83

2023-03-23

Préparée par : M.-H. Brisson
Dessinée par : J. Roy
Vérifiée par : M.-H. Brisson

_201_11330_19_reic3_2_239_InfrasProj_230323.mxd

3.1 DESCRIPTION OF THE DEPOSIT

The deposit currently identified and defined as the *Windfall project* is on the Windfall property, which consists of 286 claims and covers 12,523 ha.

3.1.1 GEOLOGICAL CONTEXT

The Windfall property is located in the eastern portion of the Northern Volcanic Zone (NVZ) of the Abitibi Subprovince, which is part of the Archean Superior Province. The Urban-Barry volcanic belt extends east-west for 135 km and is 4 km to 20 km wide.

The Urban-Barry belt contains mixed mafic to felsic volcanic rocks with lesser sedimentary deposits that are cross-cut by several east- and east-northeast-trending deformation zones. The Windfall property is located along the Mazères deformation zone. The Windfall deposit is hosted within the Macho formation that contains two distinct lithostratigraphic sequences: the Rouleau member and the Windfall member.

3.1.2 MINERALIZATION AND MINERALIZED ZONES

Two dominant styles of gold mineralization are observed in the Windfall deposit, vein type and replacement type. Vein-type mineralization consists of quartz veins that contain pyrite and subordinate amounts of carbonate, tourmaline, and commonly visible gold. These veins are generally associated with the highest gold grades, ranging on average from 20 g/t to > 100 g/t. Replacement-type mineralization consists of corridors of pyrite and gold stockworks associated with a strong silica and sericite alteration. The presence of high-grade gold intersections with spectacular visible gold is a well-documented phenomenon at the Windfall deposit.

Mineralization is currently known for a lateral extent of 3,000 m and a vertical extent of approximately 1,600 m. The deposit is subdivided into four main zones: the Lynx zone, the Main zone, the Underdog zone, and the Triple 8 zone. Current drilling is testing the extensions of several of these zones, primarily in the Lynx area.

3.1.3 RESOURCES AND RESERVES

Windfall resources include those in the Lynx, Underdog, Main, and Triple 8 zones. The resource and reserves area measures 3 km by 1.7 km by 1.2 km in depth, except for the Triple 8 zone where the depth is 1.6 km.

The resources have been classified as measured, indicated, and inferred. Measured and indicated resources are those that have the potential to be converted into reserves. Measured and indicated resources at Windfall are estimated at 11.061 Mt with grades of 11.4 g/t Au and 5.9 g/t Ag. Inferred resources are estimated at 12.287 Mt at 8.4 g/t Au and 4.8 g/t Ag.

Mineral reserves at Windfall are estimated at 12.2 Mt with grades of 8.06 g/t Au and 4.18 g/t Ag. The reserves have all been classified as probable, are included in the resource estimate, and include material extracted during bulk sampling.

The mineral reserve estimate on which the Windfall project feasibility study is based has been prepared and includes probable reserves based on cut-off grades of 3.5 g/t (operating), 2.5 g/t (incremental), and 1.7 g/t (development). The mineral reserve estimate has an effective date of September 1, 2022, and is based on the mineral resource block model dated June 7, 2022.

3.1.4 GEOCHEMISTRY

An independent study was conducted to define the geoenvironmental properties of the ore, tailings, waste rock, and overburden that will be handled by the Windfall project operations, in relation to the potential for acid mine drainage (AMD) and metal leaching.

Leach testing has determined that neither the ore, tailings, nor any type of waste rock has high-risk leaching potential. However, the tailings and ore may slightly leach arsenic, cadmium, copper, lead, zinc and mercury. Certain lithologies could leach arsenic, silver, copper, molybdenum, mercury, and manganese. The overburden is considered low risk.

Samples were also selected to reflect the range of sulphur and metal concentrations observed. Most waste rock samples were classified as being potentially acid generating (PAG), with the exception of some lithologies. All the tailings samples were also classified as having AGP and leachable for metals, including arsenic, cadmium, copper, mercury, lead, and/or zinc; however, they were not classified as high risk for metal leaching according to MELCCFP criteria.

3.2 EXTRACTION

The extraction method depends on the geomechanical conditions of the rock masses. The mining method was determined based on the configuration of the Windfall deposit, the terrain conditions, and the depth of the resource. On the mining property, two major fault systems have been identified (Bank Fault and Romeo Fault). Fault zones are generally more friable.

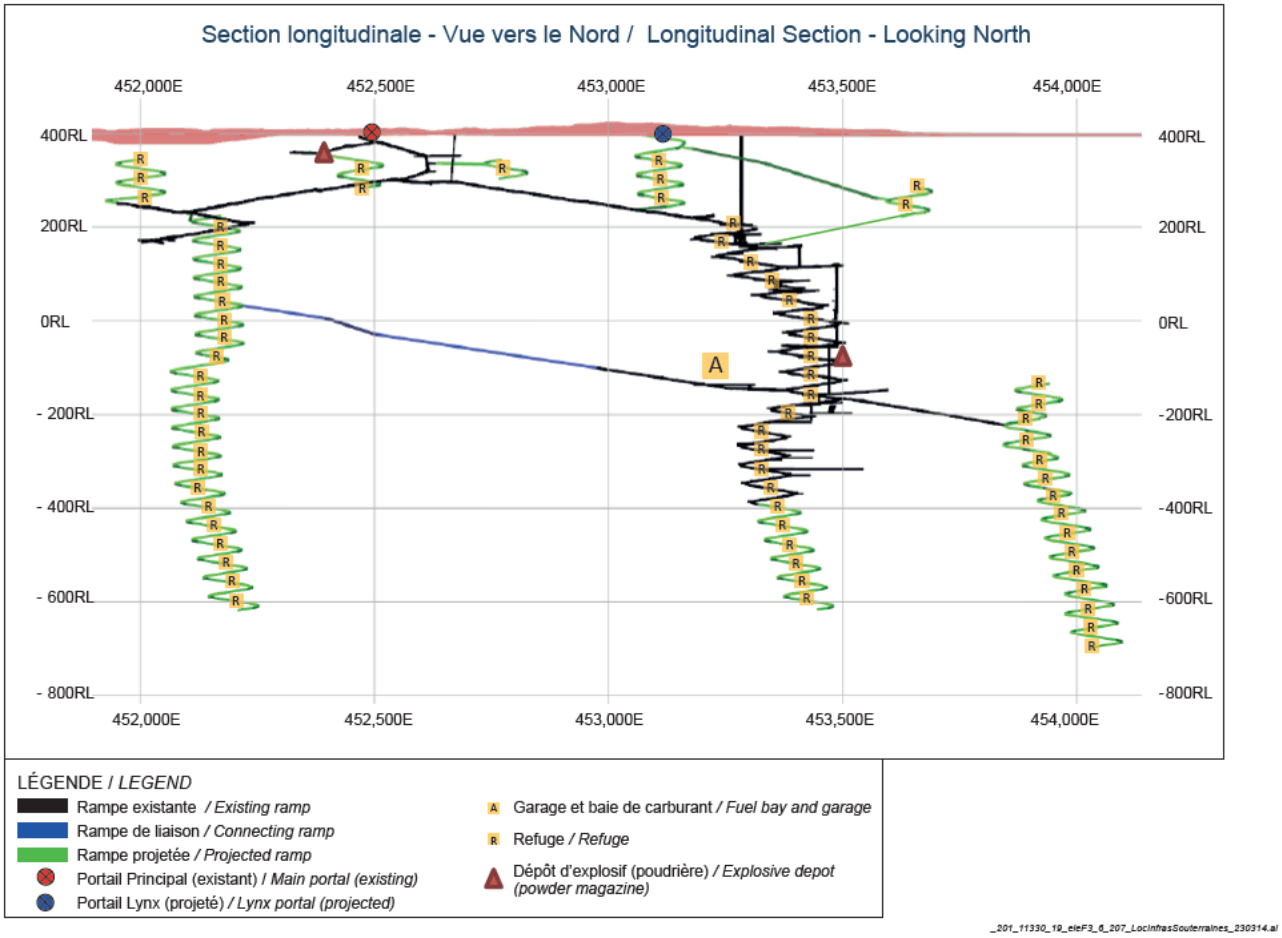
All mineralized areas can be mined using the longitudinal longhole stoping method with backfill. This method consists of developing drifts at the bottom and top of a sill, drilling between the two levels (drifts), and then drawing the material from the bottom from a main ramp or transportation drift. The 20 m or 30 m thick stopes are set up to follow mineralization and optimize the ore/waste rock ratio. No employees enter the work sites; scooping is remotely controlled from the control room located in the process plant.

The production will be carried out through two portals, the Main portal and the Lynx portal.

On each production level, there will be a sump with a drainage pump or hole to collect and dispose of seepage water (mine water), ventilation access (return airway and escapeway), an electrical substation, an area to stockpile ore waiting to be sent to the surface, access to receive backfill cement mix for the stope when needed, and easy access to a refuge station.

In addition, both the Lynx and Main mining zones are connected near surface by existing infrastructure on two levels (30 mRL in the Main zone and -140 mRL in the Lynx zone). A garage located on the ramp connecting the areas at the -140 mRL level will be accessible through both portals. The garage includes a bay for mechanical maintenance that can accommodate six to eight units, a welding bay, an oil bay, a wash bay, a storage area, a tire bay, an electrical bay, and a refuge station. Figure 3-1 illustrates the ramp systems and shared infrastructure of the mine as well as the location of the garage.

Figure 3-1 Location of the garage and ramps connecting the two portals (Modified from BBA *et al.*, 2023)



Mining operations will begin in 2024 and end in 2035, a period of approximately 10 years. Operations will start in the Lynx zone (Lynx 4, Lynx Main, and Triple Lynx), continue with the Main zone (Caribou and Zone 27), and end with the Underdog zone.

The tonnage to be extracted per year of operation (waste rock and ore) is approximately 2 Mt per year, half of which is development to access the zones that will become drifts. A total of 20.6 Mt of material will be mined, including 12.1 Mt of ore and 8.5 Mt of waste rock over a 10-year period. Some of the waste rock (approximately 20%) will be directly disposed of in backfill drifts. This would leave 6.8 Mt of waste rock to be stored on the surface waste rock stockpile.

Explosives will be stored underground in specific bays set back from the access ramp. The explosives used will be packaged (in cartridges) and unpackaged emulsions, chemically sensitized and specifically designed to moderate blasting in underground mines. The storage of explosives and detonators is governed by an internal procedure which follows legal requirements, in particular the distance to be respected between detonators and explosives and the method of disposal of explosives packaging.

3.3 ORE PROCESSING

The process plant will be built at the Windfall site. It will therefore be located in the same area as all the other mining infrastructure. It has been designed for a nominal throughput capability of 3,400 tpd with a 92% availability factor; its maximum throughput will be 4,080 tpd.

The ore treatment process consists of nine phases:

1. crushing;
2. grinding;
3. gravity recovery;
4. pre-leach thickening;
5. leaching;
6. carbon adsorption – CIP;
7. elution, refinery and reactivation;
8. cyanide destruction;
9. tailings thickener.

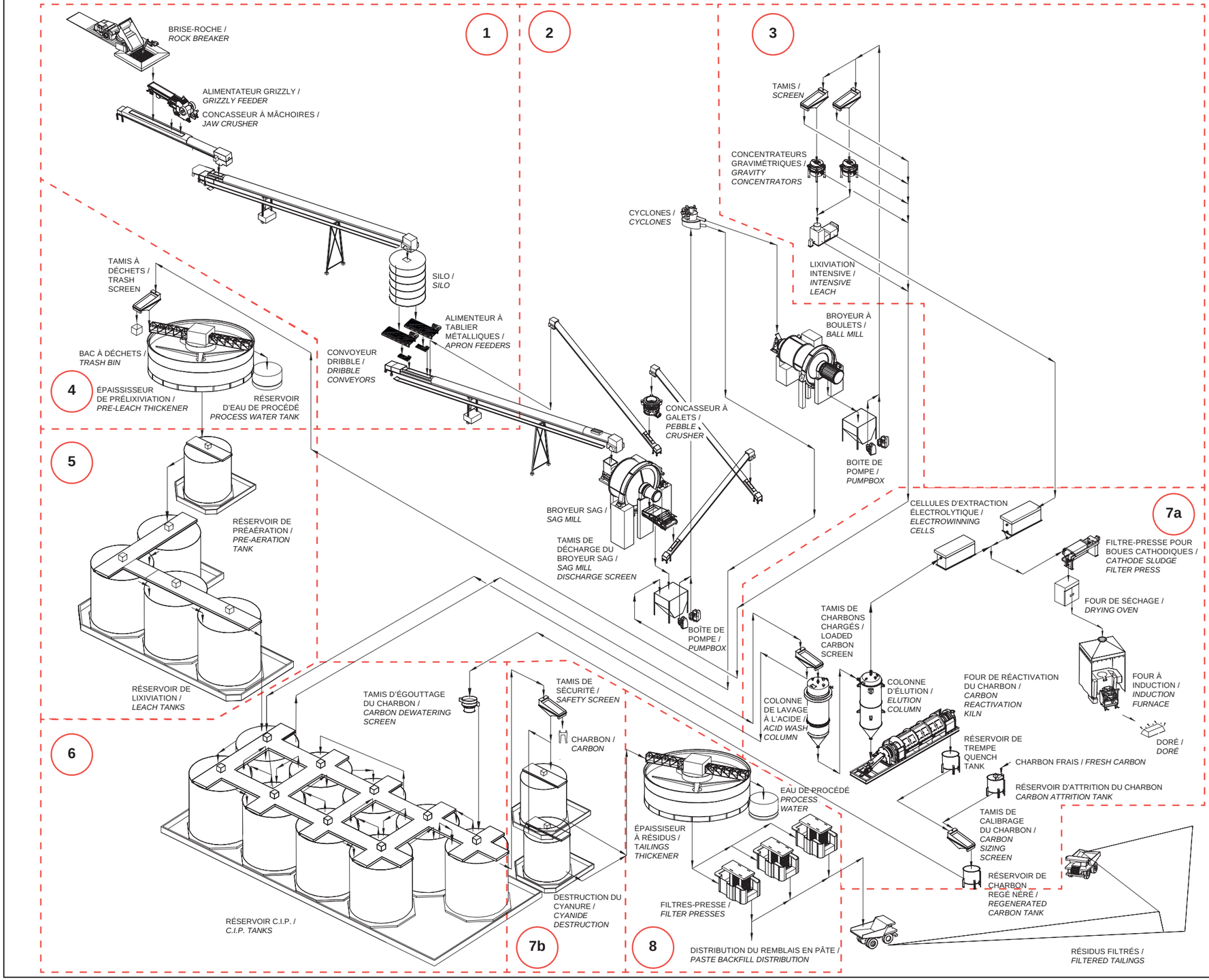
The process will start with underground primary crushing. The ore will be brought to the surface by dump truck (54 T) and stored on a stockpile, which will be built near the crushing facility, or deposited directly at the crusher and then transported by closed-circuit conveyor to the grinding circuit.

The second stage of the process consists of an SABC grinding circuit consisting of a primary variable speed semi-autogenous grinding (SAG) mill, a pebble crusher, and a fixed speed ball mill in closed circuit with a cyclone cluster. The SAG mill will discharge to a vibrating screen. Coarse materials will be conveyed to the pebble crusher by two conveyors. Sufficiently fine particles will be pumped to the cyclone cluster installed in closed circuit with a ball mill. The underflow of the cyclones, i.e., the sufficiently fine material, will be sent to the pre-leach thickener, while the coarse material will be returned to the ball mill.

The gravity circuit will receive the fine particles from the ball mill which will be redivided according to their size. The coarser materials will be returned to the cyclone feed, while the finer materials will be sent to a leaching circuit.

The pulp (containing the ore) from the cyclone underflow will go through a pre-leach thickening process. The thickened pulp then enters the leaching circuit, which puts the gold and silver into solution as gold and silver ions.

The gold and silver will be recovered by adsorption onto activated carbon in pulp (CIP) where the gold and silver ions will attach to the carbon particles. The carbon loaded with these gold and silver ions will be pumped to a screen that will separate the fine and coarse material. The fine material will be returned to the CIP circuit feed. The coarse material will undergo an acid wash before going through the elution treatment which will separate the ions, and then through the electrowinning process where the ions will be returned to solid form and cast into doré.



1. Concassage / *Crushing*

2. Broyage / *Grinding*

3. Gravimétrie / *Gravity*

4. Épaississage / *Thickening*

5. Lixiviation / *Leaching*

6. Charbon en pulpe / *Carbon-in-pulp*

7a. Élution, raffinerie et réactivation / *Elution, refinery and reactivation*

7b. Destruction de cyanures / *Cyanide destruction*

8. Usine de filtration des résidus et remblais en pâte / *Tailings filtration plant and paste backfill*

Figure 3-2 **Schéma simplifié de l'usine de traitement du minerai et de remblais en pâte /** ***Simplified Ore Treatment and Paste Backfill Plant Flow Diagram*** (réf. Modifiée de BBA et al., 2023)

After passing through the adsorption circuit, the tailings from the CIP circuit will first be directed to a screen to separate any carbon that may be mixed in and deposited in a carbon bag. The tailings will be sent to cyanide destruction and then pumped to the tailings filtration and paste backfill plant.

The filtered tailings (84% solid by weight) at the filter plant will be mixed with cement for underground backfill or transported for storage in the filtered tailings storage facility. The backfill is used either to reinforce the surface pillar or to facilitate the use of new stopes adjacent to already opened areas, thus creating support walls for the stopes to be opened. A total of 4.75 Mt of tailings and 450,000 t of cement are planned to be transported underground through the backfill operations.

The process plant will initially be supplied with water from one of the surface ponds. The water will be recirculated at 77 % and make-up water will be supplied continuously by the water treatment plant (WTP). In addition to process water, several chemicals (reagents) will be required for the ore treatment process.

At the end of the process, the surplus water extracted from the tailings filtration plant will be directed to the WTP and then discharged to the environment (Pond 1) as mine effluent.

3.4 ACCUMULATION AREAS MANAGEMENT

Several storage areas for different materials will be in place at the Windfall site. Table 3-1 summarizes the final characteristics of these stockpiles.

3.4.1 OVERBURDEN STOCKPILE

The organic and inorganic material to be stockpiled and managed at the Windfall site comes primarily from the preparation of the infrastructure sites, i.e., the tailings storage facility, process plant, stockpiles, and ponds. The site designated for the overburden stockpile can accommodate 638,100 m^3.

The ground beneath the overburden stockpile will not be covered with a geomembrane, as the overburden does not require additional protection measures, but runoff water will be collected by perimeter ditches, directed to a sedimentation pond, and treated before being released to the environment. In all cases, the contact water will be sent to the WTP for removal of suspended solids (TSS) prior to discharge to the environment.

The overburden handled during the planned construction activities may be reused as backfill at the Windfall project site. In addition, some of the overburden will be used directly for the construction of berms in the new camp area.

3.4.2 ORE STOCKPILE

A 157,750 t (54,553 m^3) capacity ore stockpile will be located adjacent to the crushing circuit. This stockpile, which will be used for temporary storage of ore prior to its transfer to the crusher, will rest on an elevated platform to facilitate the transfer of ore to the crusher.

As the ore is classified as AGP and possibly leachable for some metals (silver, arsenic, cadmium, copper, mercury, selenium and/or zinc), this stockpile footprint will be stripped, lined with a geomembrane, and protected with geotextile. A perimeter drainage ditch around the crusher platform will be built to collect runoff water and direct it to Pond C and then to the WTP for treatment at the TSS and metals circuits.

3.4.3 WASTE ROCK STOCKPILE

The waste rock volumes to be stored have been calculated from the tonnage estimated in the mine plan, plus a contingency determined by Osisko, for a total of 9.11 Mt (4,46 Mm^3). This waste rock storage will be permanent, although a certain amount could be recovered for construction and in the ongoing operations of the mine.

The stockpile used since the acquisition of the Windfall site by Osisko was expanded and lined in 2018 and expanded again in 2020. Currently at the Windfall site, all of the ore and waste rock is located on a lined surface where precipitation water is collected through collection ditches.

The authorization issued in 2020 for the storage of material on the stockpile allowed for a total of 980 kt (0,48 Mm^3) of waste rock. The maximum capacity was reached in 2022. Therefore, a third extension located to the west is planned for 2023. The capacity of this extension is expected to be reached by the end of 2026. An additional 16 m high bench will then be added to the waste rock stockpile, which should extend the waste rock storage capacity until 2030. A final expansion is thus anticipated, for a total of 9.11 Mt of stockpiled waste rock. It is anticipated that the final expansion of the waste rock stockpile will cover a portion of the land occupied by the existing overburden stockpile, which will have been reduced to accommodate progressive reclamation work on the site.

An HDPE membrane will be installed over the entire stockpile footprint and will extend into the perimeter ditches. It will be reinforced with two layers of geotextile (one below and one above the membrane) and a layer of granular material.

Table 3-1 Final characteristics of stockpiles (overburden, ore, and waste rock)

	Overburden stockpile	Ore stockpile	Waste rock stockpile
Height	21 m	10 m	32 m
Bench slopes	4H:1V for the first two benches and 3H:1V for the third bench	3H:1	3H:1
Bench width	7 m	Different piles according to content to be mixed at the plant	16 m
Final slope	4.6H:1	3H:1	3.4H:1
Berm width between benches	10 m	One bench only	10m
Total area	82,743 m^2	14,068 m^2	230,180 m^2
Volume capacity	638,100 m^3	54,553 m^3	4.9 Mm^3

3.4.4 MINE TAILINGS

The location of the tailings storage facility was chosen based on the topography of the area and the operational constraints of the site.

The tailings management facility or tailings storage facility will consist of a dry tailings stockpile, a water management system, including ditches and two ponds, and a surrounding road. The tailings will be trucked from the filtration plant and compacted in a controlled manner in the stockpile. No water retention dikes will be required to manage the tailings storage facility.

Current project planning indicates that 8.2 Mt of dry tailings (including approximately 5% of the mixed sludge from the underground water decantation system) will be stored in the tailings storage facility. The tailings storage facility will have a total capacity of 9.0 Mt (including mixed sludge). The final surface area of the tailings storage facility will be 461,500 m^2.

The tailings storage facility will have a maximum elevation of 423 m in the northwestern section and 420 m in the southeastern section, resulting in a 0.5% slope that will facilitate water runoff to the tailings storage facility's perimeter drainage ditch. In addition, basic drains will be installed to remove any water that may seep in. This design allows the tailings storage facility to meet the percolation requirements of D019.

The tailings storage facility design includes a geosynthetic liner (geomembrane) to prevent pore water infiltration into the groundwater to the extent possible. A granular drainage system will be constructed on the geosynthetic liner to facilitate water drainage and promote desaturation of the tailings.

The proposed tailings storage facility will be developed in three phases to facilitate operations and promote progressive reclamation, as recommended by the MRNF closure guidelines.

Table 3-2 Tailings storage facility development phases

Phase	Capacity (dewatered tailings)	Footprint (m^2)	Years of operation
Phase 1	4.8 Mt	240,800	1 to 5
Phase 2	2.5 Mt	119,200	6 to 8
Phase 3	1.7 Mt	101,500	9 to 11

3.5 WATER MANAGEMENT

The unique topography of the Windfall site, which lies at the head of three different watersheds, makes it possible to minimize the amount of clean water that would come into contact with the mining infrastructure. Therefore, the design of the retention ponds and ground infrastructure incorporated the watershed boundaries to the extent possible.

3.5.1 WATER BALANCE

The meteorological data used to establish the water balance are from the Chapais 2 station.

During the first years of operation, the volume of water treated and discharged to the environment will be in the order of 1.9 Mm^3 to 2 Mm^3 of water annually, depending on climate scenarios. For the final years, the annual volume discharged will be between 2.3 Mm^3 and 2.7 Mm^3.

3.5.2 WATER MANAGEMENT INFRASTRUCTURE

All water potentially in contact with the mine site will be monitored. All infrastructure will be drained by collection ditches to direct contact water to collection points, then to the WTP, before being returned to the environment. All precipitation water passing through the mine site will be collected by this ditch system and will be reused in the process plant or treated before being returned to the environment.

Water management on the site will be carried out according to the water's source:

- contact water, which includes water that has passed through the tailings storage facility, waste rock stockpile, ore stockpile, and industrial zone, will be collected and directed to the collection pond (D/D2) through a system of perimeter ditches, transition ponds, and pumps;
- water from the overburden stockpile and the industrial platform will be collected in ditches, directed to sedimentation ponds (B and J) and treated for TSS and metals before being released to the environment;
- water collected in the tailings storage facility ponds (1 and 2) will be pumped to the WTP (TSS and metals treatment) for reuse and/or treatment before release to the environment;
- underground water from the mine will be managed underground with a separate treatment unit for TSS, then pumped to the WTP (TSS and metals treatment) for reuse and/or treatment before being released to the environment;
- all water in contact with the accumulation areas going to the effluent will have passed through treatment with ammonia nitrogen and thiocyanates.

Pond dimensions and structure were established based on D019 (2012) or best practice criteria. The typical width of the base of the ditches ranges from 1.0 m to 1.8 m (except for those at the tailings storage facility).

GROUNDWATER PUMPING

Mine dewatering flows (mine water) during mine operation are expected to fluctuate between 1,775 m^3/d and 3,860 m^3/d under a base case scenario with an average hydraulic conductivity. Depending on the scenario of high hydraulic conductivity, this fluctuation could reach between 2,200 m^3/d and 4,570 m^3/d.

Based on the modelling results of the potential area of groundwater drawdown, a lowering of the groundwater table by more than 1 m (upper portion of bedrock) is anticipated within the footprint of the existing exploration ramp and within the footprint of the extensions in the Triple Lynx and Underdog zones. It should be noted that drawdowns greater than 1 m, which are on the order of seasonal fluctuations generally observed in Quebec, does not reach the drinking water supply wells located in the area of the exploration camp nor the surrounding lakes.

3.5.3 WATER TREATMENT PLANT (WTP)

Water treatment will be required at the Windfall project site to ensure that the quality of water returned to the environment meets D019 criteria and MDMER standards.

The water treatment process will include four circuits:

- A water treatment process line named WTP-TSS dedicated to the elimination of total suspended solids (TSS). The sludge generated by this circuit will be directed to the tailings storage facility.
- A second water treatment process line will be dedicated to mine water (named WTP-UG). The mine water will first go through a filtration stage. The water will then be sent to a high efficiency thickener. The thickener underflow containing the solids will be sent to the filtration plant, to be co-deposited with the tailings. Overflow (water) will be returned to underground operations as required; excess will be sent to other treatment process lines.
- The third water treatment process line (named WTP-Metals) will remove metals in runoff water from the accumulation areas by precipitation. The clarifier sludge containing metal sulphides will be directed to the WTP-UG circuit, to be disposed of in the tailings storage facility with the sludge extracted from the mine water.
- The fourth water treatment process line will take water from the metals circuit in a two-stage process using MBBR (moving bed biofilm reactor) technology for nitrification. The sludge generated by this circuit will be directed to the tailings storage facility.

Several reagents will be required for the water treatment process (caustic soda, flocculant, microsand, metal precipitator, sodium sulphide).

3.5.4 MINE EFFLUENT

At the Windfall project site, there will be only one mine effluent. The mine effluent discharge site is located in Pond 1. It should be noted that this pond currently receives treated water from the advanced exploration phase. This water discharge is a mixture of mine water, contact water, and water discharged from the filtration plant. It will be treated to ensure compatibility with the receiving environment and compliance with regulatory requirements.

3.5.5 POTABLE WATER

Raw water for the Windfall site will be supplied by underground well P5, located ± 1.1 km from the potable water production unit. The pumped raw water is considered of good quality but requires treatment for the removal of iron and manganese (green sand filters), as well as chlorination before its distribution through the aqueduct network.

For the potable water treatment process, a pre-assembled unit is being considered. The preliminary design of the system is based on a capacity adjusted to a maximum occupancy of 600 workers (406 workers housed at the camp in the operation phase, and additional capacity for the construction phase). The estimated average daily flow is 135 m^3/d, with an hourly peak of 50 m^3/h and an estimated daily peak of 270 m^3.

3.5.6 SEWAGE WATER

The sewage water generated by the Windfall site will likely be sent to a treatment system via an underground sewer network. The sewage treatment technology considered is a membrane bioreactor system, which would be supplied pre-assembled. The proposed system will comply with the environmental requirements prescribed by current regulations and the EDOs proposed by MELCCFP representatives for this purpose. The preliminary design of the sewage treatment system is based on a maximum occupancy of 450 workers. The design flow considered for the treatment equipment is 118 m^3/d.

Sewage effluent quality will be monitored under the authorization conditions as agreed upon with the MELCCFP and adjustments will be made as necessary to ensure compliance with applicable standards.

An infiltration field is still being considered as the method to manage sewage water. Therefore, field validations will be required in the summer of 2023 to verify the feasibility of implementing such a solution. In all cases, if a treatment method is required, the technical solution considered above will be favoured.

3.5.7 OTHER WATER TREATMENT SYSTEMS

During the construction period, 600 workers are expected to be present at the camp simultaneously. Additional treatment equipment will need to be added. Studies are underway to identify solutions to this required increase in systems.

In addition to the mine effluent and the domestic, potable, and sewage water treatment systems, the site will include treatment for oily water located in the machine shop and underground mine.

To keep the underground work areas dry, pumps currently collect underground water and direct it to sumps. As this TSS-laden water cannot be used or discharged as is, three MUDWIZARD decanting units have been installed in the mine.

3.6 RESIDUAL MATERIALS MANAGEMENT

The waste management strategy consists of regular transportation of residual materials (RM) by a specialized contractor from the mine site to authorized sites for specific RM types. Appropriate bins and containers will be provided at various locations for work crews. Collection will be organized and systematic.

The residual hazardous materials (RHM) storage facility will be developed and managed in accordance with provincial regulations.

In addition to storage in the designated area on the surface, a waste compactor will be used. The composter at the exploration camp will also be moved to the residual materials storage area. Waste material from the composter will be placed on the overburden stockpile for recovery during progressive reclamation work.

3.7 AIR AND GREENHOUSE GAS EMISSIONS

A detailed identification and quantification report of annual GHG emissions attributable to all sources of emissions from the project and its different phases was conducted by WSP. This study takes into account the combustion of fossil fuels, including transportation activities, wood clearing, the use of explosives and the consumption of hydroelectricity for the construction and operations phases. The closure phase is considered equivalent to the construction phase.

3.8 RELATED DEVELOPMENTS AND PROJECTS

SITE ACCESS AND FACILITY SECURITY

The Windfall mine site is currently accessible by way of a 115 km gravel road branching off the Chemin du Moulin road, southeast of Lebel-sur-Quévillon. Access is via Grade 1 forest roads, the R1000 (R1050) for 10 km and the R5000 (R0853) for 55 km, followed by a 47 km section of Grade 2 forest road, the R6000 (R1053).

A vehicle count on the road linking the mine site and Lebel-sur-Quévillon was conducted in 2019 at the junction of roads R1000 (R1050) and R5000 (R0853), where traffic flows are likely to be the highest. The results show that current traffic flows on the R5000 section (R0853) are low and spread out between 9:30 a.m. and 6 p.m., reaching a maximum hourly volume of 11 vehicles. The results for the R1000 section show increased flows in the morning (6:00 a.m.) and afternoon (5:00 p.m.) peaks, reaching a maximum hourly volume of 64 vehicles including seven trucks in the afternoon peak.

An inspection of the access road was conducted in July 2022 and a report was issued. In summary, the report indicated that the roads were generally in good condition and did not require immediate major improvements. The access roads are currently maintained by Osisko.

A gatehouse will be located at the site entrance. Site access controllers will be able to track on-site personnel and material delivery.

ACCOMMODATION FACILITIES

The camp will be composed of prefabricated modular units installed on steel tripods and will include the following sections: dormitories, cafeteria and dining room (including offices and a locker room), fitness centre and game room, reception centre (including offices and a waiting room), and laundry room. Buildings and water heaters will be operated with propane gas units.

There will be six dormitory rows of two floors each, for a total of 406 individual rooms, each with a private toilet and shower and equipped with a double bed. During the construction period, the camp will include three additional wings to accommodate the additional 200 workers.

A Cree cultural centre for First Nations employees, visitors, and friends will be built near the camp. This centre will have a vantage point over Pond 2, with a large balcony to allow for contemplation by viewers. The position of the cultural centre was selected together with the W25B tallyman.

The existing exploration camp will be maintained to allow Osisko to continue regional exploration on the Windfall property, as well as exploration on the Urban-Barry property. During the construction phase, the exploration camp will be used to accommodate the required workforce.

OFFICES AND ADMINISTRATION

Space is reserved for offices and administrative services in the process plant building. On the ground level, there will be an infirmary with direct access for the ambulance, a room for mine rescue equipment and training, as well as changing rooms for mine and plant workers. On the second floor, there will be offices, the metallurgical laboratory, the computer control room, meeting rooms, and a dining room. The third floor will house offices, control rooms for remote-controlled equipment, training rooms, meeting rooms, and another dining room.

STORAGE SITE FOR FUEL OR NEW HAZARDOUS MATERIALS

At the Windfall project site, hazardous materials can be classified into three categories: reagents, petroleum products, and residual hazardous materials. Reagents will be stored in the plant buildings where they will be used. Each storage area will be designed to comply with the National Fire Code (NFC).

Petroleum products will include diesel, gasoline, and propane.

Propane is intended for heating purposes. Six propane tanks will be installed on site: a 151,400 L tank for heating the process plant; two 75,700 L tanks for heating the underground mine; a 75,700 L tank for heating the garage and warehouse building; a 75,700 L tank for heating the filtration, backfill, and water treatment plants; and, a 75,700 L tank for heating the camp and supplying the kitchen. Each tank will be surrounded by protective bollards and connected to the building to be heated via a buried pipe. Total annual propane consumption is estimated at 23,000 L/day.

Diesel and gasoline will be stored on a designated site located midway between the process plant and the filtration, backfill, and water treatment plants. The site will include a one-week supply, namely, four 45,000 L tanks of diesel, one 1,000 L tank of diesel, and one 10,000 L tank of gasoline. The double-walled tanks include level and pressure monitoring sensors and a console for measurement readings.

STORAGE, CORE SHACK, AND WORKSHOPS

A building annexed to the process plant will include a warehouse, a core shack, and a mechanical workshop (five maintenance bays for large vehicles and four bays for small vehicles, oily water treatment, and welding chamber). Outside, near the mechanical workshop building, canvas domes will be installed for the storage of spare parts and materials waiting to be used.

BORROW PIT

For the construction of roads and ponds, to level the ground where building foundations are located, and for any other use during the construction or maintenance of infrastructure, the estimated need for loose borrow material is 509,917 m^3, as well as 11,780 m^3 of rip-rap. Wherever possible, material from the infrastructure excavation will be reused rather than disposed of in the overburden pile. The new loose material will come mainly from three pits located near the site: Flamb-1 (existing), Gravtest-3, and Gravtest-4. The Flamb-1 borrow pit used for mining purposes will be expanded during the construction and operation phases to a total area of over 3 ha. Borrow pit BNE-32G04-15, also existing, is used for the maintenance of forest roads leading to the Windfall site as well as for the roads on the Windfall site. The exploitable surface of the Gravtest-3 site extends to 9.86 ha and the volume of materials is estimated at 345,140 m^3. The Gravtest-4 site has an exploitable area of 10.7 ha and an estimated quantity of material of 535,040 m^3.

SITE CIRCULATION

Three types of roads are present on the site: haul roads, access roads, and service roads.

The surface vehicle fleet consists primarily of diesel-powered vehicles, but also includes some gasoline-powered vehicles and electric equipment. The underground fleet includes almost 50% electric vehicles.

Five-metre wide service roads will be constructed to facilitate delivery of materials and access for the operation or inspection of stockpiles, ponds, ventilation raises, and other infrastructure. For the transportation of ore and dry tailings by mining trucks, three sections of 12-metre wide haul road will be built. The haul road ditches will be equipped with a geomembrane to collect contact water and contaminants generated by the mine materials.

A traffic management procedure will be implemented to ensure the safe operation of all vehicles. Road signs will also be installed. Northern corridors will be built between the site buildings in the area of the process plant and the camp to allow employees to move around on foot and thus limit the number of trucks on the site.

ENERGY SUPPLY

The total anticipated electricity demand for the Windfall site is 27.4 MW. The plants, underground mine, and camp area will be supplied with 13.8 kV power via 15 kV cables on overhead lines.

The electricity will be supplied via a new Kuikuhaacheu transmission line, about 85 km long with a voltage level of 69 kV. This line will also provide fibre optics to the site. The chosen route was developed in collaboration with the forestry department and five tallymen of the Cree First Nation of Waswanipi (CFNW), and will be mainly in natural areas and lands cleared by the forest industry.

In 2022, Osisko signed a binding agreement with Miyuukaa Corporation (Miyuukaa), a wholly owned subsidiary of CFNW, for the transmission of hydroelectric power to the Windfall site. In this agreement, it was agreed that Miyuukaa would fund, construct, operate, and maintain the transmission line and the two new substations, Waswanipi (MICO) and Windfall.

The use of hydroelectricity during the final stages of advanced exploration and throughout the construction and operation phases will reduce GHG emissions and the Windfall project's reliance on fossil fuels. As the power line is a different project from the Windfall mining project, its impacts are not assessed in this study.

The Windfall mine project site is currently powered by diesel generators with a 13.8 kV overhead line between the mine areas and the exploration camp. The overhead line will be maintained and the generators are planned to be reused for emergency power.

COMMUNICATIONS

The Windfall project is designed to be a modern mine with all the services required for an Industry 4.0 operation, such as short-interval control, predictive maintenance, on-demand ventilation, and Integrated Remote Operations Centre (iROC). The site will be served with fibre optics.

The Windfall project will be operated from an integrated operations centre (IOC). The management of the mining and processing operations will be carried out from this site, which will be in the administrative area of the process plant.

Communication between employees moving around the site will be via Wi-Fi and radio. A Wi-Fi antenna is already installed on the current site. The security team will also have access to some satellite phones in case of network failure.

3.9 PROJECT IMPLEMENTATION AND TIMELINE

For the Windfall project, preparatory activities and works are required before starting the construction of the infrastructure, such as wood clearing, blasting, and earthworks. construction water diversion (infrastructure stability, minimization of contact with natural watersand, construction of roads, ponds, and buildings.

The major steps and milestones of the Windfall project are summarized in Table 3-3. Some of the expected deadlines may be extended during the process.

Table 3-3 Project timeline

Step	Period
Inventories of the receiving environment	2018-2022
Submission of the feasibility study	Q1-2023
Submission of the environmental impact assessment	Q1-2023
Detailed engineering	Q4-2022 – Q2-2024
Environmental assessment process	Q2-2023 – Q4-2024
Issuance of COMEX authorization	Expected in Q2-2024
Obtaining permits/authorizations	Expected in Q2-2024
Start of construction	Q2-2024
Opening of the camp	Q3-2024
Commissioning of the concentrator	Q3-2025
End of construction	Q4-2025
Start of commercial production	Q4-2025
End of commercial production	Q4-2035
Mine reclamation	2035-2036
Post-closure follow-ups	2036-2045*

* Once all water analysis tests are compliant and there are no more exceedances of criteria.

3.10 EMPLOYMENT AND TRAINING

During the construction period, approximately 1,100 workers will be required. Just under 700 workers will be required for the Windfall project operations phase, including 500 Osisko employees and 170 workers employed by Osisko's subcontractors or contractors. Employment opportunities at Osisko will include approximately 48 positions in administration and services, 372 positions in underground operations, 69 positions in the process and tailings filtration plants, and 11 positions in environment and water management.

Most workers will do rotations of 15 days on site and 13 days off site, while a few will do 8 days on site and 6 days off site. Every Thursday, charter flights will bring workers from the Saint-Hubert, Quebec City, and Bagotville airports to the Lebel-sur-Quévillon airport. On the same day, some buses will transport workers from Rouyn-Noranda, Val-d'Or, and Senneterre to Lebel-sur-Quévillon, while other buses will take workers there from Chibougamau, Chapais, and Waswanipi. Workers arriving by charter plane and bus will be transported from Lebel-sur-Quévillon by bus to the Windfall site. Workers in unskilled trades will come from the surrounding areas by bus. Whether in the skilled or unskilled trades, Cree, then Jamesian, and lastly Abitibi employees will always be given preference under the regional hiring policy. In addition to promoting regional employment, the hiring of women will be prioritized as implicitly stated in Osisko's hiring and career development policy.

General mining training and social partnership projects are already being developed by the Human Resources team. Osisko would like to get involved in vocational training with the Cree School Board and facilitate the hiring of members of the Cree community residing on the JBNQA territory.

3.11 CLOSURE AND RECLAMATION

The objective of the mine site reclamation is to restore the site to a satisfactory state, ensuring that the environment as a whole can eventually return to normal. The satisfactory state consists of:

- eliminating unacceptable health risks and ensuring personal safety;
- limiting the generation and spread of contaminants that may affect the receiving environment and, in the long term, aiming to eliminate all forms of maintenance and follow-up;
- restoring the site to a visually acceptable condition;
- restoring the infrastructure site (excluding tailings and waste rock stockpile areas) to a condition compatible with future use.

Activities included in the reclamation plan include: capping of exposed openings with concrete, backfilling of access ramps and underground mine workings, dismantling of infrastructure, assessment of soil quality at potentially contaminated sites, excavation and/or treatment of contaminated soils, revegetation of affected land, and reclamation of the tailings facility and waste rock stockpile. Various technical and environmental follow-ups will be carried out following the end of the operations to ensure the maintenance and integrity of the structures, the quality of the environment, and the sustainability of the vegetation cover.

4 COMMUNITY RELATIONS

Since 2015, when it acquired the Windfall project, Osisko has maintained a constant presence in the project's host communities to develop a relationship based on mutual trust. The first meetings with representatives of the Cree First Nation of Waswanipi (CFNW) and of Lebel-sur-Quévillon were held in October 2015 and November 2016, respectively.

Based on the principles of its Community Relations Policy, Osisko has developed a three-step community relations process that facilitates stakeholder identification and dialogue with communities. The adopted approach is flexible and can be adapted according to the feedback received.

4.1 PRESENCE IN THE COMMUNITY

In 2019, an Environmental Monitoring Committee was created, which includes Osisko and CFNW representatives. Its objective is to keep the CFNW informed of the environmental management of the project. This committee also serves as a liaison to ensure ongoing consultation with the tallyman of trapline W25B, particularly to address the concerns of the trapline's users and to gather traditional knowledge and information on their use of the territory. To date, nearly 30 meetings of the Environmental Monitoring Committee have been held.

Osisko acknowledges that the knowledge that users of the Cree territory have of their biophysical and social environments is essential to adequately assessing the impacts of its project. The company collected information from tallymen and other land users and worked to incorporate this knowledge into the development of the Windfall project. Users from the territory and the EnviroCree company from Mistissini also participated in the project's environmental data collection campaigns between 2017 and 2022.

Osisko and the town of Lebel-sur-Quévillon also signed a collaboration agreement in 2017. The purpose of the collaboration committee thus formed is to ensure transparent and effective communication, to promote the social acceptability of the project, and to maximize the socioeconomic benefits for the town of Lebel-sur-Quévillon. Since 2019, the Administration régionale Baie-James (ARBJ) has been attending the committee meetings. In August 2021, the town of Lebel-sur-Quévillon passed a resolution confirming its support for the Windfall project. Since 2017, more than a dozen collaborative committee meetings have been held.

In 2017, Osisko hired a liaison officer from the CFNW, who has an office in Waswanipi. The liaison officer is a resource person who is available to answer questions and address concerns of community members. The Liaison Officer also works with the human resources counsellors based at Camp Windfall to ensure the integration of First Nations employees, to support recruitment efforts, and to support supervisors in their team management.

Osisko has also set up a donation and sponsorship program aimed at promoting science and education, the environment, health and sport, and culture, as well as other initiatives. It also supports cultural and sports events or community organizations that fight poverty and offer services to vulnerable clients, especially in Waswanipi and Lebel-sur-Quévillon.

Osisko is contributing to the Fonds Restor-Action Cri, a Cree fund for the clean-up of orphaned exploration sites on the Eeyou Istchee James Bay Territory. It also funded research by the Cree Board of Health and Social Services of James Bay (CBHSSJB) on the effects of commuting on workers, their families, and Cree communities, particularly the effects on women.

Between 2017 and 2022, Osisko financially supported 39 different groups or organizations in the Jamesian communities through its donations and sponsorships program. In the Cree communities, 17 different groups or organizations were supported by the program.

Finally, several meetings regarding an Impact and Benefits Agreement (IBA) have taken place since 2017 between representatives of Osisko, the CFNW, and the Cree Nation Government (CNG). Various issues concerning the coexistence and harmonization of activities on the territory, environmental protection, socioeconomic benefits, and culture were discussed during these meetings and some elements remain to be resolved. Osisko and its Cree partners plan to sign this agreement shortly.

4.2 PROJECT'S INFORMATION AND CONSULTATION PROCESS

Osisko's information and consultation process with the First Nations and non-First Nations communities affected by the Windfall project began in 2015 since its first exploration activities on the Eeyou Istchee James Bay Territory. Osisko uses a proactive communication and consultation approach that focuses on meaningful stakeholder involvement and participation. More specifically, communities close to the Windfall project site are targeted, namely the CFNW and the community of Lebel-sur-Quévillon. Information was also shared with the Anishinabe First Nation of Lac Simon and the Atikamekw First Nation of Opitciwan, as well as with the municipalities of Matagami, Chapais, Chibougamau, and Senneterre.

The main objectives of this communication and consultation approach are to:

- identify and inform relevant stakeholders;
- plan consultation sessions with community stakeholders;
- gather concerns and comments;
- document land use and occupancy in the study area;
- identify the potential social and environmental impacts of the Windfall project;
- communicate the results of the field studies;
- improve the project and its social acceptability by considering traditional knowledge, and on a broader level, the contribution of the CFNW and the community of Lebel-sur-Quévillon in project design and implementation;
- allow sufficient time for stakeholders to review and validate the content of draft and final reports and documents.

Among the communication tools used by Osisko, an informative video was produced in French, English, and Cree to explain the Windfall project to host communities. Another video presents the results of the Windfall project's preliminary economic study. Osisko also shares a great deal of information about its activities and development on its website and social networks.

4.3 INFORMATION AND CONSULTATION ACTIVITIES DURING THE EXPLORATION PHASE

FIRST NATIONS COMMUNITY

In recent years, various communication activities with tallymen have been carried out depending on the project and the location of the work (traplines W24, W24A, W24C, W24D, W25A, W25B, W26, lot 16, lot 17, lot 19).

Consultations were also carried out for various authorization requests:

- bulk sampling and infrastructure construction (2016-2017): discussions with the community of Waswanipi and with the tallyman of trapline W25B;
- bulk sample taken in Triple Lynx (2019): presented to tallyman of trapline W25B, his family, and Waswanipi community members;
- bulk sampling of Caribou and Lynx 4 (2021): presented to the Environmental Monitoring Committee;
- borrow pit options under study for the exploration phase (2022): presented to tallyman of trapline W25B and discussed with tallyman of trapline W25A.

The main comments, concerns, and requests gathered during these activities and the actions Osisko has taken to address them relate to the impact of exploration activities on:

- hunting, fishing, and forestry (land disturbance, disturbance of animals by the noise of drills, etc.);
- water quality and fish;
- access roads and health and safety (worker visibility during the hunting season, safe snowmobile trails, speed, risk of accidents and spills, etc.);
- economic spinoffs for the community (jobs, training, hiring of local suppliers, etc.);
- respect for cultural sites and places of significance.

Osisko has made certain arrangements and accommodations to ensure good neighbourliness with the users of the territory, to reduce the negative effects on their quality of life, and to contribute to the maintenance of traditional activities during the exploration period (snow clearing of roads for hunting; donations of fuel, food, wood, and tents; access to a housing unit during the hunting period; access to meals at the cafeteria, etc.).

CONTINUATION OF EXPLORATION ACTIVITIES DURING THE FIRST WAVES OF COVID-19

In Quebec, the government ordered the closure of all nonessential businesses and Osisko suspended operations at Windfall on March 23, 2020. On May 15, 2020, Osisko resumed operations at Windfall, with the permission of the Quebec government, using protocols developed in close collaboration with the Crees. A monitoring committee has been formed with CFNW and CNG to monitor the gradual reopening of the Windfall site and compliance with protocols. Osisko's initiative and cooperation with the Crees in managing the health crisis were recognized at the Gala Les Mercuriades 2021, organized by the Fédération des chambres du commerce du Québec.

OTHER FIRST NATIONS COMMUNITIES

Two other First Nations communities have expressed an interest in the project, namely the Lac Simon Anishinabe and Opitciwan Atikamekw communities. The Atikamekw community of Opitciwan was met seven times since 2017 and the Council of the Nation Anishnabe of Lac Simon was met nine times.

NON-FIRST NATIONS COMMUNITY

Since 2016, Osisko has met several times with representatives and residents of the town of Lebel-sur-Quévillon to discuss the Windfall project and regional exploration projects and to share information about exploration activities, jobs, business opportunities, results, and studies. In addition to the meetings of the collaboration committee and various meetings with town representatives, Osisko participated in various public activities organized by the town or jointly.

Since 2017, Osisko has met with representatives of other Jamesian communities and presented the Windfall project at conferences, such as the Journée Maillage organized by the Société du Plan Nord (Chibougamau in 2017, Chapais in 2018, and Lebel-sur-Quévillon in 2022).

The main concerns of elected officials, citizens, and entrepreneurs, are to:

- promote communications between Osisko and the citizens of Lebel-sur-Quévillon;
- provide information on Osisko's objectives;
- keep them informed of any project changes;
- ensure the availability of ongoing training in the town; and,
- maximize local employment, local purchasing, and the hiring of local suppliers.

Holders of private vacation leases and the owner of Pavillon du Lac Berthelot, an outfitter with non-exclusive rights, were met with for the first time in 2017 and 2018. Users mentioned that the combination of forestry and mining activities is problematic for enjoying tranquility and the wilderness experience.

During the exploration period, Osisko offered certain services to ensure good neighbourliness with the non-First Nations users of the territory (digging a pit for sanitary facilities, donating drinking water, transmitting emergency messages, paying the fees for a private vacation lease, etc.).

4.4 INFORMATION AND CONSULTATION ACTIVITIES FOR THE EIA

One of the first steps in planning the information and consultation activities for the EIA specifically was to identify the stakeholders that could be affected by the Windfall project.

Between 2015 and 2022, more than 275 information and consultation activities have taken place. They are part of an ongoing process that will continue throughout project development, the permitting process, and the construction, operation, and closure phases of the project.

FIRST NATIONS COMMUNITY

As the claims associated with the Windfall project intersect with traplines W25B and W25A, several meetings with the tallymen and primary users of these traplines were conducted between 2015 and 2022. When the Windfall project was proposing to build the process plant in Lebel-sur-Quévillon, semi-structured interviews were held in July 2018 with tallymen of traplines W24C, W24D, W25A, W25B, and lots 16, 17, and 19, as well as with other land users. Several members of the Cree community were also interviewed, including representatives from various departments of the Band Council, the CBHSSJB, the Cree School Board, the Cree Trappers' Association, local entrepreneurs, women's groups, youth, and elders. In addition, open house events were held in the fall of 2017 and winter of 2018 in Waswanipi, Lebel-sur-Quévillon, and at the Windfall mine site. The 2022 consultation activities also engaged other stakeholders in the project's host community.

In January 2023, Osisko created another opportunity for stakeholders to have their say on the project. An open house was organized by the company and its consultant at the Waswanipi community and recreation centre.

NON-FIRST NATIONS COMMUNITY

In addition to numerous Windfall project presentation events since 2016, several consultation meetings have taken place in local communities. In particular, focus groups and formal interviews were conducted in 2018 and 2022 with public land leaseholders, local officials, and community stakeholders (Centre de Santé Lebel, Villes et villages en santé, Centre de femmes Îlot d'Espoir, Maison des Jeunes, Table régionale des organismes communautaires). A public event was held in September 2022 to present an update of the Windfall project to the residents and economic stakeholders of Lebel-sur-Quévillon. Osisko also organizes communication activities with educational institutions in the region.

Open houses were held on January 31, 2023, in Lebel-sur-Quévillon for the public and February 1–3 at the Windfall site and through the Teams platform for current employees. The event was held again on February 22 and 23 for the second rotation of site employees. These activities provided an opportunity to confirm some public feedback and answer other questions.

4.5 STAKEHOLDER REACTIONS AND CONCERNS

FIRST NATIONS COMMUNITY

The following key concerns were raised during the First Nations consultation activities:

- information shared in advance on Osisko's needs and opportunities for material and workforce resources;
- fair process for awarding contracts;
- hiring of workforce from Waswanipi and development of employability of the workforce;

- a work environment that is safe for women and promotes diversity and inclusion, including ways to address racism, discrimination, and language barriers;
- potential problem of workforce shortage among Waswanipi community members;
- the lure of economic benefits at the expense of Cree culture and traditional way of life;
- impact of rotating work schedules on work-family balance;
- safe passage on access roads given the anticipated increase in project-related travel;
- lifespan of the tailings storage facility geomembrane, risk of environmental spills, and potential water contamination in surrounding lakes and watercourses;
- impact on air quality;
- impact on the quality of life of users of the territory as a result of the nuisances generated by the mining project (noise, dust, light pollution);
- disruption of traditional hunting, fishing, trapping, and gathering activities (disturbance and displacement of species, access, etc.);
- preservation of the territory's biodiversity and availability of quality food resources for future generations given the perceived contamination of the environment;
- mine reclamation.

NON-FIRST NATIONS COMMUNITY

During the consultation activities of the non-First Nations community, the following concerns were mainly raised:

- reduced economic benefits to local municipalities due to fly-in, fly-out work schedules;
- the future of the workers after mine closure;
- additional pressure on the availability of workers (shortages and transfers);
- fair distribution of economic benefits throughout the region;
- impact of rotating work schedules on work-family balance;
- potential contamination of water in surrounding lakes and watercourses;
- deterioration of the quality of the wilderness experience in the area surrounding the project: pollution due to light, noise, dust, and vibrations, and hunting and fishing pressure from workers;
- road safety and increased risk of accidents.

During the various information and consultation activities, Osisko welcomed several suggestions from its stakeholders and provided responses to the questions and concerns raised. As part of the project's EIA process, several elements to address stakeholder concerns have been incorporated and are discussed in the EIA. It should be noted that Osisko has adapted or optimized certain aspects of its exploration activities as a result of exchanges and discussions with stakeholders over the past few years, which are also being factored into the development of the Windfall project. For example, in response to concerns about potential contamination of Lake SN2, Osisko has completely changed the location and direction of the mine effluent.

4.6 EXPERIENCES OF SIMILAR PROJECTS IN NORTHERN QUEBEC

To make an overall assessment of the likely changes in the lifestyles of the various communities living in or using the Windfall project area, as well as their capacity to manage project-related changes, Osisko has referred to the experiences of other similar projects in northern Quebec. The experiences of similar projects demonstrate the importance of community consultation and participation in project development. The documents consulted as well as the discussions with community stakeholders also highlight the following issues: perceived risks to road safety (speeding, accidents involving the transportation of hazardous products, etc.); management of non-hazardous waste for mining projects in the North (disturbance of wildlife habits, such as the black bear's); transition for workers and local communities following the closure of a mine.

4.7 ISSUES ARISING FROM THE EIA CONSULTATIONS

Key issues can be identified from the information and consultation activities conducted as part of the EIA. The issues identified reflect the concerns raised about the project by many of the stakeholders encountered to date. The significance of an impact was also taken into account in determining these issues.

FIRST NATIONS COMMUNITY

Many of the concerns raised relate to issues of environmental and ecosystem preservation, traditional land use, and the quality of life of First Nations stakeholders. These issues are as follows:

- Preservation of the quality of the environment.
- Preservation of biodiversity.
- Taking into account First Nations interests and concerns.

NON-FIRST NATIONS COMMUNITY

Many of the concerns expressed were related to socioeconomic benefit and environmental conservation issues. These issues are as follows:

- Concentration of economic benefits at the local level.
- Preservation of the quality of the environment.

4.8 SUBSEQUENT INFORMATION AND CONSULTATION ACTIVITIES

Following the submission of the EIA, Osisko will continue its information and consultation activities with the various stakeholders. In particular, it will maintain its involvement with the Lebel-sur-Quévillon collaboration committee, in the environmental follow-up committee with the CFNW, and in the role of its community liaison officer with the CFNW. It will also continue to inform local communities about the project's progress through public events, meetings, social media posts, press releases, and newsletters. It should be noted that at the beginning of 2023, some activities are already scheduled on the calendar.

Osisko will enhance and adapt its approach to information and consultation, including continuing to negotiate the IBA with the CFNW and the CNG, providing access to a digital platform on the Windfall project, and developing a mechanism for receiving and addressing comments, concerns, and complaints.

5 IMPACT IDENTIFICATION AND ASSESSMENT METHOD

5.1 DELINEATION OF THE STUDY AREAS

Three study areas were delineated to identify and locate the sensitive environmental components likely to be affected by the project: one for the biophysical environment, one for the social environment, and another to include the more remote social components (Map 5-1).

The local biophysical study area covers an area of 25 km^2 and encompasses the physical and biological components of the receiving environment most likely to be affected by the project. For some components of the physical environment (ambient air and sound), the local study area of the social environment was used.

The local social environment study area, which covers an area of 80 km^2, includes sensitive areas in the vicinity of the project, including First Nation camps, private vacation leases, and an outfitting operation.

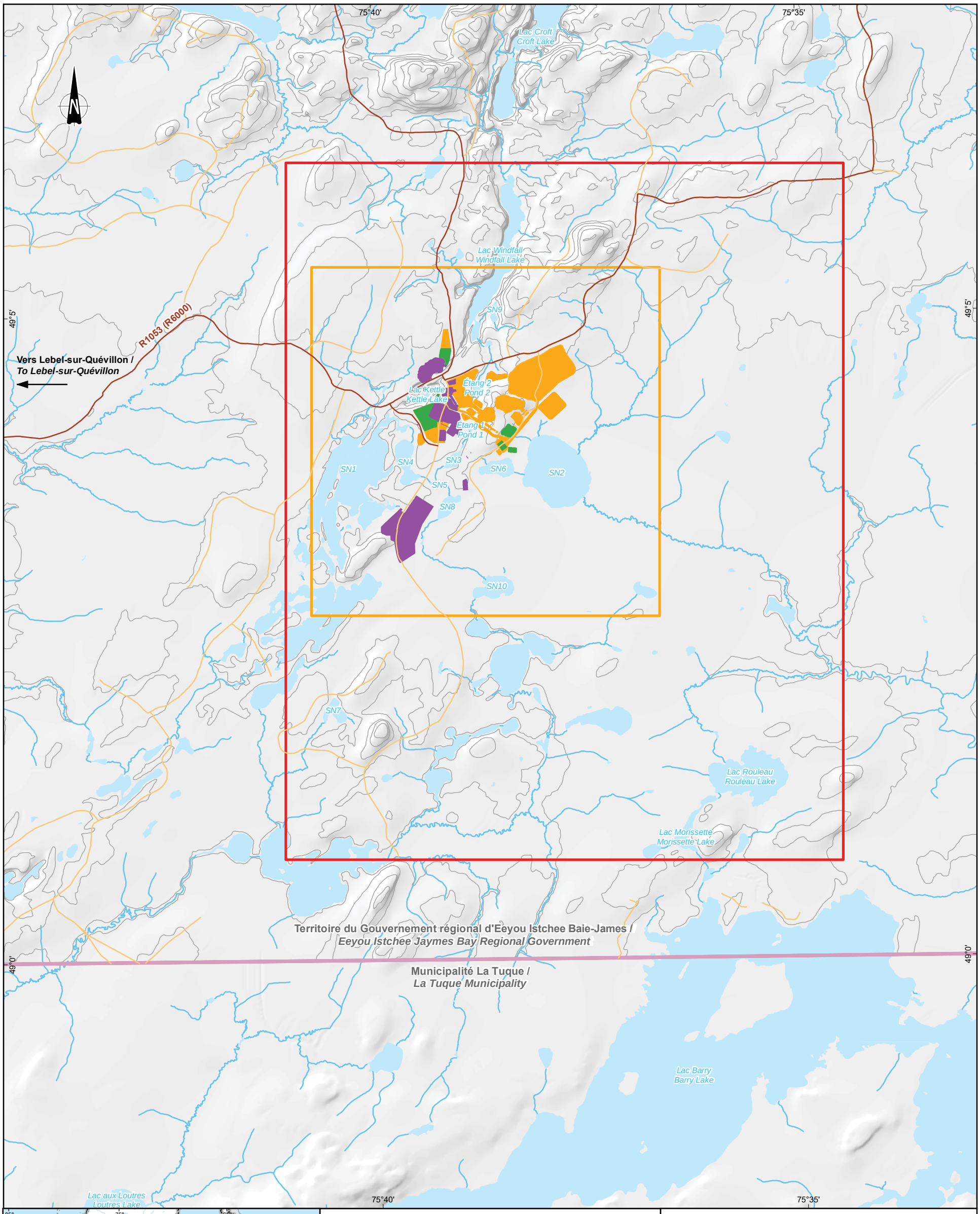
The regional study area covers a larger area in order to document the demographic and economic characteristics of the Cree First Nation of Waswanipi and the Jamesian municipalities (Lebel-sur-Quévillon, Chapais, and Chibougamau) that are most likely to be affected by the project. This study area includes the access road to the mine site from the municipality of Lebel-sur-Quévillon to the west. Despite the fact that part of the access road to the mine site (Road R0853) runs for 55 km in the Vallée-de-l'Or Regional County Municipality (RCM) in the Abitibi-Témiscamingue administrative region, this section of road, which has no mining infrastructure, was considered to be minor. It was therefore excluded from the study area.

5.2 GENERAL APPROACH

The general approach used to identify and assess the significance of potential environmental impacts was based on detailed project and environmental descriptions, public consultation, and lessons learned from similar projects.

For each of the targeted environmental components, the assessment process involved the following steps:

1. Description of the baseline condition (current conditions) for the sensitive components of the physical, biological, and social environments.
2. Identification of potential impacts based on the project's sources of impact.
3. Development of mitigation or improvement measures to reduce or improve the significance of identified impacts. Integration of these measures at this step implies a commitment from the project initiator to apply them during the implementation phase.
4. Description and assessment of the significance of residual impacts, i.e., after the implementation of mitigation measures.
5. A description of the compensation or follow-up measures applicable, if any, to certain residual impacts.



Limite administrative / *Administrative boundary*

Réseau routier / *Road Network*

Route nationale / *National road*

Route secondaire / *Secondary road*

Projet / *Project*

Zone d'étude locale du milieu biophysique / *Biophysical local study area*

Zone d'étude locale du milieu humain / *Human local study area*

Infrastructures du projet / *Project Infrastructures*

Existante / *Existing*

Existante au moment de l'EIE / *Existing at the time of the EIE*

Projetée / *Projected*

OSISKO
MINIÈRE OSISKO

Projet minier Windfall - Résumé de l'étude d'impact sur l'environnement / *Windfall Mining Project - Summary of the Environmental Impact Assessment*

Site minier Windfall, Eeyou Istchee Baie-James (Québec) /
Windfall Mining Site, Eeyou Istchee Baie-James (Quebec)

Carte 5-1 / *Map 5-1*
Zones d'étude locale des milieux biophysique et humain / *Biophysical and Human Local Study Areas*

Sources / Sources:
CanVec+, 1/50 000, RN Can, 2014
SDA, 1/20 000, MERN Québec, 2020
BDTA, 1/250 000, MRN Québec, 2002
BDGA, 1/5 000 000, MRN Québec, 2012

0 0,55 1,1 km
MTM, Fuseau 9 / *Zone 9*, NAD83

2023-03-15

Préparée par / Preparation : M.-H. Brisson
Dessinée par / Drawing : J. Villeneuve
Vérifiée par / Verification : M.-H. Brisson

_201_11330_19_reic5_1_234_locale_230315.mxd

wsp

5.3 DETERMINATION OF POTENTIAL IMPACTS AND ASSESSMENT METHOD

5.3.1 RELATIONSHIPS BETWEEN POTENTIAL SOURCES OF IMPACT AND ENVIRONMENTAL COMPONENTS

To determine the potential impacts that may result from the project, a relationship grid (matrix) was used to identify the sources of project impacts that affect the environmental components.

The potential sources of impact were identified from the project description and the technical characteristics of the project. Elements of the project that could impact the environment, either negatively or positively, are presented along the vertical axis in the interrelationship grid (Figure 5-1).

The description of the physical, biological, and social environments makes it possible to understand the context in which the project will be integrated and to identify the most sensitive components. The components of the physical, biological, and social environments that may be affected by these potential sources during the construction, operational, and closure phases are presented along the horizontal axis (Figure 5-1).

The relationships, determined by cross-referencing the knowledge gained from the environmental characterization studies, and the experience acquired by specialists and professionals during impact studies for mining and other large-scale projects, help identify the sources of project impacts on environmental components (Figure 5-1).

5.3.2 IMPACT ASSESSMENT METHOD

Following the identification of potential impacts, the goal of the impact assessment is to determine, as objectively as possible, the significance of the potential residual impacts on the components of the physical, biological, and social environments, after common and specific mitigation or improvement measures have been implemented. This assessment covers impacts of all types whether negative, positive, or indeterminate. It consists of identifying and assessing the significance of anticipated impacts at different stages of the project. The significance of an impact is a function of disturbance intensity (which incorporates the concepts of component value and degree of disturbance), its extent, duration, and probability of occurrence.

Table 5-1 Interrelationship grid between sources of impacts and environmental components

		Physical environment									Biological environment					Social Environment						
Environmental components		**Ambient air**	**Greenhouse gases**	**Sound Environment**	**Soil**	**Hydrology**	**Surface water**	**Sediments**	**Hydrogeology**	**Groundwater**	**Vegetation and wetlands**	**Ichthyofauna, benthos, and habitats**	**Herpetofauna and habitats**	**Avian fauna and habitats**	**Mammals and habitats**	**Population, economy, and employment**	**Quality of life and well-being**	**Use of the territory and its natural resources**	**Traditional First Nations land use**	**Infrastructure and public utility services**	**Heritage and archaeology**	**Landscape**
Sources of impact																						
Construction	Organization of the site, stripping, and clearing	■		■	■	■	■	■	■	■	■	■	■	■	■		■	■	■		■	■
	Surface preparation and access arrangement			■	■	■	■	■	■	■	■	■	■	■	■		■	■	■		■	■
	Construction of works and infrastructure	■	■	■	■	■	■	■	■	■	■	■	■	■	■		■	■	■		■	■
	Transportation and traffic		■	■	■		■	■		■	■	■	■	■	■		■	■	■	■		■
	Production and management of residual and hazardous waste				■		■	■		■	■	■	■	■	■		■	■	■			
	Workforce and procurement															▒	■	■				
Operations	Presence and operation of new infrastructure	■	■	■	■	■	■	■	■	■		■	■	■	■		■		■			■
	Water use and management				■	■	■	■	■	■		■	■	■	■		■		■			
	Transportation and traffic	■	■	■	■		■	■		■	■	■	■	■	■		■	■	■	■		■
	Production and management of residual and hazardous waste	■			■		■	■		■	■	■	■	■	■		■	■	■			
	Workforce and procurement		■													▒	■	■				
Closure	Presence of the remains of the site				■	▒			■						■		■		■			■
	Final restoration	■	■	■	▒	▒	▒	▒	■	▒	▒	▒	▒	▒	▒		■		▒			▒
	Production and management of residual and hazardous waste				■		■	■		■		■	■	■	■		■		■			
	Workforce and procurement		■													▒						

a. Only the environmental components affected by the project are shown in the table.

■ Negative impact

▒ Positive impact

5.4 CUMULATIVE IMPACTS ASSESSMENT

The cumulative impacts assessment is now an essential component of any environmental assessment. This involves examining the project-related impacts under review in combination with the impacts of past, present, or reasonably foreseeable future projects. The cumulative impacts assessment is presented in Chapter 11.

6 CURRENT CONDITIONS OF THE PHYSICAL ENVIRONMENT

6.1 CLIMATE

The climate at the Windfall project site is humid continental, characterized by a warm, slightly humid summer and a cold, long winter. January is the coldest month with an average temperature of -17.9 °C while July is the warmest month with an average temperature of 17.2 °C. On average, the first frost occurs around September 11 and the last around June 10.

Total annual precipitation averages 927.8 mm and is highest from April to October. Snowfall amounts vary from October to April and average 226.2 mm annually.

Weather data compiled by Environment Canada and recorded at the Matagami weather station were used. The data included temperature, relative air humidity, barometric pressure, and wind direction and speed.

6.2 AMBIENT AIR

Currently, there are no National Air Pollution Surveillance (NAPS) stations near the study area. The initial concentrations used in this study to characterize current ambient air conditions are derived from the generic initial concentrations prescribed by the MELCCFP for projects located in northern and remote areas.

6.3 GREENHOUSE GAS

Project activities will generate GHG emissions. The scientific consensus is that these GHG emissions are causing global climate change phenomena. GHG emissions, which primarily consist of carbon dioxide (CO_2), methane (CH_4), and nitrous oxides (N_2O), are quantified in metric tons and determined using MELCCFP and Environment and Climate Change Canada (ECCC) estimation methodologies.

In 2020, Quebec's total GHG emissions were 74 Mt CO_2eq, or 8.6 t per capita, representing 11.0% of Canada's total emissions of 672 Mt CO_2eq.

6.4 SOUND ENVIRONMENT

The local social environment study area is essentially located in a natural forested area where resource development is permitted. Only a few cabins are present in this area.

An assessment of the existing sound environment was conducted at sensitive areas near the proposed surface infrastructure at the project site. Measurements were taken on the properties of the dwellings closest to the new infrastructure: on the property of the Cree camp approximately 6 km south of the Windfall project site, and on the property of the non-First Nation camp 925 m south of road R1053 (R6000) and west of the mine site (1,400 m from the proposed infrastructure). The primary noise source at the first receptor point (Cree camp) was a small generator in the yard between the houses, which was in operation throughout the measuring period. Noise sources identified at the second receptor point (non-First Nations camp) were vegetation rustling in the wind, water lapping on the shoreline, birds singing, and the sound of insects.

During the construction phase, the MELCCFP Lignes directrices concernant les niveaux sonores provenant d'un chantier de construction industrielle, guidelines for noise levels from an industrial construction site apply (55 dBA during the day, 55dBA in the evening, and 45 dBA at night). During the operations phase, the noise criteria according to the Note d'instructions 9801 of the MELCCFP (55 dBA during the day and 50 dBA at night) apply for all receptor points.

6.5 SOILS

GEOLOGY

The study area is located in the Urban-Barry greenstone belt, which is part of the northern volcanic zone of the Abitibi geological sub-province. The belt, which runs east-west, is dominated by mixed sequences of mafic to felsic volcanics with some sedimentary sequences and is intersected by several shear zones that delineate major structural features (faults). The Windfall deposit is located in the central part of the Urban-Barry belt.

GEOMORPHOLOGY

The Windfall project area is located in the Mistassini Highlands natural province, which is dotted with hills that have been shaped by successive glaciations, interspersed with interglacial periods.

Surface deposits in the local biophysical environment study area consist largely (39.9%) of unsorted till with a discontinuous cover (sand with the presence of gravel, pebbles, and boulders). Organic deposits make up 28.4% of the local study area. Ice-contact deposits (sand and gravel with some pebbles and boulders) make up 20.7% of the surface deposits in the local study area. A few eskers are present. Proglacial subaqueous outwash deposits (amalgam of sand, gravel, and boulders) make up 11.0% of the area of the local study area.

SOIL QUALITY

Surveys (exploration drill holes and trenches) were conducted in 2021 and 2022 on the Windfall project site to assess the environmental quality of the soils on the property. The results of the analyses performed on the soil samples were interpreted according to the generic criteria of the MELCCFP's Response Manual—Soil Protection and Contaminated Sites Rehabilitation (Response Manual) and the limit values of Schedule I of the Regulation respecting the burial of contaminated soils (RESC).

Chemical analysis results for 167 samples showed concentrations above background levels established for the Superior and Rae geological provinces (generic criteria A) for the following parameters: silver, arsenic, cadmium, lead, nickel, tin, and cobalt. All results fell within the A-B range of the generic criteria in the Response Manual.

Results in the B-C range of the Response Manual generic criteria were observed for arsenic, manganese, and nickel. Only one exceedance of generic criterion C was observed for manganese.

In the total sulphur chemistry analysis, results from three of the 70 samples analyzed showed a concentration in the A-C range of the generic criteria in the Response Manual. All other results for total sulphur were below generic criteria A.

In addition, all samples submitted for analysis of C_{10}-C_{50} petroleum hydrocarbons indicated concentrations below the detection limit of the laboratory's measurement devices.

NATURAL BACKGROUND LEVELS

The results of chemical analyses of 108 soil samples from two soil layers were used to establish natural background levels. Natural background levels were calculated for 19 parameters for which at least one result was above the reported detection limit (RDL): aluminum, arsenic, barium, calcium, chromium, cobalt, copper, iron, lithium, magnesium, manganese, nickel, lead, potassium, sodium, total sulphur, titanium, vanadium, and zinc. For all parameters analyzed, the calculated natural background levels were below generic criteria A of the Response Manual.

6.6 HYDROLOGY

The Windfall project is located at the junction of three watersheds: CE06B, CE02, and SN2. The CE06B watershed drains into Matagami Lake via the Waswanipi River (Map 6-1). The CE02 and SN2 watersheds also drain into Matagami Lake, but via the Bell River.

Field campaigns have been conducted in recent years (2015 to 2022) to characterize the watercourses in the study area. Characteristic flows and watersheds were assessed at twelve (12) points of interest within the three watersheds mentioned above. It should be noted that infrastructure is already present in the area and that natural conditions are thus modified by a mining effluent located in Pond 1, which is part of the CE09 and CE15 sub-watersheds, in the CE02 watershed. The estimated flows at the stations in these sub-watersheds are thus increased by the discharge flows from the WTP.

Hydrogéomorphologie / *Hydrogeomorphology*

- Point de calcul / *Calculation point*
- Effluent (Étang 1) / *Effluent (Pond 1)*

Bassins versants / *Watersheds*

- CE06B : 14 km²
- CE18 : < 1 km²
- CE19 : < 1 km²
- CE02 : 9 km²
- CE15 : < 1 km²
- CE09 : < 1 km²
- SN2 : 11 km²
- SN2-T1 : 8 km²
- CE29 : 1 km²
- CE03 : 1 km²
- CE13 : < 1 km²
- CE23 : < 1 km²

Hydrographie / *Hydrography*

- Cours d'eau permanent / *Permanent watercourse*
- Cours d'eau permanent partiellement souterrain / *Partially undeground permanent watercourse*
- Cours d'eau intermittent / *Intermittent watercourse*
- Cours d'eau intermittent partiellement souterrain / *Partially undeground intermittent watercourse*
- Cours d'eau souterrain / *Underground watercourse*
- Fossé de drainage / *Drainage ditch*
- Canal / *Canal*
- Plan d'eau / *Waterbody*

Végétation / *Vegetation*

- Milieu humide / *Wetland*

Infrastructures du projet / *Project Infrastructures*

- Infrastructures aux conditions actuelles (échantillonage en vrac) / *Infrastructure at current conditions (bulk sampling)*

Routes / *Roads*

- Route forestière secondaire / *Secondary forest road*
- Route forestière tertiaire / *Tertiary forest road*

OSISKO
MINIÈRE OSISKO

Projet minier Windfall - Résumé de l'étude d'impact sur l'environnement / *Windfall Mining Project - Summary of the Environmental Impact Assessment*

Site minier Windfall, Eeyou Istchee Baie-James (Québec) / *Windfall Mining Site, Eeyou Istchee Baie-James (Quebec)*

Carte 6-1 / *Map 6-1*
Bassins versants aux conditions actuelles / *Watersheds at Current Conditions*

Sources / Sources:
CanVec+, 1/50 000, RN Can, 2014
SDA, 1/20 000, MERN Québec, 2020
BDTA, 1/250 000, MRN Québec, 2002
BDGA, 1/5 000 000, MRN Québec, 2012
AQRéseau, Réseau routier 32G, 2020

0 400 800 m
MTM, Fuseau 9 / *Zone 9, NAD83*

2023-03-15

Préparée par / Preparation : R. Boily
Dessinée par / Drawing : C. Villeneuve
Vérifiée par / Verification : E. Sormain
_201_11330_19_reic6_1_235_BV_Actuel_230315.mxd

wsp

6.7 SURFACE WATER

Surface water quality data were taken from the results of analyses performed on surface water samples collected in the most recent campaign years (2016–2017, 2021, and 2022). The 17 sampling stations are distributed throughout the area around the Windfall project site. Based on the results obtained, the surface water in the Windfall project study area is of good quality. Surface water quality around the site showed relatively few exceedances of the criteria established by the MELCCFP for the protection of aquatic life. However, there appear to be some concentrations of metals present. In general, mercury, arsenic, and lead are the three parameters that most often exceed the MELCCFP criteria for chronic effects. It should be noted that the analysis of some soil samples showed exceedances of the generic criteria for arsenic and lead. In total, values above the MELCCFP criteria for prevention of contamination (water and aquatic organisms) or protection of aquatic life (chronic effect) were detected for seven metals: aluminum, arsenic, iron, manganese, mercury, lead, and zinc.

For final effluent water quality (Pond 1), the quality criteria required by D019 and the MDMER were all met between 2019 and 2022, except for one result showing an abnormally high value for radium 226 concentrations. The results showed that the final effluent is slightly acidic and has very low mineralization. Biological analyses (acute toxicity bioassays) with daphnia and rainbow trout conducted since January 2019 have continuously demonstrated no acute toxicity of the final effluent to either organism, except for 1 sample in 2022 for daphnia (*daphnia magna*).

To validate the extent of the final effluent plume under current operating conditions, a characterization was conducted in September 2019. Based on the results, it can be determined that the current effluent plume has an influence on surface water quality of less than 10% downstream of SN8 and less than 1.5% downstream of SN11. The situation will change in all cases once this project is implemented.

6.8 SEDIMENTS

Sediment characterization campaigns have been conducted around the Windfall project site since 2010. More recently (2017, 2021, and 2022), samples were collected at 10 stations along various watercourses and water bodies. The results of the chemical analyses for the various sediment samples collected were compared to the criteria for assessing sediment quality in freshwater environments. A few criteria exceedances were noted, indicating that concentrations above baseline criteria were present prior to project implementation. Overall, cadmium and mercury appeared to exceed the comparison criteria at a few stations, while occasional exceedances were measured for chromium, lead, and zinc. Most of the exceedances were observed at a station located in Lake SN2 (WL-14). Other than these exceedances, the measured values for the various variables do not appear to be restrictive to aquatic life. However, the data collected at one station in Pond 2 (WL-19) in 2022 showed C_{10}-C_{50} petroleum hydrocarbon concentrations above the reported detection limit (RDL) for all samples analyzed.

6.9 HYDROGEOLOGY

The conceptual hydrogeological model of the Windfall project site was developed following a review of existing information (exploration data, government data, hydrogeological studies [2007, 2018, 2020]).

The analysis of the available data and the results of the hydrogeological characterization work allowed the identification of four main hydrostratigraphic units: fluvioglacial deposits (eskers—sand and gravel), till, rock, and structural features (faults). The unconsolidated deposits in the study area consist mainly of silty and gravelly sands. The permeability of this aquifer is generally medium to high and its aquifer potential is good. In the Windfall project area, unconsolidated deposits generally range in thickness from 1 m to 10 m.

Measured groundwater levels were generally near the ground surface, with measured depths ranging from 0 m to 13.5 m, with an average of 2.1 m. According to the groundwater classification system of the MELCCFP, a groundwater table can be Class I, II, or III depending on its hydrogeological properties, quality, and potential for use. Based on the information gathered for the Windfall project site, the rock is consistent with a Class II fractured aquifer, which is an aquifer that is a potential water supply source. The fluvioglacial deposit horizon is considered a Class II aquifer.

Based on the hydrogeological properties of the site, the groundwater has a medium vulnerability (DRASTIC index) for the surface deposits and for the upper portion of the rock. This index reflects the level of risk of groundwater contamination based on hydrogeological properties.

There are three drinking water wells to supply the exploration camp.

6.10 GROUNDWATER

A total of 106 samples were collected from 23 wells (15 from the rock aquifer and 8 from the sandy deposits) during at least two annual campaigns in 2020 and 2021. Groundwater sampling results were compared to the groundwater resurgence criteria (RES) and drinking water criteria (EC) presented in the MELCCFP Response Manual. Criteria exceedances were observed for ammonia nitrogen (EC, RES), nitrite (EC, RES), nitrate (EC), manganese (EC), arsenic (EC), aluminum (EC), sulphide as H_2S (EC, RES), nickel (EC), phosphorus (RES), copper (RES), and zinc (RES). Some exceedances may be associated with activities that occurred on the site prior to the sealing of the existing waste rock pile, its ditches, and the new water management infrastructure, all of which occurred prior to Osisko's arrival.

An analysis of natural background levels in groundwater was also performed with all the data collected since 2007. The results show that natural background levels exceed the EC criterion for three parameters: arsenic, manganese, and ammonia nitrogen.

7 CURRENT CONDITIONS OF THE BIOLOGICAL ENVIRONMENT

7.1 VEGETATION AND WETLANDS

TERRESTRIAL ENVIRONMENTS

The inventory conducted in the study area revealed that the vegetation present on the site is predominantly black spruce, with jack pine on drier sites, white birch on south-facing hillsides, and balsam fir and trembling aspen on sites with thin surface deposits.

Terrestrial environments account for 37.20% of the study area (Map 7-1). Of the terrestrial environments, the regeneration and plantation areas cover the largest portion in the study area (18.55%). The two early successional groupings (coniferous shrubland regeneration and indeterminate regeneration) that stand out in the study area (18.01%) are primarily associated with forestry activities. Areas logged in the late 1990s are now dominated by a shrubby regeneration of black spruce and jack pine, sometimes in association with white birch. In the shrub layer, in addition to Labrador tea present throughout the study area, a few other species were observed, particularly lowbush blueberry, velvetleaf blueberry, and sheep-laurel. The various softwood stands form the second most observed terrestrial environment in the study area. The most observed stand is black spruce-moss (9.89%). These stands are found on gently to moderately sloping land around watercourses, lakes, or bogs.

WETLANDS

Wetlands (Map 7-1) account for 44.88% of the inventory area. Of all wetland vegetation groupings, open ombrotrophic bogs and forested ombrotrophic bogs predominate. In fact, these two types of plant groupings represent 79.32% of the wetlands in the study area.

WATER AND ANTHROPOGENIC ENVIRONMENTS

Water environments (lakes) cover 12.25% of the inventory area (Map 7-1). The study area also includes 5.67% anthropogenic environments, mainly existing facilities associated with advanced exploration activities.

PLANT SPECIES OF SPECIAL STATUS

No species of special status were observed in the inventory area at any of the 391 inventory stations (2016, 2017, and 2021). However, eight species are likely to occur in the study area, two of which may have a medium potential of being present, namely the purple meadow-rue and McCalla’s willow. However, their potential presence is considered low since they were not observed during the various inventory campaigns.

Zone d'étude locale du milieu biophysique/ *Biophysical environment local study area*

Hydrographie / *Hydrography*

- Cours d'eau permanent / *Permanent watercourse*
- Cours d'eau permanent partiellement souterrain / *Partially undeground permanent watercourse*
- Cours d'eau intermittent / *Intermittent watercourse*
- Cours d'eau intermittent partiellement souterrain / *Partially undeground intermittent watercourse*
- Cours d'eau souterrain / *Underground watercourse*
- Fossé de drainage / *Drainage ditch*
- Canal / *Canal*
- Plan d'eau / *Waterbody*

Infrastructure / *Infrastructure*

- Ligne de transport d'énergie électrique / *Electric power line*
- Route forestière / *Forest road*
- Chemin de gravier (mine) / *Gravel road (mine)*
- Route d'accès / *Access road*

Empiètement du projet / *Project Encroachment*

- Empiètement permanent / *Permanent encroachment*
- Empiètement temporaire / *Temporary encroachment*

Caractérisation du milieu naturel / *Natural Environment Characterization*

Milieux humide et hydrique / *Wetlands and Hydrous Environment*

- Marais / *Marsh*
- Marécage arborescent / *Forested swamp*
- Marécage arbustif / *Shrubby swamp*
- Tourbière ombrotrophe boisée / *Forested bog*
- Tourbière ombrotrophe ouverte / *Open bog*
- Tourbière minérotrophe boisée / *Forested fen*
- Tourbière minérotrophe ouverte / *Open fen*
- Eau peu profonde / *Shallow water*

Milieu forestier / *Forest Environment*

- Feuillu / *Deciduous*
- Mixte / *Mixed-wood*
- Résineux / *Softwood*
- Régénération forestière et plantation / *Forest regeneration and plantation*

Autres milieux / *Other Environments*

- Anthropique / *Anthropogenic*
- Anthropique autorisé lors de l'échantillonnage en vrac / *Anthropogenic authorized for bulk sampling*

OSISKO
MINIÈRE OSISKO

Projet minier Windfall - Résumé de l'étude d'impact sur l'environnement / *Windfall Mining Project - Summary of the Environmental Impact Assessment*

Site minier Windfall, Eeyou Istchee Baie-James (Québec) / *Windfall Mining Site, Eeyou Istchee Baie-James (Quebec)*

Carte 7-1 / *Map 7-1*
Composantes du milieu biologique - Végétation / *Biological Environment Components - Vegetation*

Sources :
CanVec+, 1/50 000, RNCan, 2014
MERN, AQréseau+, réseau routier, 2020

MTM, Fuseau 9 / *Zone 9, NAD83*

2023-03-15

Préparée par / Preparation : É. D'Astous
Dessinée par / Drawing : C. Villeneuve
Vérifiée par / Verification : M.-H. Brisson

_201_11330_19_reic7_1_236_Vegetation_230315.mxd

wsp

INVASIVE ALIEN SPECIES

No invasive alien species were observed in the inventory area.

VASCULAR PLANTS HAVING TRADITIONAL USES

In total, 36 of the plants observed in the field are used by the Cree. These include eight tree species, 21 shrub species, six herbaceous species, and one invascular moss species. Generally speaking, species of medicinal interest observed in the field are common in the study area and in this part of Quebec.

7.2 ICHTHYOFAUNA AND BENTHOS

Based on inventories conducted between 2015 and 2022, nearly all water bodies in the local biophysical environment study area are fish habitat. The main fish-bearing lakes are Windfall, SN1, SN2, SN3, SN4, SN5, SN6, SN8, and Pond 2 (Map 7-2). Pond 1 is marginal fish habitat, but is not suitable for aquatic wildlife due to its low biological potential. Only Kettle Lake is not fish habitat, since it does not have an outflow or tributary, and no fish have been caught in it.

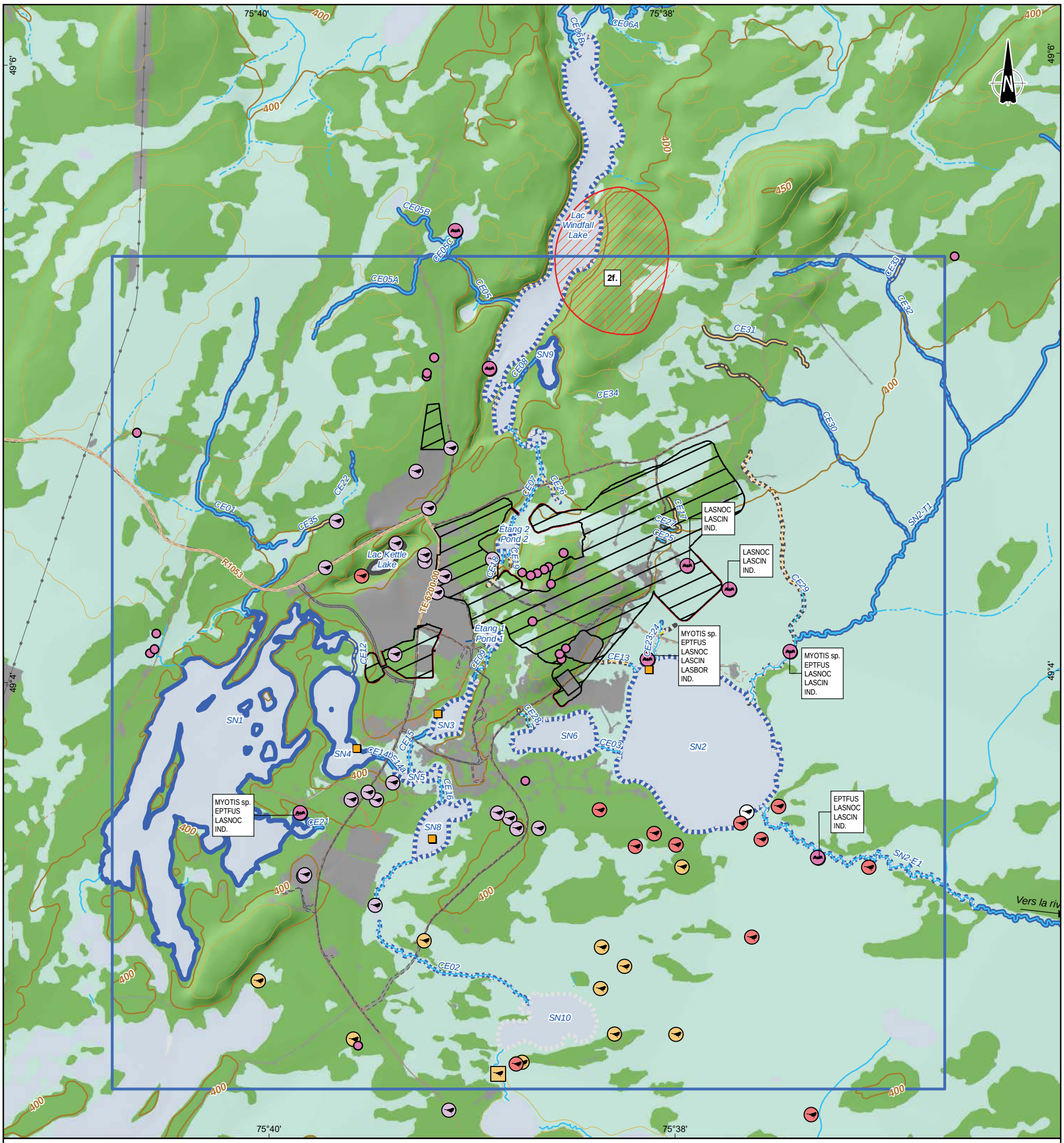
Of the 31 watercourses in the study area, 20 are considered fish habitat. These can provide shelter or passage for fish.

The following ten fish species were documented in the study area: mottled sculpin (*Cottus bairdii*), lake cisco (*Coregonus artedi*), walleye (*Sander vitreus*), brook stickleback (*Culaea inconstans*), northern pike (*Esox lucius*), lake whitefish (*Coregonus clupeaformis*), burbot (*Lota lota*), lake chub (*Couesius plumbeus*), white sucker (*Catostomus commersonii*), brook trout (*Salvelinus fontinalis*), fallfish (*Semotilus corporalis*), yellow perch (*Perca flavescens*) and trout-perch (*Percopsis omiscomaycus*). No fish species that are threatened, vulnerable, or likely to be designated as threatened or vulnerable have been identified in the study area. It should be noted that three species are present only in Lake SN2 (white sucker, lake whitefish, and walleye). This is the lake with the highest fish diversity in the inventory area and the highest fishing yield.

7.3 HERPETOFAUNA

Inventories that included the various types of herpetofauna (anurans, salamanders, garter snakes, and turtles) were conducted in 2016, 2017, and 2021. Opportunistic observations were also made during various field campaigns in 2016 and 2017. A total of eight species of herpetofauna were observed: five species of anurans—the American toad (*Anaxyrus americanus*), the wood frog (*Lithobates sylvaticus*), the mink frog (*Lithobates septentrionalis*), the northern green frog (Lithobates clamitans melanota), and the spring peeper (*Pseudacris crucifer*); two species of salamanders—the two-lined salamander (*Eurycea bislineata*) and the blue-spotted salamander (*Ambystoma laterale*); and, one species of garter snake—the common garter snake (*Thamnophis sirtalis*). According to the literature, nine other species are likely to frequent the local biophysical environment study area.

Although they were observed at low densities, the herpetofauna species recorded are all common species in Quebec. None of the species observed are at the northern limit of their range, and none have special status. Four species of special status are likely to frequent the territory—snapping turtle (*Chelydra serpentina*), wood turtle (*Glyptemys insculpta*), boreal chorus frog (*Pseudacris maculata*), and four-toed salamander (*Hemidactylium scutatum)*—but they were not detected during the inventories conducted.



Zone d'étude locale du milieu biophysique/ *Biophysical environment local study area*

Hydrographie / *Hydrography*

- Cours d'eau permanent / *Permanent watercourse*
- Cours d'eau permanent partiellement souterrain / *Partially undeground permanent watercourse*
- Cours d'eau intermittent / *Intermittent watercourse*
- Cours d'eau intermittent partiellement souterrain / *Partially undeground intermittent watercourse*
- Cours d'eau souterrain / *Underground watercourse*
- Fossé de drainage / *Drainage ditch*
- Canal / *Canal*
- Plan d'eau / *Waterbody*

Infrastructure / *Infrastructure*

- Ligne de transport d'énergie électrique / *Electric power line*
- Route forestière / *Forest road*
- Chemin de gravier (mine) / *Gravel road (mine)*
- Route d'accès / *Access road*

Empiètement du projet / *Project Encroachment*

- Empietement permanent / *Permanent encroachment*
- Empiètement temporaire /*Temporary encroachment*

Végétation / *Vegetation*

- Milieu forestier / *Forest Environment*
- Milieux humide et hydrique / *Wetlands and Hydrous Environment*
- Autres milieux / *Other Environments*

Composantes du milieu biologique - faune / *Biological Environment Component - Fauna*

Ichtyofaune et benthos

- Station d'échantillonnage du benthos (2017-2021) / *Benthos sampling station (2017-2021)*
- Habitat du poisson dans le cours d'eau ou le plan d'eau / *Fish habitat in the watercourse or in the waterbody*
- Absence de l'habitat du poisson dans le cours d'eau ou le plan d'eau / *No fish habitat in the watercourse or in the waterbody*
- Cours d'eau ou plan d'eau affecté par une modification du régime hydrique /*Watercourse or waterbody affected by a change in the water regime*

Observations de la faune aviaire/ *Avian Fauna Observations*

- Engoulevent d'Amérique (2016-2017, 2021) / *Common nighthawk (2016-2017, 2021)*
- Moucherolle à côtés olive (2017, 2021) / *Olive-sided flycatcher (2017, 2021)*
- Pygargue à tête blanche (2016-2017) / *Bald Eagle (2016-2017)*
- Quiscale rouilleux (2016-2017, 2021) / *Rusty blackbird (2016-2017, 2021)*
- Nid de quiscale rouilleux (2016) / *Rusty blackbird nest (2016)*

Chiroptères / *Chiroptera*

- Station d'inventaire acoustique (2016-2017, 2021) / *Acoustic survey station (2016-2017, 2021)*
- Site d'inventaire de maternité potentiel / *Potential maternity inventory roost*

Résultat d'inventaire des chirpotères / *Chiroptera Inventory Result*

EPTFUS	Grande chauve-souris brune / *Brig brown bat*
LASBOR	Chauve-souris rousse / *Eastern red bat*
LASCIN	Chauve-souris cendrée / *Hoary bat*
LASNOC	Chauve-souris argentée / *Silver-haired bat*
MYOTIS sp.	Complexe Myotis / *Myotis complex*
IND.	Indéterminée / *Indeterminate*

Grande faune / *Big Fauna*

- Réseau de piste de l'orignal / *Moose trail network*

Observation directe d'orignal / *Moose observation*

f. : femelle / *female*
v. : veau / *veal*

OSISKO
MINIÈRE OSISKO

Projet minier Windfall - Résumé de l'étude d'impact sur l'environnement / *Windfall Mining Project - Summary of the Environmental Impact Assessment*

Site minier Windfall, Eeyou Istchee Baie-James (Québec) / *Windfall Mining Site, Eeyou Istchee Baie-James (Quebec)*

Carte 7-2 / *Map 7-2*
Composantes du milieu biologique - Faune (excluant le caribou forestier) / *Biological Environment Components - Fauna (Excluding Woodland Caribou)*

Sources :
CanVec+, 1/50 000, RNCan, 2014
MERN, AQréseau+, réseau routier, 2020

0 250 500 m

MTM, Fuseau 9 / *Zone 9*, NAD83

2023-03-15

Préparée par / Preparation : É. D'Astous
Dessinée par / Drawing : C. Villeneuve
Vérifiée par / Verification : M.-H. Brisson

_201_11330_19_reic7_2_237_CompMilBio_230315.mxd

wsp

7.4 AVIFAUNA

Several inventories were conducted for avian fauna in 2016, 2017, and 2021, including nesting waterfowl inventories, a breeding landbird inventory, and targeted searches for species at risk. Combining observations from the surveys and available data, the number of species frequenting the survey area could be as high as 86.

A total of 12 species of waterfowl and other waterbirds were recorded, including six confirmed as nesting. Six species of birds of prey and one species of corvid (common raven) were observed, without a confirmation of nesting status. For land and forest birds, 56 species were observed, nine confirmed as nesting.

A total of five species of special status were observed in the inventory area: bald eagle (*Haliaeetus leucocephalus*), common nighthawk (*Chordeiles minor*), rusty blackbird (*Euphagus carolinus*), olive-sided flycatcher (*Contopus cooperi*), and Canada warbler (*Cardellina canadensis*). Although the bank swallow (*Riparia riparia*) was not observed, it may be using the borrow pits in the study area.

7.5 LARGE MAMMALS

A study was conducted in 2022 to determine the land use pattern of large mammals. The inventory focused on woodland caribou (*Rangifer tarandus caribou*) and moose (*Alces alces*) to address some of the concerns raised by the Cree community of Waswanipi. Black bear (*Ursus americanus*) and grey wolf (*Canis lupus*) data were also included in the study due to opportunistic sightings reported in 2016, 2017, and 2021.

WOODLAND CARIBOU

Woodland caribou from the local Assinica population (herd), located within federal Conservation Unit QC-6 northeast of Lebel-sur-Quévillon, are the most likely to frequent the study area. However, there may be some interaction between individuals from this population and those from Témiscamie and Nottaway. It should be noted that the 5 km zone of influence around the mine is located 75 km south of the QC-6 Conservation Unit and that the 50 km large wildlife inventory zone from the centre of the mine is entirely outside of protected boreal woodland caribou habitat.

According to information provided by the MELCCFP, six incidental sightings are listed within 50 km of the proposed centre of the mine: four sightings were from before 2015 and two were reported between 2015 and 2018. Through telemetry, the locations of a woodland caribou were also recorded in the spring of 2011 in the northern limit of the area, at a distance of more than 35 km from the centre of the mine. It should be noted that the locations of collared caribou do not provide an exhaustive picture of the use of the territory by all caribou.

Only one tallyman, among those included in the inventory zone for large wildlife, mentioned that a caribou had been observed during the biological inventories, and that in the past, his father used to see some caribou in the zone. In 2022, the family of another tallyman mentioned having observed traces of caribou (4 or 5 individuals including calves) on the outskirts of Roméo Lake (located more than 10 km from the site).

The aerial survey conducted in March 2018 located three caribou, two males and one female, in the southern boundary of the study area, approximately 20 km from the centre of the Windfall project site. According to the results of this inventory, the estimated number of caribou in the inventory area is about four, with a density of 0.25 caribou per 100 km^2.

The current rate of habitat disturbance was assessed across the caribou inventory area. Overall, anthropogenic elements disturb 74% of the study area within 50 km. Forest harvesting and the extensive network of logging roads are the main sources of human disturbance. The area with the highest rate of disturbance (81%) by anthropogenic and natural elements within the study area is located within 5 km of the centre of the mine. Fires have disturbed nearly 12% of this area, while anthropogenic elements generate about 81% of the disturbance. Within 10 km of the centre of the mine, 63% of the surface is disturbed.

According to the modelling carried out to determine the relative probability of occurrence of woodland caribou, a model that makes it possible to assess the state of the environment as a habitat for woodland caribou, the study area offers poor habitat conditions.

MOOSE

The moose inventory area includes two traplines, W25A and W25B. According to the tallymen of these traplines, the area is rather swampy and is therefore not suitable for moose. However, some of the more forested areas approximately 5 km or more from the Windfall project site are frequented by moose and are therefore to be considered important.

In 2018, tallymen and land users reported that moose hunting had become more difficult due to human disturbances. These findings of declining moose numbers in the area still applied in 2022. A tallyman also indicated that in 2017 and 2018, moose were occasionally seen along the road northeast of the site, but that they have not been seen there since. However, moose tracks were seen in 2022 on the access road to another mining company's exploration camp a few kilometres south of the Windfall project.

During the 2018 aerial survey, four moose (three females and one calf) were observed in two wintering areas (yarding areas), which corresponds to an estimated density of 0.5 moose/10 km^2 in the moose-specific inventory area (100 km radius). Across the caribou survey area, 40 wintering areas were located and 13 moose were counted in seven of these, including six females and seven males.

BLACK BEAR

No specific black bear inventories were conducted in the study area. However, some were observed and signs of their presence were encountered during some of the inventories for other wildlife groups. Since Osisko resumed exploration activities, black bears have also been frequently observed near the exploration camp and drilling areas. In 2022, four bears were living near the camp.

GREY WOLF

The grey wolf was not subject to a specific inventory. Although none were seen during the wildlife inventories, their tracks were observed on several occasions, covering almost the entire caribou inventory area. Carcass remains of a young moose killed by a pack of wolves were also observed.

7.6 MAMMALS—CHIROPTERANS

Chiropteran inventories were conducted in 2016, 2017, and 2021. These acoustic bat inventories confirmed the use of the local biophysical environment study area by six bat species: three resident species—the little brown bat (*Myotis lucifugus*), the northern long-eared myotis (*M. septentrionalis*), and the big brown bat (*Eptesicus fuscus*); and three migratory species—the silver-haired bat (*Lasionycteris noctivagans*), the hoary bat (*Lasiurus cinereus*), and the red bat (*Lasiurus borealis*).

The results of these inventories also suggest the presence of a travel and migration corridor used by chiropterans, which would pass through Croft Lake in particular, and then continue further south through Windfall Lake, thus forming a chain of lakes and watercourses with a general north-south orientation.

To confirm the presence of roosting sites in the Windfall project area, a search for potential chiropteran maternity colonies was conducted during the 2021 season. No potential sites were observed at anthropogenic structures (buildings), but several potential sites were identified at natural structures (tree cavities and snags). No evidence of use of these potential sites was observed; however, this does not guarantee that sites for birthing and nursing the pups are not being used in the local biophysical study area.

Of the species identified, the little brown bat and the northern long-eared myotis are considered endangered in Canada. The silver-haired, hoary, and red bats are on the MELCCFP's List of wildlife species which are likely to be designated as threatened or vulnerable.

7.7 MAMMALS—OTHER SPECIES

A small mammal inventory was conducted during August 2016 and September 2021. A total of seven species were documented: southern red-backed vole (*Myodes gapperi*), meadow vole (*Microtus pennsylvanicus*), heather vole (*Phenacomys intermedius*) deer mouse (*Peromyscus maniculatus*), woodland jumping mouse (*Napaeozapus insignis*), cinereous shrew (*Sorex cinereus*), and smoky shrew (*Sorex fumeus*). None of these species have special status.

No specific inventory was conducted to identify other mammal species. However, species observed opportunistically during these inventories were documented and the potential for the presence of species of special status was described in detail. Within the local biophysical environment study area, the following eight species were identified: Canadian beaver (*Castor canadensis*), red squirrel (*Tamiasciurus hudsonicus*), snowshoe hare (*Lepus americanus*), grey wolf (*Canis lupus*), eastern chipmunk (Tamias striatus), moose (Alces alces), black bear (Ursus americanus), and muskrat (Ondatra zibethicus). Among fur-bearing species, small mammals likely to frequent the territory, none with a special status have been observed.

8 CURRENT CONDITIONS OF THE SOCIAL ENVIRONMENT

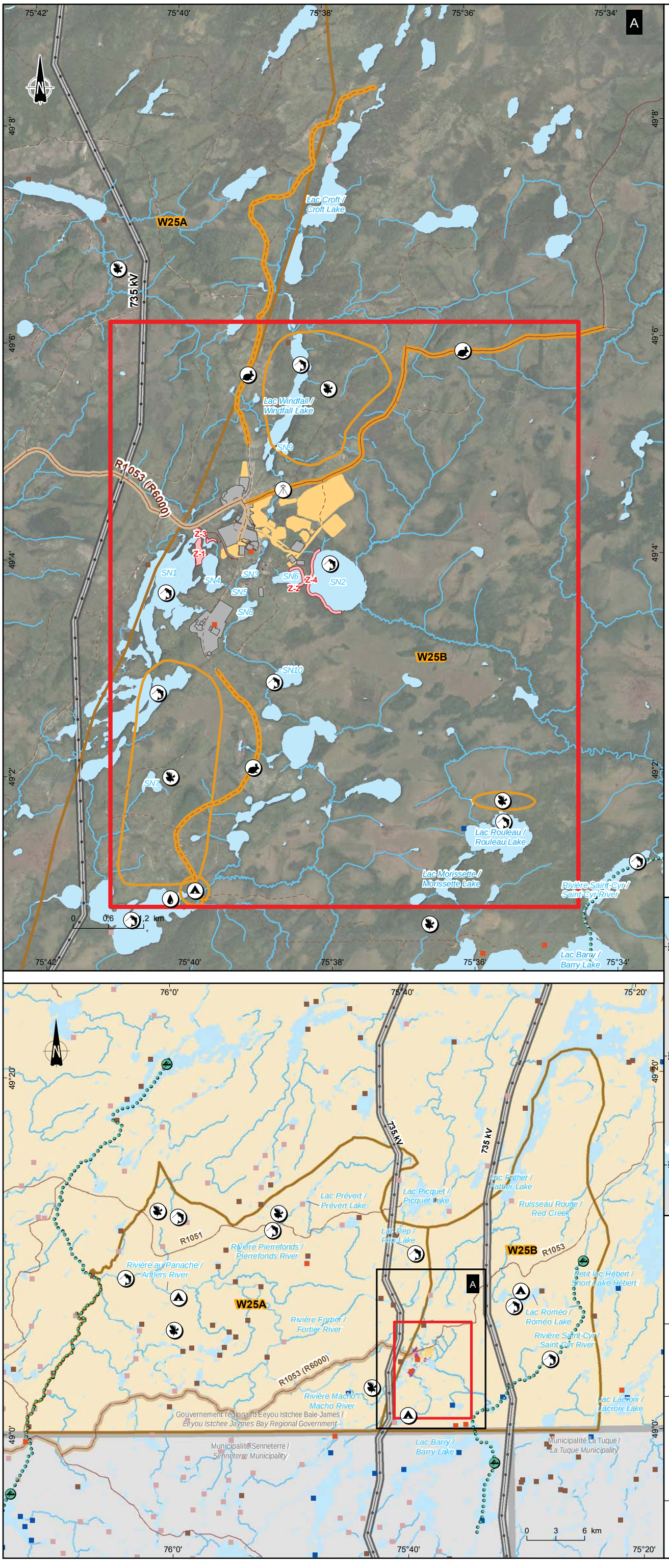
8.1 LAND PLANNING, DEVELOPMENT, AND TENURE

North of the 49th parallel, the territory is governed by the James Bay and Northern Quebec Agreement (JBNQA). The territorial regime established by the Agreement provides for the division of the territory into Category I, II, and III lands.

The Eeyou Istchee James Bay Regional Government (EIJBRG) was established in 2014 as part of the Agreement on Governance in the Eeyou Istchee James Bay Territory. The EIJBRG is responsible for the management of Category III lands, on which the Cree have exclusive trapping rights (with some exceptions in the south) and certain non-exclusive hunting and fishing rights.

The local study area consists primarily of Category III public lands under the municipal jurisdiction of the EIJBRG. It is almost uninhabited and is mainly used to harvest natural resources (forestry and mining) and, to a lesser extent, for vacationing and leisure activities. There is no structured wildlife territory, such as outfitters with exclusive rights and controlled harvesting zones. According to the EIJBRG zoning by-law governing the territory in which the local study area is located, the future mine site is located in a zone where the extractive industry is permitted. The local study area is not subject to any public land use plan or regional land development plan.

The regional study area has over 723 km^2 of protected areas. These are mainly composed of biological refuges and there are also two exceptional forest ecosystems, the Forêt rare du Lac Phooey and the Forêt rare du Lac-des-Vents. It also includes the Réserve aquatique projetée du Waswanipi Lake (projected aquatic reserve). There are no protected areas in the local study area (Map 8-1).



Limite administrative / *Administration Boundary*

Municipalité ou territoire équivalent (TE) / *Municipality or Equivalent Territory (ET)*

Terres de catégorie (CJBNQ) / *Category Lands (JBNQA)*

Terre de catégorie III / *Category III lands*

Projet / Project

Zone d'étude locale du milieu humain / *Human local study area*

Infrastructures existantes et/ou qui seront construites en 2023 / *Existing and/or new infrastructure to be built in 2023*

Infrastructures minières à l'étude / *Mining infrastructure under study*

Infrastructures connexes / *Related Infrastructures*

Ligne de transport d'énergie électrique / *Electric power transmission line*

Accès et déplacement des utilisateurs / *Access and travel paths for users*

Route régionale / *Regional road*

Route forestière / *Logging road*

Route d'accès / *Access road*

Hydrographie / *Hydrography*

Cours d'eau / *Watercourse*

Étendue d'eau / *Waterbody*

Utilisation traditionnelle du territoire par les Cris / *Cree land use*

Campement cri / *Cree Camp*

Caméra de suivi de la faune (initiative crie) / *Wildlife tracking camera (Cree Initiative)*

Zone d'habitat de l'orignal / *Moose habitat area*

Zone de pêche / *Fishing area*

Zone d'habitat du lièvre / *Hare habitat area*

Source d'eau pour usage domestique / *Water source for domestic use*

Zone valorisée pour la faune (la délimitation de ces zones est approximative pour fins de confidentialité) / *Wildlife valued area (the delimitation of these areas is approximate for confidentiality purposes)*

Terrain de trappage cri / *Cree trapline*

Archéologie / *Archeology*

Zone de potentiel archéologique identifiée en 2022 / *Area of archaeological potential identified in 2022*

Baux de villégiature / *Leisure leases*

Fins d'abri sommaire en forêt / *Temporary forest shelter*

Fins d'hébergement dans une pourvoirie sans droits exclusifs / *For lodging at an outfitter without exclusive rights*

Fins de villégiature / *For leisure purposes*

Autres fins / *Other purposes*

Sentiers / *Trails*

Canotable / *Canoe*

OSISKO
MINIÈRE OSISKO

Projet minier Windfall - Résumé de l'étude d'impact sur l'environnement / *Windfall Mining Project - Summary of the Environmental Impact Assessment*

Site minier Windfall, Eeyou Istchee Baie-James (Québec) / *Windfall Mining Site, Eeyou Istchee Baie-James (Quebec)*

Carte 8-1 / *Map 8-1*
Zone d'étude locale du milieu humain - Utilisation du territoire / *Human Environment Local Study Area - Land Use*

Sources / Sources:
CanVec+, 1/50 000, RN Can, 2014
SDA, 1/20 000, MERN Québec, 2020
BDTA, 1/250 000, MRN Québec, 2002
BDGA, 1/5 000 000, MRN Québec, 2012
Contraintes et restrictions (GESTIM), MERN Québec, 2022-12-05
GRHQ, Réseau hydrique, 2019-05
AQRéseau+, Réseau routier, 2022-09
MELCCFP, Inventaire écoforestier, 2011

0 0,6 1,2 km
MTM, Fuseau 9 / *Zone 9*, NAD83

2023-03-15

Préparée par / Preparation : S. Paradis
Dessinée par / Drawing : C. Villeneuve
Vérifiée par / Verification : M.-H. Brisson
_201_11330_19_reic8_1_238_MHLocal_230315.mxd

wsp

8.2 FIRST NATIONS INTERESTS AND TREATY LANDS

The legislative and legal context of the Nord-du-Québec region is framed by the JBNQA (1977) and the Agreement concerning a New Relationship between le Gouvernement du Québec and the Crees of Québec (Paix des braves).

Most of the regional study area is within the JBNQA agreement territory. It also cuts across most of the traditional territory of the Cree First Nation of Waswanipi, as well as a portion of the territory of the Ouje-Bougoumou Cree Nation. The local social environment study area is located on Category III lands and straddles two traplines, W25B and W25A.

The Atikamekw of Opiticiwan and Anishnabe of Lac Simon communities are outside the regional study area, located to the southeast and west-southwest of the Windfall project site, respectively.

The activities and infrastructure of the construction, operation, and closure phases will affect the First Nations interests and treaty lands component, as these activities will alter a portion of the land, where it will no longer be possible, or less attractive, to exercise rights such as hunting, fishing, trapping, and gathering. These rights are discussed under the Traditional use of the land by First Nations component in section 8.6.

8.3 POPULATION, ECONOMY, AND EMPLOYMENT

The Eeyou Istchee James Bay territory includes the municipalities of Chibougamau, Chapais, Lebel-sur-Quévillon, and Matagami, as well as the nine Cree communities of the Nord-du-Québec region: Chisasibi, Eastmain, Waskaganish, Wemindji, Whapmagoostui, Mistissini, Nemaska, Oujé-Bougoumou, and Waswanipi.

In 2021, the population of the Nord-du-Québec region was 45,740, or 0.5% of the population of Quebec.

CREE COMMUNITIES OF EEYOU ISTCHEE

In 2021, the Cree communities of Eeyou Istchee had a population of 18,225, or more than one third (39.8%) of the region's population. The main Cree community concerned by the Windfall project, Waswanipi, had a population of 1,836. According to the demographic projections of the Institut de la statistique du Québec (ISQ), the province's bureau of statistics, the population of Waswanipi is expected to increase by 14.1% between 2026 and 2041, a slightly lower growth rate than that of the communities of Eeyou Istchee (17.9%), but at least twice as high as that of Quebec (6.0%). The community had a very young population (27.1% under the age of 15).

In 2021, the average number of people per household in Waswanipi (3.6) was higher than the regional (3.1) and Quebec (2.2) averages. The median after-tax household income for this community ($102,000) was almost $40,000 higher than that of Quebec households ($63,200) in 2020.

In 2019, 5,594 workers were between the ages of 25 and 64 in the Cree communities of Eeyou Istchee. For this territory, the average pre-tax income of workers aged 25 to 64 ($49,318) was lower than that of Quebecers in the same category ($54,409). In 2016[1], the unemployment rates in the Cree communities (16.0%) and Waswanipi (19.6%) were more than twice as high as the provincial rate (7.2%).

In 2016, the proportion of people with at least a high school diploma in the Cree communities of Eeyou Istchee (48.7%) was significantly lower than in the province (80.1%). On the other hand, the proportion of people with a diploma from a trade school (vocational training) was higher in Waswanipi (21.3%) than in Nord-du-Québec (18.6%) and in the Quebec province (16.9%). Approximately 250 members of the Waswanipi community had a vocational diploma at the time, and the qualified workforce, i.e., the population with vocational, college, or university training, consisted of 515 individuals. The qualified labour pool for all Cree communities was 4,375 people.

The economic activities of the Cree communities of Eeyou Istchee are mainly related to the tertiary sector, but also partly to the primary sector. In 2016, the proportion of jobs in the primary sector (6.9%) for Cree communities was three times higher than in Quebec (2.5%). In the community of Waswanipi, 10.2% of jobs were in the primary sector, most of which were in the forestry industry (85.7%) and a small proportion in mining and quarrying (14.3%).

More than ten businesses working in sectors related to the mining and construction industries are listed in Waswanipi.

JAMESIAN MUNICIPALITIES

In 2021, the population of the Jamesian municipalities was 12,194. Among these municipalities, Chibougamau had the largest population in the region in 2021, with 7,233 inhabitants. The second-largest town was Lebel-sur-Quévillon with a population of 2,091 in 2021. The town of Chapais had a population of 1,468. According to the ISQ, the populations of the Jamesian municipalities and Lebel-sur-Quévillon are expected to continue to decline until 2041, at a rate of 5.7% and 10.8%, respectively, from 2026 to 2041. The age profile of the Jamesian and Lebel-sur-Quévillon populations in 2021 is similar to that of the province. People aged 55 and over made up more than a third (38.7%) of the population of Lebel-sur-Quévillon.

The average number of people per household in Lebel-sur-Quévillon, Chapais, and Chibougamau was the same as that of Quebec in 2021, at 2.2 people per household. In 2020, the median after-tax income of households in Lebel-sur-Quévillon ($75,500) was lower than that of Nord-du-Québec ($85,500), but more than $10,000 higher than that of Quebec households ($63,200).

1 Data for the 2021 population census of Waswanipi are not presented since they are not revised to reflect the total population and are therefore not representative.

In 2019, there were 6,211 Jamesian workers between the ages of 25 and 64. The average pre-tax income of Jamesian workers aged 25 to 64 ($62,772) was higher than that of Quebec workers ($54,409). In 2021, the unemployment rates for the Jamesian municipalities (4.0%) and Lebel-sur-Quévillon (3.6%) were roughly half that of the province (7.6%).

In 2021, the proportion of the population with a trade school diploma (vocational training) in Lebel-sur-Quévillon (29.3%) was almost twice that of Quebec overall (15.8%). There were 510 people in Lebel-sur-Quévillon and 2,515 people in the Jamesian municipalities who had professional training. The skilled labour pool in the Jamesian municipalities consisted of 5,595 people. Meanwhile, the proportion of the population with at least a high school diploma was lower for Jamesian municipalities (75.4%) than for the province (81.8%).

The economic structure of the Jamesian municipalities is largely dependent on the energy, mining, and forestry sectors. In 2021, the proportion of jobs in the primary sector was much higher for Jamesian municipalities (10.6%) and for Lebel-sur-Quévillon (10.0%) than for the province (2.4%). Most of the jobs in the primary sector in Lebel-sur-Quévillon were in the mining, quarrying, and oil and gas extraction category (63.6%).

Approximately 160 businesses are listed in Lebel-sur-Quévillon and expertise has been developed in sectors related to the mining and construction industries.

8.4 QUALITY OF LIFE AND WELL-BEING

CREE COMMUNITIES OF EEYOU ISTCHEE

Over the past few decades, First Nations have shifted from a diet based on natural resources to a mixed diet or one based more on commercial products. These dietary changes affect the health status of First Nations populations by contributing to the emergence of chronic diseases such as obesity, diabetes, and cardiovascular disease. In 2013, a decrease in country food consumption was observed among youth in the Cree communities of Eeyou Istchee.

The harvesting, preparation, and consumption of country foods are also central to the Cree identity. However, many difficulties in accessing the land contribute to a decrease in this supply.

The Cree of Eeyou Istchee also have a much stronger sense of belonging to their community than elsewhere in Quebec. The culture and identity of the Cree of Eeyou Istchee have been affected by the development of major projects in the territory over the past 50 years.

The Cree Board of Health and Social Services of James Bay (CBHSSJB) is the organization responsible for the management of health and social services for the nine Cree communities of Eeyou Istchee. A Community Miyupimaatisiiun Centre (CMC) offering a variety of services in general medicine, home care, dentistry, social services, and paramedical services is present in each community, including Waswanipi.

JAMESIAN MUNICIPALITIES

As in the Cree communities, the sense of belonging to the community is also significantly stronger among Jamesians than among Quebecers.

The Centre régional de santé et de services sociaux de la Baie-James (CRSSBJ), the health and social services centre for the region, serves all James Bay municipalities. Health and social services in Lebel-sur-Quévillon are provided by the Centre de santé Lebel, which offers a wide range of services, such as emergency services and a walk-in clinic, as well as physiotherapy, social and psychological support, family planning, substance abuse intervention, etc.

8.5 USE OF THE TERRITORY AND ITS NATURAL RESOURCES

Natural resource harvesting activities, such as hunting, sport fishing, and blueberry picking, take place in the local study area. The territory is also used for vacationing, recreational activities, and forestry and mining operations.

Only three public land use leases are known to exist in the local study area, including two private vacation leases, the closest of which is located approximately 1.4 km from the mine site and the other approximately 2 km away. The local study area also includes a lease for lodging purposes at an outfitter without exclusive rights located to the southwest, approximately 5.4 km from the Windfall project site. Generally, leaseholders visit their land a few weeks a year for hunting or fishing trips. The animals hunted by vacationers are mainly moose, bear, and hare. Most of them hunt and fish around their cottages or campsites.

There are 286 mining claims in the local social environment study area, all of which are owned by Osisko.

Only one forest management unit (MU) is cut across by the local study area, namely MU 087-62. Two recipients of supply guarantees, namely Produits forestiers Résolu (Comtois) and Barette-Chapais ltée, are found in MU 087-62. In the winter of 2022 and spring of 2023, the Barette-Chapais forestry company plans to carry out some cutting to the south of the project site.

8.6 FIRST NATIONS TRADITIONAL LAND USE

Since the creation of beaver reserves in the 1930s, the Cree territory has been divided into traplines. A tallyman is in charge of each trapline and is responsible for deciding each year on the resources to be harvested and the areas to be preserved to guarantee the renewal of the species harvested. Most of the local social environment study area is part of trapline W25B and a small portion is located on trapline W25A (Map 8-1).

A single campsite (consisting of three cabins) located on W25B is located within the local social environment study area 6 km southwest of the mine site. The tallyman of this trapline and his wife reside there permanently, but their family visits them seasonally or sporadically. Their former camp, which is located outside the local social environment study area on Father Lake, is also used by family members in the fall and spring.

The main campsite on trapline W25A is located outside the local social environment study area, 25 km west-northwest of the Windfall project site. This one has seven camps. It is used throughout the year sporadically, but regularly by family members.

The main users of the territory practise their traditional activities, including hunting, fishing, trapping, and berry picking. The main users of the territory mainly eat traditional food. To move around the territory, they use the access roads, but also the power line rights-of-way west of Windfall Lake to travel by snowmobile and ATV. Several areas are valued by the users of the territory, particularly for moose hunting, but also for symbolic reasons (Map 8-1).

8.7 INFRASTRUCTURE

ROAD INFRASTRUCTURE

Quebec Route 113 crosses the western part of the regional study area. Towards the northeast, it connects Lebel-sur-Quévillon to Route 167, passing through Waswanipi. The regional study area is criss-crossed by numerous logging roads. The existing logging roads R1050 (R1000), R0853 (R5000) and R1053 (R6000), which connect Lebel-sur-Quévillon to the Windfall project site, will serve as the main access roads for the mine over a length of approximately 115 km. In addition to the forest industry using the logging roads, we have also noted the presence of hunting camp entrances adjacent to the road.

The roads used are in forest areas and are under the responsibility of the MRNF; however, the maintenance of the roads is the responsibility of paying users. In recent years, in 2018 and 2022, Osisko has mandated its consultant to carry out inspections on the main access road. During the last inspection in 2022, an improvement in the condition of the road was noted since Osisko took over the maintenance of the access road.

According to information collected at the Windfall project gatehouse, between June and August 2022, there was an average of 176 arrivals per week. The highest volume in a week was 230 arrivals, while the lowest volume was around 140 arrivals.

RAIL AND AIRPORT INFRASTRUCTURE

A Canadian National (CN) railroad, or more specifically the Canadian National Railway Company (CNRC), crosses the western part of the regional study area, east of Quévillon Lake.

A municipal airport is located approximately 4 km southwest of the centre of Lebel-sur-Quévillon in the regional study area. It is administered by the municipality. It offers air transportation services five days a week and on call on weekends. The Chibougamau-Chapais airport, also located in the regional study area, is approximately 20 km from Chibougamau on Route 113.

ENERGY INFRASTRUCTURE

Currently, six power transmission lines operated by Hydro-Quebec cross the regional study area.

8.8 HERITAGE AND ARCHAEOLOGY

An initial study was conducted in 2007 to assess the archaeological potential on the western portion of the Windfall project site. Following the recommendations of this study, an archaeological inventory with manual probing and visual inspection (1,028 surveys) was conducted in 2017-2018. No archaeological material was found in the inventory area. Two members of the Waswanipi Cree community participated in this inventory to incorporate traditional knowledge into the research. During the 2022 consultative activities, the Cree users of traplines W25B and W25A confirmed that, to their knowledge, there were no artifacts or archaeological sites on their lands.

An archaeological potential assessment study was conducted in 2022. This study covered the eastern section of the project site, encompassing Lake SN2 and the proposed site of the tailings storage facility. Four areas of archaeological potential were identified. Two potential areas are located north of Lake SN1, one area on the eastern shore of Lake SN6, and the other on the western shore of Lake SN2. The potential areas identified would have been appropriate for occupation by the ancestors of First Nations people due to the flat topography, good drainage, and proximity to a water body. These areas have moderate archaeological potential. Other than these areas, the rest of the study area has no archaeological potential due to the numerous wetlands and poor drainage.

8.9 LANDSCAPE

The landscape inventory of the social environment study area delineated homogeneous landscape units that are distinguished by their particular composition of landforms, forest cover, land use, and the types of views they provide to observers. Landscape units were assessed for visual accessibility, visual appeal, and enhancement.

Four landscape units were identified in the study area: Windfall Lake (LAC-1), Macho River (RIV-1), St. Cyr River (RIV-2), and Panache and Fortier River (RIV-3). The results of the sensitivity analysis show a higher sensitivity of the Windfall Lake (LAC-1) and Macho River (RIV-1) landscape units due to the presence of cabins, their recreational use, and higher visibility potential. Visual considerations include preserving views from cottages and other recreational sites, protecting existing landforms and forest cover, and revegetating disturbed sites that could provide visual access to the Windfall project.

9 RESILIENCE TO CLIMATE CHANGE

Climate change will impact both the operations and infrastructure of the Windfall project. The impacts considered are those on the health and safety of workers, the economic performance of operations, and the integrity of infrastructure, the environment, and ecosystems.

The activities considered in the analysis involve the construction phase (stripping and clearing, site organization, and construction), the operations phase (extraction and management of ore and waste rock, mine water management, crushing and processing of ore, management of tailings and waste rock), and the closure phase (dismantling of infrastructure, reclamation and revegetation work, and environmental monitoring).

The infrastructure studied was grouped into six categories: mining infrastructure, ore processing facilities, water management infrastructure, energy and telecommunications infrastructure, transportation infrastructure, and buildings and support infrastructure.

For the purposes of the analysis, the climatic hazards that could potentially affect the project's activities and infrastructure as well as its implementation environment were first identified. The future trend of these climatic hazards was then described in terms of anticipated short-term climate variations (2050 horizon). The main findings of the analysis are as follows:

- In the short term, the average summer temperature will increase by +1.8 °C to +2.7 °C and possibly as much as +5.2 °C compared to current average values.
- Summer temperatures will be higher and will exceed 30 °C on an annual basis; although heat waves will continue to be an exceptional phenomenon, heat wave days will occur on an annual basis.
- The general increase in temperature will both postpone the winter season and lengthen the summer season.
- Over a full year, the number of freeze-thaw cycles is projected to decrease; however, they will increase during the winter months (December through February).
- Although winter temperatures are on the rise, the Windfall site area will continue to experience extreme cold snaps.
- Extreme precipitation events will tend to increase in frequency and intensity.
- Soil drying events will continue to be sporadic and infrequent, while the number of days conducive to the spread of wildfires will increase by 20–30%, due in part to the projected increase in potential evapotranspiration rates.
- The increase in the amount of winter precipitation and the tendency of average winter temperatures to approach the freezing point suggest that freezing rain events will be more frequent and more intense.

- Snowstorms will become more concentrated in the mid-winter months, less frequent, but more intense.
- Rain-on-snow events are likely to increase due to the expected rise in winter temperatures.
- There will be an increasing trend in strong winds and thunderstorm activity, suggesting that the likelihood of tornadoes striking the site will increase.

During the **construction phase**, specific climatic hazards (extreme precipitation, heat wave days, extreme cold waves, freezing rain episodes, snowstorms, forest fires, strong winds) could have a negative impact on work productivity, particularly by making certain operations more complex. For example, adverse weather conditions could slow down the construction of some of the project's infrastructure. Added vigilance will be required if such conditions occur.

In the **operations phase**, in addition to the moderate-risk residual impact applicable to the construction phase (disruption of operations and/or loss of work productivity), the generation of acid mine drainage represents a moderate-risk residual impact. In fact, the ore has been identified as potentially acid generating. Several project components are affected by this impact, mainly the tailings storage facility, the waste rock stockpile, and the surface and contact water management infrastructure. These must ensure adequate drainage of the tailings storage facility to prevent water from flowing directly into the surrounding environment. The tailings storage facility will include a geomembrane liner to limit pore water infiltration into groundwater, and robust design criteria adapted to climate change have been incorporated into the project.

In the **closure phase**, the only moderate-risk residual impact is the generation of acid mine drainage, which will be managed with the work leading to the mine's closure.

While discussions of climate resilience often focus on the negative impacts of climate change, new climate conditions may also present opportunities. The season that provides favourable conditions for outdoor work would be longer, which would be beneficial for some construction activities. However, it is important to note that some tasks can be carried out more easily in winter. In addition to a longer season providing favourable conditions for certain activities during the operations phase, climate change also represents an opportunity for potential savings in heating requirements due to higher winter temperatures. Finally, in warmer temperatures, vegetation would recover more quickly during site reclamation, which is an opportunity to be seized.

10 REVIEW OF IMPACTS

The Windfall project will have negative and positive impacts on various components of the physical, biological, and social environment. Sections 10.1 to 10.3 provide a brief summary of the impacts identified and the significance of the residual impacts after application of the mitigation or enhancement measures in the various project phases (construction, operations, and closure) (Tables 10-1 to 10-3). A complete list of common and specific mitigation measures is provided at the end of this document.

10.1 IMPACTS ON THE PHYSICAL ENVIRONMENT

AMBIENT AIR

During the construction phase, the work carried out, as well as traffic and transportation, will cause a temporary and local increase in the concentrations of airborne particles and contaminants. During the operations phase, ongoing site activities will generate atmospheric emissions of particulate matter and metals from on-site machinery traffic and the transportation of ore, waste rock, and tailings. Vehicle use, propane heating units, and smokestacks in various buildings will also produce gaseous emissions (NO_x, SO_2 and CO). Following completion of the restoration work and final revegetation of the exposed surfaces, gaseous contaminant emissions will cease completely while particulate matter emissions will be greatly reduced.

GREENHOUSE GASES

The assessment of GHG emissions from the Windfall project is based on the project data and mine plan available at the time of the study. This information was used to calculate an estimate of the project's GHG emissions, based on the data available at this stage of progress. The main project sources are associated with fossil fuel combustion (use of mobile and stationary machinery during construction and restoration, as well as during operations) which generates CO_2, CH_4 and N_2O.

GHG emissions related to the construction (including pre-production) of the project components (excluding transportation logistics) are estimated at 74.5 kt of CO_2 eq over a period of approximately 18 months. During the operations phase, direct GHG emissions would average about 30.1 kt of CO2 eq/year, which represents 0.04 % of total annual provincial emissions.

SOUND ENVIRONMENT

Construction and restoration activities associated with the Windfall project (use of machinery and surface blasting), as well as certain operations activities (ore crushing; ore, waste rock, and tailings management; underground blasting) will increase the level of noise and vibration around the new infrastructure.

Scenarios for the construction and operations phases, based on the year when the maximum amount of equipment is expected to be in use, were determined to simulate the noise impacts at the nearest sensitive receptors. The results of the various simulations indicate that the identified criteria would be met for all receptor points.

SOIL

During the construction period, stripping, excavation and borrow pit operations could disturb the natural soil structure and cause loss of stability and erosion. For all phases of the mine, transportation, and traffic, as well as storage or handling of waste and hazardous materials could result in the accidental introduction of petroleum hydrocarbons, contaminants, or hazardous materials that could contaminate the soil. During the operations phase, the accidental introduction of contaminants into soils could also be caused by the infiltration of contact water under the new infrastructures and by windblown contaminated fine materials (ore and mine tailings) stored on the site or transported. Since the tailings storage facility and waste rock stockpile will be constructed on an HDPE liner, contact water infiltration under the new infrastructure will only occur in the event of liner or water line failure.

HYDROLOGY

Various development and construction activities may change the local water flow regime due to slope changes in watersheds, infrastructure development that may alter watershed boundaries, and the diversion of runoff onto unaffected surfaces. According to the modelling results, the new mining infrastructure will significantly reduce the surface area of some watersheds (losses ranging from 43.9% to 89.8% for the five most impacted watersheds: P1a, P3c, P1B, P2a_1, and P3d). Other watersheds will slightly increase in area.

Dewatering of the underground mine will also result in a drawdown of the water table, which will reduce groundwater inputs to some watercourses. Watercourses in the CE02 watershed will be the most impacted, with an anticipated 30% decrease in base flow for CE02 and 67% for CE15.

SURFACE WATER

Development and construction activities may result in the release of TSS to surface waters, particularly from the leaching of particles from bare or loosened surfaces. During the operations phase, possible TSS release to surface water would be due to specific climatic events (heavy rainfall, spring melt) or wind erosion of tailings. Also, despite compliance with applicable discharge standards, the constant input of treated water from mining activities in Pond 1 will result in a minor increase in loadings to the receiving environment downstream of the mine effluent. The management of residual and hazardous materials could present a risk of accidental introduction of petroleum hydrocarbons, contaminants, or hazardous materials into the aquatic environment for all phases of the project. Final site restoration will restore surface runoff and soil storage conditions. The water treatment plant will continue to operate for the number of years required to restore the quality of percolating water at the site.

SEDIMENTS

The same sources of impact listed for the surface water component are likely to affect sediment quality. Despite the implementation of mitigation measures (Table 10-1), there is a potential for particulate matter or contaminants to be washed into watercourses during various construction activities and operations. Particles released and carried in the water are likely to be deposited on sediments, especially in slower flow areas. During final restoration, which will take approximately two years, the tailings storage facility and waste rock stockpile areas will be revegetated, restoring surface runoff and soil storage conditions.

HYDROGEOLOGY

Development and construction will alter local water conditions by increasing runoff and reducing the rate of water infiltration into the soil. The construction and presence of infrastructure during operations will also alter the local groundwater flow regime around the infrastructure. Deposition in the tailings storage facility and waste rock stockpiles will increase hydraulic loading and therefore raise local groundwater levels. During the operations phase, groundwater entering the mine will be pumped to the surface to prevent the accumulation of water in the ramps and drifts, creating a drawdown cone around the mine. Based on the modelling results, a lowering of the groundwater table by more than 1 m (upper portion of bedrock) is anticipated within the footprint of the existing exploration ramp and within the footprint of the extensions in the Triple Lynx and Underdog zones. It should be noted that drawdowns greater than 1 m, which are on the order of seasonal fluctuations generally observed in Quebec, do not reach the drinking water supply wells in the area of the exploration camp or the surrounding lakes. The cessation of pumping activities in the post-restoration phase will gradually lead to a renewed natural balance in the environment.

GROUNDWATER

The main impact anticipated for this component is the contamination or modification of groundwater. Road transportation, machinery traffic and refuelling, residual and hazardous materials production and management, and water management during the construction, operation, and closure phases present a risk of accidental introduction of petroleum hydrocarbons, winter de-icing agents, or hazardous materials that could contaminate the soil and reach the water table. During the operations and closure phases, runoff water percolating through the waste rock stockpile and tailings storage facility could leach metals. However, it is unlikely that metal-laden water will reach the aquifers given the presence of an impermeable membrane under the infrastructure and ditches in the area of the waste rock stockpile and the tailings storage facility. Furthermore, a study has shown that the percolation rates evaluated under these infrastructure are well below the standard set by D019 (3.3 $l/m^2/d$). Final site restoration will result in the removal of potential soil contamination sources.

Table 10-1 summarizes the assessment of impacts on the physical environment.

Table 10-1 Summary of impacts on the physical environment

Affected component	Project phase	Primary source of impact	Description of potential impacts	Common and specific mitigation (or enhancement) measures	Significance of residual impact
Ambient air	Construction	The organization of the site, stripping, and clearing, construction of works and infrastructure, transportation and traffic	Degradation of ambient air quality	Common mitigation measures: AIR01 to AIR07, AIR09; NOR01 Specific mitigation measures: P26	Low
	Operations	The presence and operation of new infrastructure, transportation and traffic, production and management of residual and hazardous materials	Degradation of ambient air quality	Common mitigation measures: AIR01, AIR02, AIR04 to AIR09; NOR01 Specific mitigation measures: P01, P26	Moderate
	Closure	Final restoration	Degradation of ambient air quality	Common mitigation measures: Same as for the operations phase Specific mitigation measures: Specific mitigation measures will be identified in the final restoration plan	Low
Greenhouse gas	Construction	The organization of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure, transportation and traffic	Greenhouse gas emissions	Common mitigation measures: AIR02 to AIR07; NOR01, PLA01 Specific mitigation measures: P26	Moderate
	Operations	The presence and operation of new infrastructure, transportation and traffic, production and management of residual and hazardous materials	Greenhouse gas emissions	Common mitigation measures: Same as for the construction phases Specific mitigation measures: P26	Moderate
	Closure	Final restoration	Greenhouse gas emissions	Common mitigation measures: Same as for the operations phase Specific mitigation measures: Same as for the operations phase	Moderate
Sound environment	Construction	The organization of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure, transportation and traffic	Increased noise and vibration levels in the vicinity of new infrastructure	Common mitigation measures: AIR02, NOR02, NOR03 Specific mitigation measures: P26	Low
	Operations	The presence and operation of new infrastructure as well as transportation and traffic	Increased noise and vibration levels in the vicinity of new infrastructure	Common mitigation measures: AIR02, NOR01 Specific mitigation measures: P26	Low
	Closure	Final restoration	Increased noise levels in the vicinity of site in rehabilitation Decrease in noise levels after closure	Common mitigation measures: Same as for the construction and operations phases Specific mitigation measures: No specific mitigation measures apply during the closure phase	Low
Soil	Construction	The organization of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure, transportation and traffic, production and management of residual and hazardous materials	Accidental soil contamination	Common mitigation measures: QUA01 to QUA05, QUA07 to QUA09, QUA15, QUA22 to QUA26 and NOR04, NOR05, NOR10 to NOR12 Specific mitigation measures: P26	Very low
	Operations	The presence and operation of new infrastructure, water use and management, transportation and traffic, production and management of residual and hazardous materials	Accidental soil contamination	Common mitigation measures: QUA15, QUA22, QUA23, QUA25 and QUA26 as well as the standards NOR10 and NOR12 Specific mitigation measures: Same as for the construction phase	Risk of accidental spills and seepage - Very low Seepage and wind erosion - Low
	Closure	The presence of remnants of the site, final restoration, production and management of residual and hazardous materials	Accidental soil contamination	Common mitigation measures: Same as for the construction and operations phases, as well as QUA06 Specific mitigation measures: Same as for the construction and operations phases	Very low
Hydrology	Construction	The organization of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure	Change in local flow regime Increase in surface runoff	Common mitigation measures: QUA01, QUA08, QUA10 to QUA13, QUA17 to QUA19, VEG01, VEG04, PLA01, PLA02, NOR07 to NOR16 Specific mitigation measures: P26	Low
	Operations	The presence and operation of new infrastructure, water use and management	Changes to watersheds in the study area Changes in the characteristic flows of the study area	Common mitigation measures: None Specific mitigation measures: P26	Low
	Closure	The presence of the remnants of the site and the final restoration	Final alteration of watersheds and characteristic flows of the study area	Common mitigation measures: QUA13, QUA17, QUA18, QUA20, QUA21, PLA01, PLA02, NOR07, NOR14, NOR16 Specific mitigation measures: P26	Low

Affected component	Project phase	Primary source of impact	Description of potential impacts	Common and specific mitigation (or enhancement) measures	Significance of residual impact
Surface water	Construction	The organization of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure, transportation and traffic, production and management of residual and hazardous materials	Alteration of surface water quality	Common mitigation measures: QUA01 to QU04, QUA07, QUA08, QUA10 to QUA26, NOR06 to NOR08, NOR10 et NOR12 Specific mitigation measures: P26	Low
	Operations	The presence and operation of new infrastructure, water use and management, transportation and traffic, production and management of residual and hazardous materials	Alteration of surface water quality	Common mitigation measures: Same as for the construction phase in addition to NOR09 and NOR13 Specific mitigation measures: P01, P26	Effluent discharges - Moderate Risk of accidental spills and suspended solids - Low
	Closure	Final restoration, production and management of residual and hazardous materials	Alteration/improvement of surface water quality	Common mitigation measures: Same as for the construction and operations phases in addition to NOR14 Specific mitigation measures: Same as for the construction and operations phases	Low Restoration – Positive Impact
Sediments	Construction	The organization of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure, transportation and traffic, production and management of residual and hazardous materials	Alteration of sediment quality	Common mitigation measures: QUA01 to QUA04, QUA08, QUA10 to 26, NOR06 to NOR08, NOR10, NOR12 Specific mitigation measures: No specific mitigation measures apply to the construction phase	Very low
	Operations	The presence and operation of new infrastructure, water use and management, transportation and traffic, production and management of residual and hazardous materials	Alteration of sediment quality	Common mitigation measures: Same as for the construction phase in addition to NOR09 and NOR13 Specific mitigation measures: P01, P26	Risk of accidental spills - Very low Effluent discharges - Low
	Closure	Final restoration, production and management of residual and hazardous materials	Alteration/improvement of sediment quality	Common mitigation measures: Same as for the construction and operations phases Specific mitigation measures: Same as for the construction and operations phases	Very low Restoration – Positive Impact
Hydrogeology	Construction	The organization of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure	Impact on the local flow regime	Common mitigation measures: HYD01, QUA01 to QUA04, QUA10 and QUA11 Specific mitigation measures: P26	Very low
	Operations	The presence and operation of new infrastructure (mine dewatering, stockpiles, and tailings storage facility), water use and management (pumped water and runoff)	Changes to local groundwater flow regime	Common mitigation measures: HYD01 Specific mitigation measures: P26	Low
	Closure	The presence of the remnants of the site, final restoration	Changes to local groundwater flow regime	Common mitigation measures: HYD01 Specific mitigation measures: P26	Low
Groundwater	Construction	The organization of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure, transportation and traffic, production and management of residual and hazardous materials	Contamination or alteration of groundwater quality	Common mitigation measures: NOR10, NOR12 and NOR15, QUA07, QUA14, QUA15, QUA22 to QUA26 Specific mitigation measures: P26	Very low
	Operations	The presence and operation of new infrastructure, water use and management, transportation and traffic, production and management of residual and hazardous materials	Contamination or alteration of groundwater quality	Common mitigation measures: Same as for the construction phase Specific mitigation measures: P26	Very low
	Closure	Final restoration, production and management of residual and hazardous materials	Contamination or alteration of groundwater quality	Common mitigation measures: NOR15 Specific mitigation measures: Specific mitigation measures may be defined as part of the closure plan for the proposed infrastructure	Low Restoration – Positive Impact

10.2 IMPACTS ON THE BIOLOGICAL ENVIRONMENT

VEGETATION AND WETLANDS

The main impact anticipated on vegetation and wetlands is the loss of vegetated areas. The footprint of the planned activities is 136.47 ha. Of these footprints, 134.81 ha will be permanent, and 1.66 ha will be temporary. In total, construction phase activities will result in the disturbance or loss of 63.29 ha of terrestrial environments, 50.49 ha of wetlands, and 22.69 ha of non-forest environments (anthropogenic environments and roads). Based on WSP's ecological value assessment, 8.33% of the affected wetlands have high, 66.67% have medium, and 25% have low ecological value. During the construction and operations phases, heavy vehicle traffic on the site may also result in the introduction or spread of invasive exotic plants and thus lead to a disruption of plant communities in terrestrial and wetland environments. The use of heavy vehicles, de-icing agents on the ground in winter, as well as the production and management of residual and hazardous materials can potentially accidentally introduce petroleum hydrocarbons, contaminants, or hazardous materials into the natural environment. During the closure phase, site restoration will lead to an increase in vegetated areas and the creation or restoration of some wetlands.

ICHTHYOFAUNA AND BENTHOS

No direct loss of fish (ichthyofauna) and aquatic organisms (benthos) habitat is anticipated. Various development and construction activities may alter the quality of fish habitat through the release of TSS, alteration of the hydrological regime, and the accidental introduction of petroleum hydrocarbons, contaminants, or hazardous materials. Operations can also alter the quality of fish habitat through the release of TSS and accidental spills. A minor increase in contaminant loads is also anticipated downstream of the final effluent. Habitats within the effluent mixing zone are therefore likely to experience changes in habitat quality. Final restoration will largely restore the natural conditions of the hydrological regime, which will have a positive impact on aquatic wildlife. The cessation of operations and the gradual reduction of effluent discharges, as well as revegetation, will also contribute to the restoration of surface water quality, which will benefit aquatic fauna and the benthos.

HERPETOFAUNA

The main impacts anticipated on herpetofauna during the construction period are habitat loss and fragmentation (activities related to deforestation, possible influence of mine dewatering on the volume of water in certain lakes), disturbance and vehicle collision risk (transportation and traffic, noise and light emissions), as well as alteration of habitat quality (accidental introduction of petroleum hydrocarbons, contaminants, or hazardous materials). Site organization, stripping, and clearing activities are likely to permanently affect approximately 136.47 ha of potential habitat. The impact of disturbances, vehicle collision risk, and alteration of habitat quality will also be present during operations and final restoration work. Following the decommissioning of the infrastructure, the habitats will be restored and will once again be usable by herpetofauna.

AVIFAUNA

The anticipated impacts on avifauna are similar in nature to those on herpetofauna for all phases of the project. During the construction phase (and throughout the life of the mine), a loss of 85.98 ha of terrestrial habitat (of which 22.69 ha is anthropogenic) and 50.49 ha of wetlands will occur. In total, the Windfall project is likely to affect approximately 70.97 ha of nesting pair habitat (average of 295 indicated pairs), consisting of 4.57 ha of mature habitat (average of 15 indicated pairs), 41.90 ha of young habitat (average of 174 indicated pairs) and 24.49 ha of regenerating habitat (average of 106 indicated pairs). For special status birds, approximately six nesting pairs of rusty blackbird (*Euphagus carolinus*), two to five nesting pairs of olive-sided flycatcher (*Contopus cooperi*), three to nine nesting pairs of common nighthawk (*Chordeiles minor*), and five to ten nesting pairs of Canada warbler (*Cardellina canadensis*) may be affected.

LARGE MAMMALS

The Windfall project will have impacts on large mammals that are similar in nature to those on herpetofauna and avifauna for all phases of the project. Habitat loss and fragmentation are the primary sources of impacts for large mammals. However, given the absence of recognized caribou habitat in the area of the project site and the sporadic presence of a few individuals, no habitat loss was considered for woodland caribou. For the three other main species (moose, black bear and grey wolf), permanent losses of natural environments represent 112.33 ha. Thus, for the moose, the most important species for the Cree community, the loss of natural environment area represents approximately 1.1% of the area of the inventory sector for this species. The loss of habitat for moose corresponds to 39.3 ha of quality habitat (hardwood stands (18.8 ha) and mixed stands (20.5 ha)). Regenerating stands (24.2 ha) as well as wetlands (49.5 ha) also constitute good habitats for the species. Following decommissioning, habitats will be restored or recreated and will be able to once again fulfill functional requirements for large mammals.

Translated with www.DeepL.com/Translator (free version)

MAMMALS – CHIROPTERANS

The anticipated impacts on chiropterans are similar in nature to those on herpetofauna, avifauna, and large mammals for all phases of the project. Clearing and other work associated with the construction of the work and storage areas will cause a direct loss of roost sites for chiropterans and will alter the microclimate of the immediate environment. The Windfall project will result in the loss of 4.57 ha of mature tree stands and 7.68 ha of forested wetlands that could be used as bat roosts (treed swamps and forested peatlands). The loss of wetlands and water environments will result in the loss of feeding sites for chiropterans. In return, forest fragmentation may create linear landscape features that would be used by some chiropteran species. During the closure phase, the presence and vestiges of the site could also serve as temporary shelter or be used as maternity sites. The final restoration will restore and create habitat, promote the use of feeding sites, and reduce disturbances to the bat population.

MAMMALS – OTHER SPECIES

The Windfall project will result in impacts on other mammal species similar in nature to those on herpetofauna, avifauna, large mammals, and chiropterans. For the total footprint of the project that may be suitable for the establishment of the eight inventoried species, 136.47 ha of potential habitat will be permanently affected. Following decommissioning, habitats will be restored or recreated and will be able to once again fulfill functional requirements for mammals. Table 10-2 summarizes the assessment of impacts on the biological environment.

Table 10-2 Summary of impacts on the biological environment

Affected component	Project phase	Primary source of impact	Description of potential impacts	Common and specific mitigation (or enhancement) measures	Significance of residual impact
Vegetation and wetlands	Construction	The organization of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure, transportation and traffic, production and management of residual and hazardous materials	Loss of vegetated area and disruption of plant communities in terrestrial and wetland areas Contamination of terrestrial and wetland environments	Common mitigation measures: PLA01, QUA01, QUA17, QUA18, QUA22 to QUA26, VEG01 to VEG04 Specific mitigation measures: P26	Risk of accidental spills - Very low Loss of area - Low
	Operations	Transportation and traffic, production and management of residual and hazardous materials	Disturbance of plant communities in terrestrial and wetland environments Contamination of terrestrial and wetland environments	Common mitigation measures: QUA17 and VEG02 Specific mitigation measures: P01 and P26	Very low
	Closure	Final restoration, production and management of residual and hazardous materials	Increase in vegetated areas and wetlands	Common mitigation measures: Same as for the construction and operations phases, plus VEG03, VEG04 and NOR14 Specific mitigation measures: P26	Very low Habitat Restoration - Positive Impact
Ichthyofauna and benthos	Construction	The organization of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure, transportation and traffic, production and management of residual and hazardous materials	Alteration of habitat quality	Common mitigation measures: AIR01, AIR02, FAU01, QUA01 to QUA04, QUA07 to QUA09, QUA10 to QUA26, HYD01, NOR07 to NOR14, Specific mitigation measures: P26	TSS and risk of accidental spills - Very low Changes in the hydrological regime - Low
	Operations	The presence and operation of new infrastructure, water use and management, transportation and traffic, production and management of residual and hazardous materials	Alteration of habitat quality	Common mitigation measures: Same as for the construction phase, plus QUA14 to QUA16, NOR08 to NOR10, NOR13 Specific mitigation measures: P01 and P26	TSS and risk of accidental spills - Low Effluent discharge - Moderate
	Closure	Final restoration, production and management of residual and hazardous materials	Alteration/improvement of habitat quality	Common mitigation measures: Same as for the construction and operations phases Specific mitigation measures: Same as for the construction and operations phases	TSS and risk of accidental spills - Low Habitat Restoration - Positive Impact
Herpetofauna	Construction	The organization of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure, transportation and traffic, production and management of residual and hazardous materials	Habitat loss and fragmentation Disturbance, collision and mortality risk Alteration of habitat quality	Common mitigation measures: QUA01 to QUA04, QUA06 to QUA09, QUA11 to QUA21, QUA22 to QUA26, VEG01 to VEG04, AIR01 to AIR04, NOR01, NOR02, NOR04 to NOR06, NOR07, PLA01, PLA02, FAU08 and FAU09 Specific mitigation measures: P26	Risk of accidental spills - Very low Disturbance , collision and mortality risk and loss of habitat - Low
	Operations	The presence and operation of new infrastructure, water use and management, transportation and traffic, production and management of residual and hazardous materials	Disturbance, collision and mortality risk Alteration of habitat quality	Common mitigation measures: Same as for the construction phase Specific mitigation measures: P26	Very low
	Closure	Final restoration, production and management of residual and hazardous materials	Habitat creation Disturbance, collision and mortality risk Alteration of habitat quality	Common mitigation measures: Same as for the construction and operations phases Specific mitigation measures: P26	Very low Habitat Restoration - Positive Impact

Affected component	Project phase	Primary source of impact	Description of potential impacts	Common and specific mitigation (or enhancement) measures	Significance of residual impact
Avifauna	Construction	The organization of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure, transportation and traffic, production and management of residual and hazardous materials	Habitat loss and fragmentation Disturbance, collision and mortality risk Alteration of habitat quality	Common mitigation measures: AIR01 to AIR04, FAU02, FAU06, FAU08, FAU09, NOR01, NOR17, PLA01 and PLA02, QUA01 to QUA04, QUA06 to QUA09, QUA11 to QUA26, VEG01 to VEG04 Specific mitigation measures: P26	**Birds in general:** Habitat loss - Low Disturbance, risk of spills, collision and mortality risk - Very low **Species with special status:** Habitat loss - Moderate Disturbance, risk of accidental spills, and collision and mortality risk - Low
	Operations	The presence and operation of new infrastructure, water use and management, transportation and traffic, production and management of residual and hazardous materials	Disturbance, collision and mortality risk Alteration of habitat quality	Common mitigation measures: Same as for the construction phase, in addition to FAU07 Specific mitigation measures: P26	**Birds in general:** Very low **Species with special status:** Disturbance and collision and mortality risk - Moderate Risk of accidental spills - Low
	Closure	Final restoration, production and management of residual and hazardous materials	Habitat creation Disturbance, collision and mortality risk Alteration of habitat quality	Common mitigation measures: Same as for the construction and operations phases Specific mitigation measures: P26	**Birds in general**: Very low (Habitat Restoration - Positive Impact **Species with special status:** Low Habitat Restoration - Positive Impact
Large mammals	Construction	The organisation of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure, transportation and traffic, production and management of residual and hazardous materials	Habitat loss and fragmentation, mainly for moose Disturbance, collision and mortality risk Alteration of habitat quality	Common mitigation measures: QUA01 to QUA04, QUA06 to QUA08, QUA11 to QUA21, NOR03 to NOR05, NOR07, NOR10, VEG01 to VEG04, PLA01 and PLA02, AIR01 to AIR04, FAU04, FAU06, FAU09 Specific mitigation measures: P26	**Caribou:** Low **Moose, black bear, and grey wolf:** Risk of accidental spills, disturbance, collision and mortality risk - Very low Loss of habitat - Low
	Operations	The presence and operation of new infrastructure, water use and management, transportation and traffic, production and management of residual and hazardous materials	Disturbance, collision and mortality risk Alteration of habitat quality	Common mitigation measures: Same as for the construction phase Specific mitigation measures: P26	**Caribou:** Low **Moose, black bear, and grey wolf:** Very low

Affected component	Project phase	Primary source of impact	Description of potential impacts	Common and specific mitigation (or enhancement) measures	Significance of residual impact
Large mammals (continued)	Closure	Final restoration, production and management of residual and hazardous materials	Habitat creation Disturbance, collision and mortality risk Alteration of habitat quality	Common mitigation measures: Same as for the construction and operations phases Specific mitigation measures: P26	**Caribou:** Low **Moose, black bear, and grey wolf:** Very low Habitat Restoration - Positive Impact
Chiropterans	Construction	The organization of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure, transportation and traffic, production and management of residual and hazardous materials	Habitat loss and fragmentation Disturbance, collision and mortality risk Alteration of habitat quality	Common mitigation measures: AIR01 to AIR03, FAU02 to FAU06, FAU08, FAU09,, NOR04 to NOR08, PLA01 and PLA02, QUA01 to QUA04, QUA06, QUA07, QUA10 to QUA26, VEG01 to VEG04 Specific mitigation measures: P03, P04, and P26	Habitat loss, disturbance, collision and mortality risk - Moderate Risk of accidental spills - Low
	Operations	The presence and operation of new infrastructure, water use and management, transportation and traffic, production and management of residual and hazardous materials	Disturbance, collision and mortality risk Alteration of habitat quality	Common mitigation measures: Same as for the construction phase Specific mitigation measures: Same as for the construction phase	Disturbance, collision and mortality risk - Moderate Risk of accidental spills - Low
	Closure	Final restoration, production and management of residual and hazardous materials	Habitat creation Disturbance, collision and mortality risk Alteration of habitat quality	Common mitigation measures: Same as for the construction and operations phases Specific mitigation measures: Same as for the construction and operations phases.	Disturbance, collision and mortality risk - Moderate Risk of accidental spills - Low Habitat Restoration - Positive Impact
Mammals—Other species	Construction	The organization of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure, transportation and traffic, production and management of residual and hazardous materials	Habitat loss and fragmentation Disturbance, collision and mortality risk Alteration of habitat quality	Common mitigation measures: AIR01 to AIR04, FAU06, FAU08, FAU09, NOR1, NOR02, NOR07, PLA01 and PLA02, QUA01 to QUA04, QUA06 to QUA09, QUA11 to QUA26, VEG01 to VEG04 Specific mitigation measures: P26	Disturbance, collision and mortality risk, and habitat loss - Low Risk of accidental spills - Very low
	Operations	The presence and operation of new infrastructure, water use and management, transportation and traffic, production and management of residual and hazardous materials	Disturbance, collision and mortality risk Alteration of habitat quality	Common mitigation measures: Same as for the construction phase Specific mitigation measures: P26	Disturbance, collision and mortality risk, and loss of habitat - Low Risk of accidental spills - Very low
	Closure	Final restoration, production and management of residual and hazardous materials	Habitat creation Disturbance, collision and mortality risk Alteration of habitat quality	Common mitigation measures: Same as for the operations and construction phases Specific mitigation measures: P26	Very low Habitat Restoration - Positive Impact

N/A: not applicable

10.3 IMPACT ON THE SOCIAL ENVIRONMENT

POPULATION, ECONOMY, AND EMPLOYMENT

During the construction and operation phases, the workforce and investment required for the various activities of the Windfall project will contribute to the maintenance and creation of jobs, and will generate significant economic benefits for the region. Expenditures will total $789 million for the construction phase, $2,722 million for the operations phase (over 10 years) and $83.3 million for the closure phase. During the construction phase, it is estimated that 53% of the value added ($305.7 million) will be generated in the Abitibi-Témiscamingue and Nord-du-Québec regions. The investment expenditures will support 2,800 full-time equivalent (FTE) jobs in these two regions, including 682 FTE jobs in the Nord-du-Québec region. During mine operations, 65% of the value ($1,155 million) will be generated in the Abitibi-Témiscamingue and Nord-du-Québec regions. These two regions will be able to count on an average of 635 jobs per year, including 70 indirect jobs for Nord-du-Québec. Local workers hired for the project will be able to acquire or strengthen their professional skills, thus contributing to the increase of worker qualifications and employability. Windfall employees are also likely to earn higher incomes (average salary of approximately $110,000/year). During the closure phase, infrastructure decommissioning, rehabilitation, and restoration activities will generate economic benefits through contracting; however, workforce requirements will gradually decrease from the end of operations through the post-restoration period.

QUALITY OF LIFE AND WELL-BEING

The sensitive receptors are mainly vacationers, tallymen of traplines W25B and W25A and their families, and employees. During the construction and operations phases, activities and work performed, as well as transportation and traffic, may disturb the peace and quality of life of vacationers and land users of the area near the site. The increase in transportation and traffic on the main access road from Lebel-sur-Quévillon may decrease the sense of safety of users. The presence of workers at the site will also intensify relations between First Nations and non-First Nations workers, which may increase the potential for tensions arising from cultural differences. Finally, land preparation and infrastructure construction may affect some Cree community members and contribute to a sense of gradual loss of their traditional way of life and cultural identity. Particularly in the operations phase, prolonged worker absences resulting from long work rotations may also affect the psychological well-being of workers and lead to difficulties in balancing work and family life. Water use and management, traffic and transportation, and the use of hazardous materials may raise concerns among vacationers and land users about risks to human health (quality of air, water, and fish consumed) for all phases of the project.

USE OF THE TERRITORY AND ITS NATURAL RESOURCES

Noise, dust, and vibration caused by the construction work are likely to disturb certain wildlife species of interest in the vicinity of the site, causing them to move to quieter areas. The construction of certain mining infrastructure may make certain water bodies less attractive to land users. This could change their choice of location for their wildlife harvesting activities.

FIRST NATION TRADITIONAL LAND USE

Traditional activities (hunting, fishing, trapping, and berry picking) of Cree land users in the local study area could be disturbed or altered during the construction phase. Nuisances arising from construction activities are likely to cause valued species to move away or temporarily avoid the area. The quantity of available food resources is thus likely to be altered, as is the use of the territory and the traditional experience of Cree land users of traplines W25B and W25A. During the operations phase, the presence of the mine's infrastructure could result in the loss of access to parts of the territory used for traditional activities. Some users of this area will have to consider relocating their activities. Users' perception of the quality of the food resources harvested near the mine could be affected, leading to a lack of interest in this section of their trapline. Since Osisko has been operating the exploration site since 2018, land users have already altered their traditional activities. After closure, however, the rehabilitation and final restoration of the site will allow a portion of the area affected by the mine to be reused and reappropriated for traditional activities.

INFRASTRUCTURE

During the construction phase, worker traffic and transportation of materials will generate additional traffic volume on the main site access road. Approximately 3,200 trips will be required to transport materials during the construction phase, and approximately 785 trips per year will be required during the operations phase. Traffic from the Windfall project will add to the volume of vehicles already on the access road, but is not expected to have a significant impact on users. Transportation and traffic can lead to premature deterioration of roads. However, Osisko's access and traffic flow strategy promotes the use of existing roads that it is maintaining. Finally, the Windfall project will generate an increase in demand for airport services which should translate into increased revenues for the town of Lebel-sur-Quévillon.

HERITAGE AND ARCHAEOLOGY

During the construction phase, the work involved in organizing the site, preparing and laying out the surfaces, as well as building structures and infrastructure, may uncover archaeological or historical vestiges on the Windfall project site. However, this probability is low given that no infrastructure is currently planned in the identified zones with potential.

LANDSCAPE

During the construction phase, the infrastructure likely to alter the landscape components and fields of vision associated with the LAC-1 landscape unit is the expansion of the borrow pit and the construction of the mining camp complex. The construction of the new plant and the expansion of the waste rock stockpile, the overburden stockpile, and the ponds will alter the components and fields of vision of the RIV-1 landscape unit, while the tailings storage facility, a second overburden stockpile, and ponds will alter the landscape of the RIV 2 landscape unit. During the operations phase, occasional views of the tailings storage facility may be possible directly from the lake. It is unlikely that the new infrastructure will be visible from Rouleau Lake (RIV-2), but view corridors may exist for recreational users from the more open areas of the peatlands. During the closure phase, the presence of site vestiges and final restoration can potentially alter the landscape and fields of vision for the LAC-1, RIV-1, and RIV-2 landscape units. All of the site restoration measures planned during the closure phase will restore the natural character of the landscape.

Table 10-3 summarizes the assessment of impacts on the social environment.

Table 10-3 Summary of impacts on the social environment

Affected component	Project phase	Primary source of impact	Description of potential impacts	Common and specific mitigation (or enhancement) measures	Significance of residual impact
Land planning, development, and tenure	Construction Operations Closure	No impact is anticipated on land planning and development during the construction, operations, and closure phases			
First Nations interests and treaty lands	Construction Operations Closure	Discussed under the First Nation Traditional land use component in section 8.6			
Population, economy, and employment	Construction	Workforce and procurement	Maintenance and creation of jobs Economic benefits for local and regional businesses Increase in the qualifications and employability of the Cree and regional workforce	Common mitigation measures: POP01 and POP02 Specific mitigation measures: P05 to P12, and P26	Positive impact
	Operations	Workforce and procurement	Maintenance and creation of jobs Economic benefits for local and regional businesses Increase in the qualifications and employability of the Cree and regional workforce Increased income for workers	Common mitigation measures: POP01 and POP02 Specific mitigation measures: Same as for the construction phase	Positive impact
	Closure	Workforce and procurement	Reduction of jobs and income Economic benefits for local and regional businesses	Common mitigation measures: POP02 and POP03 Specific mitigation measures: P05, P07, P12, P13 and P26	**Eeyou Istchee and Jamésie:** Positive impact (economic benefits) Low (-) (job reduction)
Quality of life and well-being	Construction	The organization of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure, transportation and traffic, production and management of residual and hazardous materials, workforce and procurement	Alteration of the quality of life and well-being of vacationers and land users Concerns of vacationers and land users about human health risks Decreased sense of safety for users of the access road Risk of tension between First Nations and non-First Nations workers Sense of loss and undermining of Cree cultural identity	Common mitigation measures: AIR01 to AIR03, NOR01, NOR02, FAU04, FAU08, FAU09, POP01, VIE01 to 04, UTT01 to 03 Specific mitigation measures: P14 to P21, and P26	**Eeyou Istchee:** Very low to low **Jamésie:** Very low
	Operations	The presence and operation of new infrastructure, water use and management, transportation and traffic, production and management of residual and hazardous materials, workforce and procurement	Alteration of the quality of life and well-being of vacationers and land users Concerns of vacationers and land users about human health risks Decreased sense of safety for users of the access road Risk of tension between First Nations and non-First Nations workers Alteration of the psychological and social well-being of workers and difficulties in reconciling work and family life Sense of loss and undermining of Cree cultural identity	Common mitigation measures: Same as for the construction phase Specific mitigation measures: P14 to P22, and P26	**Eeyou Istchee and jamésie:** Very low
	Closure	The presence of the remnants of the site, the final restoration, and the production and management of residual and hazardous materials	Concerns of vacationers and land users about human health risks	Common mitigation measures: POP02, VIE01 and VIE04, and UTT03 Specific mitigation measures: P14, P19, and P26	**Eeyou Istchee and Jamésie:** Very low

Affected component	Project phase	Primary source of impact	Description of potential impacts	Common and specific mitigation (or enhancement) measures	Significance of residual impact
Use of the territory and its natural resources	Construction	The organization of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure, transportation and traffic, production and management of residual and hazardous materials, as well as workforce and procurement	Occasional alteration in the practice of some wildlife harvesting activities Potential increase in hunting and fishing pressures	Common mitigation measures: AIR01 to AIR03, PLA01 and 02, QUA01 to 27, NOR02, NOR03, VIE01, UTT03 Specific mitigation measures: P14, P23, and P26	Very low to low
	Operations	No additional impacts other than those during construction are anticipated on the use of the territory and natural resource during the project's operations phase			
	Closure	No impacts on use of the territory and natural resources are anticipated during the closure phase. After closure, the rehabilitation and restoration work will have restored the natural character of the sites under study and adapted them to the surrounding environment			
First Nation traditional land use	Construction	The organization of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure, transportation and traffic, production and management of residual and hazardous materials	Disruption of traditional activities in the local study area (hunting, fishing, trapping, berry picking)	Common mitigation measures: AIR01 to 03, AIR09, NOR01 to 03, NOR13, NOR16, FAU01 to 09, VEG01 to 04, UTT01 to 03, VIE01 to 03 Specific mitigation measures: P19, P20, and P26	Low to moderate
	Operations	Presence and operation of new infrastructure, water use and management, transportation and traffic, production and management of residual and hazardous materials	Disruption of traditional activities in the local study area (hunting, fishing, trapping, berry picking) Adaptation by Cree land users due to the presence of the mine	Common mitigation measures: AIR01 to AIR03, AIR 09, NOR01 to NOR03, NOR13, NOR16, FAU01 to FAU09, VEG01 to VEG04, UTT01 to UTT03, VIE01 to VIE03 Specific mitigation measures: P19 and P26	Moderate
	Closure	Presence of the remnants of the site, final restoration, production and management of residual and hazardous materials	Temporary disruption of traditional activities during closure work Reuse and reappropriation of the mine site for traditional purposes	Common mitigation measures: UTT01 to UTT03, AIR01 to AIR09, NOR01 to NOR03, NOR13, NOR16, FAU01 to FAU09, VEG01 to VEG04, VIE01 to VIE03 Specific mitigation measures: P19, P24, and P26	Temporary disruption of traditional activities during closure work - Very low (-) Reuse and reappropriation of the site - Positive impact
Infrastructure	Construction	Transportation and traffic	Potential for traffic disruptions on the main access road Premature deterioration of roads due to increased heavy truck traffic and transportation Increased demand for airport services	Common mitigation measures: AIR02, FAU04, INF01, VIE02 Specific mitigation measures: P14 and P26	Very low
	Operations	No additional impacts other than those during construction are anticipated on infrastructure during the project's operations phase			
	Closure	No impact on infrastructure is anticipated during the closure phase. After closure, the rehabilitation and restoration work will have restored the natural character of the sites under study and adapted them to the surrounding environment			
Heritage and archaeology	Construction	The organization of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure	Uncovering or altering any archaeological or historical remains	Common mitigation measures: ARC01 to ARC04 Specific mitigation measures: P26	Low
	Operations	No impact is expected during the operations phase on heritage and archaeology			
	Closure	No impact is expected during the closure phase on heritage and archaeology			
Landscape	Construction	The organization of the site, stripping and clearing, surface preparation and access arrangement, construction of works and infrastructure, transportation and traffic	Alteration of the components of landscape units LAC-1, RIV-1, and RIV-2 and associated fields of vision	Common mitigation measures: NOR16, PLA01, PAY01, QUA01, QUA04, QUA09, QUA18, QUA19, VEG01, VEG06 Specific mitigation measures: P25 and P26	Low
	Operations	Presence and operation of new infrastructure, transportation and traffic	Alteration of the components of landscape units LAC-1, RIV-1, and RIV-2 and associated fields of vision	Common mitigation measures: Same as for the construction phase Specific mitigation measures: Same as for the construction phase	Low
	Closure	The presence of the remnants of the site, final restoration	Alteration of the components of landscape units LAC-1, RIV-1, and RIV-2 and associated fields of vision	Common mitigation measures: Same as for the construction and operations phases plus PLA02 and QUA21 Specific mitigation measures: P26	Habitat Restoration - Positive Impact

11 CUMULATIVE IMPACTS ASSESSMENT

According to the Directive issued for the Windfall project (ref.: 3214-14-059; July 2017 and revised January 2022), the elements to be considered in the cumulative impacts assessment are the combined effects of the project and past, present, or future actions (that have a high probability of occurring) on a valued component of the environment. Cumulative impacts are also assessed in relation to the key issues of the project.

The main issues identified for the Windfall project include:

- **Preservation of the quality of the environment.** This includes protection of air quality, minimization of the contribution to climate change (GHG emissions), protection of the integrity of the water system and wetlands, and protection of surface and groundwater quality.
- **Biodiversity conservation.** This includes minimizing the loss of vegetation cover and wetlands, preserving terrestrial and aquatic habitats (including birds, fish, moose, and caribou) and protecting plant and wildlife species at risk.
- **Consideration of First Nations interests and concerns.** This includes maintaining the integrity of Cree traditional activities and culture as well as preserving the community and psychosocial well-being of the Crees.
- **Concentration of economic benefits at the local level.** This includes considerations of spinoffs for the community and the hiring of local labour in the long term (post-mine closure).

For a component to be considered valued, it must be a project's primary issue, highly valued by the public or specialists, susceptible to significant disruption, and susceptible to modification by a combination of project-specific and external sources of impact. Table 11-1 presents the six valued components for the physical, biological, and social environments.

Table 11-1 Identification of environmental components selected as valued components

Environmental component	Rationale
Physical environment	
Greenhouse gases (GHG)	Given the importance placed on achieving the GHG reduction targets that Quebec must meet, any increase in emissions province-wide must be taken into account to ensure an up-to-date snapshot of the regional and provincial context.
Surface water	The impact of the Windfall project on surface water components will essentially be felt at the scale of the study area. All intercepted surface water as well as water generated by mining activities will be collected and treated to meet applicable discharge standards before being released into Pond 1, which is located at the head of watersheds CE09, CE15 (SN3 lake) and CE02 (towards SN8 and SN10 lakes). Despite the treatment, surface water quality will be slightly modified by the constant release of a low concentration of contaminants (below discharge standards) that will be introduced throughout the operation of the mine.
Biological environment	
Flora	– Terrestrial vegetation: The terrestrial vegetation in the study area has been significantly disturbed over the years by logging activities. Besides mineral resources, the forest represents one of the region's most important natural resources and is home to diverse wildlife. – Wetlands: Wetlands are relatively well represented in the area of the mine project and significant impacts are generated as a result of encroachment and dewatering associated with the mine site, but also with extensive exploration activities. The recognized importance of these sensitive and fragile environments in ecosystems, combined with the effects described above, supports inclusion of this component in the cumulative impacts assessment.
Ichtyofauna and benthos	Although no species with a special status were identified in the watercourses affected by the project during the inventories carried out, the discharge of the effluent into Pond 1 during the operations phase will result in some degradation of the fish habitat quality in the waterbodies composing the concerned watersheds (CE09, CE15 and CE02).
Avian fauna and habitats	Bird habitat in the Windfall project area has already been significantly impacted by logging in the late 1990s and early 2000s. Despite the number of years that have gone by, this habitat has still not regenerated to its original state. Additional losses caused by the project could further harm local bird populations. Furthermore, five species of special status are considered likely to use the area.
Large fauna	Large fauna will not be significantly affected by the project. Two species, woodland caribou (*Rangifer tarandus caribou*) and moose (*Alces alces*), require special attention because of their scarcity, their protection status, and their apparent population decline in the region.
Chiropterans	Most of the bat species inventoried (5 out of 6) are species of special status, two of which are considered endangered in Canada (Schedule 1 of the Species at Risk Act). In addition, the presence and rapid spread of white-nose syndrome (WNS) in Quebec, now considered the main cause of the decline of bat populations in northeastern North America, makes bats more vulnerable to cumulative impacts than any other wildlife component present in the study area.
Social environment	
Traditional First Nations land use	The Windfall project facilities and activities encroach upon and interfere with traditional First Nations land use, particularly for the users of traplines W25B and W25A. These trapline users were also affected by the extensive logging activities of the late 1990s and early 2000s.

To measure the potential cumulative impacts of the Windfall project, an inventory of past, present, and future local and regional projects, actions, and events was conducted:

– Exploitation of natural resources: mining exploration activities, Bachelor site (ore processing), gite Barry site, gite Gladiator site, Langlois mine, Coniagas mine, Rose Lake mine, Flordin mine, gite Toussaint and Pusticamica, Springer mine, Megane gold mine, Philibert mine, Joe Mann mine, Nelligan mine, Opémisca project, Chesbar iron mine, Certac mine, gite lac Nicobi, Shortt lake gold mine, quarries and sand pits, logging activities.

- Infrastructure and services: reinforcement of the 315 kv power transmission system in Abitibi-Témiscamingue; new 69 kv power transmission line between Waswanipi and the Windfall mine site, Road 113, and Road 1053; Nordic cogeneration plant in Lebel-sur-Quévillon; project to reactivate the Grevet-Chapais railway line (Grande Alliance); relocation of the snowmobile trail between Lebel-sur-Quévillon and Chapais (Grande Alliance).
- Land use (non-First Nations): expansion of the towns of Lebel-sur-Quévillon and Chapais, sport hunting, rough shelter leases.
- Wildlife or protected territory: wildlife reserves, protected areas, and biodiversity reserves; Assinica National Park; Recovery Strategy for the Woodland Caribou; species of special status; Paix des Braves Agreement, Nadoshtin and Boumhounan Agreements; JBNQA, Agreement on Governance in the Eeyou Istchee James Bay Territory.
- Natural and other disturbances: Forest fires, white-nose syndrome.

11.1 GREENHOUSE GASES

Projects in the regional study area that emit GHGs that are cumulative with Windfall's emissions are those related to natural resource development, infrastructure and services, and the expansion of existing cities. These emissions are in addition to the natural emissions from forest fires that have occurred in the past.

In 2020, Quebec's total GHG emissions were 74 Mt CO_2eq, or 8.6 t per capita, representing 11.0% of Canada's total emissions of 672 Mt CO_2eq. During the Windfall project's operations, the direct and indirect GHG emissions would average approximately 30.1 kt CO_2eq/year. These emissions represent 0.1% of emissions from the Industry sector and 0.04% of total provincial emissions. At the federal level, annual emissions from project operations represent 0.005% of total Canadian emissions. The contribution of direct emissions from project operations is therefore **low** at the provincial and federal levels.

11.2 SURFACE WATER

The cumulative impacts assessment on surface water concerns the same aspects and generate the same cumulative impacts as for the ichtyofauna, benthos and habitat component. The cumulative impacts assessment for these two components is presented in section 11.4.

11.3 FLORA

The cumulative impacts assessment on flora concerns two distinct aspects: the loss of terrestrial vegetation cover and the loss of wetlands.

Forest fires and logging are the largest sources of canopy disturbance in the project study area and within 100 km of the Windfall project site. Next are the power line corridors that cross the territory from north to south or east to west. A portion of approximately 15,700 km^2 to 18,850 km^2 has also been affected by logging or linear infrastructure development. This is in addition to the logging planned for the near future, which will affect an area of approximately 60 km^2 south of the mine site.

The Windfall project will affect a total of 1.05 km^2 of undeveloped land:

— 22.9% (0.241 km^2) in regenerating (i.e., recently cut) tree stands;

— 32.1% (0.337 km^2) in mature hardwood, mixed, and softwood stands;

— 45.0% (0.472 km^2) in wetlands.

The Windfall project will be responsible for 0.81 km^2 of encroachment on vegetation stands not previously disturbed by other projects/activities.

Considering all the disturbances that are or will be caused by other projects, actions, and significant events, the magnitude of the project's contribution to cumulative impacts on flora will be **low**. In fact, this contribution represents only between 0.005% and 0.004% of what has been and will be affected by all the activities considered.

11.4 ICHTHYOFAUNA, BENTHOS AND HABITAT

Considering the spatial boundary selected for this component, five other projects intersect this territory: the construction of a new 69 kV power line and associated substation (Windfall substation), the opening of two new borrow pits (Gravtest-3 and Gravtest-4) associated with Windfall project, but outside the project site limits, ongoing exploration work by Osisko (Windfall Exploration and Urban Barry) and ongoing activities at Barry and Gladiator sites (Bonterra). The only one of these projects that could have a mine effluent is the Barry project, currently in operation approximately 12 km south-west of Windfall mining site.

The Barry project is in the same watershed (level 4) as the mine effluent of the Windfall project. However, the Barry project is necessarily submitted to strict discharge standards, similar in nature to those applicable for the Windfall project. Furthermore, the water from Pond 1, which receives the treated effluent from the Windfall project, follows a path of more than 17 km through various lakes and watercourses before reaching the lac aux Loutres area, which receives the mine effluent from the Barry site. Considering the distance separating the two sites and the strict discharge standards applicable, no cumulative impact is apprehended. The residual impact on ichtyofauna, benthos and habitat will remain moderate.

11.5 AVIAN FAUNA (SPECIAL-STATUS SPECIES)

The main factors that have or could have an effect on populations of bird species at risk are habitat modification and loss, disruption (exploitation of natural resources, infrastructure and services, land use, natural disturbances), risk of collision (infrastructure and services), and habitat or species protection (wildlife or protected territory).

The installation of project-related infrastructure will result in the loss of 0.59 km^2 (59.34 ha) of habitat for the Common Nighthawk. Considering the activities identified in the study area, it is estimated that 11.87 km^2 has been or would potentially be lost, representing a loss of approximately 0.1% of available habitat. The Windfall project would contribute less than 5% of the potential habitat loss for the species in this study radius. That said, the Windfall project will also have a positive effect on these species, primarily during the restoration phase, by creating more open habitat than was originally present. The cumulative impact on the species would be **low**.

For the Olive-sided Flycatcher, the siting of the project's infrastructure will result in habitat losses of 0.46 km^2 (45.92 ha). Habitat loss in the study area is directly related to the presence of permanent infrastructure of the various projects and to logging. Considering the activities identified in the study area, it is estimated that 7.18 km^2 has been or would potentially be lost, representing a loss of approximately 0.05% of available habitat. The Windfall project would contribute approximately 6% of the potential habitat loss for the species in this study radius. The cumulative impact would remain **low**.

Since the Windfall project is located in the northern portion of the Canada Warbler's range, part of the proposed infrastructure will alter or destroy 0.09 km^2 (8.69 ha) of its potential habitat. When considering the cumulative impacts, it is estimated that 20.60 km^2 has been or would potentially be lost, representing a loss of approximately 2% of available habitat. The Windfall project would contribute less than 0.5% of the potential habitat loss for the species within this study radius (100 km). The cumulative impact on bird species is **low** considering their small numbers in the area compared to the rest of Quebec, but also because the cumulative impacts of all identified projects resulting in habitat loss are low, in addition to the fact that the Windfall project contributes minimally to habitat loss given the availability of equivalent habitat in the project study area.

At the level of the local biophysical environment study area, bald eagles use the area probably to feed and travel through, but not to nest. The Windfall project would not contribute to the cumulative loss of their nesting habitat due to other projects in this area. However, the addition of one more project and the increase in human presence in their hunting territory will contribute to disruption. As for the presence of large bodies of water and fish-bearing rivers in this area, equivalent habitats do exist, and across large areas. The cumulative impact is therefore **low** at the study area level and very low at the provincial level.

Within the area of the Windfall mine site, 0.40 km^2 (40.43 ha) of potential Rusty Blackbird habitat would be affected by the project. Considering other activities and projects in the study area, approximately 9.07 km^2 has been or would potentially be lost, representing a loss of approximately 0.1% of available habitat. The Windfall project would contribute to less than 5% of the potential habitat loss for the species in this study radius. Considering the low use of the area by the species and the contribution of the Windfall project to potential habitat loss, the cumulative impact of the project is therefore **low**.

11.6 CHIROPTERANS

The main threats facing bats are habitat loss, wind power development, and white-nose syndrome. In the absence of wind projects in the region, the potential adverse effects of human development projects are primarily related to habitat loss.

Based on the Windfall project's assessment of impacts to habitat loss and disruption to chiropteran populations, it was determined that the project would have a medium residual effect (Table 10-1). Although some habitat loss is anticipated, the natural environments within the site are of moderate quality for chiropteran and, due to the planned reclamation activities, habitat loss will not compromise the integrity of local populations. Logging activities, mineral exploration projects, the Bonterra and Langlois mining projects, associated roads and transmission lines, the opening of a new snowmobile trail corridor, the quarry near Waswanipi, and the expansion of the municipal territories of the main towns and reserves present are likely to result in the loss of mature forest environments, wetlands, and potential travel corridors. However, the area that will be affected is limited. Natural disturbances such as wildfires and white-nose syndrome will likely cause significant habitat loss and mortality. The risk that resident bats identified in the local biophysical environment study area will be affected by WNS remains high.

The cumulative impacts anticipated for the Windfall project will be negligible and will consist mainly of increased disruption of chiropterans in the vicinity of the project, as well as occasional losses and alterations of their habitat. The level of this cumulative impact is therefore considered to be **very low.**

11.7 WOODLAND CARIBOU

The assessment of cumulative impacts on woodland caribou is based on the trends in local and regional populations as well as on the status of habitats suitable for the species. With respect to woodland caribou populations, section 7.5 showed that on a regional scale, the Assinica population may use the area surrounding the Windfall mine site. In the immediate area of the mine site, the low population density and the few sightings reported (three caribou observed about 20 km south of the site) by users of the surrounding traplines suggest that there are no longer any woodland caribou present there.

In terms of suitable habitat, woodland caribou generally favour large forest complexes within which they move and forage. The area within the 50 km radius considered for the cumulative impacts assessment of this valued component has undergone significant changes since the 1980s. This degradation of forest habitat will continue over the next few years since at least one forestry company (Barrette-Chapais) will be logging in the areas south of the Windfall mine site, in and around Lake Barry.

The Windfall project will contribute **little or nothing** to cumulative impacts on woodland caribou populations, given that these caribou have made very little use of the study area within 50 km of the Windfall site in the past decade, and due to the existing habitat degradation.

11.8 MOOSE

As with woodland caribou, the cumulative impacts assessment for moose is based on the status of the local and regional population, as well as the status of the habitat suitable for the species. Moose populations are reported to have always been at relatively low densities due to the typical habitat of the area, where food is scarce and of poor quality (especially in winter). According to trapline users, moose hunting took place on the Windfall exploration site and along the access roads until 2007, but since then the hunting area has been moved north.

In addition to the increase in noise and human activity in the area, major habitat changes over the past 40 years, primarily due to forestry activities and forest fires, have contributed to the decline in moose numbers. Nevertheless, it appears that these habitat disturbances could have a positive impact on the quality of moose habitat in the medium term, as forest regeneration will increase the amount of food available.

Thus, in terms of cumulative impacts, past activities at the regional scale could be considered positive for the species. However, on a local scale, the proliferation of human activities (continued forestry activities, the presence of operating mines, numerous mine sites undergoing exploration, and a rise in recreational activities, especially hunting and fishing) tends to keep moose away from these areas, and this specifically affects trapline users. The cumulative impacts would therefore be **moderate**.

11.9 TRADITIONAL USE OF THE LAND AND NATURAL RESOURCES

Since the gradual opening of the territory to logging and mining in the 1940s and 1950s, and with the completion of Road 113 (formerly Road 58) linking Lebel-sur-Quévillon, Waswanipi, and Chapais in the early 1960s, the Cree community's current use of the land and resources, particularly hunting, fishing, and trapping activities, has undergone considerable change.

Several negative cumulative impacts resulting from the interactions of significant projects, actions, and events with the Windfall project affect the Cree community of Waswanipi:

- Reduced success in hunting and trapping: fragmentation of the territory and loss of vegetation cover affecting the diversity and density of wildlife in the region.
- Abandonment of the use of significant sections of the territory: presence of mining or other facilities, nuisances (noise, dust, and light), and disappearance or displacement of flora and fauna.
- Degradation of the quality of key environmental components of the territory's resources (water, air, soil).
- Reduced sense of security: increased risk of traffic accidents (higher number of vehicles related to mining, forestry, and hunting and fishing activities by non-First Nations people).
- Risk of depletion of certain game species: risk of overfishing or poaching due to the increased presence of workers. It should be noted that hunting and fishing activities are prohibited for workers at Windfall Camp.

The community of Waswanipi, however, can also feel the following positive cumulative impacts:

- Emergence of new and more diversified habitats with the progressive regeneration of the forest: promotes the presence of moose.
- Greater accessibility and ease of movement for users of the territory through the development and maintenance of forest and access roads, and the opening of corridors for power lines.
- Employment opportunities in various active projects near their homes.

Considering the breadth of the territory, the progressive regeneration of resources affected by fires and forestry activity, the more localized nature of the mining facilities, the travel-related benefits, and the economic spinoffs, the anticipated cumulative impact at the Waswanipi community level would be **moderate**.

Within the Cree community of Waswanipi, the users of traplines W25B and W25A are those most impacted by the presence of the Windfall project. The main negative impacts are related to the cumulative nuisances (waste, noise, light, traffic) of the various projects and activities (Barry mine, Gladiator mine site, power lines, logging, access and forest roads, outfitters, forest fires, etc.). The combined effects of all the projects and activities on the territory and over time therefore suggest a **moderate to strong** cumulative impact for the users of these two traplines.

The proposed measures to address land use issues will be contained in an Impact Benefit Agreement (IBA) that is currently being negotiated between the mine and representatives of the Cree Nation Government and the Cree First Nation of Waswanipi (CFNW). These measures have not yet been established, but could include financial compensation, assurance of socio-economic benefits for local communities, ongoing collaboration with project stakeholders, particularly through various follow-up committees (e.g., environmental aspects, training and employment, business opportunities), and assistance and funding for some forest, wildlife, social, or cultural development. This agreement would provide a degree of mitigation for anticipated cumulative impacts during all phases of the project. The cumulative residual effect would then be reduced by these actions and considered **moderate** for the entire study area.

11.10 SUMMARY OF CUMULATIVE IMPACTS

The analysis of cumulative impacts on the six valued components leads to the conclusion that the Windfall project will only result in low cumulative impacts on GHGs, flora, avifauna, chiropterans, and caribou in the study area (spatial scope) and for the selected periods (temporal scope). Moderate cumulative impacts are anticipated for moose and traditional land and natural resource use. Finally, very low cumulative effects on surface water and ichthyofauna, benthos and habitat are anticipated. These components still have moderate residual impacts.

12 ACCIDENT RISK MANAGEMENT

The purpose of the risk analysis of major technological accidents related to the Windfall project is to identify the hazards that could occur and to evaluate the possible consequences to people and the environment. It is also used to develop protective measures to prevent potential accidents or to reduce their frequency and consequences.

The first steps are to identify sensitive environmental components and external hazards and to compile a history of past accidents in similar industries. Hazards related to activities, infrastructure, or equipment are identified, leading to the development of risk-related accident scenarios. If the assessed accident scenarios may affect the population, an additional assessment is made of the individual risks. Finally, safety measures are identified to eliminate or reduce the risk of accidents and a risk management plan is developed, including an emergency response plan, to manage residual risks that cannot be eliminated.

The Windfall project is located at a considerable distance from any permanent dwellings and poses little risk to people in the event of an accident. However, an accident could affect people on site, property, and the environment. The site is also located at great distances from resources that could be mobilized. It is therefore important to identify the risks so that the resources are in place to respond diligently and confidently in the event of a major accident.

Osisko is committed to ensuring that the risk management process will sufficiently reduce the plausible consequences of identified accident scenarios to keep the level of risk as low as reasonably practicable.

12.1 IDENTIFICATION OF SENSITIVE ENVIRONMENTAL COMPONENTS

The sensitive environmental components to be considered in a technological risk analysis are those that could be affected by a major accident at the mine. These primarily include the local population, mining infrastructure, and sensitive or protected environmental components near the site.

Built environment: The built environment near the project, in the local study area of the social environment, is almost uninhabited and is used mainly for the exploitation of natural resources (forestry and mining). The tallyman of trapline W25B has a camp in the local study area, located 6 km southwest of the mine site. He lives there permanently with his family. There are also three public land use leases in the local study area, two of which are for private vacation leases (the closest is located approximately 1.3 km from the mine site) and one for lodging purposes at a non-exclusive outfitter approximately 5.4 km away.

Traditional, recreational, and tourist activities: The main users of the territory practise their traditional or recreational activities, including hunting, fishing, trapping, and berry picking. The users of the territory travel by snowmobile or quad on private trails.

Convention Territory and Valued Areas: Four valued wildlife areas are located within the local study area (LSA), one of which is located directly north of the project site. Three others are located south of the project site, including one that surrounds a Cree camp on trapline W25B.

Biological environment: The study area is suitable for peatland development. No species of special status of flora, fish, herpetofauna, fur-bearing animals, small fauna, or small mammals have been observed in the local biophysical study area. However, species of special status of avian fauna (6), large fauna (woodland caribou), and chiropterans (5) have been observed.

Archaeological sites: Four areas of moderate archaeological potential were identified within the local social environment study area. Two potential areas are located north of Lake SN1, one area on the eastern shore of Lake SN6, and the other on the western shore of Lake SN2.

12.2 HAZARD IDENTIFICATION

12.2.1 IDENTIFICATION OF EXTERNAL HAZARDS

External hazards are events from natural or anthropogenic sources that can affect the proper functioning or integrity of the site.

RESILIENCE TO CLIMATE CHANGE

Some climate trends are already apparent in the historical weather data for the vicinity of the Windfall project site (Chapter 9). The projected changes in these trends are considered to assess the impact of climate change on the probabilities or consequences of the accident and malfunction scenarios identified in this chapter. To do this, climate hazards, i.e., phenomena or events likely to cause injuries, social disruptions, as well as damage to infrastructure and natural environments, have been identified according to the observed trends. The main climate hazards considered are extreme precipitation, longer summer seasons, high summer temperatures, drying soils and forest fires, freeze-thaw and winter thaw cycles, extreme cold snaps, changes in winter precipitation, and storms (high winds and thunderstorms).

The consequences of these climate hazards can be direct or indirect. The risk of extreme weather conditions (high winds, heavy rain, tornadoes, etc.) at the project site is considered non-negligible. However, the design of the plant's buildings and equipment will comply with current codes and regulations to withstand the overloads created by extreme weather conditions.

EXTERNAL HAZARDS FROM NATURAL AND ANTHROPOGENIC SOURCES

The following natural and anthropogenic external hazards were considered:

- Earthquakes: The Eeyou Istchee James Bay Territory is located in an area of relatively low seismic activity. According to Natural Resources Canada, the probability of occurrence of strong earthquakes is quite low, with a relative hazard of level 1. The risk of a earthquake causing major consequences in the study area is considered negligible.
- Ground instability: Given the flat terrain at the project site, the risk associated with instability of the surface deposits is considered negligible.
- Flooding: Flood flows in the local biophysical study area were assessed as low because the watersheds involved are fairly flat, with a large percentage of lakes and wetlands. The risk of major flooding at the project site is considered negligible.
- Forest fire: The geographic location of the site makes the probability of forest fires developing around the site relatively high.
- Road transportation: The roads are generally in good condition and do not require immediate major improvements. The Wetetnagami River Bridge (R0853-03) is also in good condition.
- Rail transportation: The closest point to the project reached by the CN rail line is approximately 75 km away.
- Air transportation: The risk of airplane crashes is highest in the landing and take-off maneuvering areas. However, the project site is located outside the landing and take-off maneuvering areas of any nearby airfield (Lebel-sur-Quévillon and Chapais airports).
- Power transmission: The site will be supplied with electricity via a power line. These lines are particularly sensitive to the climate hazards mentioned above.
- Vandalism and trespassing: The Windfall mine site could be the target of ill-intentioned individuals. However, Osisko has put in place several security measures to limit this risk.

12.2.2 IDENTIFICATION OF HAZARDS RELATED TO SITE ACTIVITIES

The main hazards at the site during the period covered by the environmental assessment are related to the following activities:

- use of flammable gases;
- storage and use of chemicals;
- storage and use of petroleum products;
- use of conveyors and other rotating equipment;
- use of transformers;
- transport of chemicals, petroleum products, and explosives;
- storage and use of explosives;
- operation of an underground mine;
- storage of tailings and waste rock;
- transport of mine tailings;
- water retention in ponds;

- operation of water treatment plant;
- use of air handling systems.

12.3 HISTORY OF MINING ACCIDENTS AROUND THE WORLD

The historical record of mining accidents around the world is used to identify hazards that may occur and to establish the accident scenarios that will be used in the risk assessment. It can also be used to improve the design of infrastructure and equipment, to determine the required safety equipment, and to better define the risk management plan.

The ARIA database of the Bureau d'analyse des risques et pollutions industriels (BARPI) of the French ministry of ecology and sustainable development was consulted. Since the leaching process related to ore extraction is not specific to the gold industry, the ARIA database search was extended to metal ore processing in general. Accidents that have occurred since January 2010 around the world were examined.

Among the recorded accidents related to extractive activities, the most relevant to the project were selected and classified by type of event, i.e., dike breaches, landslides/collapses, discharge of contaminated water to the environment, fires, explosions, and others.

12.4 POTENTIAL ACCIDENT RISKS

The identification of hazards related to the site's activities and the historical record of accidents have led to the development of the following potential accident scenarios:

- hazardous materials spill;
- mine tailings spill;
- fire/explosion;
- release of toxic gas;
- explosion of explosive material;
- release of nitrogen oxide;
- discharge not compatible with the environment (liquid effluent);
- discharge not compatible with the environment (air effluent);
- breach of a retention structure;
- subsidence of an accumulation area;
- underground subsidence;
- underground mine flooding;
- forest fire.

Each scenario describes the potential causes, the potential consequences, and the preventive and control measures implemented by Osisko.

12.5 QUANTITATIVE ASSESSMENT OF CONSEQUENCES

As part of the major technological accident risk analysis for the Windfall project, hazard and consequence analysis modelling was performed for propane and sulphur dioxide (SO_2). These products will be present at the site in quantities that require a quantitative assessment of consequences for the operation phase.

PROPANE

Six tanks will be installed at the Windfall project site: five 20,000 USG tanks and one 40,000 USG tank. The impact radius was calculated for a 20,000 USG tank and a 40,000 USG tank. For each tank, three scenarios were considered: standardized scenario (catastrophic tank rupture), alternative standardized scenario (0.2" leak on the transfer hose when connected to a tanker truck), and domino effects (considering the proximity between two of the tanks). For all scenarios it is expected that the project infrastructure (e.g. buildings) would be affected in the event of an incident. With respect to natural environments, potential impacts would be felt particularly on waterbodies within the impact radius. The waterbodies that could be affected would be SN2, SN3 and SN6 lakes, as well as Ponds 1 and 2 and Kettle Lake. The latter could receive debris related to the fire and/or explosion. These waterbodies, with the exception of Kettle Lake, are fish habitat.

SULPHUR DIOXIDE

The following scenarios were used to assess the consequences for the sulphur dioxide tank: standardized scenario (catastrophic rupture of the 36 m^3 tank), alternative standardized scenario (0.2" leak in the upper region of the tank —safety valve), and alternative scenario (0.1" leak lasting 2 minutes while filling the tank). The assessment showed that under the least favorable meteorological conditions, the toxic cloud generated by the release of this substance could disperse over significant distances outside the boundaries of the LSA. Elements located outside the LSA will also be affected, such as two Cree camps, several recreational leases and two canoe trails.

12.6 RISK MANAGEMENT PROGRAM

To ensure the safety of workers, the public, and the environment during operations, a program will be established to manage risks that cannot be eliminated with existing prevention measures. The main features of this program will be as follows:

- implementation of an environmental and health and safety management system;
- environmental monitoring during the construction and operation phases;
- development of safe operating procedures;
- setting up an equipment maintenance program and a periodic inspection program;
- training workers, particularly on the operation of equipment, the risks inherent in activities, as well as safe work methods and personal protective equipment;
- visual identification system for stored chemicals, piping, and connections to loading and unloading areas;

- safe storage of chemicals;
- investigation of accidents and incidents to determine causes and implement corrective actions;
- rigorous change management process.

12.7 PRELIMINARY EMERGENCY RESPONSE PLAN

An emergency response plan is an essential tool to ensure a quick and effective response when an emergency situation arises. The preliminary plan contains the roles, responsibilities, and means of contact for responders; procedures for alerting and mobilizing, emergency response, and evacuation; and the process for restoring normalcy.

The emergency plan developed will be known to internal stakeholders, updated annually, readily available in emergency situations, and easy to consult. Response measures will be in accordance with applicable regulations and industry best practices. When required, this plan will be revised and adapted to any new activity on the site.

13 ENVIRONMENTAL PROGRAMS

13.1 MONITORING AND FOLLOW-UP PROGRAMS

As part of the activities associated with the construction, operation and closure phases, Osisko will ensure that it has the human and financial resources to implement and carry out an environmental monitoring and follow-up program. In fact, it is expected that approximately eleven resources, part of the Environment team (including the operation of the water treatment unit), will be working on site to ensure the implementation of this program.

13.1.1 CONSTRUCTION

Environmental monitoring during the project will consist of ensuring that Osisko's environmental commitments and obligations are met. It will also ensure that the proposed mitigation measures are incorporated into the project and that the plans and specifications comply with laws, regulations, and other environmental considerations. Another activity of the monitoring program will be to see that all necessary approvals and permits have been received.

A site meeting to be held at the very beginning of the work will be organized by the site managers and the environmental monitor in conjunction with the general work contractor. The purpose of this meeting will be to inform and educate site personnel on the environmental and safety provisions that will apply throughout the construction period and on the general operation of the monitoring activities.

During the work, mitigation measures will be rigorously implemented, particularly during work carried out near sensitive environments, water courses, and water bodies. In general, the environmental monitor will conduct regular visits to the work areas and will ensure that the various commitments, obligations, measures, and other requirements are rigorously respected by the stakeholders. The monitor will also evaluate the quality and effectiveness of the measures applied and note any non-compliance observed, and must then report any observations to the site manager so that appropriate preventive and corrective measures can be taken as soon as possible, if required. The monitor will also ensure that workers report any spills to the authorities without delay.

13.1.2 OPERATION

The environmental follow-up program for the Windfall project is intended to follow the trends of sensitive environmental components, some of which is in accordance with federal and provincial requirements. Its purpose is to detect and document any changes in the environment whether or not they are project-related, to verify the accuracy of the impact assessment, and to evaluate the effectiveness of the mitigation measures included in the EIA.

A follow-up of the air quality at the source and in the ambient air will be conducted at sampling stations representative of the environments affected by the project. Air quality in the underground mine will also be monitored. The quantities of fuel used, as well as the associated GHG emissions, will also be recorded and reported in accordance with provincial and federal requirements.

Tailings, waste rock and ore geochemistry will also be monitored.

Water quality follow-up at the final effluent is also planned and will include physicochemical and biological characterization (toxicity testing). Final effluent water quality data will be sent monthly to MELCCFP through its Environmental Monitoring System (SENV) and quarterly to ECCC through its Mine Effluent Reporting System (MERS).

Follow-up of surface water quality will be conducted in addition to the analysis of the mining effluent so that any changes in environmental conditions in the waters of the receiving environment can be observed. As for the underground water, observation wells are already present on site to track groundwater quality in the area surrounding at-risk development. If needed, new observation wells will be installed. Osisko will also be following up on the water quality of the drinking water wells at the mine site, and in the event that the sanitary sewage treatment system requires surface discharge, a follow-up of the influent and sanitary sewage effluent will be carried out. Finally, a biological follow-up of sentinel fish populations, benthic invertebrate communities, and sediments will be conducted on a three-year basis.

Stability monitoring of water impoundment structures will be an integral part of the follow-up program, in line with the requirements of the Dam Safety Act.

As for the social environment, the purpose of the follow-up is to evaluate the effectiveness of the measures proposed to mitigate the impacts on the social environment during the operation of the Windfall project. The results will allow, if necessary, to adjust these measures in order to better respond to the identified impacts. As Osisko is already engaged in an ongoing dialogue with First Nations and non-First Nations land users, this approach is part of the continuity of operations. The continuation and dissemination of the results of the activities will be defined by the terms and conditions in the Impact and Benefits Agreement (IBA). A follow-up committee will also be set up by Osisko to encourage the involvement of the communities concerned in the project. The members of the follow-up committee will respect the rules established by the Mining Act (section 101.0.3). An annual report on the activities of the follow-up committee will be made public.

In summary, the proposed environmental follow-up program will include the following components:

- ambient air quality;
- underground air quality;
- greenhouse gases;
- geochemistry of waste rock and tailings;
- compliance of mine effluents;
- surface water quality;
- groundwater quality;
- drinking water quality
- compliance of sanitary water;
- ichthyofauna and benthos (biological follow-up);

— social environment;

— stability of water impoundment structures.

13.1.3 CLOSURE

Closure phase environmental follow-up will be conducted in accordance with the Windfall mine site restoration plans. In the closure phase, there are two periods, the post-operational sub-phase and the post-restoration sub-phase. The post-operational phase is the interval between the cessation of production and the completion of site restoration work. The post-restoration phase is initiated thereafter. The restoration program and associated follow-ups are reviewed every five (5) years, in accordance with *Mining Act*, and according to the terms of the *Guide de préparation du plan de réaménagement et de restauration des sites au Québec.* The planned follow-up will cover surface and groundwater quality, site revegetation, and monitoring the integrity of the works.

After 10 years of water quality follow-up, if the requirements of D019 are met and downward trends in contaminant concentrations are observed, Osisko may consider discontinuing water quality follow-up, subject to MRNF and MELCCFP approval.

13.2 BIODIVERSITY PROGRAM

Biodiversity loss is an important societal issue for responsible project proponents who must develop measures that balance economic development with the inevitable losses associated with the nature of the development. The Windfall project will result in loss of vegetation cover and wetlands and habitat degradation. Following the assessment of the impacts and issues of the project presented in the previous sections, Osisko understands that the greatest impacts of the Windfall project will be on certain wildlife groups since it will lead to habitat losses and potentially to the displacement of species that are valued for hunting by the Crees.

Osisko is committed to developing a biodiversity program, for which the principles and objectives are to be defined, among others, with the members of WCFN. Reflection has begun and preliminary meetings have been held, but the approach has yet to be defined. The biodiversity program could be a research project on valued species. The objective would be to find ways to enhance biodiversity, particularly species of special status found in the study area.

14 ASSESSMENT OF THE CONSIDERATION OF ISSUES

As part of the activities associated with the impact assessment for the Windfall project, various issues were identified and confirmed during the various consultation activities carried out with the non-First Nations and First Nations populations in the project area. These issues include:

- **Preservation of the quality of the environment.** This issue includes protecting air quality, minimizing the contribution to climate change (GHG emissions), protecting the integrity of the water system and wetlands, and protecting surface and groundwater quality.
- **Preservation of biodiversity.** This issue includes minimizing the loss of vegetation cover and wetlands, preserving terrestrial and aquatic habitats (including bird, fish, moose, and caribou) and protecting plant and wildlife species at risk.
- **Consideration of First Nations interests and concerns.** This includes maintaining the integrity of Cree traditional activities and culture as well as preserving the community and psychosocial well-being of the Cree people.
- **Concentration of economic benefits locally.** This issue includes considerations for community benefits and the hiring of a local workforce in the long term (after mine closure).

However, it must be kept in mind that as project-related communication activities are ongoing, other issues could eventually be identified.

The impact assessment completed in Chapters 6 to 8 not only provided a better understanding of the project's impacts on the affected environmental components but also, by extension, of the major issues identified and presented above. In addition, the mitigation measures presented in these chapters and the monitoring and follow-up programs presented in Chapter 13 have addressed the various concerns raised in relation to these issues.

Table 14-1, presented below, lists each of the issues and summarizes the information concerning them, including the desired objectives, the management and design choices integrated into the project, and the proposed actions and measures, followed by an assessment for each issue. This demonstrates that the issues have been considered and integrated and allows us to conclude the Windfall project's environmental impact assessment.

Table 14-1 Assessment of the consideration of issues raised by the project

Issue	Desired objectives	Management and design choices integrated into the project	Actions taken and measures proposed under the EIA	Assessment of the issue
Preservation of the quality of the environment	– Preserve air quality, minimize GHG emissions, protect the integrity of the water system and wetlands as well as surface and groundwater quality.	– The sites used for the installation of the various facilities were chosen in areas already disturbed by human activities, away from wetlands and water bodies whenever possible. – Optimized surface traffic due to the position of the Lynx portal and the nearby process plant infrastructure. – Design of the structures according to the watersheds on the site to minimize the impact on the various watercourses and lakes in the study area. – Full characterization of mining materials to implement adequate protection measures for the water system. – On-site ore processing to reduce the number of trucks on local and regional roads. – Recirculation of 77% of the water used by the process plant. – Installation of a cyanide destruction unit in the tailings of the activated carbon adsorption circuit of the process plant. – Reuse of the tailings generated by the process plant, which is mixed with cement before being directed to the underground backfill. This reduces the amount of material that must be stored on the surface by 40%. – Treatment of drainage water, process water, and water from the various stockpiles in a four-step process before it is released into the environment. – Only one effluent will be used and it will be the same as currently used for advanced exploration activities (Pond 1); relocation of the effluent during the study to take into account environmental concerns. – Connecting the project to the provincial power grid to reduce air emissions. – Use of electric vehicles and machinery in the mine. – Predictive study of climate change effects and integration of findings into project design criteria to provide safety factors, especially for water retention structures. – Sorting and off-site disposal of waste as it is produced. On-site composting of organic materials. – Management of tailings by dry stacking, significantly reducing project risks since there will no longer be any dikes for the tailings storage facility. – Closure and restoration of the cells in the tailings storage facility as soon as they reach full capacity.	– Completed atmospheric modelling for the construction and operations phases (Chapter 6, Section 6.2.1, and Appendix 6-1). – Calculation of construction and operations phase GHG emissions (Chapter 6, Section 6.3.1, Appendix 6-2). – Completed environmental soil characterization (Chapter 6, Section 6.5.1, Appendix 6-4). – Completed surface water characterization (Chapter 6, Section 6.7.1, Appendix 6-7). – Completed groundwater characterization (Chapter 6, Section 6-9). – Modelling studies of the effects of dewatering underground drifts, estimation of the water percolation rate under the membrane of the waste rock stockpile and for the tailings storage facility (Chapter 6 and Appendix 6-8). – Environmental characterization of in situ sediments (Chapter 6, Section 6.8.1, Appendix 6-7). – Hydraulic modelling of the area surrounding the mining facilities in relation to the surface water catchment area (Chapter 6, Section 6.6.1, Appendix 6-5). – Geochemical characterization of materials (Chapter 3, Section 3.1.5, and Appendix 3-1). – Existing and planned sound environment studies (Chapter 6 and Appendix 6-3) – Ongoing consultations with land users as part of the project design to incorporate traditional knowledge and address project concerns (Chapter 4). – Common and specific mitigation measures for air quality, GHG emissions, surface and groundwater, soils and sediments (Chapter 6, Appendix 5-2). – Additional planned environmental monitoring and follow-up measures (Chapter 13).	– During the construction phase, impacts are expected to be very low to moderate and mitigation measures will be monitored. – The expected impacts on the quality of the environment during operations will also be very low to moderate. Air quality/GHG emissions and surface water quality will be given special attention in the monitoring programs implemented because of the importance to wildlife and the concerns expressed by land users. – During and following closure, low to very low impacts are anticipated as well as several positive impacts associated with the cessation of activities, site reclamation, and monitoring of effluent quality that will be maintained post-restoration for at least 10 years. – In summary, it appears that the issue of preserving the quality of the environment has been considered diligently and seriously at all stages of the Windfall project so as to minimize the disturbances generated, and to ensure an effective restoration that should allow a return to natural conditions similar to or better than those prevailing prior to the start of the work.

Issue	Desired objectives	Management and design choices integrated into the project	Actions taken and measures proposed under the EIA	Assessment of the issue
Biodiversity preservation	– Minimizing the loss of vegetation cover and wetlands, preserving terrestrial and aquatic habitats (including bird, fish, chiropteran, moose, and caribou), and protecting plant and wildlife species at risk.	– The sites used for the installation of the various facilities were chosen in areas already disturbed by human activities, away from wetlands and water bodies whenever possible. – Design of the structures according to the watersheds on the site to minimize the impact on the various watercourses and lakes in the study area. – Integration of the inventory results in the study of project location alternatives to minimize impacts on species with status. – Installation of a cyanide destruction unit in the tailings of the activated carbon adsorption circuit of the process plant. – Selection of ore processing methods to minimize ground encroachment and plant size. – Reuse of already active areas that will be converted to other uses. – Reuse of the tailings generated by the treatment plant, which is mixed with cement before being directed to the underground backfill. This reduces the amount of material that must be stored on the surface by 40%. – Treatment of drainage water, process water, and water from the various stockpiles in a four-step process before it is released into the environment. – Only one effluent will be used and it will be the same one as currently used for advanced exploration activities (Pond 1). – Sorting and off-site disposal of waste as it is produced. On-site composting of organic materials. – Management of tailings by dry stacking, significantly reducing project risks since there will no longer be any dikes for the tailings storage facility. – Closure and restoration of the cells in the tailings storage facility as soon as they reach full capacity.	– Inventory of vegetation, wetlands, and the water environment (Chapter 7, Section 7.1.1, Appendix 7-1). – Ichthyofauna and benthos inventory (Chapter 7.2.1, Appendix 7-2). – Herpetofauna inventory (Chapter 7, Section 7.3.1, Appendix 7-3). – Avifauna inventory (Chapter 7, Section 7.4.1, Appendix 7-4). – Large mammal inventory (Chapter 7, Section 7.5.1, Appendix 7-5). – Chiropteran inventory (Chapter 7, Section 7.6.1, Appendix 7-6). – Inventory of fur-bearing animals and small mammals (Chapter 7, Section 7.7.1, Appendix 7-7). – Interviews with tallymen and their families, as well as their participation in field inventories to integrate traditional knowledge into the project (Chapter 4). – Common and specific mitigation measures for vegetation, wetlands, water environments, aquatic wildlife, herpetofauna, avifauna, terrestrial wildlife, and species with status (Chapter 7, Appendix 5-2). – Additional planned environmental monitoring and follow-up measures (Chapter 13). – Biodiversity program (Chapter 13).	– During the construction phase, the expected impacts are very low to moderate and are specifically related to habitat loss, disturbance/collision risk, and alteration of habitat quality (accidental spills). Particular attention will be paid to monitoring the implementation of proposed mitigation measures and compliance with them. – The expected impacts on the quality of the environment during operations will also be very low to moderate. Discharges associated with site effluent into fish habitat and potential wildlife disturbance/collision (particularly for chiropterans) will be given special consideration in the monitoring programs put in place due to the high importance placed on fish habitat and the protected status accorded to several wildlife species present in the area. – During and following closure, low to very low impacts are anticipated as well as several positive impacts associated with the cessation of activities, site revegetation, and monitoring of effluent quality that will be maintained post-restoration for at least 10 years. – In summary, it appears that the issue of biodiversity preservation has been considered diligently and seriously at all stages of the Windfall project so as to minimize the disturbances generated on fauna and flora, and to ensure an effective restoration that should allow a return to natural conditions similar to or better than those prevailing prior to the start of the work.

Issue	Desired objectives	Management and design choices integrated into the project	Actions taken and measures proposed under the EIA	Assessment of the issue
Consideration of First Nations interests and concerns	– Maintenance of the integrity of traditional activities and Cree culture, preservation of the community and psychosocial well-being of the Cree people.	– The sites used for the installation of the various facilities were chosen in areas already disturbed by human activities, away from wetlands and water bodies whenever possible. – Placement of noisy infrastructure (e.g., crushers) as far as possible from sensitive receptors. – On-site ore processing to reduce the number of trucks on local and regional roads. – Establishment of a relationship of communication and dialogue with the Cree community of Waswanipi and with the tallymen of traplines W25B and W25A, and consideration of their concerns. – Construction of a Cree cultural centre for the employees of the mine site. – Treatment of drainage water, process water, and water from the various stockpiles in a four-step process before it is released into the environment. – Only one effluent will be used and it will be the same as currently used for advanced exploration activities (Pond 1); relocation of the effluent during the study to take into account environmental concerns. – Sorting and off-site disposal of waste as it is produced. On-site composting of organic materials. – Management of tailings by dry stacking, significantly reducing project risks since there will no longer be any dikes for the tailings storage facility. – Liaison Officer hired in 2017 by Osisko during the exploration phase to assist Cree workers on site and facilitate the recruitment of Cree workers for the project. – Organization of cultural exchange activities and sharing of the Cree way of life at the camp through posters explaining elements of Cree culture. – Osisko's existing responsible procurement, human resources, professional development, workplace harassment, and community relations policies. – Implementation of worker reconciliation measures with an employee assistance program. – Donation and sponsorship program for the Cree and Jamesian communities focusing on the promotion of science and education, the environment, or health and sport; support for cultural and community activities and socioeconomic partners. – Collaboration and advanced exploration agreements with host communities and the intention to finalize an Impact and Benefit Agreement with the Cree Nation Government and the Cree First Nation of Waswanipi. – Grant to study the effects of commuting on workers and their families. – Closure and restoration of the cells in the tailings storage facility as soon as they reach full capacity.	– Maintaining a constant link with the Cree community of Waswanipi and the tallymen to facilitate the exchange of information. – Consultations in the Cree community of Waswanipi with translation services to enable communication with unilingual Cree elders. – Addressing the concerns raised in the various consultations (Chapter 4). – Proposed common and specific mitigation measures to limit the effect on First Nations communities and their activities (Chapter 8, Sections 8.4.2 to 8.4.4 and 8.6.2 to 8.6.4). – Additional planned environmental monitoring and follow-up measures (Chapter 13).	– During the construction phase, the expected impacts are very low to moderate and are specifically associated with traditional land use. Particular attention will be paid to monitoring the implementation of proposed mitigation measures and compliance with them. – The expected impacts on environmental quality during operations will also be low to moderate and are also closely associated with traditional land use. Concerns are primarily centred around hunting success and access to harvesting areas. A special communication link will be maintained with the members of the Waswanipi Cree community and more specifically with the users of the traplines directly affected by Windfall site activities. – During and following closure, low to very low impacts are anticipated as well as several positive impacts associated with the cessation of activities, site revegetation, and monitoring of effluent quality that will be maintained post-restoration for at least 10 years. – In summary, it appears that the issue of considering First Nations interests and concerns has been taken into account diligently and seriously at all stages of the Windfall project so as to minimize the disruption to their traditional activities. Reclamation of disturbed areas will be carried out in such a way as to ensure a return to pre-construction conditions, while taking into account the expectations of the First Nations community.

Issue	Desired objectives	Management and design choices integrated into the project	Actions taken and measures proposed under the EIA	Assessment of the issue
Concentration of economic benefits locally	– Encouraging community benefits and the hiring of a local workforce in a long-term perspective (after the mine closes).	– Implementation of a local hiring policy for both employees and service providers. – Networking meetings with businesses in the Nord-du-Québec region to forge ties with them and integrate them into project development. – Liaison officer hired in 2017 by Osisko during the exploration phase to assist Cree workers on site and facilitate the recruitment of Cree workers for the project. – Osisko's existing responsible procurement, human resources, professional development, workplace harassment, and community relations policies. – Current workforce training initiatives related to mining industry jobs. – Integration of ongoing training programs to help employees relocate following mine closure. – Implementation of worker reconciliation measures with an employee assistance program. – Donation and sponsorship program for the Cree and Jamesian communities focusing on the promotion of science and education, the environment, or health and sport; support for cultural and community activities and socioeconomic partners. – Collaboration and advanced exploration agreements with host communities and the intention to finalize an Impact and Benefit Agreement with the Cree Nation Government and the Cree First Nation of Waswanipi.	– Economic impact assessment (Chapter 1, Section 1.4.2, Chapter 3, Section 3.14, Appendix 1-1). – Consultations with various stakeholders to learn about programs in the region and develop long-term relationships. – Proposed common and specific mitigation measures to promote the strengthening of the local economy (Chapter 8, Sections 8.3.2 to 8.3.4).	– The Windfall project has placed great importance on taking this issue into account in all phases of the project. Local hiring and procurement are among Osisko's priorities and are applied to all of its activities. The overall impact in relation to this issue is positive.

COMMON AND SPECIFIC MITIGATION MEASURES

Windfall Mining Project – Table of common mitigation measures by component

No.	Code	Description of the common mitigation measure or commitment	Construction	Operations	Closure	Follow-up/ monitoring/ awareness
Ambient air						
1	AIR01	Use water or dust suppressant on roads during activities to prevent, as much as possible, dust emissions related to activities at risk of causing the raising of dust. The dust suppressant must meet standard BNQ 2410-300.	x	x	x	
2	AIR02	Restrict access to designated areas and limit vehicle speeds for the work sites and mine operations. Post signage at specific locations.	x	x	x	
3	AIR03	Instead of burning tree and brush cuttings, chop them up and spread them on the site whenever possible.	x			
4	AIR04	Whenever possible, use electricity from the Hydro-Québec grid as the primary source of power.	x	x	x	
5	AIR05	Continually assess new energy conservation initiatives to reduce GHG emissions and standard pollutants associated with equipment choice, construction methods, and operating procedures.	x	x	x	
6	AIR06	Educate workers on fuel-efficiency practices, such as effectively managing acceleration and deceleration and turning off vehicles during idle periods, when possible.	x	x	x	
7	AIR07	Determine whether the use of biofuels, such as biodiesel, is feasible and complies with manufacturer recommendations.	x	x	x	
8	AIR08	Implement mechanisms to track fuel and electricity consumption in operations management and equipment maintenance.		x		
9	AIR09	Produce and implement a dust management plan for all project phases.	x	x	x	
10	**NOR01**	**Ensure exhaust systems (and dust collection systems, where applicable) on vehicles and equipment are in good condition and operating properly to limit the emission of airborne contaminants.** **Reference: *Clean Air Regulation*, s. 6.**	x	x	x	
Sound environment						
11	**NOR02**	**Ensure noise levels of stationary sources associated with mining activities meet the requirements of Instruction Note 98-01.** **Reference: D019, section 2.4.1.**		x		
12	**NOR03**	**Ensure maximum blasting distances and loads meet D019 criteria and guideline thresholds for the use of explosives in or near Canadian fisheries waters.** **Reference: D019, section 2.4.2; *Fisheries Act*, subsection 35(2); and Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters, p. 6, paras. 8-9.**	x			
Soil, surface water, and sediment quality						
13	QUA01	Perform only minimal stripping, clearing, excavation, backfilling, and grading of work areas.	x		x	
14	QUA02	Where grading is required in areas with steep slopes, cover the bottom of the ditch with granular drainage material and/or stone fill to prevent erosion.	x		x	
15	QUA03	To lower the risk of erosion on slopes, use methods such as trenches, containment berms, or diversion ditches perpendicular to the slope.	x		x	
16	QUA04	In all areas where particulate matter is likely to contaminate a watercourse due to erosion, stabilize the slopes of cuts and backfills using techniques that blend into the natural environment as much as possible (softening the slope to 1.5H:1V and other available techniques). Use sediment barriers (geotextile, straw, etc.) at the foot of steep slopes as necessary to reduce the volume of particles transported. Protective structures (straw, shavings, mats) may also be used directly on the slope. Avoid cuts on steep slopes. Ensure backfill is adequately compacted.	x		x	

No.	Code	Description of the common mitigation measure or commitment	Construction	Operations	Closure	Follow-up/ monitoring/ awareness
17	QUA05	Perform excavation, backfilling, and rehabilitation work in a way that limits the need to borrow material and crushed stone. Truck in the required backfill material from borrow pits on or near the project site. Depending on its characteristics, use excavated soil as backfill material from the site or remove it from the site if there is too much or its quality is not suitable for engineering purposes. When removed, transport and dispose of the soil in accordance with applicable laws and regulations.	x		x	
18	QUA06	Characterize the environmental quality of the soil in areas of the site where activities that may have contaminated soils have occurred. If contaminated soils are discovered, remediate the land.			x	
19	QUA07	If contaminated spoils must be stored temporarily, take all necessary actions to preserve the integrity of the surrounding soil and water as well as the safety of workers (stockpiling on a waterproof or impermeable surface, covering the stockpiles, limiting access to the stockpiles, etc.).	x		x	
20	QUA08	Where possible, cut trees and shrubs flush with the ground on embankment slopes. Preserve their root systems to promote infiltration of runoff and natural soil stability.	x			
21	QUA09	Monitor excavation and profiling work to detect any potential faults. Put in place corrective measures to prevent landslides if a risk has been identified.	x			
22	QUA10	Wherever possible, perform development work that may affect the hydraulic capacity of permanent watercourses outside the snowmelt period. Ideally, install culverts in permanent watercourses as quickly as possible, during low flow conditions. Culverts must not impede the flow of water or contribute to the formation of ponds upstream in high-water conditions. Restore temporarily altered water flow gradually after construction to prevent sudden changes in flow. The end of the culvert should extend no more than 30 cm beyond the backfilled roadbed. The backfill must be stabilized at both ends of the culvert and must not contain any organic material.	x			
23	QUA11	When installing or replacing a culvert, first confine the work area (e.g., by partially or completely dewatering the area) to avoid releasing particulate matter into the water. Work techniques and materials (diversion structures, geotextile, polythene, etc.) should avoid creating turbidity in the water as much as possible. Continuously maintain the natural flow of the watercourse; return water immediately downstream of the work area. Wherever possible, do not narrow the bed of the watercourse by more than 2/3 during construction. If necessary, pump collected water in the work area into a vegetated area at least 30 m from the watercourse.	x			
24	QUA12	Once a culvert has been installed, remove any other structures required for this work from the water. Stabilize the bed of the watercourse at the culvert's inlet and outlet. Ideally, restore the bed of the watercourse to its natural state, with similar materials. Stabilize and, if necessary, revegetate its banks.	x			
25	QUA13	Implement a runoff management system during the construction phase. As appropriate, use methods to control the emission of suspended solids, such as temporary water retention ponds, sediment barriers, turbidity barriers, and slope stabilization. Inspect and clean the chosen solution as required. In addition, pump water into a vegetated area at least 30 m from a watercourse.	x		x	
26	QUA14	If calcium chloride dust suppressants are used, do not dispose of them or rinse off equipment in or near water or on vegetation.	x	x	x	
27	QUA15	Wherever possible, use abrasives instead of ice melters in winter. When necessary, use water as a dust suppressant instead of a chemical solution.	x	x	x	
28	QUA16	During snow removal, keep plowed snow 30 m away from watercourses where possible.	x	x	x	
29	QUA17	Do not stockpile temporary waste, debris, material, or spoils (e.g., organic material from stripping of the soil surface) in the 15 m strip of land bordering the high-water mark of a watercourse or waterbody or in any wetland (pond, marsh, swamp, or peatland). Do not pile waste or wood debris there either. Divert runoff to a vegetated area at least 30 m from the watercourse or intercept it with sediment barriers or a sedimentation pond.	x	x	x	
30	QUA18	If required, remove temporary culverts and bank protection. Restore watercourse beds and banks.	x		x	
31	QUA19	Do not take granular materials for construction of the works from the bed or banks of a waterbody, nor from any source located within 75 m of the aquatic environment, except for the portion of rock excavated in the area adjacent to the loading docks and access roads, or from the watercourses or waterbodies that will be directly affected by the project's infrastructure.	x			

No.	Code	Description of the common mitigation measure or commitment	Construction	Operations	Closure	Follow-up/ monitoring/ awareness
32	QUA20	Restore riparian buffer strips that have been degraded by the work to replicate the natural bank of the watercourse or waterbody.	x		x	
33	QUA21	Build temporary developments (e.g., construction trailers, access roads, storage areas, waste sites) more than 60 m from a watercourse.	x		x	
34	QUA22	Plan sufficient emergency petroleum and chemical recovery kits and place them at sensitive locations. Handle petroleum products (hydrocarbons) in a way that prevents and controls leaks and spills.	x	x	x	
35	QUA23	Keep machinery in good condition (clean and free of any leaking contaminants) and ensure fuel and lubricant tanks are perfectly sealed. If a leak is found, repair it immediately.	x	x	x	
36	QUA24	During construction, perform maintenance of vehicles and surface equipment mainly on site, inside an existing truck shop. Refuel with properly equipped service trucks, more than 60 m away from watercourses. Place a collection tray under the transfer points during refuelling to prevent drips from falling on the ground.	x		x	
37	QUA25	Equip all stationary equipment containing oil and/or fuel (e.g., light towers, generators) and within 60 m of a watercourse or waterbody with a leakproof recovery system. The equipment must carry absorbent material in order to respond quickly and effectively to accidental spills.	x	x	x	
38	QUA26	Report all spills immediately. In the event of a spill of hydrocarbons or any other deleterious substance, notify the MELCCFP alert network (1-866-694-5454) immediately. If the spill reaches a waterbody, notify Environment Canada (1-866-283-2333). All contaminant spills require an immediate response to contain and recover the product. Remove and dispose of contaminated soil at an authorized site and perform a characterization following the MELCCFP's *Politique de protection des sols et de réhabilitation des terrains contaminés* (soil protection and contaminated sites rehabilitation policy).	x	x	x	
39	**NOR04**	**Manage spoils according to the extent of their contamination and following the requirements of the *Politique de protection des sols et de réhabilitation des terrains contaminés* (soil protection and contaminated sites rehabilitation policy).** **Reference: c. Q-2, r. 37 – *Land Protection and Rehabilitation Regulation*: schedules I and II and the *Guide d'intervention – Protection des sols et réhabilitation des terrains contaminés* (response manual – soil protection and rehabilitation of contaminated sites): Table 5 – authorized soil reclamation methods in Quebec.**	x		x	
40	**NOR05**	**Dispose of contaminated spoils following the matrix to that effect in the *Guide d'intervention*. If the spoils may be disposed of in a stockpile, the proponent must request an authorization from the Ministry and must not act before receiving said authorization.** **Reference: c. Q-2, r. 18 – *Regulation respecting the burial of contaminated soils*: Schedule I and *Guide d'intervention – Protection des sols et réhabilitation des terrains contaminés* (response manual – soil protection and rehabilitation of contaminated sites): Appendix 5 – excavated soil management matrix and section 6.4.3.1 – list of authorized treatment facilities.**	x		x	
41	**NOR06**	**Dispose of excess or unusable spoils (clay, silt, gravel, rock) with due care and in accordance with the *Protection Policy for Lakeshores, Riverbanks, Littoral Zones and Floodplains* and D019, keeping a safe distance from waterbodies.**	x		x	
42	**NOR07**	**Design culverts and crossing structures to maintain the free flow of water and fish passage. The construction of crossings and culverts must not reduce the width of a watercourse by more than 20%, measured from the natural high-water mark. The base of the culvert must be sunk below the natural bed of the watercourse to a depth of at least 15 cm or 10% of the height of the structure. The culvert's ends must extend no more than 30 cm from the base of the backfill and be adequately stabilized.** **Reference: *Regulation respecting the sustainable development of forests in the domain of the State*.**	x		x	
43	**NOR08**	**Have contractors maximize the use of mine wastewater produced at the site and minimize their liquid discharge (reference: D019, section 2.2.2.1).** **Produce a management plan for surface water (whether natural or related to the treatment process). Reference: D019, section 3.2.8.5.**	x	x	x	
44	**NOR09**	**Ensure site effluents comply with applicable standards.** **Reference: *Metal and Diamond Mining Effluent Regulations*, s. 4 and Schedule 4 and D019, section 2.1.1.1.**		x		x

No.	Code	Description of the common mitigation measure or commitment	Construction	Operations	Closure	Follow-up/ monitoring/ awareness
45	**NOR10**	**Stop accidental leaks as soon as they are detected, then contain and recover contaminants using appropriate equipment (absorbent sheets, sediment logs, drain covers, etc.). Notify the Minister immediately. Excavate contaminated soils, then place them in leakproof containers and dispose of them in accordance with the hazardous materials management program.** **Rapid action is crucial to prevent deep infiltration.** **Reference: *Environment Quality Act*, s. 21 and *Regulation respecting hazardous materials*, s. 9.**	x	x	x	
46	**NOR11**	**Set aside overburden and segregate topsoil to reuse for the restoration of disturbed areas.** **Reference: D019, section 2.6.**	x		x	
47	**NOR12**	**Manage hazardous materials in accordance with the *Regulation respecting hazardous materials* (RSQ, c. Q-2, r. 15.2), following a management system distinct from that for residual materials. If required, have the recovery performed by a specialized company. Store all hazardous materials in a designated area and protect them from the weather with a waterproof tarp until their loading and transport. In winter, place containers on pallets or storage tables. If the storage time exceeds 30 days, the storage area must include a watertight shelter with at least three sides, a roof, and a watertight floor forming a sump with a retention capacity of 110% of the volume of the largest container. The hazardous materials storage area must be located away from vehicular traffic and at a reasonable distance from drainage ditches or catch basins and any other sensitive features, and at least 60 m from any watercourse. Reference: *Regulation respecting hazardous materials* (RSQ, c. Q-2, r. 15.2).**	x	x	x	
48	**NOR13**	**Implement the surface water quality monitoring program (for final effluents) in accordance with the *Metal and Diamond Mining Effluent Regulations* and D019. Compare the quality results for the effluent and receiving watercourse to the criteria of the regulations in effect. Reference: D019, section 2.1.1 and *Metal and Diamond Mining Effluent Regulations*, Schedule 5.**		x		x
49	**NOR14**	**Implement a post-restoration monitoring and maintenance program (including for the water quality of mining effluents) to ensure the integrity of the structures and the effectiveness of corrective measures applied in the field. This monitoring must be carried out during the first ten years after the mine's closure, at a rate of eight sampling campaigns per year. Reference: D019, section 2.11.**			x	x
Hydrology and hydrogeology						
50	HYD01	Establish a network of wells around the mining infrastructure to measure the drawdown and rise of the water table near the mine.	x	x	x	
51	**NOR15**	**Implement a groundwater quality monitoring program. A minimum of three observation wells should be installed in selected locations around the stockpile to test groundwater quality upstream and downstream.** **Reference: D019, sections 3.2.10 and 2.3.2.1.**		x		x
Vegetation and wetlands						
52	VEG01	During clearing, pay special attention to avoid damaging the vegetation bordering the work areas. If trees accidentally fall, remove them in a way that does not disturb the environment.	x			
53	VEG02	Have contractors clean all construction equipment before arriving at the work site. The intent is to completely remove mud, plant fragments, and visible debris that may be contaminated with invasive exotic plant species.	x	x	x	
54	VEG03	If possible, perform work in wetlands on frozen ground or during low-flow conditions.	x		x	
55	VEG04	Leave vegetation along watercourses, wetlands, and access roads undisturbed.	x		x	
56	**NOR16**	**Restore work areas and stockpiles by grading, covering with natural soils, scarifying, or seeding to encourage revegetation. Stabilize reworked areas, embankment slopes, loose deposit piles, and others as work is completed.** **Reference: D019 for the restoration phase.**			x	

No.	Code	Description of the common mitigation measure or commitment	Construction	Operations	Closure	Follow-up/ monitoring/ awareness
Wildlife and habitats						
57	FAU01	Do not carry out work in waterbodies during the spawning periods of the species present: July 1–31 (brook trout), July 1–August 31 (lake whitefish), and July 15–April 15 (northern pike and walleye).	x		x	
58	FAU02	Do not perform clearing activities during the general bird nesting period (May 1–August 15). Validate other equivalent measures with the Ministry before implementing them.	x			
59	FAU03	Do not perform clearing activities during the bat birthing and rearing period (June 1–August 15, approximately).	x			
60	FAU04	Mark areas of high risk of collision with large wildlife with appropriate signage.	x	x	x	
61	FAU05	Before dismantling a building or other facility, inspect concealed spaces to check for potential chiropteran maternity or roosting sites. Where appropriate, take protective measures to ensure the survival of the chiropterans.			x	
62	FAU06	Raise awareness among workers not to leave food lying around so as not to attract wildlife to work areas. Prohibit feeding wildlife.	x	x	x	
63	FAU07	Implement bird-scaring measures if they start visiting the runoff management ponds for waste rock and ore stockpiles, the tailings facility, and process water.		x		
64	FAU08	Limit the emission of light towards the sky by using moderate, even lighting that meets actual lighting needs and whose light is directed towards the surface to be lit.	x	x		
65	FAU09	Carefully direct portable lights and moving light sources.	x		x	
66	**NOR17**	**Create an exclusion zone around active migratory bird nests discovered during the nesting season.**	x	x	x	
Planning, land use, and land tenure						
67	PLA01	Favour previously cleared or disturbed sites for the location of temporary site facilities (site offices, access roads, etc.).	x		x	
68	PLA02	Upon completion of the work, clear work areas of all equipment, machinery, materials, temporary facilities, waste, scrap, rubble, and spoil from the work. Redesign and restore these work areas to blend in with the natural landscape (soil regrading and loosening, slope softening). If segments of roads or paths are abandoned, scarify and revegetate them. Seed the slopes of the project rights-of-way to quickly stabilize them. Vegetate all areas that will not be useful for future projects.	x		x	
Population, economy, and employment						
69	POP01	Maintain existing mechanisms to support diversity and inclusion in hiring, onboarding, and skills development processes.	x	x	x	
70	POP02	Provide regular updates on the lifespan of the mine and inform workers and neighbouring municipalities in advance of the expected mine closure date.		x	x	
71	POP03	Establish a mechanism to help reorient the workforce and support employees during the transition towards mine closure.			x	
Quality of life and well-being						
72	VIE01	Maintain ongoing dialogue with targeted stakeholders and local communities.	x	x	x	
73	VIE02	At the orientation meeting, raise awareness among workers, subcontractors, and transporters to follow road safety rules and Osisko's traffic policy.	x	x	x	
74	VIE03	Establish a system for handling complaints and comments.	x	x	x	
75	VIE04	Maintain the Employee and Family Assistance Program.	x	x	x	

No.	Code	Description of the common mitigation measure or commitment	Construction	Operations	Closure	Follow-up/ monitoring/ awareness
Traditional First Nations land use						
76	UTT01	Raise awareness among workers on the traditional practices of First Nations communities and the activities of First Nations land users.	x	x	x	x
77	UTT02	Maintain a collaborative communication approach to inform key land users of the start and progress of the work.	x	x	x	x
78	UTT03	Continue to prohibit site workers from recreational hunting and fishing.	x	x	x	x
Infrastructure and public utility services						
79	INF01	Continuously perform roadway maintenance during operations to remove all accumulations of loose material or other debris.	x	x	x	
Heritage and archaeology						
80	ARC01	Conduct a manual archaeological survey every 10 m in areas of archaeological potential that have not been surveyed and that are within the construction area. This work should be done before the start of the construction phase to give some leeway if a major discovery is made. Where appropriate, recommendations will be made on mitigation measures to be implemented before or during development.	x			
81	ARC02	If a significant archaeological site is discovered, perform “salvage archaeology,” i.e., a complementary survey or a targeted excavation to sample the site before it is destroyed by the work.	x			
82	ARC03	Archaeological monitoring is recommended if work is to be done in areas identified as having archaeological potential where no prior archaeological surveys have been conducted. This monitoring is not required where manual surveys have been carried out.	x			
83	ARC04	If archaeological remains are found during construction work outside the identified zones of archaeological potential, stop all work pending evaluation by an archaeologist. Contact the regional office of the Ministère de la Culture et des Communications: Outaouais, Abitibi-Témiscamingue, and Nord-du-Québec Directorate, Abitibi-Témiscamingue and Nord-du-Québec Office 145 Québec Ave., Rouyn-Noranda, Quebec J9X 6M8 Phone: 819-763-3517 Fax: 819-763-3382 dratnq@mcc.gouv.qc.ca.	x			
Landscape						
84	PAY01	To the extent possible while ensuring the stability of the collection areas, shape the top of the tailings storage facility so it blends into the landscape.			x	

Windfall Mining Project – Table of specific mitigation measures by component

No.	Code	Description of the specific mitigation measure	Construction	Operations	Closure
1	P01	Progressively rehabilitate the tailings storage facility in three phases to reduce the area subject to wind and runoff erosion.		x	
2	P02	During the orientation training, make employees aware of the status species that can be observed on the Windfall site. Add large wildlife reporting measures to the forest road traffic procedure.	x		
3	P03	If an active roosting or maternity site used by chiropterans is discovered, establish a 100 m buffer zone, free of human activity, around the habitat and maintain it until a biologist has confirmed that the animals have left.	x	x	x
4	P04	If unflooded natural cavities or old drifts are discovered, verify whether they are being used as hibernacula by chiropterans. If necessary, establish a 500 m buffer zone free of human activity around the entire underground network constituting the habitat.	x	x	x
5	P05	In accordance with the existing hiring policy, when their qualifications are equal, favour women as well as local and First Nations people in the hiring process. In order, give priority to people from the Cree First Nation of Waswanipi, people from the other Cree communities of Eeyou Istchee, people from Northern Quebec, people from Abitibi-Témiscamingue, people from Quebec, and people from Canada.	x	x	x
6	P06	Continue to ensure the visibility of job opportunities in the local community through participation in various local and regional initiatives (e.g., career days).	x	x	
7	P07	Continue to encourage local purchasing and the involvement of local suppliers of goods and services in supply chain opportunities, applying the existing Responsible Procurement Policy.	x	x	x
8	P08	Encourage the development of local businesses aligned with Osisko's needs, particularly First Nations-owned businesses, as set out in the Responsible Procurement Policy.	x	x	
9	P09	Maintain collaboration with local training institutes to develop training programs adapted to the mining industry and the regional context.	x	x	
10	P10	Continue to develop specific and transferable employee skills by supporting professional development activities that are aligned with employees' roles and Osisko's needs, as outlined in the Professional Development Policy.	x	x	
11	P11	Participate in the implementation of a business opportunities, training, and employment committee governed by the upcoming Impact and Benefit Agreement (IBA) with the Cree First Nation of Waswanipi and the Cree Nation Government.	x	x	
12	P12	Continue to hold regular information sessions with local contractors from the Cree community of Waswanipi to inform them of upcoming service needs related to mining operations.	x	x	x
13	P13	Prioritize the reassignment of local employees to mine closure activities.			x
14	P14	Continue to inform the public about the progress of the project, upcoming major work, environmental impacts and preventive measures to mitigate them, as well as the safety measures in place.	x	x	x
15	P15	Continue to educate non-First Nations workers and contractors on Cree culture and traditional practices during the orientation meetings and subsequent training activities for supervisors.	x	x	
16	P16	Continue to host cultural activities to foster cross-cultural exchange and a respectful work culture.	x	x	
17	P17	Continue to educate workers about the various forms of harassment and implement mechanisms for handling complaints. Ensure the application of the Workplace Harassment Policy and take appropriate corrective action when a complaint is substantiated.	x	x	
18	P18	Continue to assist land users near the Windfall site with road safety issues.	x	x	x
19	P19	Establish a new Environmental Monitoring Committee (the terms of which will be specified in the IBA) to discuss and determine solutions to the issues that may arise during the mine's phases.	x	x	x

No.	Code	Description of the specific mitigation measure	Construction	Operations	Closure
20	P20	Build a recreation centre accessible to all workers and a Cree cultural site with a teepee for First Nations workers to gather and practice traditional activities such as cooking, crafting, and storytelling.	x		
21	P21	Continue the psychosocial support program to help all employees balance work and family life.	x	x	
22	P22	Ensure that reliable means of communication are available at the work camp to let workers communicate with their families.	x	x	
23	P23	Continue discussions with the leaseholder around SN1 Lake.	x		
24	P24	Work with the W25B and W25A tallymen to rehabilitate, restore, and revegetate the site and return it to its natural state.			x
25	P25	To the extent possible, preserve the forest cover along the road and revegetate bare areas with native vegetation once the work is completed.	x		
26	P26	Have an environmental monitor conduct regular visits of work areas; ensure that the stakeholders uphold commitments and adhere to obligations, measures, and other requirements; evaluate the quality and effectiveness of the measures applied; and note any non-compliance observed.	x		x