Troilus Mining Project Technical Data Report – Human Health Risk Assessment (Problem Formulation Multimedia)

Final Report

June 20, 2025

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Table of Contents

List of Tables

List of Figures

List of Appendices

Executive Summary

Troilus Gold Corp (Troilus) proposes to develop, reopen, and operate the former Troilus gold-copper mine (the Project) located in the southeastern part of the Nord-du-Québec administrative region in the Eeyou Istchee Baie-James territory, approximately 76 kilometres (km) northwest of the Cree community of Mistissini and approximately 125 km north of the town of Chibougamau. The Project is being assessed in accordance with the Impact Assessment Act, 2019. This Human Health Risk Assessment (HHRA) Problem Formulation (Multimedia) and an inhalation HHRA (Appendix H.7) were conducted to support the assessment of effects on human health to fulfill a requirement of the Tailored Impact Statement (TIS) Guidelines: Troilus Mining Project.

Specifically, as listed in the TIS Guidelines, the following main factors are considered in this HHRA problem formulation:

- identification of the boundaries of the study
- identification of the current and future contaminants of potential concern (CoPCs)
- identification of current and future human receptors
- identification of current and future exposure pathways
- development of the conceptual site model illustrating the connections existing between the CoPC, the receptors and the exposure routes

Based on an assessment of baseline conditions and Project-related changes to metal concentrations in soil, water (groundwater and surface water) and country food (vegetation, wild meat, and fish), consumption of fish by Indigenous and Recreational Receptors was identified as a complete pathway. Changes in surface water quality due to Project-related activities are uncertain and could result in increased concentrations of metals in fish tissues. The presence of mercury in fish is already a regional concern in Quebec and the Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs have fish consumption advisories due to the presence of mercury near the Project (e.g., Lake Mistassini). Monitoring of Project-related changes to surface water and fish quality in the Project Area is recommended during key project phases.

Acronyms / Abbreviations

AMW	Albanel-Mistassini-et-Waconichi
CCME	Canadian Council of Ministers of the Environment
CoPC	Contaminant of Potential Concern
CSM	Conceptual Site Model
FNFNES	First Nations Food, Nutrition & Environment Study
GCDWQ	Guidelines for Canadian Drinking Water Quality
Golder	Golder Associates Ltd.
HHRA	Human Health Risk Assessment
LSA	Local Study Area
MAC	Maximum Acceptable Concentration
MECP	Ministry of the Environment, Conservation and Parks
MELCCFP	Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs
ND	Non Detect
PA	Project Area
PM	Particulate Matter
RDL	Reported Detection Limit
RSA	Regional Study Area
SGQ_{HH}	Human Health Soil Quality Guidelines
TDR	Technical Data Report
TIS	Tailored Impact Statement
Troilus	Troilus Gold Corp

1 Introduction

Troilus Gold Corp (Troilus) proposes to develop, reopen, and operate the former Troilus gold-copper mine (the Project) located in the southeastern part of the Nord-du-Québec administrative region in the Eeyou Istchee Baie-James territory, approximately 76 kilometres (km) northwest of the Cree community of Mistissini and approximately 125 km north of the town of Chibougamau. The Project is being assessed in accordance with the *Impact Assessment Act*, 2019.

The Project has the potential to alter baseline conditions with respect to the concentrations of chemicals in air, soil, water, and biota. These changes to the environment have the potential to adversely affect the health of human receptors, and as such, this Human Health Risk Assessment (HHRA) Problem Formulation (Multimedia) and an inhalation HHRA (Appendix H.7) were conducted to support the assessment of effects on human health to fulfill a requirement of the Tailored Impact Statement (TIS) Guidelines: Troilus Mining Project. The conclusions of both reports are integrated into the Health Conditions Valued Component chapter, Chapter 22 of the Impact Statement.

2 Project Overview

This section provides an overview of the Project, which was summarized from Project Description (Chapter 3 of the Impact Statement). The Project involves reopening the former Troilus gold-copper mine, which was in operation from 1996 to 2010 and then restored. It is expected that the Project will produce an average of 244,600 ounces of gold annually for 22 years. Copper and silver will also be produced.

The Project involves the following:

- Open pit mining of four open pits (2 existing pits, 2 new pits)
- Development of waste rock, ore, and overburden piles
- Expansion of the existing tailings management facility
- Reuse of the industrial area for the construction of production infrastructures such as an ore processing plant with a capacity of 50,000 tons per day, primary and secondary crushers, workshops, mechanical garages and others
- Establishment of a workers' camp in the area of the existing camps
- Development of water management structures such as: collection ditch network, sedimentation basins, pumping basins, clean water diversion structures, water treatment plant
- Reuse of the open pits as a storage site for tailings from the processing plant
- Access road involving the deviation of approximately 5 km from the current access road
- Reuse of the existing power substation and power line involving the diversion of approximately 4 km of power line to the site of the Troilus mine (the site)
- Diversion of Bibou Creek for the majority of its route, approximately 9.7 km

2.1 Key Project Phases

The timing of activities and installation of Project components will occur in sequence to allow for the efficient extraction of materials. Various construction, operations, and decommissioning and closure activities are proposed throughout the life of the mine. For the purposes of the assessment, these Project activities are anticipated to be advanced in three phases:

- Construction phase (Year -3 to Year -1)
- Operations phase (Year 1 to Year 22)
- Decommissioning and Closure phase (Year 22 onward)

2.1.1 Construction Phase

The construction phase (Year -3 to Year -1) includes the following activities:

- Activities in Year -3 involve beginning construction on the main Bibou Creek diversion, secondary diversions, and sedimentation ponds.
- Activities in Year -2 involve construction of a new ore processing plant, construction of water management infrastructure, operation of a small pit west of the existing pit 97 to create space for the sedimentation pond, and construction of a new access road to the south.
- Activities in Year -1 involve beginning of the removal of overburden in the footprint of pit 87; initiation of the waste rock dump and overburden disposal for the expansion of pit 87 to the northeast of the site, over the existing waste rock impoundment area; and expansion of the tailings management facility footprint to the northwest through the construction of a buttress

Additional construction will occur through the operations phase of the Project, with the start of the operations phase defined by the start of ore processing.

2.1.2 Operations Phase

The operations phase spans Year 1 to Year 22, with ore extraction ending in Year 21. Activities in Year 22 focus on processing stored material without extracting new ore. Peak ore extraction is during Year 6 to Year 8. An estimated 18.3 megatonnes (Mt) of ore will be mined each year, amounting to a total of 380 Mt of ore. The operations phase involves the following activities:

- Year 1: Initial ore processing, expansion of pit 87, start of mining of the "southwest" pit. Commence the creation of the waste rock dump and overburden repository for the expansion of pit 87, southwest of the site.
- Year 2: Continued mining in the Z87 and southwest pits. Development of the West Waste Rock Dump begins. Construction of a 161 kV transmission line south of the ore processing plant to replace the existing one.
- Years 3-5: Active pits are pit 87, pit J4 (from year 5), and southwest pit.

- Years 6-10: Active pits are pit 87, southwest pit, and pit J4. Expansion of Waste Rock Dump 87 to the north of the site. Removal of overburden material from landfill 87 to allow expansion of waste rock landfill 87.
- Years 11-15: Tailings deposit begins in the southwest pit. Removal of the overburden dump southwest to allow the disposal of waste rock.
- Years 16-20: Active pits are pit 87 and pit X22. Start of mining of pit X22 (year 18) west of pit 87. Development of the Southwest Waste Rock Dump on the southwest pit footprint. Progressive deposition of tailings in pit J4, then in pit 87.
- Year 21: Last year of mining (in the pit X22)
- Year 22: Completion of ore processing on remaining stored material

2.1.3 Decommissioning and Closure Phase

The decommissioning and closure phase (Year 22 onward) involves gradual closure of infrastructure and restoration in accordance with environmental standards. The site was restored when the first operation closed in 2010. The lessons learned and the findings of the various rehabilitation works will be used to produce a redevelopment plan for the Project operations. This closure and redevelopment plan will be filed with the Ministère des Ressources naturelles et des Forêts before the Project begins operations in accordance with the provisions of the *Mining Act* (Compilation of Québec Laws and Regulations c M-13.1). The restoration of the site will be done gradually for various developments such as the tailings pond, certain waste rock piles, and open pits. The main decommissioning and closure phase activities are:

- Dismantling of buildings
- Revegetation of waste rock piles
- Diversion of Bibou Creek to the J4, 87, and X22 pools
- Flooding of pits J4, 87, and X22
- Environmental monitoring

2.2 Environmental Setting

As noted in Land Use (Chapter 19 of the Impact Statement), the Project is located within the Lake Albanel-Mistassini-et-Waconichi (AMW) Wildlife Reserve and the Assinica Wildlife Reserve. Specifically, the Project is located within the Lake AMW Wildlife Reserve, while the access road is located in the Assinica Wildlife Reserve. Wildlife reserves are created under the *Loi sur la conservation et la mise en valeur de la faune*. The Lake AMW Wildlife Reserve is managed by the Nibiischii Corporation and is dedicated to conservation, development, and sustainable harvesting of wildlife and, secondarily, to the practice of recreational activities; the reserve does not exclude the exploitation of other resources, such as ores and wood (Nibiischii 2021). The Nibiischii Corporation also has the temporary mandate of managing the Assinica Wildlife Reserve on behalf of the Cree Nation of Oujé-Bougoumou (Nibiischii 2021).

Further details about the environmental setting of the Project are available in Vegetation (Chapter 16 of the Impact Statement), Terrestrial and Avian Fauna (Chapter 17 of the Impact Statement) and Aquatic Fauna (Chapter 18 of the Impact Statement).

2.3 Human Activities

The ways in which people interact with the land around the Project is an important component of the HHRA and is used to identify potential ways a person may be exposed to Project-related chemicals. The information presented in Section 2.3 is primarily sourced from Land Use (Chapter 19 of the Impact Statement) unless otherwise indicated. Two Cree camps are located at the northern boundary of the Project, near Lake A. Several other camps (e.g., main camps, secondary camps, seasonal camps, campsites and outfitting camps) are in the vicinity of the Project. Information about hunting, trapping, fishing, and gathering near the Project provided as part of the Project-specific Indigenous engagement program with Cree First Nation is included in Section 2.3.1.

2.3.1 Cree First Nation

Cree communities of Mistissini and Oujé-Bougoumou are located approximately 76 km southeast and approximately 125 km south of the Project, respectively. The Project is located within two wildlife reserves that are managed by the Nibiischii Corporation, a Cree-owned company. Hunting within the reserves is restricted to Indigenous people. Specifically, the Project overlaps with the hunting territories of the Awashish and Brien families (trapline M34), the Neeposh family (trapline M39) and the Petawabano family (trapline M40) (Golder Associates Ltd. [Golder] 2022). Trapline M35A is also located nearby. There are several camps (e.g., main camp, winter camp, hunting camp) used at different times of the year within each of these hunting territories (Golder 2022).

Based on interviews conducted with tallymen (i.e., family members managing traplines) from the M34, M39 and M40 traplines, harvested species include moose, caribou, goose, bear, beaver, rabbit (hare) and small birds (e.g., ptarmigan). Moose hunting occurs in the northern part of terrain M34, near lakes Robineau, Avranches, and Canotaicane, south of terrain M39A, south and east of lake Frotet, the northeastern part of terrain M40, and most of terrain M35A. Forest caribou have been reported around lakes Canotaicane and Avranches, in the northwestern part of terrain M39A, northeast of lake Troilus, and near the M40 and M35A traplines. Bears are commonly found in the western part of terrain M39A, north and east of lake Troilus, the southern part of the M40 trapline, and on the M35A trapline, although Indigenous people hunt only one or two bears per family for subsistence. There are two beaver lodges in the area, and beavers are trapped along the traplines for subsistence. Hares are trapped or hunted by the tallyman of M39A. Waterfowl are hunted in natural ponds, and ptarmigan and other birds are hunted along the access road to the mine.

The tallymen also reported fishing for walleye, sucker, whitefish, pike and speckle trout in the area of the Project. Specifically, people fish for walleye, sucker, whitefish, pike, and brook trout in Lake A and Lake Boisfort. Lake Canotaicane is a prized fishing area for sturgeon, brook trout, walleye, and pike. People also fish for walleye, pike, and whitefish in Lake Robineau and walleye, pike, whitefish, lake trout, brook trout, sucker, and red sucker in Lake Troilus. The tallymen harvest blueberries along forestry roads and traplines,

and harvest cranberries in some areas along traplines. Harvesting of plants (e.g., Labrador tea) and tree bark (e.g., tamarack) for use as traditional medicine is not reported near the Project. Several Indigenous-owned outfitting operations are present in the area and provide fishing packages for non-indigenous people. The recreational activities for non-indigenous people are discussed in Section 2.3.2.

2.3.2 Non-Indigenous and Recreational Land Use

The recreational activities in the area consist mainly of fishing and other outdoor activities. The Lakes AMW and Assinica wildlife reserves are major tourist attractions for the region. Lakes AMW Wildlife Reserve offers accommodation in the form of cabins, camps, and campgrounds at various sites, including Lake Albanel, Lake Waconichi, Lake Robineau, and Bay Pénicouane. Fishing and canoe-camping are the main activities but kayaking and paddleboarding are also available. Hiking trails, marina services, and boat and motor rentals are available at some sites. A canoe-camping circuit is available from Lake Robineau (Nibiischii 2021). In the Assinica Wildlife Reserve, accommodation is limited to rustic camping on the shores of various lakes and rivers. The main activities are fishing, canoe-camping, and nature observation. Walleye, lake trout, brook trout, and northern pike can be caught in both reserves (Nibiischii 2021). Personal watercrafts are strictly prohibited on reserve waters (Nibiischii 2021).

There are several outfitters in the area. For example, the Square-Tail Lodge offers fishing packages for native brook trout, walleye and pike (Destination Nord 2025). Square-Tail Lodge has two lodging camps, one is located north of Lake Troilus, and the other on the shore of Lake Frotet. The camp on Lake Troilus is built on a point at the junction of the lake outlet and the headwaters of the North Branch of the Broadback River. The camp is accessible from the northern road leading to the site, then by boat. The second camp, located on the shore of Frotet Lake (Square-Tail Lodge 2025). Broadback Outfitters is located in the Assinica Wildlife Reserve, overlooking Frotet Lake. It is accessible by floatplane from Oujé-Bougoumou. It offers camp accommodations and guided lake and river fishing, mainly for pike and walleye. This Indigenous-owned outfitter also organizes interpretation activities on Indigenous culture.

All terrain vehicle trails are present in the Chapais and Chibougamau areas; however, their use is prohibited in the Lakes AMW and Assinica Wildlife Reserves. The Trans-Québec 93 snowmobile trail and a local trail link Chapais, Oujé-Bougoumou, Chibougamau, and Mistissini (Golder 2020). Similarly, no snowmobile trails cross near the Project. There are several additional land use leases in the area, for various purposes including an outfitter lodge, a resort, a telecommunication tower, forest conservation and protection, and industrial purposes.

3 Regulatory Setting

As noted in the TIS Guidelines, a HHRA is required to assess the effects on the health of persons exposed to biophysical stressors, particularly increased concentrations of chemical substances present in the environment and linked to various phases to the Project. Health Canada provides general guidance for conducting HHRA and assessing human health affects in Impact Assessments, namely:

- Guidance for Evaluating Human Health Effects in Impact Assessment: Human Health Risk Assessment (Health Canada 2023a)
- Guidance for Evaluating Human Health Effects in Impact Assessment: Air Quality Health Canada 2023b)
- Guidance for Evaluating Human Health Effects in Impact Assessment: Country Foods (Health Canada 2023c)
- Guidance for Evaluating Human Health Effects in Impact Assessment: Drinking and Recreational Water Quality (Health Canada 2023d)

4 Human Health Risk Assessment Methods

The purpose of a HHRA is to evaluate the health risk to people from their exposure to chemicals in environmental media (e.g., soil, water, sediment, biota). In the context of an Impact Assessment for major infrastructure projects, the HHRA evaluates the potential change in health risk to people that may occur between baseline environmental conditions and estimated future conditions linked to the various phases of the Project. Baseline environmental conditions may be based on historical monitoring data, measured data collected during baseline studies, or modelled data. Future conditions are based on modelled environmental conditions that reflect the influence of Project activities.

Risk from exposure to a chemical depends on three factors:

1. The presence of a human receptor.
2. The presence of a chemical with inherent toxicity.
3. The exposure pathway and the degree of human receptor exposure to a chemical.

As illustrated in Figure 4-1, if all three factors of health risk interact (i.e., a receptor is exposed to a chemical hazard), a risk may exist. The degree of adverse health risk depends on other factors such as the exposure dose or concentration, exposure duration, and the inherent toxicity of the chemical to the human receptor. If one or more factors(s) is absent, there would be no potential health risk. Also, if a receptor is exposed to a chemical, but the chemical is inherently non-toxic, then there is no potential risk.

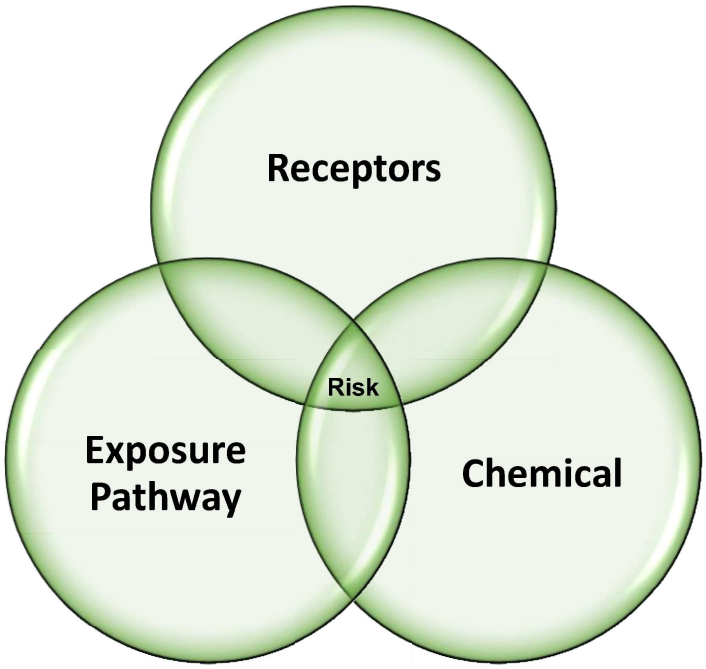

Figure 4-1 Risk Venn Diagram

4.1 Risk Assessment Framework

As stated in the TIS Guidelines for the Project, a problem formulation exercise should be conducted to determine whether a more detailed HHRA is required. A problem formulation is an information gathering and interpretation stage that defines the nature and scope of a risk assessment, permits practical boundaries to be placed on the overall scope, and confirms that the risk assessment is directed at the key areas and issues of concern related to the Project emissions. Specifically, as listed in the TIS Guidelines, the following main factors are considered in this problem formulation:

- identification of the boundaries of the study
- identification of the current and future contaminants of potential concern (CoPCs)
- identification of current and future human receptors
- identification of current and future exposure pathways
- development of the conceptual site model (CSM) illustrating the connections existing between the CoPC, the receptors and the exposure routes

An uncertainty and sensitivity assessment is also an important part of the risk assessment process. Uncertainties can arise in various aspects of the assessment, such as sample collection and analysis and the assumptions made when applying professional judgment. This uncertainty does not invalidate the

results of the risk characterization. However, articulating the uncertainty aids in interpreting the potential of adverse health risk. Similarly, a sensitivity analysis helps identify the effect of assumptions on the results of the risk analysis. Based on the air quality modelling results, it was previously determined that an inhalation HHRA was required. The inhalation HHRA is provided as an appendix to Chapter 22 (Health Conditions) of the Impact Statement.

5 Spatial Boundaries for the Multimedia HHRA

The Project comprises approximately 2,521 ha and is located in the southeastern part of the Nord-du-Québec Administrative Region, on the Eeyou Istchee James Bay Territory, about 76 km northwest of the Cree community of Mistissini and about 125 km north of the city of Chibougamau. The Project is located at the former Troilus mine and is accessible via a 44 km access road.

The construction, operation, and closure and decommissioning phases of the Project have the potential to alter baseline (existing) conditions with respect to the concentrations of chemicals in the air, soil, water, and biota near the site. These changes to the environment have the potential to adversely affect the health of human receptors. The spatial boundaries for the multimedia HHRA are described below.

5.1 Project Area

The Project Area (PA) encompasses the Project footprint and is the anticipated area of physical disturbance associated with the construction, operations and decommissioning and closure of the Project. The PA is shown on Figure A.1, Appendix A.

5.2 Local Study Area

The Local Study Area (LSA) includes the area in which Project-related effects (direct or indirect) that can be modelled or measured with a level of confidence appropriate for the assessment and in which there is a reasonable expectation that the potential effects in the LSA are of public interest. The LSA for the multimedia HHRA includes the PA and the spatial boundaries outlined in the LSA from Atmospheric Conditions Quality (Chapter 8 of the Impact Statement) and the LSA from Surface Water Quality (Chapter 12 of the Impact Statement), as shown on Figure A.1, Appendix A.

5.3 Regional Study Area

The Regional Study Area (RSA) includes the area within which cumulative effects on health conditions as they relate to some of the biophysical determinants of health are likely to occur, depending on the location of other past, present, or reasonably foreseeable future projects or activities. The RSA includes the spatial boundaries outlined in the RSA from Atmospheric Conditions Quality (Chapter 8 of the Impact Statement) and the LSA from Surface Water Quality (Chapter 12 of the Impact Statement) as shown on Figure A.1, Appendix A.

6 Baseline Conditions and Project-Related Changes in Environmental Media

Baseline conditions, defined here as existing concentrations of metals (i.e., CoPCs) in soil, vegetation, groundwater, surface water and fish that are relevant to the problem formulation are documented in Appendix B, Groundwater Quality (Chapter 14 of the Impact Statement), or Surface Water Quality (Chapter 12 of the Impact Statement).The baseline conditions relevant to this problem formulation and potential Project-related changes are summarized in the following sections.

6.1 Soil

6.1.1 Baseline Conditions

The baseline conditions in soil are based on data from 33 soil samples (including field duplicates) collected by Stantec during the country foods sampling program in August 2024. Soil sampling methodology and measured baseline concentrations of metals in soil are presented in Appendix B. Baseline concentrations of metals in soil were compared to federal human health-based guidelines from the Canadian Council of Ministers of the Environment (CCME, i.e., Human Health Soil Quality Guidelines [SQG_{HH}]; CCME 1999). If CCME SQG_{HH} were not available, provincial human health-based guidelines (i.e., direct contact component, or S1) from Ontario (Ministry of the Environment, Conservation and Parks [MECP] 2011) were used. Federal and provincial human health-based guidelines for agricultural land use were applied because it is the most sensitive land use. Baseline concentrations were also compared to Quebec background values for the “Province du Supérieur” stratigraphic unit (Beaulieu 2021).

The comparison of baseline concentrations of metals in soil to human health-based guidelines and Quebec background is presented in Table 6.1. With the exception of cadmium, baseline concentrations are below the human health-based guidelines. No human health-based guidelines are available for aluminum and manganese. Concentrations of cadmium, lead, selenium and silver at some locations were higher than the Quebec background values (Table 6.1). As the mine is located in an area that is naturally enriched with metals, this is not unexpected.

Table 6.1 Human Health Screening—Soil

Parameter	Maximum Concentration in Baseline Data (mg/kg)	Human Health-based Guideline or Standard			Quebec Background	
		Value (mg/kg)	Source	No. Samples with Concentrations > Value	Value (mg/kg)	No. Samples with Concentrations > Value
Aluminum	13,000	n/v	None available	Not calculated	n/v	Not calculated
Antimony	<RDL	7.5	MECP S1	0 of 33	n/v	Not calculated
Arsenic	<RDL	12	CCME SQG_{HH}	0 of 33	5	0 of 33
Barium	87	6,800	CCME SQG_{HH}	0 of 33	240	0 of 33

Parameter	Maximum Concentration in Baseline Data (mg/kg)	Human Health-based Guideline or Standard			Quebec Background	
		Value (mg/kg)	Source	No. Samples with Concentrations > Value	Value (mg/kg)	No. Samples with Concentrations > Value
Cadmium	2.1	1.4	CCME SQG_{HH}	**2 of 33**	0.9	**15 of 33**
Chromium	22	220	CCME SQG_{HH}	0 of 33	100	0 of 33
Cobalt	8.1	22	MECP S1	0 of 33	33	0 of 33
Copper	48	1,100	CCME SQG_{HH}	0 of 33	65	0 of 33
Lead	59	140	CCME SQG_{HH}	0 of 33	40	**5 of 33**
Manganese	50	n/v	None available	Not calculated	1,000	0 of 33
Mercury	0.27	6.6	CCME SQG_{HH}	0 of 33	0.3	0 of 33
Molybdenum	<RDL	110	MECP S1	0 of 33	8	0 of 33
Nickel	8.4	200	CCME SQG_{HH}	0 of 33	50	0 of 33
Selenium	4.2	80	CCME SQG_{HH}	0 of 33	3	**2 of 33**
Silver	0.64	77	MECP S1	0 of 33	0.5	**2 of 33**
Zinc	64	10,000	CCME SQG_{HH}	0 of 33	150	0 of 33

Notes:
CCME SQG_{HH}= Canadian Council of Ministers of the Environment. Human Health Soil Quality Guidelines - Direct Contact. Agricultural Land Use (CCME 1999 and updates).
MECP S1 = MECP (2011) Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition. Agricultural Land Use. Lowest of medium/fine and coarse. S1 is a soil component value protective of an exposure scenario where children and pregnant women are present.
Quebec Background = Concentrations from “Guide d’intervention – Protection des sols et réhabilitation des terrains contaminés” (Beaulieu 2021) for the “Province du Supérieur” stratigraphic unit.
n/v = No value
RDL = Reported detection limit

6.1.2 Project-related Changes

Dust deposition from mining activities primarily affects areas close to the mine and along the roads. This localized impact is evident based on the dust deposition contour plots included in Appendix K and L of the Troilus Gold Project Technical Data Report [TDR] – Air Quality Assessment). The maximum predicted monthly total particulate matter (PM) depositions for construction and operations are below the MECP soiling criteria for locations outside the modelled mine boundary (TDR Air Quality Assessment, Chapter xx). For example, Project-related deposition relative to the regulatory criteria is 10% for construction and 14% for operations at Cree Camp CC4 adjacent to the main access road. Details regarding the maximum PM depositions and MECP soiling criteria are located in the TDR Air Quality Assessment. Based on the dust deposition results, Project-related changes to soil quality are expected to be minimal and limited in extent.

6.2 Vegetation (Blueberries)

6.2.1 Baseline Conditions

The baseline conditions in vegetation are based on data from 11 blueberry samples (including one field duplicate) collected by Stantec during the country foods sampling program in August 2024. Blueberry sampling methodology and measured baseline concentrations of metals in blueberries are presented in Appendix B. Federal or provincial human health-based guidelines are not available for comparison to baseline concentrations of edible vegetation (i.e., blueberries). However, baseline concentrations of metals in blueberries can be compared to concentrations of toxic trace metals (i.e., arsenic, cadmium, lead and mercury) in blueberries measured as part the First Nations Food, Nutrition & Environment Study (FNFNES) (Chan et al. 2016).

The comparison of maximum baseline metal concentrations in blueberries to the maximum FNFNES concentrations is presented in Table 6.2. With the exception of arsenic, maximum concentrations of cadmium, lead and mercury in blueberries in the LSA were less than the maximum FNFNES concentrations. For arsenic, the baseline concentrations in two of 11 blueberry samples are greater than the maximum concentration reported by Chan et al. (2016). However, the concentrations in the remaining nine blueberry samples were below detection limits. Further, baseline soil concentrations of arsenic are less than CCME SQG_{HH} and Quebec Background.

Table 6.2 Human Health Screening—Blueberries (Baseline Conditions)

Parameter	Maximum Concentration in Baseline Data (mg/kg)	FNFNES (Maximum)	
		Value (mg/kg)	No. Samples with Concentrations > Value
Aluminum	10	n/v	n/a
Antimony	<RDL	n/v	n/a
Arsenic	0.012	0.005	**2 of 11**
Barium	15	n/v	n/a
Cadmium	0.0075	0.03	0 of 11
Chromium	0.065	n/v	n/a
Cobalt	0.026	n/v	n/a
Copper	3.7	n/v	n/a
Lead	0.013	0.03	0 of 11
Manganese	530	n/v	n/a
Mercury	0.0013	<0.002*	0 of 11
Molybdenum	0.57	n/v	n/a
Nickel	0.69	n/v	n/a
Selenium	0.019	n/v	n/a
Silver	0.0053	n/v	n/a
Zinc	5.6	n/v	n/a
Notes			

Parameter	Maximum Concentration in Baseline Data (mg/kg)	FNFNES (Maximum)	
		Value (mg/kg)	No. Samples with Concentrations > Value

FNFNES = First Nations Food, Nutrition & Environment Study. Table 27: Mean and maximum levels of toxic trace metals in traditional food samples from Quebec (fresh weight)
RDL = Reported detection limit
ND = Non detect
n/v = No value
n/a = Not applicable
* = Concentrations of mercury (wet weight) in blueberries were reported below detection limit

6.2.2 Project-related Changes

As identified in Section 6.1.2, dust deposition from mining activities primarily affects areas close to the mine and along the roads. This localized impact is evident based on the dust deposition contour plots included in Appendix K and L of the TDR Air Quality Assessment). Based on the dust deposition results from the TDR Air Quality Assessment, Project-related changes to edible vegetation (e.g., blueberry) quality are expected to be minimal, and limited in extent.

6.3 Groundwater

6.3.1 Baseline Conditions

Based on a review of the Hydrogeological Information System in Land Use (Chapter 19 of the Impact Statement), no wells are listed in the RSA. However, there are three water supply wells (i.e., PU-4, PO-DET 4 and PU-2) within the PA. The wells are shown on Figure 14-1 of Groundwater Quality (Chapter 14 of the Impact Statement). Two of the wells (i.e., PU-4 and PO-DET-4) are potable water supply wells. These wells are available for use by members of the Cree people. Specifically, PO-DET 4 is used by the Awashish family in the two camps at the northern boundary of the Project, near Lake A. Baseline conditions for these two potable supply wells are described in Groundwater Quality (Chapter 14 of the Impact Statement). In Groundwater Quality (Chapter 14 of the Impact Statement), baseline concentrations of metals were compared to "critères eau de consommation" from the Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs (MELCCFP) and the "critères de résurgence dans les eaux de surface" from the MELCCFP. Baseline concentrations of arsenic at PU-4 were above the " critères eau de consommation" from the MELCCFP and baseline concentrations of copper at PO-DET 4 were above the "critères de résurgence dans les eaux de surface" from the MELCCFP. Details about baseline concentrations of metals in groundwater are provided in Groundwater Quality (Chapter 14 of the Impact Statement), and details about the water supply wells is provided in Land Use (Chapter 19 of the Impact Statement).

6.3.2 Project-related Changes

As noted in Groundwater Quality (Chapter 14 of the Impact Statement), several mitigation and improvement measures will be implemented to mitigate impacts and promote groundwater quality. These include:

- Planning the sequencing of mining operations to balance high and low sulfide material extraction based on detailed geochemical mapping.
- Rapidly stabilizing exposed soils using temporary coverings like geotextile fabrics, mulch, and hydroseeding to limit erosion and runoff.
- Installing peripheral ditches, settling basins, and sediment barriers to control erosion and intercept fine particles rich in metals.
- Phase stripping works to minimize the amount of exposed substrate at any given time.
- Using low-permeability materials and vegetation to cover waste rock piles and tailings storage facilities to limit infiltration.
- Maintaining or replacing treatment systems, transitioning to passive treatments if possible while ensuring treatment efficiency.
- Establishing control points upstream and downstream of the site to monitor runoff water quality.

To minimize long-term impacts, a post-closure environmental monitoring program will be implemented to monitor groundwater quality. Should post-closure monitoring indicate that groundwater quality is deteriorating, adaptive management tools will be deployed. Based on the mitigation and improvement measures and potential adaptive management tools, Project-related changes to groundwater used as drinking water are expected to be negligible.

In anticipation of reopening the former Troilus gold-copper mine, the tallymen of M34 (Awashish family) have indicated their intention to relocate their two camps at the northern boundary of the Project to the Boisfort Lake area. As such, PO-DET 4 is not expected to be used as a potable water supply in the future.

6.4 Surface Water

6.4.1 Baseline Conditions

Baseline concentrations of metals (i.e., dissolved metals) in surface water are from 23 samples collected between 2019 and 2023 at Lake Amont (E7), Lake A (E3), E4, pit J4, and pit 87. Measured baseline metals concentrations in surface water are presented in Surface Water Quality (Chapter 12 of the Impact Statement). While surface water was not identified as a drinking water supply in the PA (Surface Water Quality Chapter 12 of the Impact Statement), baseline concentrations of metals in surface water are compared to federal human health-based guidelines from Health Canada (2025) (i.e., Guidelines for Canadian Drinking Water Quality [GCDWQ] Maximum Acceptable Concentration [MAC]). If Health Canada

GCDWQs were not available, provincial human health-based guidelines (i.e., drinking water component, or GW1) from the MECP [2011]) were used.

The comparison of baseline metal concentrations in surface water to human health-based guidelines is presented in Table 6.3. Maximum concentrations of metals in baseline surface water are below the human health-based guidelines, with the exception of lead at pit J4 (0.0072 mg/L). No human health-based guidelines are available for iron, lithium, phosphorous, potassium, sodium, tin and titanium.

Table 6.3 Human Health Screening—Surface Water (Baseline Conditions)

Parameter (Dissolved)	Maximum Concentration in Baseline Data (mg/L)	Human Health-based Guideline or Standard (mg/L)	Source	No. Locations with Concentrations > Value [a]
Aluminum	0.23	2.9	GCDWQ MAC	0 of 5
Antimony	0.0025	0.006	GCDWQ MAC	0 of 5
Arsenic	0.0067	0.01	GCDWQ MAC	0 of 5
Barium	0.039	2	GCDWQ MAC	0 of 5
Beryllium	0.00035	0.004	MECP GW1	0 of 5
Boron	0.089	5	GCDWQ MAC	0 of 5
Cadmium	0.0012	0.007	GCDWQ MAC	0 of 5
Calcium	150	None required	None required	n/a
Chromium	0.0023	0.05	GCDWQ MAC	0 of 5
Cobalt	0.002	0.003	MECP GW1	0 of 5
Copper	0.055	2	GCDWQ MAC	0 of 5
Iron	0.99	n/v	n/a	n/a
Lead	0.0072	0.005	GCDWQ MAC	**1 of 5** [a]
Lithium	0.049	n/v	n/a	n/a
Magnesium	13	None required	None required	n/a
Manganese	0.067	0.12	GCDWQ MAC	0 of 5
Mercury	0.000024	0.001	GCDWQ MAC	0 of 5
Molybdenum	0.0093	0.07	MECP GW1	0 of 5
Nickel	0.036	0.1	MECP GW1	0 of 5
Phosphorus	0.038	n/v	n/a	n/a
Potassium	20	n/v	n/a	n/a
Selenium	0.0019	0.05	GCDWQ MAC	0 of 5
Sodium	10	20[c]	GCDWQ MAC	0 of 5

Parameter (Dissolved)	Maximum Concentration in Baseline Data (mg/L)	Human Health-based Guideline or Standard (mg/L)	Source	No. Locations with Concentrations > Value [a]
Strontium	0.82	7	GCDWQ MAC	0 of 5
Thallium	0.00035	0.002	MECP GW1	0 of 5
Tin	0.0000035	n/v	n/a	n/a
Titanium	0.21	n/v	n/a	n/a
Uranium	0.019	0.02	GCDWQ MAC	0 of 5
Zinc	0.2	5	MECP GW1	0 of 5

Notes:

GCDWQ MAC = Guidelines for Canadian Drinking Water Quality – Maximum Acceptable Concentration

MECP GW1 = Ontario Ministry of the Environment, Conservation and Parks (MECP 2011). Groundwater Components for Potable Water Scenario GW1

[a] Locations in baseline data set are Lake Amont (E7), Lake A (E3), E4, pit J4, and pit 87

[b] Concentration exceeding the human health-based guideline is at pit J4

[c] For persons on strict sodium-reduced diets applying to all sources, levels in drinking water should be below 20 mg/L.

n/v = No value

n/a = Not applicable

6.4.2 Project-related Changes

Surface water quality modeling was conducted by Blumetric (Predictive Water Quality Model technical report; Appendix H.5). As indicated in that technical report, modeled concentrations of metals as a result of Project-related activities are predicted to meet regulatory criteria or are comparable to baseline values at the mine boundary (see Junction 28 on Figure A, Predictive Water Quality Model technical report). Further, surface water monitoring stations will be established to collect water quantity and quality data for regulatory compliance monitoring. Based on the requirement for regulatory compliance, Project-related changes to surface water quality are expected to be negligible in terms of drinking water.

6.5 Fish

6.5.1 Baseline Conditions

The baseline conditions in fish are based on data from fish samples collected by Stantec during the country foods sampling program conducted in August and September 2024. Angling fish samples include liver and fillet samples from lake whitefish (*Coregonus clupeaformis*), larger northern pike (Esox lucius), and walleye (*Sander vitreus*). Forage fish samples consist of whole body samples from smaller northern pike, yellow perch (Perca flavescens), and white sucker (*Catostomus commersoni*). The methodology for fish sampling and the measured baseline concentrations of metals in fish are provided in Appendix B. For the problem

formulation, baseline fish data focuses on fillet samples (30 samples), as this is the part of the fish most commonly consumed.

Maximum concentrations of metals in angling fish are presented in Table 6.4**.** For these metals, with the exception of mercury federal or provincial human health-based guidelines are not available for comparison. Health Canada has set a maximum limit of 0.5 parts per million (ppm; or 0.5 mg/kg) total mercury in retail fish, with few exceptions (Health Canada 2020). When establishing maximum levels for mercury in food, Health Canada's primary concern is human safety, although the availability, nutritional value, and importance of the food in the Canadian diet are also considered. Of the 30 angling fish samples, three samples (i.e., two walleye samples and one northern pike sample collected from Lake Amont) had maximum concentrations of mercury (0.54 mg/kg, 0.54 mg/kg and 0.51 mg/kg), which with numerical rounding, are equal to the Health Canada limit. As well, these baseline concentrations are less than the maximum concentrations (i.e., 1.27 mg/kg for walleye, and 1.34 mg/kg for northern pike) reported by Chan et al. (2016). The presence of mercury in fish tissues is a regional concern in Quebec (MELCCFP 2025). Specifically, the MELCCFP has fish consumption advisories for waterbodies near the Project (including fish consumption advisories for Lake Mistassini due to mercury). The MELCCFP fish consumption advisories are generally based on guidelines from Health Canada (MELCCFP 2025).

Table 6.4 Angling Fish - Fillet Baseline Data (Baseline Conditions)

Parameter	Maximum Concentration in Angling Fish [a] Baseline Data (mg/kg)
Antimony	<RDL
Barium	0.095
Cadmium	0.0022
Chromium	0.078
Cobalt	0.047
Copper	0.20
Lead	<RDL
Manganese	0.88
Mercury	0.54
Molybdenum	<RDL
Nickel	0.012
Selenium	0.76
Silver	<RDL
Zinc	3.2

Notes:
[a] Angling fish: 30 fillet samples and 28 liver samples of lake whitefish, northern pike, and walleye
RDL = Reported detection limit

6.5.2 Project-related Changes

It is reasonable to assume that Project-related increases in surface water concentrations could lead to increases in fish tissue concentrations. Surface water modeling results are provided in the Predictive Water Quality Model technical report (Appendix H.5). While modeled concentrations of metals in surface water as

a result of Project-related activities are predicted to meet regulatory criteria or are comparable to baseline values at the mine boundary, the magnitude of the increase in fish tissues represents an area of uncertainty.

7 Identification of Human Receptors

Based on information presented in Section 2.3 about human activities and the planned construction of worker camp (Golder 2022), three potential human receptor groups were identified to represent human receptors within the LSA.

- **Indigenous Receptors** – This group includes Indigenous people who may live within the LSA or use the lands within the LSA for harvesting of country foods, or for recreational, ceremonial or spiritual purposes. This receptor group encompasses individuals of all ages - infants, toddlers, children, teens, and adults.
- **Recreational Receptors** – This group includes non-Indigenous people who may use the lands within the LSA for harvesting country foods or engaging in recreational activities. This receptor group also includes all ages - infants, toddlers, children, teens, and adults.
- **Off-Duty Worker Receptors** – This group includes workers who are present in the worker camp during their off-duty period. These receptors are evaluated only while they are in the worker camp.

Some populations may be more sensitive to exposures compared to the general population. For example,

- pregnant people – due to fetal development
- toddlers - due to their higher intake rates relative to their body weight,
- elderly – due to potential age-related vulnerabilities
- Indigenous people – due to higher consumption of traditional foods compared to non-Indigenous members of the population, and
- individuals with respiratory diseases – due to their increased susceptibility to airborne contaminants.

Occupational exposures of workers for the Project are not assessed within the HHRA. Instead, worker health and safety is managed through compliance with applicable provincial and federal legislation. Non-work-related exposures of these persons, which would occur outside the PA during non-work hours, would be the same as the other human receptors already identified.

8 Identification of Multi-Media Exposure Pathways

Exposure pathways are used to describe how a substance can move from a source media (e.g., soil) to a point where it can enter the body. A discussion of the complete and incomplete exposure pathways, by media, relevant for the Project is provided below.

8.1.1 Soil

Human receptors can come in contact with soil via incidental ingestion, dermal contact and inhalation of suspended particulate. As discussed in Section 6.1, dust deposition from mining activities primarily affects areas close to the mine and along the roads, with minimal impact on soil quality outside the mine boundary. As Project-related changes to soil quality are expected to be minimal, and limited in extent, this pathway is considered to be negligible.

8.1.2 Vegetation (Blueberries)

People are known to gather blueberries within the LSA and as such, the consumption of berries is a potentially complete pathway. As described in Section 6.2.2, dust deposition from mining activities primarily affects areas close to the mine and along the roads, with minimal impact on soil quality outside the mine boundary. As Project-related changes to vegetation quality are expected to be minimal, and limited in extent, this pathway is considered to be negligible. In addition, garden produce isn't expected to be grown at Cree camps within the LSA, which are used to access traplines.

8.1.3 Wild Meat

Indigenous people are known to hunt and trap within the LSA. As such, consumption of wild meat is a potentially complete pathway for Indigenous Receptors. While there are no baseline wild meat data available, wild animals that are hunted or trapped in the LSA could come into contact with Project-related metals through direct contact with soil, surface water and sediment and through ingestion of food. As described in Sections 6.1.2 and 6.2.2, dust deposition from mining activities primarily affects areas close to the mine and along the roads, with minimal impact on soil quality outside the mine boundary. Because Project-related changes to soil and vegetation are minimal and limited in extent, it is unlikely that the tissue concentrations of wild animals hunted or trapped in the LSA would be affected. As a result, this is a negligible pathway.

8.1.4 Groundwater

People may consume groundwater from PU-4 and PO-DET-4 and as such, the consumption of groundwater is a potentially complete pathway. As described in Section 6.3.2, several mitigation and improvement measures will be implemented to mitigate impacts and promote groundwater quality. Should post-closure monitoring indicate that groundwater quality is deteriorating, adaptive management tools will be deployed. With planned adaptive management, this pathway is considered negligible.

8.1.5 Surface Water

Indigenous and Recreational Receptors could occasionally come into contact with surface water through incidental ingestion/dermal contact during recreational activities such as boating and fishing. As indicated in that Predictive Water Quality Model technical report (Appendix H.5), modeled concentrations of metals as a result of Project-related activities are predicted to meet regulatory criteria or are comparable to baseline values at the mine boundary. With the requirement for regulatory compliance, this pathway is considered negligible.

8.1.6 Fish

People are known to fish within the LSA and as such, the consumption of fish is a complete exposure pathway for the Indigenous and Recreational Receptors. Changes in surface water quality due to Project-related activities are uncertain and could result in increased concentrations of metals in fish tissues. As such, monitoring is recommended in Section 11.

9 Conceptual Site Model

A CSM was developed to illustrate the potentially complete and incomplete exposure pathways among receptors and environmental media. The human health CSM is presented in Figure 9-1.

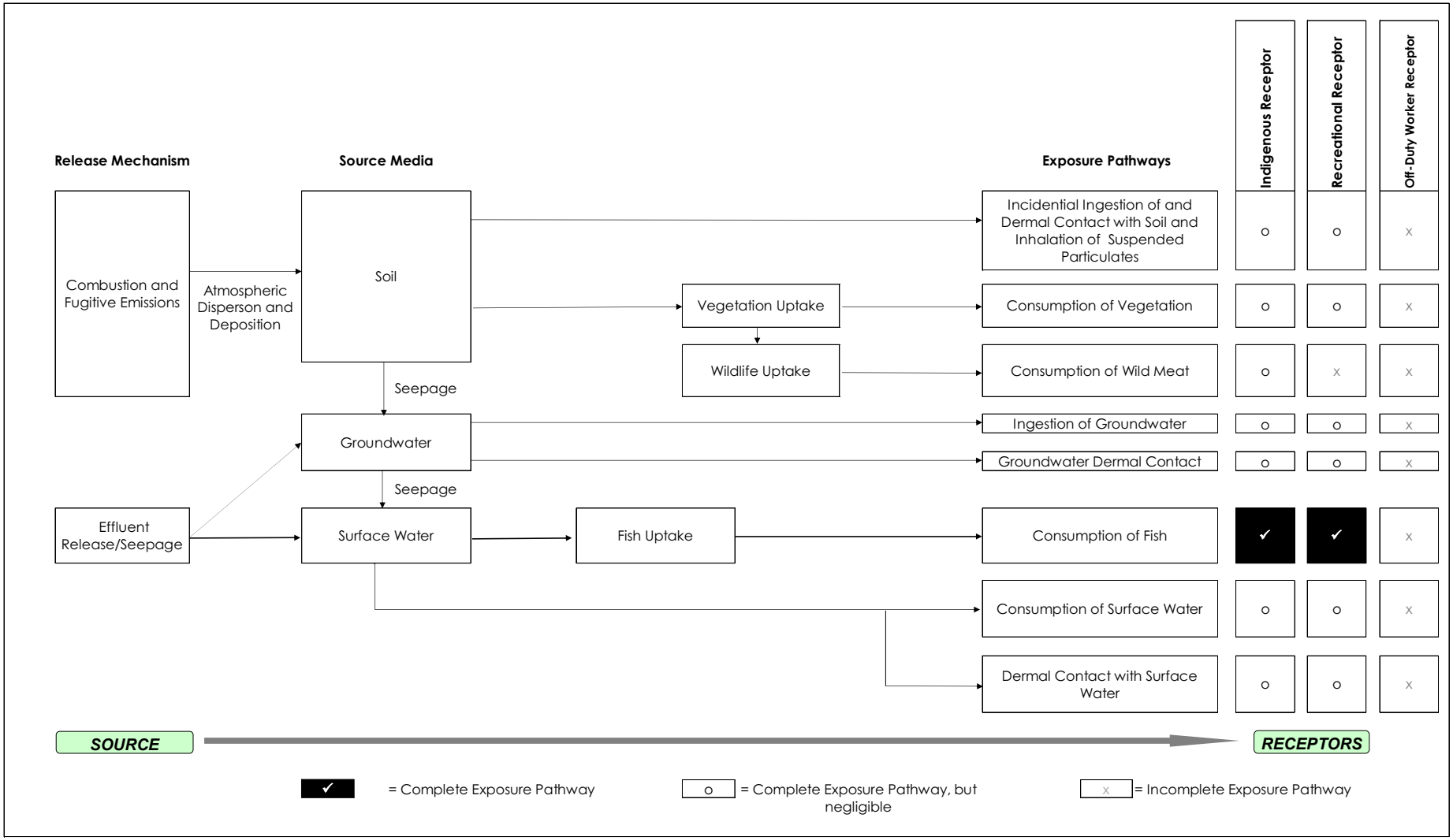

Figure 9-1 Conceptual Site Model for Human Health Risk Assessment

10 Uncertainty and Sensitivity Assessment

Uncertainty is inherent in many aspects of evaluating health risks to human receptors. The level of uncertainty is dependent upon the availability and quality of information, as well as the variability associated with many of the processes and factors being considered. Since uncertainty can influence the overall risk, it is important to identify and understand the uncertainties and potentially reduce the uncertainties through additional investigations. A discussion of the uncertainties identified in the problem formulation is provided below.

10.1.1 Baseline Data

Baseline concentrations of metals in a wide variety of environmental media and food items were measured, including soil, vegetation (berries), groundwater, surface water, and fish. A total of 33 soil samples (including three field duplicates); 11 vegetation (berries) samples (including one field duplicate); 30 fillet samples and 28 liver samples of lake whitefish, northern pike, and walleye; and 33 whole body samples of northern pike, yellow perch, and white sucker were collected from across the LSA. Surface water samples were collected from sample locations throughout the LSA in sampling programs beginning in 1991 and continuing through 2023 (see Surface Water Quality (Chapter 13 of the Impact Statement) for more details). Groundwater samples were collected from 35 wells between 2018 and 2023 (see Groundwater Quality (Chapter 14 of the Impact Statement) for more details). Baseline data are not available for wild meat. Additional sampling would provide a larger data set for estimating baseline concentrations. However, the data collected from environmental media is sufficiently representative of baseline conditions and associated uncertainty is low.

10.1.2 Receptor Selection

A susceptible population will exhibit a different or enhanced response to a Project-related chemical than will most persons exposed to the same level of the chemical in the environment. The reasons for this may include genetic makeup, age (e.g., children or seniors), health and nutritional status, behavior, and exposure to other toxic substances. Human receptors are selected such that the most sensitive individuals and individuals having the greatest potential for exposure to Project-related chemical and adverse responses from such exposures are represented.

10.1.3 Exposure Pathways

The uncertainty associated with the selection of human health exposure pathways stems from the potential to omit a relevant pathway that would subsequently undermine the accuracy of the predicted exposure. However, only certain exposure pathways are determined to be relevant within the HHRA. Therefore, the probability that a complete pathway is missed or omitted is considered low.

10.1.4 Project-Related Changes

Project-related changes in the concentrations of the metals in soil and surface water will govern the Project-related changes in the quality of terrestrial and aquatic country foods. Changes in country food quality could result in changes in human health risk associated with the consumption of country foods.

Project-related changes in the concentrations of metals were evaluated using dust deposition estimates within the LSA. Dust deposition near mines primarily affects areas immediately surrounding the roads and direct mining operations. Project-related changes to the quality of terrestrial country foods are expected to be minimal and limited in extent and exposure to Project-related chemicals (i.e., metals) through exposure to soil and consumption of terrestrial country foods is expected to be negligible. As such, the uncertainty related to the Project-related change in health risk associated with exposure to soil and consumption of terrestrial country foods is low.

As noted, the Project may result in increased concentrations of metals in surface water. While modeled surface water concentrations are predicted to meet regulatory criteria or are comparable to baseline values at the mine boundary, the magnitude of the increase in fish tissues represents an area of uncertainty.

11 Summary and Recommendations

Based on an assessment of baseline conditions and Project-related changes to metal concentrations in soil, water (groundwater and surface water) and country food (vegetation, wild meat, and fish), consumption of fish by Indigenous and Recreational Receptors was identified as a complete pathway. Changes in surface water quality due to Project-related activities are uncertain and could result in increased concentrations of metals in fish tissues. The presence of mercury in fish is already a regional concern in Quebec and the MELCCFP have fish consumption advisories due to the presence of mercury near the Project (e.g., Lake Mistassini). Monitoring of Project-related changes to surface water and fish quality in the PA is recommended during key project phases.

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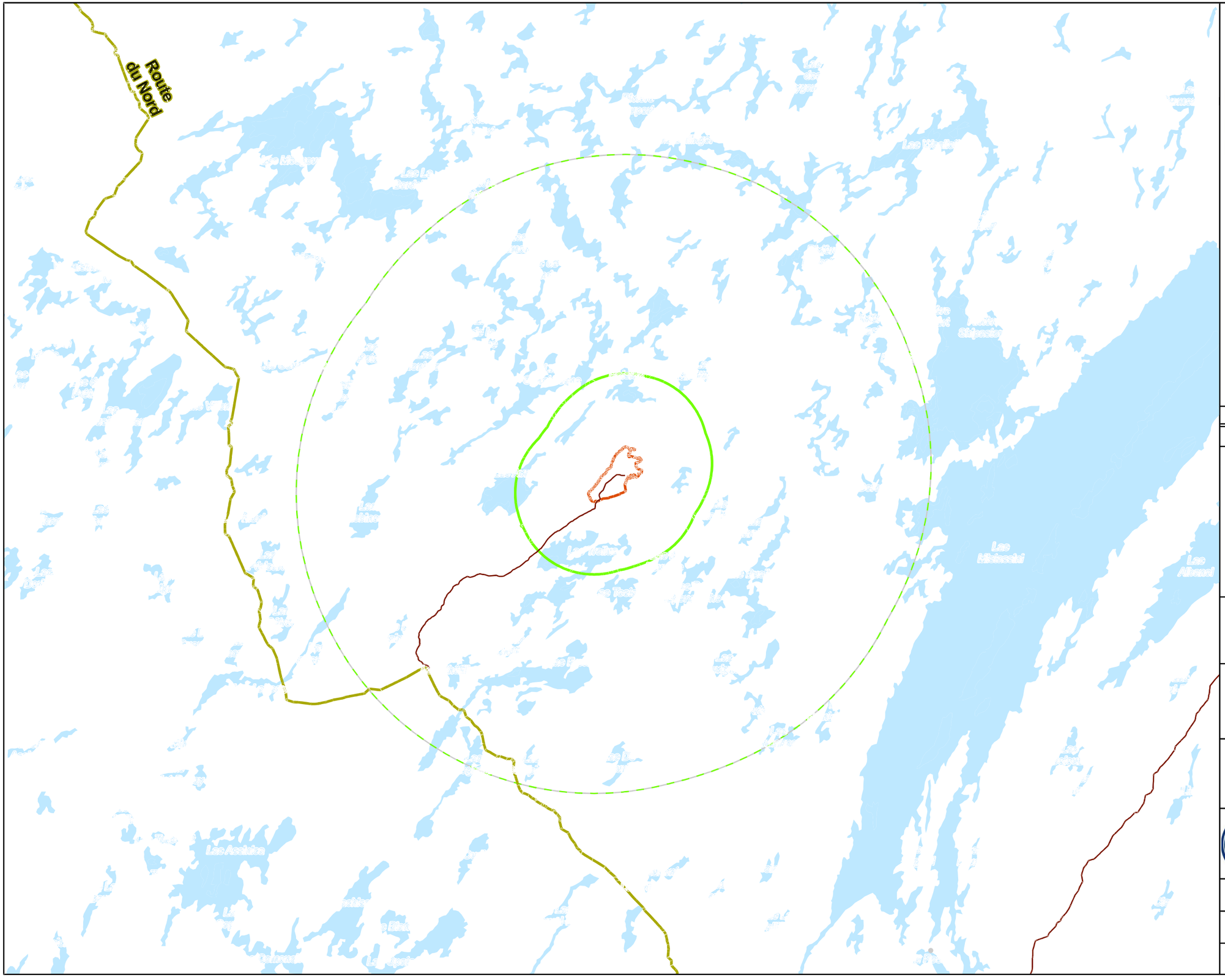
Appendices

APPENDIX A - Figures



BluMetric Stantec

APPENDIX B - Sampling Methodology and Baseline Data

Table B-1, Appendix B
Baseline Concentrations of Metals in Soil
Troilus Mining Project Technical Data Report
Problem Formulation (Multimedia)
167040485

Sample ID						TROI-T1-S	TROI-T2-S	TROI-T3-S	TROI-T4-S	TROI-T5-S	TROI-T6-S	TROI-T7-S	TROI-T8-S
Duplicate Information													
Date Sampled						15-Aug-24	15-Aug-24	14-Aug-24	14-Aug-24	13-Aug-24	13-Aug-24	13-Aug-24	15-Aug-24
Parameter	**RDL**	**Units**	**CCME CSQG**	**MECP S1**	**Quebec Background**								
Aluminum	20	mg/kg	n/v	n/v	n/v	13000	420	1400	1800	1200	1200	1700	1100
Antimony	2.0	mg/kg	n/v	7.5	n/v	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Arsenic	5.0	mg/kg	12	n/a	5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Barium	5.0	mg/kg	6800	n/a	240	29	33	84	58	16	51	21	34
Cadmium	0.5	mg/kg	1.4	n/a	0.9	<0.50	<0.50	**0.96**	0.68	<0.50	**1.8**	<0.50	**1.1**
Chromium (Total)	2.0	mg/kg	220	n/a	100	19	<2.0	4.1	3.5	2.7	<2.0	<2.0	<2.0
Cobalt	2.0	mg/kg	n/v	22	30	<2.0	<2.0	<2.0	<2.0	<2.0	2.7	<2.0	<2.0
Copper	2.0	mg/kg	1100	n/a	65	6.9	4.0	26	28	2.7	18	2.2	9.6
Lead	5.0	mg/kg	140	n/a	40	7.8	27	**59**	19	<5.0	**42**	11	35
Manganese	2.0	mg/kg	n/v	n/v	1000	47	17	20	13	15	34	3.7	50
Mercury	0.020	mg/kg	6.6	n/a	0.3	0.072	0.27	0.17	0.093	<0.020	0.15	0.033	0.21
Molybdenum	1.0	mg/kg	n/v	110	8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	1.0	mg/kg	200	n/a	50	5.5	2.2	5.2	5.5	1.7	3.9	<1.0	3.6
Selenium	1.0	mg/kg	80	n/a	3	<1.0	<1.0	<1.0	<1.0	<1.0	**4.2**	<1.0	<1.0
Silver	0.50	mg/kg	n/v	77	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Zinc	10	mg/kg	10000	n/a	150	16	32	37	30	10	17	<10	49

See notes on last page.

Table B-1, Appendix B
Baseline Concentrations of Metals in Soil
Troilus Mining Project Technical Data Report
Problem Formulation (Multimedia)
167040485

Sample ID			TROI-T9-S	TROI-T11-S	TROI-T9-S	TROI-T10-S	TROI-B1-S	TROI-B1-S	TROI-B2-S	TROI-B3-S	TROI-B4-S	TROI-B5-S	TROI-B6-S
Duplicate Information				Field dup. of TROI-T9-S	Lab dup.			Lab dup.					
Date Sampled			14-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24	15-Aug-24	15-Aug-24	15-Aug-24	14-Aug-24	15-Aug-24	13-Aug-24	13-Aug-24
Parameter	**RDL**	**Units**											
Aluminum	20	mg/kg	2200	1600	2200	1900	3300	3000	2100	1700	2000	850	1900
Antimony	2.0	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Arsenic	5.0	mg/kg	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Barium	5.0	mg/kg	30	20	31	51	18	18	30	40	87	21	41
Cadmium	0.5	mg/kg	0.54	<0.50	0.53	**1.2**	<0.50	<0.50	<0.50	<0.50	**1.0**	**1.1**	**1.1**
Chromium (Total)	2.0	mg/kg	3.7	3.8	3.7	2.7	6.2	5.8	22	2.7	6.2	<2.0	<2.0
Cobalt	2.0	mg/kg	<2.0	<2.0	<2.0	2.3	<2.0	<2.0	<2.0	<2.0	2.3	<2.0	3.4
Copper	2.0	mg/kg	6.7	5.6	6.8	22	5.3	5.0	8.5	5.5	18	15	13
Lead	5.0	mg/kg	7.3	5.1	7.9	28	7.2	7.0	12	16	**55**	**45**	24
Manganese	2.0	mg/kg	3.6	3.3	4.1	9.2	29	25	37	4.9	16	20	13
Mercury	0.020	mg/kg	0.039	<0.020	0.04	0.22	0.054	0.058	0.14	<0.020	0.14	0.17	0.12
Molybdenum	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	1.0	mg/kg	4.7	2.1	4.8	8.1	2.5	2.1	4.3	2.2	7.2	3.4	3.2
Selenium	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Silver	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	**0.54**	<0.50	<0.50	<0.50	<0.50
Zinc	10	mg/kg	12	<10	13	64	13	12	20	12	39	40	30

See notes on last page.

Table B-1, Appendix B
Baseline Concentrations of Metals in Soil
Troilus Mining Project Technical Data Report
Problem Formulation (Multimedia)
167040485

Sample ID			TROI-B7-S	TROI-B8-S	TROI-B11-S	TROI-B9-S	TROI-B10-S	TROI-A1-S	TROI-A2-S	TROI-A3-S	TROI-A4-S	TROI-A5-S	TROI-A6-S
Duplicate Information					Field dup. of TROI-B8-S								
Date Sampled			13-Aug-24	15-Aug-24	15-Aug-24	14-Aug-24	14-Aug-24	15-Aug-24	15-Aug-24	14-Aug-24	14-Aug-24	13-Aug-24	13-Aug-24
Parameter	RDL	Units											
Aluminum	20	mg/kg	2300	2000	3900	3200	2500	1400	820	1800	3800	1100	3600
Antimony	2.0	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Arsenic	5.0	mg/kg	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Barium	5.0	mg/kg	32	14	13	63	49	21	61	38	75	34	44
Cadmium	0.5	mg/kg	<0.50	<0.50	<0.50	**2.1**	**1.3**	<0.50	**1.1**	<0.50	**1.2**	**0.93**	**1.2**
Chromium (Total)	2.0	mg/kg	2.6	2.4	3.8	2.4	5.9	<2.0	<2.0	3.4	2.9	<2.0	2.7
Cobalt	2.0	mg/kg	<2.0	<2.0	<2.0	8.1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	4.9
Copper	2.0	mg/kg	3.8	<2.0	<2.0	18	22	2.6	10	11	16	6.3	19
Lead	5.0	mg/kg	5.6	<5.0	<5.0	22	23	10	**59**	15	19	28	18
Manganese	2.0	mg/kg	9.2	8.2	8.7	22	17	22	7.3	27	9.8	4.5	18
Mercury	0.020	mg/kg	0.051	0.028	<0.020	0.14	0.091	0.082	0.16	0.15	0.096	0.16	0.15
Molybdenum	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	1.0	mg/kg	1.7	1.0	<1.0	5.0	6.0	1.1	4.1	3.1	4.9	2.0	4.7
Selenium	1.0	mg/kg	<1.0	<1.0	<1.0	**4.2**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.9
Silver	0.50	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Zinc	10	mg/kg	<10	<10	<10	25	53	<10	23	25	38	39	27

See notes on last page.

Table B-1, Appendix B
Baseline Concentrations of Metals in Soil
Troilus Mining Project Technical Data Report
Problem Formulation (Multimedia)
167040485

Sample ID			TROI-A7-S	TROI-A8-S	TROI-A9-S	TROI-A11-S	TROI-A10-S
Duplicate Information						Field dup. of TROI-A9-S	
Date Sampled			13-Aug-24	15-Aug-24	14-Aug-24	14-Aug-24	14-Aug-24
Parameter	**RDL**	**Units**					
Aluminum	20	mg/kg	540	990	2600	1700	690
Antimony	2.0	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0
Arsenic	5.0	mg/kg	<5.0	<5.0	<5.0	<5.0	<5.0
Barium	5.0	mg/kg	10	50	33	27	14
Cadmium	0.5	mg/kg	<0.50	**1.0**	**1.0**	**0.95**	<0.50
Chromium (Total)	2.0	mg/kg	<2.0	<2.0	6.8	6.9	<2.0
Cobalt	2.0	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0
Copper	2.0	mg/kg	<2.0	22	38	48	13
Lead	5.0	mg/kg	<5.0	38	34	18	18
Manganese	2.0	mg/kg	<2.0	22	12	14	7.7
Mercury	0.020	mg/kg	<0.020	0.2	0.14	0.085	0.079
Molybdenum	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	1.0	mg/kg	<1.0	4.2	8.4	4.9	1.4
Selenium	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	2.0
Silver	0.50	mg/kg	<0.50	**0.64**	<0.50	<0.50	<0.50
Zinc	10	mg/kg	<10	19	20	25	20

Notes

CCME CSQG	Canadian Council of Ministers of the Environment (2024). Soil Quality Guidelines - Direct Contact. Agricultural Land Use
MECP	Ontario Ministry of the Environment, Conservation and Parks (2011). Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition. Agricultural Land Use Lowest of medium/fine and coarse.
S1	S1 is a soil component value protective of an exposure scenario where children and pregnant women are present
Quebec Background	Beaulieu, M. 2021. Guide d'intervention – Protection des sols et réhabilitation des terrains contaminés. Ministère de l'Environnement et de la lutte contre les changements climatiques, Québec, mai 2021, 326 p. Province du Supérieur stratigraphic unit.
mg/kg	milligrams per kilogram
n/v	No value
n/a	Not applicable - federal guideline available
RDL	Reported detection limit
Field dup.	Field duplicate sample
Lab dup.	Laboratory duplicate sample
Shaded	Greater than CCME CSQG or MECP S1
Bold underlined	Greater than Quebec Background

Table B-2, Appendix B
Baseline Concentrations of Metals in Blueberries
Troilus Mining Project Technical Data Report
Problem Formulation (Multimedia)
167040485

Sample ID			TROI-B1-B	TROI-B2-B	TROI-B3-B	TROI-B4-B	TROI-B5-B	TROI-B6-B	TROI-B7-B	TROI-B8-B	TROI-B11-B	TROI-B9-B	TROI-B10-B
Duplicate Information											Field dup. of TROI-B8-B		
Date Sampled			15-Aug-24	15-Aug-24	14-Aug-24	15-Aug-24	13-Aug-24	13-Aug-24	13-Aug-24	15-Aug-24	15-Aug-24	14-Aug-24	14-Aug-24
Species			Blueberry	Blueberry	Blueberry	Blueberry	Blueberry	Blueberry	Blueberry	Blueberry	Blueberry	Blueberry	Blueberry
Parameter	**RDL**	**Units**											
Aluminum	0.40	mg/kg	7.5	8.2	7.6	6.5	5.0	5.4	7.0	8.7	10	3.2	9.3
Antimony	0.040	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Arsenic	0.0050	mg/kg	0.011	0.012	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Barium	0.006	mg/kg	10	14	9.6	13	13	15	14	11	9.1	10	10
Cadmium	0.001	mg/kg	0.0075	0.0066	0.0021	<0.0010	<0.0010	<0.0010	0.0019	0.0037	0.004	0.0023	0.0011
Chromium	0.05	mg/kg	<0.050	0.065	<0.050	0.052	0.06	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	0.002	mg/kg	0.004	0.016	0.0072	0.013	0.012	0.012	0.013	0.008	0.0091	0.026	0.014
Copper	0.05	mg/kg	2.7	3.2	3.1	3.3	2.5	3.7	2.5	3.2	2.8	3.0	2.9
Lead	0.007	mg/kg	0.0076	0.013	0.0071	0.009	<0.0070	0.0074	0.0087	0.0098	0.012	<0.0070	0.012
Manganese	0.03	mg/kg	210	260	290	180	320	190	530	280	270	150	260
Mercury	0.0003	mg/kg	0.0012	0.0011	0.00091	0.0011	0.00096	0.0013	0.00098	0.0013	0.0011	0.00069	0.0011
Molybdenum	0.003	mg/kg	0.15	0.57	0.14	0.12	0.35	0.14	0.12	0.11	0.17	0.056	0.10
Nickel	0.01	mg/kg	0.37	0.69	0.53	0.49	0.40	0.51	0.36	0.46	0.40	0.36	0.54
Selenium	0.009	mg/kg	<0.0090	<0.0090	0.019	<0.0090	<0.0090	<0.0090	<0.0090	<0.0090	<0.0090	<0.0090	<0.0090
Silver	0.0010	mg/kg	0.0014	0.0027	0.0018	0.0021	<0.0010	0.0011	0.0016	0.0053	0.0051	0.0015	0.0014
Zinc	0.3	mg/kg	4.8	5.2	4.7	4.7	4.9	4.4	4.6	5.6	5.2	3.8	5.2

Notes

mg/kg	milligrams per kilogram
RDL	Reported detection limit
Field dup.	Field duplicate sample

Table B-3, Appendix B
Baseline Concentrations of Metals in Fish
Troilus Mining Project Technical Data Report
Problem Formulation (Multimedia)
167040485

Sample ID			122-ESLU-172MM-14G	127-ESLU-110MM-4G	129-ESLU-145MM-14G	13-CHAIRE-COCL-398MM-1400G	13-FOIE-COCL-398MM-1400G	140-CHAIRE-COCL-465MM-750G	140-FOIE-COCL-465MM-750G	141-CHAIRE-COCL-482MM-1150G
Water Body			Lac Amont	Lac Amont	Lac Amont	Lac Amont	Lac Amont	Lac A	Lac A	Lac A
Date Sampled			31-Aug-24	28-Aug-24	31-Aug-24	28-Aug-24	28-Aug-24	31-Aug-24	31-Aug-24	31-Aug-24
Sample Type			Whole body	Whole body	Whole body	Fillet	Liver	Fillet	Liver	Fillet
Species			Northern pike	Northern pike	Northern pike	Lake whitefish	Lake whitefish	Lake whitefish	Lake whitefish	Lake whitefish
Angling or Forage Fish			Forage fish	Forage fish	Forage fish	Angling fish	Angling fish	Angling fish	Angling fish	Angling fish
Parameter	**RDL**	**Units**								
Antimony	0.04	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Barium	0.015	mg/kg	0.081	0.37	0.087	0.021	0.026	0.036	0.031	0.036
Cadmium	0.001	mg/kg	0.0029	0.050	0.060	<0.0010	0.077	0.0017	0.024	0.0014
Chromium	0.05	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	0.002	mg/kg	0.0078	0.033	0.023	0.0095	0.059	0.045	0.22	0.047
Copper	0.05	mg/kg	0.16	0.30	0.25	0.16	6.2	0.13	0.24	0.13
Lead	0.007	mg/kg	<0.0070	<0.0070	<0.0070	<0.0070	0.032	<0.0070	<0.0070	<0.0070
Manganese	0.03	mg/kg	0.34	1.9	0.61	0.11	1.7	0.12	0.18	0.18
Mercury	0.0003	mg/kg	0.055	0.027	0.031	0.077	0.25	0.099	0.04	0.12
Molybdenum	0.003	mg/kg	<0.0030	0.0062	0.0036	<0.0030	0.13	<0.0030	0.0089	<0.0030
Nickel	0.01	mg/kg	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	0.012
Selenium	0.009	mg/kg	0.27	0.29	0.32	0.56	2.7	0.67	0.59	0.71
Silver	0.001	mg/kg	<0.0010	<0.0010	<0.0010	<0.0010	0.40	<0.0010	<0.0010	<0.0010
Zinc	0.3	mg/kg	3.9	12	10	2.3	21	2.2	9.7	2.1

See notes on last page.

Table B-3, Appendix B
Baseline Concentrations of Metals in Fish
Troilus Mining Project Technical Data Report
Problem Formulation (Multimedia)
167040485

Sample ID			141-FOIE-COCL-482MM-1150G	142-CHAIRE-COCL-455MM-750G	142-FOIE-COCL-455MM-750G	143-CHAIRE-COCL-371MM-450G	143-FOIE-COCL-371MM-450G	145-CHAIRE-ESLU-575MM-800G	145-FOIE-ESLU-575MM-800G	146-CHAIRE-ESLU-499MM-485G
Water Body			Lac A	Lac A	Lac A	Lac A	Lac A	Lac A	Lac A	Lac A
Date Sampled			31-Aug-24	31-Aug-24	31-Aug-24	31-Aug-24	31-Aug-24	31-Aug-24	31-Aug-24	31-Aug-24
Sample Type			Liver	Fillet	Liver	Fillet	Liver	Fillet	Liver	Fillet
Species			Lake whitefish	Lake whitefish	Lake whitefish	Lake whitefish	Lake whitefish	Northern pike	Northern pike	Northern pike
Angling or Forage Fish			Angling fish	Angling fish	Angling fish	Angling fish	Angling fish	Angling fish	Angling fish	Angling fish
Parameter	**RDL**	**Units**								
Antimony	0.04	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Barium	0.015	mg/kg	0.030	0.056	<0.017	<0.017	0.022	0.048	0.030	0.032
Cadmium	0.001	mg/kg	0.013	0.0016	0.013	0.0013	0.51	0.0022	0.42	0.0015
Chromium	0.05	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	0.002	mg/kg	0.25	0.019	0.15	0.026	0.36	0.0091	0.16	0.0075
Copper	0.05	mg/kg	0.19	0.16	0.23	0.15	7.5	0.14	12	0.13
Lead	0.007	mg/kg	<0.0070	<0.0070	<0.0070	<0.0070	0.0094	<0.0070	<0.0070	<0.0070
Manganese	0.03	mg/kg	0.19	0.39	0.16	0.29	2.8	0.31	1.2	0.15
Mercury	0.0003	mg/kg	0.052	0.068	0.027	0.027	0.042	0.38	0.22	0.24
Molybdenum	0.003	mg/kg	0.0074	<0.0030	0.011	<0.0030	0.16	<0.0030	0.20	<0.0030
Nickel	0.01	mg/kg	0.020	<0.010	0.026	<0.010	0.084	<0.010	0.12	<0.010
Selenium	0.009	mg/kg	0.54	0.69	0.53	0.65	2.3	0.45	2.8	0.48
Silver	0.001	mg/kg	<0.0010	<0.0010	<0.0010	<0.0010	0.040	<0.0010	0.089	<0.0010
Zinc	0.3	mg/kg	9.4	2.5	10	2.1	31	2.9	56	2.4

See notes on last page.

Table B-3, Appendix B
Baseline Concentrations of Metals in Fish
Troilus Mining Project Technical Data Report
Problem Formulation (Multimedia)
167040485

Sample ID			146-FOIE-ESLU-499MM-485G	147-CHAIRE-SAVI-362MM-351G	147-FOIE-SAVI-362MM-351G	14-CHAIRE-COCL-394MM-1400G	14-FOIE-COCL-394MM-1400G	150-CHAIRE-COCL-403MM-525G	150-FOIE-COCL-403MM-525G	151-CHAIRE-ESLU-394MM-296G
Water Body			Lac A	Lac A	Lac A	Lac Amont	Lac Amont	Lac A	Lac A	Lac A
Date Sampled			31-Aug-24	31-Aug-24	31-Aug-24	28-Aug-24	28-Aug-24	31-Aug-24	31-Aug-24	31-Aug-24
Sample Type			Liver	Fillet	Liver	Fillet	Liver	Fillet	Liver	Fillet
Species			Northern pike	Walleye	Walleye	Lake whitefish	Lake whitefish	Lake whitefish	Lake whitefish	Northern pike
Angling or Forage Fish			Angling fish	Angling fish	Angling fish	Angling fish	Angling fish	Angling fish	Angling fish	Angling fish
Parameter	**RDL**	**Units**								
Antimony	0.04	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Barium	0.015	mg/kg	0.050	0.031	0.045	0.023	0.023	<0.017	0.024	0.045
Cadmium	0.001	mg/kg	0.22	0.0015	1.2	<0.0010	0.079	<0.0010	0.64	0.001
Chromium	0.05	mg/kg	<0.050	<0.050	<0.050	0.078	<0.050	<0.050	<0.050	<0.050
Cobalt	0.002	mg/kg	0.091	0.0058	0.53	0.0045	0.055	0.021	0.31	0.0041
Copper	0.05	mg/kg	12	0.12	2.6	0.12	4.4	0.12	7.9	0.12
Lead	0.007	mg/kg	0.011	<0.0070	<0.0070	<0.0070	0.027	<0.0070	0.0098	<0.0070
Manganese	0.03	mg/kg	1.6	0.14	2.4	0.15	1.6	0.16	2.9	0.88
Mercury	0.0003	mg/kg	0.13	0.21	0.095	0.076	0.19	0.064	0.079	0.14
Molybdenum	0.003	mg/kg	0.23	<0.0030	0.22	<0.0030	0.14	<0.0030	0.12	<0.0030
Nickel	0.01	mg/kg	0.061	<0.010	0.090	<0.010	0.025	<0.010	0.040	<0.010
Selenium	0.009	mg/kg	2.8	0.52	1.5	0.71	2.4	0.74	2.1	0.22
Silver	0.001	mg/kg	0.076	<0.0010	0.002	<0.0010	0.36	<0.0010	0.039	<0.0010
Zinc	0.3	mg/kg	34	2.4	19	2.0	19	2.2	25	2.7

See notes on last page.

Table B-3, Appendix B
Baseline Concentrations of Metals in Fish
Troilus Mining Project Technical Data Report
Problem Formulation (Multimedia)
167040485

Sample ID			152-CHAIRE-ESLU-543MM-800G	152-FOIE-ESLU-543MM-800G	153-CHAIRE-SAVI-434MM-530G	153-FOIE-SAVI-434MM-530G	154-CHAIRE-SAVI-311MM-215G	154-FOIE-SAVI-311MM-215G	157-CHAIRE-ESLU-407MM-350G	15-CHAIRE-COCL-423MM-1800G
Water Body			Lac A	Lac A	Lac A	Lac A	Lac A	Lac A	Lac A	Lac Amont
Date Sampled			28-Aug-24	28-Aug-24	31-Aug-24	31-Aug-24	31-Aug-24	31-Aug-24	31-Aug-24	28-Aug-24
Sample Type			Fillet	Liver	Fillet	Liver	Fillet	Liver	Fillet	Fillet
Species			Northern pike	Northern pike	Walleye	Walleye	Walleye	Walleye	Northern pike	Lake whitefish
Angling or Forage Fish			Angling fish	Angling fish	Angling fish	Angling fish	Angling fish	Angling fish	Angling fish	Angling fish
Parameter	**RDL**	**Units**								
Antimony	0.04	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Barium	0.015	mg/kg	<0.015	0.017	0.043	0.022	<0.017	<0.017	0.095	0.021
Cadmium	0.001	mg/kg	0.0012	0.13	0.0017	1.0	0.0010	0.78	<0.0010	<0.0010
Chromium	0.05	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	0.002	mg/kg	0.0037	0.036	0.0048	0.50	0.0033	0.39	0.002	0.0063
Copper	0.05	mg/kg	0.12	8.6	0.19	1.9	0.13	2.0	0.13	0.17
Lead	0.007	mg/kg	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070
Manganese	0.03	mg/kg	0.17	0.79	0.13	1.4	0.12	1.7	0.13	0.11
Mercury	0.0003	mg/kg	0.32	0.14	0.35	0.18	0.30	0.11	0.21	0.091
Molybdenum	0.003	mg/kg	<0.0030	0.15	<0.0030	0.21	<0.0030	0.28	<0.0030	<0.0030
Nickel	0.01	mg/kg	0.012	0.024	<0.010	0.057	<0.010	0.071	<0.010	<0.010
Selenium	0.009	mg/kg	0.44	2.4	0.53	1.7	0.40	1.7	0.41	0.76
Silver	0.001	mg/kg	<0.0010	0.043	<0.0010	0.0015	<0.0010	0.0022	<0.0010	<0.0010
Zinc	0.3	mg/kg	2.6	28	3.0	19	3.2	17	2.6	2.4

See notes on last page.

Table B-3, Appendix B
Baseline Concentrations of Metals in Fish
Troilus Mining Project Technical Data Report
Problem Formulation (Multimedia)
167040485

Sample ID			15-FOIE-COCL-423MM-1800G	161-ENTIER-PECA-161MM-2G	16-CHAIRE-COCL-462MM-2400G	16-FOIE-COCL-462MM-2400G	17-CHAIRE-COCL-396MM-1600G	17-FOIE-COCL-396MM-1600G	189-ENTIER-ESLU-152MM-11G	190-ENTIER-ESLU-122MM-10.5G
Water Body			Lac Amont	Lac A	Lac Amont	Lac Amont	Lac Amont	Lac Amont	Lac A	Lac A
Date Sampled			28-Aug-24	31-Aug-24	28-Aug-24	28-Aug-24	28-Aug-24	28-Aug-24	31-Aug-24	31-Aug-24
Sample Type			Liver	Whole body	Fillet	Liver	Fillet	Liver	Whole body	Whole body
Species			Lake whitefish	Yellow perch	Lake whitefish	Lake whitefish	Lake whitefish	Lake whitefish	Northern pike	Northern pike
Angling or Forage Fish			Angling fish	Forage fish	Angling fish	Angling fish	Angling fish	Angling fish	Forage fish	Forage fish
Parameter	**RDL**	**Units**								
Antimony	0.04	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Barium	0.015	mg/kg	0.022	0.84	0.022	0.024	0.02	0.025	0.024	0.079
Cadmium	0.001	mg/kg	0.038	0.075	<0.0010	0.31	<0.0010	0.21	0.014	0.040
Chromium	0.05	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	0.002	mg/kg	0.038	0.080	0.0060	0.12	0.0044	0.066	0.015	0.032
Copper	0.05	mg/kg	3.0	0.53	0.13	7.3	0.18	7.7	0.18	0.24
Lead	0.007	mg/kg	0.02	0.0074	<0.0070	0.096	<0.0070	0.043	<0.0070	<0.0070
Manganese	0.03	mg/kg	1.4	7.8	0.099	1.2	0.11	2.0	0.47	2.6
Mercury	0.0003	mg/kg	0.15	0.063	0.097	0.20	0.090	0.21	0.10	0.068
Molybdenum	0.003	mg/kg	0.13	0.01	<0.0030	0.14	<0.0030	0.18	<0.0030	0.005
Nickel	0.01	mg/kg	<0.010	0.065	<0.010	<0.010	<0.010	0.014	0.011	0.027
Selenium	0.009	mg/kg	2.3	0.43	0.68	1.9	0.74	2.8	0.43	0.42
Silver	0.001	mg/kg	0.23	<0.0010	<0.0010	0.52	<0.0010	0.62	<0.0010	<0.0010
Zinc	0.3	mg/kg	19	16	2.0	19	2.3	23	6.0	19

See notes on last page.

Table B-3, Appendix B
Baseline Concentrations of Metals in Fish
Troilus Mining Project Technical Data Report
Problem Formulation (Multimedia)
167040485

Sample ID			191-ENTIER-ESLU-165MM-17G	192-ENTIER-ESLU-191MM-34G	193-ENTIER-ESLU-150MM-18G	194-ENTIER-PEFL-79MM-4.5G	195-ENTIER-PEFL-85MM-5.6G	196-ENTIER-PEFL-79MM-4.2G	197-ENTIER-PEFL-85MM-5.5G	198-ENTIER-PEFL-93MM-8.2G
Water Body			Lac A	Lac A	Lac A	Lac A	Lac A	Lac A	Lac A	Lac A
Date Sampled			31-Aug-24	31-Aug-24	31-Aug-24	31-Aug-24	31-Aug-24	31-Aug-24	31-Aug-24	31-Aug-24
Sample Type			Whole body	Whole body	Whole body	Whole body	Whole body	Whole body	Whole body	Whole body
Species			Northern pike	Northern pike	Northern pike	Yellow perch	Yellow perch	Yellow perch	Yellow perch	Yellow perch
Angling or Forage Fish			Forage fish	Forage fish	Forage fish	Forage fish	Forage fish	Forage fish	Forage fish	Forage fish
Parameter	**RDL**	**Units**								
Antimony	0.04	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Barium	0.015	mg/kg	0.024	0.026	0.042	0.56	0.65	0.73	0.54	0.34
Cadmium	0.001	mg/kg	0.0055	0.0045	0.015	0.02	0.019	0.026	0.025	0.021
Chromium	0.05	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	0.002	mg/kg	0.034	0.03	0.027	0.012	0.018	0.027	0.020	0.024
Copper	0.05	mg/kg	0.17	0.18	0.20	0.26	0.40	0.41	0.30	0.36
Lead	0.007	mg/kg	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070	<0.0070
Manganese	0.03	mg/kg	0.40	0.57	0.73	1.9	2.0	2.1	4.0	2.9
Mercury	0.0003	mg/kg	0.087	0.095	0.077	0.088	0.082	0.09	0.086	0.071
Molybdenum	0.003	mg/kg	<0.0030	<0.0030	<0.0030	0.0063	0.008	0.0097	0.0053	0.0061
Nickel	0.01	mg/kg	0.010	0.011	0.038	<0.010	<0.010	<0.010	<0.010	<0.010
Selenium	0.009	mg/kg	0.39	0.41	0.37	0.33	0.38	0.38	0.42	0.39
Silver	0.001	mg/kg	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	0.3	mg/kg	3.9	3.8	5.4	13	16	17	13	11

See notes on last page.

Table B-3, Appendix B
Baseline Concentrations of Metals in Fish
Troilus Mining Project Technical Data Report
Problem Formulation (Multimedia)
167040485

Sample ID			214-ENTIER-PECA-60MM-1.8G	21-CHAIRE-SAVI-471MM-800G	21-FOIE-SAVI-471MM-800G	22-CHAIRE-SAVI-490MM-900G	22-FOIE-SAVI-490MM-900G	267-CHAIRE-SAVI-417MM-400G	267-FOIE-SAVI-417MM-400G	268-CHAIRE-SAVI-389MM-470G
Water Body			Lac A	Lac Amont	Lac Amont	Lac Amont	Lac Amont	Lac A	Lac A	Lac A
Date Sampled			31-Aug-24	28-Aug-24	28-Aug-24	28-Aug-24	28-Aug-24	1-Sep-24	1-Sep-24	1-Sep-24
Sample Type			Whole body	Fillet	Liver	Fillet	Liver	Fillet	Liver	Fillet
Species			Yellow perch	Walleye	Walleye	Walleye	Walleye	Walleye	Walleye	Walleye
Angling or Forage Fish			Forage fish	Angling fish	Angling fish	Angling fish	Angling fish	Angling fish	Angling fish	Angling fish
Parameter	**RDL**	**Units**								
Antimony	0.04	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Barium	0.015	mg/kg	0.83	0.040	0.031	0.042	0.030	<0.015	0.019	0.042
Cadmium	0.001	mg/kg	0.041	0.0013	1.6	0.0015	1.0	0.0013	1.7	0.0013
Chromium	0.05	mg/kg	<0.050	<0.050	0.052	<0.050	<0.050	<0.050	0.075	<0.050
Cobalt	0.002	mg/kg	0.053	<0.0020	0.78	<0.0020	0.40	0.0029	0.39	0.0029
Copper	0.05	mg/kg	0.66	0.10	2.3	0.089	2.0	0.12	2.5	0.12
Lead	0.007	mg/kg	0.0081	<0.0070	0.016	<0.0070	0.0093	<0.0070	<0.0070	<0.0070
Manganese	0.03	mg/kg	5.5	0.071	1.9	0.084	1.2	0.057	2.4	0.12
Mercury	0.0003	mg/kg	0.058	0.54	0.39	0.54	0.27	0.32	0.16	0.44
Molybdenum	0.003	mg/kg	0.013	<0.0030	0.18	<0.0030	0.12	<0.0030	0.25	<0.0030
Nickel	0.01	mg/kg	0.032	<0.010	0.015	<0.010	0.011	<0.010	0.06	<0.010
Selenium	0.009	mg/kg	0.60	0.46	2.1	0.42	1.5	0.68	2.1	0.58
Silver	0.001	mg/kg	<0.0010	<0.0010	0.024	<0.0010	0.011	<0.0010	0.002	<0.0010
Zinc	0.3	mg/kg	15	2.1	18	1.9	18	2.1	23	2.3

See notes on last page.

Table B-3, Appendix B
Baseline Concentrations of Metals in Fish
Troilus Mining Project Technical Data Report
Problem Formulation (Multimedia)
167040485

Sample ID			268-FOIE-SAVI-389MM-470G	286-ENTIER-PECA-82MM-4.2G	287-ENTIER-PECA-60MM-1.8G	288-ENTIER-PECA-62MM-1.8G	28-CHAIRE-SAVI-345MM-1341G	28-FOIE-SAVI-345MM-1341G	31-ENTIER-PECA-95MM-72G	32-ENTIER-PECA-63MM-2.1G
Water Body			Lac A	Lac A	Lac A	Lac A	Lac Amont	Lac Amont	Lac Amont	Lac Amont
Date Sampled			1-Sep-24	1-Sep-24	1-Sep-24	1-Sep-24	28-Aug-24	28-Aug-24	28-Aug-24	28-Aug-24
Sample Type			Liver	Whole body	Whole body	Whole body	Fillet	Liver	Whole body	Whole body
Species			Walleye	Yellow perch	Yellow perch	Yellow perch	Walleye	Walleye	Yellow perch	Yellow perch
Angling or Forage Fish			Angling fish	Forage fish	Forage fish	Forage fish	Angling fish	Angling fish	Forage fish	Forage fish
Parameter	**RDL**	**Units**								
Antimony	0.04	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Barium	0.015	mg/kg	0.017	0.52	1.0	1.0	0.037	0.031	0.26	0.67
Cadmium	0.001	mg/kg	0.91	0.035	0.035	0.081	0.0015	0.93	0.014	0.024
Chromium	0.05	mg/kg	<0.050	<0.050	<0.050	0.059	<0.050	<0.050	<0.050	<0.050
Cobalt	0.002	mg/kg	0.63	0.066	0.076	0.28	0.0031	0.24	0.0096	0.024
Copper	0.05	mg/kg	2.2	0.46	0.64	1.3	0.2	2.3	0.32	0.36
Lead	0.007	mg/kg	<0.0070	<0.0070	0.011	0.065	<0.0070	<0.0070	<0.0070	0.052
Manganese	0.03	mg/kg	2.4	5.3	7.9	27	0.092	1.4	0.64	2.9
Mercury	0.0003	mg/kg	0.22	0.068	0.048	0.038	0.13	0.066	0.056	0.044
Molybdenum	0.003	mg/kg	0.23	0.010	0.017	0.044	<0.0030	0.20	0.0062	0.0095
Nickel	0.01	mg/kg	0.033	0.047	0.053	0.21	<0.010	<0.010	<0.010	0.010
Selenium	0.009	mg/kg	1.5	0.67	0.64	0.74	0.35	1.0	0.51	0.44
Silver	0.001	mg/kg	0.0034	<0.0010	<0.0010	0.0017	<0.0010	0.011	0.0021	0.0035
Zinc	0.3	mg/kg	19	12	16	18	2.7	18	6.7	12

See notes on last page.

Table B-3, Appendix B
Baseline Concentrations of Metals in Fish
Troilus Mining Project Technical Data Report
Problem Formulation (Multimedia)
167040485

Sample ID			34-ENTIER-PEFL-68MM-2.8G	35-ENTIER-PECA-60MM-1.9G	36-ENTIER-PECA-57MM-1.5G	37-ENTIER-PECA-54MM-1.5G	45-ENTIER-PEFL-55MM-1.4G	46-ENTIER-PEFL-72MM-3.4G	47-ENTIER-PEFL-67MM-2.8G	48-ENTIER-PEFL-59MM-2.2G
Water Body			Lac Amont	Lac Amont	Lac Amont	Lac Amont	Lac Amont	Lac Amont	Lac Amont	Lac Amont
Date Sampled			28-Aug-24	28-Aug-24	28-Aug-24	28-Aug-24	28-Aug-24	28-Aug-24	28-Aug-24	28-Aug-24
Sample Type			Whole body	Whole body	Whole body	Whole body	Whole body	Whole body	Whole body	Whole body
Species			Yellow perch	Yellow perch	Yellow perch	Yellow perch	Yellow perch	Yellow perch	Yellow perch	Yellow perch
Angling or Forage Fish			Forage fish	Forage fish	Forage fish	Forage fish	Forage fish	Forage fish	Forage fish	Forage fish
Parameter	**RDL**	**Units**								
Antimony	0.04	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Barium	0.015	mg/kg	0.73	0.73	0.79	0.73	0.94	0.58	0.47	0.35
Cadmium	0.001	mg/kg	0.03	0.015	0.041	0.02	0.039	0.020	0.032	0.016
Chromium	0.05	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	0.002	mg/kg	0.0066	0.019	0.026	0.023	0.0075	0.010	0.017	0.016
Copper	0.05	mg/kg	0.36	0.43	0.51	0.52	0.35	0.33	0.34	0.33
Lead	0.007	mg/kg	0.0089	0.011	0.014	0.016	0.0071	0.016	0.015	0.014
Manganese	0.03	mg/kg	1.5	3.1	3.9	3.6	2.1	3.1	3.0	3.2
Mercury	0.0003	mg/kg	0.031	0.049	0.043	0.036	0.045	0.026	0.046	0.047
Molybdenum	0.003	mg/kg	0.011	0.011	0.018	0.015	0.013	0.011	0.014	0.0083
Nickel	0.01	mg/kg	<0.010	<0.010	0.015	0.017	0.014	<0.010	0.011	0.015
Selenium	0.009	mg/kg	0.43	0.59	0.56	0.52	0.39	0.39	0.44	0.34
Silver	0.001	mg/kg	0.0033	0.0038	0.0050	0.0040	0.0021	0.0035	0.0021	0.0018
Zinc	0.3	mg/kg	15	12	14	12	17	12	13	14

See notes on last page.

Table B-3, Appendix B
Baseline Concentrations of Metals in Fish
Troilus Mining Project Technical Data Report
Problem Formulation (Multimedia)
167040485

Sample ID			4-CHAIRE-SAVI-405MM-600G	4-FOIE-SAVI-405MM-600G	5-CHAIRE-SAVI-525MM-600G	5-FOIE-SAVI-525MM-600G	63-ENTIER-ESLU-99MM-4.25G	64-ENTIER-ESLU	65-ENTIER-CACO-139MM-25G	66-ENTIER-ESLU-177MM-34G
Water Body			Lac Amont	Lac Amont	Lac Amont	Lac Amont	Lac Amont	Lac Amont	Lac Amont	Lac Amont
Date Sampled			28-Aug-24	28-Aug-24	28-Aug-24	28-Aug-24	29-Aug-24	29-Aug-24	29-Aug-24	29-Aug-24
Sample Type			Fillet	Liver	Fillet	Liver	Whole body	Whole body	Whole body	Whole body
Species			Walleye	Walleye	Walleye	Walleye	Northern pike	Northern pike	White sucker	Northern pike
Angling or Forage Fish			Angling fish	Angling fish	Angling fish	Angling fish	Forage fish	Forage fish	Forage fish	Forage fish
Parameter	**RDL**	**Units**								
Antimony	0.04	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Barium	0.015	mg/kg	0.017	0.027	0.021	0.027	0.57	1.0	0.082	0.029
Cadmium	0.001	mg/kg	0.0017	1.8	0.0021	1.0	0.029	0.052	0.018	0.0018
Chromium	0.05	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt	0.002	mg/kg	<0.0020	0.35	<0.0020	0.19	0.014	0.032	0.016	0.010
Copper	0.05	mg/kg	0.13	2.0	0.12	2.1	0.41	0.78	0.37	0.16
Lead	0.007	mg/kg	<0.0070	0.009	<0.0070	0.0089	0.0085	0.0093	<0.0070	<0.0070
Manganese	0.03	mg/kg	0.056	1.3	0.045	1.4	3.3	2.1	0.21	0.17
Mercury	0.0003	mg/kg	0.16	0.068	0.40	0.18	0.046	0.029	0.029	0.049
Molybdenum	0.003	mg/kg	<0.0030	0.21	<0.0030	0.15	0.0098	0.022	0.0081	<0.0030
Nickel	0.01	mg/kg	<0.010	0.013	<0.010	0.01	<0.010	0.023	0.013	<0.010
Selenium	0.009	mg/kg	0.41	1.0	0.41	1.1	0.35	0.41	0.32	0.24
Silver	0.001	mg/kg	<0.0010	0.0100	<0.0010	0.010	0.0041	0.0088	0.0047	<0.0010
Zinc	0.3	mg/kg	2.6	17	2.1	19	24	11	4.5	3.5

See notes on last page.

Table B-3, Appendix B
Baseline Concentrations of Metals in Fish
Troilus Mining Project Technical Data Report
Problem Formulation (Multimedia)
167040485

Sample ID			67-ENTIER-ESLU-197MM-37G	68-CHAIRE-ESLU-450MM-500G	68-FOIE-ESLU-450MM-500G	69-CHAIRE-ESLU-508MM-600G	69-FOIE-ESLU-508MM-600G	70-CHAIRE-ESLU-672MM-1400G	70-FOIE-ESLU-672MM-1400G	74-CHAIRE-ESLU-450MM-400G
Water Body			Lac Amont	Lac Amont	Lac Amont	Lac Amont	Lac Amont	Lac Amont	Lac Amont	Lac Amont
Date Sampled			29-Aug-24	29-Aug-24	29-Aug-24	29-Aug-24	29-Aug-24	29-Aug-24	29-Aug-24	29-Aug-24
Sample Type			Whole body	Fillet	Liver	Fillet	Liver	Fillet	Liver	Fillet
Species			Northern pike	Northern pike	Northern pike	Northern pike	Northern pike	Northern pike	Northern pike	Northern pike
Angling or Forage Fish			Forage fish	Angling fish	Angling fish	Angling fish	Angling fish	Angling fish	Angling fish	Angling fish
Parameter	**RDL**	**Units**								
Antimony	0.04	mg/kg	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Barium	0.015	mg/kg	0.041	<0.018	0.019	0.019	0.030	0.037	0.040	0.033
Cadmium	0.001	mg/kg	0.0014	<0.0012	0.14	<0.0012	0.13	0.0016	0.24	<0.0010
Chromium	0.05	mg/kg	<0.050	<0.050	0.086	<0.050	0.053	<0.050	0.15	<0.050
Cobalt	0.002	mg/kg	0.0070	0.0029	0.044	0.004	0.046	0.0025	0.049	0.0025
Copper	0.05	mg/kg	0.16	0.16	15	0.13	15	0.092	27	0.14
Lead	0.007	mg/kg	<0.0070	<0.0070	0.011	<0.0070	0.0082	<0.0070	0.041	<0.0070
Manganese	0.03	mg/kg	0.34	0.13	1.1	0.15	1.2	0.098	1.0	0.10
Mercury	0.0003	mg/kg	0.055	0.09	0.062	0.14	0.076	0.51	0.40	0.096
Molybdenum	0.003	mg/kg	<0.0030	<0.0030	0.24	<0.0030	0.19	<0.0030	0.24	<0.0030
Nickel	0.01	mg/kg	<0.010	<0.010	0.01	<0.010	<0.010	<0.010	0.017	<0.010
Selenium	0.009	mg/kg	0.24	0.32	2.0	0.36	2.2	0.34	2.6	0.28
Silver	0.001	mg/kg	<0.0010	<0.0010	0.24	<0.0010	0.25	<0.0010	1.6	<0.0010
Zinc	0.3	mg/kg	5.2	2.2	80	2.5	31	2.6	45	2.0

See notes on last page.

Table B-3, Appendix B
Baseline Concentrations of Metals in Fish
Troilus Mining Project Technical Data Report
Problem Formulation (Multimedia)
167040485

Sample ID			74-FOIE-ESLU-450MM-400G	80-CHAIRE-ESLU-491MM-650G	80-FOIE-ESLU-491MM-650G
Water Body			Lac Amont	Lac Amont	Lac Amont
Date Sampled			29-Aug-24	29-Aug-24	29-Aug-24
Sample Type			Liver	Fillet	Liver
Species			Northern pike	Northern pike	Northern pike
Angling or Forage Fish			Angling fish	Angling fish	Angling fish
Parameter	**RDL**	**Units**			
Antimony	0.04	mg/kg	<0.040	<0.040	<0.040
Barium	0.015	mg/kg	0.037	0.084	0.037
Cadmium	0.001	mg/kg	0.11	0.0019	0.12
Chromium	0.05	mg/kg	0.059	<0.050	0.085
Cobalt	0.002	mg/kg	0.06	0.0024	0.045
Copper	0.05	mg/kg	14	0.13	33
Lead	0.007	mg/kg	0.013	<0.0070	0.029
Manganese	0.03	mg/kg	1.5	0.38	1.5
Mercury	0.0003	mg/kg	0.071	0.16	0.13
Molybdenum	0.003	mg/kg	0.30	<0.0030	0.30
Nickel	0.01	mg/kg	<0.010	<0.010	0.025
Selenium	0.009	mg/kg	1.8	0.46	2.0
Silver	0.001	mg/kg	0.34	<0.0010	1.5
Zinc	0.3	mg/kg	53	3.1	55

Notes

mg/kg	milligrams per kilogram
RDL	Reported detection limit

Stantec

Memo

To:	Guylaine Bois, M. Sc. and Julie Massicotte Stantec Consulting Ltd.	From:	Elena Legrand, Ph.D. and Loren Knopper, Ph.D. Stantec Consulting Ltd.
Project/File:	167040485	Date:	April 19, 2024

Reference: Standard Operating Procedures for Terrestrial Biota Sampling in Support of the Human Health and Ecological Risk Assessment

1 Preamble

The construction, operation and decommissioning of the Troilus mine project ("the Project") has the potential to alter environmental quality in nearby areas. Specifically, dust deposition, drainage from the mine site, and seepage from waste rock and tailings storage facilities can alter chemical concentrations in air, water and soil, as well as the environmental components associated with them (i.e., sediment, fish, terrestrial and aquatic vegetation, and terrestrial and aquatic invertebrates). Changes in chemical concentrations can lead to changes in exposures and health risks for human and ecological receptors in the areas surrounding the Project compared to existing (pre-Project) conditions. To properly evaluate the potential effects that the Project could have on human and ecological receptors, it is necessary to establish baseline chemical concentrations in the aquatic and terrestrial environments. In so doing, the magnitude of Project-related changes in chemical concentrations in environmental biota can be determined.

The collection of baseline air and aquatics data (fish, sediment, aquatic invertebrates) are being undertaken by the Atmospheric and Aquatics Disciplines. Herein are standard operating procedures (SOP) that could be followed for the collection of terrestrial media (soil and terrestrial plants). Selection of sampling locations in the local and regional study areas (LSA and RSA), and the plant species that are required for collection, will be determined in consultation with the other discipline teams. The baseline data set obtained for the terrestrial environment will be combined with the baseline data set collected by others to provide an overall baseline data set for use in the Human Health and Ecological Risk Assessment (HHERA).

1.1 Objectives

The purpose of the summer 2024 sampling program is to establish baseline chemical concentrations in soil and terrestrial vegetation for use in the HHERA component of the Impact Assessment (IA) submission for the Project. Chemicals (or chemicals of potential concern) to be analyzed in samples will be determined at a later date based on discussion with technical leads. The primary objectives of the sampling program are:

1. The collection of soil samples to provide baseline chemical concentrations in soils;
2. The collection of paired (co-located) soil and vegetation sample (e.g., forage, browse, and traditional and/or medicinal plants), to provide chemical concentrations in soil and vegetation that

can be used to predict future chemical uptake into vegetation. Plant species used by First Nations people for traditional or medicinal use will be determined in collaboration with the Indigenous team. For this SOP, Labrador Tea and berries were used as example; and

1.2 Study Design

Sampling locations are to be determined in collaboration with the other disciplines teams. It is not necessary that all vegetation types be present at a given location in order for the location to be used for sample collection. It is, however, essential that vegetation samples are co-collected with soil samples (i.e., vegetation samples collected within a 10 m radius of a corresponding soil sampling). It is important to co-collect each of the terrestrial samples (vegetation and soil) at the sampling locations that will be selected. If a preferred location is not accessible or is deemed unacceptable, samples should be taken from an accessible alternate location. All sample locations must be properly georeferenced and plotted on a figure.

- A **surface soil** sample should be collected from 10 to 20 locations within the LSA and RSA. These samples would be co-collected with the vegetation samples (i.e., the soil that the sampled plant grows in).
- **Vegetation:**
    - **Browse and forage** – should be collected from 10 to 20 locations in the LSA and RSA. Samples should be new growth because this is what the animals will typically eat.
    - **Traditional and/or medicinal plants (e.g. Labrador Tea, blueberries)** – should be collected from 10 to 20 locations in the LSA and RSA. The traditional and/or medicinal plants must be selected after consultation with the Indigenous team to determine which species and part of the plant should be collected based on the use of the plant by the local First Nations. The SOP provided in this memo are using the Labrador Tea and the blueberries as examples.

The SOPs described below should be referenced when scoping the field work for 2024. The SOPs serve as an integral part of the QA/QC Plan for the Troilus Project and should be used together with other SOPs and the Health and Safety Plan (HSP). **The Stantec HSP and safe work practices must be strictly followed and will include an initial safety meeting as well as daily toolbox meetings prior to sampling.**

Details about collection procedures (e.g., equipment and material needed, abundance of species, amount of media, health and safety concerns) are found in the SOPs below.

1.2.1 Sample Identification and Labeling

Samples collected during location activities shall have discrete sample identification numbers. These numbers are necessary to identify and track each of the many samples collected for analysis. Each sample

should be identified by a unique 5-digit numerical code that indicates the sample location, the sampled type (e.g., surface soil), and sample number.

Here are examples of the sample identification codes for the Troilus study area:

Troilus study area: THHERA220 – SS – 1

220 is the **numerical location identifier** of the sampling location (to be determined). This is a numerical code used to identify each sampling location within the Project and will be used to identify sample location for all media collected.

SS is the two-letter **sample designation** used to characterize the specific type of sample collected. The proposed sample codes, along with the types of samples that will be collected during location investigations are described below. The sample designation for the Labrador Tea and blueberries are given as examples and will need to be confirmed after selection of the traditional and/or medicinal plants based on consultation with the Indigenous team.

- SS – Surface soil
- DV – Vegetation (deciduous)
- CV – Vegetation (coniferous)
- LV – Vegetation (Labrador tea)
- BV – Vegetation (berries)
- EW – Earthworm
- SG – Slug

The final number in the sample identification code (in the example above it is 1) will be used to **identify specific samples** within that sample location. The first sample in any location will always start at 1 and increase consecutively (1, 2, 3…). Samples collected for QA/QC purposes should be identified with 0 in place of the final number to indicate a duplicate sample (e.g., THHERA220-SS-0).

Analytical sample bottles or Ziploc bags will be traced using this system. In the field, immediately prior to sample collection, sample IDs will be marked either directly on all bottles or a label using a water proof marker. All analytical bottles and bags arriving to the Field Program Coordinator will be entered into a database.

1.2.2 Sample Handling

Disposable gloves shall be worn when handling all samples.

- **Sample Containers** - Certified, commercially clean sample containers shall be obtained from the laboratory. Prior to use in the field, all analytical bottles will be sorted by Stantec to identify

individual bottles and indicate the type of sample to be collected. PVC plastic containers must not be used to hold samples. “Plastics” refers to containers of bags made from unpigmented polyethylene or polypropylene.

- **Sample Preservation/Filtration** - Sample preservation efforts shall commence at the time of sample collection and will continue until analyses are performed. Samples will be kept cool, refrigerated or stored on ice packs at 4°C immediately following collection and frozen as soon as possible

- **Sample Handling and Shipping** - A properly and fully completed chain of custody form will accompany all sample shipments. Samples should be kept frozen until submission to the laboratory. Samples will be submitted to the laboratory after validation of the list of chemicals to analyze for. Samples will go via courier for expedited delivery to the analytical laboratory. All samples will be shipped to the laboratory and prepared for analyses within specific holding times.

- **Holding Times and Analyses** - The holding time is specified as the maximum allowable time between sample collection and analysis and/or extraction, based on the analyte of interest, stability factors, and preservative (if any) used.

- **Sample Documentation and Tracking** - This section describes documentation required in the field notes and on the sample chain of custody forms.

- **Field Notes** - Documentation of observations and data acquired in the field will provide information on the acquisition of samples and also provide a permanent record of field activities. The observations and data will be recorded on a sample collection field sheet. On a daily basis, field sampling data sheets will be completed for each sampling location and submitted to the Field Program Coordinator. Information on field notes and documentation is included in each of the SOPs that follow, depending on the field activity. The information on the data sheets will, at a minimum, include the following:

    - Location name;
    - Photos;
    - UTM coordinates;
    - Sampling crew member’s name;
    - Sample number;
    - Description of samples (matrix sampled);
    - Evidence of product/contaminants;

- Sample depth (if applicable);
- Number and volume of samples;
- Date and time of sample collection;
- Sampling method or reference to the appropriate SOP;
- Sample handling;
- Analysis requested;
- Field observations;
- Results of any field measurements, such as depth to water, pH, temperature, and conductivity;
- Personnel present; and
- Level of PPE used during sampling.

Changes or deletions to the field sheet or field book should be lined out with a single strike mark and remain legible. Sufficient information should be recorded to allow the sampling event to be reconstructed without relying on the sampler's memory.

Anyone making entries in another person's field book will sign and date those entries. On a weekly basis, any additional information contained in field books will be photocopied and the copies maintained in an office file designated by the Field Program Coordinator.

- **Sample Chain-of-Custody** - During field sampling activities, traceability of the sample must be maintained from the time the samples are collected, until laboratory data are issued. Initial information concerning collection of the samples will be recorded on the field sheets, as described above. Subsequently this information will be entered into the Stantec project database. Information on the custody, transfer, handling, and shipping of samples will be recorded on a chain of custody form. Copies of all chain of custody forms will be maintained in the project database. The sampler’s name will be associated with the chain of custody form, as well as the person responsible for delivery of the samples to the laboratory. Until samples are delivered to the laboratory, they will be stored in a secure area. One chain of custody form will be completed for each set of samples submitted. The chain of custody will contain the following information:
    - Date and time of collection;
    - Sample number(s);

- Sample type(s);
- Analyses requested;
- Number of containers;
- Name of persons relinquishing custody, dates, and times;
- Name of persons accepting custody, dates, and times;
- Method of shipment; and
- Shipping air bill number (if appropriate).

Upon receipt at the laboratory, the name of the person receiving the samples will be added to the chain of custody form and a copy of the chain of custody returned to the Field Program Coordinator. Copies of the chain of custody forms documenting custody changes and all custody documentation will be received and maintained within the field and office databases.

1.3 Standard Operation Procedures (SOP)

1.3.1 Surface Soil

Surface soil samples (top 10 cm of soil, underneath leaf litter) will be collected using a stainless-steel shovel or aluminum trowel. Surface soil samples will be composited on location. Five 100 g or larger sub-samples will be collected and mixed to generate one composite surface soil sample. for each sampling location. Each surface soil sampling location will be photographed, logged and details recorded on the data sheet.

Sampling locations (10 to 20) and chemicals to analyze for in surface soils samples are to be determined at a later date.

1.3.1.1 Equipment and Materials List

The following is a list of equipment that may be needed for surface soil sampling:

- Stainless steel shovel or aluminum trowel;
- Sampling containers from laboratory (1 - 250 mL glass soil jar);
- Large Ziploc freezer bags;
- Disposable gloves (nitrile, non-powdered);
- Map showing sample locations;
- Sample collection data sheets and field book;
- Cooler and ice packs;
- Camera and batteries;
- Cellular phone/satellite phone/radio;
- Waterproof and permanent marking pens;
- Geotechnical Gauge (i.e., visual descriptive guide for soil);
- Appropriate health and safety equipment as specified in the HSP; and
- Appropriate decontamination supplies (e.g., brushes, paper towels, distilled water, methanol).

1.3.1.2 Decontamination

Before any work begins, all equipment needs to be decontaminated. Each piece of sampling equipment that comes into contact with a sample will be decontaminated before work at each sample location. A discussion of equipment decontamination is found in **Section 1.3.5**.

1.3.1.3 Surface Soil Sampling Procedures

All sampling containers will be provided and should be obtained from the laboratory prior to going out into the field. Observations made during sample collection should be recorded on the data sheets and/or in the field book, as specified in this SOP:

1. Once on location, locate the pre-selected sampling locations (to be determined). If this location is unsuitable for sampling, choose the nearest suitable location and note this location as well as reasons for choice on field sheets or field book.

2. Clean the sampling equipment using decontamination procedures described below.
3. Don a clean pair of disposable gloves, a new pair must be worn for each sample taken.
4. Push aside leaf litter and other debris to exposed soil surface.
5. Collect five 100 g grab samples opportunistically from within approximately 10 m of the center of the sampling location from a depth of 0-10 cm. The locations of the five grab samples should be selected to be representative of the area and should also be representative of the locations of any vegetation samples to also be collected at this location. If a depth of 10cm is not possible, record the deepest depth achievable.
6. For each sample of the five samples, clear and remove leaf litter and surface debris (e.g., rocks), from an approximate 10 cm by 10 cm area.
7. Samples will be collected into a large Ziploc freezer bag.
8. Once the five 100 g grab samples have been collected into the freezer bag, the composite sample should be shaken to thoroughly mix the sample. Large rocks or clumps should be removed from the composite sample.
9. From the composited sample, a 250 ml soil jar should be filled for submission to the appropriate laboratory for chemical analysis.
10. All sample containers must be labeled, well-sealed and placed into a cooler with ice packs and protective packing materials. Samples should be frozen as soon as possible.
11. Remaining soil will be returned to the sample hole(s).
12. Sample identification, labeling, documentation, and quality control will be implemented as defined above.
13. Complete the sample data sheet and any applicable field book information before leaving the location.
14. Laboratory submission forms are to be appropriately completed and signed.
15. Soil samples are to be kept frozen until submission to the laboratory. Samples will be submitted to the laboratory after validation of the list of chemicals to analyze for.
16. Field duplicate samples, if required, will be collected by selecting an additional five (new) locations for sub-sampling, and will be true field duplicates (do not take a second subsample from the first bag containing soil).

1.3.1.4 Field Quality Assurance/Quality Control (QA/QC) Procedures

Quality assurance/quality control (QA/QC) samples are designed to help identify potential sources of sample contamination. All QA/QC samples are labeled with QA/QC identification numbers and sent to the laboratory with the other samples for analyses. Field QA/QC procedures for the surface soil sampling program are as described above (e.g., THHERA-220-SS-0).

As per the QA/QC plan, collection of approximately 10% blind duplicates is required for the surface soil sampling program. This program permits the evaluation of the representativeness of the samples.

Surface soil sampling locations will be pre-selected to collect a duplicate sample. The duplicate sample will be collected following the protocol described above for surface soil sampling. This sample will be labeled as a duplicate surface soil sample and analyzed for the same analytical packages as the surface soil sample.

1.3.1.5 Documentation

Documentation of observations and data acquired in the field will provide information on the proper acquisition of samples and also provide a permanent record. These observations and data will be recorded on the sample collection data sheet. A copy of this data sheet is attached to this SOP (Attachment A). These data sheets will be submitted when samples are delivered to the Field Program Coordinator.

Any additional field notes or supporting information shall be kept in a bound field book. On a daily basis field books will be photocopied and the copies maintained in a field office file designated by the Field Program Coordinator.

1.3.2 Vegetation Sampling

Vegetation samples will be collected from within a radius of approximately 10 m of the corresponding soil sampling location. Where sufficient material is not available within this area, a slightly larger radius may be used; however, the intent of the sampling program is that the soil and vegetation samples will be representative of the same area. Preference should be given to new growth from three types of plants: deciduous species (e.g., alder, birch), coniferous species (spruce), and traditional and/or medicinal plants (e.g., Labrador tea). As noted above, traditional and/or medicinal plants must be selected after consultation with the Indigenous team to determine which species and part of the plant should be collected based on the use of the plant by local First Nations. Aquatic species that are accessible from sample locations could also be collected.

Chemicals to analyze for in vegetation samples are to be determined at a later date.

1.3.2.1 Equipment and Materials List

The following is a list of equipment that may be needed for vegetation sample preparation:

- Weigh scale;
- Pruning shears, scissors;

- Disposable gloves;
- Cellular phone/satellite phone/radio;
- Field book;
- Coolers and ice packs;
- Large Ziploc bags;
- Camera and batteries;
- Field data sheets and field book;
- Waterproof and permanent marking pens;
- Appropriate health and safety equipment; and
- Appropriate decontamination supplies (e.g., brushes, paper towels, distilled water, methanol).

1.3.2.2 Decontamination

Before any work begins, all equipment needs to be decontaminated. Each piece of sampling equipment that comes into contact with a sample will be decontaminated before work at each sample location. A discussion of equipment decontamination is found in **Section 1.3.5**.

1.3.2.3 Vegetation Sampling Procedures

In general, representative samples of the vegetative species from each location will be collected in Ziploc bag in the field. Observations made during sample collection should be recorded on the data sheets and/or in the field book, as specified in this SOP.

1. Once on location, locate the pre-selected sampling locations (to be determined). If this location is unsuitable for sampling, choose the nearest suitable location and note this location as well as reasons for choice on field sheets or field book.
2. Don a clean pair of disposable gloves; a new pair must be worn for each vegetation sample prepared.
3. Place the three types of vegetation (deciduous species, coniferous species, Labrador tea) in separate Ziploc bags. Samples should be frozen as soon as possible.
4. Complete the sample data sheet and any applicable field book information before leaving the location.
5. Laboratory submission forms are to be appropriately completed and signed.

6. Vegetation samples are to be kept frozen until submission to the laboratory. Samples will be submitted to the laboratory after validation of the list of chemicals to analyze for.

7. General identification of the dominant plant species will be recorded in a field book by sampling technician.

8. Field duplicate samples, if required, will be collected by selecting an additional five (new) locations for sub-sampling, and will be true field duplicates (do not take a second subsample from the first bag containing vegetation).

1.3.2.4 Field Quality Assurance/Quality Control Samples

Quality assurance/quality control (QA/QC) samples are designed to help identify potential sources of sample contamination. All QA/QC samples are labeled with QA/QC identification numbers and sent to the laboratory with the other samples for analyses. Field QA/QC procedures are as described above (e.g., THHERA-220-FO-0, THHERA-220-BR-0).

As per the QA/QC plan, collection of approximately 10% blind duplicates is required for the vegetation sampling program. This program permits the evaluation of the representativeness of the samples. One vegetation sampling location will be pre-selected to collect a duplicate sample. If it is determined that there will not be enough grass or poplar tips to generate a duplicate sample, notify the Field Program Coordinator.

1.3.2.5 Documentation

Documentation of observations and data acquired in the field will provide information on the proper acquisition of samples and also provide a permanent record. These observations and data will be recorded on the sample collection data sheet. A copy of this data sheet is attached to this SOP (Attachment B). These data sheets will be submitted when samples are delivered to the Field Program Coordinator.

Any additional field notes or supporting information shall be kept in a bound field book. On a daily basis field books will be photocopied and the copies maintained in a field office file designated by the Field Program Coordinator.

1.3.3 Berry Sampling

Berry samples will be collected at all soil sampling locations on an opportunistic basis using gloved-hands then placed into Ziploc bags. Several Ziploc bags may be collected per sampling location, depending upon the types of berries present (e.g., blueberries, Saskatoon berries, raspberries, blackberries, pincherries, chokecherries, bunchberries). Each berry type will form a separate sample (i.e., if blueberries and bunchberries are present, then two samples will be collected: one of blueberries, and one of bunchberries). For example, designate berry samples as follows, with a comment to designate the berry type:

- THHERA – 33876 – BB – 1 (blueberry);
- THHERA – 33876 – BB – 2 (bunchberry); and

- THHERA – 33876 – BB – 0 (bunchberry, field duplicate).

Chemicals to analyze for in vegetation samples are to be determined at a later date.

1.3.3.1 Equipment and Materials List

The following list of equipment will be needed to collect berry samples:

- Disposable gloves;
- Field sheets and field book;
- Camera and batteries;
- Duct tape;
- Wash/rinse tubs;
- Waterproof and permanent marking pens;
- GPS unit;
- Cellular phone/satellite phone/radio
- Large Ziploc bags;
- Coolers and ice packs;
- Appropriate health and safety equipment; and
- Appropriate rinsing and sample preparation supplies (e.g., brushes, paper towels, distilled water, methanol).

1.3.3.2 Decontamination

Before any work begins, all equipment needs to be decontaminated. Each piece of sampling equipment that comes into contact with a specific type of vegetation should be decontaminated before a new type of vegetation is collected at each sample location. A discussion of decontamination procedures is found below in **Section 1.3.5.**

1.3.3.3 Berry Sampling Procedures

The type of berries to be collected, if any, will be determined in collaboration with the Indigenous team. If the selected type of berries cannot be found on the sampling location, then any other wild berries may be collected as an alternative. The reason for collecting berries other than the selected berry type, must be specifically noted on the field sheet/field book and all sample requirements shall still be met. Different types of berries must be collected separately in separate bags.

The procedure for collecting berry samples will involve picking berries and placing them in Ziploc bags. Safety should be the first priority and all precautions must be followed, as outlined in the HSP.

The following procedures will be followed to collect a berry sample at each location:

1. Once on location, locate the pre-selected sampling locations (to be determined). If this location is unsuitable for sampling, choose the nearest suitable location and note this location as well as reasons for choice on field sheets or field book.
2. Walk the location to determine the optimal spot to pick samples.
3. Don on a pair of disposable gloves to pick berries, placing collected berries into a large Ziploc freezer bag:
    a. At least 25 g of berries must be collected (roughly ¼ cup).
4. Place all samples in coolers with ice packs. Samples should be frozen as soon as possible.
5. Sample identification, labeling, documentation, and any quality control will be implemented as defined above.
6. Complete any applicable field book information; recording the sample number, as well as identification of the produce collected at each location.
7. Laboratory submission forms are to be appropriately completed and signed.
8. Berry samples are to be kept frozen until submission to the laboratory.
9. Samples will be submitted to the laboratory after validation of the list of chemicals to analyze for.

1.3.3.4 Field Quality Assurance/Quality Control Samples

Quality assurance/quality control (QA/QC) samples are designed to help identify potential sources of sample contamination. All QA/QC samples are labeled with QA/QC identification numbers and sent to the laboratory with the other samples for analyses. Field QA/QC procedures for the berry sampling program will be as identified as described above (e.g., THHERA-220-BB-0).

As per the QA/QC plan, collection of approximately 10% blind duplicates is required for the berry sampling program. This program permits the evaluation of the representativeness of the samples. It is preferred that the field duplicate be taken as an independent sample, and not simply split from a single (larger) sample. This sample will be labeled as a duplicate berry sample and analyzed for the same chemicals as the initial sample.

1.3.3.5 Documentation

Documentation of observations and data acquired in the field will provide information on the proper acquisition of samples and also provide a permanent record. These observations and data will be recorded on the sample collection data sheet. A copy of this data sheet is attached to this SOP (Attachment C). These data sheets will be submitted when samples are delivered to the Field Program Coordinator.

Any additional field notes or supporting information shall be kept in a bound field book. On a daily basis field books will be photocopied and the copies maintained in a field office file designated by the Field Program Coordinator.

1.3.4 Decontamination

The overall objective of multimedia sampling programs is to obtain samples that accurately depict the chemical and/or physical conditions at the sampling location. Extraneous contaminant materials can be brought onto the sampling location and/or introduced into the medium of interest during the sampling program. Trace quantities of these contaminant materials can consequently be captured in a sample and lead to false positive analytical results, and ultimately to an incorrect assessment of the background conditions associated with the location. Decontamination of sampling equipment is required prior to use on this program to ensure that sampling cross-contamination is prevented and that possible on-location contaminants are not carried off-location.

1.3.4.1 Equipment and Materials List

The following is a list of equipment and materials that may be needed to perform decontamination:

- Brushes;
- Wash tubs;
- Buckets;
- Scrapers, flat bladed;
- Sponges or paper towels;
- Potable, distilled and/or deionized water;
- Paper towels;
- Spray bottles;
- Methanol; and
- Appropriate health and safety equipment

1.3.4.2 Decontamination Procedures

The following steps will be used to decontaminate sampling equipment.

1. Personnel will dress in suitable safety equipment to reduce personal exposure as required by the HSP (note, since this is a baseline sampling program, only basic personal protective equipment such as steel-toed boots, safety glasses, and gloves (to prevent contamination of samples) is anticipated to be required at most locations.

2. Gross contamination on equipment will be scraped off at the sampling or investigation location.

3. Equipment that will not be damaged by water will be placed in a wash tub containing potable water and scrubbed with a bristle brush or similar utensil; equipment will be rinsed with potable water in a second wash tub, followed by a potable water rinse.

4. Equipment that will not be damaged by solvents will be sprayed or washed with methanol. The equipment will then be rinsed with distilled or deionized water, wiped and allowed to air dry; soil sampling equipment that comes into direct contact with the sample (i.e., trowels) will be cleaned with methanol and rinsed with distilled water.

5. Following decontamination, equipment will be placed in a clean area, and covered or placed in clean plastic bags, to prevent contact with potentially contaminated soils or equipment.

1.3.4.3 Documentation

Sampling personnel will be responsible for documenting the decontamination of sampling, testing, and appropriate related equipment. The documentation will be recorded in a field book on consecutively numbered pages. The information entered in the field book concerning decontamination should include the following:

- Senior member of field team;
- Start and end times for decontamination;
- Date;
- Type of decontamination procedure used;
- Number and type of samples collected, if any;
- Decontamination observations;
- Weather conditions;
- Disposition of equipment/materials follow decontamination; and

- How liquid/solid wastes handled.

All data sheets will be submitted when samples are delivered to the Field Program Coordinator. Original data sheets and appropriate photocopied pages from the field book will be maintained in an office file designated by the Field Program Coordinator.

Attachments:

Attachment A Soil Field Sheet
Attachment B Vegetation Field Sheet
Attachment C Berry Field Sheet

Attachment A Soil Field Sheet

Attachment B Vegetation Field Sheet

Attachment C Berry Field Sheet

July 2024

BY E-MAIL

Subject: Work plan for professional services in health risk assessment - characterization of contaminants of potential concern in aquatic fauna.

Troilus Mining Project Impact Study

Ref: 167040485-110-300-260

Troilus Gold Corp. has mandated the BluMetric/Stantec team to carry out the federal and provincial environmental impact studies for the Troilus mining project, located in Northern Quebec, about 175 km north of Chibougamau, about 200 km by road and about 50 km northwest as the crow flies from the Cree community of Mistissini.

The purpose of this work plan is to collect and analyze fish flesh in order to obtain reference concentrations that will be used in the human health and ecosystem risk assessment required in the federal impact study.

The work plan presents the methodology for carrying out the collection and analysis, as well as the work team, schedule, work effort and deliverables.

1 Methodology

The species and sites to be sampled were selected in conjunction with the team responsible for the aquatic environment and land use. The selection of sampling stations and target species was made on a preliminary basis, and may be modified as additional information is obtained by the discipline leaders However, the total number of samples will not be changed unless authorized by the customer. The parameters analyzed will be contaminants of potential concern, i.e. the following 16 metals: Al, Sb, Ag, As, Ba, Cd, Cr, Co, Cu, Mn, Hg, Mo, Ni, Pb, Se, Zn.

The fish selected are three species consumed by land users: walleye (*Sander vitreus*), lake whitefish (*Coregonus clupeaformis*) and northern pike (*Esox lucius*). Only individuals of sufficient size to be consumed will be retained; morphometric measurements will be taken, and a sample of dorsal muscle and liver will be collected for analysis. Harvesting of target species will be carried out using experimental RSI gillnets. Fish still alive will be kept in a fish tank, measured and weighed, then released away from the fishing station. Species likely to be consumed by land users will be placed in a tank to be measured and weighed, and the liver and a flesh sample of the dorsal muscle will be taken. All this will be done in a controlled environment to avoid any source of contamination.

Fish consumed by terrestrial piscivorous species will also be targeted. The species selected are lake chub (*Couesius plumbeus*), white sucker (*Catostomus commersoni*) and northern pike. Only small individuals that can be eaten by terrestrial predators will be retained; morphometric measurements will be taken, and the entire specimen will be sent for analysis. Specimens will be collected using a shoreline seine and fyke nets, and electrofished in environments suitable for their presence.

For each of the fish species mentioned above, five specimens will be collected from Lake Amont and five from Lake A.

Whole individuals will be processed in a controlled environment to avoid any source of contamination.

The time between capture and processing should be as short as possible to avoid flesh degradation. This is particularly important during the summer months, when the water is warm and gillnets are set and hauled in the following day.

When picking up fish caught in nets or other catching gear, the operator's hands must be clean, especially if he has handled oil or petrol without wearing gloves. We recommend washing hands with biodegradable, unscented soap and rinsing thoroughly with water.

Lake A has a boat launch for easy access, while Lake Amont is accessible by light all-terrain vehicle carrying equipment for the fishing team and a light boat. Access is in the north-east zone of the lake.

Fishing equipment list.

4 RSI gillnets - 8 panels - stretched mesh (25, 38, 51, 64, 76, 102, 127 and 152 mm)

1 Portable electric fishing - Halltech Aquatic Research

1 Shore seine - 25m long x 2m high - 3 mm mesh and central pocket with 2 mm mesh

1 Small fine-mesh seine - 5m x 1.5m with 4-mm mesh

4 Two-section veer nets - 1" mesh, 4 m wings, 33 m leader, 80 cm high.

Field fishing sheets waterproof paper

Preparation of fish samples

Flesh quantity, identification and packaging.

When the fish is of sufficient size, approximately 100 grams of flesh (without skin) should be removed, preferably under the dorsal fin.

White and longnose suckers, lake chub and small pike should be kept whole, so no flesh is removed. It is particularly important to rinse whole specimens thoroughly to reduce the risk of contamination. Flesh samples and whole specimens should be individually wrapped in aluminum foil, then placed in a polyethylene bag clearly marked with a marker pen. The following information should be written on the sterile, dry plastic bag:

- the sequential number assigned to the individual captured as part of your project;
- the species code;
- maximum total length of the fish;
- Its weight.

Example. :152 389

CACO

565 mm

891 g

The sample must not contain skin, viscera or bones. Disposable polyethylene, nitrile or powder-free latex gloves (talc inside gloves is a source of contamination) will be worn. Two people will be assigned to fish sample preparation. One will identify the bags containing the samples and record the information on the fishing sheets. The other will handle the fish to measure weight and length, and to remove the flesh. The gloves and knife of the person

handling the fish must be clean before removing the flesh, especially if they have been in contact with internal organs. They should be cleaned with soapy water and rinsed thoroughly with clean tap water, or, in isolated areas, with water from the lake at the capture site, then rinsed with denatured ethanol contained in a wash bottle. New gloves are recommended for each fish. However, gloves in good condition can be reused if they have been cleaned as described above. When handling organs such as the liver, care should be taken to avoid soiling the outside of the fish from which it is to be removed. If necessary, rinse the outside of the fish with water to remove any dirt.

Flesh sampling method

When sampling the flesh, we will ensure that it is still firm and has not been degraded by heat. If the flesh shows obvious signs of degradation, the fish cannot be preserved for analysis and will be rejected.

A clean work surface will be prepared using a plastic butchering board previously washed with soap and rinsed with non-contaminated water.

When removing the flesh, a knife will cut the fillet from head to tail, keeping a piece of skin attached and folded over the work surface to avoid any contact with the work surface. The knife is inserted between the skin and the flesh to remove, depending on the size of the fish, a piece weighing between 25 and 100 grams without the skin, peritoneum or bone. The piece of flesh will be removed with the tip of the knife and placed on the piece of aluminium foil, wrapped and placed in the conservation bag duly identified. The sample bags will be grouped together in a larger bag with the appropriate information.

List of equipment required for sample preparation

- Powder-free polyethylene or nitrile gloves
- Skinning board
- Filleting knife
- Knife sharpener or whetstone
- Tweezers for otolith sampling
- Wire-cutting pliers
- Fish ruler (mm)
- Balance (gram accuracy)
- Sterile plastic sampling bags with closure
- Aluminum foil for wrapping flesh
- Pieces of paper to wrap bone structures for age readings.
- Scissors

- Permanent marker
- Pencil and eraser (to fill in the fishing form)
- Fishing sheets
- Sampling protocol

Gps points of fishing stations lake A :

Seine : 51.034444, -74.427011,

51.028087, -74.42720.

Verveux : 51.031939, -74.439478

51.034937, -74.428320

Filets maillants;

51.033945, -74.433254

51.027618, -74.437401

Gps points of fishing stations lake Amont :

Seine : 50.978906, -74.532930

50.967003, -74.559677

Filets maillants;

50.973234, -74.532695

50.971077, -74.539234

Verveux

50.978176, -74.532046

50.978840, -74.537304

Exemple de fiche de pêche

Région : _____ Espèce : **Doré jaune (SAVI)**

Nom du plan d'eau : _____ Type de pêche : _____

Période du ____/____/____

Coordonnées NAD 83 degrés décimaux au ____/____/____

Lat. : _____ Numéro carte 1:50,000 _____

Long. : _____ Personne-ressource :

Numéro laboratoire MELCC	Numéro Station	Numéro Individu	Longueur maximale (mm)	Poids (g)	Sexe	**Notes**

Réservé au MELCC

Legend for anomalies to be entered in the “Notes”

DCV: Deformation of the spinal column

DN: Deformation of the fins - add the number of fins affected

DA: Deformation other, to be specified in the remarks below

PAPB: Papilloma of the mouth (mouth ulcers in catostomids)

T (T or N or C) : Tumor, specify: T: head; N: fin; C: body

PINT: Internal parasite, specify in remarks below

PEXT: External parasite, specify in remarks below

BSG: Black spots, severe infestation: distance between spots less than or equal to eye diameter, large part of body covered

COND: Extreme thinness

CHAMP: Whitish moss or patch on skin

Reference: Ministère de l'Environnement et de la Lutte contre les changements climatiques, 2022. Protocole d'échantillonnage pour le suivi des substances toxiques dans la viande de poisson de pêche sportive en eau douce, Québec, Direction générale du suivi de l'état de l'environnement, 6 pages and 3 appendices.

Stantec

Stantec is a global leader in sustainable engineering, architecture, and environmental consulting. The diverse perspectives of our partners and interested parties drive us to think beyond what's previously been done on critical issues like climate change, digital transformation, and future-proofing our cities and infrastructure. We innovate at the intersection of community, creativity, and client relationships to advance communities everywhere, so that together we can redefine what's possible.

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