



Canadian Environmental
Assessment Agency

Agence canadienne
d'évaluation environnementale

Rainy River Project

Environmental Assessment Report



January 2015

Canada 

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Rapport d'évaluation environnementale : Projet Rainy River

Executive Summary

New Gold Inc. (the proponent) is proposing the construction, operation, decommissioning and abandonment of an open-pit and underground gold mine and an onsite metal mill (the Project) located approximately 65 kilometres northwest of Fort Frances in the Township of Chapple, Ontario. Mining would occur for 15 to 20 years, with an ore production capacity of 27 000 tonnes per day (tpd). The onsite metal mill is proposed to have an ore input capacity of 21 000 tpd. The Project also involves the realignment of a portion of Highway 600 and the construction of a 230 kilovolt transmission line.

The Project is subject to an environmental assessment (EA) under the *Canadian Environmental Assessment Act, 2012* (the Act), by the Canadian Environmental Assessment Agency (the Agency), as it exceeds the following thresholds of the *Regulations Designating Physical Activities*:

- 16 (b) the construction, operation, decommissioning, and abandonment of a new metal mill with an ore input capacity of 4000 tpd or more; and
- 16 (c) the construction, operation, decommissioning, and abandonment of a new rare earth element mine or gold mine, other than a placer mine, with an ore production capacity of 600 tpd or more.

A provincial Individual EA was conducted under the Ontario *Environmental Assessment Act*. The proponent volunteered to participate in this process as a means of simultaneously meeting both federal and provincial EA requirements. Federal and provincial agencies worked to coordinate activities under the two EA processes to avoid unnecessary duplication of effort.

The Agency prepared this EA report in consultation with the public, Aboriginal groups, the Province of Ontario, Environment Canada, Fisheries and Oceans Canada, Health Canada, and Natural Resources Canada following a technical review of the proponent's Environmental Impact Statement and an evaluation of the potential environmental effects of the Project.

In conducting this EA, the Agency considered effects that the Project may have on the following components of the environment:

- those which fall within federal jurisdiction, as described in section 5(1) of the Act;
- wildlife species listed under the *Species at Risk Act* or assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC);
- those directly linked or incidental to federal decisions that enable the Project to be carried out, as described in section 5(2)(a) of the Act; and
 - those which have an effect on health, socio-economic conditions, matters of historical, archaeological, paleontological or architectural interest, or other matters of physical or cultural heritage, as described in section 5(2)(b) of the Act.

Valued components are notable features of the natural and human environment that have the potential to be impacted by the Project. The EA focused on the following valued components which fall within the categories described above:

- section 5(1) of the Act: fish and fish habitat; migratory birds; and with respect to Aboriginal peoples, current use of lands and resources for traditional purposes, health and socio-economic conditions,

physical and cultural heritage, and any structure, site or thing that is of historical, archaeological, paleontological or architectural significance;

- numerous wildlife species listed under the *Species at Risk Act* or assessed by COSEWIC; and
- section 5(2) of the Act: recreation and commercial use; amphibians and reptiles; and furbearing animals.

Other components such as the atmospheric environment, water quality and quantity, and the terrestrial landscape were also considered from a perspective of changes to the environment that can potentially affect the valued components described above.

The Agency assessed the potential for the Project to have significant adverse effects on the valued components. These evaluations were completed based on the Environmental Impact Statement provided by the proponent, advice from federal and provincial experts, independent reviews and comments provided by Aboriginal communities, and comments provided by the public through various consultation activities. Key comments from Aboriginal communities related to changes to water quality and quantity; heavy metal contamination of country foods, including fish and White-tailed Deer; and reduced access to hunting, fishing, and plant harvesting. Key comments from the public related to water contamination and the potential for bioaccumulation of contaminants in wildlife.

The Agency identified the following potential environmental effects in relation to section 5 of the Act:

- alteration and disruption of fish habitat in the Minor Creek Systems, which may impact fish, the water quantity in the Pinewood River, amphibians and reptiles, furbearers, recreation and commercial use by non-Aboriginal peoples and fishing by Aboriginal peoples;
- water taking in the Pinewood River, which may affect fish and fish habitat, and fishing by Aboriginal peoples;
- contamination into the Pinewood River and the Modified Minor Creek Systems from effluent discharge, which may impact fish and fish habitat, amphibians and reptiles, fishing by Aboriginal peoples and Aboriginal health;
- potential for acid rock drainage and metal leaching, which may impact fish and fish habitat, amphibians and reptiles, recreation and commercial use by non-Aboriginal peoples, fishing by Aboriginal peoples and Aboriginal health;
- disturbance to migratory birds and migratory bird species at risk, their eggs and their nests;
- the removal of suitable habitat for wildlife, including amphibians, reptiles and furbearers;
- the removal of land and reduced access to the land currently used for hunting and plant harvesting by Aboriginal peoples; and
- reduced access to and use of the lands, waters, wildlife and vegetation for cultural practices by Aboriginal peoples.

The proponent's project planning and design incorporated mitigation measures to prevent or reduce the adverse effects of the Project. The following highlights a number of mitigation measures in relation to effects considered in this assessment, identified by the Agency:

- fish habitat offsetting and compensation plans;

- establishment of minimum flow and level requirements for the protection of fisheries in the Pinewood River;
- treatment of mine contact water prior to discharge into the receiving environment;
- subaqueous disposal of potentially acid generating tailings (decommissioning and abandonment phase);
- provision of private lands as habitat for Eastern Whip-poor-will and Bobolink, which will also provide protection and habitat for other migratory birds;
- development of habitats capable of supporting a diversity of wildlife species when restoring disturbed habitats at decommissioning;
- development and implementation of a fugitive dust best management practices plan;
- provision of access to private lands for hunting and plant harvesting by Aboriginal peoples; and
- provision of access to the project site for ceremonial and cultural purposes by Aboriginal peoples.

The Agency identified several potential or established Aboriginal and Treaty rights held by First Nations and Métis communities that could potentially be affected by the Project, including: fishing, hunting, plant harvesting and the use of culturally important sites for ceremonial purposes. The Agency believes that the key mitigation measures serve as accommodation for these potential impacts.

The Agency has determined that the follow-up program should focus on confirming predictions of effects on valued components and effectiveness of mitigation measures.

The Agency concludes that the Rainy River Project is not likely to cause significant adverse environmental effects, taking into account the implementation of the key mitigation measures, and will make this recommendation to the Minister of the Environment. The Agency has identified key mitigation measures and follow-up program requirements for consideration by the Minister of the Environment in establishing conditions as part of the decision statement, in the event the Project is ultimately permitted to proceed.

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List of Abbreviations and Acronyms

Abbreviation/Acronym	Definition
°C	Degrees Celsius
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
EA	Environmental Assessment
EIS	Environmental Impact Statement
ha	Hectares
km	Kilometres
kV	Kilovolt
L	Litre
m	Metre
mg	milligram
mm	Millimetre
Mt	Megatonne
the Act	Canadian Environmental Assessment Act ,2012
the Agency	Canadian Environmental Assessment Agency
tpd	Tonnes per day
VC	Valued Component

Glossary

Term	Definition
Acid drainage	Acidic water (and possibly water that contains metal(s)) resulting from the chemical weathering of rock or soil material primarily caused by the oxidation of sulphide minerals. Also referred to as acid mine drainage or acid rock drainage.
Assimilative capacity	The amount of pollutants that a water body may absorb while continuing to meet water quality standards.
Backfill	The soil used to refill an excavation unit at the end of the investigations; also known as backdirt.
Baseflow	The portion of the stream discharge that is derived from natural storage (i.e. groundwater outflow and the draining of large lakes and swamps or other sources outside the net rainfall that create surface runoff); discharge sustained in a stream channel, not a result of direct runoff, and without the effects of regulation, diversion, or other works of man.
Berm	A horizontal strip or shelf built into an embankment or cut to break the continuity of the slope, usually for the purpose of reducing erosion or to increase the thickness of the embankment at a point of change in a slope or define water surface elevation. A horizontal step in the sloping profile of an embankment dam. A shelf that breaks the continuity of a slope, or artificial ridge of earth. A ledge or shoulder, as along the edge of a road or canal. An artificial ridge of earth.
Channel	Natural or artificial watercourse of perceptible extent, with a definite bed and banks to confine and conduct continuously or periodically flowing water. Rivers and streams or a general term for any natural or artificial facility for conveying water.
Contact water	Water that comes into contact with mine infrastructure
Culvert	A conduit, usually covered by fill, whose primary function is to convey surface water through an embankment.
Cyanidation	A method of extracting exposed gold or silver grains from crushed or ground ore by dissolving it in a weak cyanide solution. May be done in tanks inside a mill or in heaps of ore out of doors.
Effluent	An effluent – hydrometallurgical facility effluent, milling facility effluent, mine water effluent, tailings impoundment area effluent, treatment pond effluent, seepage and surface drainage, treatment facility effluent other than effluent from a sewage treatment facility – that contains a deleterious substance.” (Metal Mining Effluent Regulations)
Environmental design flood	The minimum design flood criteria standard is the 100-

Term	Definition
	year flood which is the peak or flood flow with one chance in one hundred of occurring in any given year.
Erosion	The wearing away of the land surface by running water, wind, ice or other geological agents, including such processes as gravitational creep. Geological erosion is natural occurring erosion over long periods of time.
Flotation	A milling process using surface active chemicals to selectively modify some mineral surfaces causing them to become attached to air bubbles and float, while others do not and sink. This process allows the selective concentration and recovery of the valuable minerals. Pre-treatments include grinding and addition of the reagents.
Fugitive dust	Emissions that escape from industrial processes and equipment and are not controlled or collected. Stone dust, fly ash, soot, and unburned droplets of fuel oil are the main types of particulate resulting from the operation of hot-mix asphalt paving plants.
Freshet	The flood of a river from heavy rain or melted snow.
Groundwater recharge	The inflow to a groundwater reservoir.
Hydroseeded	To sow (a field, a lawn, etc.) with seed by distribution in a stream of water propelled through a hose.
Leaching	A chemical process for the extraction of valuable minerals from ore. Also, a natural process by which groundwater dissolve minerals, thus leaving the rock with a smaller proportion of some of the minerals than it contained originally.
Low-grade ore	Extracted ore with a lower gold content.
Minor Creek Systems	The four minor creek systems in the pre-disturbance state that drain the project site and flow into Pinewood River, including Clark Creek and Teeple Drain, West Creek, Marr Creek, and Loslo Creek and Cowser Drain.
Modified Minor Creek Systems	The remainder of the pre-disturbance Minor Creek Systems and any new channels or ponds following construction of the project site, including West Creek Diversion Channel; Stockpile Pond Diversion Channel; Clark Creek Diversion Channel; West Creek Pond; Stockpile Pond; Clark Creek Pond; Teeple Road Pond; Loslo Creek downstream of the constructed wetland; and the unidentified creek linking Teeple Pond to Pinewood River.
Project site	The geographic area occupied by the Designated Project under the control of the Proponent.
Reverse circulation drilling	Obtains samples using two coaxial pipes and a tricone bit. Air and water are injected between the pipes to the bit and clay to pebble-sized sediment particles and cm-

Term	Definition
	sized cuttings of boulders and bedrock are flushed instantly through the center pipe to surface where they are logged and bulk samples are collected.
Seepage	The appearance and disappearance of water at the ground surface. Seepage designates the type of movement of water in saturated material. It is different from percolation, which is the predominant type of movement of water in unsaturated material.
Slough	A place of deep mud or mire.
Spillway	A structure that passes normal and/or flood flows in a manner that protects the structural integrity of the dam. Overflow channel of a dam or impoundment structure. A structure over or through which flow is discharged from a reservoir. If the rate of flow is controlled by mechanical means such as gates, it is considered a controlled spillway. If the geometry of the spillway is the only control, it is considered an uncontrolled spillway. Any passageway, channel, or structure designed to discharge surplus water from a reservoir.
Stope	A usually step like excavation underground for the removal of ore that is formed as the ore is mined in successive layers.
Tailings	The waste material and water mixture that is left over after the mill removes the valuable rocks. The rock material in tailings is usually the size of sand grains or smaller.
Thicket	A group of bushes or small trees that grow close together.
Total particulate matter	Total suspended particulate matter less than 44 microns in diameter. The portion that is between 10 and 44 microns in size is too large to be inhaled; its worst effect would be soiling of materials (houses, cars, etc.) and would originate from sources such as wind-blown dust from stockpiles.
Trophic levels	Levels of the food chain. The first trophic level includes photosynthesizers that get energy from the sun. Organisms that eat photosynthesizers make up the second trophic level. Third trophic level organisms eat those in the second level, and so on. It is a simplified way of thinking of the food web. In fact, some organisms eat members of several trophic levels.
Ungulates	Animals that have hooves, such as moose and deer.

1 Introduction

1.1 Purpose of the Environmental Assessment Report

New Gold Inc.(the proponent) is proposing the construction, operation, decommissioning and abandonment of an open-pit and underground gold mine and an onsite metal mill (the Project) located approximately 65 kilometres (km) northwest of Fort Frances in the Township of Chapple, Ontario. Mining would occur for 15 to 20 years, with an ore production capacity of 27 000 tonnes per day (tpd). The onsite metal mill is proposed to have an ore input capacity of 21 000 tpd. The Project, as proposed, also involves the realignment of a portion of Highway 600 and the construction of a 230 kilovolt (kV) transmission line.

The purpose of this environmental assessment (EA) report is to provide a summary of information and analysis considered by the Canadian Environmental Assessment Agency (the Agency) in reaching its conclusion in accordance with the *Canadian Environmental Assessment Act, 2012* (the Act) on whether the Project is likely to cause significant adverse environmental effects, after taking into account the proposed mitigation measures. Proposed mitigation measures and commitments made by the proponent can be found in Appendix A. This report will form the basis of the Agency's recommendation to the Minister of the Environment for her decision in relation to the Project.

1.2 Scope of Environmental Assessment

1.2.1 *Environmental assessment requirements*

The Project is subject to the Act because it involves activities that are designated by the *Regulations Designating Physical Activities* (the Regulations). Specifically, the Project includes the construction, operation and decommissioning of a new metal mill and of a gold mine that meet the descriptions and thresholds set out in items 16(b) and 16(c) of the schedule to the Regulations:

- 16 (b) the construction, operation, decommissioning, and abandonment of a new metal mill with an ore input capacity of 4000 tpd or more; and
- 16 (c) the construction, operation, decommissioning, and abandonment of a new rare earth element mine or gold mine, other than a placer mine, with an ore production capacity of 600 tpd or more.

Based on the project description submitted by the proponent, the Agency initiated a screening of the designated project in accordance with sections 8 – 12 of the Act to determine if an EA was required. On September 4, 2012, the Agency posted a notice on the Canadian Environmental Assessment Registry Internet Site and invited the public to provide comments by September 24, 2012 on the designated project and its potential effects on the environment. The Agency determined on October 18, 2012, that an EA was required.

The Project was also subject to an individual EA under the Ontario *Environmental Assessment Act*. The proponent volunteered to participate in this process as a means of simultaneously meeting both federal and provincial EA requirements.

The federal and provincial governments collaborated during the technical review of the Environmental Impact Statement (EIS) and coordinated public and Aboriginal consultation efforts to ensure an effective and efficient EA and consultation process.

1.2.2 *Environmental effects assessed*

As required under the Act, the federal EA has examined the significance of potential adverse environmental effects of the Project that are within federal jurisdiction, which includes:

- fish and fish habitat and other aquatic species;
- migratory birds;
- federal lands;
- effects that cross provincial or international boundaries; and
- effects that impact on Aboriginal peoples, such as their use of lands and resources for traditional purposes.

The federal EA also considered the adverse effects of the Project on wildlife species listed on the *Species at Risk Act* and their critical habitat, as well as effects on species assessed by the Committee on the Status of Endangered Wildlife (COSEWIC) in Canada.

The following decisions under other federal legislation would also be required before the Project could proceed:

- an authorization under section 35 of the *Fisheries Act* for the serious harm to fish within part of the Minor Creek Systems;
- an amendment to Schedule 2 of the *Metal Mining Effluent Regulations* pursuant to subsection 36(5) of the *Fisheries Act* for the disposal of mine waste into fish frequented waters; and
- a licence under paragraph 7(1)(a) of the *Explosives Act*.

Therefore, in accordance with subsection 5(2) of the Act, the federal EA considered changes to the environment that might result from these decisions as well as any associated effects on health, socio-economic conditions, matters of historical, archaeological, paleontological or architectural interest, or other matters of physical or cultural heritage.

1.2.3 *Factors considered during the assessment*

In accordance with section 19 of the Act, the federal EA considered:

- changes to the Project that may be caused by the environment;
- the effects of malfunctions or accidents that may occur in connection with the Project on components of the environment within federal jurisdiction;
- any cumulative effects on components of the environment within federal jurisdiction that are likely to result from the project in combination with other physical activities that have been or will be carried out;
- the significance of the environmental effects of the project;

- comments from the public;
- technically and economically feasible measures to mitigate any significant adverse environmental effects of the project;
- the requirements of a follow-up monitoring program for the Project;
- the purpose of the Project;
- alternative means of carrying out the Project that are technically and economically feasible and the effects of these alternatives on components of the environment within federal jurisdiction; and
- any other matter that the Agency determines is relevant to the EA.

The federal EA also takes into account comments from the public, community knowledge, and Aboriginal traditional knowledge.

Expert federal departments provided specialist or expert information or knowledge relevant to the Project in accordance with section 20 of the Act. The following federal authorities provided advice in relation to the review of the proponent's EIS and the preparation of this EA report: Fisheries and Oceans Canada, Environment Canada, Health Canada, and Natural Resources Canada.

1.2.4 *Selection of valued components*

The scoping process sets the limits of an EA, and focuses the study on relevant factors and concerns, which were outlined in the Environmental Impact Statement Guidelines.

<http://www.ceaa.gc.ca/050/documents-eng.cfm?evaluation=80007>

In determining the potential for significant environmental effects, the EA focused on those components of the environment, described under "Factors Considered" (section 1.2.3), which have particular value or significance and are likely to be impacted by the Project. Valued components (VCs) refer to components of the environment that are valued in their role in the ecosystem and have value placed on them by humans. A selection of VCs associated with the Project has been identified to be of concern to the proponent, government agencies, Aboriginal peoples and the public.

The VC selection process by the proponent included consideration of the temporal and spatial scope of the Project and anticipated project-environment interactions. It also was informed by data from environmental and socio-economic baseline studies (including personal interviews and literature sources), feedback received from the public and Aboriginal groups, and discussion with government authorities. The proponent assessed the natural environment holistically, selecting VCs in order to assess broad ecosystem components and species groups rather than focusing on more specific ecosystem components and species, with the exception of federally and provincially identified species-at-risk (species at risk) and other rare species where individual species were assessed.

The Agency focused on VCs that pertain to the prediction of environmental effects on fish and fish habitat, migratory birds, and Aboriginal peoples (as defined in section 5(1) of the Act) in its analysis of significance (Table 1).

The Agency also considered VCs that pertain to the prediction of environmental effects on recreation and commercial use, amphibians and reptiles, furbearers, and migratory bird habitat (as defined in section 5(2) of the Act). These VCs were included in the analysis of significance because federal

authorizations and approvals may be required for the Project. A *Fisheries Act* authorization is required for the serious harm to fish within part of the Minor Creek Systems. In order to allow for the disposal of mine waste into fish frequented waters, an amendment to Schedule 2 of the Metal Mining Effluent Regulations (Metal Mining Effluent Regulations) (pursuant to subsection 36(5) of the Fisheries Act) is also required.

The Agency also considered the prediction of environmental effects to species at risk as defined in section 79(2) of the *Species at Risk Act* or those assessed by COSEWIC.

Other components identified by the proponent, (i.e., air quality, and water quality and quantity) were examined from a perspective of changes to the environment that can potentially affect the VCs listed under section 5 of the Act and section 79(2) of the *Species at Risk Act*.

The VCs analyzed by the Agency and the corresponding VCs selected by the proponent are presented in Table 1.

Table 1 Potentially Affected Valued Component

Valued Component	Selected (Yes or No)?	Rationale	Corresponding Valued Components identified by the Proponent
Effects identified under Section 5(1) of the Act			
Fish and fish habitat	Yes	Effects on water quality and quantity and removal of fish habitat.	<ul style="list-style-type: none"> • Pinewood River • Minor Creek Systems
Aquatic species	No	Aquatic species at risk as defined under <i>the Species at Risk Act</i> not present in the project site.	
Migratory birds	Yes	Effects on migratory bird populations.	<ul style="list-style-type: none"> • Migratory birds •
Health and socio-economic conditions of Aboriginal peoples	Yes	Changes to water and air quality causing changes to Aboriginal health. Changes to Aboriginal community activities from a commercial perspective.	<ul style="list-style-type: none"> • Human health • Hunting • Trapping • Fishing • Traditional plant harvesting
Current use of lands and resources for traditional purposes by Aboriginal peoples	Yes	Changes to the environment causing a change in the use of lands for traditional purposes.	<ul style="list-style-type: none"> • Traditional hunting • Traditional fishing • Trapping • Traditional plant harvesting
Physical or cultural heritage and effects on historical, archaeological, paleontological or architectural sites or structures of Aboriginal peoples	Yes	Changes in the environment causing changes on physical and/or cultural heritage of importance to Aboriginal communities.	<ul style="list-style-type: none"> • Cultural heritage resources
Effects identified under Section 5(2) of the Act			
Migratory birds	Yes	Effects on migratory bird habitat.	<ul style="list-style-type: none"> • Migratory birds
Recreation and commercial use	Yes	Effects on the Richardson Trail caused by the destruction of the Minor Creek Systems approved under <i>Metal Mining Effluent Regulations</i> . Effects on recreational and commercial use caused by the destruction of the Minor Creek Systems authorized under the <i>Fisheries Act</i> and approved under the <i>Metal Mining Effluent Regulations</i> .	<ul style="list-style-type: none"> • Recreational uses by non-Aboriginal peoples • Trapping • Hunting • Fishing

Valued Component	Selected (Yes or No)?	Rationale	Corresponding Valued Components identified by the Proponent
Amphibians and reptiles	Yes	Effects on amphibians and reptiles and their habitat caused by destruction of the Minor Creek Systems authorized under the <i>Fisheries Act</i> and approved under <i>Metal Mining Effluent Regulations</i> .	<ul style="list-style-type: none"> • Minor Creek Systems • Pinewood River
Furbearers	Yes	Effects on furbearers and their habitat caused by destruction of the Minor Creek Systems authorized under the <i>Fisheries Act</i> and approved under the <i>Metal Mining Effluent Regulations</i> .	<ul style="list-style-type: none"> • Minor Creek Systems • Pinewood River
Effects identified under Section 79(2) of the Species at Risk Act			
Federal species at risk		Effects on specific species which are federally listed under the <i>Species at Risk Act</i> .	<ul style="list-style-type: none"> • Ontario Endangered Species Act species • Species of special concern and provincially rare species

1.2.5 Spatial and temporal boundaries by proponent

Temporal boundaries are defined based on the timing and duration of project activities that could adversely affect the environment. The purpose of the temporal boundaries is to identify when an effect may occur in relation to specific project phases and activities. In general, temporal boundaries for this assessment include the construction, operation, decommissioning, and abandonment phases of the Project.

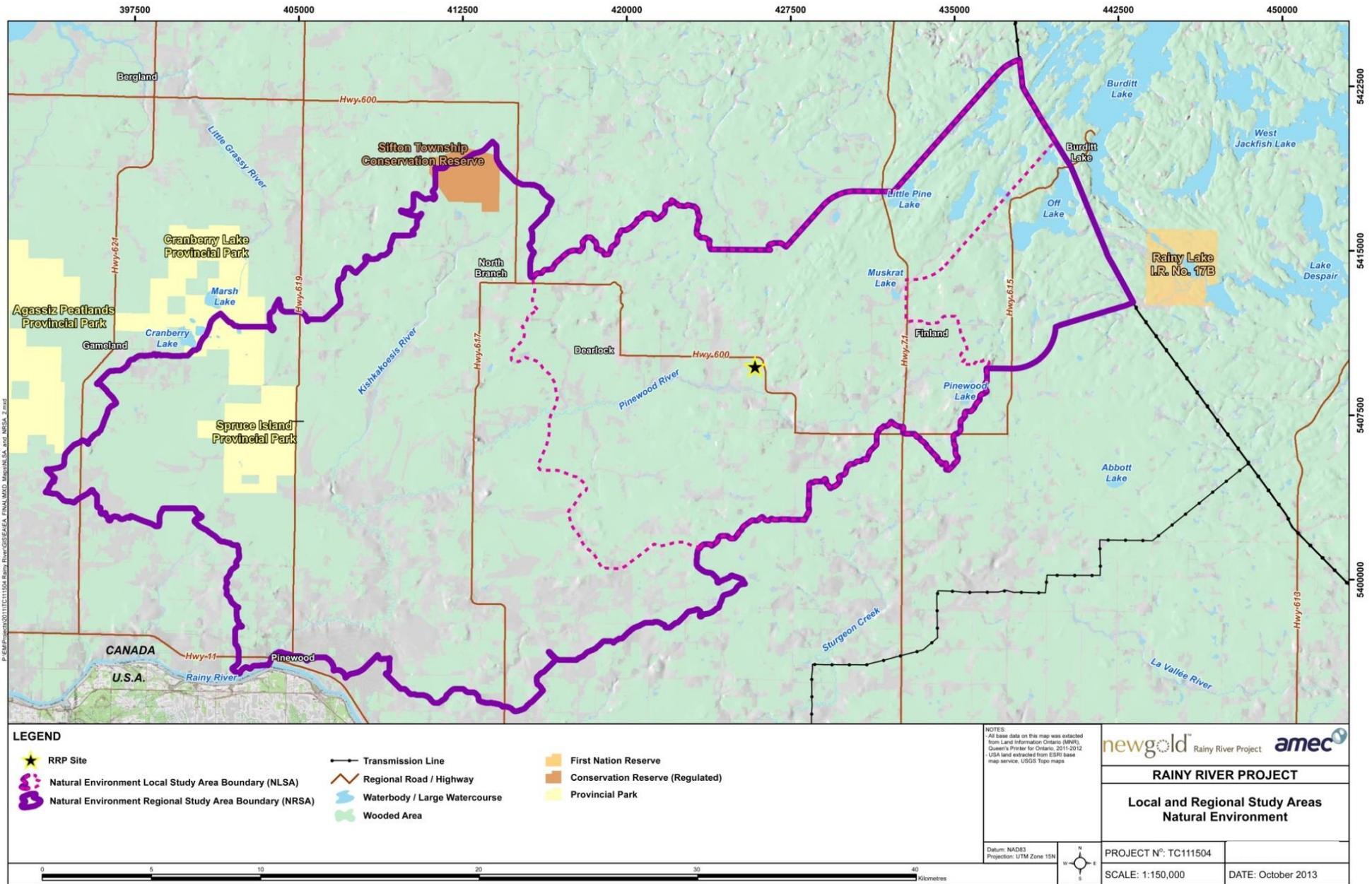
The EIS indicates that the smaller Natural Environment Local Study Area is nested within a larger Natural Environment Regional Study Area (Figure 1). The Natural Environment Local Study Area has been defined as the Upper Pinewood River, including all lands and waters within the watershed upstream of, and including McCallum Creek and Tait Creek tributary sub-watersheds. It includes a one kilometre buffer bordering the northern margin of the watershed to account for minor road allowance excursions beyond the watershed boundary at some locations, and a four kilometre (km) buffer of the proposed 230 kV transmission line. It measures 27 000 hectares (ha) and includes approximately 36 percent of the upper Pinewood River watershed. The Natural Environment Regional Study Area includes the entire Pinewood River watershed with the corridor extension to the northeast to accommodate transmission line routing alternatives. The Natural Environment Regional Study Area boundary encompasses a total area of 69 000 ha.

The proponent expects all reasonably measurable project-related effects to the terrestrial environment to occur within the Natural Environment Local Study Area, including those effects on wildlife populations related to air quality and sound emissions. Reasonably measurable project-related effects on the aquatic environment are also expected to occur mainly within the Natural Environment Local

Study Area, but may extend into the Natural Environment Regional Study Area. The Natural Environment Regional Study Area was included as a study area as Fisheries and Oceans Canada and the Ministry of Natural Resources and Forestry requested that the effect of water taking for the onsite metal mill on aquatic habitats in the middle and lower reaches of the Pinewood River be assessed.

The EIS indicates that the Human Environment Local Study Area is the area immediately surrounding the project site, set back sufficiently to include any properties, persons, and activities that could reasonably be expected to experience any environmental effect, such as those related to land use disruption, sound and air quality emissions, groundwater well function, recreation and commercial use, and traditional land use. Project effects to persons, properties, and activities outside of the Human Environment Local Study Area are encompassed in the Human Environment Regional Study Area (Figure 2). The Human Environment Regional Study Area includes Aboriginal and non-Aboriginal communities generally within a 100 km driving distance from the Project. In addition, the Lac La Croix and Seine River First Nations were included by the proponent as they have direct socio-economic interest in the Project

Figure 1: Local and Regional Natural Environment Study Areas



Source: Rainy River EIS, AMEC.

1.2.6 *Methodology and approach*

The Agency reviewed the EIS, additional information requested from the proponent, public and Aboriginal comments received, and the views of federal, provincial and other experts. The Agency examined the predicted changes to the physical environment. The Agency then assessed the environmental effects on chosen VCs in terms of magnitude; geographic extent; duration; frequency; and whether the environmental changes are reversible or irreversible, based on the direct effects from the Project and those effects that may result from predicted changes to the environment.

The Agency's conclusions for the assessment of key VCs are presented and based on the methodology and criteria developed by the proponent in accordance with the Agency's *Reference Guide: Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects*.

For each VC, the following criteria were used to evaluate the predicted degree of effects after mitigation:

- Magnitude is a measure of a given key indicator representing the potential effect after mitigation relative to the baseline condition.
- Extent is the geographic area over which an effect will occur.
- Duration is the period of time over which an effect will occur.
- Frequency is how often an effect will occur within a given time period.
- Reversibility is the degree to which the effect can or will be reversed.
- Natural environment context and socio-economic environment context.

Criteria are categorized into three levels. Level I indicates a negligible or limited potential to contribute to a significant effect, Level II represents an intermediate or moderate potential, and Level III indicates a high potential to contribute to a significant effect.

Effects are considered significant if a Level II or III rating is assigned to each of the following attributes: magnitude, geographic extent, duration, and frequency and a Level II or III rating is assigned to either natural environment or socio-economic environment context. Effects are considered insignificant if a Level I rating is assigned to any of the following attributes: magnitude, geographic extent, duration, or frequency; or if a Level I rating is assigned to both natural environment and socio-economic environment contexts. See Appendix B for a summary of the residual effects assessment. The criteria used to determine potential for an adverse environmental effect, such as magnitude, geographic extent, duration, frequency, and reversibility are described in detail in Appendix C.

2 Project Overview

2.1 Location

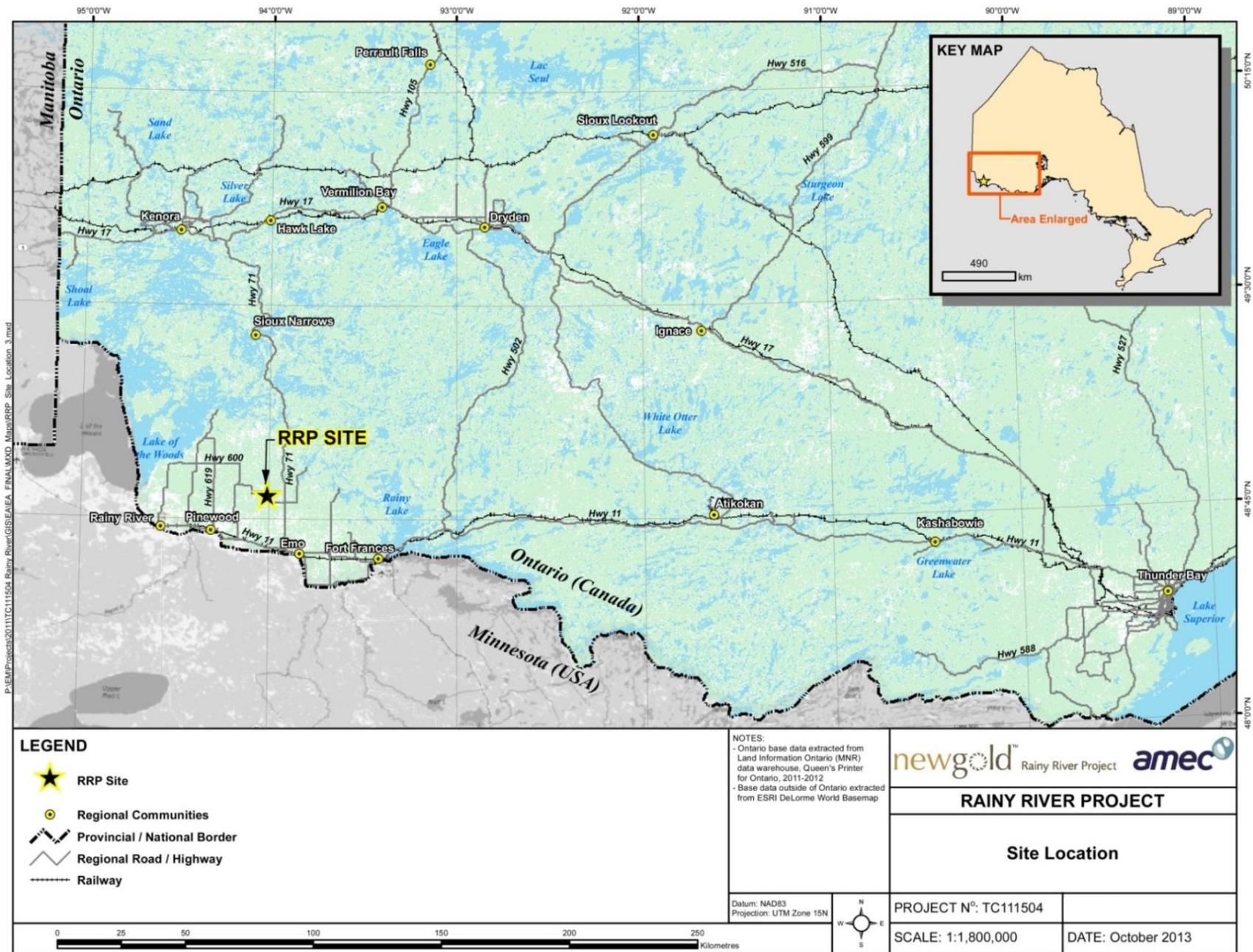
The Project is located in the Township of Chapple, District of Rainy River, in northwestern Ontario, approximately 65 km northwest of Fort Frances, and 420 km west of Thunder Bay (Figure 3).

2.2 Project Components

Components of the Project (Figure 4) include:

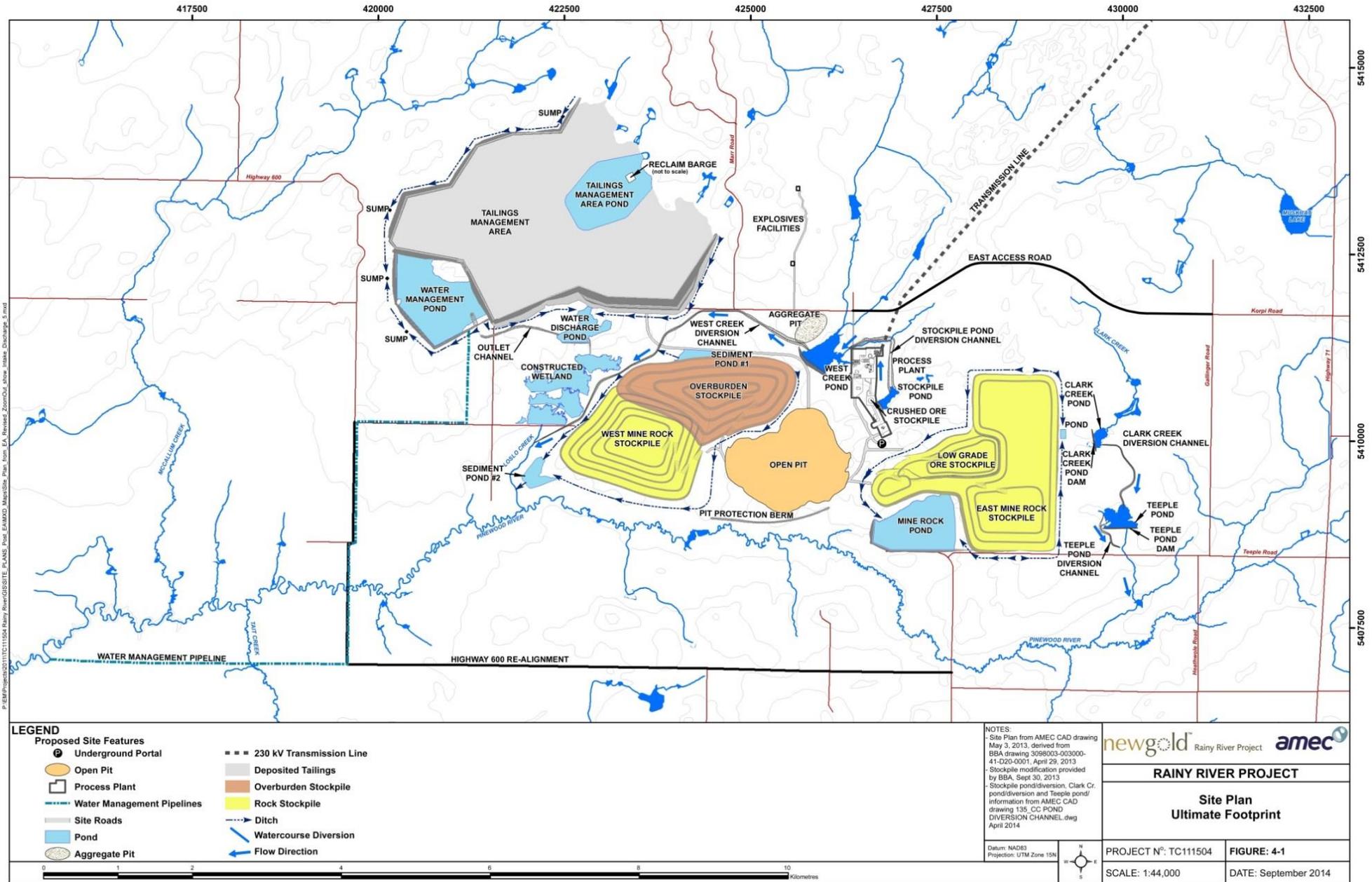
- **Open pit.** The open pit will be approximately 170 hectares (ha) in surface area and 400 metres (m) deep. Mining is proposed to occur at an ore production capacity of up to 21 000 tonnes per day (tpd) over the life of the mine (with a contingency of up to 20 percent, the ore production capacity of the open pit will be 25 200 tpd).
- **Underground mine.** The underground mine will be approximately 800 m deep. Mining is proposed to occur at an ore production capacity of 1500 tpd (with a contingency of up to 20 percent, the ore production capacity of the underground mine will be 1800 tpd).
- **Overburden stockpile.** (approximately 70 to 80 megatonnes (Mt)) and mine rock stockpiles (approximately 350 to 400 Mt). Low grade and high grade ore will be stockpiled during operation;
- **Primary crusher and onsite metal mill.** Ore will be crushed and processed onsite to produce doré (gold with silver) bars for shipment offsite.
- **Tailings management area.** The tailings management area will be approximately 800 ha to provide a storage capacity of 115 Mt for tailings over the projected mine life. The maximum projected dam heights are expected to be in the range of 20 to 25 m above grade.
- **Water collection, management, distribution, and treatment systems.** The water management plan design will rely on recycling water from various constructed ponds for process water and excess water storage uses to reduce the need for fresh water.
- **Transmission line.** The new 230 kV transmission line will connect to the existing Hydro One Networks Inc. line approximately 17 km northeast of the proposed project site.
- **Highway realignment.** Realignment of 11 km of the gravel-surfaced Highway 600 will be required, and provincial approvals needed, to fully access the ore body.
- **Road development.** The new East Access Road will provide continued access to Marr Road properties that would otherwise be disrupted by the project development.
- **Aggregate operations.** Aggregate is needed to supply construction materials for mine and road development.
- **Associate buildings, facilities, and infrastructure.** These will include a maintenance garage, a warehouse and administration complex, a fuel storage and refuelling area, laydown area(s), access roads and non-hazardous waste facilities.
- **Explosives manufacturing and storage facilities.** Explosives will be required in order to extract rock in the open pit and underground mines, and potentially at quarries, if developed.

Figure 3: Project Location



Source: Rainy River EIS, AMEC

Figure 4: Project Components



Source: Rainy River EIS, AMEC

2.3 Project Activities

Key activities associated with construction, operation, decommissioning, and abandonment of the Project are listed below.

Construction phase

- Procurement and movement of construction materials to identified laydown areas;
- Initiation of open pit mine development and portal development for underground mining operations;
- Preparation of onsite mineral waste handling facilities, including tailings management area dams;
- Establishment of watercourse diversions, intake structures, and site drainage works;
- Construction of associated buildings and facilities, and a fuel tank farm;
- Construction of explosives manufacturing and storage facilities;
- Construction of the Highway 600 realignment and Pinewood River crossing, the East Access Road, and redirection of local traffic; and
- Construction and energizing of a 230 kV transmission line.

Operations phase

- Ore and mine rock extraction;
- Ore processing;
- Mineral waste management (overburden, mine rock stockpiles, and tailings);
- Water collection, management, distribution, and treatment; and
- Progressive site reclamation where practical.

Decommissioning phase

- Project infrastructure (e.g., buildings, machinery, equipment) to be removed;
- An onsite demolition landfill for non-hazardous waste generated by mine closure;
- Tailings management area to be saturated to reduce the potential for acid rock drainage and metal leaching by restricting oxygen contact with the tailings surface;
- Overflow spillway(s) to be developed or deepened to ensure drainage of excess runoff in the tailings management area;
- Natural flooding of the open pit and underground mine (potential for enhanced flooding of open pit);
- Removal of the 230 kV transmission line, unless another owner requires its use;
- Closure and reclamation of the various project components (associated buildings, facilities and infrastructure such as a maintenance garage, warehouse and administration complex, fuel storage and refuelling area, laydown area(s), explosives manufacturing and storage facilities);
- Progressive rehabilitation of mine rock and overburden stockpiles where practical (overburden and vegetation for non-potentially acid generating mine rock and multi-layered cover for east mine rock stockpile to control Acid Rock Drainage and Metal Leaching);
- Watercourse diversions and realigned Highway 600 will remain in place; and
- Ongoing environmental monitoring and site management.

Abandonment phase

- Ongoing environmental monitoring and site management until passive flooding of the open pit is complete.

2.4 Schedule

Construction, which the proponent expects to last two years, is proposed to start after completion of the federal and provincial EA processes and once applicable federal and provincial regulatory approvals and permits have been obtained. The operation phase is planned to start in 2016 and continue for 16 years. Active closure and decommissioning are therefore anticipated to begin in 2032 and continue actively for approximately two years. This will be followed by the abandonment phase of approximately 94 years while the open pit is flooding. This will include a final period of environmental monitoring and site management (of less than one year) once the pit is fully flooded in accordance with the mine closure plan filed under the Ontario *Mining Act* to return the leased lands back to the Crown.

3 Project Justification and Alternatives

3.1 Purpose of the Project

The Environmental Impact Statement (EIS) indicates that the purpose of the Project is to meet the strong demand for gold in the global marketplace and that there is a local and regional need in northwestern Ontario for economic development. The proponent expects the Project to have a positive economic influence on the region, providing construction and permanent employment opportunities for a large number of people. The region has experienced recent declines in both employment and population, in large part related to the downturn of the forestry industry.

3.2 Alternative Means of Carrying Out the Project

In accordance with paragraph 19(1)(g) of the Act, the proponent assessed alternative means of carrying out the Project that are technically and economically feasible and the environmental effects of any such alternative means. The proponent considered alternative methods for construction, operation, decommissioning, and abandonment of:

- mining;
- mine water management;
- mine rock and overburden management;
- processing;
- onsite metal mill effluent management;
- tailings management;
- onsite metal mill complex;
- explosives facility;
- aggregates;
- water supply;
- Highway 600 realignment;
- power supply; and
- transmission line rerouting.

The EIS indicates the following performance objectives to distinguish between individual alternatives:

- cost-effectiveness;
- technical applicability and system integrity and reliability;
- ability to service the site effectively;
- effects to the VCs; and
- amenability to reclamation.

The EIS indicates that each performance objective was evaluated using a distinct set of criteria and indicators to help rate the predicted performance of each alternative at a level of preferred, acceptable,

or unacceptable. It describes a comparative evaluation of the advantages and disadvantages of each alternative method and takes into account the relative importance of the individual performance objectives listed above. Alternatives rated “unacceptable” in any single performance objective were rejected by the proponent.

An alternatives assessment for disposal of mine waste (i.e. effluent, tailings, waste rock, low grade ore, and overburden) also was undertaken according to Environment Canada’s *Guidelines for the Assessment of Alternatives for Mine Waste Disposal*¹ (Environment Canada 2013) which involves a multi-step assessment of the mine waste disposal alternatives based on a multi-criteria decision analysis to identify disposal areas for three types of mine waste (non-potentially acid generating waste rock and overburden, potentially acid generating waste rock, and tailings). This assessment was required because the proposed mine waste disposal areas would directly impact Loslo Creek and Marr Creek. In order to allow for the disposal of mine waste into fish frequented waters, an amendment to Schedule 2 of the *Metal Mining Effluent Regulations* (pursuant to subsection 36(5) of the *Fisheries Act*) is required.

The EIS also describes the assessment of the alternative methods of decommissioning the open pit, underground mine rock stockpiles, tailings management area, buildings and equipment, and drainage.

Appendix D describes in greater detail the alternative means considered for the project components; their economic and technical feasibility; environmental considerations; and the preferred options in carrying out the Project.

3.2.1 *Comments received*

Government authorities

The Ministry of Natural Resources and Forestry expressed concerns about the proponent’s evaluation of transmission line route alternatives. It requested details about the rationale behind the proponent’s selection of its preferred transmission line alternative and public consultation on the provision of any additional information. The proponent provided a supplemental report that outlined additional details and presented figures supporting the selection of its preferred alternative. In addition, the proponent conducted consultations with the public and local Aboriginal communities on the supplemental report.

Aboriginal communities

Aboriginal communities did not express any concern about the alternatives assessment.

Public

Public comments were not received in relation to the alternatives assessment.

¹ <http://www.ec.gc.ca/pollution/default.asp?lang=En&n=125349F7-1&offset=1&toc=show>

Agency analysis and conclusion

The proponent's alternatives assessment considered matters such as managing the footprint of the Project, reducing the quantities of mine rock generated, eliminating or managing direct releases of effluents to the environment, and loss of fish habitat. The Agency notes that the alternatives assessment for mine waste disposal was undertaken according to Environment Canada's *Guidelines for the Assessment of Alternatives for Mine Waste Disposal* (Environment Canada 2013). The proponent has responded to the Ministry of Natural Resources and Forestry in relation to the siting of the transmission line. The proponent committed to meeting applicable federal and provincial guidelines for the protection of aquatic life, or other scientifically defensible alternatives, in the receiving water body, as well as any site-specific approval requirements established by Environment Canada and the Ministry of the Environment and Climate Change.

The Agency is satisfied that the proponent has sufficiently assessed alternative means of carrying out the project.

4 Consultations Activities and Advice Received

The Agency coordinated public and Aboriginal consultation opportunities, to the extent possible, with the Province of Ontario. For the purposes of the federal environmental assessment (EA), the Agency served as the Crown Consultation Coordinator. The Ministry of the Environment and Climate Change was the lead on consultation activities for the provincial EA, while the Ministry of Northern Development and Mines was the coordinator for provincial Crown consultation activities.

4.1 Aboriginal Consultations

4.1.1 *Consultation Aboriginal consultation in the environmental assessment process*

The federal government has a duty to consult with Aboriginal groups when it proposes to take an action or make a decision that might adversely affect established or potential Aboriginal or Treaty rights. Where appropriate, the federal government accommodates these interests. The Act facilitates consideration of these impacts on Aboriginal groups by requiring that all federal EAs consider the effect of any project-related effects on their health and socio-economic conditions, physical and cultural heritage, the current use of lands and resources for traditional purposes, and changes to any structure, site or thing that is of historical, archaeological, paleontological or architectural significance to them. Aboriginal consultation is also an important part of good governance and sound policy development and decision making.

The Agency identified 16 Aboriginal groups whose potential or established Aboriginal and Treaty rights could be adversely impacted by the Project:

- Rainy River First Nation
- Naicatchewenin First Nation
- Anishinaabeg of Naongashiing First Nation (Big Island)
- Big Grassy River First Nation
- Ojibways of Onigaming First Nation
- Naotkamegwanning First Nation (Whitefish Bay)
- Métis represented by the Métis Nation of Ontario Region 1 Consultation Committee
- Mitaanjigamiing (Stanjikoming) First Nation
- Couchiching First Nation
- Buffalo Point First Nation
- Northwest Angle #33
- Northwest Angle #37
- Anishinabe of Wauzhushk Onigum (Rat Portage)
- Lac La Croix First Nation
- Seine River First Nation
- Nigigoonsiminikaaning First Nation

The Agency supports Aboriginal participation through its Participant Funding Program. Funds were provided to reimburse eligible expenses of Aboriginal groups that participated in the EA. Nine identified Aboriginal groups applied for and received funding through this program (Whitefish Bay, Big Grassy River, Métis Nation of Ontario Region 1 Consultation Committee, Naicatchewenin, Rainy River, Couchiching, Mitaanjigamiing, Nigigoonsiminikaaning, and Seine River). In total, the Agency awarded \$156 540.37 to support Aboriginal participation in the EA.

The Agency consulted all sixteen Aboriginal groups through a variety of methods including phone calls, emails, letters, and in-person meetings. The Agency requested written comments from Aboriginal groups on the project description, the draft environmental impact statement (EIS) Guidelines, the EIS Summary, and the draft EA report (Table 2). The Agency provided regular updates to the Aboriginal groups to keep them informed of key developments and to solicit feedback.

Table 2 Aboriginal and Public Comment Opportunities

Document or Subject of Consultation	Dates
Summary of the Project Description	September 4, 2012 to September 24, 2012
Draft EIS guidelines	October 19, 2012 to November 19, 2012
EIS/EA report summary	January 17, 2014 to February 17, 2014
Draft EA report	October 9, 2014 to November 8, 2014

The Agency held meetings during the review of the EIS with Aboriginal groups, the proponent, and representatives from the province. These sessions provided an opportunity for members of Aboriginal communities (or in some cases, Chief and Council) to hear presentations on the EA and the proponent's EIS and to provide comments. Comments and additional information provided by the proponent were considered in the Agency's analysis.

Potential effects on Aboriginal peoples are discussed in sections 7.3, 7.4 and 7.5. Appendices E and J contain a summary of concerns raised by the Aboriginal groups during the EA process and the proponent's or Agency's responses, as appropriate. All comments have been considered in developing this EA report.

4.1.2 *Proponent's Aboriginal consultation and engagement activities*

The EIS indicates that the proponent engaged all Aboriginal communities identified by the Agency to discuss issues and offered Aboriginal communities financial support for conducting traditional knowledge and land use studies and reviewing the EIS. The proponent conducted archeological studies and reviewed previous studies related to Aboriginal use of the project site. The proponent also presented information to Aboriginal communities on the fish habitat compensation plan for the loss of habitat resulting from the use of water bodies for mine waste disposal.

The proponent indicated that it signed agreements with some of the Aboriginal groups, including data-sharing protocols, memoranda of understanding, and impact benefit agreements.

The EIS indicates that through funding from the proponent, Pwi-Di-Goo-Zing Ne-Yaa-Zhing Advisory Services, on behalf of Big Grassy River First Nation, Couchiching First Nation, Lac La Croix First Nation, Mitaanjigamiing First Nation, Naicatchewenin First Nation, Rainy River First Nation, and Seine River First Nation, contracted Dillon Consulting Limited to conduct a high-level technical review of the EIS. Elders, youth, hunters, consultation coordinators, and other community knowledge holders from the above-mentioned communities participated in a workshop to help identify the knowledge, values, and priorities held by these First Nations, and to discuss issues, concerns, and opportunities associated with the Project. Comments from the technical review completed on behalf of these First Nations were then considered and incorporated into the EIS and in the Agency's analysis.

4.2 Public Consultation

The Agency provided four opportunities for the public to participate in the EA process:

- An opportunity to comment on the Project Description;
- An opportunity to comment on the draft EIS Guidelines;
- An opportunity to comment on the summary of the proponent's EIS; and
- An opportunity to comment on the draft EA report.

Notices of these opportunities to participate were posted on the Canadian Environmental Assessment Registry Internet Site and advertised through local media.

Groups who participated in the consultations include: the Townships of Emo, Alberton, Dawson, Lake of the Woods, La Vallee, Morley, and Chapple; the Town of Fort Frances; the Rainy River Future Development Corporation; Resolute Products Inc.; and the United Native Friendship Centre.

The Agency supported public participation through its Participant Funding Program. A total of \$9 840 was allocated to the Rainy River Soil and Crop Improvement Association.

Hardcopies of the draft EIS Guidelines, EIS Summary, and draft EA report were made available at public viewing centres in the Towns of Barwick, Rainy River, Fort Frances, Emo and Atikokan. During the review of the EIS, the Agency conducted two open houses, one in the Town of Fort Frances and one in Emo. These open houses were held jointly with the proponent, representatives from other federal departments and the provincial government. Over 100 members of the public attended each one. These sessions provided opportunities for members of the public to hear presentations on the EA process, review the proponent's EIS, and provide comments. Those comments were considered in the preparation of this EA report (Appendix F).

4.2.1 *Public participation activities by the proponent*

The proponent indicated it engaged local residents from the towns of Rainy River and Fort Frances; residents of the townships of Chapple, La Vallee, Alberton, Dawson, Lake of the Woods, and Morley; and other potentially affected or interested stakeholders, including local land owners.

The proponent stated that public consultation activities included information sharing, general consultation with community members, and key stakeholder meetings.

4.3 Participation of Federal and Other Experts

Several federal departments with specialist information or expert knowledge relevant to the Project provided advice pursuant to section 11 of the Act, to help determine whether a federal EA was required. They also participated in the review of the EIS Guidelines and the EIS, and provided input into the preparation of the EA report pursuant to section 20 of the Act.

Fisheries and Oceans Canada has regulatory and statutory responsibilities under the *Fisheries Act* and provided advice and information related to fish and fish habitat in the context of commercial, recreational or Aboriginal fisheries, and provisions for water flow and fish passage.

Environment Canada has regulatory and statutory responsibilities under the *Canadian Environmental Protection Act, 1999* (CEPA), *Migratory Birds Convention Act, 1994* (MBCA), *Species at Risk Act*, and the pollution prevention provisions of the *Fisheries Act* including the *Metal Mining Effluent Regulations*. Environment Canada provided advice related to air quality, effluent discharges, geochemistry, water quality and quantity, terrestrial species at risk, international boundary waters, migratory birds, meteorology, climate change, and accidents and malfunctions.

Health Canada provided advice on potential effects on Aboriginal health related to country food, water quality and air quality. Natural Resources Canada has regulatory and statutory responsibilities under the *Explosives Act*, and provided advice related to groundwater quantity.

At the beginning of the EA process, Transport Canada identified that a *Navigable Waters Protection Act* (NWPA) permit may be required to enable the Project to proceed. However, under the new *Navigation Protection Act*, Transport Canada determined that the Pinewood River is not navigable in the area of the proposed crossing for the re-alignment of Hwy 600. The Pinewood River is also excluded from the Schedule of the *Navigation Protection Act* and an application will not be required.

The Agency notified the Department of Foreign Affairs and International Trade due to the proximity of the project site to the Canada–United States of America border. The Agency also discussed the Project with the International Joint Commission. The International Joint Commission was interested in the Project, but did not raise concerns throughout the EA process.

The Agency and Ontario conducted the federal and provincial EA process cooperatively to the fullest extent possible, which included working closely on the technical review of the EA. The following provincial ministries, while concurrently participating in the provincial EA process, provided advice on the federal EA and have overlapping mandates with the federal authorities: The Ministry of the Environment and Climate Change, Ministry of Northern Development and Mines, and Ministry of Natural Resources and Forestry. The advice of the Ministry of Transportation and the Ministry of Tourism, Culture, and Sport were also considered in the review of the environmental effects, mitigation measures and conclusions.

5 Geographical Setting

5.1 Biophysical Environment

The Project is located in the Township of Chapple, District of Rainy River, in northwestern Ontario. The area has variable, gently undulating terrain and is drained principally by the Pinewood River and its associated minor tributaries.

All aspects of drainage associated with the Project, including water taking and effluent and runoff discharges, occur within an upstream portion of the Pinewood River watershed. Specifically, the project site is drained by four minor creek systems (Clark Creek and Teeple Drain, West Creek, Marr Creek, and Loslo Creek and Cowser Drain; henceforth referred to as the Minor Creek Systems), which flow into Pinewood River. Farther south, the Pinewood River enters Rainy River, which is an international waterway separating Canada (Ontario) from the United States of America (Minnesota).

Data used by the proponent to describe the local climate came from the Environment Canada climate station located approximately 20 km south of the project site at Barwick. Local climate conditions in the area are typical of northwestern Ontario, with a mean annual temperature of 3.2 degrees Celsius (°C), a mean summer high of 18.8°C in July, and a mean winter low of -15.9°C in January. Mean annual average precipitation is 695.7 millimetres (mm), with 80 percent falling as rain and 20 percent as snow. The maximum mean monthly precipitation is 113.8 mm in June and the minimum is 25.1 mm in February. There are no areas of natural and scientific interest or federal lands within or proximal to the general site area. Key wildlife species found within the Natural Environment Local Study Area include White-tailed Deer, moose, and breeding birds.

The project site and surrounding areas are heavily impacted by historical farming and forestry operations. Areas of regenerating abandoned farmland are evident throughout the project site and Natural Environment Local Study Area. Most of the land is cleared, with remaining trees dominated by mixed poplar forest, which is indicative of disturbed lands recovering from past forestry and farming activities or regrowth following past fires (Figure 5). Potential changes to this environment as a result of project activities are assessed in sections 6 and 7.

Figure 5: Pinewood River and surroundings, portraying lands recovering from past forestry and farming activities in which the project site is located

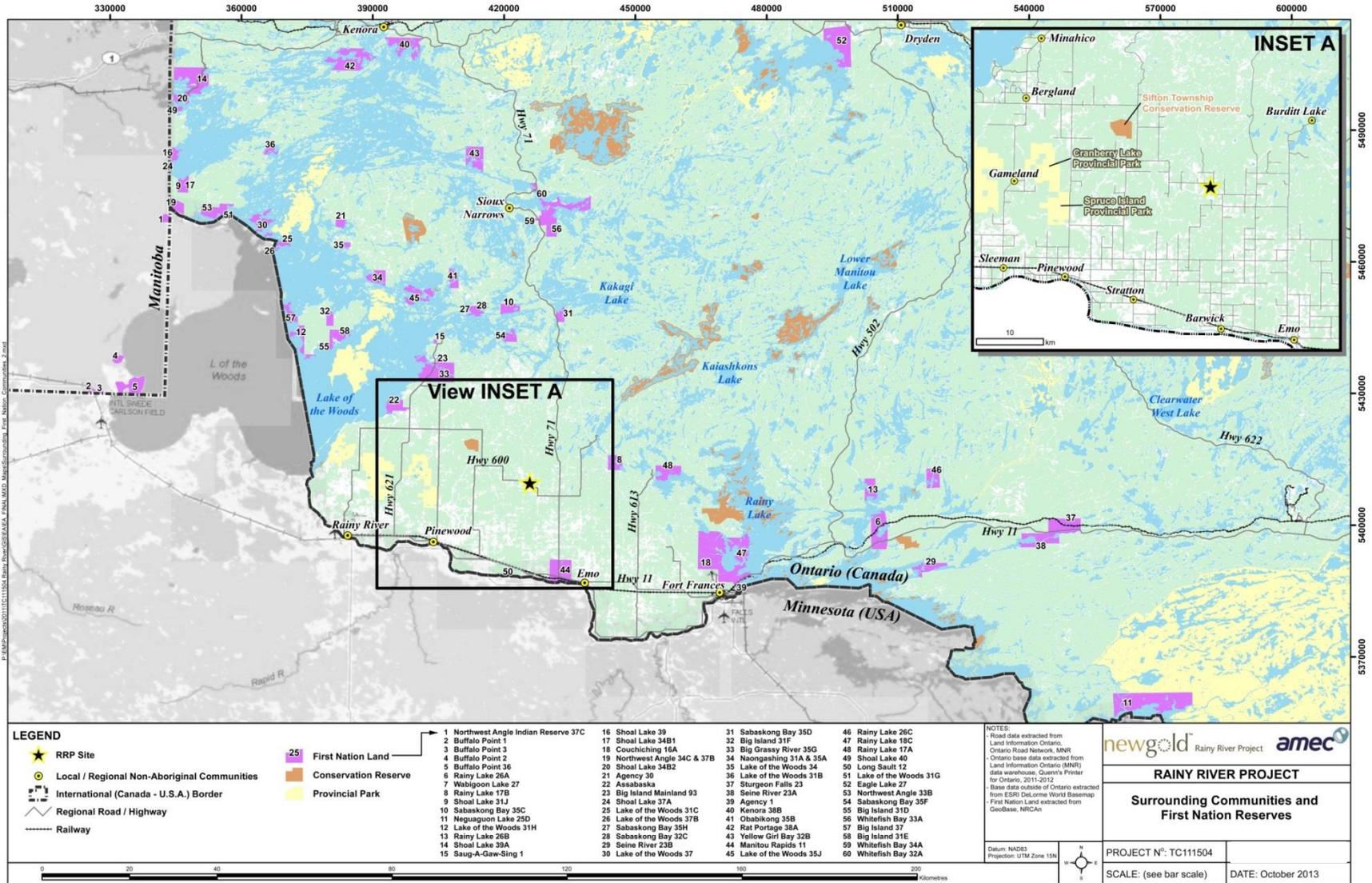


Source: Rainy River EIS, AMEC

5.2 Human Environment

The closest local municipalities are: Emo (population 1305; 28 km to the southeast); Rainy River (population 909; 45 km to the southwest); and Fort Frances (population 8103; 50 km to the east-southeast). Naicatchewenin and Rainy River First Nations are the closest reserves and are located approximately 19 km east and southeast, respectively, of the site (Figure 6). Much of the Human Environment Local Study Area has traditionally seen economic activities related to forestry, agriculture, recreation, and tourism. The local economy is struggling due to the decline in forestry activity. The Project is located in a low-density rural area, within which some limited agricultural (mainly cattle and fodder cropping) and logging activities occur and some private residences are found.

Figure 6: Communities and First Nation Reserves surrounding the project site



Source: Rainy River EIS, AMEC

6 Predicted Changes to the Environment

6.1 Atmospheric Environment

6.1.1 *Baseline by proponent*

Air quality baseline by proponent

The atmospheric environment baseline includes a description of both air quality and the acoustic (sound) environment. The project site is in a rural area away from major industrial emission sources. Local sources of air emissions include road traffic, agriculture, an engineered wood particle board mill located 30 km away, and drilling associated with mineral exploration activities.

The baseline air quality at the Environment Canada and Ministry of the Environment and Climate Change monitoring stations meets the Ontario Ambient Air Quality Criteria, which are generally more stringent than the Canadian National Ambient Air Quality Objectives. Air quality monitoring conducted at the project site focused on potential contaminants of concern, including particulate matter also known as total suspended particulate, and metals. Table 3 provides a baseline summary

Acoustic environment baseline by proponent

Sound data were collected at residential sites, at locations selected for wildlife habitat sensitivity, and at monitoring stations covering a wider area around the project site. Measured baseline sound levels were indicated to be below the sound limits, as per the Ministry of the Environment and Climate Change NPC-300 noise guidelines for Class 3 (rural) areas, of 45 A-weighted decibels (dBA) for daytime (7:00 to 19:00) and 40 dBA for evening and nighttime (19:00 to 7:00).

6.1.2 *Changes to atmospheric environment predicted by proponent*

Changes to air quality

Predicting the changes to the atmospheric environment involved evaluating the main sources of air emissions from the construction, operation, and decommissioning phases of the Project. The model for air quality was based on maximum predicted ground level air concentrations in the Natural Environment Local Study Area during operation, both before and after, with the application of mitigation measures. The model was based on conservative estimates (i.e., if all sources are active at their maximum output at all times). The model showed levels of total suspended particulate and fine particulate matter may infrequently exceed *Ambient Air Quality Criteria* at the project site boundary. Exceedances of contaminants of potential concern due to the Project are predicted to be infrequent at the project site boundary during operation (Table 3).

Emissions sources during operation were: blasting; material handling in the open pit; dust from crushing; road dust emissions; dust from managing mine rock, ore and overburden; concrete batching; underground mining activities; gold ore processing; and exhaust from back-up power generation. Fugitive dust and contaminant emissions have the highest potential for causing adverse offsite effects during operation.

Sulphur dioxide emissions occur primarily from the cyanide destruction system in the onsite metal mill; releases of hydrogen cyanide will be from the leaching process; and releases of nitrogen oxides (NO_x)

will be from blasting and propane combustion. Key metals were modelled with the assumption that dust is of the same composition as the ore or mine rock. The predicted concentrations of key metals at the project site boundary were all shown to be below their respective *Ambient Air Quality Criteria* limits. Table 3 provides a comparison of *Ambient Air Quality Criteria* limits, baselines and modelled impacts.

Table 3 Comparison of Ambient Air Quality Criteria Limits with Air Quality Background Concentrations and Modelled Impacts.

	Air Quality Background Concentration (µg/m3)	Air Quality Background + Modeled Impact Concentration (µg/m3)	Ambient Air Quality Criteria Limits (µg/m3)
Particulate matter as total suspended particulate	39.0	125.0	120
Fine particulate matter (PM2.5)	9.8	33.7	30
Sulphur oxides, mainly as sulphur dioxide (SO2)	3.0	12.3	275
Nitrogen oxides (NOx)	11.0	37.7	200
Key Metals			
Arsenic (As) ²	no data	0.012	0.3
Cadmium (Cd)	0.0022	0.004	0.025
Lead (Pb)	0.010	0.029	0.5
Mercury (Hg)	0.0017	0.0017	0.5
Hydrogen cyanide ³	no data	1.40	8

Adapted from Rainy River EIS, AMEC

The proponent proposed mitigation measures to mitigate the effects on air quality (Appendix A). After mitigation, the residual effects on air quality were predicted to be confined to the project site; continuous through mine construction, operation, and decommissioning; and reversible following decommissioning. The proponent indicated that with mitigation, concentrations of contaminants of potential concern are predicted to be below Ambient Air Quality Criteria limits for emissions during all phases of the Project, with only infrequent potential exceedances of Ambient Air Quality Criteria for total suspended particulate and fine particulate matter at the project site boundary during operation.

² The proponent cited that data was not available from the existing Environment Canada or Ministry of the Environment and Climate Change stations so it used a concentration of 0 to represent background levels.

³ The proponent indicated that data for existing hydrogen cyanide are not available so it used a concentration of 0 to represent background levels. Hydrogen cyanide is released from milling operations and since there are no existing metal mills in the Natural Environment ^{Regional} Study Area, background data for hydrogen cyanide are absent.

Changes to acoustic environment

Sound emissions will be greatest during the operation phase and most notable in areas of concentrated heavy equipment operation associated with the open pit, stockpiling, onsite metal mill, and crusher operations. Sound disturbances will have lesser adverse effects in areas of low traffic, such as the proposed transmission line and the tailings management area. The results of the sound contour modelling indicate that the sound levels are not expected to exceed Ministry of the Environment and Climate Change NPC-300 noise guidelines.

The proponent proposed mitigation measures to mitigate the effects on sound levels (Appendix A). After mitigation, the residual effects on noise were predicted to be confined to the project site; continuous through mine construction and operation; and reversible at decommissioning. The modelled sound contours for the project site and surrounding receptors in the Natural Environment Local Study Area for the two worst case scenarios (2015 and 2020) demonstrate compliance with applicable Ministry of the Environment and Climate Change NPC-300 noise guidelines.

6.2 Water Quantity (Levels and Flows)

6.2.1 Baseline by proponent

The Minor Creek Systems, as defined in section 5.1, which drain the project site, are generally low gradient, low energy systems with wide, densely vegetated grass and sedge dominated floodplains, with frequent naturally impounded water bodies such as beaver ponds and related log jams. The Minor Creek Systems flow into the Pinewood River and make up part of the total watershed area of the Pinewood River, which is 57 550 ha. The Pinewood River has limited baseflow due to the prevalence of clay substrates in the Natural Environment Local Study Area and low groundwater recharge rates. As a result, the River can experience extreme low to zero flow conditions in the late summer and early fall during drought years and during mid to late winter.

6.2.2 Changes to water quantity predicted by proponent

Construction

Temporary Water Taking

The proponent proposes to take water from the Pinewood River watershed during construction to build an initial water inventory for project start-up. This would be achieved, in part, through the capturing and holding of site runoff from the tailings management area, water management pond, and mine rock pond catchments, which would otherwise enter the Pinewood River. A water intake structure would also be constructed downstream of McCallum Creek, where there is substantial increase in total river flow due to the inflow of two major tributaries.

The water taking would result in an amount not greater than 20 percent flow reduction in the Pinewood River from April to June and 15 percent reduction at other times of the year, as measured below McCallum Creek. The actual flow reduction in the Pinewood River would begin upstream of that, prior to the construction of the West Creek Diversion Channel, due to the holding of site runoff which would otherwise enter the river via the Minor Creek Systems.

Minor Creek Systems

Potential effects on creeks are limited to the Minor Creek Systems within the Natural Environment Local Study Area, where the creeks will be altered and disrupted by mine components (Figure 7), during all project phases including abandonment. Following construction of the project site, the Minor Creek Systems are referred to as the Modified Mine Creek Systems, which is defined as the remainder of the pre-disturbance Minor Creek Systems and any new channels or ponds, including West Creek Diversion Channel; Stockpile Pond Diversion Channel; Clark Creek Diversion Channel; West Creek Pond; Stockpile Pond; Clark Creek Pond; Teeple Road Pond; Loslo Creek downstream of the constructed wetland; and the unidentified creek linking Teeple Pond to Pinewood River. The effects of associated habitat loss on fish and fish habitat are discussed further in section 7.1. The upstream portions of these creeks will require flow diversion or interception to prevent upstream flows from interacting with the project site. Potential effects on creek flows, and the resulting effects on the Pinewood River, will vary from creek to creek (Table 4).

Table 4 Summary of Potential Effects on Creek Flows and Resulting Effects on Pinewood River.

	Change to Creek	Redirection of Creek Flow	Effect on Pinewood River Flows
Clark Creek and Teeple Drain	<p>A portion of the natural channel will be displaced by the east mine rock stockpile and mine rock pond.</p> <p>Clark Creek Pond will be constructed to receive flows upstream of the east mine rock stockpile. Clark Creek Diversion Channel will be constructed to receive flows from the Clark Creek Pond.</p>	<p>Drainage from the east mine rock stockpile to be captured by stockpile drainage collection ditches and diverted to the mine rock pond.</p> <p>Mine rock pond water will be recycled for onsite metal mill operation and not discharged to the environment.</p> <p>Upstream drainage will be diverted through the Clark Creek Diversion Channel to Teeple Pond.</p>	<p>Recycling of drainage waters for onsite metal mill operation is expected to reduce flows in Pinewood River, downstream of the existing Clark Creek outflow.</p>
West Creek	<p>Natural channel and flows will be redirected around the overburden and west mine rock stockpile.</p> <p>A West Creek Pond and West Creek Diversion Channel will be constructed for the diversion.</p>	<p>Flows will be diverted through the (new) West Creek Diversion Channel, to Loslo Creek at a point downstream of the constructed wetland, and subsequently into Pinewood River.</p>	<p>West Creek Diversion Channel is expected to reduce flows in Pinewood River between the existing West Creek outflow, and the Loslo Creek outflow.</p>
Marr Creek	<p>Natural channel will be removed by the tailings management area, overburden, and west mine rock stockpiles.</p>	<p>Drainage flows will be collected and managed within the tailings management area and stockpile drainage collection systems.</p> <p>Treated effluent in the water management pond will be discharged through the</p>	<p>Drainage redirection is expected to reduce flows in Pinewood River, between the existing Marr Creek outflow and the Loslo Creek outflow, and to a lesser extent to the pipeline discharge point downstream of McCallum Creek.</p>

	Change to Creek	Redirection of Creek Flow	Effect on Pinewood River Flows
		constructed wetland to Loslo Creek, and through a pipe directly into Pinewood River downstream of McCallum Creek.	
Loslo Creek and Cowser Drain	Upstream portion of the natural channel will be removed by the tailings management area. Downstream portion of the natural channel will be altered by the water discharge pond and the constructed wetland.	Drainage flows will be collected in tailings management area ditches and directed either to the tailings management area, water management pond, or water discharge pond. Treated effluent in the water management pond will be discharged through the constructed wetland to Loslo Creek, and through a pipe directly into Pinewood River downstream of McCallum Creek.	Drainage redirection is expected to reduce flows in Pinewood River, between the existing Loslo Creek outflow and the pipeline discharge point downstream of McCallum Creek. The downstream portion of the natural channel will remain active for most of the year, receiving flows from the constructed wetland and the West Creek Diversion Channel.

Adapted from Rainy River EIS, AMEC

Pinewood River

As a result of the changes to the Minor Creek Systems described above, the locations of creek inflows to the Pinewood River will be modified during all project phases, including abandonment. The resulting flow reduction in the Pinewood River ranges from 8.1 to 34.2 percent between Clark Creek and Loslo Creek and by 8 percent between Loslo Creek and the tailings management area pipeline discharge point downstream of the McCallum Creek outflow.

Below the McCallum Creek outflow, Pinewood River flow increases substantially, as the natural watershed is expanded by McCallum Creek and Tait Creek. At the pipeline discharge point, Pinewood River flow will be influenced negatively by upstream runoff losses and positively by water released back through the constructed wetland, the West Creek Diversion Channel, and the discharge pipe.

Operation

Losses from the water management system during operation include water stored permanently in the tailings management area, evaporation from the onsite metal mill, and water used for dust suppression. A small amount of water (100-200 m³ per day) will be taken from West Creek Pond for potable water. Despite recycling and water losses to storage in the system, a surplus of treated water is expected during operation, due to additions from ground water intercepted by mine workings and the development of enhanced site runoff conditions.

The proponent owns the majority of the water supply wells within the zone of influence of open pit dewatering. The proponent predicted that reduction in groundwater flow is not expected to affect flows in the Pinewood River or the Minor Creek Systems.

Decommissioning and Abandonment

Modifications made to the Minor Creek Systems and the constructed diversion channels during construction will be maintained during decommissioning and abandonment, resulting in continued flow reductions in the Pinewood River between Clark and Loslo Creeks.

Additional water taking from the Pinewood River is proposed, with government oversight, during decommissioning, including the holding of site runoff and tailings management area outflows, to augment the flooding of the tailings management area and filling of the pit. Flooding of the pit is expected to take several decades, depending on the quantity of runoff that is intercepted and held. Water management during tailings management area flooding and open pit filling could result in additional reductions in Pinewood River flows until the open pit is filled.

The proponent proposed mitigation measures to mitigate the effects on water quantity (Appendix A). After mitigation, the residual effects on water quantity were predicted to be confined to the project site; long-term; continuous through mine construction, operation, and decommissioning; and irreversible. The proponent indicated that the effects, however, will be compensated and as such, are not of concern.

6.3 Water Quality

6.3.1 Baseline by proponent

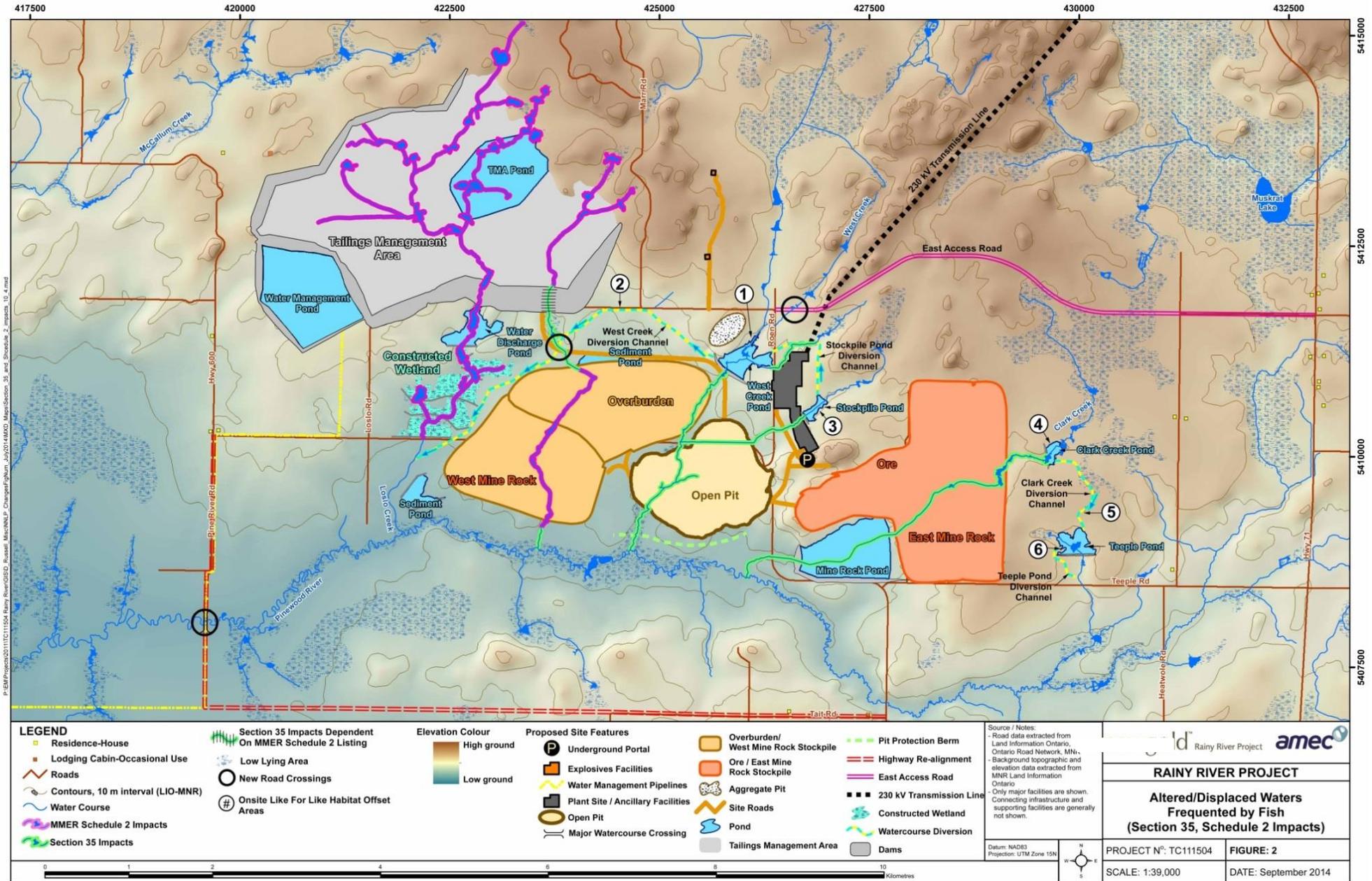
*Canadian Environmental Quality Guidelines*⁴ and *Provincial Water Quality Objectives*⁵ are values set by the federal and provincial governments respectively, and are considered protective of all forms of aquatic life, including the most sensitive species for an indefinite period of exposure with included safety factors. It is possible for certain parameters to exceed *Canadian Environmental Quality Guidelines* and *Provincial Water Quality Objectives* values in the background environmental baseline condition, even in areas that are completely undisturbed.

Surface water quality monitoring data for the Project indicate that the baseline exceeded levels relative to *Canadian Environmental Quality Guidelines* and *Provincial Water Quality Objectives* for the following parameters: copper (mainly *Canadian Environmental Quality Guidelines*), arsenic, lead, nickel, and zinc. The baseline for groundwater also exceeded *Canadian Environmental Quality Guidelines* for arsenic, iron and cadmium and *Provincial Water Quality Objectives* parameters for cobalt and iron. The ability of these parameters to cause a health risk to fish, wildlife, and humans is a function of release rates, exposure pathways, and organism presence and sensitivity.

⁴ <http://ceqg-rcqe.ccme.ca/>

⁵ <https://www.ontario.ca/environment-and-energy/water-management-policies-guidelines-provincial-water-quality-objectives>

Figure 7: Aquatic Habitat Displaced by Mine Features



Source: Rainy River EIS, AMEC

The ore and a substantive portion of the waste mine rock are potentially acid generating, which creates the risk of acid rock drainage and metal leaching in the Natural Environment Local Study Area. It is estimated that approximately 44 percent of the waste material within the future pit would be potentially acid generating.

6.3.2 *Changes to water quality predicted by proponent*

Changes to water quality in the Pinewood River and the Modified Minor Creek Systems could arise due to contaminant sources, such as mine water from the open pit and underground mine, water associated with the treated tailings from the process plant (Table 5 lists the major contaminants in the treated effluent), and runoff and seepage from the tailings management area and stock piles.

The proposed water management plan includes six primary constructed ponds for water management (Figure 8): tailings management area pond, water management pond, water discharge pond, mine rock pond, and sediment ponds #1 and #2.

All contact water, including mine water from the open pit and underground mine, will flow directly or indirectly to one of these ponds. The tailings management area and stockpiles will incorporate perimeter ditching to intercept and redirect any seepage to the water treatment systems and subsequently to the final discharge points.

Four final discharge points for the operation phase are proposed (Figure 8):

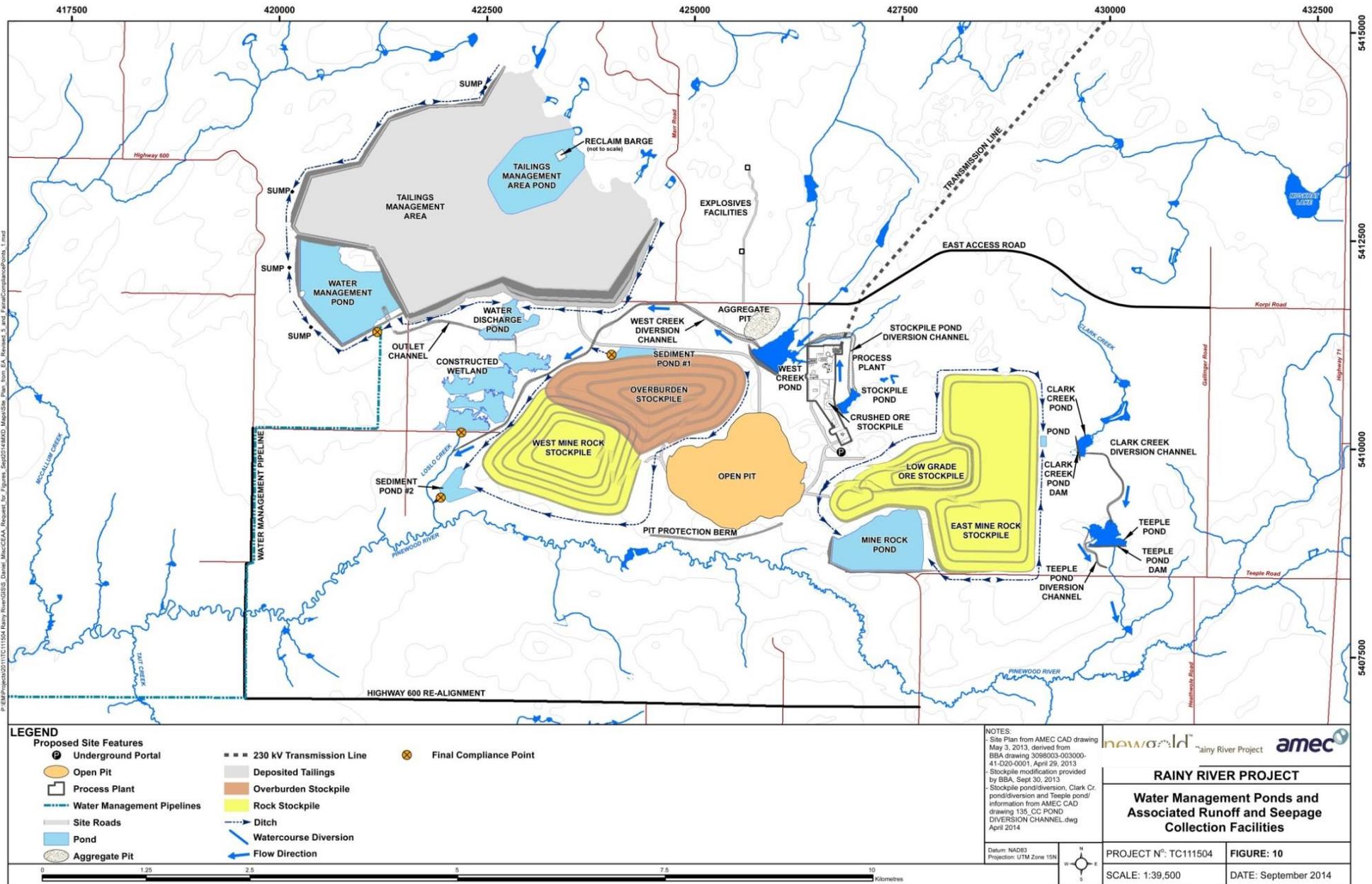
- the constructed wetland, which will discharge into Loslo Creek;
- the pipeline, which will discharge directly into Pinewood River downstream of the McCallum Creek outflow;
- sediment pond #1, which will discharge into the West Creek Diversion Channel; and
- sediment pond #2, which will discharge into Loslo Creek.

Table 5 Laboratory Aging of Synthetic Process Plant Discharge (after sulphur dioxide and air treatment process) Compared to Provincial and Federal Water Quality Standards

Parameter	Cyanide Destruction 60-day Aging Test Results (mg/L)	Water Quality Standards	
		(Provincial Water Quality Objectives (mg/L))	Canadian Environmental Quality Guidelines (mg/L)
Cyanide (total)	<0.01	-----	-----
Cyanide (free)	<0.01	0.005	0.005
Arsenic	0.003	0.1 0.005 - interim	0.005
Copper	0.012	0.005 at hardness > 20 mg/L calcium carbonate	0.004 at hardness > 180 mg/L calcium carbonate
Nickel	0.003	0.025	0.150 at hardness >180 mg/L CaCO ₃
Lead	0.0005	0.005 at hardness > 80 mg/L calcium carbonate	0.007 at hardness >180 mg/L calcium carbonate
Zinc	0.086	0.030 0.020 - interim	0.030
Un-ionized ammonia (NH ₃ -U)	0.153	0.020	0.019

Adapted from Rainy River EIS, AMEC

Figure 8: Water Management Ponds and Final Effluent Discharge Points



Source: Rainy River EIS, AMEC

Appendix G summarizes the various water bodies associated with the water management plan or project site, as described in the Environmental Impact Statement (EIS), and differentiates between those water bodies that are part of a water treatment and those forming part of a freshwater system.

The proponent proposed mitigation measures to reduce the effects on water quality (Appendix A). After mitigation, the residual effects on water quality were predicted to be confined to the project site, but long-term and irreversible. The proponent indicated however, that the effects will be compensated and as such are not of concern. The EIS indicates that treated runoff and seepage discharges will be in compliance with the federal *Metal Mining Effluent Regulations* Schedule 4 limits and the Ministry of the Environment and Climate Change's Environmental Compliance Approval and *Provincial Water Quality Objectives* or site-specific criteria at the mixing zone boundary will be met. The river system is sufficiently adaptable such that if unexpected concerns arise, adaptive management techniques will be applied to optimize the water management plan.

6.4 Terrestrial Landscape

6.4.1 *Baseline by proponent*

The Natural Environment Local Study Area encompasses a variety of terrestrial habitats with habitat overlap which is reflected in the aerial extent coverage reported (Table 6). Also, many of the woodland habitat areas have been harvested in the past and are in a state of regeneration. Two provincially rare plant species, Field Sedge and New England Violet, were identified in the Natural Environment Local Study Area, both within woodland habitats. Field Sedge was abundant and widespread within hardwood forests in the Natural Environment Local Study Area. The New England Violet was identified in coniferous forests and coniferous swamps within the northern and northeastern parts of the Natural Environment Local Study Area.

6.4.2 *Changes to terrestrial landscape predicted by proponent*

Clearing will mostly affect vegetation community types that are common throughout the Natural Environment Local Study Area and Natural Environment Regional Study Area (Table 6). Most habitat lost will be woodland (1475.3 ha, or 7.3 percent of woodland habitat within the Natural Environment Local Study Area) and will occur during construction of the tailings management area, overburden stockpile, open pit, and mine rock stockpiles. Most of the affected hardwood forests are relatively young due to forestry activities, and provide deer browse and habitat for woodland breeding birds, like Eastern Whip-poor-will and Golden-winged Warbler. Coniferous forests provide late winter moose habitat and also support woodland breeding bird species. The project site largely avoids more mature hardwood forests, which are the best candidate habitats for bat roosting colonies.

Loss of wetland habitat (291.8 ha, or 9.5 percent of wetland habitat within the Natural Environment Local Study Area) will occur during construction of the tailings management area, overburden rock stockpile, and open pit. No bog communities will be impacted directly. The removal of wetland habitat within the Natural Environment Local Study Area will also impact 19 ha of open water habitat in relation to the Minor Creek Systems. Wetlands in the Natural Environment Local Study Area provide habitat for Snapping Turtles (section 7.7), and waterfowl like Trumpeter Swans (section 7.2).

Open country habitat loss (399 ha, or 15.3 percent of open country habitat within the Natural Environment Local Study Area) will occur during construction of the tailings management area,

overburden and west mine rock stockpile, open pit, east mine rock stockpile, and onsite metal mill site. Open country habitats may support area-sensitive breeding bird communities like Bobolink, and provide foraging habitat for the Barn Swallow. Typically, these sites are created by human activity, and continue to be habitually disturbed.

Rock and mineral barren habitat will be cleared (10.9 ha or 14.2 percent of rock and mineral barren habitat within the Natural Environment Local Study Area). Rock and mineral barren habitat communities may support area sensitive breeding communities like Common Nighthawk and may provide habitat for Eastern Whip-poor-wills.

Table 6 Terrestrial Habitat Types Reported by the Proponent

Habitat	Sub-habitat	Dominant Species	Aerial Extent in Natural Environment Local Study Area (ha)	Loss due to Clearing (ha)
Woodland	<ul style="list-style-type: none"> Hardwood forest 	<ul style="list-style-type: none"> Trembling Aspen Birch 	12 961.3	1133.9 (8.7%)
	<ul style="list-style-type: none"> Coniferous forest 	<ul style="list-style-type: none"> Pine and Spruce 	2637.1	118.3 (4.5%)
	<ul style="list-style-type: none"> Coniferous swamp 	<ul style="list-style-type: none"> Tamarack Black Spruce White Spruce Eastern White Cedar 	4612.4	223.1 (4.8%)
	Total		20 210.8	1475.3 (7.3%)
Wetland	<ul style="list-style-type: none"> Meadow and shallow marsh 	<ul style="list-style-type: none"> Sedge and grass 	1239.7	138.8 (11.2%)
	<ul style="list-style-type: none"> Fen 	<ul style="list-style-type: none"> Tamarack Black Spruce Sedges, herbs, and heather shrubs Sphagnum mosses 	954.8	123.3 (12.9%)
	<ul style="list-style-type: none"> Thicket Swamp 	<ul style="list-style-type: none"> Speckled Alder Willow 	865.2	29.7 (3.4%)
	<ul style="list-style-type: none"> Bog 	<ul style="list-style-type: none"> Black Spruce (short and stunted) Sedges and heather shrubs Sphagnum mosses 	2.2	0
	Total		3061.9	291.8 (9.5%)

Habitat	Sub-habitat	Dominant Species	Aerial Extent in Natural Environment Local Study Area (ha)	Loss due to Clearing (ha)
Open country	<ul style="list-style-type: none"> Cattle rangelands and agricultural land 	<ul style="list-style-type: none"> Grasses (Reed Canary Grass and Blue-joint Grass) Herbs (Timothy, Smooth Brome, Alfalfa, clovers, and other gaminoids) 	2044.3	286.7 (14%)
	<ul style="list-style-type: none"> Cultural meadow 	<ul style="list-style-type: none"> Non-native grasses Herbs (Timothy, Smooth Brome, and Red Clovers) 	569.5	112.3 (19.7%)
	Total		2613.8	399 (15.3%)
Rock and Mineral Barren	<ul style="list-style-type: none"> Rock and mineral barren 	<ul style="list-style-type: none"> Coniferous forest tracts (very shallow soils) 	77	10.9 (14.2%)
	Total		77	10.9 (14.2%)

Adapted from Rainy River EIS, AMEC

Two of three habitat locations at the project site supporting New England Violet and one of two habitat locations supporting Field Sedge will be cleared. The New England Violet and the Field Sedge are known to have medicinal value for Aboriginal communities.

An increase in vehicle traffic at the project site will result in increased dust generation and deposition on vegetation. Dust can affect photosynthesis, respiration, transpiration, allow the penetration of phytotoxic gaseous pollutants, and may result in some visible injury symptoms and generally decrease plant productivity. Vegetation communities likely to be most affected by dust deposition are located alongside the roads on which haul trucks will be travelling, i.e., between the open pit, onsite metal mill, and stock pile areas. These vegetation communities are already subject to a degree of dust exposure, as the roads connecting these components are located where Roen Road and Highway 600 currently exist. A fugitive dust best management practices plan will be implemented at the start of mine construction as identified in section 7.4.

The proponent proposed mitigation measures to reduce the effects on the terrestrial landscape (Appendix A). After mitigation, the residual effects on the terrestrial landscape were predicted to be long-term continuing through mine construction and operation, however, reversible or largely reversible following mine decommissioning and confined to the project site. The proponent concluded that the change to the terrestrial landscape was not a concern after mitigation was applied.

7 Predicted Effects on Valued Components

7.1 Fish and Fish Habitat

7.1.1 *Baseline by proponent*

The Pinewood River flows downstream to the Rainy River. The Pinewood River and the Minor Creek Systems consist of different habitats that support small- and large-bodied fish.

The Pinewood River has typical widths of 10 to 15 m within the general vicinity of the project area with wider sections associated with beaver impoundments and drowned oxbows. Substrates consist of clays and silt with some detritus, while gravel, rock, or cobble substrates are sparse and contribute little to no in-stream habitat or cover for fish. Turbidity is high because of erosion of the clay and silt substrates and agricultural drainage inputs. Beaver dams are frequent and present periodic obstacles to fish passage.

The Minor Creek Systems, described in section 5.1, exhibit summer widths of 0.5 to 3 m, except in locations impounded by beaver dams. They are generally low gradient, low energy systems characterized by single to braided diffuse channels with wide, densely vegetated grass and sedge dominated floodplains.

Within the Natural Environment Local Study Area, large-bodied fish (Northern Pike, Brown Bullhead, and White Sucker) were found exclusively in the Pinewood River, with the exception of White Sucker, which is also found in Loslo and Clark Creeks. Walleye and Yellow Perch occur further downstream in the Pinewood River, but not in the project site. Lake Sturgeon is known to occur in the Rainy River and three were located near the mouth of the Pinewood River, downstream of the project site. Small-bodied fish are abundant within the Pinewood River watershed. Small-bodied fish communities within the habitats of the Minor Creek Systems are typically warm water and cool water baitfish and include Brook Stickleback, Central Mudminnow, and Brassy Minnow.

7.1.2 *Effects predicted by proponent*

Potential adverse effects are discussed with respect to fish and fish habitat in general rather than by individual species. The Project will result in environmental effects on fish from the alteration and disruption of existing fish habitat, and from changes in water quality and quantity.

The direct loss of fish habitat in the Minor Creek Systems will occur from development of the tailings management area, open pit, overburden and mine rock stockpiles, road crossings, and pipeline crossings and outlets (Table 7). The Project will also result in the alteration of fish habitat in Clark Creek and West Creek, through diversion of the creeks around the mine infrastructure (Figure 7). The water

bodies which are altered or disrupted must be added to Schedule 2 of the *Metal Mining Effluent Regulations* to allow their use for mine waste disposal.

Table 7 Summary of Creek Habitat Disturbance⁶

Creek	Total Habitat Available (ha)	Total Area Lost (<i>Metal Mining Effluent Regulations</i> , Sub-section 27.1) (ha)	Total Area Lost (<i>Fisheries Act</i> , section 35(2)) (ha)	Habitat Disturbed by the Project (ha)
Clark Creek	5.32	0	2.1582	2.1582
Loslo Creek	19.77	19.0781	0	19.0781
Marr Creek	2.71	2.2408	0.441	2.6818
West Creek	9.49	0	1.9923	1.9923
Total	37.28	21.3189	4.5915	25.9104

Adapted from Rainy River EIS, AMEC

Changes to water quality could occur from tailings and rock stockpile management, and treated effluent discharge into the Pinewood River. Also, there may be effects on habitat due to flow reductions in the Pinewood River from water taking, groundwater interception, and creek runoff collection. Following decommissioning, it will be possible to direct a major portion of project site catchment flows directly to the Pinewood River, including runoff from the reclaimed tailings management area and portions of the reclaimed stockpiles.

The physical effects impacting the Pinewood River are minor and relate to the construction of a new crossing of the realigned Highway 600 and a flood protection berm that will protect the open pit from flooding during 100-year and greater storm events. The new crossing will consist of a multi-cell culvert or spanning structure, which was planned using the Ministry of Transportation Environmental Guide for Fish and Fish Habitat. It will be designed in accordance with Ministry of Transportation's Highway Drainage Design Standards, which ensures that fish passage will not be impeded by maintaining existing velocities, depths, and gradients.

Adverse effects on fish habitat relating to site runoff capture, management, and discharge are not expected by the proponent. Some flow reductions are expected by the proponent in the Pinewood River upstream of the McCallum Creek outflow, as described in section 6.2.

⁶ No part of the Pinewood River will be altered or disrupted by mine facilities

7.1.3 Comments received

Government Authorities

Environment Canada, Fisheries and Oceans Canada, Ministry of Natural Resources and Forestry and the Ministry of the Environment and Climate Change expressed concerns about the plan to reduce flow by 20 percent during the spring and up to 15 percent during the remaining open water period to build water inventory for project start-up and how this would affect the wetted width of the river. The proponent will only take water for a maximum of two years during mine construction as this is necessary for the viability of the Project. The proponent's modelling shows that a decrease in flow of 20 percent, which is expected to occur only during the two years of construction, will result in a decrease of less than 10 percent for wetted width and depth.

Fisheries and Oceans Canada and Ministry of Natural Resources and Forestry expressed concerns about permanent flow reduction in the Pinewood River. The proponent confirms that the West Creek and Marr Creek diversions will result in permanent flow reductions in that section of the Pinewood River. The proponent indicates that Pinewood River is a low gradient system and effectively maintains areas of fish habitat, even under very low flow conditions.

Federal and provincial authorities expressed concern about the ability of the proponent to perpetually maintain the tailings management area in a saturated state to prevent the generation of acid rock drainage and metal leaching (Acid Rock Drainage and Metal Leaching).

Federal and provincial authorities expressed concern about potentially acid generating (potentially acid generating) material being used for construction, especially for road construction. The proponent has committed not to use potentially acid generating for road construction. The proponent will use potentially acid generating material in a controlled manner, where saturated conditions can be maintained.

Ministry of the Environment and Climate Change expressed concern about the modified effluent criteria proposed by the proponent. Ministry of the Environment and Climate Change considered the fact that some *Provincial Water Quality Objectives* parameters do not take more recent toxicological information into account, and that some jurisdictions have more recently updated surface water criteria based on water hardness as a toxicity modifier. As a result, Ministry of the Environment and Climate Change proposed site-specific effluent criteria that are achievable by the proponent after effluent treatment and extended aging processes. The proponent will adhere to Ministry of the Environment and Climate Change site-specific criteria which will be confirmed in the final Ministry of the Environment and Climate Change Environmental Compliance Approval for effluent from the proposed discharge points into the Pinewood River. The proponent will discharge effluents into the Pinewood River and the Modified Minor Creek Systems in a manner that will achieve rapid mixing so that site-specific criteria for water quality will be achieved at the boundary of the mixing zone. Current modelling results indicate that the mixing zone is 30 m from the discharge point. If future operational monitoring shows that effective receiver mixing is not attained, additional measures will be implemented to enhance mixing to a level which is acceptable to the Ministry of the Environment and Climate Change.

Aboriginal communities

Aboriginal communities expressed concerns about water quality and quantity, impacts on fish populations due to water treatment processes, outlet locations for water returned back to the environment, and expected flow rates.

They were concerned about effects on fish and fish habitat at the project site and downstream. A request was made to study species at various trophic levels. To better accommodate an ecosystem-based approach, the proponent selected its valued components (VCs) by focusing on habitats, features, specific species groups, and related system interactions, rather than individual species.

They expressed concerns about the possibility of acid rock drainage and metal leaching from the tailings management area and waste rock stockpiles. The proponent has designed the Project and the mine closure plan with acid rock drainage prevention and mitigation measures to avoid acid rock drainage from waste rock stockpiles and the tailings management area during operation, decommissioning, and abandonment.

They expressed concerns about the use of site-specific water quality objectives and the ability of the constructed wetlands to accommodate the effluent discharge flows, meet water quality values, and prevent the potential for mercury pollution. The proponent has designed the constructed wetland to polish the effluent from the tailings management area. This effluent is anticipated to be high quality, and mercury concentrations are likely to be similar to those of Pinewood River background concentrations. No appreciable change in mercury levels is expected in the Pinewood River.

Aboriginal communities expressed concerns about the use of chemicals as a long-term water treatment option. The proponent has designed the Project without the use of long-term chemical treatment of water at decommissioning. Passive treatment measures, such as periodic fertilization of the upper pit lake water column during abandonment, may be used.

They also expressed concerns about the water quality of the pit overflow discharge during abandonment. The proponent will protect aquatic life, when taking hardness modifiers into consideration, with the open pit overflow discharge. The proponent will continue studies to optimize final pit overflow water quality.

Public

The public raised general concerns related to impacts on fish and fish habitat.

7.1.4 Residual environmental effects predicted by proponent

The proponent committed to a number of mitigation measures to mitigate the effects to fish and fish habitat, some of which were in response to comments or concerns raised (Appendix A). The Agency identified those measures required to prevent significant adverse effects (subsection 7.1.5).

Residual effects on fish and fish habitat will result from the alteration and disruption of existing fish habitat, and from changes in water quality and quantity, and are predicted to be minor in magnitude and confined to the project site. They will be long-term, continuing throughout mine construction, operation, decommissioning, and abandonment and irreversible. The Project will result in the loss of 25.87 ha of creek and agricultural drain habitat. However, the fish habitat offsetting and compensation plans will offset the unavoidable effects of the Project on fish habitat. The river system is sufficiently adaptable,

so that if unexpected concerns arise during mine operation or following closure, an adaptive management plan can be implemented at the site.

The proponent considered the overall adverse effects on fish and fish habitat as not likely to be significant.

7.1.5 *Mitigation measures*

The Agency has identified key mitigation measures required to prevent significant adverse effects on fish and fish habitat:

- Manage fish and fish habitat by:
 - Implementing a fish habitat compensation plan⁷, in accordance with Metal Mining Effluent Regulations, to offset the loss of fish habitat resulting from the deposit of deleterious substances into water bodies frequented by fish. This compensation plan will involve the creation of fish habitat through the creation of the West Creek Diversion Channel, the Stockpile Pond Diversion Channel, the Clark Creek Diversion Channel, the West Creek Pond, Stockpile Pond and the Clark Creek Pond (Figure 7) for losses associated with the removal of creeks at the project site.
 - Implementing a fish habitat offsetting plan⁸ to offset serious harm to fish, including any permanent alteration to, or destruction of, fish habitat, in accordance with the Fisheries Act. This offsetting plan will involve watershed-based enhancements (fencing off cattle, offline cattle watering sources, and channel and riparian zone restoration) and the creation of fish habitat through establishing Teeple Road Pond.
 - Designing and constructing new road watercourse crossings for the realignment of Highway 600 to allow for fish passage and meet the Ministry of Transportation Environmental Guide for Fish and Fish Habitat and the Ministry of Transportation Highway Drainage Design Standards.
 - Following the Fisheries and Oceans Canada Freshwater Intake End-of-Pipe Guidelines for water intakes.
- Minimize changes to water flows and levels in the Pinewood River, the Minor Creek Systems and the Modified Minor Creek Systems such that adverse effects to fish and fish habitat are reduced by:
 - Establishing flow and level requirements for the protection of fisheries in the Pinewood River, in consultation with the appropriate government authorities, and not taking water from the Pinewood River when flows are below the minimum threshold set by Ontario.

⁷ The fish habitat compensation plan is referred to as the No Net Loss Plan in the proponent's EIS.

⁸ The fish habitat offsetting plan is also referred to as the No Net Loss Plan in the proponent's EIS.

- Designing and implementing the water management plan to achieve these flow and level requirements during all applicable project phases, including recycling water onsite for ore processing from the tailings management area and water management ponds, capturing and returning groundwater to the Pinewood River, optimizing the timing, position and quality of final effluent discharges, and balancing water needs during open pit filling at decommissioning.
- Manage quality of water discharged into the Pinewood River and the Modified Minor Creek Systems from the project site by:
 - Treating effluent prior to discharge to the environment to comply with the Ministry of the Environment and Climate Change Environmental Compliance Approval, the *Fisheries Act*, and federal *Metal Mining Effluent Regulations* Schedule 4 limits at all times.
 - Designing and implementing the water management plan to achieve these compliance limits during construction and operation. This includes treatment of effluent prior to discharge to the environment; treatment of tailings slurry to break down cyanide and precipitate heavy metals prior to discharge to the tailings management area; collection of runoff and seepage in ditches; diversion of contaminated site contact water directly or indirectly into the tailings management area or water management facilities for release via final discharge points; use of a constructed wetland with a control structure for final effluent polishing of all discharge except any effluent discharged directly through the pipeline; and placement of secondary containment at pipelines that cross West Creek Channel Diversion to prevent accidental discharge of effluent.
- Control acid rock drainage and metal leaching throughout the project lifecycle by:
 - Lining the former Clark Creek channel (under the east mine rock stockpile) with non-potentially acid generating material to provide drainage of effluent, sorting waste rock into non-potentially acid generating and potentially acid generating rock stockpiles through the development and implementation of a detailed mine rock segregation program using provincial criteria for determining potentially acid generating material, using potentially acid generating material for construction only where saturated conditions can be maintained, and placing an engineered cover over the east mine rock stockpile, and any remaining ore stockpiles, at the decommissioning phase.
 - Covering the tailings beach with overburden, and the tailings with two metres of water, maintaining the tailings in a perpetually saturated state, and controlling water quality in the open pit lake during the decommissioning and abandonment phases.
 - Filling the open pit as rapidly as practicable during the decommissioning and abandonment phases, using all available means, including directing drainage from the east mine rock stockpile into the pit.
 - Treating water in the upper water column of the open pit lake, to avoid release of contaminated water, and ensure passive outflow does not exceed regulatory standards during the decommissioning and abandonment phases.
 - Designing and constructing the perimeter ditching around the east mine rock stockpile and low grade ore stockpile to accommodate a 100-year flood event.

The proponent has committed to implement additional mitigation measures as identified in Appendix A: Part 2.

7.1.6 *Agency analysis and conclusion*

The Project is predicted to cause effects on fish from the alteration and disruption of existing fish habitat, and from changes in water quality and quantity. The Project will cause direct loss and alteration of fish and fish habitat in the Minor Creek Systems. There may be changes in water levels and flow as a result of alteration and disruption of the Minor Creek Systems and water taking from the Pinewood River. Impacts to surface water as a result of dewatering activities are expected to be minimal as groundwater is not a major contributor to surface water flows. Changes to water quality may occur from tailings and rock stockpile management, and treated effluent discharge into the Pinewood River. The proponent plans to mitigate the effects to fish and fish habitat by implementing fish habitat offsetting and compensation plans to offset the loss of fish habitat. The effects to water flow will be mitigated by capturing and returning groundwater to the Pinewood River to minimize potential flow effects on the river, particularly during low flow periods; restricting water taking from the Pinewood River to the first two years of the construction phase; and implementing a water management plan to reduce the effects related to water quantity and ultimately on fish habitat. Also, the proponent plans to mitigate effects to water quality by implementing the water management plan which includes using potentially acid generating material for construction only where saturated conditions can be maintained and placing an engineered cover over the east mine rock stockpile at decommissioning; recycling the treated onsite metal mill effluent discharge into the tailings management area; and reusing the contact water collected from the various stockpile and seepage collection systems. The Agency is satisfied that the proponent has responded to government authorities and Aboriginal comments, including by establishing minimum flow requirements for the protection of fisheries in the Pinewood River. The Agency considers the residual effects to be minor and localized with the implementation of the fish habitat offsetting and compensation plans, the proponent's water management plan, and the proponent's commitment to develop minimum flow thresholds to protect aquatic habitats, in consultation with Ministry of the Environment and Climate Change and Fisheries and Oceans Canada.

The Agency concludes that the Project is not likely to cause significant adverse environmental effects on fish and fish habitat and water quantity, taking into account the implementation of mitigation measures.

7.2 **Migratory Birds**

7.2.1 *Baseline by proponent*

The proponent recorded 158 migratory bird species protected under Article I of the *Migratory Birds Convention Act* in the Natural Environment Local Study Area. Of them, the most commonly observed migratory bird species were: White-throated Sparrow, Veery, Ovenbird, Red-eyed Vireo, American Robin, Nashville Warbler, and Common Yellowthroat. Additional baseline information regarding migratory birds that are identified as species at risk is provided in section 7.9.

The Natural Environment Local Study Area encompasses a variety of suitable breeding, foraging, and stopover migratory bird habitats (Table 8), including woodland habitats (coniferous forest, mixed forest, and deciduous forest), marsh habitats (swamp, meadow marsh, bog, and fen), and open country

habitats (grassland, pastures, and meadow). Field studies conducted in spring and fall found low numbers of migrating waterfowl, shorebirds and songbirds, indicating that the Natural Environment Local Study Area is not an important migratory stopover location.

Table 8 Bird Habitat Reported by the Proponent

Habitat and Area	Diversity and Species Observed by Proponent
<p>Woodland habitats cover 74.9 percent of the Natural Environment Local Study Area</p>	<ul style="list-style-type: none"> • The greatest diversity of migratory birds occupy larger woodland areas in the Natural Environment Local Study Area; • Very was the most abundant species, and was found throughout the Natural Environment Local Study Area; • Ovenbird, Hermit Thrush, and Black-and-white Warbler were other species found throughout the Natural Environment Local Study Area.
<p>Wetland habitats (swamp, fen, bog, marsh) cover 11.3 percent of the Natural Environment Local Study Area</p> <p>Marsh habitats cover 4.6 percent of the Natural Environment Local Study Area with only a small amount found within the project site</p>	<ul style="list-style-type: none"> • 11 waterfowl species were recorded, including Trumpeter Swan, Canada Goose, Mallard, and Wood Duck; • Four species nest in colonies on the ground (American White Pelican, Double-crested Cormorant, Herring Gull, and Ring-billed Gull); • American Bittern and Sandhill Crane were widely observed.
<p>Open country habitats cover 9.7 percent of the Natural Environment Local Study Area, consisting primarily of agricultural habitat</p>	<ul style="list-style-type: none"> • Four meadow habitat features greater than 30 ha occur in the Natural Environment Local Study Area; • Grassland bird species were widely observed (the most common species were Bobolink and Savannah Sparrow, which were observed in hay fields and pastures); • Black-billed Magpies were common in agricultural lands close to anthropogenic features across the Natural Environment Local Study Area.

Adapted from Rainy River EIS, AMEC

7.2.2 Effects predicted by proponent

Potential adverse effects on migratory birds include direct loss of habitat, their eggs and nests, decreased reproduction rates, and mortality. These effects may occur directly or indirectly through land clearing, increased human presence, changes to habitat suitability related to light and sound, and vehicle collisions during construction and operation.

Specific effects to migratory birds that are identified as species at risk are described in section 7.9.

Vegetation clearing will occur during construction of the tailings management area, low grade ore and east mine stockpiles, overburden and west mine rock stockpiles, open pit, realigned Highway 600 and access roads, and other mine site infrastructure. The activity of vegetation clearing can have direct impacts on birds, nests and eggs, particularly during the bird breeding season.

Vegetation clearing for the entire project will remove a total of 1475.3 ha of woodland habitat, 291.8 ha of wetland habitat and 399 ha of open country habitat (a total of eight percent of the Natural

Environment Local Study Area). A large portion of this migratory bird habitat will result from the construction of the tailings management area and other project components which will destroy parts of the Minor Creek Systems. This will result in clearing of all three habitat types described above.

Loss of wetland habitat during construction will impact and displace species like Trumpeter Swans and other waterfowl, which require marsh habitat for breeding. Trumpeter Swans exhibit strong nest site fidelity, therefore breeding success may be impacted as breeding pairs will likely attempt to return to cleared breeding habitats. Historical studies indicated that this species can habituate to human presence. Loss of open country (agricultural and meadow) habitat during construction will displace Savannah Sparrows, Clay-colored Sparrows, and Song Sparrows.

There are potential impacts to migratory birds during construction and operation from light and sound emissions. Mine construction and operation will require artificial lighting both day and night. Bright artificial lights may negatively impact Common Nighthawk and other nocturnal birds by causing them to avoid habitat within or adjacent to the mine site, or by decreasing their forage efficiency. Sound emissions will be greatest in areas of concentrated heavy equipment operation, most notably with the open-pit and stockpiling operation, and with the onsite crusher and metal mill. Noise can mask important bird communication signals and behavioural triggers like the songs of territorial males, calls of females, begging calls of nestlings, approaching predators, or the presence of prey. Overly noisy habitats can result in decreased breeding success or lower bird density.

In addition, migratory birds may experience increased mortality rates from collisions with vehicles, due to increased local traffic during construction and operation.

7.2.3 Comments received

Government authorities

Ministry of Natural Resources and Forestry raised concerns with noise levels with respect to wildlife. The proponent will minimize sound levels at the project site by using sound abatement measures.

Aboriginal Communities

Aboriginal communities expressed concerns about the relationship of the project site to the Mississippi Flyway, and the importance of Lake of the Woods and Rainy Lake as migratory stopover sites. The proponent responded that the natural environment regional study area (Natural Environment Regional Study Area) is within this flyway, but migration surveys in 2010 did not indicate high numbers of waterfowl, or shorebirds in the area.

Concerns were expressed about the potential for birds to access the tailings management area. The proponent will treat the tailings slurry to a level below the cyanide threshold, as outlined by the International Cyanide Management Code. At decommissioning, the exposed tailings beach will be covered with overburden and the remaining tailings will be flooded with water to prevent oxidation of tailings during abandonment. The proponent will ensure that the tailings pond waters remain of high quality, such that they will not pose a threat to the environment, including birds. The margins of the tailings pond will be developed as wetland habitat.

Public

The public expressed general concerns about the potential impacts to migratory birds.

7.2.4 *Residual environmental effects predicted by proponent*

The proponent committed to a number of mitigation measures (Appendix A) to mitigate the effects on migratory birds and migratory bird habitat, some of which were in response to comments or concerns raised. The Agency identified those measures required to prevent significant adverse effects (subsection 7.2.5).

Residual effects on migratory birds resulting from vegetation clearing during construction and operation of the proposed mine infrastructure were predicted to be minor in magnitude and confined to the project site. They were predicted to be long-term, continuous through mine construction, operation and decommissioning but reversible following decommissioning and abandonment. The proponent does not expect residual adverse effects to migratory birds from changes to the atmospheric environment (air quality and noise) and from vehicle collisions after applying mitigation measures.

The proponent considered the overall effects on migratory birds as not likely to be significant.

7.2.5 *Mitigation measures*

The Agency has identified the following key mitigation measures as necessary to prevent significant adverse effects on migratory birds.

- Provide approximately 1400 hectares of private lands as habitat for Eastern Whip-poor-will and Bobolink, which will provide protection and habitat for migratory birds.
- Carry out project activities in a manner that avoids harming or killing migratory birds, or disturbing, destroying, or taking nests or eggs, in accordance with Environment Canada's policy on Incidental Take of Migratory Birds in Canada, and avoidance guidelines on General Nesting Periods of Migratory Birds in Canada⁹.
- Create artificial nesting structures for Barn Swallows prior to the removal of existing nesting structures to encourage colonization by Barn Swallows.
- Manage site lighting fixtures to reduce light pollution in surrounding environment and minimize disturbance to nocturnal species, such as Common Nighthawk.
- Minimize sound levels at the Project site boundary by applying sound abatement measures to control sound levels from mining trucks, excavators, and diesel generators.
- Deter migratory birds from using the tailings management area.

Additional mitigation measures related to air quality are discussed in section 7.4. The proponent has committed to implement additional mitigation measures as identified in Appendix A: Part 2.

⁹ <http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=1B16EAFB-1>

7.2.6 *Agency analysis and conclusion*

The Project may result in decreased reproduction rates and increased mortality in migratory birds due to clearing of land and changes to the atmospheric environment. The proponent's commitments to restrict habitat clearing to outside of the breeding season, and efforts to manage light and sound emissions will reduce bird mortality and avoid breeding effects. Measures to mitigate the effects to water quality, such as treatment of the tailings slurry, covering the exposed tailings beach with overburden and saturating the tailings management area with water, will also mitigate effects to migratory birds. The proponent has responded to federal authority and Aboriginal comments, including a commitment to implement sound abatement measures. The Agency considers the residual effects on migratory birds are localized and diminish in duration and frequency once operation begins. Effects to migratory birds will also be mitigated by compensatory habitat, fugitive dust management best practices plan, and revegetation at decommissioning (sections 7.3 and 7.4).

The Agency concludes that the Project is not likely to cause significant adverse environmental effects on migratory birds taking into account the implementation of mitigation measures.

7.3 **Current Use of Lands and Resources for Traditional Purposes by Aboriginal Peoples**

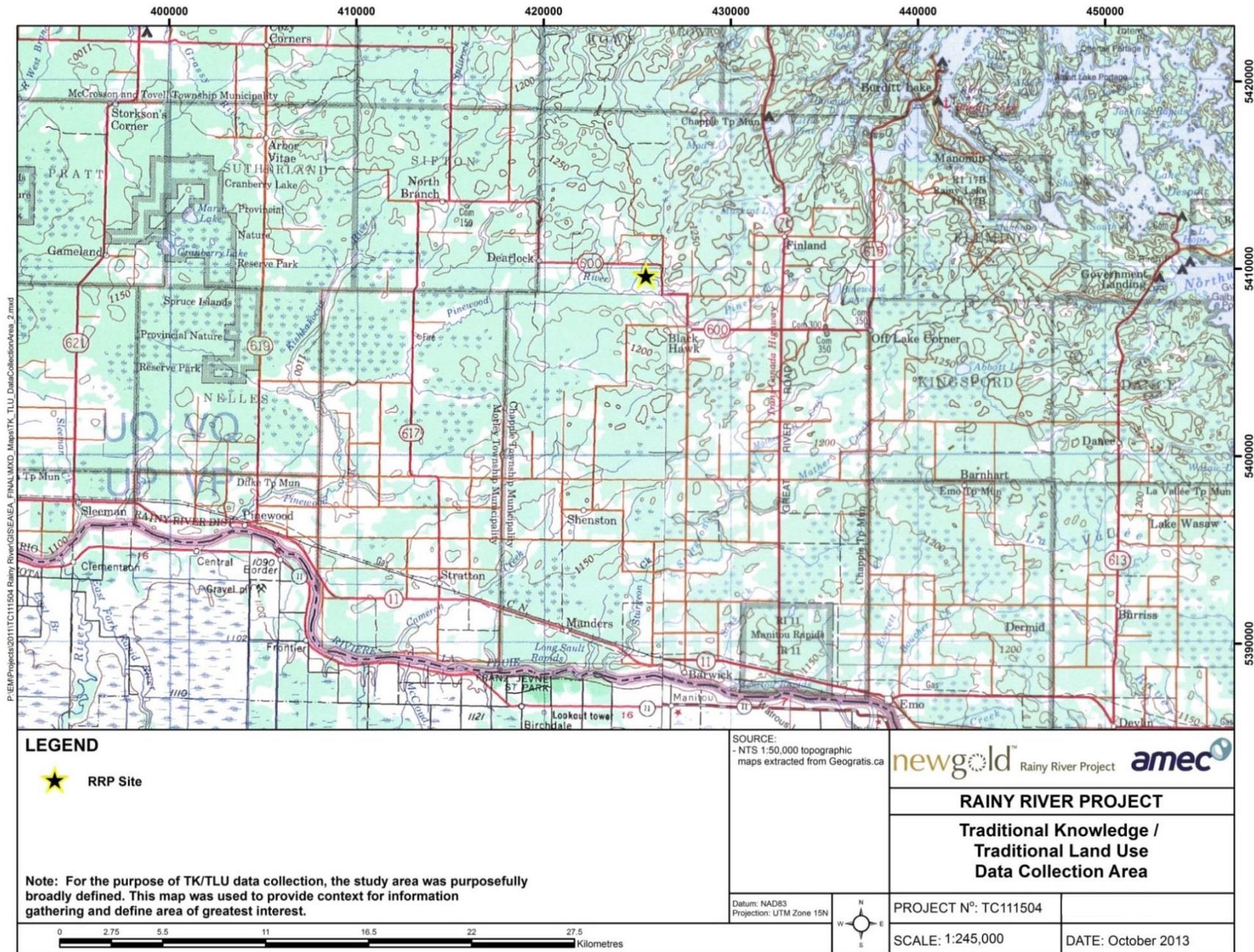
7.3.1 *Baseline by proponent*

Aboriginal communities currently use lands within the project site and the Human Environment Regional Study Area for hunting, subsistence fishing, baitfish harvesting and plant harvesting, including for medicinal use (Field Sedge and New England Violet) (Figure 9). More specifically, they use the Pinewood River, the Minor Creek Systems and adjacent watersheds for fishing.

Big Grassy River First Nation and the Métis Nation of Ontario Region 1 completed their own Traditional Knowledge and Traditional Land Use studies after the final environmental impact statement (EIS) was issued by the proponent. Métis Nation of Ontario Region 1 requested that the results of its Traditional Knowledge and Traditional Land Use study be kept confidential. Generally, these studies identify a number of traditional land uses in and around the project site, including hunting, fishing and plant harvesting.

Big Grassy River First Nation actively hunts deer and small game in the project site, and generally within the Human Environment Local Study Area, while moose are occasionally hunted within the Human Environment Regional Study Area. The studies showed that the community uses Lake of the Woods and Rainy River, located downstream of the Project, for subsistence fishing and baitfish harvesting. Harvesting berries, wild medicines, wild rice, and other plants occurs in the Human Environment Regional Study Area. Big Grassy River First Nation community members collect sage for food, healing, and ceremonial purposes, and cedar, sweet grass, and fungus for medicinal purposes at the project site.

Figure 9: A broad view of the proponent’s Traditional Knowledge and Traditional Land Use data collection area, encompassing the Natural Environment Regional Study Area and Human Environment Regional Study Area



7.3.2 *Effects predicted by proponent*

The Project will cause loss and fragmentation of terrestrial wildlife habitat for hunting during construction, operation and decommissioning; loss of aquatic habitats and changes to water quality and quantity that could affect fish and fish habitat for fishing; and a loss of plants harvested for food and medicines.

Hunting activities may be affected through the direct impacts on ungulates including White-tailed Deer and moose, furbearers, and game birds. Ungulates and furbearers also may experience increased mortality rates from collisions with vehicles due to increased local traffic during construction and operation. Noise can mask important behavioural triggers to detect predators and other environmental cues. In addition, food waste generated at the project site could attract predators to the area that prey on ungulates and furbearers. Ungulates and furbearers may bioaccumulate heavy metals from consuming vegetation contaminated by emissions and dust or water from the tailings management area. The predicted effects on game birds are similar to environmental effects on migratory birds discussed in section 7.2. Also, the transmission line corridor may create additional access for hunters in the region, adding pressure on resources.

Hunting activities may also be affected through the loss of access to lands within the project site. Travelling beyond the Natural Environment Local Study Area for traditional hunting becomes time and cost prohibitive for Aboriginal people. Although a small portion (1.5 percent) of the local Wildlife Management Unit will be removed for hunting, the realignment of Highway 600 and the creation of the transmission line corridor may create additional access for Aboriginal and non-Aboriginal hunters to areas south of the Pinewood River and around the transmission line corridor.

Subsistence fishing and baitfish harvesting may be affected through changes to water quantity in the Pinewood River during construction; impacts to water quality due to the tailings management area, overburden and east and west mine rock stockpile areas, and treated effluent discharge during operation; and the loss of fish habitat during construction and operation (section 7.1).

Plant harvesting of berries and other plants for food and medicines may be affected through the direct removal of plants during construction; replacement of native species with non-native species during habitat restoration; and contamination due to emissions and dust. The New England Violet and the Field Sedge, both rare plants, are known to have medicinal value for Aboriginal communities. Wild rice also is harvested; however, it grows at Lake of the Woods, downstream of the project site, and is affected by fluctuating water levels. The proponent does not predict adverse water quality effects downstream of the site, nor changes to water levels at Lake of the Woods or to wild rice growing areas.

7.3.3 *Comments received*

Government authorities

Federal authorities sought clarification on VCs linked to traditional land use, results of additional Traditional Knowledge and Traditional Land Use studies, and the likelihood these studies would modify conclusions of the environmental effects assessment. The proponent considered the additional Traditional Knowledge and Traditional Land Use studies and provided additional information during the course of the EA on predicted effects and mitigation measures to reduce effects on current use of lands

and resources for traditional purposes. The proponent confirms that Big Grassy River First Nation and the Métis Nation of Ontario Region 1 have used and continue to use the project site and surrounding lands, and desire to do so in the future.

Aboriginal communities

Aboriginal communities expressed concern about inadequate knowledge and data on traditional land use and historic changes. They also expressed concern about the loss of access for hunting, fishing, and plant harvesting for food and medicines throughout the project site and surrounding areas. Related concerns for hunting included reduced abundance of wildlife due to the loss of habitat within the project site. They asked the proponent to further study the effects on wild rice, medicines, vegetation, and wildlife habitat. They raised concerns that closure objectives do not relate to the restoration of land use that has been identified by the traditional land use studies.

They expressed concerns about the potential adverse effects of noise and vibration on wildlife, particularly during breeding and birthing seasons.

Métis Nation of Ontario Region 1 expressed concern about the use of herbicides for vegetation management along the transmission line right of way.

Public

Public comments were not received in relation to this VC.

7.3.4 Residual environmental effects predicted by proponent

The proponent committed to a number of mitigation measures (Appendix A) to mitigate the effects on current use of lands and resources for traditional purposes by Aboriginal people, some of which were in response to comments or concerns raised. The Agency identified those measures required to prevent significant adverse effects (subsection 7.3.5). In addition to the key mitigation measures identified below, the proponent has also committed to develop a compact project site to reduce overall habitat loss and limit potential interference with wildlife movement, and reduce extent of air and noise emissions.

The residual effects on current use of lands and resources for traditional purposes by Aboriginal people were predicted to be minor in magnitude and confined to the project site. They are likely to be medium-term in duration continuing through mine construction, operation, and decommissioning but reversible following decommissioning and abandonment. The residual effects on hunting and plant harvesting are the loss of access to lands, including for wild medicines, berries, and other vegetation at the project site. The residual effects on fishing include changes to water quality and quantity, and the loss of fish habitat within the project site.

The proponent considered the overall effects on current use of lands and resources for traditional purposes by Aboriginal people as not likely to be significant.

7.3.5 Mitigation measures

The Agency has identified the following key mitigation measures as necessary to prevent significant adverse effects on current use of lands and resources for traditional purposes:

- Provide access to private lands to Aboriginal communities for their current use of land, including hunting and plant harvesting.
- Prohibit the use of herbicides and minimize removal of vegetation along the transmission line corridor.
- Maintain a fence around the tailings management area to prevent access by wildlife.
- Restore habitat or develop new habitats with the goal of supporting a diversity of wildlife species, including ungulates and furbearers, as well as native plant species previously collected at the project site for food and medicinal purposes.
- Revegetate and recolonize disturbed areas as part of progressive restoration during operation and decommissioning.
- Separate and stockpile removed organic-rich material during construction of open pit and during tailings dam stripping for use as topsoil during revegetation.
- Revegetate in a manner that ensures selected native plant species recolonize easily in the project site, such as on mine rock stockpiles, in collaboration with regulatory authorities.
- Restore access to Aboriginal communities to the project site following decommissioning, to the extent that such access is safe and possible.

The proponent will consult with Aboriginal communities on the implementation of mitigation measures to provide access to private lands, and restore access to the project site following decommissioning.

The proponent has committed to implement additional mitigation measures as identified in Appendix A: Part 2.

7.3.6 *Agency analysis and conclusion*

Aboriginal groups are expected to be able to continue traditional practices in the Natural Environment Regional Study Area, with some modifications, after taking into account mitigation measures and proponent's commitments. Access to the project site for traditional uses such as hunting and gathering of traditional plants will be lost for the most part during the life of the Project. However, the project site is a small portion of the Natural Environment Regional Study Area and the remainder of the regional area is expected to remain available and accessible for traditional practices. Controlled use of the project site by Aboriginal peoples may be allowed once construction is completed. Access to private lands is expected to offset loss of access to the project site for hunting and plant harvesting, including medicinal plants. At decommissioning, access to the project site will be restored to the extent that such access is safe and possible. The proponent has committed to continue engagement with Aboriginal groups throughout the Project, including with respect to Traditional Knowledge and Traditional Land Use studies and the development of adaptive management techniques related to the mine closure plan, including the restoration of habitat for wildlife (section 10).

The Agency concludes that the Project is not likely to cause significant adverse environmental effects on the current use of lands and resources for traditional purposes by Aboriginal people, taking into account the implementation of the mitigation measures.

7.4 Health and Socio-economic Conditions of Aboriginal Peoples

7.4.1 *Baseline by proponent*

Wildlife, fish, and plants are important food sources for Aboriginal communities. Aboriginal communities identified the consumption of fish from the Pinewood River and of White-tailed Deer and moose. Northern Pike and Walleye in the Pinewood River were sampled for metal concentrations of mercury, cadmium, and lead to determine baseline levels for human consumption. Mercury in both species exceeded selected human consumption guidelines in the baseline condition. Cadmium and lead concentrations were below their detection limits. No published information exists on background metal concentrations in ungulates (primarily cadmium, lead, and mercury).

Big Grassy River First Nation noted that it uses the Pinewood River for both commercial fishing and baitfish harvesting. Members of Big Grassy River First Nation trap baitfish in the Pinewood River watershed, which are caught and sold seasonally. Aboriginal communities may also hold commercial fishing licenses on Lake of the Woods.

Aboriginal communities use the Natural Environment Regional Study Area and the Pinewood River watershed, downstream of the project site, for fishing, hunting, and plant gathering, including berries and wild rice.

7.4.2 *Effects predicted by proponent*

The predicted effects on Aboriginal health may result from the release of contaminants into the atmosphere, surface water, and groundwater that can bioaccumulate in the food chain during construction and operation. Possible emission sources include dust from milling operation, heavy equipment operation along site haul roads and mineral stockpiles, treated effluent release to surface waters, diesel fuel and material spills, and direct tailings management area discharge into the Pinewood River.

Effluent release to groundwater is expected to be negligible due to the abundance of low permeability clay and the extensive use of runoff and seepage collection systems.

Contaminants of potential concern in the atmosphere include dust and metals (total suspended particulates, particulate matter (up to 10 micrometers in size), fine particulate matter (up to 2.5 micrometers in size), mercury, arsenic, cadmium, and lead) as well as nitrogen and sulfur dioxides (section 6.1). Some are essential elements and others, such as arsenic, chromium, and nickel, have no biological function or requirement. Cadmium, lead, and mercury, in particular, show an increased tendency to bioaccumulate because organisms lack the ability to effectively excrete these metals. The ability of these parameters to cause a health risk is a function of release rates, exposure pathways, and organism presence and sensitivity.

Cadmium, lead and mercury were found in low concentrations in the ore and mine rock, and were modeled at low concentrations at the project site boundary. Air emissions for health considerations are expected to be below *Ambient Air Quality Criteria* limits for emissions during all phases of the Project, with only infrequent potential exceedances of *Ambient Air Quality Criteria* for total suspended particulate and fine particulate matter at the project site boundary during operation. Air emissions are

expected to be considerably lower at the nearest permanent receptors. Antimony may exceed provincial and federal drinking water guidelines, although it is not known to be carcinogenic or to bioaccumulate. People are not expected to drink directly from the tailings management area or Pinewood River.

Releases of mercury and lead from the tailings management area are predicted to be below *Provincial Water Quality Objectives*. Acceptable concentrations according to *Provincial Water Quality Objectives* include consideration of fish tissue residue criteria. These criteria are used for assessing the significance of contaminant residues in fish tissues to fish populations and to wildlife consumers of fish. Furthermore, mercury concentrations in the tailings management area are expected to be similar to those in the Pinewood River, and therefore the health risk from fish consumption is not expected to change as a result of the Project. Methylmercury is the form of mercury preferentially taken up by fish. The rate of mercury methylation in the constructed wetland could increase, due to the release of sulphate from the tailings management area. However, the wetland area of 60 ha is too small for mercury methylation in the wetland to increase concentrations in the Pinewood River that would be distinguishable from background concentrations.

The Project will not increase heavy metal concentrations to a level that would be of concern in local country foods; however, as cadmium concentrations were found to be higher relative to *Provincial Water Quality Objectives* limits, monitoring for metal concentrations in White-tailed Deer liver tissue is proposed.

Health risks related to potential spills of hazardous materials during operation were considered to be small. Spills are viewed as unlikely as these materials are routinely handled, transported, and highly regulated at all northern Ontario mine sites. To reduce effects from spills, cyanide will be shipped in a solid form to facilitate easy clean-up on land. The unlikely spill of cyanide into a water body would cause the cyanide to break down rapidly, and could kill fish in the water body. The consumption of fish exposed to cyanide would not necessarily harm humans, as humans are able to detoxify the chemical in small doses. Ongoing presence of cyanide above *Provincial Water Quality Objectives* in drinking water could create a health hazard, although this is extremely unlikely. Commercial fishing activities such as licenced bait fishing in the Pinewood River watershed may be affected by the direct loss of fish habitat during construction and operation. In addition, changes in water quality and quantity may also impact commercial fishing activities in Pinewood River. Impacts on commercial fishing will have an indirect economic effect on Aboriginal peoples

7.4.3 *Comments received*

Government authorities

Health Canada provided a list of expert international sources with knowledge that could be incorporated into the human health risk assessment. Health Canada commented about potentially carcinogenic metals and sought validation that there are no elevated health risks. The proponent calculated risk and provided an example that indicated a minimal increase in non-cancer risk and a minimal increase on the incremental lifetime cancer risk. Health Canada was satisfied with the proponent's response. Health Canada also commented on the monitoring of fish tissue with respect to human consumption patterns.

Aboriginal communities

Aboriginal communities expressed general concerns about monitoring, contaminants in country foods, and wells (section 10).

Public

The public was concerned about wildlife drinking potentially contaminated water from the project site, including the tailings management area and water management ponds. The public was also concerned with the associated potential for bioaccumulation of contaminants through the food chain, and concerns about long-term health effects on nearby residents.

7.4.4 Residual environmental effects predicted by proponent

The proponent committed to a number of mitigation measures (Appendix A) to mitigate the effects on Aboriginal health and socio-economic conditions, some of which were in response to comments or concerns raised. The Agency identified those measures required to prevent significant adverse effects (subsection 7.4.5).

The residual effects on Aboriginal health and socio-economic conditions were predicted to be short-term, infrequent and reversible at decommissioning. They are expected to be minor in magnitude and confined to the Human Environment Local Study Area. The proponent predicted that health risks from the consumption of fish and wildlife are not likely. The residual effects on commercial fishing are the same as those described in section 7.3.4.

The proponent considered the overall effects on health and socio-economic conditions of Aboriginal people as not likely to be significant.

7.4.5 Mitigation measures

The Agency has identified the following key mitigation measures as required to prevent significant adverse effects on Aboriginal health and socio-economic conditions. Additional key mitigation measures related to water quality are listed in section 7.1.

- Control air emissions to avoid exceedances of the Canadian Ambient Air Quality Standards and meet air quality requirements established by Ontario at the nearest human receptor.
- Use dust control equipment (e.g., bag houses, bin vents, surfactants, such as calcium chloride and water sprays) to control dust emissions from the crusher and onsite metal mill, provided such applications are acceptable to the Ministry of the Environment and Climate Change.
- Implement a fugitive dust best management practices plan for both the construction and operation phases. The plan will identify all potential sources of fugitive dusts, outline mitigation measures, and detail inspection and recordkeeping requirements to demonstrate effective management.
- Maintain site roadways to minimize silt loading; the road maintenance and inspections procedures, including timelines, will be incorporated into the fugitive dust best management practices plan.
- Use low-sulphur diesel equipment and pollution control equipment to control air emissions from mobile heavy equipment operation, including meeting any applicable federal requirements for the emissions of these vehicles and equipment. Develop and implement preventative maintenance measures related to air quality.

- Employ dedicated water sprays at active stockpile areas, if further mitigation is required.
- Revegetate disturbed areas in a manner that minimizes all exposed dust sources.

The proponent has committed to implement additional mitigation measures as identified in Appendix A: Part 2.

7.4.6 *Agency analysis and conclusion*

Effects on Aboriginal health from consumption of country foods are expected to be minor as contaminant releases are expected to be within federal and provincial emissions and discharge criteria. The mitigation measures for impacts to water quality and air quality will reduce the risks of bioaccumulation of contaminants in the food chain. The mitigation measures, such as working with local Aboriginal peoples to monitor metal concentrations in country foods, will ensure that real-time information on any potential changes to the EA predictions is available to Aboriginal peoples (section 10).

With respect to socio-economic conditions, Aboriginal groups would be able to continue commercial bait fishing in the Natural Environment Regional Study Area, and in the Pinewood River specifically, after the development and implementation of the fish habitat offsetting and compensation plans. The proponent provided greater explanation about how the Project would result in no increased risk related to mercury concentrations to address Aboriginal concerns. The Agency expects the residual effects on Aboriginal health and socio-economic conditions are expected to be minor and localized as contaminant releases are to be within federal and provincial emissions and discharge criteria.

The Agency concludes that the Project is not likely to cause significant adverse environmental effects on health and socio-economic conditions of Aboriginal people, taking into account the implementation of the mitigation measures.

7.5 Physical or Cultural Heritage, and Effects on Historical, Archaeological, Paleontological, or Architectural Sites or Structures of Aboriginal Peoples

7.5.1 *Baseline by proponent*

Archaeological sites in Ontario are protected under the Ontario Heritage Act. Sites cannot be disturbed unless clearance is obtained from the Ministry of Tourism, Culture, and Sport. Surveys and historical records identified a total of 14 archaeological sites of importance to Aboriginal peoples within the Natural Environment Local Study Area and artifacts were also identified. The Traditional Knowledge and Traditional Land Use studies reported cultural sites and historical travel routes of importance to Aboriginal peoples. No sites or structures of historical, paleontological or architectural importance that relate to Aboriginal peoples were identified in the Human Environment Regional Study Area. The focus of the effects assessment was on physical or cultural heritage and archaeological sites related to Aboriginal peoples.

Big Grassy River First Nation's Traditional Knowledge and Traditional Land Use study reported that a variety of cultural and spiritual sites from the late 1970s to present day overlap within 250 m of the

project site. These cultural and spiritual sites include a burial ground and several sacred and spiritual sites in the project footprint. The Traditional Knowledge and Traditional Land Use study also showed lands within the Human Environment Local Study Area and Human Environment Regional Study Area, which have been used by Big Grassy River First Nation since the 1960s and 1940s respectively, continue to be used to present day. The Traditional Knowledge and Traditional Land Use also identified historical travel routes that were used to cross what is now the Canada-United States border, between Ontario and Minnesota.

Other Aboriginal communities identified current cultural use within the project site. The Aboriginal communities have requested that the specific locations and details of cultural use remain confidential. This request notwithstanding, the use has been taken into account in the EA.

7.5.2 Effects predicted by proponent

Aboriginal cultural heritage resources within and adjacent to the project site may likely be affected during the construction and operation phases of the Project through displacement and the introduction of physical, visual, audible, or atmospheric elements not in keeping with their character and setting.

Vegetation clearing may affect archaeological sites through the disturbance and removal of soils during the construction and operation phases.

7.5.3 Comments received

Government authorities

Federal and provincial authorities expressed concern about the lack of sacred burial sites, as no burial or sacred sites were initially identified in the EIS. However, the Traditional Knowledge and Traditional Land Use studies did identify burial grounds.

Aboriginal communities

Big Grassy River First Nation raised concerns about maintaining a spiritual relationship with the Project, and how the potential environmental effects from the Project may impact the broader cultural continuity, through reduced access to and use of the lands, waters, wildlife, and vegetation in impacted project areas. Other Aboriginal communities expressed concern over the direct loss of cultural sites on the project property.

Public

The proponent interviewed landowners as part of the impact assessment to obtain information that would contribute to understanding the existence of archaeological sites on properties, but no concerns were raised.

7.5.4 Residual effects predicted by proponent

The proponent committed to a number of mitigation measures (Appendix A) to mitigate the effects on physical or cultural heritage, and effects on archaeological sites or structures of importance to Aboriginal people, some of which were in response to comments or concerns raised. The Agency identified those measures required to prevent significant adverse effects (subsection 7.5.5).

The residual effects on physical or cultural heritage, and effects on archaeological sites or structures of importance to Aboriginal people were predicted to be minor in magnitude and confined to the project site. They will, however, be permanent and irreversible. Residual effects on cultural heritage include the displacement of current cultural use, which has been kept confidential on request by Aboriginal communities. The proponent predicted that residual effects on cultural heritage, archaeological sites, or structures were not expected with the above mentioned mitigation measures in place.

The proponent considered the overall effects on physical or cultural heritage, and effects on archaeological sites or structures of importance to Aboriginal people as not likely to be significant.

7.5.5 *Mitigation measures*

The Agency has identified the following key mitigation measures as required to prevent significant adverse effects on physical or cultural heritage, and effects on historical, archaeological, paleontological, or architectural sites or structures:

- Avoid known culturally significant sites where possible.
- Assess additional significant sites, should any be discovered during project development.
- Preserve any discovered burial sites.
- Salvage, preserve and manage artifacts by transferring them to a facility identified by the Aboriginal groups, in consultation with the Ministry of Tourism, Culture and Sport.
- Establish a procedure for safe access to site for cultural and ceremonial purposes to Aboriginal communities, including young people, to participate in ceremonies and learn from elders and ceremonialists.

The proponent will consult Aboriginal groups on the implementation of these key mitigation measures. In addition, the Agency notes that the proponent plans to engage and educate Aboriginal communities on identified archaeological sites, including by sharing knowledge about the technique used to find the sites and by seeking their input on location of ancient sites and provide training to all mine employees to ensure that workers are respectful of indigenous ceremonies, culture, and the principles and values of the Ojibwe people. The proponent has also committed to implement additional mitigation measures as identified in Appendix A: Part 2.

7.5.6 *Agency analysis and conclusion*

Archaeological sites, cultural sites and historical travel routes of importance to Aboriginal peoples could be impacted by the Project through displacement and the introduction of physical, visual, audible, or atmospheric elements. These effects will be greatest during construction. It is expected that the project site will be available for some controlled cultural use after construction, and for cultural use upon decommissioning. The proponent commits to reduce the effects on physical or cultural heritage by avoiding culturally significant sites where possible and managing additional significant sites, should any be discovered during project development. Effects on archaeological sites or artifacts will be minimal as the sites will be preserved and the artifacts will be transferred to Aboriginal communities. The proponent has committed to preserving any discovered burial sites.

The Agency expects the residual effects on current cultural use to diminish in duration and frequency. The residual effects are expected to be mitigated upon the provision of access to nearby sites for cultural use and given that access to the project site for controlled cultural use by Aboriginal peoples will likely increase after construction. The Agency further considers the residual effects on artifacts will be minimal as they will be preserved and transferred to Aboriginal communities.

The Agency concludes that the Project is not likely to cause significant adverse environmental effects on physical or cultural heritage, or archaeological sites or structures, taking into account implementation of the mitigation measures.

7.6 Recreation and Commercial Use

7.6.1 Baseline by proponent

Trapping, hunting, fishing, and other recreational activities occur in the Human Environment Local Study Area. Trapping, hunting and fishing for tourism or commercial purposes also occur.

The project site overlaps four traplines used by non-Aboriginal people. Within the Human Environment Local Study Area, beaver, marten, and weasels are frequently trapped; River Otters and mink are less frequently trapped. Spruce Grouse, Sharp-tailed Grouse, waterfowl, bears and deer are also hunted in the Human Environment Local Study Area. Limited bait fishing occurs within the project site, specifically within West Creek and Clark Creek, and limited fishing of Northern Pike and Brown Bullhead occurs in the Pinewood River. The project site does not support a large commercial or recreational fishery. More extensive recreational fishing opportunities are available within Off Lake, Beadle Lake, Boundary Lake, Little Pine Lake, and Burditt Lake, located northeast of the project site. The Human Environment Local Study Area is in Ontario's Wildlife Management Unit #10 and is located in four bear management areas operated by tourist outfitters authorized by the Ministry of Natural Resources and Forestry.

Local residents use the 12 km Richardson Trail in the Natural Environment Local Study Area for hiking, snowmobiling, snowshoeing, and for all-terrain vehicles to access remote hunting areas. It is comprised of old logging roads, municipal and private roads, and animal trails.

7.6.2 Effects predicted by proponent

Of the four traplines, the Project will most notably overprint 38 percent of one trapline and 13.9 percent of another. Project components associated with federal authorizations will affect the land base within the first and second traplines. Construction of new fish habitat to offset effects will occur within both traplines. Individuals that previously trapped and hunted wildlife on lands within the project site will no longer be granted access to that land during construction, operation and decommissioning. The proponent purchased the lands for the development of the Project, which has allowed it to limit trapping and hunting activities since the project site and associated lands are privately owned. Trapping and hunting activities will continue to decline for safety, security and liability reasons.

The loss of access and areas for trapping and hunting at the project site may have an indirect socio-economic effect on trappers and hunters. Commercial fishing activities, such as licenced bait fishing in the Pinewood River watershed, may be affected by the direct loss of fish habitat during construction of the tailings management area, west rock and overburden stockpiles, open pit and the east rock

stockpile, and operation of the mine. In addition, changes in water quality and quantity also may impact commercial fishing activities in Pinewood River and may have an indirect socio-economic effect.

Cottaging, camping, snowmobiling, and hiking are limited activities in the Human Environment Local Study Area, but may still be affected during construction, operation and decommissioning. The south part of Richardson Trail will be partially altered and disrupted by tailings management area construction, but other parts of the trail will remain accessible.

7.6.3 Comments received

Government authorities

The Ministry of Natural Resources and Forestry commented on impacts to commercial and recreational use of the area, specifically with regards to continued access for hunting and impacts to a local honey bee farmer. The proponent committed to develop habitat that would likely support species of importance to local hunters, including White-tailed Deer. The proponent identified that bee health and the quality of honey produced would not be affected because the effluent released into the tailings management area will be treated for cyanide and heavy metals, and therefore, will not contain contaminants.

Aboriginal communities

Aboriginal communities did not comment on non-Aboriginal recreation and commercial use. Comments on traditional use are listed in section 7.3.

Public

The public had general comments about the use of the area for trapping and hunting but did not express socio-economic concerns related to trapping, hunting or fishing for commercial purposes. The proponent has committed to collaboratively develop accommodation measures with local trapline holders. In relation to the Richardson Trail, the proponent plans to enhance other components of the Trail.

Sport fishing is the main tourist attraction for the area, but no specific concerns have been raised. Local residents indicated that fishing occurs more often in larger streams and water bodies (i.e., Rainy River, Rainy Lake, and the Lake of the Woods). The proponent indicates that more extensive recreational fishing opportunities are also available in lakes northeast and upstream of the project site (i.e., Off Lake, Beadle Lake, Boundary Lake, Little Pine Lake, and Burditt Lake).

7.6.4 Residual effects predicted by proponent

The proponent committed to a number of mitigation measures (Appendix A) to mitigate the effects on recreation and commercial use, some of which were in response to comments or concerns raised. The Agency identified those measures required to prevent significant adverse effects (subsection 7.6.5).

The residual effects on trapping, hunting and fishing were predicted to result from restricted access and loss of land for trappers and hunters, loss of fish habitat for bait fishing at the project site, and removal of a portion of the Richardson Trail by the tailings management area. There is a negligible loss of bear management areas due to the development of the mine. The residual effects on recreation and commercial use were predicted to be minor in magnitude and confined to the Human Environment

Local Study Area. They are predicted to be medium-term in duration and continuous through mine construction, operation and decommissioning, and reversible at decommissioning.

The proponent considered the overall effects on recreation and commercial use as not likely to be significant.

7.6.5 *Mitigation measures*

In the view of the Agency, the Project will not have significant adverse effects on recreation and commercial use. Consequently, the Agency has not identified any key mitigation measures and notes that the proponent has committed to implement mitigation measures as identified in Appendix A: Part 2.

7.6.6 *Agency analysis and conclusion*

Indirect socio-economic effects on recreational and commercial use, such as trapping, hunting, fishing, and the enjoyment of Richardson Trail, may result from the displacement of lands for hunting and fishing, and the removal of a portion of Richardson Trail by the tailings management area. The proponent's commitment to restore access to the project site for trapping and hunting at decommissioning, when it is safe to do so, will mitigate effects to trapping and hunting. Measures to reduce effects on fish and fish habitat will also mitigate effects to recreation and commercial use. The proponent has indicated that it would enhance components of the Richardson Trail and mitigate the impacts by working with local landowners. The Agency considers the residual effects on recreation and commercial use will generally be minor in magnitude and localized, as the project site is privately owned and limited commercial use occurs at the project site.

The Agency concludes that the Project is not likely to cause significant adverse environmental effects on recreation and commercial use, taking into account the implementation of mitigation measures.

7.7 **Amphibians and Reptiles**

7.7.1 *Baseline by proponent*

Amphibians

Annual amphibian breeding surveys recorded the presence of eight frog species in the Natural Environment Local Study Area: American Toad, Boreal Chorus Frog, Mink Frog, Northern Green Frog, Northern Leopard Frog, Spring Peeper, Tetraploid Gray Treefrog, and Wood Frog. Historically, two salamander species have been recorded in the Natural Environment Local Study Area, but none were observed. Woodlands and wetlands were identified as important amphibian breeding habitat.

Woodland amphibian breeding habitats within the Natural Environment Local Study Area consist of vernal (permanent or ephemeral) pools, wetlands and lakes within or adjacent (120 m) to woodlands.

Wetland amphibian breeding habitat within the Natural Environment Local Study Area consists of vernal pools and wetlands greater than 0.05 ha. Beaver ponds and other wetlands features are numerous throughout the Natural Environment Local Study Area.

Reptiles

Three species of reptiles were observed opportunistically in the Natural Environment Local Study Area: Eastern Gartersnake, Western Painted Turtle, and Snapping Turtle. Historically, the Northern Red-bellied Snake and Red-sided Gartersnake have been recorded in the Natural Environment Local Study Area, but none were observed and few snake observations were recorded during field studies.

Reptile hibernacula consist of animal burrows, rock crevices, and other natural areas that enable hibernation below the frost line. No hibernacula features were found in the Natural Environment Local Study Area, although it may provide suitable habitat for hibernacula.

Turtle overwintering sites are described as permanent water bodies, large wetlands, and bogs or fens with dissolved oxygen. The Natural Environment Local Study Area may provide suitable turtle overwintering habitat, but no records exist for turtle wintering sites there. Turtles generally nest in sand and gravel located in open, sunny areas where they are able to dig. Gravel pits, woodlands, and wetlands may provide suitable turtle nesting habitat. Road embankments in the Natural Environment Regional Study Area have been noted as being used for turtle nesting.

Western Painted Turtles were observed near Muskrat Lake and Little Pine Lake. The lakes provide important overwintering habitat for the species during migration to the north. Additional baseline information regarding reptiles that are identified as species at risk (i.e., Snapping Turtle) is provided in section 7.9.

7.7.2 Effects predicted by proponent

The predicted environmental effects on amphibians and reptiles will result from the alteration and removal of woodland, wetland, creek and pond habitats in relation to federal authorizations. Of the total habitat removed (section 6.2), 1475.3 ha of woodland and 291.8 ha of wetland associated with amphibian breeding will be impacted.

Treated effluent discharges from the project site into the environment are expected to meet provincial site-specific criteria and federal *Metal Mining Effluent Regulations* Schedule 4 limits. Partially treated effluent passing through the constructed wetland is expected to meet *Provincial Water Quality Objectives* equivalent discharge limits (modified receiver targets) for the protection of aquatic life including amphibians and reptiles, prior to mixing with the Pinewood River.

Specific effects to reptiles that are identified as species at risk (i.e., Snapping Turtle) are also described in section 7.9.

7.7.3 Comments received

Government Authorities

The Ministry of Natural Resources and Forestry expressed concerns about amphibians experiencing reduced fitness or survival if they move to the tailings management area, and suggested placing silt fencing in the area to discourage amphibian immigration. The proponent indicated it is neither feasible nor standard practice to attempt wildlife exclusion measures over such a large area but committed to discuss the mitigation with the Ministry of Natural Resources and Forestry, if required. The proponent also noted that effluent pre-treatment in the processing plant will reduce cyanide and associated heavy

metals to levels that are below wildlife toxicity thresholds (section 7.1). The Ministry of Natural Resources and Forestry stressed the need to design habitat for various wildlife (e.g., amphibians) in proposed West Creek Pond and Clark Creek Ponds.

Environment Canada expressed concern regarding the lack of mitigation measures restricting Snapping Turtles and other reptiles from entering the site, and the increased risk of mortality from construction and operation activities. Ministry of Natural Resources and Forestry also expressed concern relating to Snapping Turtles entering the site. Environment Canada recommended that turtles be captured onsite prior to construction and relocated to safe areas of suitable habitat, and be restricted from entering the construction site through the use of exclusion fencing.

Aboriginal groups

Aboriginal communities expressed general concerns about wildlife but did not specifically comment on reptiles and amphibians.

Public

Members of the public did not comment on reptiles and amphibians.

7.7.4 Residual environmental effects predicted by proponent

The proponent committed to a number of mitigation measures (Appendix A) to mitigate the effects on amphibians and reptiles, some of which were in response to comments or concerns raised. The Agency identified those measures required to prevent significant adverse effects (subsection 7.7.5).

The residual effects on amphibians and reptiles were predicted to be minor in magnitude and confined to the project site. These effects may be long-term continuing through mine construction and operation but reversible at decommissioning. The proponent stated all amphibians observed are regionally common species and suitable frog habitat is widespread across the Natural Environment Local Study Area. The proponent considered the overall effects on amphibians and reptiles as not likely to be significant.

7.7.5 Mitigation measures

The Agency has identified the following key mitigation measures as required to prevent significant adverse effects on amphibians and reptiles:

- Implement measures to prevent Snapping Turtles from accessing areas of the project site during the construction and operation phases.

The proponent has committed to implement additional mitigation measures as identified in Appendix A: Part 2.

7.7.6 Agency analysis and conclusion

The Agency assessed the potential impacts to amphibians and reptiles with a focus on those species that use the watercourses and wetland communities within the project site. Effects on amphibians and reptiles may result from changes to water quality, and will result from habitat loss during the construction of the west rock and overburden stockpiles and the east rock stockpile. Measures to

mitigate the effects to fish and fish habitat, such as covering the exposed tailings beach to ensure that the tailings pond waters remain of high quality such that they will not pose a threat to wildlife, will also mitigate effects to amphibians and reptiles. The proponent has addressed concerns by federal authorities and Aboriginal groups by committing to implement measures to prevent Snapping Turtles from accessing areas of the project site, such as by installing exclusion fencing, during construction and operation. The proponent has also committed to capture and relocate Snapping Turtles observed on-site that are likely to be harmed, particularly during the construction phase.

The Agency expects the residual effects on amphibians and reptiles to diminish in duration and frequency and to be reversible upon the establishment of fish habitat offsetting and compensation plans under the requirements of the *Fisheries Act* and the *Metal Mining Effluent Regulations* respectively, in consultation with Fisheries and Oceans Canada, the Ministry of Natural Resources and Forestry, and Environment Canada. The creation of like-for-like habitat is expected to indirectly provide habitat for amphibians and reptiles.

The Agency concludes that the Project is not likely to cause significant adverse environmental effects on amphibians and reptiles, taking into account the implementation of mitigation measures.

7.8 Furbearers

7.8.1 Baseline by proponent

Beaver, muskrat, American Mink, and River Otter species, and their habitat types, were identified in baseline studies. Records also noted tracks, browsing, or scat evidence within watercourses and wetland communities in the Natural Environment Local Study Area.

Beaver activity such as dams, lodges, and chewed stumps was recorded along Marr Creek, West Creek, and Clark Creek within the project site, and throughout the Natural Environment Local Study Area. Aerial surveys recorded beaver lodges in most wetlands in the Natural Environment Local Study Area. High prevalence of beaver activity has naturally modified several marsh habitats and watercourses near the project site.

Furbearer dens generally occur in large, undisturbed, unfragmented, treed ecosites, although otters prefer shorelines. Suitable landscapes for furbearer dens were noted in the Natural Environment Local Study Area and include cavity trees or downed woody debris as hollowed trees, downed hollow logs, old beaver lodges, or muskrat homes. No furbearer dens were recorded in the Natural Environment Local Study Area, however, as noted above active beaver dams and lodges were observed.

Furbearer movement corridors are typically found within a riparian area of a lake, river, stream, or wetland. Movement corridors are generally associated with dens. Tracks from American Mink along the banks of Marr Creek suggest that Marr Creek or the Pinewood River itself is a movement corridor.

7.8.2 Effects predicted by proponent

The predicted environmental effects to furbearers will result from the alteration and disruption of the Minor Creek Systems and wetland communities during the construction of the tailings management area, west rock and overburden stockpiles, open pit and the east rock stockpile. Vegetation clearing will

remove 291.8 ha of wetland habitat and 28 km of river shoreline habitat. There are equally suitable habitats for furbearers adjacent to the project site.

The functionality of beaver ponds may also be affected by flow reductions in the Pinewood River, due to water taking (section 7.1).

7.8.3 Comments received

Government Authorities

The Ministry of Natural Resources and Forestry expressed concerns about the impacts to wildlife including furbearers, dispersing to and colonizing new habitats (e.g., increased mortality risk). The proponent states that habitat being disturbed by the Project is abundant within the Natural Environment Local Study Area, and it is predicted that displaced individuals will migrate to suitable habitat adjacent to the project site. The proponent noted that mortality of furbearers is not expected.

Aboriginal groups

Aboriginal communities expressed concerns about wildlife in general but did not specifically comment on furbearers.

Public

The public had general comments about the use of the area for trapping but did not specifically comment on furbearers.

7.8.4 Residual environmental effects predicted by proponent

The proponent committed to a number of mitigation measures (Appendix A) to mitigate the effects on furbearers, some of which were in response to comments or concerns raised. The Agency identified those measures required to prevent significant adverse effects (subsection 7.8.5).

The residual effects on furbearers result from the removal of watercourses and wetland communities during the construction of the proposed mine infrastructure. The residual effects on furbearers are predicted to be minor in magnitude and confined to the project site. They are predicted to be long-term, continuing through mine construction and operation but reversible after decommissioning.

The proponent considered the overall effects on furbearers as not likely to be significant.

7.8.5 Mitigation measures

In the Agency's view there will not be significant adverse effects to furbearers. Consequently, the Agency has not identified any key mitigation measures. However, the proponent has committed to implement additional mitigation measures as identified in Appendix A: Part 2.

7.8.6 Agency analysis and conclusion

The Agency assessed the potential impacts to furbearers with a focus on those species that use the watercourses and wetland communities within the project site. Effects to furbearers will result from the alteration and disruption of the Minor Creek Systems and wetland communities during the construction of the tailings management area, west rock and overburden stockpiles, open pit and the east rock

stockpile. The proponent's commitment to restore habitat at decommissioning will encourage development of habitats capable of supporting a diversity of wildlife species, including furbearers. The proponent has indicated that the types of habitat removed from the project site are abundant within the Natural Environment Local Study Area, and that displaced individuals will migrate to suitable habitat adjacent to the project site. The Agency expects the residual effects on furbearers to diminish in duration and frequency and to be reversible upon the establishment of the detailed fish habitat offsetting and compensation plans under the requirements of the *Fisheries Act* and the *Metal Mining Effluent Regulations* respectively, in consultation with Fisheries and Oceans Canada, the Ministry of Natural Resources and Forestry and Environment Canada. The creation of like-for-like habitat is expected to indirectly provide habitat for furbearers associated with watercourses.

The Agency concludes that the Project is not likely to cause significant adverse environmental effects on furbearers, taking into account the implementation of mitigation measures.

7.9 Federal Species at Risk

7.9.1 *Baseline by proponent*

Under section 79(2) of the Species at Risk Act, the Agency must identify the Project's adverse effects on listed wildlife species and their critical habitats. If the Project proceeds, preventative measures must be taken in accordance with applicable recovery strategies and management plans to lessen and monitor effects.

Seven threatened species listed in Schedule 1 of the Species at Risk Act (six migratory bird species and one mammal) were identified; Eastern Whip-poor-will, Canada Warbler, Olive-sided Flycatcher, Golden-winged Warbler, Red-headed Woodpecker, Common Nighthawk, and the Grey Fox. Two species of special concern listed on Schedule 1 of the Species at Risk Act were identified: Short-eared Owl and Snapping Turtle.

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assessed other species as being endangered, threatened, or of special concern. The following species have been included for consideration because they may eventually be scheduled under the Species at Risk Act: Eastern Wood-peewee (special concern), Barn Swallow (threatened), Bobolink (threatened), Lake Sturgeon (special concern), Little Brown Myotis (endangered), and Northern Myotis (endangered).

Species-specific information on species at risk locations and habitat is confidential and under a data sharing agreement between the proponent and the Ministry of Natural Resources and Forestry. The EIS included general baseline information on these species.

General preferred habitat types in the Natural Environment Local Study Area include woodland, marsh, and open country habitats for federal species at risk. Appendix H provides descriptions of the preferred habitat types and general baseline information about species at risk in the Natural Environment Local Study Area.

Two adult Snapping Turtles were observed within the Natural Environment Local Study Area. No evidence of nesting was observed. However, the Natural Environment Local Study Area includes rivers, creeks, ponds, and wetlands that may provide suitable habitat for these turtles.

7.9.2 *Effects predicted by proponent*

Potential adverse effects on species at risk include habitat loss, which may occur directly or indirectly through vegetation clearing (Table 6) from mine infrastructure construction and atmospheric environment effects (section 6.1) involving dust and noise. Appendix H provides species-specific descriptions of effects to species listed under the *Species at Risk Act* and assessed by COSEWIC.

Snapping Turtles are known to cross roads to travel between various habitat features and use roadsides as potential nesting sites. A predicted increase of vehicular traffic at the project site may result in increased collisions with Snapping Turtles. Potential for increased Snapping Turtle and turtle nest predation may result from domestic waste, produced during construction and operation activities, attracting wildlife scavengers (e.g., raccoons).

Species at Risk listed under the Species at Risk Act

The construction of the transmission line will have limited residual adverse effects on local Eastern Whip-poor-will population, given the extent of similar habitat within the Natural Environment Regional Study Area. The Eastern Whip-poor-will may persist on the peripheries of the project site and transmission line, and displaced birds may colonize nearby tracts of identified suitable habitat.

Predicted residual effects on the Canada Warbler, Olive-sided Flycatcher, Golden-winged Warbler, Common Nighthawk, Short-eared Owl, and Snapping Turtle include displacement of suitable habitat centered on the project site and potential exposure to noise, vehicular traffic, and site effluents. These effects are likely to occur during construction and operation of the Project.

Species assessed as Endangered, Threatened or Special Concern by COSEWIC

Predicted residual effects on the Eastern Wood-pewee, Northern Myotis, and Little Brown Myotis include displacement of suitable habitat centered on the project site and potential exposure to noise, vehicular traffic, and site effluents. These effects are likely to occur during construction and operation of the Project.

Predicted residual effects on the Barn Swallow during construction include displacement of nesting structures to a new location where surrogate structures will be provided, and the loss of wetland and agricultural foraging habitats. The environmental effects of foraging habitat removal may not be adverse, depending on the proximity of surrogate nesting sites.

Predicted residual effects on the Bobolink during construction and include open country breeding habitat loss centred on the project site. Availability of similar habitat surrounding the project site will likely minimize the long-term impacts of development on local Bobolink population.

The proponent considered the overall effects on species listed under the *Species at Risk Act* and assessed by COSEWIC as not likely to be significant.

7.9.3 *Comments received*

Government Authorities

Environment Canada expressed concerns about the potential effects of the Project on migratory birds - listed under the *Species at Risk Act* due to the changes in land use at the project site. Environment

Canada also expressed concern regarding increased artificial light use and insect prey species, and their effects (e.g. mortality) on Eastern Whip-poor-will and Common Nighthawk. In addition, Environment Canada recommended that female Snapping Turtles found along the inside edge of the roadways be captured during a two week period beginning from late May to early June, if they attempt to nest.

The project site will remove existing Common Nighthawk and Eastern Whip-poor-will habitat. The Eastern Whip-poor-will habitat can be compensated as part of the overall benefit permitting process under the Ontario *Endangered Species Act*. Common Nighthawk is not listed under the Ontario *Endangered Species Act* however, and is not afforded the same compensation, but will also likely benefit from the compensatory habitat. The proponent, as noted in the follow-up monitoring plan (section 10), will monitor the Common Nighthawk and Eastern Whip-poor-will.

Aboriginal groups

Aboriginal communities expressed concerns about wildlife in general but did not specifically comment on species at risk.

Public

Members of the public commented on wildlife in general but did not specifically comment on species at risk.

7.9.4 Residual environmental effects predicted by proponent

The proponent committed to a number of mitigation measures (Appendix A) to mitigate the effects on species at risk, some of which were in response to comments or concerns raised. The Agency identified those measures required to prevent significant adverse effects (subsection 7.9.5).

The residual effects on species at risk were predicted to be minor in magnitude and confined to the project site. They will be long-term in duration, continuing through mine construction and operation but reversible following abandonment. No residual effects were predicted for Lake Sturgeon, Grey Fox, or Red-headed Woodpecker.

7.9.5 Mitigation measures

The Agency has identified the following key mitigation measures as required to prevent significant adverse effects on species at risk:

- Consider species at risk habitat needs when restoring habitat.

Additional mitigation measures for species at risk that are migratory birds are described in section 7.2. Additional mitigation measures for species at risk that are reptiles are described in section 7.7. The proponent has committed to implement additional mitigation measures as identified in Appendix A: Part 2.

7.9.6 *Agency analysis and conclusion*

In accordance with section 79(2) of the *Species at Risk Act*, the Agency assessed the potential impacts to federal species at risk, with a focus on those species that use the terrestrial landscape, watercourses and wetland communities within the project site. The Project may have adverse effects on species at risk due to habitat loss and changes to light and sound emissions. No residual adverse effects were predicted for Lake Sturgeon, Grey Fox, or Red-headed Woodpecker. The proponent's commitment to create compensatory habitat for Eastern Whip-poor-will and Bobolink, and to create artificial nesting structures to encourage colonization by Barn Swallows, will mitigate potential adverse effects. The proponent's commitment to conduct active revegetation and recolonization of disturbed areas during operation and at decommissioning will ensure that species at risk are considered and managed during each phase of the Project. There may be effects on Snapping Turtles due to increased transportation at the project site (mortality and loss of nesting habitat) and increased predation by attracting predators to the area with the disposal of food wastes. The proponent committed to prohibit food waste generation and disposal onsite to reduce predation. The proponent has also committed to capture and relocation of Snapping Turtles observed on-site that are likely to be harmed, particularly during the construction phase. The Agency expects the residual effects on species listed under the *Species at Risk Act* and assessed by COSEWIC to diminish in duration and frequency once operation begins.

The Agency concludes that the Project is not likely to cause significant adverse environmental effects on federal species at risk and those species assessed by COSEWIC, taking into account the implementation of mitigation measures.

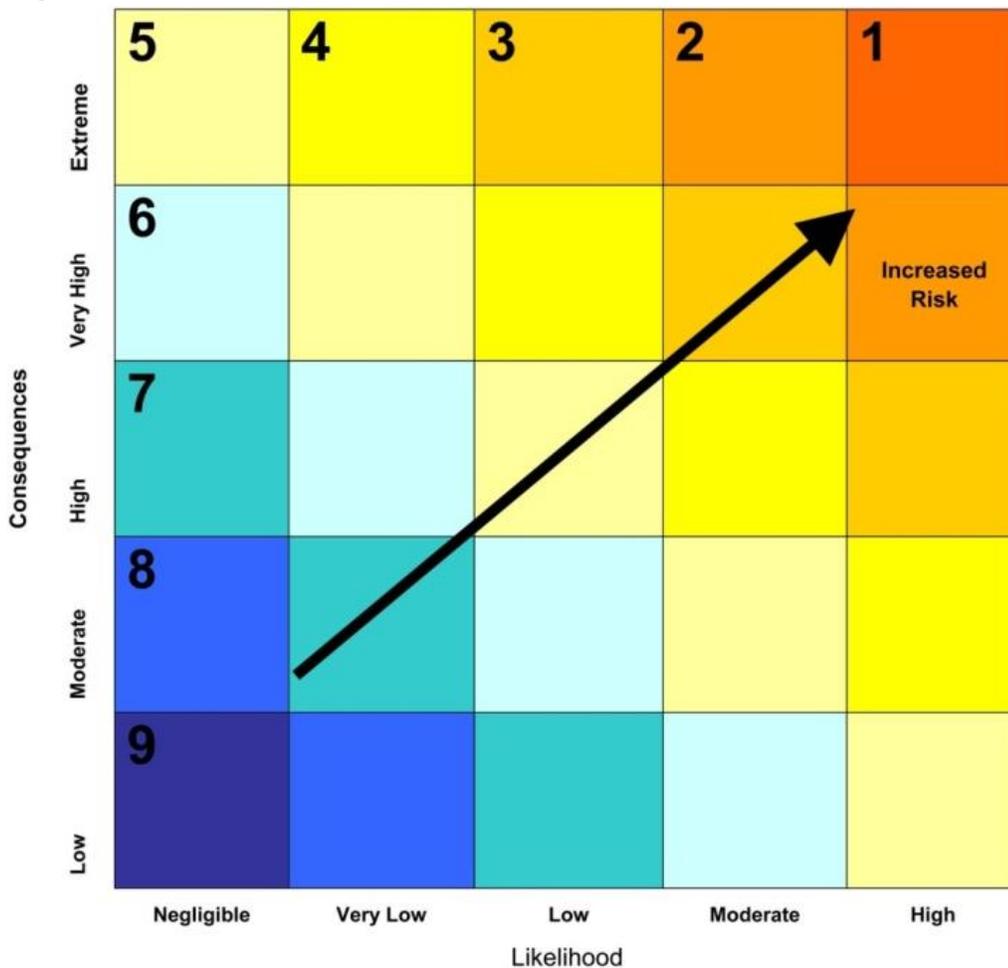
8 Other Effects Considered

8.1 Effects of Malfunctions and Accidents

Pursuant to paragraph 19(1)(a) of the Act, the proponent must take into account the environmental effects of malfunctions and accidents that may occur in connection with the designated project. Malfunctions and accidents have the potential to occur from project construction through to decommissioning or abandonment. The assessment considered malfunctions and accidents that could have material environmental effects. Refer to Table 9 for further information.

The proponent assessed each malfunction and accident according to likelihood of occurrence and magnitude of consequence. A risk ranking between 1 (highest) and 9 (lowest) was assigned, referring to a diagonal row of cells within a risk matrix (Figure 10). Increased risk is associated with malfunctions and accidents having a greater likelihood of occurrence and increased level of consequence.

Figure 10: Environmental Risk Matrix



Source: Rainy River EIS, AMEC

Table 9 Malfunctions and Accidents Risk Summary

Malfunction or Accident	Issue of Concern	Likelihood	Consequence	Risk (See Fig. 8-1)
Structural Failures				
Open pit slope failure	Damage to habitat; limited flooding of open pit	Low	Moderate	6
East mine rock stockpile slope failure	Damage to terrestrial habitat, aquatic life	Very low	High	6
Overburden stockpile slope failure	Damage to terrestrial habitat, aquatic life	Very low	Moderate	7
Tailings dam failure	Damage to terrestrial habitat, aquatic life	Negligible	Extreme	5
Pond dam failure	Damage to aquatic life	Negligible	Moderate	7
Creek diversion failure	Damage to aquatic and terrestrial habitat, and aquatic life	Negligible	Moderate to high	7
Accidents				
Tailings pipeline failure	Damage to habitat and aquatic life	Very Low	High	6
Water pipeline failure	Damage to aquatic life	Very Low	Low	7
Fuel release during truck transport	Damage to aquatic life and downstream human environment	Very Low	High	6
Fuel release from storage facilities and dispensing area	Damage to habitat	Low	Low	7
Transportation accident – hazardous materials (excluding fuel)	Damage to habitat, aquatic life and downstream human environment	Very Low	High	6
Transportation accident – non-hazardous materials	Local terrestrial environment impact	Low	Low	7
Chemical spills from pressurized vessels	Damage to property and human environment	Negligible	Very high	6
Other Malfunctions				
Unexpected water quality concerns	Damage to aquatic life	Very Low	High	6

8.1.1 Effects predicted and mitigation measures by proponent

Structural failures

The environmental impact statement (EIS) identifies six potential structural failures, and in each case the proponent has either identified design safeguards or proposed actions to mitigate effects.

Open pit slope failure

The EIS indicates that open pit slope failure of 40 metre could cause a rerouting of the Pinewood River into the open pit, which could reduce downstream flow. The likelihood, however, is low because the flood control berm is 60 metre from the open pit slope. Potential effects of reduced water flow into the Pinewood River are discussed in section 6.2.

Proponent's design safeguards:

- Maintain appropriate ramp width and grade;
- Monitor pit wall for geotechnical stability;
- Maintain appropriate overburden slope angles;
- Monitor overburden slope movement;
- Revegetate exposed overburden as soon as practical;
- Reinforce, in case of localized erosion, overburden slopes with mine rock or progressive re-vegetation; and
- Construct a flood protection berm 60 m from the maximum open pit extent.

East mine rock stockpile slope failure

The EIS indicates that the east mine rock stockpile contains encapsulated potentially acid generating waste rock. In the event of a slope failure, there would be a release of runoff affected by acid rock drainage and metal leaching and loss of habitat. If the rock failure were to infill a perimeter ditch, acid rock drainage and metal leaching runoff could potentially overflow or otherwise exit the ditch and could drain towards the Clark Creek Diversion or the Pinewood River. Effluent could contain pH, total suspended solids and ammonia in excess of applicable discharge criteria and would be toxic to aquatic life. Potential effects on water quality and fish and fish habitat are discussed in sections 6.3 and 7.1, respectively.

Proponent's proposed actions in case of failure:

- Re-contour, in the event of a stockpile slope failure, the slope in place;
- Excavate any material which migrated as far as the drainage ditch area and return it to the stockpile. If required, repair the drainage ditches; and
- Report and monitor spill, if potentially acid generating rock or stockpile runoff migrated beyond the collection ditches.

Overburden stockpile slope failure

The EIS indicates that the overburden and west mine rock stockpile, containing non-potentially acid generating (non-potentially acid generating) rock, could partially sink to the ground raising the toe of the stockpile (where the slope meets the ground) adjacent to the West Creek Diversion Channel or Pinewood River.

A worst case failure is expected by the proponent to extend 10 m from the stockpile toe and potentially release suspended solids into the West Creek Diversion Channel or Pinewood River. Suspended solids could interfere with aquatic life by damaging fish gills, interfering with feeding, or smothering eggs by preventing oxygen exchange. Potential effects on fish and fish habitat are discussed in section 7.1.

Proponent's design safeguards:

- Construct external slopes with relatively dry clays or clays mixed with rock for stability; and
- Capture stockpile runoff in perimeter runoff collection ditches and direct the water to sedimentation ponds.

Proponent's proposed actions in case of failure:

- Excavate any material that migrates as far as the perimeter ditch and return it to the stockpile. If required, repair the drainage ditches; and
- Deploy silt fencing, if the slope failure caused effluent in the perimeter ditching to spill, downstream of the spill to prevent sediment laden waters from entering a watercourse.

Tailings management area dam failure

The EIS indicates that failure of the tailings management area dam could result in some contained spilling of tailings solids and ponded effluent into the Pinewood River. The proponent anticipates that a tailings management area dam failure is unlikely to occur as the ponded effluent would be stored in the north portion of the tailings management area. Some of the tailings solids would be deposited in the constructed wetland as the tailings slurry flows down the West Creek into Pinewood River. The tailings slurry would destroy fish habitat and vegetation in its path. The tailings slurry would degrade surface water and groundwater quality. Potential effects on water quality and fish and fish habitat are discussed in sections 6.3 and 7.1, respectively.

Proponent's design safeguards:

- Construct tailings management area dams to withstand the probable maximum flood and maximum possible earthquake in accordance with the Ontario *Lakes and Rivers Improvement Act*;
- Inspect tailings management area dams visually on a daily basis;
- Install geotechnical monitoring equipment to monitor any movement of dams; and
- Conduct geotechnical inspections at regular intervals.

Proponent's proposed actions in case of failure:

- Pump, in the event of a breach or failure, the tailings management area pond to the water management pond, to reduce the amount of released effluent during the emergency repair;
- Contain the spill to the extent possible using temporary earthen or snow dams, silt fences, turbidity curtains, sandbags and other available equipment;
- Work closely with local residents and authorities and address the needs of downstream residents; and
- Develop spill management measures as part of the contingency and response plan in consultation with appropriate government agencies in the event of dam failure to:
 - Contain spilled tailings based on their acid rock drainage characteristics;
 - Excavate spilled tailings and haul them back to the repaired tailings management area or, alternatively, engineer a cover over the deposited material; and
 - Restore and revegetate all areas where tailings are removed, to the extent practical.

Pond dam failure

The EIS indicates that the proponent will create several ponds containing mine-affected water to support onsite water management. The mine rock, water management, water discharge, and seepage collection ponds may contain elevated levels of minerals and metals. If a pond dam breaches, the effluent would flow into the Pinewood River causing toxic substances to destroy fish and fish habitat.

Other ponds such as the West Creek, Clark Creek, stockpile, and Teeple ponds will contain fresh water. If these pond dams breach, the fresh water would flow into Pinewood River. Depending on the quantity of water and speed of release, the environment in the flow path would be damaged with scour and erosion. A major pond failure could damage vegetation, result in a temporary loss of aquatic habitat and cause physical harm to any wildlife caught in the flow path, either by drowning or debris collision. Potential effects on water quantity, water quality, and fish and fish habitat are discussed in sections 6.2, 6.3 and 7.1, respectively.

The proponent noted that, should a release of deleterious waters occur, remediation would not be possible unless a downstream pond is present to catch released water. Although water from the mine rock pond and water management pond would be toxic to aquatic life, it would be diluted to non-toxic levels when mixed with Pinewood River under emergency conditions. The proponent does not expect long-term environmental impacts from a pond dam failure.

Proponent's design safeguards:

- Store environmental design flood¹⁰ runoff above the maximum operating water level in ponds containing mine-affected water;
- Construct spillways to ensure safe discharge to the environment should an event ever exceed the environmental design flood;
- Construct dam slopes and crest widths for stability in relation to the mine rock pond, water management pond, as well as ponds not affected by mine water;
- Design the retention period of sedimentation ponds to meet the *Metal Mining Effluent Regulations* discharge requirements for total suspended solids;
- Size the diversions to convey the probable maximum flood without overtopping; and
- Inspect pond dams on a regular interval by site employees; and periodically on an interval that meets, at a minimum, regulatory requirements by a qualified geotechnical engineer.
- Proponent's proposed actions in case of failure:
 - Deploy, in the event of a failure or imminent failure of a pond dam, silt fences, turbidity curtains, sandbags and other erosion and sediment control measures to prevent the entry of sediments into a downstream water body; and
 - Keep appropriate spill control equipment at the project site.

Creek diversion failure

The EIS indicates that the complete failure of either West Creek or Clark Creek diversion channels would be related to erosion, sedimentation and loss of aquatic habitat due to a major storm event. The

¹⁰ The minimum design flood criteria standard is the 100-year flood, which is the peak or flood flow with one chance in one hundred of occurring in any given year.

excess flows could wash soil out from vegetation causing erosion and could degrade terrestrial habitat. Where the beached runoff re-enters surface waters, extra sediments would be released to the water column thus affecting aquatic life, including fish and fish habitat. Potential effects on water quantity, water quality, and fish and fish habitat are discussed in sections 6.2, 6.3 and 7.1, respectively.

Proponent's design safeguards:

- Size all diversions to convey the probable maximum flood without overtopping; and
- Operate the initial portion of the West Creek Diversion Channel as the emergency spillway for the West Creek pond.

Proponent's proposed actions in case of failure:

- Undertake emergency repair, in the event of a failure or imminent failure of a diversion, as soon as possible;
- Address the needs of downstream residents by working closely with local residents and authorities; and
- Install, if possible, erosion and sediment control measures (such as silt fences, turbidity curtains, sandbags, erosion mats and other equivalent measures) downhill of the failure.

The proponent has committed to implement additional mitigation measures as identified in Appendix A: Part 2.

Accidents

The EIS indicates seven potential accidents or failures, and in each case the proponent has either identified design safeguards or proposed actions to mitigate effects.

Tailings pipeline failure

The EIS indicates that a tailings pipeline failure would result in a tailings slurry spill. The effect of the spill would depend on the time of the year, the location of the spill, and the volume spilled. If the spill occurred when the ground was frozen, spilled material would be readily cleaned up and no environmental impact would be expected. During the remainder of the year, the spill would cover surrounding terrestrial or aquatic habitat. The pipeline only crosses one watercourse (West Creek). The solids, essentially sand, contained in the slurry would be retained in close proximity to the pipeline rupture, regardless of season. Liquid from the spill would flow by gravity toward the West Creek and West Creek Diversion Channel, the constructed wetland, and potentially the Pinewood River. Potential effects on water quality and fish and fish habitat are discussed in sections 6.3 and 7.1, respectively.

Proponent's design safeguards:

- Install pressure sensors at four locations along the pipeline route and flow transmitters at the onsite metal mill and at the tailings management area dam, as the primary operational safeguards;
- Install a vacuum relief valve at the tailings management area dam to ensure reverse flow is not possible. The proponent responded that the pump will automatically shut off in the event of a pressure loss resulting from a failure;
- Inspect the tailings pipeline twice per 12-hour shift;
- Undertake incidental observation to identify leaks occurring below the pressure loss detection point; and
- Institute a ditch and capture basin system to act as secondary containment in case of a leak; and
- Install secondary containment at the tailing pipeline crossing of the West Creek.

Proponent's proposed actions in case of accident:

- Use heavy equipment and spill containment materials in order to contain or limit the discharge of tailings and effluent to the environment;
- Implement spill management measures as part of the contingency and response plan, depending on the amount of tailings spilled and whether tailings enter West Creek, in consultation with appropriate regulatory agencies; and
- Excavate spilled tailings and load on a haul or vacuum truck, and transport to the tailings management area.

Water pipeline failure

The EIS indicates that a water pipeline failure would release water causing erosion downslope due to the force and volume of water being released. This could result in a short-term sediment plume to be released to water, resulting in potential impacts to aquatic life by damaging fish gills, interfering with feeding, or smothering eggs by preventing oxygen exchange. Potential effects on fish and fish habitat are discussed in section 7.1.

Proponent's design safeguards:

- Inspect and employ regular incidental observation activities to identify visible leaks or failure of the pipeline.

Proponent's proposed actions in case of accident:

- Shutdown pumps, upon discovery of a leak or failure, and repair the pipeline; and
- Employ, if possible, erosion and sediment control measures, such as matting, straw bales or silt fencing to prevent overland runoff containing sediments from directly entering a watercourse.

Fuel release during truck transport

The EIS indicates that fuel spills from tanker trucks could occur due to collisions, accidents related to poor weather conditions, or other mishaps. A diesel spill from a truck travelling to site could affect the soil (or snow in winter) in the vicinity of the spill, and could potentially enter a water body and impact aquatic life, if the accident occurred on or near a water crossing. Diesel fuel and gasoline is toxic to aquatic life when spilled in fresh water and impacts to aquatic life could include serious physiological damage or mortality. Potential effects on water quality and fish and fish habitat are discussed in sections 6.3 and 7.1, respectively.

Proponent's design safeguards:

- Develop and implement spill management measures as part of the contingency and response plan; and
- Manage trucking and supply contracts, by incorporating, as reasonable, features to minimize the potential for environmental impacts on the trucking route, including:
 - strict adherence to speed limits, national trucking hour limits and other applicable requirements;
 - drivers must meet all applicable regulatory training requirements as per the *Transportation of Dangerous Goods Act*, be trained in spill response procedures and carry Material Safety Data Sheets for hauled material regulated under the federal *Hazardous Products Act*; and
 - all material transport vehicles must maintain basic emergency response equipment in order to stop or slow spills, using available equipment.

Proponent's proposed actions in case of accident:

- Employ spill counter measures, including use of absorbent materials, establishment of a collection trench, and setting of containment booms on water;

- Contain fuel with booms, berms or other means, and, possibly also pump, skim or mop fuel with absorbent matting, and dispose in an approved facility designed to manage such wastes;
- Contain and remediate, where possible, spills that may directly enter a fast moving watercourse; and
- Conduct a review, after any major spill, to ensure that the required design changes, procedures and appropriate monitoring measures are in place to ensure that similar incidents are not repeated.

Fuel release from storage facilities and dispensing areas

The EIS indicates that environmental effects of a fuel release from a storage facility may be less than a release from truck transport, as fuel storage tanks are in a fixed location. A fuel spill or a major spill during a rainfall event would affect the immediate terrestrial environment. The fuel storage facility will be located near the crusher where drainage will flow to the mine rock pond or stockpile pond. In either case, the spill and associated runoff would be contained and treated prior to being discharged from the pond.

Proponent's design safeguards:

- Include design and construction features to minimize the potential for environmental impacts as follows: containment berms, collision protection poles, placement of the storage areas away from watercourses and the use of leak detection requirements;
- Incorporate operational procedures to minimize the potential of accidents or malfunctions into the contingency and response plan;
- Keep and maintain a large spill kit, including absorbent material, at the fuel storage facility; and
- Inspect, regularly, all fuel storage locations and volumes for leakage and other operational problems.

Proponent's proposed actions in case of accident:

- Implement spill management measures as part of the contingency and response plan if fuel escapes the secondary containment berms;
- Seal, when the area is secured, the leak or failure, if possible;
- Contain the spill by using absorbent materials or by constructing a downstream berm;
- Collect and haul spilled fuel offsite for disposal;
- Send used absorbent material offsite for disposal at a licensed facility;
- Report on and notify spills in accordance with the Ministry of the Environment and Climate Change requirements;
- Cease all pumping from the pond if a spill migrates to the mine rock pond or stockpile pond, contain the spill with a boom, and remove with a skimmer;
- Test soils in the vicinity of the spill for hydrocarbons and delineate the affected soils; and
- Treat impacted soil onsite in a bioremediation area or haul offsite for treatment and disposal.

Transportation accidents

The EIS indicates that transport vehicle accidents on route to the project site could result in a spill of the materials, including fuel or hazardous materials. The consequences of a spill would depend on the type and quantity of material spilled, and the location and timing of the spill. Spills involving solid briquettes of cyanide into the aquatic environment are of particular concern, as impacts to aquatic life would occur, including serious physiological damage and mortality. Potential effects on water quality, and fish and fish habitat are discussed in sections 6.3 and 7.1, respectively.

Proponent's design safeguards:

- Ship all materials of consequence in sealed containers, such as tanker trucks, containers, shipment cubes (1000 litres), sealed bulk bags, 205 litres sealed drums and smaller containers on pallets;
- Ensure, all shipments comply with regulatory requirements, including the federal *Transportation of Dangerous Goods Act* and associated regulations; and
- Incorporate operational procedures on minimizing the potential for environmental impacts into trucking contracts and the contingency and response plan including: strict adherence to speed limits; restricting oversized loads to daylight travel where possible; avoiding material transport when visibility is low; and regular vehicle maintenance.

Proponent's proposed actions in case of accident:

- Remove potential ignition sources in the event of a spill of flammable or combustible materials, if safely possible; also slowdown or stop the spill;
- Notify the Ministry of the Environment and Climate Change's Spills Action Centre (per the requirements of the Ontario *Environmental Protection Act*), the Township of Chapple, Emo Fire Department, and, if required, the Technical Standards and Safety Authority (for fuel fires and explosions);
- Conduct an assessment and determine the best means to prevent immediate environmental impacts;
- Implement spill management measures as part of the contingency and response plan, such as the use of absorbent materials, establishment of a collection trench downslope, and setting of containment booms on water if effective for the spilled material;
- Ensure clean-up and remediation reduces long-term environmental impacts to the extent possible; and
- Conduct a review and report, after the incident, to ensure that any required design changes and procedures are in place to prevent a similar accident.

Chemical spill within contained facilities and chemical spills from pressurized vessels

The EIS indicates that there is no reasonable potential for chemical spills within contained facilities to be released directly to the environment or to have an environmental effect. The EIS indicates that pressurized vessel failure has the potential to affect worker health, cause damage to project infrastructure or facilities; and cause localized temporary air quality concerns due to a release of sulphur dioxide or oxygen. Impacts would be limited to the immediate atmospheric environment as a result of the rapid dissipation of the material as it expands out from the vessel itself and the volume of gas contained.

Proponent's design safeguards:

- Store all chemicals which pose a potential risk to the environment within contained areas, with sealed floors and sumps or drains reporting to facilities which will provide for retrieval of the spilled materials;
- Ensure all chemicals used at the site have a Material Safety Data Sheet, in order to comply with industry best practices and with the *Workplace Hazardous Materials Information System Ontario Regulation 860* and *Occupational Health and Safety Act* for the safe use of these materials;
- Include a spill pad for the liquid oxygen storage area; and
- Manage spills from the sulphur dioxide area in a containment area.

The proponent has committed to implement additional mitigation measures as identified in Appendix A: Part 2.

Other malfunctions

Unexpected water quality concerns related to acid rock drainage

The EIS indicates that effluent released from the water management pond could impact water quality (i.e., pH levels, elevated dissolved minerals, ammonia or cyanide) and would be toxic to aquatic life, if the treatment of mine rock and tailings materials is insufficient. Potential effects on water quality and fish and fish habitat are discussed in sections 6.3 and 7.1, respectively.

Proponent's design safeguards:

- Segregate rock for use as construction materials according to a site-specific protocol, which is expected to include:
 - preliminary visual identification of construction materials from the open pit which undergo geochemical testing;
 - supplementary refinement based on a geochemical block model, to identify the location of blocks of material which are eligible for construction usage;
 - periodical geochemical testing of the blocks to assess appropriate location for storage or for construction use and confirmation of model results; and
 - visual inspection of material during placement and after construction for signs of acid rock drainage.
- Extract any material used in construction that is identified as acid generating, through visual identification and subsequent sampling. Transport material to the east mine rock stockpile for storage and encapsulate. Alternatively, take other appropriate measures to leave the material in place.

The proponent has committed to implement additional mitigation measures as identified in Appendix A: Part 2.

8.1.2 Residual effects by proponent

Residual effects from structural failures of the east mine rock stockpile slope, overburden stockpile slope, tailings management area dam, pond dam, and creek diversion were predicted to have the potential to destroy or disrupt fish and fish habitat through the release of acid drainage, metals and suspended solids into the Pinewood River watershed. Residual effects from accidents such as tailings pipeline failure, water pipeline failure, fuel release during truck transport and transportation accidents were predicted to also have the potential to impact aquatic life by damaging fish gills, and interfering with feeding or smothering eggs by preventing oxygen exchange. Chemical spills from pressurized vessels were predicted to have a potential impact on the atmospheric environment as a result of rapid dissipation of released material. Residual effects on unexpected water quality concerns related to acid rock drainage were predicted to have a potential impact to fish and fish habitat through degradation of water quality.

The residual effects on structural failures, accidents and other malfunctions are unlikely to occur taking into account the implementation of mitigation measures, proposed project design, operational safeguards and contingency procedures.

8.1.3 Comments received

Government authorities

Federal authorities expressed concerns over the potential effects of a tailings management area dam failure on channel morphology, substrate types and downstream fish and fish habitat. The Ministry of

Natural Resources and Forestry also expressed concerns relating to a tailings management area dam failure. The proponent provided an additional dam breach and watercourse erosion assessment. This assessment included the worst case scenario of a full dam breach releasing a large volume of tailings into the Pinewood River at a time of low to zero flow in the summer. The assessment indicates that the release of tailings would likely affect a six kilometre reach of the Pinewood River, immediately downstream of the tailings management area. The remaining 30 km reach of the Pinewood River to the confluence of Rainy River would have low susceptibility to erosion.

Environment Canada expressed concern about the potential for uncollected seepage from project facilities and requested more information on the management of effluent from the sediment ponds. The proponent will have a contingency and response plan in place to address the potential for uncollected seepage from project facilities, including the sediment ponds. In response to Environment Canada's concern the proponent will install secondary containment for tailings and contact water pipelines at the crossing of the West Creek.

Environment Canada expressed concerns about the potential for poorly screened materials through visual inspection of potentially acid generating or non-potentially acid generating rock to affect water quality and fish in the Pinewood River watershed. The proponent will use visual evaluation and geochemical data to characterize the rock material as potentially acid generating or non-potentially acid generating. The local potentially acid generating till is quite distinctive from the surrounding materials and is readily identified in the field. Environment Canada was satisfied.

Aboriginal communities

Aboriginal communities expressed concerns about spills and suggested the establishment and dissemination of a protocol in advance of a spill or emergency. The proponent indicated that there is no possible event where downstream waters would be contaminated by a spill, such that alternative drinking water would be required by Aboriginal communities. The additional dam breach and watercourse erosion assessment includes worst-case scenarios for a tailings dam failure. The proponent will develop a contingency and response plan that includes a number of aspects relating to accidents and malfunctions.

Concerns were expressed about spills and accidents impacting on Aboriginal fisheries and wildlife in the Pinewood River watershed. The proponent will provide timely notification and consultation on spills and accidents if any, and on the details of any investigation and response to these events (Appendix A). The proponent will also provide assistance and opportunities for ongoing consultation on environmental approvals, the mine closure plan, a contingency and response plan, and the follow-up monitoring plan.

Aboriginal communities expressed concerns about the potential for acid rock drainage and metal leaching to impact drinking water and aquatic life. The proponent would ensure that surface water going into the Pinewood River from the mine would meet site-specific criteria for the protection of aquatic life.

Concerns were raised about the potential for acid rock drainage from tailings and mine rock to enter the Pinewood River. The proponent will use in-plant sulphur dioxide and air treatment on the mill effluent followed by removal of additional metals through effluent aging in the tailings management area and water management ponds. The proponent also indicated that the constructed wetland is expected to

absorb residual metals over the period of the mine life, such that there will be an expected accumulation of residual metals within the wetland sediments. The area of the wetlands is comparatively small and the potential exposure to fish and wildlife is limited.

Public

Members of the public did not express concerns about structural failures or accidents. There was a concern related to unexpected water quality impacts from acid rock drainage. The public expressed concern about the potential for groundwater contamination in the event of seepage or leakage from the tailings management area. The seepage from the tailings management area is expected to be small given the low permeability of the bedrock and clays in the area. The proponent will monitor groundwater quality around the tailings management area, including pre-mining samples collected from well owners who request sampling.

8.1.4 *Agency analysis and conclusion*

The Agency is satisfied with the characterization of the risk of structural failures, accidents, and other malfunctions in the EIS. The proponent has responded to government authorities, Aboriginal and public comments including by committing to provide timely notification to Aboriginal communities on spills and accidents, if any. The structural failures, accidents and other malfunctions that could result in significant residual effects have a very low to negligible likelihood of occurrence. The proponent will continue to engage the Aboriginal communities in the development of a contingency and response plan related to accidents and malfunctions. The Agency considers that the residual effects on structural failures, accidents and other malfunctions are unlikely to occur, taking into account the implementation of mitigation measures, proposed project design, operational safeguards and contingency procedures.

The Agency concludes that the Project is not likely to result in significant adverse environmental effects as a result of structural failures, accidents, and other malfunctions, taking into account the likelihood and consequence of occurrence, the proposed project design, operations safeguards, contingency procedures and implementation of the mitigation measures.

8.2 **Effects of the Environment on the Project**

Environmental factors such as water supply availability, increased mine water volumes, and natural hazards could potentially affect the Project, resulting in service interruption, damage to infrastructure, or adverse environmental effects.

8.2.1 *Effects predicted by proponent*

Water Supply Availability

Local runoff conditions vary, resulting in a probability of too little, or too much water at the project site in any given year. Low flows in the Pinewood River would reduce assimilative capacity of the river to accept mine effluent in a sufficient mixing ratio to meet discharge limits for the protection of aquatic life.

Increased Mine Water Volumes

The tailings management area provides for seasonal effluent discharge to the environment. Increased mine water from precipitation, surface runoff and groundwater inflow would potentially increase the rate

or period of seasonal excess effluent release to the environment. Mine water does not pose a safety hazard and will not cause additional malfunctions or environmental effects.

Natural Hazards

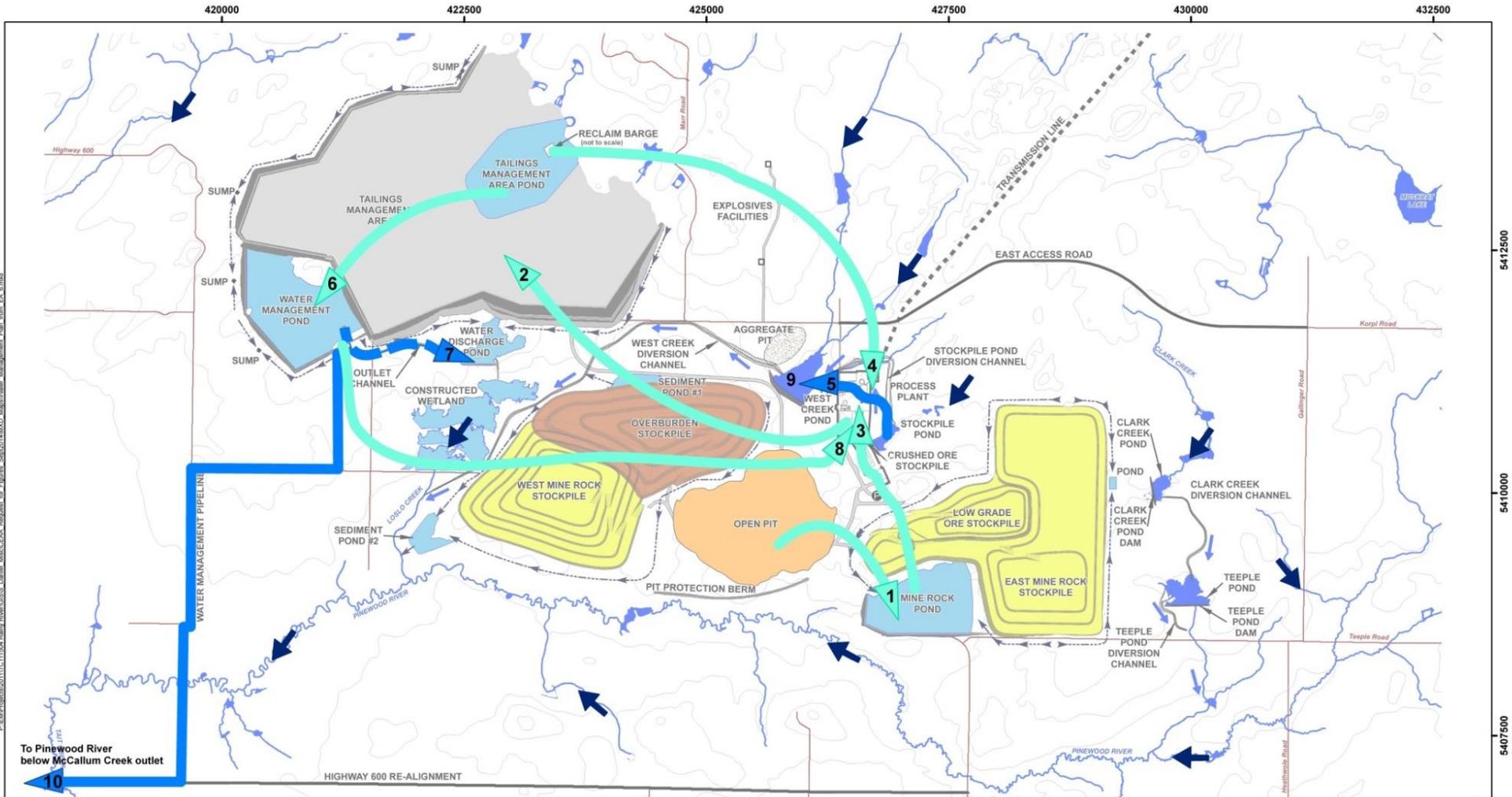
Potential natural hazards in the geographic location of the Project include earthquakes (tailings management area structural failure), extreme floods (tailings management area structural failure and open pit flooding), natural fires, and ice jams. A tailings management area structural failure resulting from an earthquake would have the potential to release contaminants from the tailings management area directly into the environment. However, the project site is located in a low risk seismic zone. Extreme floods would have the potential to cause structural failure of the tailings management area, and to flood site facilities. This would cause some contained tailings material and all of the ponded effluent to spill into the Pinewood River. Forest fires are part of the natural regeneration cycle at the project site. Project components most vulnerable to fires include the onsite metal mill and the transmission line. Natural fires would not result in any additional environmental effects. Ice jams on the Pinewood River could affect the integrity and function of the pit protection berm.

8.2.2 Mitigation measures by the proponent

The Agency agrees with the following key mitigation measures proposed by the proponent to mitigate any change to the Project that may be caused by the environment:

- Design the water management plan (Figure 11) to provide a large reservoir capacity within the tailings management area, and the east mine rock and water discharge ponds that will accommodate year-to-year variations in runoff (water supply) conditions.
- Design the tailings management area and open pit to withstand the probable maximum flood, including by constructing a pit protection berm between the Pinewood River and the open pit, and designing the tailings management area according to the Ontario *Lakes and Rivers Improvement Act*.
- Ensure that an electrical distribution system at the project site is available by repairing damaged transmission lines, maintaining emergency diesel generators; and locating the onsite metal mill and transmission line close to open fields, wetlands, patchy forest and exposed rock terrain, to limit the risk of damage from fire.
- Develop measures to manage ice jams as part of the contingency and response plan to ensure that ice jams will not cause the Pinewood River to overflow the pit protection berm.

Figure 11: Water Management Plan



LEGEND

- Integrated Water Recycle (Green arrow)
- Excess Water Discharge (Blue arrow)
- General Surface Water Flow Direction (Black arrow)

ID (on this Figure)	From	To	Method	Purpose	Control Logic
1	Open Pit	Mine Rock Pond	Pumped	Dewatering of the Open Pit	Rate to match inflows (lower bench may flood during storm events).
2	Process Plant	TMA	Pumped	Tailings slurry discharge	Pumped at fixed rate.
3	Mine Rock Pond	Process Plant	Pumped	Process Plant Make-up	Fixed rate with overflow float switch at minimum pond level.
4	TMA	Process Plant	Pumped	Process Plant Make-up	Pumped at fixed rate adjusted according to Mine Rock Pond supply.
5	Stockpile Pond	West Creek Pond	Gravity	Divert clean runoff.	Free draining to match inflow.
6	TMA	Water Management Pond	Pumped	Seasonal transfer: Net annual inflow to the system.	Transfer net annual inflow after effluent is released from the Water Management Pond.
7	Water Management Pond	Constructed Wetland	Gravity	Discharge treated effluent to the Pinewood River via the constructed wetland.	Seasonal discharge to constructed wetland (all months except Feb./March) for added treatment and maintain to Pinewood River flows.
8	Water Management Pond	Process Plant	Pumped	Mill process fresh water and make-up requirements	Pumped at variable rates as needed.
9	West Creek Pond	Potable	Pumped	Provide potable water	Pumped at variable rates as needed.
10	Water Management Pond	Pinewood River / McCallum Creek	Pumped	Discharge treated effluent to the Pinewood River.	Discharge treated effluent to the Pinewood River.

NOTES:

newgold™ Rainy River Project amec

RAINY RIVER PROJECT

Water Management Plan

Datum: NAD83
Projection: UTM Zone 19N

PROJECT N^o: TC111504 FIGURE: 4-10

SCALE: 1:37,500 DATE: September 2014

Source: Rainy River EIS, AMEC

8.2.3 *Residual effects by proponent*

The residual effects on water supply availability, increased mine water volumes and natural hazards were predicted not to cause additional malfunctions or environmental effects with the implementation of mitigation measures. In addition, the increased mine water volumes were predicted not to pose a safety hazard. A further assessment of the impacts to water quantity is discussed in section 6.2.

8.2.4 *Comments received*

Government authorities

Federal authorities raised concerns about the efficacy of proposed design safeguards to mitigate for the effects of potential water level fluctuations in covered and uncovered areas of the tailings management area.

Federal and provincial authorities also raised concerns about impacts of insufficient water supply in the Pinewood River on fish and fish habitat. The proponent proposed to take water in Pinewood River for a maximum of two years during mine construction.

Aboriginal communities

Aboriginal communities expressed concerns about the effect of ice jams on the outflow infrastructure of the mine, mixing of effluent, and water quality sampling. Ice jams are expected to occur in the Pinewood River from time to time.

Public

During the comment period of the EIS Guidelines, members of the public raised concerns about the potential for surface and groundwater contamination, in the event that heavy flooding or rainfall events cause the tailings management area to overflow.

8.2.5 *Agency analysis and conclusion*

The proponent has adequately designed the Project to account for water supply availability, increased mine water volumes, and natural hazards. Mitigation measures to reduce the potential effects include designing the tailings management area to contain the environmental design flood, and spillways to pass the probable maximum flood.

The proponent has responded to government authorities, Aboriginal and public comments by committing to maintaining the top of the tailings surface below the elevation of the spillway by three metres. The Agency expects that the residual effects of the environment on the Project will not cause additional malfunctions or environmental effects with the implementation of mitigation measures. In addition, the Agency agrees with the proponent that the increased mine water volumes are not predicted to pose a safety hazard.

8.3 Cumulative Environmental

A cumulative environmental effects assessment determines if environmental effects are likely to result from the designated project in combination with other physical activities that have been or will be

carried out. The proponent's assessment of cumulative effects took into consideration the Agency's *Operational Policy Statement*¹¹.

8.3.1 Approach and scoping

The cumulative environmental effects assessment considered all valued components (VCs) identified (Table 1) during the assessment of environmental effects of the Project. It incorporated the temporal and spatial boundaries of the VCs in the project-specific environmental effects assessment. It was restricted to the analysis of cumulative effects on the existing environmental baseline conditions, related to identified projects and activities that will be carried out within the broader regional context, and possibly overlapping with the Project in terms of effects, time, and location. Projects and activities at the planning stage, for which a decision to proceed has not been made, were generally excluded.

The EIS considered past and current projects and activities in the evaluation of project-specific effects, relative to existing baseline conditions. These included forestry operations, transportation uses and potential disturbances to wildlife. No regional studies are available for consideration. The EIS identifies potentially foreseeable but undefined projects that could contribute to cumulative effects. The existing and reasonably foreseeable projects are listed in Table 10.

Table 10 Summary of Existing and Reasonably Foreseeable Projects Identified by the Proponent

Project/Activity	Distance from the Project	Project/Activity Status
Existing projects		
Dave Rampel Solar Park	1.5 km east of the hamlet of Pinewood, within the lower portion of the Pinewood River watershed.	Ontario's Renewable Energy Approval received in September 2013
Forestry – Crossroute Forest Management Unit	Project site is located within the Ontario's Crossroute Forest Management Unit	No planned harvesting in the area overlapping with the Human Environment Local Study Area.
Ministry of Transportation rehabilitation projects	Human Environment Regional Study Area	To be constructed from 2013 to 2016
Municipal works (e.g. building or local road upgrades)	Human Environment Regional Study Area	To be completed in 2015
Exploration – Bayfield Ventures	At the project site	Exploration
Madsen Gold Project - Exploration	266 km north	Exploration

¹¹ Canadian Environmental Assessment Agency. 2013. Assessing Cumulative Environmental Effects under the *Canadian Environmental Assessment Act, 2012*.

Project/Activity	Distance from the Project	Project/Activity Status
Reasonably foreseeable projects		
Hammond Reef Gold Project	187 km east	Federal and provincial EA in preparation
Josephine Cone Mine	145 km northeast	Federal and provincial EA in preparation
Phoenix Gold Project	263 km north	Provincial approval received; tentative plans for production in 2014
Cochenour Project	258 km north	Production anticipated in the first half of 2015

Adapted from Rainy River EIS, AMEC

The EIS identifies possible positive cumulative effects on regional employment and business opportunities from some larger proposed mining projects listed in Table 10, and from the proposed Dave Rampel Solar Park.

8.3.2 *Comments received*

Government authorities

Health Canada expressed concern about air quality and noise cumulative effects from future quarries for the Project, and its potential to impact Aboriginal health. Explosives would also be required in the development of quarries, which could increase air emissions and noise levels near the project site. The proponent noted that locations identified for the proposed quarries, are all within the project site, and not close to any Aboriginal communities, which are all located well outside the Natural Environment Local Study Area and Natural Environment Regional Study Area. It also noted that approximately 3 700 000 m³ of aggregate is required, the equivalent of 30 days of mining during the operation phase. The proponent concluded that based on this comparison the potential effects on air quality from aggregate handling in the pits and quarries is minor, compared to the potential air quality effects during the operation phase. Health Canada was satisfied with the response.

Aboriginal communities

Aboriginal communities expressed concern about land and animals already impacted by forestry practices in the area, and requested information on the Crossroute Forestry Management Plan to inform the cumulative effects assessment. The proponent indicated that information on the Crossroute Forest Management Plan and forestry practices are described in the EIS.

Aboriginal communities expressed concern about existing health impacts on fish, and suggested that information from other mines be used to inform the cumulative effects assessment. The proponent contacted the Seven Generations School and the Ministry of Natural Resources and Forestry, but did not obtain any additional information to inform the assessment. The proponent clarified that deformities and lesions were not noted on fish captured within the Natural Environment Regional Study Area or Natural Environment Local Study Area. Fish diseases or parasites that were visually recognizable were limited to black spot (caused by larval trematodes) which do not pose a health risk.

Aboriginal communities expressed concern that the spatial boundary in the consideration of cumulative effects was unclear. The project effects on the natural environment were unlikely to extend beyond the Natural Environment Regional Study Area. Only future projects that have the potential to affect identified VCs within the Natural Environment Regional Study Area were considered in the assessment of cumulative effects; no such projects were identified by the proponent.

Big Grassy River First Nation expressed concern about existing impacts; impediment to accessing lands; the ability of members to harvest berries, wild rice and other culturally important plants; and the ability to practice a traditional way of life. The proponent is pursuing ongoing discussions of site-specific mitigation measures on key VCs, including but not limited to culture, water quality, and traditional land use. The proponent will work closely with Big Grassy River First Nation to address community impacts; an important aspect of this will be an agreement that is being negotiated with Big Grassy River First Nation that will outline certain benefits to the community as a result of the Project.

Public

Members of the public did not raise concerns about cumulative effects.

8.3.3 Agency analysis and conclusion

In considering the proponent's approach to cumulative effects assessment, the Agency sought additional information in relation to past effects from forestry, agriculture and fires on migratory birds and exclusion of Bayfield Ventures activities as a reasonably foreseeable project. The Project will put additional stress on migratory bird habitats, but the proponent will implement additional mitigation measures to limit effects. The Agency accepts the proponent's position that the Bayfield Ventures project is hypothetical as there is no defined project plan other than continued exploration drilling.

The baseline for existing projects, such as agriculture, forestry and transportation infrastructure, was considered in the EA. The reasonably foreseeable projects listed in Table 10 are located far enough from the project site that they are not expected to have a cumulative effect with the environmental effects of the Project within the Natural Environment Regional Study Area identified by the proponent.

The only planned project within the Natural Environment Regional Study Area is the Dave Rampel Solar Park. The EIS does not describe the potential environmental effects of this solar park, but notes that there will be no tree or forest clearing associated with the solar park proposal, since the entire lease area consists of active agricultural fields. Upon review of the Dave Rampel Solar Park Renewable Energy Application¹², the Agency has confirmed the predicted effects of the solar park include noise disturbance, dust, spills, alteration of current land conditions, storm water runoff, and materials generated at or transported from the project location. These effects are predicted to extend 300 m from

¹² Ontario Solar PV Fields Inc., 2010 <http://www.ontariosolarpvfields.com/project4.html>

the solar park. No predicted or residual effects of the solar park appear to overlap with the effects of the Project.

The Agency considers that there are no cumulative effects of the planned projects identified by the proponent with the Project. The thirteen Ministry of Transportation rehabilitation projects within the Human Environment Regional Study Area are mainly bridge rehabilitation works where the environmental effects are localized and understood. The potential effects can be mitigated with the implementation of the Ministry of Transportation environmental standards and practices, developed to protect the environment during all stages of highway management including maintenance. Residual effects are not expected.

The Agency concludes that the Project is not likely to result in significant adverse cumulative effects taking into account the proponent's assessment of potential cumulative effects, Health Canada and Aboriginal comments, the proponent responses and the Agency's analysis.

9 Impacts on Potential or Established Aboriginal or Treaty Rights

9.1 Potential or Established Aboriginal or Treaty Rights in the Project Area

The Project is located in a region covered by a historic treaty (Treaty 3) and overlapping assertions of Aboriginal rights by Métis represented by the Métis Nation of Ontario. As a result, the proponent identified several potential or established Aboriginal and Treaty rights held by First Nations and Métis communities that could be potentially affected by the Project. These include rights to fishing, hunting, and plant harvesting.

Plant and animal species of particular importance to the exercise of potential or established Aboriginal or Treaty rights were identified through Traditional Knowledge and Traditional Land Use studies conducted by the proponent, Big Grassy River First Nation, and Métis Nation of Ontario Region 1. These resources include deer, furbearers, game birds, moose, wild rice and berries.

9.2 Potential Adverse Impacts of the Project on Potential or Established Aboriginal or Treaty Rights

The EIS indicates that the Project has potential environmental effects that may adversely impact potential or established Aboriginal or Treaty rights. Vegetation clearing for mine construction and replacement of native species with non-native species during decommissioning could adversely affect potential or established Aboriginal or Treaty rights, due to the loss and fragmentation of terrestrial wildlife habitat for hunting and the loss of traditional plants for food and medicinal purposes. In addition, changes to fish, fish habitat, and commercial fisheries could adversely affect potential or established Aboriginal or Treaty rights to fishing, due to loss of fishing opportunities and contamination of fish tissues.

Potential effects on Aboriginal peoples within the context of current use of lands and resources for traditional purposes, health and socio-economic conditions, physical or cultural heritage and effects on historical, archaeological, paleontological or architectural sites or structures are discussed in greater detail in sections 7.3, 7.4, and 7.5, respectively.

Appendix E provides a table summarizing key Aboriginal concerns.

9.3 Proposed Accommodation Measures

The proponent worked with Aboriginal communities and federal and provincial authorities in developing mitigation measures that also serve as accommodation measures, designed to minimize or avoid potential adverse impacts on potential or established Aboriginal or Treaty rights.

The EIS indicates that the proponent is working with the Ministry of Natural Resources and Forestry to secure private lands to be used as habitat compensation for the Eastern Whip-poor-will. Subject to Ministry of Natural Resources and Forestry support, there is an opportunity to provide access to these lands to Aboriginal communities for hunting and plant gathering. The proponent committed to working

with community members from the Métis Nation of Ontario Region 1 and Big Grassy River First Nation to develop adaptive management techniques related to the mine closure plan, and the remediation of wildlife habitat after decommissioning. These measures are discussed in greater detail in section 7.3.

The EIS also notes that access to nearby private lands will be provided by the proponent for traditional plant harvesting activities and the proponent committed to using native plant species to revegetate the project site during reclamation, to offset direct losses of traditional plants harvested for food and medicinal purposes. Measures to compensate for losses of traditional plants will also serve to minimize, avoid or compensate for potential adverse impacts on potential or established Aboriginal and Treaty rights. These measures are discussed in greater detail in section 7.3.

The proponent is working with Fisheries and Oceans Canada and the Ministry of Natural Resources and Forestry on fish habitat offsetting and compensation plans, to offset the loss of fish habitat within the proposed mine footprint. These plans are discussed in greater detail in section 7.1.

The proponent stated that it has signed some agreements with Aboriginal communities, and is working to finalize others. These agreements are expected to address any potential residual adverse impacts to potential or established Aboriginal or Treaty rights that may remain after the implementation of proposed mitigation measures.

9.4 Issues to be Addressed During the Regulatory Approval Phase

The regulatory approval phase of the Project consists of authorizations, licenses, or approvals related to areas of federal jurisdiction (e.g., effects on fish and fish habitat). Substantive work for potential federal authorizations under the *Fisheries Act*, *Explosives Act* and the *Metal Mining Effluent Regulations* will be required should the EA decision conclude that the Project can proceed. In this situation, the federal Crown would consult Aboriginal communities, as appropriate, prior to making regulatory decisions. The decision to undertake additional Crown consultation will take into consideration the consultation record resulting from the EA.

9.5 Agency Conclusion Regarding Impacts to Aboriginal or Treaty Rights

Based on the analysis of environmental effects of the Project on Aboriginal peoples and the related mitigation measures outlined in sections 7.3, 7.4 and 7.5 and the potential impacts and accommodation measures provided in sections 9.2 and 9.3, the Agency is satisfied that the potential impacts of the Project on potential or established Aboriginal or Treaty rights have been adequately identified and appropriately accommodated.

The Agency has identified key mitigation measures that address environmental effects on Aboriginal peoples and would support accommodation of potential impacts on potential or established Aboriginal or Treaty rights for consideration by the Minister of the Environment in establishing conditions as part of the decision statement, should the Project ultimately be permitted to proceed.

10 Follow-Up Program

Under the Act, pursuant to paragraph 19(1)(e), every EA must consider the need for, and the requirements of, a follow-up program. The purpose of a follow-up program is to verify the accuracy of an EA and to determine the effectiveness of any measures taken to mitigate the adverse environmental effects of a project. Appendix A: Part 1 and Table 11 outline the key requirements for the proponent's follow-up program. The proponent has committed to implement additional follow-up monitoring measures as identified in Appendix I.

Monitoring results will be provided to the Agency and federal and provincial authorities annually during the construction, operation, decommissioning, and abandonment phases of the Project. Additional reporting mechanisms will be prescribed in provincial and federal environmental approvals.

Table 11 Follow-up Monitoring Requirements

Factor/Effect	Report Elements
<p>Fish and Fish Habitat</p> <p>Loss of fish habitat for Aboriginal, recreational and commercial fisheries in the Minor Creek Systems and Pinewood River</p> <p>Potential effects to fish and fish habitat caused by increases or decreases in flows</p> <p>Potential decrease in water quality from contaminants in effluent, seepage and site runoff</p>	<p>The follow-up monitoring plan will include:</p> <ul style="list-style-type: none"> • Conducting fish habitat and fisheries assessments to assess the character and quality of aquatic resources and habitat stability and structural function; • Verifying the effectiveness of re-created fish habitat; • Monitoring water flows and levels while respecting minimum flow thresholds for water taking from Pinewood River, as set by Ontario; • Verifying water quality in the open pit; • Monitoring the maintenance of a perpetually saturated state of the tailings; and • Verifying the effectiveness effluent treatment and acid rock drainage and metal leaching management.
<p>Migratory Birds</p> <p>Disturbance to migratory birds</p> <p>Loss of migratory bird habitat</p>	<p>The follow-up monitoring plan will include:</p> <ul style="list-style-type: none"> • Verifying the effectiveness of mitigation to avoid harming or killing migratory birds, or disturbing, destroying or taking nests or eggs; • Verifying the effectiveness of light and sound management intended to avoid disturbance of migratory birds; • Verifying the effectiveness of efforts to deter migratory birds from using the tailings management area; • Verifying the effectiveness of migratory bird habitat, artificial nests and habitat restoration; • Monitoring for Eastern Whip-poor-will, Bobolink, Barn Swallow and Common Nighthawk populations, including monitoring for breeding bird activity; • Conducting targeted point-count surveys for woodland area-sensitive breeding birds and diurnal species at risk, including but not limited to Golden-winged Warbler, Barn Swallow, Bobolink, and targeted twilight surveys for

Factor/Effect	Report Elements
	<p>Eastern Whip-poor-will in suitable habitat; and</p> <ul style="list-style-type: none"> • Selecting monitoring locations in proximity to the proposed mine and transmission line sites, within compensatory habitat areas, and in appropriate control areas.
<p>Current use of lands and resources for traditional purposes by Aboriginal peoples</p> <p>Potential changes to fishing, hunting, and plant harvesting practices</p> <p>Health and socio-economic conditions of Aboriginal peoples</p> <p>Potential decreases in air quality</p> <p>Potential changes to Aboriginal health from contamination of country foods and potential changes to commercial fishing practices</p> <p>Physical or cultural heritage and effects on historical, archaeological, paleontological or architectural sites or structures of Aboriginal peoples</p> <p>Potential changes to cultural heritage resources</p>	<p>The follow-up monitoring plan will include:</p> <ul style="list-style-type: none"> • Sharing with and engaging Aboriginal communities on the development and implementation of the monitoring included here-in; • Monitoring terrestrial landscapes after decommissioning, including restoration of habitat and use by wildlife; • Monitoring air quality for dust and metals (total suspended particulate, particulate matter, fine particulate matter, mercury, arsenic, cadmium, and lead) as well as nitrogen oxides and sulphur dioxide; • Monitoring groundwater levels and quality throughout the zone of influence to confirm that effects on groundwater are restricted to the project site and do not affect drinking water wells; • Monitoring contaminant levels, including mercury, arsenic, cadmium, and lead, in country foods, including Northern Pike and Walleye in the Pinewood River; and • Notifying Aboriginal groups in cases of exceedances of provincial, federal or international health-based criteria in fish tissue, exceedances of air quality standards, and exceedances of provincial water quality standards in wells. <p>The follow-up monitoring plan will be implemented in consultation with the local First Nations and Métis. The reporting of any results relating to traditional pursuits would be subject to confidentiality expressed by the Aboriginal peoples involved, and if deemed appropriate, would be reported in summary form as part of the follow-up monitoring plan annual report.</p> <p>Any notable cultural heritage finds will be reported according to regulatory requirements at the time, with reporting as required when and if further information becomes available.</p>

10.1 Comments Received

Government authorities

Federal and provincial authorities have indicated that they will be identifying specific monitoring and reporting requirements as part of regulatory authorizations. They also requested that the follow-up monitoring plan be designed to confirm flow predictions in Pinewood River, and confirm maintenance of ecological flows and stability for fish life cycles in the Minor Creek Systems and the Modified Minor Creek Systems. The proponent will measure flows in the Pinewood River, and indicated that the stability of diversion channels and ponds will be monitored on an annual basis for habitat stability and

habitat structural function until the completion of construction. The Ministry of Natural Resources and Forestry was concerned by the lack of a follow-up monitoring plan for rare plants. Fisheries and Oceans Canada requested a description of monitoring in relation to the fish habitat offsetting plan. The proponent will consult with Fisheries and Oceans Canada on the development of the follow-up monitoring plan.

Natural Resources Canada reviewed the information related to impacts to groundwater quantity, and is of the view that the proponent has provided sufficient information for the purpose of the EA. Natural Resources Canada agrees with the proponent's model conclusions, mitigation measures and water management plan. Natural Resources Canada notes that the proponent will update its groundwater modelling and implement monitoring as part of the water management plan.

Aboriginal communities

Aboriginal communities expressed concern about the risks of mercury pollution on human health and its potential effects on drinking water. They were also concerned about the potential health risks from consuming fish and wild game, including White-tailed Deer, if heavy metals accumulate in their tissues. The contamination of wildlife that will be consumed may cause Aboriginal communities to avoid these areas for hunting. They were also concerned about contamination of berries. The proponent responded that no appreciable change in mercury levels is expected in the Pinewood River, and mercury health risks associated with fish consumption are not expected to change. The proponent will work with local Aboriginal peoples to monitor metal concentrations in country foods, including fish muscle and liver tissue, White-tailed Deer liver tissue, and other wildlife tissues as appropriate. This analysis could be expanded to include testing for additional metals. The most effective path forward will be determined in collaboration with local Aboriginal hunters and Aboriginal communities.

Aboriginal communities expressed concern about impacts on water quality, and requested that they be involved in monitoring for water quality. The proponent committed to joint water quality monitoring and reporting with local Aboriginal communities, and to engage them in developing the water management plan prior to construction.

Aboriginal communities expressed concerns about the potential dewatering of wells in the vicinity of the zone of influence from the open pit. The proponent acknowledged that there will likely be changes to groundwater flow from mine development, but these changes will almost entirely be restricted to its privately-owned property. The proponent will establish a groundwater well (piezometer) network around the open pit area to monitor groundwater levels on a continuous basis using water level transducers, with transducer downloads to be completed twice per year, commencing at least six months prior to the start of pumping. The proponent will also request well owners to participate in well water quality monitoring.

Aboriginal communities raised general concerns regarding the effects of the Project on wildlife, habitat, and wildlife movement. They asked to be involved in the planning and execution of the proposed follow-up monitoring plan related to several components, including terrestrial landscapes and species at risk. The proponent will engage Aboriginal communities and provide opportunities for ongoing consultation on environmental approvals, the mine closure plan, contingency and response plan; engage Aboriginal communities in the implementation of monitoring; and monitor key terrestrial landscapes and species at

risk during construction, operation, decommissioning, and abandonment, including post closure habitat development and utilization by wildlife.

Public

Public comments were not received in relation to the follow-up program.

10.2 Agency Analysis and Conclusion

The Agency and government authorities reviewed the proponent's follow-up monitoring plan. During the course of the EA, the proponent clarified the frequency of monitoring for certain elements of the plan as follows: air quality, sound, vibration, surface and groundwater, key terrestrial landscapes and species at risk will be monitored during the construction, operation, and decommissioning phases; archaeology and built heritage will be monitored only during the construction phase; and monitoring frequency for traditional land use will be defined following ongoing consultations with Aboriginal groups. The proponent committed to updating groundwater modelling and implementing monitoring in response to comments from government authorities and Aboriginal groups. The proponent also committed to implement a wildlife follow-up monitoring plan for Eastern Whip-poor-will, Common Nighthawk, Bobolink, and Barn Swallow populations in response to government authorities' comments. Furthermore, the proponent committed to providing assistance and opportunities for ongoing consultation to Aboriginal groups on environmental approvals, the mine closure plan, the contingency and response plan, and the follow-up monitoring plan on matters related to spills and accidents. The proponent confirmed that it would develop an addendum on matters related to engaging the Métis Nation of Ontario Region 1 and other Aboriginal communities on the follow-up monitoring plan. Specifically, the Agency notes that the follow-up program will be informed by additional decisions made during the regulatory phase, and will be enhanced by specific engagement of Aboriginal communities.

The Agency is satisfied with the follow-up program as proposed by the proponent with changes proposed during the course of the EA.

11 Conclusions and Recommendations of the Agency

The Agency took into account the environmental impact statement (EIS), the views of the public, government agencies, and Aboriginal groups in determining whether or not the Project is likely to cause significant adverse environmental effects and to establish the requirements of the follow-up monitoring plan to be implemented by the proponent. The Agency received comments from Aboriginal groups, members of the public, and federal and provincial authorities on a draft of this EA report. Appendix J contains a summary of comments received and Agency responses.

The environmental effects of the Project have been determined using assessment methods and analytical tools that reflect current best practices of environmental and socio-economic assessment practitioners, including the consideration of cumulative effects and potential structural failures, accidents and malfunctions.

The Agency concludes that the Rainy River Project is not likely to cause significant adverse environmental effects, taking into account the implementation of the key mitigation measures described in this environmental assessment (EA) report and will make this recommendation to the Minister of the Environment.

Appendix A Part 1 – Key Mitigation and Follow-up Measures Considered by the Agency in the EA Report

Note: The Proponent Commitment Reference numbers provided below correspond to the commitments made by the proponent in their document entitled, “New Gold Rainy River Project – Commitments Registry” dated August 2014. This Appendix is a subset of the proponent’s list of commitments.

Part 1 of this appendix lists key mitigation measures and follow-up program requirements identified by the Agency for consideration by the Minister of the Environment in preparing conditions as part of the decision statement.

Valued Component	Mitigation Measures	Proponent Commitment Reference No.
Effects identified under Section 5(1) of the Act		
Fish and Fish Habitat	<ul style="list-style-type: none"> • Manage fish and fish habitat by: <ul style="list-style-type: none"> ○ <u>Implementing a fish habitat compensation plan</u>¹³, in accordance with <i>Metal Mining Effluent Regulations</i>, to offset the loss of fish habitat resulting from the deposit of deleterious substances into water bodies frequented by fish. This compensation plan will involve the creation of fish habitat through the creation of the West Creek Diversion Channel, the Stockpile Pond Diversion Channel, the Clark Creek Diversion Channel, the West Creek Pond, Stockpile Pond and the Clark Creek Pond (Figure 7) for losses associated with the removal of creeks at the project site. ○ <u>Implementing a fish habitat offsetting plan</u>¹⁴ to offset serious harm to fish, including any permanent alteration to, or destruction of, fish habitat, in accordance with the <i>Fisheries Act</i>. This offsetting plan will involve watershed-based enhancements (fencing off cattle, offline cattle watering sources, and channel and riparian zone restoration) and the creation of fish habitat through establishing Teeple Road Pond. 	20, 22, 24, 27, 29, 30, 33, 34, 36, 38, 42, 43 44, 45, 46, 47, 49, 51, 52, 53, 55, 56, 57, 58, 59, 60, 61, 62, 65, 66, 68, 70,72, 73, 74, 75, 81, 118

¹³ The fish habitat compensation plan is referred to as the No Net Loss Plan in the proponent’s EIS.

¹⁴ The fish habitat offsetting plan is also referred to as the No Net Loss Plan in the proponent’s EIS.

Valued Component	Mitigation Measures	Proponent Commitment Reference No.
	<ul style="list-style-type: none"> ○ <u>Designing and constructing new road watercourse crossings for the realignment of Highway 600</u> to allow for fish passage and meet the Ministry of Transportation Environmental Guide for Fish and Fish Habitat and the Ministry of Transportation Highway Drainage Design Standards. ○ Following the Fisheries and Oceans Canada Freshwater Intake End-of-Pipe Guidelines for water intakes. ● Minimize changes to water flows and levels in the Pinewood River, the Minor Creek Systems and the Modified Minor Creek Systems such that adverse effects to fish and fish habitat are reduced by: <ul style="list-style-type: none"> ○ <u>Establishing flow and level requirements</u> for the protection of fisheries in the Pinewood River, in consultation with the appropriate government authorities and not taking water from the Pinewood River when flows are below the minimum threshold set by Ontario. ○ <u>Designing and implementing the water management plan</u> to achieve these flow and level requirements during all applicable project phases, including recycling water onsite for ore processing from the tailings management area and water management ponds, capturing and returning groundwater to the Pinewood River, optimizing the timing, position and quality of final effluent discharges, and balancing water needs during open pit filling at decommissioning. ● Manage quality of water discharged into the Pinewood River and the Modified Minor Creek Systems from the project site by: <ul style="list-style-type: none"> ○ <u>Treating effluent prior to discharge to the environment to comply with</u> the Ministry of the Environment and Climate Change Environmental Compliance Approval and federal <i>Metal Mining Effluent Regulations</i> Schedule 4 limits at all times. ○ <u>Designing and implementing the water management plan</u> to achieve these compliance limits during construction and operation. This includes treatment of effluent prior to discharge to the environment; treatment of tailings slurry to break down cyanide and precipitate heavy metals prior to discharge to the tailings management area; collection of runoff and seepage in ditches; diversion of contaminated site contact water directly or indirectly into the tailings management area or water management facilities for release via final discharge points; use of a constructed wetland with a control structure for final effluent polishing of all discharge except any effluent discharged directly through the pipeline; and placement of secondary containment at pipelines that cross West Creek Channel Diversion to prevent accidental discharge of effluent. ● Control acid rock drainage and metal leaching throughout the project lifecycle by: <ul style="list-style-type: none"> ○ <u>Lining the former Clark Creek Channel</u> (under the east mine rock stockpile) with non-potentially acid generating material to provide drainage of effluent, sorting waste rock 	

Valued Component	Mitigation Measures	Proponent Commitment Reference No.
	<p>into non-potentially acid generating and potentially acid generating rock stockpiles using provincial criteria for determining potentially acid generating material, using potentially acid generating material for construction only where saturated conditions can be maintained, and placing an engineered cover over the east mine rock stockpile, and any remaining ore stockpiles, at the decommissioning phase.</p> <ul style="list-style-type: none"> ○ <u>Covering tailings with two metres of water</u>, maintaining the tailings in a perpetually saturated state, and controlling water quality in the open pit lake during the decommissioning and abandonment phases. ○ <u>Filling the open pit</u> as rapidly as practicable during the decommissioning and abandonment phases, using all available means, including directing drainage from the east mine rock stockpile into the pit. ○ <u>Treating water in the upper water column of the open pit lake</u>, to avoid release of contaminated water, and ensure passive outflow does not exceed regulatory standards during the decommissioning and abandonment phases. ○ <u>Designing and constructing the perimeter ditching</u> around the east mine rock stockpile and low grade ore stockpile to accommodate a 100-year flood event. 	
Migratory Birds including those listed as federal species at risk	<ul style="list-style-type: none"> • <u>Provide approximately 1400 hectares of private lands as habitat</u> for Eastern Whip-poor-will and Bobolink, which will provide protection and habitat for migratory birds. • Carry out project activities in a manner that avoids harming or killing migratory birds, or disturbing, destroying, or taking nests or eggs, in accordance with Environment Canada's policy on Incidental Take of Migratory Birds in Canada, and avoidance guidelines on General Nesting Periods of Migratory Birds in Canada¹⁵. • <u>Create artificial nesting structures</u> for Barn Swallows, prior to the removal of existing nesting structures, to encourage colonization by Barn Swallows. • <u>Manage site lighting fixtures</u> to reduce light pollution in surrounding environment and minimize disturbance to nocturnal species, such as Common Nighthawk. 	85, 86, 95, 97, 98, 101, 102, 103, 104, 108, 110, 111, 112, 113, 197

¹⁵ <http://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=1B16EAFB-1>

Valued Component	Mitigation Measures	Proponent Commitment Reference No.
	<ul style="list-style-type: none"> • <u>Minimize sound levels at the Project site boundary</u> by applying sound abatement measures to control sound levels from mining trucks, excavators, and diesel generators • Deter migratory birds from using the tailings management area. 	
Current use of lands and resources for traditional purposes of Aboriginal groups	<ul style="list-style-type: none"> • <u>Provide access to private lands</u> to Aboriginal communities for their current use of land, including hunting and plant harvesting. • Prohibit the use of herbicides and minimize removal of vegetation along the transmission line corridor. • Maintain a fence around the tailings management area to prevent access by wildlife. • <u>Restore habitat or develop new habitats</u> with the goal of supporting a diversity of wildlife species, including ungulates and furbearers, and native plant species previously collected at the project site for food and medicinal purposes. • <u>Revegetate and recolonize disturbed areas</u> as part of progressive restoration during operation and decommissioning. • <u>Separate and stockpile removed organic rich material</u> during construction (of open pit and during tailings dam stripping) for use as topsoil during revegetation. • <u>Revegetate in a manner</u> that ensures selected native plant species recolonize easily in the project site, such as on mine rock stockpiles, in collaboration with regulatory authorities. • <u>Restore access to Aboriginal communities</u> to the project site following decommissioning, to the extent that such access is safe and possible. <p>The proponent will consult with Aboriginal communities on the implementation of mitigation measures to provide access to private lands, and restore access to the project site following decommissioning.</p>	95, 115, 116, 119, 122, 127, 129, 130, 131, 132, 194
Health and socio-economic conditions of Aboriginal groups	<ul style="list-style-type: none"> • <u>Control air emissions</u> to avoid exceedances of the Canadian Ambient Air Quality Standards and meet air quality requirements established by Ontario at the nearest human receptor. • <u>Use dust control equipment</u> (e.g. bag houses, bin vents, surfactants, such as calcium chloride and water sprays) to control dust emissions from the crusher and onsite metal mill, provided such applications are acceptable to the Ministry of the Environment and Climate Change. • <u>Implement a fugitive dust best management practices plan</u> for both the construction and operation phases. The plan will identify all potential sources of fugitive dusts, outline mitigation measures, and detail inspection and recordkeeping requirements to demonstrate effective management. • <u>Maintain site roadways to minimize silt loading</u>. The road maintenance and inspections procedures, including timelines, will be incorporated into the fugitive dust best management practices plan. 	1, 2, 4, 8, 123, 144

Valued Component	Mitigation Measures	Proponent Commitment Reference No.
	<ul style="list-style-type: none"> • <u>Use low-sulphur diesel equipment and pollution control equipment</u> to control air emissions from mobile heavy equipment operations, including meeting any applicable federal requirements for the emissions of these vehicles and equipment. Develop and implement preventative maintenance measures related to air quality. • Employ dedicated water sprays at active stockpile areas, if further mitigation is required. • Revegetate disturbed areas in a manner that minimizes all exposed dust sources. 	
Physical or cultural heritage and effects on historical, archaeological, paleontological or architectural sites or structures of Aboriginal groups	<ul style="list-style-type: none"> • Avoid known culturally significant sites where possible. • <u>Assess additional significant sites</u>, should any be discovered during project development. • Preserve any discovered burial sites. • <u>Salvage, preserve and manage artifacts</u> by transferring them to a facility identified by the Aboriginal groups, in consultation with Ministry of Tourism, Culture and Sport. • <u>Establish a procedure for safe access to site for cultural and ceremonial purposes</u> to Aboriginal communities, including young people, to participate in ceremonies and learn from elders and ceremonialists • The proponent will consult Aboriginal groups on the implementation of these key mitigation measures. 	132, 167, 175, 195
Effects identified under Section 5(2) of the Act		
Amphibians and reptiles including those listed as federal species at risk	<ul style="list-style-type: none"> • Implement measures to prevent Snapping Turtles from accessing the project site during the construction and operation phases. 	93,
Furbearers	No specific mitigation measures have been identified by the Agency, but measures taken in relation to fish and fish habitat will benefit the fur bearing population.	61
Federal species at risk	<ul style="list-style-type: none"> • Provide suitable habitat for species at risk species as part of revegetation efforts. 	103
Other measures		
Accidents and	<ul style="list-style-type: none"> • In the unlikely event that an accident or malfunction occurs, the proponent will implement measures 	42, 43, 159, 182,

Valued Component	Mitigation Measures	Proponent Commitment Reference No.
malfunctions	<p>to minimize any adverse environmental effects associated with the occurrence.</p> <ul style="list-style-type: none"> In the unlikely event that an accident or malfunction occurs, the proponent is to exercise due diligence and inform the Agency and other responsible federal and provincial agencies as soon as practicable regarding the nature of the occurrence, measures taken to reduce the environmental effects of the occurrence and plans to avoid like future accidents or malfunctions. 	197
Follow-Up Program		
Fish and fish habitat	<p>The follow-up monitoring plan will include:</p> <ul style="list-style-type: none"> Conducting fish habitat and fisheries assessments to assess the character and quality of aquatic resources and habitat stability and structural function; Verifying the effectiveness of re-created fish habitat; Monitoring water flows and levels while respecting minimum flow thresholds for water taking from Pinewood River, set by Ontario; Verifying water quality in the open pit; Monitoring the maintenance of a perpetually saturated state of the tailings; and Verifying the effectiveness effluent treatment and acid rock drainage and metal leaching management. 	24, 28, 32, 44, 47, 51, 52, 63, 64, 67, 69, 76, 77, 80, 81
Migratory birds including those listed as federal species at risk	<ul style="list-style-type: none"> The follow-up monitoring plan will include: Verifying the effectiveness of mitigation to avoid harming or killing migratory birds, or disturbing, destroying or taking nests or eggs; Verifying the effectiveness of light and sound management intended to avoid disturbance of migratory birds; Verifying the effectiveness of efforts to deter migratory birds from using the tailings management area; Verifying the effectiveness of migratory bird habitat, artificial nests and habitat restoration; Monitoring for Eastern Whip-poor-will, Bobolink, Barn Swallow and Common Nighthawk populations, including monitoring for breeding bird activity; Conducting targeted point-count surveys for woodland area-sensitive breeding birds and diurnal species at risk, including but not limited to Golden-winged Warbler, Barn Swallow, Bobolink, and targeted twilight surveys for Eastern Whip-poor-will in suitable habitat; and Selecting monitoring locations in proximity to the proposed mine and transmission line sites, within 	82, 85, 99, 105, 109, 110, 111, 112

Valued Component	Mitigation Measures	Proponent Commitment Reference No.
	compensatory habitat areas, and in appropriate control areas.	
<p>Aboriginal peoples</p> <p>Current use of lands and resources for traditional purposes by Aboriginal peoples</p> <p>Health and socio-economic conditions of Aboriginal peoples</p> <p>Physical or cultural heritage and effects on historical, archaeological, paleontological or architectural sites or structures of Aboriginal peoples</p>	<ul style="list-style-type: none"> • The follow-up monitoring plan will include: • Sharing with and engaging Aboriginal communities on the development and implementation of the monitoring included here-in; • Monitoring terrestrial landscapes after decommissioning, including restoration of habitat and use by wildlife; • Monitoring air quality for dust and metals (total suspended particulate, particulate matter, fine particulate matter, mercury, arsenic, cadmium, and lead) as well as nitrogen dioxide and sulphur dioxide; • Monitoring groundwater levels and quality throughout the zone of influence to confirm that effects on groundwater are restricted to the project site and do not affect drinking water wells; • Monitoring contaminant levels, including mercury, arsenic, cadmium, and lead, in country foods, including Northern Pike and Walleye in the Pinewood River; and • Notifying Aboriginal groups in cases of exceedances of provincial, federal or international health-based criteria in fish tissue, exceedances of air quality standards, and exceedances of provincial water quality standards in wells. • The follow-up monitoring plan will be implemented in consultation with the local First Nations and Métis. The reporting of any results relating to traditional pursuits would be subject to confidentiality and other considerations expressed by the Aboriginal peoples involved, and if deemed appropriate, would be reported in summary form as part of the follow-up monitoring plan annual report. • Any notable cultural heritage finds will be reported according to regulatory requirements at the time, with reporting as required when and if further information becomes available. 	<p>4, 8, 117, 121, 164, 168, 174, 176</p>

Part 2 – Proponent’s Mitigation Measures and Commitments to Address Effects on Valued Components Identified by the Aboriginal Community and Federal Authorities

(Adapted from Rainy River EIS, AMEC)

The numbers in the first column correspond to the commitments made by the proponent in its document entitled, “New Gold Rainy River Project – Commitments Registry” dated August 2014. This Appendix is a subset of the proponent’s list of commitments.

See footnote for abbreviations¹⁶.

Proponent Commitment Reference No.	Commitment / Mitigation	Project Phase	Link to Federal or Provincial Authority or Aboriginal Community
Federal VC	Fish and Fish Habitat		
Proponent VC	Geochemistry		
20, 24	<ul style="list-style-type: none"> Design and build ditches and ponds to collect and manage runoff, including a retention period in accordance with federal <i>Metal Mining Effluent Regulations</i> requirements for total suspended solids. Monitor runoff and seepage related to tailings and stockpiles. Carry out blast hole sampling from open pit operations for mine rock segregation during open pit operation phase. Collect tailings samples at regular intervals during mine operation phase. Carry out field trials to confirm modelling results during all or a portion of the mine 	E,C,O,D	Ministry of Northern Development and Mines , Ministry of the Environment and Climate Change, Environment Canada

¹⁶ E: Engineering and procurement; C: Construction; O: Operations; D: Decommissioning and active closure; P: Abandonment

Note: the government agencies listed are generally for reporting purposes per Agency guidance, rather than necessarily the comment source agency

Proponent Commitment Reference No.	Commitment / Mitigation	Project Phase	Link to Federal or Provincial Authority or Aboriginal Community
	construction and operation phases.		
27	<ul style="list-style-type: none"> Place an engineered cover over the east mine rock (potentially acid generating) stockpile to minimize the potential for acid rock drainage and metal leaching in any remaining effluent draining into the Mine Rock Pond and leaching into the surface and groundwater. 	O,D	Ministry of Northern Development and Mines
28	<ul style="list-style-type: none"> Monitor kinetic cells to both demonstrate and continue to evaluate the robustness of the geochemical results. 	C,O	Ministry of Northern Development and Mines , Environment Canada
29	<ul style="list-style-type: none"> Encapsulate remaining ore stockpile at decommissioning with multi-layer cover and seeding. Direct runoff and seepage to the open pit as part of the passive water management plan. 	C,O,D	Ministry of Northern Development and Mines
30	<ul style="list-style-type: none"> Collect, manage and treat site runoff and seepage per Provincial and <i>Metal Mining Effluent Regulations</i> requirements. 	C,O,D	Environment Canada, Ministry of the Environment and Climate Change
Federal VC	Fish and Fish Habitat		
Proponent VC	Water Quantity		
32, 36	<ul style="list-style-type: none"> Monitor, on a continuous basis, West Creek pond and West Creek diversion flows using water level transducers. Monitor, on a monthly basis, by taking manual measurements, during the winter period, when transducer results experience interference caused by ice pressure. Place a secondary containment in place at the tailings pipeline crossing at West Creek. 	C,O	Ministry of the Environment and Climate Change, The Agency, Ministry of Natural Resources and Forestry
33	<ul style="list-style-type: none"> Maintain the West Creek Diversion Channel separate from the constructed wetland downstream of the tailings management area so as not to mix the natural creek water with excess water discharged from the tailings management area. 	C,O,D,P	Non-specific
34	<ul style="list-style-type: none"> Position West Creek Diversion Channel far enough from the pit perimeter to ensure integrity and stability and to provide like-for-like fish habitat replacement. 	C,O,D,P	Ministry of Natural Resources and Forestry, Fisheries

Proponent Commitment Reference No.	Commitment / Mitigation	Project Phase	Link to Federal or Provincial Authority or Aboriginal Community
			and Oceans Canada
38	<ul style="list-style-type: none"> • Restrict water taking from the Pinewood River to the first two years of the construction phase to develop an initial water inventory. 	C,O	Ministry of the Environment and Climate Change
43	<ul style="list-style-type: none"> • Ensure that the tailings management area dams meet the requirements of the Ontario <i>Lakes and Rivers Improvement Act</i>. • Construct tailings management area to withstand the probable maximum flood and maximum credible earthquake; • Design safeguards against tailings management area dam failure: <ul style="list-style-type: none"> ○ Construct tailings management area dams to withstand the probable maximum flood and maximum possible earthquake in accordance with Ontario's <i>Lakes and Rivers Improvement Act</i>. ○ Inspect tailings management area dams visually on a daily basis. ○ Install geotechnical monitoring equipment to monitor any movement of dams. ○ Conduct geotechnical inspections at regular intervals. • Implement actions in case of tailings management area dam failure: <ul style="list-style-type: none"> ○ Pump, in the event of a breach or failure, the tailings management area pond to the water management pond, to reduce the amount of released effluent during the emergency repair. ○ Contain the spill to the extent possible using temporary earthen or snow dams, silt fences, turbidity curtains, sandbags and other available equipment. ○ Work closely with local residents and authorities and address the needs of downstream residents. <ul style="list-style-type: none"> • Develop a remedial action plan in consultation with appropriate government agencies in the event of dam failure. • Contain spilled tailings based on their acid rock drainage characteristics. • Excavate spilled tailings and haul them back to the repaired tailings management area or, alternatively, engineer a cover over the deposited material. • Restore and revegetate all areas where tailings are removed to the extent practical. ○ Implement an emergency management plan in the event of dam breach. 	C,O	Ministry of Natural Resources and Forestry

Proponent Commitment Reference No.	Commitment / Mitigation	Project Phase	Link to Federal or Provincial Authority or Aboriginal Community
	<ul style="list-style-type: none"> • Design safeguards against open pit slope failure: <ul style="list-style-type: none"> ○ Maintain appropriate ramp width and grade. ○ Monitor pit wall for geotechnical stability. ○ Maintain appropriate overburden slope angles. ○ Monitor overburden slope movement. ○ Revegetate exposed overburden as soon as practical. ○ Reinforce, in case of localized erosion, overburden slopes with mine rock or progressive re-vegetation. ○ Construct a flood protection berm 60 m from the maximum open pit extent. • Design safeguards against overburden stockpile slope failure: <ul style="list-style-type: none"> ○ Construct external slopes with relatively dry clays or clays mixed with rock for stability. ○ Capture stockpile runoff in perimeter runoff collection ditches and direct the water to sedimentation ponds. • Implement actions in case of overburden stockpile slope failure: <ul style="list-style-type: none"> ○ Excavate any material that migrates as far as the perimeter ditch and return to the stockpile and if required, repair the drainage ditches. ○ Deploy silt fencing, if the slope failure caused effluent in the perimeter ditching to spill, downstream of the spill to prevent sediment laden waters from entering a watercourse. • Implement actions in case of east mine rock stock pile slope failure: <ul style="list-style-type: none"> ○ Re-contour the slope in place. ○ Excavate any material which migrated as far as the drainage ditch area and return to the stockpile, and if required, repair the drainage ditches. • Report and monitor spill, if potentially acid generating rock or stockpile runoff migrate beyond the collection ditches. 	C,0	
Federal VC	Fish and Fish Habitat		
Proponent VC	Water Quality		
22, 44	<ul style="list-style-type: none"> • Manage potentially acid generating mine rock (and ore), with drainage from the potentially acid generating mine rock and ore stockpile reporting to the mine rock pond for re-use as part of the process plant water supply. 	O	Ministry of the Environment and Climate Change,

Proponent Commitment Reference No.	Commitment / Mitigation	Project Phase	Link to Federal or Provincial Authority or Aboriginal Community
	<ul style="list-style-type: none"> • Capture and monitor runoff and seepage from the tailings management area and stockpiles. • Release runoff or seepage to the environment only if it meets applicable criteria or re-use in the process plant during the operation phase. • Control cyanide and metal concentrations in the tailings management area seepage and all treated effluent discharges to the environment through the use of in-plant cyanide destruction and heavy metal precipitation, augmented by extended effluent aging in the tailings management area ponds. 		Environment Canada
20	<ul style="list-style-type: none"> • Use of sediment ponds #1 and #2 for sedimentation of solids prior to discharge; 	C, O, D	Environment Canada
42	<ul style="list-style-type: none"> • Prohibit chemical spills from entering the environment. <ul style="list-style-type: none"> ○ Control any chemical spills within the process plant or chemical storage areas through provision of secondary containment, as appropriate. • Manage spills of potentially hazardous materials during transport, or from onsite material storage and handling facilities. • Take measures to prevent and clean up any hydrocarbon spills (and other spills) at source. • Design safeguards for fuel release during truck transport: <ul style="list-style-type: none"> ○ Develop and implement an emergency management plan. • Manage trucking and supply contracts, by incorporating, as reasonable, features to minimize the potential for environmental impacts on the trucking route, including: <ul style="list-style-type: none"> • Strict adherence to speed limits, national trucking hour limits and other applicable requirements. • Drivers must meet all applicable regulatory training requirements as per the federal <i>Transportation of Dangerous Goods Act</i>, be trained in spill response procedures and carry appropriate Material Safety Data Sheets, regulated under the federal <i>Hazardous Products Act</i>. • All material transport vehicles must maintain basic emergency response equipment in order to stop or slow spills, using available equipment. • Proponent's proposed actions: <ul style="list-style-type: none"> ○ Employ spill counter measures as part of the emergency management plan, including use of absorbent materials, establishment of a collection trench and 	C,O,D, P	Non-specific

Proponent Commitment Reference No.	Commitment / Mitigation	Project Phase	Link to Federal or Provincial Authority or Aboriginal Community
	<ul style="list-style-type: none"> ○ setting containment booms on water. ○ Contain fuel by booms, berms or other means, and, possibly also pump, skim or mop fuel with absorbent matting, and dispose in an approved facility designed to manage such wastes. ○ Contain and remediate, where possible, spills that may directly enter a fast moving watercourse. ○ Conduct a review, after any major spill, to ensure that the required design changes, procedures and appropriate monitoring measures are in place to ensure that similar incidents are not repeated. ● Design safeguards against fuel release from storage facilities and dispensing areas: <ul style="list-style-type: none"> ○ Include the following design and construction features to minimize the potential for environmental impacts: containment berms, collision protection poles, placement of the storage areas away from watercourses and the use of leak detection requirements. ○ Incorporate operational procedures to minimize the potential of accidents or malfunctions into the emergency management plan. ○ Keep and maintain a large spill kit, including with absorbent material, at the fuel storage facility. ○ Inspect, regularly, all fuel storage locations and volumes for leakage and other operational problems. ● Implement actions in case of fuel release from storage facilities and dispensing areas: <ul style="list-style-type: none"> ○ Implement spill response measures as part of the emergency management plan if fuel escapes the secondary containment berms. ○ When the area is secured, seal the leak or failure, if possible. ○ Contain the spill by using absorbent materials or by constructing a downstream berm. ○ Collect and haul spilled fuel offsite for disposal. ○ Report on spills to the Ministry of the Environment and Climate Change and other appropriate agencies in accordance with the Ontario <i>Environmental Protection Act</i>. ○ Cease, if a spill migrates to the mine rock pond or stockpile pond, all pumping from the pond and contain the spill with a boom, and remove with a skimmer. ○ Test soils in the vicinity of the spill, for hydrocarbons and delineate the affected soils. 		

Proponent Commitment Reference No.	Commitment / Mitigation	Project Phase	Link to Federal or Provincial Authority or Aboriginal Community
	<ul style="list-style-type: none"> ○ Treat impacted soil onsite in a bioremediation area or haul offsite for treatment and disposal. ● Send offsite used absorbent material for disposal at a licensed facility. ● Employ passive treatment measures, rather than long-term chemical treatment, of the upper pit lake water column during abandonment to minimize long-term chemical use for water treatment. 		
42	<ul style="list-style-type: none"> ● Design safeguards against transportation accidents: <ul style="list-style-type: none"> ○ Ship all materials of consequence in sealed containers, such as tanker trucks, containers, shipment cubes (1000 L), sealed bulk bags, 205 L sealed drums and smaller containers on pallets. ○ Ensure all shipments comply with regulatory requirements, including the federal <i>Transportation of Dangerous Goods Act</i> and associated regulations. ○ Incorporate, into trucking contracts and the emergency management plan, operational procedures on minimizing the potential for environmental impacts, including: strict adherence to speed limits; restricting oversized loads to daylight travel where possible; avoiding material transport when visibility is low; and regular vehicle maintenance. ● Implement actions in case of transportation accidents: <ul style="list-style-type: none"> ○ Remove potential ignition sources if safely possible in the event of a spill of flammable or combustible materials and slow down or stop the spill. ○ Notify the Ministry of the Environment and Climate Change's Spills Action Centre (per the requirements of the Ontario <i>Environmental Protection Act</i>), the Township of Chapple, Emo Fire Department, and, if required, the Technical Standards and Safety Authority (fuel fires and explosions). ○ Conduct an assessment and determine the best means to prevent immediate environmental impacts. ○ Implement spill countermeasures as part of the emergency management plan, such as the use of absorbent materials, establishment of a collection trench downslope and setting collection booms on water if effective for the spilled material. ○ Ensure clean-up and remediation reduces, to the extent possible, long-term environmental impacts. ○ Conduct a review and report, after the incident, to ensure that any required design changes and procedures are in place to prevent a similar accident. 	C,O	

Proponent Commitment Reference No.	Commitment / Mitigation	Project Phase	Link to Federal or Provincial Authority or Aboriginal Community
	<ul style="list-style-type: none"> • Design safeguards against chemical spill within contained facilities and chemical spills from pressurized vessels: <ul style="list-style-type: none"> ○ Store all chemicals which pose a potential risk to the environment within contained areas, with sealed floors and sumps or drains reporting to facilities which will provide for retrieval of the spilled materials. ○ Ensure all chemicals used at the site have a Material Safety Data Sheet, in order to comply with industry best practices and with the <i>Workplace Hazardous Materials Information System Ontario Regulation 860</i> and <i>Occupational Health and Safety Act</i> for the safe use of these materials. ○ Include a spill pad for the liquid oxygen storage area. ○ Manage spills from the sulphur dioxide area in a containment area. • Ensure the gas plume dissipates quickly upon entering the natural environment. 		
45	<ul style="list-style-type: none"> • Inspect all active pipelines twice per 12 hour shift and informally at other times. • Should flow unexpectedly lessen or stop in a pipeline inspect immediately. • Design safeguards against water pipeline failure: <ul style="list-style-type: none"> ○ Inspect and employ regular incidental observation activities to identify visible leaks or failure of the pipeline. • Implement actions in case of water pipeline failure: <ul style="list-style-type: none"> ○ Shutdown pumps upon discovery of a leak or failure and repair the pipeline. ○ Employ, if possible, erosion and sediment control measures, such as matting, straw bales or silt fencing to prevent overland runoff containing sediments from directly entering a watercourse. • Design safeguards against tailings pipeline failure: <ul style="list-style-type: none"> ○ Install pressure sensors at four locations along the pipeline route and flow transmitters at the onsite metal mill and at the tailings management area dam as the primary operational safeguards. ○ Install a vacuum relief valve at the tailings management area dam to ensure reverse flow is not possible. The proponent advises that the pump will automatically shut off in the event of a pressure loss resulting from a failure. ○ Undertake incidental observation to identify leaks of less than the pressure loss detection. ○ Institute a ditch or capture basin system to act as secondary containment in case of a leak. 	C,O,D	Non-specific

Proponent Commitment Reference No.	Commitment / Mitigation	Project Phase	Link to Federal or Provincial Authority or Aboriginal Community
	<ul style="list-style-type: none"> • Implement actions in case of tailings pipeline failure: <ul style="list-style-type: none"> ○ Use heavy equipment and spill containment materials in order to contain or limit the discharge of tailings and effluent to the environment. ○ Implement spill response measures as part of an emergency management plan, depending on the amount of tailings spilled and whether tailings enter West Creek, in consultation with appropriate regulatory agencies. • Excavate spilled tailings and load on a haul or vacuum truck, and transport to the tailings management area. 		
46	<ul style="list-style-type: none"> • Cover the exposed tailings beach at decommissioning¹⁷ with a layer of overburden and the remaining tailings with a layer of water to prevent oxygen contact with the tailings. 	O,D	Ministry of Northern Development and Mines
47	<ul style="list-style-type: none"> • Maintain the deposited tailings during the abandonment¹⁸ period in a saturated condition in perpetuity to prevent the generation of Acid Rock Drainage and Metal Leaching. • Monitor and evaluate the integrity of the tailings management area cover system (e.g. low permeability overburden zone) and the continuous saturation of the tailings. 	P, C,O	Ministry of Northern Development and Mines , Environment Canada
49	<ul style="list-style-type: none"> • Develop a detailed mine closure plan to ensure that the deposited tailings solids remain permanently saturated in the post-closure condition. 	E,O,D,P	Ministry of Northern Development and Mines , Environment Canada
51	<ul style="list-style-type: none"> • Mitigate potential adverse environmental effects to the Pinewood River watershed: <ul style="list-style-type: none"> ○ Recycle contact water for process plant needs to reduce overall water demands, and minimize final effluent discharge volumes into the Pinewood 	C,O	MOE, Ministry of Northern Development and

¹⁷ Note: the proponent uses the term closure to refer to the decommissioning phase.

¹⁸ Note: the proponent uses the term post-closure to refer to the abandonment phase.

Proponent Commitment Reference No.	Commitment / Mitigation	Project Phase	Link to Federal or Provincial Authority or Aboriginal Community
	<p>River.</p> <ul style="list-style-type: none"> ○ Use sulphur dioxide and air treatment for cyanide destruction and heavy metal precipitation in the process plant followed by extended effluent aging in the tailings management area pond and in the water management pond to achieve the highest quality effluent reasonably achievable. ○ Use a constructed wetland system for final effluent polishing of a major portion of the discharge. ○ Manage the site for acid rock drainage and metal leaching control during the operation phase and following decommissioning to prevent adverse water quality impacts to the Pinewood River. ○ Follow Fisheries and Oceans Canada's <i>Freshwater Intake End-of-Pipe Guidelines</i> as mitigation for potential fisheries effects associated with water intakes. ○ Construct the Pinewood River Highway 600 realignment crossing (bridge or culverts) in a manner that does not restrict fish passage. ○ Maintain current fish habitat productivity. ○ Implement an extensive water management plan for water quality and flow discharges, and receiving water aquatic life and habitat. 		Mines , Ministry of Transportation, Fisheries and Oceans Canada
47, 51	<ul style="list-style-type: none"> ● Design safeguards against unexpected water quality concerns related to acid rock drainage: <ul style="list-style-type: none"> ○ Segregate rock for use as construction materials according to a site-specific protocol, which is expected to include: <ul style="list-style-type: none"> ● preliminary visual identification of construction materials from the open pit which undergo geochemical testing. ● supplementary refinement based on a geochemical block model, to identify the location of blocks of material which are eligible for construction usage. ● periodical geochemical testing of the blocks to assess appropriate location for storage or for construction use and confirmation of model results. ● visual inspection of material during placement and after construction for signs of acid rock drainage. ● Extract and transport any material used in construction, after visual identification and subsequent sampling, that is identified as acid generating to the East Mine Rock 		

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	Stockpile for storage or encapsulate (or take other measures), as appropriate, to leave the material in place.		
52	<ul style="list-style-type: none"> Ensure all final discharge points have a point of control to immediately cease discharge. Construct the control structure at the discharge point of the treatment wetland in compliance with <i>Metal Mining Effluent Regulations</i>. Sample, regularly, all discharge locations in accordance with Ontario's environmental approval requirements. 	C,O	Ministry of the Environment and Climate Change, Environment Canada
53	<ul style="list-style-type: none"> Ensure that excess water discharged to the environment meets federal and provincial guidelines for the protection of aquatic life, <i>Metal Mining Effluent Regulations</i> Schedule 4 limits and provincial Ministry of the Environment and Climate Change Environmental Compliance Approval in the receiver. 	C,O,D,P	Ministry of the Environment and Climate Change, Environment Canada
55	<ul style="list-style-type: none"> Develop a minimum flow threshold acceptable to the Ministry of the Environment and Climate Change, below which water from the Pinewood River would not be taken to build up the initial water inventory for the onsite metal mill. 	E,C,O	Ministry of the Environment and Climate Change, Fisheries and Oceans Canada
Federal VC	Fish and Fish Habitat, Aboriginal Health and Socio-Economic Conditions, and Current Use of Lands and Resources for Traditional Purposes by Aboriginal Peoples		
Proponent VC	Fish and Fish Habitat		
56	<ul style="list-style-type: none"> Assess the appropriateness of the use of the Water Survey of Canada station during the operation phase. Set up a separate dedicated flow monitoring station (if the Water Survey of Canada is found unsuitable), either independently or in association with the Water Survey of Canada. 	E,C	Ministry of the Environment and Climate Change
57	<ul style="list-style-type: none"> Limit the potential for adverse flow effects to the Pinewood River by optimizing the timing and positioning of final effluent discharges. 	C,O,D	Ministry of the Environment and Climate Change

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58	<ul style="list-style-type: none"> Operate the final effluent discharge from both the constructed wetland and the pipeline discharge from the water management pond, such that a minimum one-to-one receiver to final effluent mixing ratio would be maintained in the Pinewood River. 	O,D	Ministry of the Environment and Climate Change
59	<ul style="list-style-type: none"> Ensure discharge of effluents to the Pinewood River achieves rapid mixing within the river. Implement additional measures, in consultation with the Ministry of the Environment and Climate Change, if mixing is not attained. These could include the use of rock groynes placed on either side of the channel to force mid-channel mixing, and use of boulder clusters to increase flow turbulence within the mixing zone. 	O	Ministry of the Environment and Climate Change
60	<ul style="list-style-type: none"> Consider environmental aspects (such as fish spawning) when scheduling project development activities. 	E,C	Ministry of Natural Resources and Forestry, Fisheries and Oceans Canada, Environment Canada
61	<ul style="list-style-type: none"> The proponent will be required to: <ul style="list-style-type: none"> Develop and implement a No Net Loss Plan and compensation strategy to offset the loss of fish habitat; and, Enhance existing restoration programs to offset the loss of fish habitat. 	E,C	Fisheries and Oceans Canada
	<ul style="list-style-type: none"> Design safeguards against creek diversion failure: <ul style="list-style-type: none"> Size, all diversions to convey the environmental design flood. Operate the initial portion of the West Creek Diversion Channel as the emergency spillway for the West Creek pond. Size the West Creek Diversion Channel to convey the probable maximum flood without overtopping. Implement actions in case of creek diversion failure: <ul style="list-style-type: none"> Undertake emergency repair, in the event of a failure or imminent failure of a diversion, as soon as possible. Address the needs of downstream residents by working closely with local residents and authorities. Install, if possible, erosion and sediment control measures (such as silt fences, turbidity curtains, sandbags, erosion mats and other equivalent measures) downhill of the failure. 	C,O	

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62	<ul style="list-style-type: none"> Maintain a 120 m buffer zone adjacent to rivers and creeks to the extent practical, to protect watercourses and their associated vegetated margins, except where aquatic habitat will be lost (and compensated for as part of Fisheries and Oceans Canada authorizations) for project development. 	C,O	MRN, Fisheries and Oceans Canada
63	<ul style="list-style-type: none"> Monitor metals on a continuous basis in Walleye and Northern Pike species after mine start-up. Collect and analyse a reasonable sample of fish, by working with fishermen, to reflect any applied methods of food preparation should there be an increase in fishing in Pinewood River. 	O,D	The Agency
64	<ul style="list-style-type: none"> Sample fish tissue (dorsal muscle tissue and livers) from both Northern Pike and Walleye. Monitor Pinewood River game fish tissues for contaminants of potential concern over time. Notify potential consumers and the applicable provincial departments (Ministry of the Environment and Climate Change and Ministry of Natural Resources and Forestry), if contaminant concentrations increase over time, and provide information related to increased health risks (if any). 	O,D	Ministry of the Environment and Climate Change, Ministry of Natural Resources and Forestry, the Agency
65	<ul style="list-style-type: none"> Provide specific erosion and sediment control measures and their locations in the permit application documents once detailed design is completed. 	E,C	Ministry of Natural Resources and Forestry, Fisheries and Oceans Canada
66	<ul style="list-style-type: none"> Inspect pond dams at a regular interval by site employees for any visible signs of concern and particularly during and after major storm events. Inspect pond dams periodically by a qualified geotechnical engineer in accordance with regulatory requirements. Design safeguards against pond dam failure: <ul style="list-style-type: none"> Store environmental design flood runoff above the maximum operating water level in ponds containing mine-affected water. Construct spillways to ensure safe discharge to the environment should an event ever exceed the environmental design flood. Construct dam slopes and crest widths for stability in relation to the mine rock pond, water management pond, as well as ponds not affected by mine water. Design all sedimentation ponds with a retention period to meet the <i>Metal Mining Effluent Regulations</i> discharge requirements for total suspended 	C,O,D,P	Ministry of Natural Resources and Forestry, Fisheries and Oceans Canada

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	<ul style="list-style-type: none"> solids. <ul style="list-style-type: none"> ○ Size diversions to accommodate the environmental design flood. • Implement actions in case of pond dam failure: <ul style="list-style-type: none"> ○ Deploy, in the event of a failure or imminent failure of a pond dam, silt fences, turbidity curtains, sandbags and other erosion and sediment control measures to prevent the entry of sediments into a downstream water body. • Keep appropriate spill control equipment at the project site. 		
67	<ul style="list-style-type: none"> • Monitor surface water during construction, operation and active closure phases, with decommissioning monitoring expected to continue for a decade (or more) at reduced frequencies pending ongoing analysis of data. 	C,O,D,P	Ministry of the Environment and Climate Change, Ministry of Northern Development and Mines , Environment Canada
69	<ul style="list-style-type: none"> • Sample sediments to evaluate soil quality parameters prior to undertaking any further closure activities for any contact water ponds and drainage works (including stockpile sediment ponds) where breaching is proposed. 	D	Ministry of Northern Development and Mines
70	<ul style="list-style-type: none"> • Describe the ongoing water management plan and provide freshet¹⁹ data on request. 	E	BGRFN, Ministry of the Environment and Climate Change, Environment Canada
72	<ul style="list-style-type: none"> • Carry out the following mitigation measures related to the transmission line: <ul style="list-style-type: none"> ○ Leave tree stumps, root mats and ground vegetation cover intact to reduce the potential for surface erosion and to help maintain groundcover for plant 	C	Ministry of Natural Resources and

¹⁹ the flood of a river from heavy rain or melted snow

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	<p>and wildlife habitat.</p> <ul style="list-style-type: none"> ○ Leave vegetation (shrub) screens to the extent practical along the single creek crossing that exists between Beadle and Preachers Lake, near the east end of the alignment, for erosion protection, while ensuring clearance requirements for conductors. ○ Maintain in-water work and place all poles above the high water mark. ○ Apply industry standard sediment interception and erosion control practices. ○ Reseed or otherwise stabilize any exposed areas at the end of the construction period to control erosion until native vegetation takes hold. If the erosion is more severe, use other methods such as placement of straw matting or equivalent. ○ Store larger quantities of construction materials at a minimum distance of 200 m from any open (non-frozen) surface water, and from major access points. ○ Do not conduct fuelling and maintenance of vehicles within 50 m of surface water bodies. 		Forestry
68, 73, 74, 75, 118	<ul style="list-style-type: none"> • Include a First Nation training component and First Nation representatives in the monthly surface water collection program • Share laboratory results, including a summary explanation with each participating First Nation. • Fund a joint water quality monitoring and reporting program with the area First Nations (including Big Grassy River First Nation) as part of the water management plan. The program will be developed jointly with the First Nations in lead-up to the initiation of mine construction. (Letter to Chiefs from Kyle Stanfield, October 2013). • Closely coordination a program with Rainy River First Nation in support of the pre-existing First Nation Watershed Program and water quality protection. 	C,O,D,P	Aboriginal communities, the Agency, RRFN, Fisheries and Oceans Canada, Ministry of Northern Development and Mines
Federal VC	Fish and Fish Habitat, Recreation and Commercial Use		
Proponent VC	Groundwater		
76, 77, 80	<ul style="list-style-type: none"> • Monitor groundwater during construction, operation and decommissioning phases as part of the water management plan. • Monitor ground water, as part of the mine closure plan, with abandonment monitoring 	C,O,D,P	Ministry of the Environment and Climate Change,

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	<p>expected to continue for a decade (or more).</p> <ul style="list-style-type: none"> • Implement a water management plan that will include regular sampling and dipping of dedicated monitoring wells to identify any impacts to wells (flow and quality) from the mine. • Provide timely notification to Aboriginal communities and on spills and accidents if any, and on the details of any investigation and response to these events. • Consult with Aboriginal communities on an ongoing basis on environmental approvals, the mine closure plan, the emergency management plan, and the follow-up monitoring plan. • Request local well owners to participate in well water quality monitoring as part of the water management plan. • Place groundwater monitoring wells around the tailings management area and east mine rock stockpile and pond areas, as shown in Figure 13-3 of the EIS. This groundwater monitoring network may be amended or expanded through the Ministry of the Environment and Climate Change approvals process. • Measure water levels continuously in the monitoring wells with data downloaded semi-annually. • Collect groundwater samples quarterly. 		Ministry of Northern Development and Mines , Natural Resources Canada
81	<ul style="list-style-type: none"> • Carry out the following mitigation measures to reduce potential effects on groundwater: <ul style="list-style-type: none"> ○ Capture and return groundwater to the Pinewood River during mine operation to minimize potential flow effects on the river, particularly during low flow periods. ○ Use sulphur dioxide and air treatment of tailings slurry for cyanide destruction and associated heavy metals precipitation, before discharge to the tailings management area. ○ Manage the site for acid rock drainage control, both during operation and following closure to prevent adverse water quality impacts to the Pinewood River, including that associated with any groundwater seepage. ○ Accelerate open pit inflow following mine closure, balancing the need for managing water quality and maintaining Pinewood River flows until the pit is completely flooded. ○ Monitor water levels, water quality, and flow discharges as part of the water 	E,C,O,D,P	Ministry of the Environment and Climate Change, Ministry of Northern Development and Mines , Natural Resources Canada

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	management plan, as well as aquatic life in the receiving water and habitat maintenance.		
Federal VC	Migratory Birds, Aboriginal Health and Socio-Economic Conditions, and Current Use of Lands and Resources for Traditional Purposes by Aboriginal Peoples		
Proponent VC	Vegetation communities and rare plants		
82, 109	<ul style="list-style-type: none"> • Monitor key terrestrial systems and species at risk during the construction and operation phase, with post closure habitat development and utilization by wildlife to continue at reduced frequencies consistent with the <i>Endangered Species Act</i> Permit requirements. 	C,O,D,P	Ministry of Natural Resources and Forestry
85	<ul style="list-style-type: none"> • Implement measures to limit short- and long-term adverse effects to local vegetation communities: <ul style="list-style-type: none"> ○ Minimize dust production along primary mine rock and overburden transportation routes by implementing dust suppression methods (including road watering) and thereby minimizing the zone of influence. ○ Monitor dust deposition on vegetation adjacent to mine roads annually. ○ Conduct active revegetation and recolonization of disturbed areas as part of progressive reclamation during operation and active reclamation at decommissioning. ○ Maintain forest buffers between project components and nesting and foraging habitat. 	C,O,D	Non-specific, Ministry of the Environment and Climate Change
86, 102, 203	<ul style="list-style-type: none"> • Carry out the following mitigation measures with regards to transmission line: <ul style="list-style-type: none"> ○ Undertake transmission line construction in winter (normally December 1 to March 31) to better protect ground cover in sensitive areas where the protection of wetlands, rare plants and species at risk is required, and completion of the remainder of transmission line construction in the late summer and fall, outside of the bird breeding season. ○ Undertook additional rare plant and breeding bird surveys in May and June 2014 to identify any further potential environment constraints and site specific 	E,C	Ministry of Natural Resources and Forestry, Ministry of Transportation, Environment Canada

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	<ul style="list-style-type: none"> ○ habitat protection measures. ○ Ensure conductor wire separation distances are sufficiently far apart to preclude larger avian species, particularly raptors which frequently use hydro pole for perching or nesting, from electrocution by contacting two conductor wires simultaneously. ○ Remove vegetation only to the extent necessary to support construction activities and longer-term transmission line reliability (from interference with conductors and adjacent hazardous trees). Minimize vegetation removal and retain existing low vegetation ground cover. ○ Prohibit use of herbicides and utilize mechanical removal for vegetation management periodically. 		
Federal VC	Furbearers and Amphibians and Reptiles		
Proponent VC	Ungulates, Furbearers, Bats, Amphibians		
91	<ul style="list-style-type: none"> • Carry-out a wildlife follow-up monitoring plan that evaluates the effectiveness of avoidance measures. • Report results annually to Environment Canada and MNR. 	C,O,D	Environment Canada, Ministry of Natural Resources and Forestry, The Agency
92	<ul style="list-style-type: none"> • Develop a detailed wildlife follow-up monitoring plan through consultation with the Ministry of Natural Resources and Forestry and Environment Canada. Additional control sites around the periphery of the mine footprint can be developed and monitored following mine construction and periodically throughout mine operation. • Issue draft plan to Ministry of Natural Resources and Forestry and Environment Canada prior to initiation of construction. 	E,C,O	Ministry of Natural Resources and Forestry
94	<ul style="list-style-type: none"> • Capture and release Snapping Turtles observed on-site that are likely to be harmed, particularly during the construction phase [as agreed by proponent on December 3, 2014]. • In regard to the transmission line, the proponent will carry out the following mitigation measures: <ul style="list-style-type: none"> ○ Advise construction crews not to interfere with or harass wildlife. No hunting or fishing by construction crews will be allowed. Disciplinary actions will be 	C	Environment Canada, Ministry of Natural Resources and Forestry

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	<p>taken should either occur.</p> <ul style="list-style-type: none"> ○ Ensure contractors handle food and food wastes in a responsible manner, and educate workers to ensure no feeding of wildlife. ○ Contact Ministry of Natural Resources and Forestry for direction should any nuisance wildlife be encountered which pose a risk to construction crews. 		
Federal VC	Migratory Birds, Amphibians and Reptiles		
Proponent VC	Wildlife		
95	<ul style="list-style-type: none"> • Carry out the following primary mitigation strategies for limiting adverse effects to wildlife: <ul style="list-style-type: none"> ○ Limit hunting on all lands owned by the proponent. ○ Maintain a 120 m buffer zone adjacent to rivers and creeks to protect watercourses and their associated vegetated margins. ○ Restore disturbed habitats at decommissioning and develop habitats capable of supporting a diversity of wildlife species. ○ Enforce speed limits, install warning signs for wildlife encounters, and log collisions to help identify and avoid increased potential for vehicular collisions with wildlife. ○ Include wildlife awareness information into regular safety and environmental inductions performed by the mine. Workers and contractors will be made aware of seasonal changes in local deer or large mammal behaviour or presence in proximity to the mine. ○ Treat the tailings slurry to levels equal to or less than 1 mg/L weak acid dissociable cyanide before deposition in the tailings management area (which is well below the 50 mg/L weak acid dissociable cyanide threshold criteria outlined by the <i>International Cyanide Management Code</i>). ○ Cover the exposed tailings beach at decommissioning with a layer of low permeability overburden and the remaining tailings with at least two metres of water to restrict oxygen contact with the tailings. ○ Implement dust suppression measures along the transportation routes, minimizing the zone of influence. ○ Dispose of food waste generated on site in a manner which reduces attraction of wildlife. 	E,C,O,D	Ministry of the Environment and Climate Change, Ministry of Natural Resources and Forestry, Ministry of Northern Development and Mines
96, 97	<ul style="list-style-type: none"> • The primary mitigation strategies for limiting adverse effects to amphibians will include: <ul style="list-style-type: none"> ○ Develop a compact project site to reduce overall habitat loss and to limit 	C,O	

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	<p>potential adverse effects related to sound emissions to the extent practical.</p> <ul style="list-style-type: none"> ○ Install silt fencing if frog mortality on roadways is found to be a problem along mine access roads or the re-aligned Highway 600. This will prevent frogs from crossing the road and may direct them to the nearest culvert(s). ○ Implement sound abatement strategies to dampen sound infiltrating habitats surrounding high traffic area of the mine. ○ Discharge effluent in protection of Pinewood River aquatic life standards so that there are no adverse water quality effects to amphibians. ○ Maintain abiotic conditions within tailings management area to discourage wildlife presence. ○ Engage Ministry of Natural Resources and Forestry in the design and review of West Creek and Clark Creek Diversions as part of the fish habitat compensation plans to ensure amphibian habitat is taken into account. 		
Federal VC	Migratory Birds, Aboriginal Health and Socio-Economic Conditions, and Current Use of Lands and Resources for Traditional Purposes by Aboriginal Peoples		
Proponent VC	Birds and Habitat , species at risk: Species protected under the Ontario Endangered Species Act and species of special concern and provincially rare species		
98, 101, 103, 104, 108, 113	<p>The primary mitigation strategies for limiting adverse effects to birds and habitat:</p> <ul style="list-style-type: none"> • Restrict clearing and modification of trees and woodland, and known Trumpeter Swan breeding habitat to outside of the breeding seasons (May 1 to August 15, and March 15 to August 15, respectively). • Minimize level of potentially disturbing activities near active raptor and raven nests. • Monitor Bald Eagle nest in Woodland 122 annually to determine seasonal activity to guide project activities in the area. Should eagles continue to use the nest site and raise offspring, work will be adjusted to reduce adverse effects to their breeding success. Limit less typical activities near the nest site during nest building and breeding season. The local eagle pair appears tolerant of agricultural activities and road grading • Implement sound abatement strategies. • Enforce speed limits, install warning signs for wildlife encounters, and keep a log of collisions to help identify and avoid increased potential for vehicular collisions with wildlife. • Provide environmental training and updates for project personnel, including sighting logs, 	E,C,O,D	Ministry of Natural Resources and Forestry, Environment Canada, Ministry of the Environment and Climate Change, Ministry of Northern Development and Mines

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	<p>seasonal changes in animal behaviour, and awareness of Bald Eagle nesting activities prior to commencement of new or irregular activities within 500 m to an active nest, and the protocols to avoid disturbance during these activities.</p> <ul style="list-style-type: none"> • Maintain forest or natural buffers between project components and nesting habitat where practicable. • Provide compensatory habitat to provide protection and indirect habitat for species protected under the <i>Endangered Species Act</i>. • Restore disturbed habitats at decommissioning and develop habitats capable of supporting a diversity of wildlife species, including species at risk. • Actively restore the project site to productive, naturalized vegetation communities on cessation of mining capable of supporting a diversity of wildlife species. • Provide suitable habitat for species at risk through project revegetation efforts at decommissioning, and minimize the length of time that areas are exposed to erosion and sediment transport. • Remove animal carcasses (road-killed and other) found on-site to limit attraction of wildlife. 		
99, 105, 110, 113	<ul style="list-style-type: none"> • Mitigation measures that will be used to reduce potential adverse effects to Eastern Whip-poor-will and Common Nighthawk include the following: <ul style="list-style-type: none"> ○ Provide compensatory whip-poor-will habitat that protects known territories and other identified suitable habitat. ○ Implement a noise abatement plan to dampen sound infiltrating habitats surrounding high traffic areas of the mine. ○ Manage dust through dust suppression activities (best management practices). ○ Develop and implement a wildlife follow-up monitoring plan for Common Nighthawk and Eastern Whip-poor-will, in partnership with the Ministry of Natural Resources and Forestry, Environment Canada and interested Aboriginal communities. ○ Continue funding external research programs for the species with the Ministry of Natural Resources and Forestry. ○ Include a mortality trigger and other requirements that will be decided upon during consultation with the Ministry of Natural Resources and Forestry and 	E,C,O,D	Ministry of Natural Resources and Forestry, Ministry of the Environment and Climate Change, Environment Canada

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	<p>Environment Canada.</p> <ul style="list-style-type: none"> ○ Provide environmental training for project personnel, including species at risk identification and knowledge of the Ontario <i>Endangered Species Act</i> permit conditions. 		
111	<ul style="list-style-type: none"> • The primary mitigation strategies for limiting adverse effects to Bobolink will include: <ul style="list-style-type: none"> ○ Restrict the development of open country habitats to periods outside the breeding bird season which occurs from May 1 to July 31. ○ Acquire and protect compensatory open country breeding bird habitat suitable for Bobolink breeding at a ratio of one-to-one for open-country habitat removed for project development. ○ Implement a noise abatement plan to dampen sound infiltrating habitats surrounding high traffic areas of the mine. ○ Implement a wildlife follow-up monitoring plan for Bobolink populations and nesting in proximity to the proposed mine site within compensatory habitat areas, and in appropriate control areas. ○ Provide environmental training for project personnel, including species at risk identification and knowledge of the Ontario <i>Endangered Species Act</i> permit conditions. ○ Enforce speed limits, install warning signs for wildlife encounters, and keep a log of collisions to help identify and avoid increased potential for vehicular collisions with wildlife. 	E,C,O,D	Ministry of Natural Resources and Forestry, Ministry of the Environment and Climate Change, Ministry of Northern Development and Mines
112	<ul style="list-style-type: none"> • Mitigation measures that will be used to reduce potential adverse effects to Barn Swallows will include the following: <ul style="list-style-type: none"> ○ Identify Barn Swallow nesting colonies prior to mine construction. ○ Create artificial nesting structures to encourage re-colonization or new colonization by Barn Swallows where farm structures are removed. ○ Zones will be established where Barn Swallow colonization is desired, tolerated or not desired to provide protection to swallows nesting in other locations where their presence is encouraged and does not cause problems for mine operation. ○ Implement a noise abatement plan to dampen sound infiltrating habitats surrounding high traffic areas of the mine. ○ Implement a wildlife follow-up monitoring plan for Barn Swallow populations in proximity to the proposed mine and transmission line sites and in appropriate control areas. 	E,C,O,D	Non-specific, Ministry of the Environment and Climate Change, Ministry of Northern Development and Mines

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Federal VC	Current use of lands and resources for traditional purposes by Aboriginal peoples, Physical or cultural heritage and effects on historical, archaeological, paleontological or architectural sites or structures of Aboriginal peoples		
Proponent VC	Land and resource use related to both traditional and non-traditional use: Land use plans and policies; Mineral exploration; Forestry; Agriculture and adjacent residents; Hunting; Trapping; Fishing, and Other outdoor recreational uses.		
84, 86, 102, 115, 116, 117, 119, 121, 122, 123, 127, 131, 145	<ul style="list-style-type: none"> • Develop a compact project site to reduce overall habitat loss and to limit potential interference with wildlife movement, and reduce extent of air and noise emissions. • Develop an accommodation with local trapline holders that meets the needs of both the proponent and the trappers; • Enhance components of the Richardson Trail and mitigate the impacts in collaboration with local landowners. • Continue to collect and consider traditional knowledge and traditional land use information, and consider for the construction, operation and decommissioning phases of the project. For example, the proponent will further investigate the historical travel corridor and incorporate appropriately any new information that may become available. (Letter to Chiefs from Kyle Stanfield, October 2013). • • Share results of the traditional knowledge and traditional land use data collection in non-public Aboriginal community forums (Letter to Chiefs from Kyle Stanfield, October 2013). • Maintain an open invitation for First Nations and MNO to participate in all joint baseline and environmental monitoring, and share results. (Letter to Chiefs from Kyle Stanfield, October 2013). • Reach out to the Seven Generations Education Institute and/or the Ministry of Natural Resources and Forestry to obtain any additional information on baseline health of animals and fish. (Letter to Chiefs from Kyle Stanfield, October 2013). • Coordinate monitoring programs targeted at ungulates (moose, deer) with Aboriginal communities. (Letter to Chiefs from Kyle Stanfield, October 2013). • Assemble a map showing the locations of the closest First Nation community water supply intakes on receipt of the locations/coordinates. (Letter to Chiefs from Kyle 	E,C,O,D,P	Aboriginal communities, the Agency, BGRFN, MNO

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	<p>Stanfield, October 2013).</p> <ul style="list-style-type: none"> • Provide any new information to Aboriginal communities on any potential impacts on health. (Letter to Chiefs from Kyle Stanfield, October 2013). • Calculate the area of forest land that will be removed from the total forest land within Big Grassy River First Nation territory, utilizing public sources and provide this information to the First Nation once they delineate their traditional territory. • Provide Aboriginal groups access to certain lands for gathering of wild medicines, berries or other vegetation. • Work with Aboriginal groups to ensure employee well-being, including drug use and drug testing programs. • 		
132, 200, 168	<ul style="list-style-type: none"> • Ensure that Aboriginal communities have the ability to access the site for cultural and ceremonial purposes so that local Aboriginal people can undertake ceremonies at different times of the year to show respect for the land. • Work closely with First Nations and Metis Nation of Ontario to undertake traditional studies and technical reviews of the Draft EA and mine closure plan. Continue to support First Nations as the mine operation phase begins. • Work with Aboriginal peoples to monitor metal concentrations in country foods, including a specific commitment to work with local hunters to sample White-tailed Deer liver tissues for metals analysis. • 	E,C,O,D,P	BGRFN, The Agency
138	<ul style="list-style-type: none"> • Provide fish habitat compensation onsite related to the <i>Fisheries Act</i>. A portion of this compensation habitat, notably the Clark Creek, Clark Creek pond and Teeple pond, could potentially be provided to licensed bait fishermen. • 	E,C	BGRFN, Fisheries and Oceans Canada
Federal VC	Aboriginal groups – Health and socio-economic conditions		
Proponent VC	Economic VSEC: Direct, indirect and induced employment opportunities Business opportunities, Income growth, Economic diversification, Human capital, and Government revenues.		

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164	<ul style="list-style-type: none"> Conduct analysis of ungulate organ meat by local hunters for potential health risks associated with its consumption. Results of any such analysis would be made available to local residents and Aboriginal communities. 	E,C,O,D	Aboriginal communities, Non-specific
168	<ul style="list-style-type: none"> Work with local Aboriginal peoples on an ongoing basis to monitor metal concentrations in country foods including fish muscle and liver tissue, White-tailed Deer liver tissue, and other wildlife tissues. This analysis could be expanded to include testing for additional metals. The proponent will work with local Aboriginal hunters to determine the most effective path forward on this topic. 	E,C,O	Non-specific, The Agency, BGRFN
144	<ul style="list-style-type: none"> Provide any new information that has a potential to impact human health to Aboriginal groups. 	E,C,O,D	Aboriginal communities
169	<ul style="list-style-type: none"> Conduct a risk assessment of the potential long-term exposure of fish and wildlife to accumulated metals within the constructed wetland. Such a study will be carried out within one to two years prior to mine closure (or earlier during the project operation phase). If a meaningful risk is determined to exist, mitigate the risk as part of overall mine decommissioning by removing the contaminated sediments from the wetland and disposing in the bottom of the pit lake. This could readily be accomplished by a small dredging operation. 	O,D	BGRFN, Ministry of Northern Development and Mines
4, 8	<ul style="list-style-type: none"> Conduct air quality monitoring, during construction, operation and decommissioning, including monitoring of the following parameters: total suspended particulate, metals on the total suspended particulate size fraction up to 10 micrometers in dust fall and passive monitoring for nitrogen dioxide and sulphur dioxide. 	C,O,D	
Federal VC	Current use of lands and resources for traditional purposes by Aboriginal peoples, Physical or cultural heritage and effects on historical, archaeological, paleontological or architectural sites or structures of Aboriginal peoples		
Proponent VC	Social VSEC: Demographics and populations; Housing and accommodations; Public utilities; Community and social services; Highway traffic; Human health; and Cultural heritage resources.		
174	<ul style="list-style-type: none"> Monitor for archaeological and built heritage findings during the construction phase. 	C	The Agency, Ministry of Tourism, Culture and Sport

Proponent Commitment Reference No.	Commitment / Mitigation	Project Phase	Link to Federal or Provincial Authority or Aboriginal Community
175, 176	<ul style="list-style-type: none"> • Manage site clearance in accordance with Part VI of the Ontario <i>Heritage Act</i>, • Supervise construction, related to transmission line, by a qualified archaeologist at identified areas of high archaeological potential. • Hold, regular and ongoing discussions with stakeholders, Aboriginal people and local communities to help monitor any effects to the socio-cultural environment. • Identify mutually satisfactory ways to mitigate negative or enhance positive effects. • Establish a formal complaints procedure to provide stakeholders and Aboriginal peoples a voice during the construction, operation and decommissioning phase of the transmission line project. • Establish a response protocol to ensure that follow up occurs. • With regard to protection of cultural heritage values during transmission line construction: <ul style="list-style-type: none"> ○ Suspend all work should human remains be identified during construction. <ul style="list-style-type: none"> • Notify the Ontario Provincial Police, or local police, who will conduct a site investigation and contact the district coroner. • Notify the Ministry of Tourism, Culture and Sport, the Registrar of Cemeteries, and the Ministry of Government Services. ○ Suspend all work should cultural heritage values (archaeological or historical materials or features) be identified during construction or operation. <ul style="list-style-type: none"> • Contact the Ministry of Tourism, Culture and Sport archaeologist. ○ Engage Aboriginal people about the transmission line construction and respond should culturally significant areas be discovered. ○ Conduct a ceremony once the artifacts are physically returned, and follow direction on curatorial services required from Aboriginal communities • Establish a formal complaints procedure to provide stakeholders and Aboriginal peoples a voice during the construction, operation and decommissioning phase of the transmission line project. 	C	Ministry of Natural Resources and Forestry
Proponent VC	General/Other		
186, 187, 188, 189, 191, 198, 200	<ul style="list-style-type: none"> • Implement and maintain the environmental management system in accordance with regulatory requirements, including worker awareness of this commitment. • Develop monitoring details through ongoing stakeholder consultation during the EA 	E,C,O,D,P	Ministry of the Environment and Climate Change,

Proponent Commitment Reference No.	Commitment / Mitigation	Project Phase	Link to Federal or Provincial Authority or Aboriginal Community
	<p>process, and through conditions placed on regulatory instruments such as permits, authorizations and approvals issued by the federal and provincial regulatory agencies.</p> <ul style="list-style-type: none"> • Implement a follow-up monitoring plan acceptable by the Federal and Provincial governments. This plan will verify the accuracy of the environmental assessment predictions and determine the effectiveness of any mitigation measures. • Provide an annual report to the Agency during the construction and operation phases of the Project. • A list of follow-up monitoring plan commitments made during the EA process will be maintained, indicating where appropriate: <ul style="list-style-type: none"> ○ The nature of the commitment; ○ To whom, or to what group or agency the commitment was made, if specific; ○ Whether the commitment is related to the EA process alone; ○ Whether the commitment is addressed or linked to a regulatory instrument, such as a regulation or environmental approval; ○ Any applicable timeline; ○ The status of the commitment; and ○ Additional actions required to fulfil the commitment • Work closely with Aboriginal Groups throughout the EA, and as mine operation begins, supporting traditional studies, and involving these groups in technical reviews of the mine closure plan. 		<p>Ministry of Natural Resources and Forestry, Ministry of Northern Development and Mines , Fisheries and Oceans Canada, Environment Canada, Non-specific, MNO</p>

Appendix B Summary of Residual Effects Assessment

Minor Creek Systems refer to the following creeks: Clark Creek and Teeple Drain, West Creek, Marr Creek, and Loslo Creek, and Cowser Drain

VC Affected	Residual Effect	Predicted Degree of Effect After Mitigation						Agency determination on significance of residual adverse environmental effect	Likelihood of Occurrence
		Magnitude	Extent	Duration	Frequency	Reversibility	Natural and Socio-economic environment context		
Fish and fish habitat	<ul style="list-style-type: none"> Loss of approximately 26 ha of existing fish habitat in the Minor Creek Systems. Changes in flow from loss of fish habitat in the Minor Creek Systems and indirect changes to the Pinewood River. Diminished flows from the Pinewood River during water taking. Potential water quality changes and related effects on fish habitat in the Pinewood River from treated effluent releases. 	<p>Level I - low</p> <p>Effects considered to be minor (4 percent of the Natural Environment Regional Study Area) and will be offset in accordance with the <i>Fisheries Act</i> and <i>Metal Mining Effluent Regulations</i>.</p> <p>Effects are considered to be minor (<20 percent during average and high flow years; with flow enhancement during low flow periods in the Pinewood River).</p> <p>Treated runoff and seepage discharges will be in compliance with federal <i>Metal Mining Effluent Regulations</i> Schedule 4 limits and provincial Ministry of the Environment and Climate Change Environmental Compliance Approval.</p>	<p>Level I - low</p> <p>Effects are considered to be confined to the project site.</p>	<p>Level III - high</p> <p>Effects to the Minor Creek Systems and the Pinewood River are long-term and will extend beyond the life of the Project.</p>	<p>Level III - high</p> <p>Effect to habitat is expected to be continuous through construction, operation, decommissioning and abandonment.</p> <p>Level II - medium</p> <p>Effects to flows are expected to have seasonal regularity; water taking will be continuous during the open water period during the second half of the construction period.</p>	<p>Level III - high</p> <p>Effects to the Minor Creek Systems are not reversible at decommissioning, but the loss of fish habitat will be offset within the Pinewood River watershed.</p> <p>Level I – low</p> <p>Effects of water taking are readily reversible over time and upon cessation of water taking from the Pinewood River during construction.</p>	<p>Level II - medium</p> <p>Adverse effects to the Minor Creek Systems would involve commonplace and widespread ecological communities, typical of small headwater creek systems in the area.</p> <p>The Pinewood River and the Minor Creek Systems are dominant local systems which support commonplace and widespread ecological communities.</p>	<p>Not significant</p> <p>Rationale: Effects on fish and fish habitat are expected to diminish in duration and frequency and are expected to be reversible within the Pinewood River watershed upon the establishment of fish habitat offsetting measures. The measures will offset the loss of fish habitat and maintain the productivity of the fisheries in the Minor Creek Systems and the Pinewood River.</p> <p>Residual effects are expected to be minor and localized with the implementation of the proponent's water management plan and its commitment to develop minimum flow thresholds to protect aquatic habitats, in consultation with Ministry of the Environment and Climate Change and Fisheries and Oceans Canada. The proponent's commitment to implement monitoring programs for groundwater and surface water quantity will verify the predictions in the EA and determine the effectiveness of the mitigation measures.</p>	Effect will occur.

VC Affected	Residual Effect	Predicted Degree of Effect After Mitigation						Agency determination on significance of residual adverse environmental effect	Likelihood of Occurrence
		Magnitude	Extent	Duration	Frequency	Reversibility	Natural and Socio-economic environment context		
Migratory birds	<ul style="list-style-type: none"> Habitat removal (1475.3 ha of woodland, 291.8 ha of wetland, and 399 ha of open country habitats) from mine site development. 	<p>Level I - low</p> <p>Effects are considered to be minor (8percent of the Natural Environment Local Study Area).</p>	<p>Level I – low</p> <p>Effects are considered to be confined to the project site.</p>	<p>Level III – high</p> <p>Long-term effects will persist for the life of the Project.</p>	<p>Level III - high</p> <p>Effect is expected to be continuous through construction, operation, and decommissioning of the mine.</p>	<p>Level III - high</p> <p>Effects are reversible following decommissioning and abandonment.</p>	<p>Level III - high</p> <p>Adverse effects will generally involve commonplace and widespread species, together with some species at risk species.</p>	<p>Not significant</p> <p>Rationale: Residual effects on migratory birds are localized and the Project is unlikely to affect habitat availability or use of the migratory birds within the Natural Environment Local Study Area. Effects are expected to diminish in duration and frequency and are expected to be reversible upon the provision of compensatory habitat that will protect and provide habitat for Schedule 1 migratory birds pursuant to the Schedule 1 of the <i>Species at Risk Act</i> and assessed by COSEWIC and those that are not listed or designated. Potential local habitat for the migratory birds may be created from rehabilitation of the project site at decommissioning and abandonment.</p>	Effect will occur.
Current use of lands and resources for traditional purposes by Aboriginal peoples	<ul style="list-style-type: none"> Loss or fragmentation of terrestrial wildlife habitat for hunting and impacts to species hunted (e.g. White-tailed Deer, Moose, furbearers). Loss of 27 ha of existing fish habitat in the Minor Creek Systems for bait fishing. Loss of plants harvested for food and medicines. Loss of cultural features. No predicted 	<p>Level I - low</p> <p>Effects on hunting are considered to be minor (1.5percent of the Wildlife Management Unit 10) Ungulates such as White-tailed Deer are considered widespread and abundant in the Natural Environment Local Study Area.</p> <p>Effects on fishing are considered to be minor as fishing activities are limited in the Pinewood River and the Minor Creek Systems. Loss of fish habitat will be compensated.</p>	<p>Level I – low</p> <p>Effects are considered to be confined to the project site and the Human Environment Local Study Area.</p>	<p>Level II – medium</p> <p>Effects are medium-term and will last until decommissioning.</p>	<p>Level III - high</p> <p>Effects are expected to be continuous through construction, operation, and decommissioning.</p>	<p>Level II - medium</p> <p>Effects are reversible following decommissioning and abandonment.</p>	<p>Level III - high</p> <p>Aboriginal communities identified traditional land uses on the project site and within the regional study areas, including hunting, subsistence fishing and baitfish harvesting, and plant harvesting.</p>	<p>Not significant</p> <p>Rationale: Effects on current use of lands and resources for traditional purposes are expected to diminish in duration and frequency and are expected to be reversible upon the provision of access to private land for hunting and plant harvesting, the fish habitat offsetting and compensation plan for the loss of fish habitat and the implementation of a water management plan. Taking into account mitigation and proponent's commitments, Aboriginal peoples will be able to continue traditional practices in a modified context in the Natural Environment Regional Study Area.</p>	Effects could reasonably be expected to occur.

VC Affected	Residual Effect	Predicted Degree of Effect After Mitigation						Agency determination on significance of residual adverse environmental effect	Likelihood of Occurrence
		Magnitude	Extent	Duration	Frequency	Reversibility	Natural and Socio-economic environment context		
	effects on historical travel routes used to cross what is now the Canada-US border between Ontario and Minnesota.	Effects on plant harvesting (wild medicines, berries, etc.) are considered to be minor and will be compensated. Effects on current cultural use will be compensated.							
Health and socio-economic conditions of Aboriginal peoples	<ul style="list-style-type: none"> Potential concerns with indirect health effects from possible contamination in the atmosphere, surface water, and groundwater from the mine development (particularly heavy metals that bioaccumulate in the food chain). Loss of 27 ha of existing fish habitat in the Minor Creek Systems* for commercial baitfish license holders. 	<p>Level I - low</p> <p>Effects of contaminant releases are considered to be minor and within federal and provincial emission and discharge criteria.</p> <p>Effects on fish habitat considered to be minor (four percent of the Natural Environment Regional Study Area) and will be compensated in accordance with the <i>Fisheries Act</i>.</p>	<p>Level I - low</p> <p>Effects are considered to be confined to the project site and the Human Environment Local Study Area.</p>	<p>Level I - low</p> <p>No possible health effects are anticipated for Aboriginal communities.</p>	<p>Level I - low</p> <p>Effects are expected to occur infrequently or not at all.</p>	<p>Level II - medium</p> <p>Effects are reversible at decommissioning.</p>	<p>Level III - high</p> <p>Potential health risks identified by Aboriginal communities are important to address because of their use of the land and consumption of White-tailed Deer, fish and plants in the Natural Environment Local Study Area.</p> <p>Aboriginal communities identified commercial fishing and baitfish harvesting on the project site and within the regional study areas.</p>	<p>Not significant</p> <p>Rationale: Residual effects are expected to be minor and localized as contaminant releases are to be within federal and provincial emission and discharge criteria. The mitigation measures for impacts to water and air quality will reduce the risks of bioaccumulation of contaminants in country foods that could affect Aboriginal health. The proponent will monitor metal concentrations in country foods, including fish muscle and liver tissue, and White-tailed Deer liver tissue to verify the predictions on health related risks.</p> <p>Aboriginal peoples would be able to continue commercial bait fishing in a modified context in the Natural Environment Local Study Area after taking into account mitigation measures including the development and implementation of the fish habitat offsetting and compensation plan and proponent's commitments.</p>	Effects unlikely to occur.

VC Affected	Residual Effect	Predicted Degree of Effect After Mitigation						Agency determination on significance of residual adverse environmental effect	Likelihood of Occurrence
		Magnitude	Extent	Duration	Frequency	Reversibility	Natural and Socio-economic environment context		
Physical or cultural heritage, and effects on historical, archaeological, paleontological or architectural sites or structures of Aboriginal peoples	<ul style="list-style-type: none"> Construction and operation (i.e. stockpiles and tailings management area) will impact current cultural use. Effects to archaeological sites are not expected. No known archaeological sites within project site. Cultural sites and historical travel routes of importance to Aboriginal groups were identified on the project site and within the regional study areas. 	Level I - low Effects on current cultural use within project site will occur.	Level I – low Effects are considered to be confined to the project site.	Level III - high Effects on current cultural use are expected to extend beyond the life of the Project.	Level III - high Effects on cultural features are expected to be continuous through construction, operation and decommissioning	Level III - high Effects are not reversible at decommissioning, but current cultural use will be compensated.	Level III - high Cultural heritage resources are of high importance to Aboriginal peoples. Aboriginal communities identified cultural sites and historical travel routes on the project site and within the regional study areas.	Not significant Rationale: Residual effects on current cultural use are expected to diminish in duration and frequency and are expected to be reversible upon the provision of access to nearby sites for cultural use and limited and controlled cultural use of project site in select areas at select times. Aboriginal peoples would be able to continue current cultural use in a modified context in the Natural Environment Local Study Area after taking into account mitigation and proponent's commitments.	Effect will occur.
Recreation and commercial use	<ul style="list-style-type: none"> Displacement of lands and restricted access for trapping, hunting and fishing (1.5 percent of Ontario's Wildlife Management Unit #10). Removal of a portion of Richardson 	Level I – low Effects are considered to be minor (1.5 percent of Wildlife Management Unit #10).	Level I – low Effects are considered to be confined to the Human Environment Local Study Area.	Level II – medium Effects will last until decommissioning.	Level III – high Effects are expected to be continuous during construction and operation of the mine.	Level II –medium Effects are reversible at decommissioning.	Level II – medium Recreation and commercial use are limited in the Human Environment Local Study Area. Richardson Trail is an important recreation use trail for local residents.	Not significant Rationale: Residual effects on recreation and commercial use are expected to diminish in duration and frequency and are expected to be reversible at decommissioning. Recreation and commercial uses will be able to continue in a modified context. The proponent's commitments to further discussions with local landowners to enhance Richardson Trail components; restoring access to lands within the project site for trappers and hunters at decommissioning; and implementing the fish habitat offsetting and compensation plans, provide confidence that the indirect socio-economic effects on recreation and	Effects unlikely to occur.

VC Affected	Residual Effect	Predicted Degree of Effect After Mitigation						Agency determination on significance of residual adverse environmental effect	Likelihood of Occurrence
		Magnitude	Extent	Duration	Frequency	Reversibility	Natural and Socio-economic environment context		
	Trail by the tailings management area.							commercial use have been characterized and mitigated appropriately.	
Amphibians and reptiles	<ul style="list-style-type: none"> Habitat removal (1475.3 ha of woodland and 291.8 ha of wetland) from mine site development. Loss of 27 ha of existing fish habitat in the Minor Creek Systems which may also be habitat for amphibians and reptiles. 	Level I – low Effects are considered to be minor (6.5 percent of the Natural Environment Local Study Area).	Level I - low Effects are considered to be confined to the project site.	Level III – high Effects will persist throughout construction, operation, and well into the decommissioning phase.	Level III – high Effects are expected to be continuous through construction and operation of the mine.	Level I - low Effects are reversible at decommissioning.	Level II – medium Adverse effects will generally involve commonplace and widespread amphibian and reptile species.	Not significant Rationale: Effects on amphibians and reptiles are expected to diminish in duration and frequency and are expected to be reversible upon the establishment of fish habitat offsetting and compensation measures. The creation of like-for-like fish habitat may indirectly provide habitat for amphibians and reptiles. Local adverse residual effects are unlikely to produce significant effects.	Effect will occur.
Furbearers	<ul style="list-style-type: none"> Habitat removal (291.8 ha of wetland) from mine site development. Loss of 27 ha of existing fish habitat in the Minor Creek Systems which may also be habitat for furbearers. 	Level I – low Effects are considered to be minor (1.2 percent of the Natural Environment Local Study Area).	Level I - low Effects are considered to be confined to the project site.	Level III – high Effects will persist throughout construction, operation, and well into the decommissioning phase.	Level III – high Effects are expected to be continuous through construction and operation of the mine.	Level I - low Effects are reversible at decommissioning.	Level II – medium Adverse effects will generally involve commonplace and widespread furbearer species.	Not significant Rationale: Effects on furbearers are expected to diminish in duration and frequency and are expected to be reversible upon the establishment of fish habitat compensation and offset measures. The creation of like-for-like fish habitat may indirectly provide habitat for furbearers associated with watercourses. Local adverse residual effects are unlikely to produce significant effects.	Effect will occur.
Federal species at risk	<ul style="list-style-type: none"> Habitat removal (1475.3 ha of woodland, 10.9 ha of 	Level I - low Effects considered to be minor (8.1 percent of the Natural	Level I - low Effects are considered to be confined to the project site.	Level III - high Long-term effects will persist for the life of the	Level III - high Effect is expected to be continuous through construction and operation of the	Level III - high Effects are reversible following abandonment.	Level III - high Adverse effects will involve species that are listed under the <i>Species at Risk Act</i> and assessed by	Not significant Rationale: Effects on species that are listed under the <i>Species at Risk Act</i> and assessed by COSEWIC are expected to diminish in duration and frequency and	Effect will occur.

VC Affected	Residual Effect	Predicted Degree of Effect After Mitigation						Agency determination on significance of residual adverse environmental effect	Likelihood of Occurrence
		Magnitude	Extent	Duration	Frequency	Reversibility	Natural and Socio-economic environment context		
	open rock and mineral barren, 291.8 ha of marsh, and 399 ha of open country habitats) from mine site development.	Environment Local Study Area). Adverse effects for some species will be compensated in accordance with the <i>Endangered Species Act</i> .		Project and will take several years for forest habitats to re-establish following active reclamation at decommissioning.	mine.		COSEWIC.	are expected to be reversible. Furthermore, the provision of compensatory habitat will protect and provide habitat for Schedule 1 migratory birds pursuant to the <i>Species at Risk Act</i> and assessed by COSEWIC. Potential local habitat for species that are listed under the <i>Species at Risk Act</i> and assessed by COSEWIC may be created from rehabilitation of the project site at decommissioning and abandonment.	

Appendix C Environmental Effect Rating Criteria

Table C-1: Environmental Effect Attribute Rating Criteria (Source: AMEC, Rainy River EIS)

Significance Level	Context		Extent		Frequency	Reversibility	Likelihood of Occurrence
	Ecological	Socio-economic	Magnitude and Geographic Extent	Duration			
I	No meaningful adverse ecosystem effects.	Effect is not considered important or is not considered important to the stability of affected communities in the region.	See Table C-2 for VC specific criteria.	Short-term: effect is not measurable beyond construction period (two years), or beyond active reclamation period, if directly linked to reclamation phase.	Effect is expected to occur infrequently, or not at all.	Effect is readily reversible.	Unlikely to occur.
II	Adverse effects involve common species or communities, or resources of limited significance.	Effect is considered somewhat important to the stability of affected communities in the region by persons living in potentially affected communities or the region.	See Table C-2 for VC specific criteria.	Medium-term: effect is likely to persist for life of this project.	Effect is expected to occur intermittently, possibly with some degree of regularity.	Effect is reversible at substantial cost, or with difficulty.	Could reasonably be expected to occur.
III	Adverse effects involve locally or regionally important species, communities, or	Effect is considered highly important to the stability of communities by persons living in	See Table C-2 for VC specific criteria.	Long-term: effect is likely to persist beyond life of this project.	Effect is expected to occur regularly or continuously.	Effect is not reversible.	Will occur, or is likely to occur.

Significance Level	Context		Extent		Frequency	Reversibility	Likelihood of Occurrence
	Ecological	Socio-economic	Magnitude and Geographic Extent	Duration			
	resources.	potentially affected communities or the region.					

Table C-2: Environmental Effect Rating Criteria - Magnitude and Geographic Extent (Source: AMEC, Rainy River EIS)

Valued Component	Level I	Level II	Level III
Water quantity	Change to creek and river flows is less than 15 percent of seasonal norms; or is otherwise such that downstream aquatic habitat would not be meaningfully affected.	Change to creek and river flows is 15 to 25 percent of seasonal norms.	Change to creek and river flows is greater than 25 percent of seasonal norms.
Water quality	Water quality effects in receiving waters consistent with applicable federal and provincial regulations and guidelines, or other scientifically defensible values; or if guidelines exceeded, no anticipated adverse environment effects beyond any defined mixing zones.	Water quality effects in receiving waters have the potential to adversely affect drinking water uses, aquatic life, and wildlife, beyond any defined mixing zones.	Water quality effects in receiving waters are likely to adversely affect drinking water uses, aquatic life, and wildlife, beyond any defined mixing zones, likely resulting in an unacceptable effect.
Fish and fish habitat	No net loss of the productive capacity of habitats.	Unacceptable loss of the productive capacity of local fish habitat.	Unacceptable loss of the productive capacity of regional fish habitat.

Valued Component	Level I	Level II	Level III
<p>Wildlife (including species at risk) Wildlife refers to migratory birds, furbearers, amphibians and reptiles</p>	<p>Effect considered to be minor, or solely confined to project lands; or in the case of applicable species at risk species, where no net loss of the productive capacity of habitat is achieved (or anticipated to be achieved) through permits.</p>	<p>Activity has the potential to meaningfully affect off property wildlife species.</p>	<p>Activity is likely to meaningfully affect off property wildlife species.</p>
<p>Socio-economic Socio-economic also refers to recreation and commercial use and VCs related to Aboriginal peoples.</p>	<p>No or Low level effects; individuals or local communities are affected. Effect occurs but may or may not be detectable, and is within the normal range of variability. If effect can be measured quantitatively, then Level I effect represents change less than ten percent from baseline conditions within project/local study area.</p>	<p>Effect is clearly distinguishable but is unlikely to pose a serious risk to the VC or represent a management challenge. If effect can be measured quantitatively, then Level II effect represents change of 10 to 20 percent from baseline conditions within project study area. Effect extends to the regional study area or includes effects at a Provincial level.</p>	<p>Effect is likely to pose a serious risk to the VC and represents a management challenge. If effect can be measured quantitatively, then Level III effect represents change greater than 20 percent from baseline conditions within project study area. Effect is expected to extend beyond the regional study area and Provincial to the National or International level.</p>

Appendix D Alternative Means and Preferred Options

Project Component	Alternative Type (Method, Location or Both)	Alternatives Considered	Economic and Technical Feasibility and Select Environmental Considerations	Preferred Option
Construction and Operation				
Mining	Method	Open-pit	<ul style="list-style-type: none"> Technically and economically feasible for shallow ore deposits, large ore deposits, or high tonnage/low grade deposits. Generates larger quantities of mine rock. Higher surface disturbance. 	
		Underground	<ul style="list-style-type: none"> Not considered to be feasible based on disseminated nature of the deposit. Generates lower quantities of mine rock. Less surface disturbance. 	
		Combination of open-pit and underground	<ul style="list-style-type: none"> Technically and economically feasible for complex ore bodies. Generates larger quantities of mine rock than underground alone, but less than open pit alone. Higher surface disturbance than underground alone, but less than open pit alone. 	✓
Mine water management	Method and location	Integrate mine water treatment with site water management	<ul style="list-style-type: none"> Technically and economically feasible. No direct release of mine water to the environment. Preferred option for decreasing the overall area of project site. 	

Project Component	Alternative Type (Method, Location or Both)	Alternatives Considered	Economic and Technical Feasibility and Select Environmental Considerations	Preferred Option
		Separate mine water pond system	<ul style="list-style-type: none"> • Considered to be technically feasible. • Considered to be economically unfeasible. • Direct discharge to the environment on meeting all regulatory requirements. 	
<p>Mine rock and overburden management</p> <p>(the complete alternatives were evaluated under Environment Canada's Guidelines for the Assessment of Alternatives for Mine Waste Process which can be found in the Final Rainy River EIS report, Appendix P)</p>	Location	Alternative A (Northwest Alternative) located to the immediate southwest of the proposed tailings management area	<ul style="list-style-type: none"> • Economically unfeasible and therefore dismissed. • Unacceptable distance from the project site. • Considered to be technically feasible. • Does not overprint waters frequented by fish. 	
		Alternative B (South alternative) located directly south of the proposed open pit and south of the Pinewood River	<ul style="list-style-type: none"> • Economically unfeasible and therefore dismissed. • Financial backing from investors was not secured because of inability to comply with Ministry of the Environment and Climate Change noise guidelines at Black Hawk area receptors. • Does not overprint waters frequented by fish. 	
		Alternative C (Clark Creek Basin) located immediately east of the open pit	<ul style="list-style-type: none"> • Considered to be economically feasible. • Technically preferred for potentially acid generating mine rock and low grade ore stockpiling. • Overprints a portion of small creek systems. 	✓
		Alternative D (Northeast Alternative) located north of and slightly overlapping with Alternative C	<ul style="list-style-type: none"> • Economically unfeasible and therefore dismissed. • Considered to be technically feasible. • Does not overprint waters frequented by fish. 	

Project Component	Alternative Type (Method, Location or Both)	Alternatives Considered	Economic and Technical Feasibility and Select Environmental Considerations	Preferred Option
		Alternative E (West Alternative) located immediately west of the open pit	<ul style="list-style-type: none"> • Considered to be economically feasible. • Technically preferred for non potentially acid generating mine rock and overburden stockpiling. • Overprints a portion of small creek systems. 	✓
Processing	Method	Whole ore cyanidation	<ul style="list-style-type: none"> • Considered to be economically unfeasible. • Considered to be technically preferable. • Easily detoxified either within the onsite metal mill or through volatilization in tailings ponds. 	
		Gravity recovery	<ul style="list-style-type: none"> • Considered to be economically unfeasible. • Considered to be technically feasible. • Requires cyanidation of the gravity concentrate. 	
		Flotation concentrate recovery	<ul style="list-style-type: none"> • Considered to be economically unfeasible. • Considered to be technically feasible. • Requires cyanidation of the flotation concentrate. • High power demands. • More tailings management options. 	
		Combination of non-cyanide and cyanide recovery (gravity recovery and whole ore cyanidation)	<ul style="list-style-type: none"> • Technically and economically feasible. • Preferred option for higher gold recovery. • Requires cyanidation of gravity or flotation concentrate. 	✓

Project Component	Alternative Type (Method, Location or Both)	Alternatives Considered	Economic and Technical Feasibility and Select Environmental Considerations	Preferred Option
Onsite metal mill effluent management	Method	In-plant sulphur dioxide and air treatment coupled with natural degradation	<ul style="list-style-type: none"> • Highest operating cost, but considered to be economically preferred for low investor and environmental risk. • Considered to be technically preferred for ability to destroy cyanide when followed by natural degradation. • Results in lower metal concentrations in the final effluent. • Preferred option for reclamation. 	✓
		Natural Degradation Followed by hydrogen peroxide oxidation	<ul style="list-style-type: none"> • Economically, technically (higher risk), and environmentally (natural and human) acceptable. • Less effective on effluent tailings slurries. • Acceptable at reclamation. 	
Tailings management area (Alternatives were evaluated under Environment Canada's Guidelines for the Assessment of Alternatives for	Location	Alternative A (Northwest Alternative)	<ul style="list-style-type: none"> • Considered to be economically unacceptable (proximity to residential area, unfavourable tailings storage to dam fill ratio). • Considered to be technically preferable (lower dam). • Unable to service site effectively. • Overlaps only two species at risk territories, no loss of aquatic habitat and suitable for water cover at closure. 	

Project Component	Alternative Type (Method, Location or Both)	Alternatives Considered	Economic and Technical Feasibility and Select Environmental Considerations	Preferred Option
<p>Mine Waste Process. The complete analysis can be found in the Final Rainy River EIS report, Appendix P)</p>		<p>Alternative B (Loslo Creek Basin Alternative)</p>	<ul style="list-style-type: none"> • Considered to be economically and technically preferable (lower dam). • Acceptable for servicing the site effectively. • Displaces two creeks and beaver meadow wetlands, overlaps Bobolink territory, but can produce high quality effluent and avoid whip-poor-will habitat; suitable for water cover at closure. 	
		<p>Alternative C (Clark Creek Basin)</p>	<ul style="list-style-type: none"> • Considered to be economically, technically (higher dam), and environmentally unacceptable (removes Clark Creek, questionable ability to provide quality effluent, removes whip-poor-will habitat and beaver meadow wetlands); will require more extensive soil covers at closure. 	
		<p>Alternative D (South Alternative)</p>	<ul style="list-style-type: none"> • Considered to be economically, technically (higher dam), and environmentally unacceptable (does not remove aquatic habitat or species at risk territories but unable to provide quality effluent). • Unable to service the site effectively. 	

Project Component	Alternative Type (Method, Location or Both)	Alternatives Considered	Economic and Technical Feasibility and Select Environmental Considerations	Preferred Option
<p>Onsite metal mill complex (East of open pit)</p> <p>- Onsite metal mill, primary crusher, and coarse ore transfer house; ancillary buildings; and electrical substation, diesel generators, and onsite distribution system.</p>	Location	Options for shifting the onsite metal mill location to avoid interference with whip-poor-will habitat	<ul style="list-style-type: none"> • Selection of a site is constrained by proximity to the open pit and protection from blast fly rock, foundation conditions, property boundaries, and species at risk sensitivities. • Shifting of the complex to other suitable areas will either result in loss of whip-poor-will habitat, conflict with surface rights of other companies, or does not provide a suitable location geographically. • An Ontario <i>Endangered Species Act</i> Net Benefit Permit will be required from the Ministry of Natural Resources and Forestry to provide further suitable habitat for Eastern Whip-poor-will instead. 	✓
Explosives facility	Location	Offsite	<ul style="list-style-type: none"> • Explosives facilities in Winnipeg and Thunder Bay are considered too far and economically unfeasible. • Transportation increases risk of traffic accidents and collisions with wildlife. 	
		Onsite	<ul style="list-style-type: none"> • Common practice with consideration of safe operational setbacks, distance to mining operations, traffic routes, and species at risk sensitivities. The site will be east of the tailings management area. • Avoids interference with known whip-poor-will habitat. 	✓

Project Component	Alternative Type (Method, Location or Both)	Alternatives Considered	Economic and Technical Feasibility and Select Environmental Considerations	Preferred Option
Aggregates (further investigation may change the preferred alternatives)	Location	non potentially acid generating mine rock	<ul style="list-style-type: none"> • Cost-effective, environmentally responsible (will already be available as a result of mining operations), and technically feasible. Preferred option for aggregate production. • Temporary and intermittent air emissions associated with crushing. 	✓
		Quarry sources on project site	<ul style="list-style-type: none"> • Rock outcrops on project property that could be developed (technically feasible and environmentally preferred). • Preferred for Highway 600 and East Access Road. • Shorter haul distances, and consequently reduced traffic and greenhouse gas emissions. 	✓
		Sand and gravel sources on project site	<ul style="list-style-type: none"> • Gravel pit; loss of whip-poor-will habitat. • Feasibility still under investigation. • Shorter haul distances, and consequently reduced traffic and greenhouse gas emissions. 	
		Off property sand and gravel sources	<ul style="list-style-type: none"> • Higher costs due to longer haul distances. • Potential to support local quarries. • Upon further investigation, may be found to be technically preferable. • Increased greenhouse gas emissions associated with longer haul distance. 	

Project Component	Alternative Type (Method, Location or Both)	Alternatives Considered	Economic and Technical Feasibility and Select Environmental Considerations	Preferred Option
Water supply	Method and Location	Take water directly from the Pinewood River	<ul style="list-style-type: none"> • Pipelines will be constructed for effluent discharge and additional costs will be minimal. • Confinement of project site. • Loss of fish habitat. • Can develop an initial water inventory to support onsite metal mill start-up. 	
		Capture site drainage water (site runoff)	<ul style="list-style-type: none"> • No cost as this will be done for regulatory reasons (<i>Metal Mining Effluent Regulations</i>) and tailings management construction. • Loss of fish habitat. • Maintains flow losses in the Pinewood River under all flow conditions. 	
		Groundwater	<ul style="list-style-type: none"> • Potential to meet early water needs inadequate. 	
		Combination of water taking sources	<ul style="list-style-type: none"> • Capture of site drainage for ongoing operation and initial water inventory from the Pinewood River. • Loss of fish habitat. • Maintain Pinewood River low flows during low flow conditions. 	✓
Solid waste management: hazardous solid waste	No Alternative	No alternative	<ul style="list-style-type: none"> • To be shipped offsite to a licensed landfill or other licensed facility • Hydrocarbon affected soils to be potentially remediated onsite using approved methodologies. • Limited air and greenhouse gas emissions from fuel consumption to transport the waste. 	✓

Project Component	Alternative Type (Method, Location or Both)	Alternatives Considered	Economic and Technical Feasibility and Select Environmental Considerations	Preferred Option
Solid waste management: non-hazardous solid waste	Location	Truck waste offsite to the Township of Chapple Landfill	<ul style="list-style-type: none"> Economically preferred. Less land area required. Opportunities for local business; capacity to handle project waste was confirmed in a study. Limited air and greenhouse gas emissions from fuel consumption to transport the waste. 	✓
		Develop an onsite landfill	<ul style="list-style-type: none"> Design and development make this option costly. Less transportation and release of greenhouse gases in transportation. Avoids air and greenhouse gas emissions from fuel consumption to transport the waste. 	
Domestic sewage management	Method and Location	Package sewage treatment plant	<ul style="list-style-type: none"> Proven technologies make it technically preferable. Discharge to environment is expected to meet Ministry of the Environment and Climate Change requirements. 	✓
		Offsite treatment	<ul style="list-style-type: none"> May generate local business opportunity. Haulage costs will exceed operating costs of package systems. Increased emissions related to transport. 	
Highway 600 realignment	Location	Alternative A	<ul style="list-style-type: none"> Crosses the Pinewood River. 	
		Alternative B	<ul style="list-style-type: none"> Crosses the Pinewood River. 	

Project Component	Alternative Type (Method, Location or Both)	Alternatives Considered	Economic and Technical Feasibility and Select Environmental Considerations	Preferred Option
		Alternative C	<ul style="list-style-type: none"> Supported by the Township of Chapple and Ministry of Transportation (removing investor risk). Best sightlines (fewer turns). Crosses the Pinewood River. 	✓
		Alternative D	<ul style="list-style-type: none"> Crosses the Pinewood River and a minor tributary. 	
Power supply	Method and Location	Construct a 230 kV transmission line to the existing grid	<ul style="list-style-type: none"> High construction costs but low operating costs, lower financial risk. Risk of service disruptions. Potential for habitat fragmentation. 	✓
		Diesel-fired generators	<ul style="list-style-type: none"> Low construction costs but high operating costs. Typically used on smaller scale projects. Less susceptible to service disruptions. Higher impact on air quality. 	
Transmission line routing	Location	Alternative A (northeastern route)	<ul style="list-style-type: none"> Low clearing costs; most lands already owned. More remote option and has fewer impacts on local residents. 	✓
		Alternative B (Direct Route)	<ul style="list-style-type: none"> Higher clearing and land acquisition costs. Higher impacts on species at risk as passes through forested land. 	
		Alternative C (East Route)	<ul style="list-style-type: none"> Higher clearing and land acquisition costs. Higher impact on species at risk as passes through forested land. 	

Project Component	Alternative Type (Method, Location or Both)	Alternatives Considered	Economic and Technical Feasibility and Select Environmental Considerations	Preferred Option
		Alternative D (Along existing roads)	<ul style="list-style-type: none"> • Reduced tree clearing and access costs, but longest route and runs along a winding road which is not preferable for transmission line routing. • Accessible year round for construction. 	
Decommissioning and Abandonment				
Open pit	Method	Natural flooding	<ul style="list-style-type: none"> • Will extend costs across a long timeframe. • More time to stabilize pit water quality. • Pit walls exposed to oxidation. 	
		Enhanced flooding	<ul style="list-style-type: none"> • Shortens the reclamation timeframe and allows for earlier reclamation of the tailings management area. • Decreased exposure of walls to oxidation. • Adverse effects on downstream fish habitat. 	✓
		Partially backfill the open pit with tailings	<ul style="list-style-type: none"> • Substantial savings in tailings management. • Must ensure that the pit can be safely separated from underground workings at a reasonable cost to avoid catastrophic flooding (must be technically viable). • Preferred, if the safety of underground workings can be guaranteed. 	✓
Underground mine	Method	Natural flooding	<ul style="list-style-type: none"> • Standard industry practice with no additional costs. • Little effect on site effluent discharge quality, receiving water quality or receiver fish habitat. 	✓

Project Component	Alternative Type (Method, Location or Both)	Alternatives Considered	Economic and Technical Feasibility and Select Environmental Considerations	Preferred Option
		Enhanced flooding	<ul style="list-style-type: none"> Involves use of secure bulkheads to separate underground from open pit. Advantage includes less time for acid rock drainage to occur. Disadvantages include reductions in flows for fish and fish habitat. 	
		Backfill with mineral wastes	<ul style="list-style-type: none"> Partial backfilling required supporting mining; full backfilling is not financially or technically viable. Preferred for part of the underground mine. Little effect on site effluent discharge quality, receiving water quality or receiver fish habitat. 	✓
Stockpiles	Method and location	Re-use	<ul style="list-style-type: none"> Tailings dam and other related construction. Potentially used for development and maintenance of site roads. Reduction in overall mineral wastes. 	✓
		Stabilize, cover and revegetate	<ul style="list-style-type: none"> Overburden and west mine rock stockpiles will use a self-sustaining vegetative cover. Provision of wildlife habitat. Reduction in overall mineral wastes. 	✓
		Use in backfill	<ul style="list-style-type: none"> Used in the underground mine. Reduction in overall mineral wastes. 	✓

Project Component	Alternative Type (Method, Location or Both)	Alternatives Considered	Economic and Technical Feasibility and Select Environmental Considerations	Preferred Option
		Engineered cover	<ul style="list-style-type: none"> For the east mine rock stockpile and unprocessed ore stockpile on surface at closure. Provision of wildlife habitat. Reduction in overall mineral wastes. 	✓
tailings management area	Method	Cover with mineral wastes, and revegetate	<ul style="list-style-type: none"> Considered to be economically unfeasible. Terrestrial and wetland habitat created. 	
		Stabilize and permanent flooding, and perimeter cover with overburden and revegetate (combination of two alternatives described above)	<ul style="list-style-type: none"> Considered to be economically, technically, and environmentally preferred. Terrestrial and wetland habitat created. 	✓
		Cover with modified mineral waste and revegetate	<ul style="list-style-type: none"> Considered to be economically unfeasible. Terrestrial habitat created. 	
Buildings and Equipment	Method and location	Combination	<ul style="list-style-type: none"> Parts that are not suitable for resale or reuse offsite can be stored in an approved landfill on the mine site (pending approval). Hazardous material must be shipped to a licensed landfill or other licensed facility. 	✓
Infrastructure (roads, pipelines, and transmission lines)	Method and location	Decommission, remove and dispose of wastes in accordance with applicable regulations	<ul style="list-style-type: none"> Viable for pipelines and transmission lines as there is no future use for them. 	✓
		Leave in place for future use	<ul style="list-style-type: none"> Viable for Highway 600 realignment and East Access Road. 	✓
		Reclaim in place	<ul style="list-style-type: none"> Potential to reclaim site haul roads. 	✓

Project Component	Alternative Type (Method, Location or Both)	Alternatives Considered	Economic and Technical Feasibility and Select Environmental Considerations	Preferred Option
Drainage (road culverts, ditching, various ponds, creek realignments)	Method and location	Stabilize and leave in place	<ul style="list-style-type: none"> Preferred for ditching as there will be no flood risk once culverts are removed. 	✓
		Removal and restoration (ponds)	<ul style="list-style-type: none"> Water management ponds will no longer be required and will create an unnecessary liability. 	✓
		Maintain West Creek and Clark Creek realignment	<ul style="list-style-type: none"> The creeks will become stabilized over the course of mine development and may become part of project fish habitat compensation. 	✓

Adapted from Rainy River EIS, AMEC

Appendix E Summary of Key Aboriginal Concerns

This appendix provides a summary of key comments received prior to preparation of the draft EA report by the Agency. For a summary of comments received on the draft EA report, please refer to Appendix J.

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
Multiple groups	Atmospheric environment	5(1)(c), 5(1)(a)	Concern about dust and noise.	<ul style="list-style-type: none"> The proponent responded that proposed mitigation measures for controlling dust include spraying water. Sound and air quality will be monitored during construction, operation, and active closure phases consistent with Ministry of the Environment and Climate Change requirements. Studies of air quality and noise carried out for the Project are described in the EIS, section 7.2; section 9.2.1; volume 2, section 5.3; and volume 2, sections 7.3 and 7.4. 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.
Multiple groups	Surface water quality and quantity	5(1)(a)	Concern about storage of tailings and potential for mine waste and acid rock drainage to enter the Pinewood River watershed.	<ul style="list-style-type: none"> The proponent provided information on plans for tailings storage. Monitor Pinewood River flows, measure contaminants, and take corrective action if necessary. The potential for tailings waste to affect water quality in the area and proposed mitigation measures are described in the EIS, section 8.2.6; and volume 2, section 6.8. Changes to the plans for the tailings management area since initially proposed are identified in the EIS, table S-4. 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.
Multiple groups	Surface water	5(1)(a)	Concern about	<ul style="list-style-type: none"> The proponent aims to develop a 	The Agency is

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
	quality and quantity		surface water quality and the ability of the wetlands to accommodate the flows and water quality values.	<p>compact site to limit the areal extent of disturbance to creeks; design infrastructure using best management practices; and implement a water management plan to collect, monitor, and treat contact water as required.</p> <ul style="list-style-type: none"> • Active re-vegetation at closure will minimize length of time that areas are exposed to erosion and sediment transport. • Fish habitat will be provided to offset losses that cannot be otherwise mitigated. • Surface water quality is described in the EIS, section 7.5; and volume 2, sections 5.6.3, 5.8 and 5.7.5. The potential for environmental effects on human health associated with treated effluents discharged to surface waters are described in the EIS section 9.2.9; section 13.1; and volume 2, section 7.21. Concerns and proposed approaches to resolve concerns associated with potential impacts to surface water are identified in the EIS, table S-16. 	satisfied with the proponent's response and factored it in the Agency analyses and conclusions.
Big Grassy River First Nation	Surface water quality and quantity	5(1)(a), 5(1)(c)	Concerns that examination of changes to water was inadequate.	<ul style="list-style-type: none"> • The additional information collected and shared through Big Grassy River First Nation's Traditional Knowledge and Traditional Land Use study supports the existing effects assessment (i.e. current bait fishing and extensive use of the Pinewood River). 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
				<ul style="list-style-type: none"> The EIS indicates that aquatic life in the Pinewood River will be protected through a variety of mitigation measures. The proponent intends to monitor and establish ecological targets to ensure that the Pinewood River continues to provide for all life functions for all resident fish species during all phases of the Project. The EIS also describes fish habitat offsetting and compensation plans to offset the loss of fish habitat. The plan involves offsite watershed restoration and onsite like-for-like habitat replacement, at a one to one ratio. The collaborative process included working with Aboriginal communities. 	
Big Grassy River First Nation	Surface water quality and quantity	5(1)(b)	Concerns about lack of detailed planning for the proposed co-disposal of overburden with the non-potentially acid generating mine rock to facilitate handling of clay rich materials.	<ul style="list-style-type: none"> The non-potentially acid generating and overburden material are proposed for disposal in an area west of the open pit. As identified in the EIS, the stockpiles are to be partially co-disposed, to facilitate access for the overburden, rather than as completely discrete stockpiles as shown schematically on the report figures. The stockpiles have been planned and designed accordingly and no changes to surface area are required. Further detail about the disposal of overburden and non-potentially acid generating material is provided in the 	The Agency understands that the stockpiles have been designed on a conceptual basis and more detail will be developed during the regulatory phases.

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
				EIS, section 4.6.	
Multiple groups	Surface water quality and quantity	5(1)(a), 5(1)(c)	Concerns about the potential for increased mercury methylation rates within the constructed wetland, and human health risks from mercury pollution.	<ul style="list-style-type: none"> Wetland treatment is one component of the overall water management plan proposed for the project site. Constructed wetlands have been proven to be effective in polishing mine-related effluent and have been in used since the 1970's. That said, there is a potential for increased mercury methylation rates within the constructed wetland. However, mercury health risk associated with fish consumption from the Pinewood River is not expected to change as a result of project site development. The proponent agrees to work with local Aboriginal peoples on an ongoing basis to monitor metal concentrations in country foods, such as fish muscle and liver tissues (pike and walleye), and White-tailed Deer liver tissue. A commitment to monitor contaminants of potential concern in fish tissues is stated in the EIS, section 13.5.2. Information on human health risks from metals (i.e. arsenic, boron, cadmium, cobalt, chromium, copper, iron mercury, magnesium, molybdenum, nickel, lead, selenium, and zinc), is included in the EIS, section 7.21. Data presented in table 7-41 of the EIS indicates that mercury 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
				<p>concentrations in the final tailings management area discharge are likely to be similar to those of background Pinewood River concentrations.</p>	
Naotkamegwanning First Nation	Surface water quality and quantity	5(1)(a)	Concerns about iron oxide staining being observed in open pit mines, and subsequent treatment and relocation.	<ul style="list-style-type: none"> The proponent has a water management plan for in-pit water. No direct discharge of water from the open pit to the environment will take place during construction or operation. During the early construction phase water will be collected and treated for discharge to the environment. Water within the pit will be pumped to a pond to be contained and re-used. The pit will be allowed to flood when operation ceases. Once flooded, the pit may discharge to the environment by gravity through a constructed spillway after the pit water quality meets the regulatory requirements. 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.
Multiple groups	Groundwater	5(1)(a)	Concern about the drawdown of water and whether it could affect community water supplies.	<ul style="list-style-type: none"> The proponent does not expect any measurable effects on water supply wells that it does not own. The proponent committed monitoring groundwater level (flow) and quality as part of the water management plan. This will include regular sampling and dipping of dedicated monitoring wells to identify any impacts to any wells in the vicinity of the zone of influence from the open pit and rectify any impacts to water availability for well owners. The proponent will invite local well 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
				owners to participate in well water quality monitoring as part of the water management plan.	
Multiple groups	Vegetation	5(1)(a), 5(1)(c)	Concern about effects on vegetation, country foods, and rare plants.	<ul style="list-style-type: none"> The EIS indicates that environmental effects on vegetation communities within the project site are direct and localized. All of the vegetation community types that will be displaced by vegetation clearing are common throughout the Natural Environment Local Study Area and Natural Environment Regional Study Area. The proponent proposes to develop a compact project site, avoiding riparian and other sensitive habitats to the extent practical; use water spraying to manage dust; transplant rare plant species; and implement active re-vegetation at closure to restore habitats. The proponent has committed to monitoring metal concentrations in country foods to verify the predictions on human health effects and assess the effectiveness of the mitigation measures. Studies of vegetation carried out for the Project are described in the EIS, section 7.7; section 9.2.4; volume 2, section 5.9; and volume 2, section 7.8. 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.
Multiple groups	Fish and fish habitat	5(1)(a)	Concern about fish and fish habitat.	<ul style="list-style-type: none"> The EIS identifies mitigation measures for the direct loss of fish habitat and indirect effects on fish and fish habitat 	The Agency is satisfied with the proponent's

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
				<p>from changes in water quality and quantity.</p> <ul style="list-style-type: none"> The EIS also describes a fish habitat compensation plan for losses associated with the removal of creeks in the Natural Environment Local Study Area in accordance with the <i>Metal Mining Effluent Regulations</i>. This plan will result in the creation of 25.7 ha of fish habitat through the creation of the West Creek diversion channel, the stockpile pond diversion channel, the Clark Creek diversion channel, the West Creek pond, and the Clark Creek pond. The EIS also describes an offsetting plan for unavoidable serious harm to fish, in accordance with the <i>Fisheries Act</i>. The proponent provided information on its proposed fish habitat offsetting and compensation plans and water management plan in relation to water quality standards. Studies of fisheries and aquatic resources carried out for the Project are described in the EIS, section 7.6; section 9.2.2; volume 2, section 5.8; and volume 2, section 7.5 and 7.6. Approaches to resolve concerns associated with potential impacts to local fisheries are identified in the EIS, tables S-1, S-2, S-3, and S-16. Changes to the Project since initially proposed (including considerations for 	<p>response and factored it in the Agency analyses and conclusions.</p>

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
				fish and fish habitat) are also identified in table S-4 of the EIS.	
Multiple groups	Fish and fish habitat, human health	5(1)(a) 5(1)(c)	<p>Big Grassy River First Nation identified an inadequate examination of effects on fish, fish habitat, and inadequate human health risk assessment.</p> <p>Aboriginal communities recommend a human and animal risk assessment on the long-term exposure to contaminants of concern.</p>	<ul style="list-style-type: none"> The major metal removal mechanisms would occur with in-plant sulphur dioxide and air treatment of the mill effluent followed by the removal of additional metals through effluent aging in the tailings management area and water management ponds. However, the constructed wetland is expected to take up residual metals over the period of the mine life, such that there would be an accumulation of residual metals in the wetland sediments. The potential exposure to fish and wildlife is limited to within the wetland. Once milling operations cease, the quality of water released from the tailings management area on an ongoing basis, during abandonment, is expected to improve. The proponent agrees to work with local Aboriginal communities on an ongoing basis to monitor metal concentrations in country foods (notably fish muscle and liver tissues, and White-tailed Deer liver tissue). Section 13.5.2 of the EIS contains a commitment to monitoring contaminants of potential concern in fish tissues. The proponent agrees to conduct a risk assessment of the potential long- 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
				term exposure of fish and wildlife to accumulated metals in the constructed wetland, within one to two years prior to mine closure. If a risk is determined to exist, the proponent has committed to mitigating it during mine closure by removing and disposing the contaminated sediments (for example, bottom of the pit lake). This could readily be accomplished by a small dredging operation.	
Big Grassy River First Nation	Human health	5(1)(c)	Concerns about chemical treatment of water as a long-term treatment option. This is not an option that Big Grassy River First Nation considers ideal.	<ul style="list-style-type: none"> The most recent modelling studies, included as Appendix E to the draft mine closure plan, indicate that long-term chemical treatment of water would not be required for the project site at closure. Water quality and water treatment is addressed in a number of locations within the EIS, including sections 4.12, 5.6.3, 7.5 to 7.7, 13.5, and 13.6; and appendices E, T and W. 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.
Nootkamegwanning First Nation	Human health	5(1)(c)	Concerns about impacts on farm land surrounding the project site and how it will affect the human consumption of crops and produce.	<ul style="list-style-type: none"> The proponent provided information about human health and ecological risks in relation to air, tailings management area and stockpile emissions, and responded that project development would be unlikely to cause heavy metal enrichment in local country foods or surrounding farmland. Hence, there is no potential adverse effect to human consumption of crops and produce on neighbouring lands. 	The Agency is satisfied with the proponent's response with the understanding that the proponent has committed to monitoring metal concentrations in country foods.

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
Multiple groups	Wildlife	5(1)(c)	Concern about potential impacts on wildlife (especially waterfowl) in the area of the mine	<ul style="list-style-type: none"> • The proponent provided information on its proposed water management plan and water quality standards. The proponent stated that it would provide funding for a third-party independent review of the draft mine closure plan. • The EIS indicates that the Natural Environment Local Study Area is not an important migratory stopover location, as field studies conducted in spring and fall found low numbers of migrating waterfowl, shorebirds, and songbirds. • Species like Trumpeter Swans and other waterfowl require marsh habitat for breeding. Marsh habitat will be directly impacted and displaced by the proposed tailings management area. • The proponent committed to restricting clearing and modification of woodland, marsh and open country breeding bird habitat to outside of the breeding season (March 1 to August 15 for woodland bird species; March 15 to August 15 for marsh bird species; April 1 to August 15 for open country bird species), and to creating generally abiotic conditions within the fenced tailings management area to limit interest in the pond to waterfowl and other birds. • Studies of wildlife carried out for the Project are described in the EIS, 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
				<p>section 7.8; and volume 2, section 5.10. Concerns and proposed approaches to resolve concerns associated with potential impacts to wildlife are identified in the EIS, tables S-1, S-2, S-3, and S-16. Changes to the Project since proposed (including considerations for fish and fish habitat) are identified in the EIS, table S-4.</p>	
Multiple groups	Wildlife	5(1)(c)	Request for more information on the effects on wildlife, wildlife movement, contamination, and their habitat	<ul style="list-style-type: none"> The EIS indicates the proponent's willingness to work with Aboriginal hunters to undertake an ongoing analysis of White-tailed Deer liver tissues to test for any trends in cadmium levels, the primary metal of potential concern in ungulate organ meat. This analysis could be expanded to include testing for additional metals. The proponent has committed to working with local Aboriginal hunters to determine the most effective path forward on this topic. Effects to vegetation, habitat, and to wildlife groups and species are addressed in the EIS, sections 7.8 through 7.16. The effects assessment for wildlife includes the potential for effects due to contaminant release. The potential for effects to human consumers of country foods is addressed in section 7.21 of the EIS. 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.
Naotkamegwanning First Nation	Wildlife	5(1)(c)	Concerns about lack of detail noting changes in	<ul style="list-style-type: none"> The proponent provided information on details of field investigation methods and published references regarding 	The Agency is satisfied with the proponent's

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
			migratory routes of bird species, and some species no longer returning to the area.	the existing baseline condition with respect to migratory birds used in the assessment of potential impacts related to the Project.	response and factored it in the Agency analyses and conclusions.
Multiple groups	Traditional knowledge/ traditional land use	5(1)(c)	Concerns about inadequate traditional knowledge and traditional land use data collection (including changes to fish harvesting, water use, land use, and the effects of traveling further).	<ul style="list-style-type: none"> • The EIS indicates that Aboriginal groups identified activities on the project site and within the regional study areas, including hunting, subsistence and commercial fishing and baitfish harvesting, plant harvesting, cultural sites, and historical travel routes. • Big Grassy River First Nation and the Métis Nation of Ontario Region 1 Consultation Committee completed their own Traditional Knowledge and Traditional Land Use studies after the final EIS was issued by the proponent. • The proponent responded that no changes to the effects assessment are proposed because the additional traditional knowledge and traditional land use information collected and shared through these studies supports the existing EA effects assessment. • Pursuant to completion of the traditional knowledge and traditional land use, the proponent committed to continuing to collect traditional knowledge and traditional land use information, as appropriate, for the construction, operation, and decommissioning of the Project. It 	The Agency is satisfied with the proponent's response and notes that the proponent proposed additional mitigation measures to reduce the indirect effects on current use of lands and resources for traditional purposes by Aboriginal peoples.

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
				<p>further noted that it would continue dialogue on project matters with Aboriginal communities and involve them in monitoring.</p>	
Multiple groups	Traditional knowledge/ traditional land use	5(1)(c)	Concern about effects on medicines collected in the area.	<ul style="list-style-type: none"> The proponent committed to refraining from the use of herbicides for transmission line vegetation control. Access to private lands will also be provided for medicine harvesting. 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.
Multiple groups	Traditional knowledge/ traditional land use	5(1)(c)	Concerns about the loss of traditional hunting areas.	<ul style="list-style-type: none"> The proponent does not expect the residual effects on hunting due to loss of hunting habitat at the project site to be significant, and does not expect there to be any effects on hunting due to the transmission line right of way. The proponent does not expect a significant effect from minor habitat disturbance due to the realignment of Highway 600. To mitigate these effects, the proponent supports an Aboriginal community's suggestion to provide improved access to other nearby private lands for hunting. At closure, the proponent commits to involving Aboriginal community members in the development of adaptive management techniques related to the mine closure plan, including the rehabilitation of habitat for wildlife, and commits to restoring access to project lands to the extent safe and possible. 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
Multiple groups	Traditional knowledge/ traditional land use	5(1)(c)	Concerns about the loss of cultural and spiritual sites	<ul style="list-style-type: none"> • The proponent acknowledges the cultural sites mentioned in the Traditional Knowledge and Traditional Land Use studies and commits to the following during the construction and operation phases: • honouring requests of land users for ceremonies in advance of construction; and • allowing limited and controlled cultural use of project site lands in selected areas at selected times. • The proponent responded that it proposes to develop a compact mine site; adjust site layout to accommodate known archaeological sites and sensitive areas; and avoid culturally significant sites where possible. 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.
Multiple groups	Traditional knowledge/ traditional land use	5(1)(c)	Concern about the effects of Aboriginal trails and travel routes along the transmission line right-of-way.	<ul style="list-style-type: none"> • Based on the traditional knowledge and traditional land use studies, the proponent does not expect effects to any trails used by Aboriginal communities. Several forest access roads and trails developed by forestry operators would be used to access the transmission line right-of-way during construction. • The proponent commits to undertaking additional consultation and engagement with Aboriginal groups during the regulatory phase for right-of-way clearing and infrastructure development. 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
Multiple groups	Traditional knowledge/ traditional land use	5(1)(c)	Concern about the effects on traditional plant harvesting.	<ul style="list-style-type: none"> Based on Traditional Knowledge and Traditional Land Use studies, the proponent does not expect effects on traditional plant harvesting and supports an Aboriginal community suggestion to provide improved access to other nearby private lands for plant harvesting. 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.
Big Grassy River First Nation	Traditional knowledge/ traditional land use	5(1)(c)	Request that water losses in the Pinewood River be reviewed in light of new data that has been released by Big Grassy River First Nation on the traditional knowledge and traditional land use.	<ul style="list-style-type: none"> The proponent appreciates the additional information, however does not plan to change the effects assessment because it believes that anticipated changes to quality, quantity and rate of flow would not alter traditional land use. 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.
Big Grassy River First Nation	Traditional knowledge/ traditional land use	5(1)(c)	Request that a review of the traditional knowledge and traditional land use data to determine if more conservative protection levels for the Pinewood River are warranted.	<ul style="list-style-type: none"> The proponent does not believe that further protection is required based on the results of the Traditional Knowledge and Traditional Land Use studies in relation to use and rights. The proponent expects that implementation of the water management plan and an adaptive management plan will protect aquatic life in the Pinewood River. 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.
Big Grassy River First Nation	Traditional knowledge/ traditional land use	5(1)(c)	Concerns that closure objectives do not relate to restoration of land use that has been	<ul style="list-style-type: none"> As most of the project site is private land where access to practice traditional use is limited, and some mine hazards would remain at the site post-closure, the proponent did not 	The Agency is satisfied with the proponent's response and factored it in the

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
			<p>identified by the BGRFN Traditional Knowledge and Traditional Land Use study. Traditional use and rights should be practiced throughout the region.</p>	<p>commit to providing completely open access to the site post closure for traditional use.</p> <ul style="list-style-type: none"> • However, the proponent committed to providing access to other nearby private lands for hunting and plant harvesting and continuing to involve Aboriginal groups in the development of adaptive management techniques related to the mine closure plan, including the rehabilitation of habitat for wildlife. The proponent also committed to restoring access to the project site following mine closure to the extent that such access is safe and possible. 	<p>Agency analyses and conclusions.</p>
<p>Big Grassy River First Nation</p>	<p>Aboriginal peoples – health and socio-economic conditions</p>	<p>5(1)(c)</p>	<p>Big Grassy River First Nation was concerned that the socio-economic assessment was poorly conducted, failing to take into account the values, priorities, strengths, and vulnerabilities of Aboriginal peoples. They expressed their desire to realize community-specific socio-economic benefits from the Project including,</p>	<ul style="list-style-type: none"> • The proponent committed to implementing a program to hire Aboriginal employees, including by developing and distributing a table of employment opportunities to all area Aboriginal communities; and monitoring the hiring and performance success of Aboriginal employees. The proponent also committed to addressing community impacts, including the completion of an agreement that will outline benefits to the community as a result of project development. Furthermore, the proponent committed to developing and implementing programs to ensure employee well-being by providing training for mine employees on cultural awareness; training for mine 	<p>The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.</p>

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
			but not limited to employment opportunities and improved community social services and infrastructure.	employees on dangers of drug use; and training for mine employees to encourage drug testing.	
Multiple groups	Accidents and malfunctions	5(1)(a)	Concern about the potential for accidents and malfunctions.	<ul style="list-style-type: none"> The potential for spills and the proponent's safeguards and contingency plans are listed in chapters 9 and 13 of the EIS, and the proponent has committed to developing an emergency management plan that includes a number of aspects relating to accidents and malfunctions. The proponent is also willing to provide assistance and opportunities to Aboriginal groups for ongoing consultation on environmental approvals, the mine closure plan, the emergency management plan, the follow-up monitoring plan, timely notification and consultation on spills and accidents if any, and on the details of any investigation and response to these events. 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.
Big Grassy River First Nation	Cumulative effects	N/A	Concern that the cumulative effects assessment is inadequate, particularly where biophysical VCs are being impacted by	<ul style="list-style-type: none"> The proponent responded that it is pursuing ongoing discussions of site-specific mitigation measures for key VCs, including but not limited to culture, water quality, and traditional land use. The proponent responded that it will work closely with Big Grassy 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
			multiple sources.	<p>River First Nation.</p> <ul style="list-style-type: none"> The proponent assessed several cumulative effect causing agents and their mitigation measures: habitat destruction and fragmentation; movement of animals further away from preferred harvesting areas; disturbance of important areas for harvesting medicines and other plants; potential changes to water quality in the proposed project site; and lack of access or disruption to important places and spiritual sites. 	
Naotkamegwaning First Nation	Water quality	5(1)	Expressed interest in whether the method of mine construction will be similar to fracking and its potential impact to water quality.	<ul style="list-style-type: none"> The proponent responded that there is no fracking (hydraulic fracturing) proposed for the Rainy River Project. Fracking is a specialized means of accessing gaseous materials (like natural gas) deep in the earth that is not relevant to the Project. 	The Agency is satisfied with the proponent's response and factored it in the Agency analyses and conclusions.
Rainy River and Naicatchewenin First Nations	Consultation process	N/A	Opposed the Project due to lack of meaningful engagement by the proponent and concerns not fully accommodated.	<ul style="list-style-type: none"> The proponent believes that its engagement has been robust and adequate and that it has been respectful and generous in its negotiations with the Aboriginal groups. The proponent released a draft EIS along with funding to both First Nations and Métis communities to undertake independent technical review of the draft EIS. The proponent provided Aboriginal groups with the capacity and an additional two months to review 	The Agency notes that the proponent is committed to ongoing engagement and negotiations with the Rainy River and Naicatchewenin First Nations to address their concerns related to meaningful engagement by the proponent and accommodation. At

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
				<p>complex technical documents.</p> <ul style="list-style-type: none"> The proponent also signed on to a Participation Agreement in March 2012 with several First Nations including Rainy River and Naicatchewenin First Nations and has been requested to be involved in further negotiations in December 2013. The proponent committed to ongoing consultation processes and negotiations with Rainy River and Naicatchewenin First Nations. 	<p>the time of submission of this EA Report, the proponent had signed individual Impact Benefit Agreements with Rainy River and Naicatchewenin First Nations.</p>
Naotkamegwaning First Nation, Northwest Angle #37	Consultation process	N/A	Concern about potential impacts the Project may have.	<ul style="list-style-type: none"> N/A 	<p>The federal Minister of the Environment provided a response noting that the Agency communicated with the First Nation at key steps of the EA and sought comments from the First Nation on supporting documents. Participant funding has also been offered to the First Nation to support its participation.</p> <p>The Agency also followed-up with phone calls and</p>

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
					considered their comments in the Agency analyses and conclusions.
Northwest Angle #37	Consultation process	N/A	States that Northwest Angle #37 has not been consulted by New Gold Inc. or the Crown.	<ul style="list-style-type: none"> N/A 	The Agency responded by providing copies of past correspondence with the First Nation and information on next steps of the EA process.
Anishinaabeg of Naongashiing First Nation, Onigaming First Nation	Consultation process	N/A	Concern about potential impacts the Project may have. Also concerned with the short timeframe to provide comments on the proponent's EIS.	<ul style="list-style-type: none"> N/A 	<p>The Agency responded with a request for more information on how the Project may adversely impact the First Nation's potential or established Aboriginal or Treaty rights.</p> <p>The Agency also followed-up with phone calls and indicated that it would consider comments received after the comment period on the EIS.</p>
Anishinaabeg of	Consultation	N/A	After the comment	<ul style="list-style-type: none"> N/A 	The Agency

Group	Subject	Link to Section 5 of the Act	Comment or Concern	Summary of Proponent's Response	Agency Response
Naongashiing First Nation	process		period on the EIS, Anishinaabeg of Naongashiing First Nation inquired about applying for Participant Funding.		responded that there was an opportunity to apply for funding to support their participation in the review of the draft EA report. However, the First Nation did not respond.

Appendix F Summary of Key Public Comments

This appendix provides a summary of key comments received prior to preparation of the draft EA report by the Agency. For a summary of comments received on the draft EA report, please refer to Appendix J.

Subject	Comment/Concern	Summary of Proponent's Response
Water quality and quantity	Concerns about impacts to the water table in the area and effects on water resources (drinking water, contaminants, liability for these issues, ability to seek compensation).	Groundwater effects have been predicted through exploratory drilling and computer modelling. Water table drawdown is predicted to extend three km north of the open pit and will be restricted to the local watershed. Groundwater flow effects will be limited to lands held privately by the proponent. Degradation of groundwater is not expected. Water quality and quantity predictions will be confirmed through monitoring; any effects to a homeowner's water supply will be remedied by the proponent.
Wildlife	Concerns about the mine and tailings pond sites being fenced to ensure local wildlife cannot consume water from the site. Concerns regarding the consumption of wildlife that does drink water at the site.	Cyanide in process water will be destroyed to levels well below the toxicity threshold for wildlife. Long-term water quality in the tailings management area is predicted to meet Ontario drinking water standards. The tailings management area will be fenced off and is not expected to pose a threat to wildlife.
Groundwater	Concerns about seepage and leakage from discharge at the tailings management area into local groundwater, and monitoring of local wells.	Little seepage from the tailings management area is expected due to low permeability of underlying clay and bedrock. Degradation of groundwater is not expected. Water quality and quantity predictions will be confirmed through monitoring; any effects to a homeowner's water supply will be remedied by the proponent.
Air quality	Resident in close proximity to mine is concerned about health issues from contaminants and chemicals released during mining operation.	Potential air quality effects were predicted using computer modelling and were compared to <i>Ambient Air Quality Criteria</i> limits. Contaminants that are expected to be released include particulate matter, nitrogen oxides, sulphur dioxide, metals, and hydrogen cyanide. Predicted concentrations are below <i>Ambient Air Quality Criteria</i> limits at sensitive receptors in the vicinity of the Project; no significant adverse effects on local air quality are expected.
Noise	Concerns about noise from operations, traffic, blasting of explosives, and whether blasting and transportation of ore will occur at night. Comments were received	Blasting sound levels are expected to be below Ontario's blasting guideline noise limits. Blasting is not expected to occur at night and will follow a regular schedule. Truck movement for material

Subject	Comment/Concern	Summary of Proponent's Response
	regarding noise pollution and possible effects to the value and livability of lands surrounding this site.	transportation was modelled and is expected to meet Ontario's noise guideline limits. The Project is not expected to affect the value and livability of lands surrounding the site.
Soil	Concerns whether mine discharges will contaminate soil and which heavy metals will be released in the slurry from the tailings.	Soil contamination by discharge from mine operation is unlikely; material discharged to the tailings management area consists of ground rock of the same composition as that found throughout the area and will be contained within the tailings management area. Spraying clean water to manage dust will help protect soils from airborne deposition. Monitoring will identify any contaminated soil, which will be remediated according to provincial government requirements.
Health	Concerns about long-term health effects of living next door to the mine. A question was raised inquiring whether Environment Canada had any information available from past mining projects.	<p>Potential releases of contaminants and spills of controlled materials that could affect human health were considered in the environmental impact statement. No such long-term health effects are anticipated. Air quality modelling showed that <i>Ambient Air Quality Criteria</i> limits for health-based parameters for the worst case meteorological condition will not be exceeded. Concentrations of contaminants after mixing in the Pinewood River are predicted to meet <i>Provincial Water Quality Objectives</i> and <i>Canadian Environmental Quality Guidelines</i> limits for drinking water and are not expected to pose a direct health hazard.</p> <p>The proponent and Environment Canada are unaware of any such studies.</p>
Road access	Proposed road access and municipal services (such as road maintenance) have not been finalized and there are concerns about resident access through the project site and associated potential delays and risks. Additionally, existing hydro services may be altered. Finally, residents conducting business at their properties may incur additional costs as a result of interruptions.	<p>The proponent will ensure safe access to properties during the construction and operation phases. Input into detailed plans will be welcomed as they are developed.</p> <p>Any infrastructure that requires relocation will be completed as quickly as possible to minimize disruption to local users. The only disruption of hydro services is anticipated to occur during the switchover from the existing line to the constructed line.</p>
In favour	United Native Friendship Centre noted that although it	The proponent acknowledged the importance of environmental

Subject	Comment/Concern	Summary of Proponent's Response
	<p>is important that the environment be completely protected through all stages of the Project, the employment opportunities stemming from the Project will be an important factor in the wellbeing of communities near the Project.</p>	<p>protection. The Project has been designed to minimize local and regional environmental impacts, including a compact project site and maximized water recycling. Habitat is being created to offset certain unavoidable impacts to fisheries and other species. In addition, the Project has been designed to minimize adverse impacts to factors that contribute to community wellbeing, while providing direct and indirect economic opportunities to the local and regional population.</p>
<p>In favour</p>	<p>Rainy River Future Development Corporation noted that this project holds great promise for the economic future of Fort Frances and the Rainy River District, and that it fully support the company in its efforts to open the mine.</p>	<p>The proponent thanked the Rainy River Future Development Corporation for its support.</p>

Appendix G Summary of Water Bodies

Summary of various water bodies and their role in the water management plan for the Project. Summarized based on the Rainy River EIS (AMEC).

Water Body	Role of Water Body	Result
Tailings management area pond	The tailings management area provides permanent storage for tailings from the onsite metal mill (after treatment for cyanide destruction and metals precipitation), along with water permanently stored within the tailings pore spaces. Natural degradation and precipitation processes within the tailings management area will result in a clear water tailings management area pond above the tailings surface.	Water within treatment system
Water management pond	Surplus water from the tailings management area pond will be transferred to the water management pond where it will be allowed to further age, naturally breaking down ammonia and precipitating heavy metals from the water.	Water within treatment system
Water discharge pond	The water discharge pond will receive decanted water from the water management pond, seepage from the tailings management area, and runoff from the local catchment area.	Water within treatment system
Constructed wetland	A constructed wetland will be established downstream of the water discharge pond within the Cowser Drain (Loslo Creek) valley, upstream of the Pinewood River. It will be designed to improve water quality through the enhancement of natural water treatment processes. Point of discharge to Loslo Creek.	Water within treatment system
Discharge pipeline	All effluent from the water management pond that is not discharged through the constructed wetland will be discharged by pipeline to the Pinewood River downstream of McCallum Creek. The direct release of effluent by pipeline would occur during the spring and fall, to take advantage of extended aging in the tailings management area pond and water management pond, and the increased seasonal flows. Point of final discharge into Pinewood River downstream of McCallum Creek.	Water within treatment system

Water Body	Role of Water Body	Result
Mine rock pond	The mine rock pond will receive runoff from the east mine rock stockpile (encapsulated potentially acid generating mine rock), low grade ore stockpile and some runoff from the process plant. The open pit and underground mine water will be pumped to the mine rock pond. Water from this pond will be recycled for use within the site water management plan.	Water within treatment system
Sediment ponds #1 and #2	Ditches will also be excavated around the overburden and west mine rock stockpiles to direct runoff to sediment control ponds (sediment ponds #1 or #2) for collection and settling of solids. Runoff and seepage collected by these facilities would discharge directly to the environment via West Creek Diversion Channel (pond #1), and Loslo Creek (pond #2).	Water within treatment system
West Creek Diversion Channel	The West Creek Diversion Channel collects non-contact water and receives discharge from Sediment pond #1. It will be situated parallel to, but separate from, the constructed wetland to avoid mixing of fresh water and effluent.	Mix of treated water and freshwater
West Creek Pond	The West Creek Pond will be established in line with West Creek to supply potable water for domestic and sanitary uses. The West Creek Pond will contain natural, non-contact water, and therefore does not require further management or treatment prior to release.	Fresh water
Stockpile Pond	The Stockpile Pond will collect non-contact water and route it to the West Creek Pond.	Fresh water
Clark Creek Diversion Channel and Clark Creek Pond	The (proposed) Clark Creek Pond will be constructed at the head of the Clark Creek Diversion Channel to facilitate re-routing of the lower reach of Clark Creek to Pinewood River.	Fresh water
Loslo Creek	The remaining Loslo Creek channel will receive effluent discharge from the tailings management area via the constructed wetland outflow, a mix of treated and freshwater from the West Creek Diversion Channel, and discharge from Sediment Pond #2.	Mix of treated water and freshwater
Pinewood River upstream of Loslo Creek	The Pinewood River will receive freshwater inputs from the Clark Creek Diversion Channel and Clark Creek Pond upstream of Loslo Creek.	Freshwater

Water Body	Role of Water Body	Result
Pinewood River downstream of Loslo Creek	The Pinewood River will receive treated effluent via the discharge pipeline downstream of McCallum Creek, and a mix of treated and freshwater from Loslo Creek.	Mix of treated water and freshwater
Minor Creek Systems	Portions of the Minor Creek Systems not mentioned here will be altered or replaced by mine components, as per creek modifications described in section 6.2.	N/A

Appendix H Summary of Species at Risk

Summary of species listed under Schedule 1 of the Species at Risk Act (Species at Risk Act) and those assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), their preferred habitat, likelihood of occurrence, and potential effects (Rainy River EIS, AMEC)

Notes: THR – Threatened; END- Endangered

Species	Species Designation	Preferred Habitat	Observed (Likelihood of Occurrence)	Potential Effects
Species at Risk listed as Endangered, Threatened or Special Concern under Schedule 1 of the <i>Species at Risk Act</i>				
Short-eared Owl (<i>Asio flammeus</i>)	Special Concern	<ul style="list-style-type: none"> Nest in areas of tall grass in grasslands, agricultural lands, and wetlands. Use similar habitat for foraging. 	<ul style="list-style-type: none"> One individual was observed in 2010. Surveys between 2011 and 2013 did not provide additional observations. 	<ul style="list-style-type: none"> Will remove 690.8 hectares (ha) of open country and wetland habitat. Increased mortality rate from collisions. No direct impact by project activities.
Snapping Turtle (<i>Chelydra serpentina</i>)	Special Concern	<ul style="list-style-type: none"> Inhabit a wide variety of aquatic habitats (e.g., ponds, sloughs, shallow bays or river edges, and slow streams). Tolerate disturbance and will inhabit man-made ponds, ditches and canals. Nest in sand and gravel banks along waterways and within a variety of manmade features, including road 	<ul style="list-style-type: none"> Two were observed in the Natural Environment Local Study Area during baseline studies. While a suitable nesting habitat was observed, no nests were noted. Beaver ponds are widespread. Natural sand and gravel substrates are not common. 	<ul style="list-style-type: none"> Will remove 291.8 ha of wetland habitat. Increased predation of Snapping Turtles and their nests. It is not expected that harmful levels of contaminants will affect Snapping Turtles.

Species	Species Designation	Preferred Habitat	Observed (Likelihood of Occurrence)	Potential Effects
		embankments.		
Eastern Whip-poor-will (Antrostomus vociferous)	THR (Sched. 1)	<ul style="list-style-type: none"> • Prefer rock or sand barrens with scattered trees, savannahs, old burns in early succession, and open conifer plantations. • Pine (barrens and plantations), oak (barrens and savannahs), and aspen and birch (early to mid-succession) are common tree species associations. 	<ul style="list-style-type: none"> • Suitable habitat in the form of rocky outcrops and open forests is widespread within the Natural Environment Local Study Area. • 51 were observed in the Natural Environment Local Study Area from 2010-2012. • 	<ul style="list-style-type: none"> • Will remove 1475.3 ha of woodland habitat and 10.9 ha of open rock barren habitat. • Sound may affect 454 ha of woodland and open rock barren habitat. • Increased mortality rates from collisions.
Canada Warbler (Cardellina Canadensis)	THR (Sched. 1)	<ul style="list-style-type: none"> • Will nest in the interior of wet mixed woodlands or swamps. • 	<ul style="list-style-type: none"> • Habitats are rare in the Natural Environment Local Study Area and likely inhibit this species from occurring in greater numbers. • At three different locations during 2009-2010 and 2012 surveys, with two of those along the proposed transmission line. 	<ul style="list-style-type: none"> • Will remove 1475.3 ha of woodland habitat and specifically 18 ha along the proposed transmission line corridor. • Negatively impact interactions with the environment and decrease breeding success. • Less concerned about collisions than with other species.
Olive-sided Flycatcher (Contopus)	THR (Sched. 1)	<ul style="list-style-type: none"> • Prefer natural forest openings created by natural disturbance. 	<ul style="list-style-type: none"> • Widespread in Northern Ontario. The Natural Environment Local Study Area provides suitable 	<ul style="list-style-type: none"> • Will remove a total of 291.8 ha of wetland and 118.3 ha of coniferous forest. • Sound may decrease

Species	Species Designation	Preferred Habitat	Observed (Likelihood of Occurrence)	Potential Effects
cooperi)		<ul style="list-style-type: none"> Snags of large trees remaining on disturbed landscapes provide elevated perches used for foraging and may provide habitat for insects. 	<ul style="list-style-type: none"> breeding habitat. At seven locations between 2009 and 2012. Sightings were widespread across the area and in various habitats, including clear cut and riparian habitat bordering agricultural land. 	<ul style="list-style-type: none"> breeding success. Increased mortality rates from collisions.
Golden-winged Warbler (Vermivora chrysoptera)	THR (Sched. 1)	<ul style="list-style-type: none"> Breed in successional/shrub, or old field habitats surrounded by forests. Associated with deciduous of mixed forests occurring over upland landscapes. 	<ul style="list-style-type: none"> Known to occur near Rainy River. The Natural Environment Local Study Area contains ample suitable breeding habitat. Total of 23 birds between 2011 and 2012 in woodland habitat. 	<ul style="list-style-type: none"> Will remove a total of 123.3 ha of shrub land and 419 ha of suitable woodland habitat. Fifteen to seventeen pairs will likely be displaced as a result of vegetation removal. Decreased breeding success. Increased mortality rates from collisions.
Red-headed Woodpecker (Melanerpes erythrocephalus)	THR (Sched. 1)	<ul style="list-style-type: none"> Associated with the Carolinian forest where they inhabit open woodlands, oak savannah, riparian forest, and hedgerows. Drawn to American Beech trees on which they forage for beech nuts and insects. 	<ul style="list-style-type: none"> Estimated 30 to 50 pairs occur in 10 Ontario Breeding Bird Atlas (OBBA) survey squares in the Rainy River Clay Plain. Oak savannah is not present. Open woodlands and riparian forest may provide suitable habitat. One bird was observed in 2011. 	<ul style="list-style-type: none"> Will remove a total of 1475.3 ha of woodland habitat. Sound may decrease breeding success. Increased mortality rates from collisions.
Common	THR (Sched. 1)	<ul style="list-style-type: none"> Utilize a wide variety of natural 	<ul style="list-style-type: none"> In proximity to the proposed mine footprint 	<ul style="list-style-type: none"> Will remove a total of 1475.3 ha of woodland habitat in the

Species	Species Designation	Preferred Habitat	Observed (Likelihood of Occurrence)	Potential Effects
Nighthawk (Chordeiles minor)		<p>open country habitats including sand dunes, cutovers, burns, rocky outcrops, bogs, short-grass prairies, open forests, marshes, lakeshores, rock barrens, and forest clearings.</p> <ul style="list-style-type: none"> Adapted to anthropogenically modified habitats including mine tailings, quarries, urban parks, airports, gravel roads, and flat-topped buildings. Prefer natural habitats. 	<p>and along the proposed transmission line corridor.</p> <ul style="list-style-type: none"> Cumulative studies between 2010 and 2011 indicated that they were most readily observed where cleared forest and rocky outcrops were present, particularly in proximity to the proposed transmission line. Cleared forest in this area provides both nesting habitat and open foraging habitat. 	<p>Natural Environment Local Study Area, with 10.9 ha of treed and open rock barren and 123.3 ha of shrub habitat.</p> <ul style="list-style-type: none"> Sound disturbance along the transmission line will affect auditory cues. May experience a greater increase in mortality rates from collisions.
Grey Fox (Urocyon cinereoargenteus)	THR (Sched. 1)	<ul style="list-style-type: none"> Prefer deciduous forests, especially swampy areas. Appear along the border with the United States. 	<ul style="list-style-type: none"> The Natural Environment Local Study Area provides suitable habitat. Three commercial traplines partially intersect the Natural Environment Local Study Area. Published fur harvesting records show that Grey Fox had been captured in the general area. 	<ul style="list-style-type: none"> No adverse environmental effects.
Species Assessed as Endangered, Threatened or Special Concern by COSEWIC				
Eastern	Special Concern	<ul style="list-style-type: none"> Breed in deciduous 	<ul style="list-style-type: none"> Occurs near Rainy River 	<ul style="list-style-type: none"> Will remove 1140 ha of

Species	Species Designation	Preferred Habitat	Observed (Likelihood of Occurrence)	Potential Effects
Wood-pewee (Contopus virens)	(no schedule or status)	<ul style="list-style-type: none"> and mixed forests. Prefer forest edge habitats. 	<ul style="list-style-type: none"> District. The Natural Environment Local Study Area contains ample suitable breeding habitat associated with natural open areas (rock outcrops and wetlands), and interspersed agricultural lands. A total of 14 were recorded at 14 point count locations. 	<ul style="list-style-type: none"> suitable deciduous forest habitat. Will displace at least five pairs of Eastern Wood-pewee. Increased mortality rate from collisions.
Barn Swallow (Hirundo rustica)	THR (Sched. Status pending)	<ul style="list-style-type: none"> Nest largely in and on artificial structures including barns and other outbuildings, garages, houses, bridges and road culverts. Prefer various types of open habitat for foraging including grassy fields, pastures, various kinds of agricultural crops, lake and river shorelines, cleared right-of ways, cottage areas and farmyards, islands, wetlands, and subarctic tundra. 	<ul style="list-style-type: none"> The Natural Environment Local Study Area contains a small rural settlement which may provide artificial structures with suitable breeding habitat. The presence of agricultural lands, suitable for foraging habitat, is extensive within the Natural Environment Local Study Area, consisting primarily of hay fields and pasture lands (row cropping is rare in the area). A total of 29 were observed. 	<ul style="list-style-type: none"> Removal of 399 ha of open country and 291.8 ha of wetland habitat may reduce potential foraging grounds. Two barns and farm buildings on six rural properties used for nesting will be removed. Road mortality from vehicle collisions. Human presence may cause stress on adults or startle fledglings.
Bobolink (Dolichonyx)	THR (Sched. Status pending)	<ul style="list-style-type: none"> Nest primarily in forage crops (e.g., 	<ul style="list-style-type: none"> The presence of agricultural lands is 	<ul style="list-style-type: none"> Loss of 399 ha of open country habitat, 134 ha of

Species	Species Designation	Preferred Habitat	Observed (Likelihood of Occurrence)	Potential Effects
oryzivorus)		<p>hayfields and pastures) and old field habitat.</p> <ul style="list-style-type: none"> • Can adapt to low-moderate livestock grazing, but not intensive grazing. • Preferred habitat characteristics are often found in old (greater than 8 years) forage crops. • Nesting success is positively correlated to larger habitat size, although this species will utilize smaller areas of 10 to 30 ha. 	<p>extensive within the Natural Environment Local Study Area, consisting primarily of hay fields and pasture lands (row cropping is rare in the area). Scattered populations of Bobolink are known to exist in the Rainy River District.</p> <ul style="list-style-type: none"> • Frequently observed in hayfields and in 41.2 percent of the breeding bird point counts in 2011. • 	<p>which were assessed as high quality Bobolink habitat.</p> <ul style="list-style-type: none"> • Fifteen to twenty pairs of Bobolink will likely be displaced. • Increased mortality rates from collisions with vehicles. • Effects of noise include masking important communication signals and causing physiological changes.
Lake Sturgeon (Acipenser fulvescens)	Special Concern	<ul style="list-style-type: none"> • Spawning occurs in the spring in fast-flowing water at depths between 0.6 and 5 m over hard-pan clay, sand, gravel and boulders. 	<ul style="list-style-type: none"> • Was recorded at the confluence of the Pinewood River and the Rainy River. 	<ul style="list-style-type: none"> • Effects are not predicted to reach the confluence of the Pinewood River and the Rainy River. • No adverse environmental effects.
Little Brown Myotis (Myotis lucifugus)	END	<ul style="list-style-type: none"> • Requires cavity trees of large diameter to use as maternity roots and foraging habitat such as wetlands 	<ul style="list-style-type: none"> • The study area provides an abundance of forest edge interface as well as low-lying swamplands which provide ample foraging habitat. Woodlands 	<ul style="list-style-type: none"> • Vehicular collisions may pose a mortality threat. • Will remove six percent of hardwood that is a high quality habitat for cavity-nesting bats.

Species	Species Designation	Preferred Habitat	Observed (Likelihood of Occurrence)	Potential Effects
		<p>and open woodlands.</p> <ul style="list-style-type: none"> Bat hibernacula generally consist of caves, abandoned mine shafts, and underground foundations. 	<p>consisting of large diameter Trembling Aspen likely provide suitable cavities for maternal roosts.</p> <ul style="list-style-type: none"> Was recorded at all five bat detector locations a total of 137 times. 	
Northern Myotis (Myotis septentrionalis)	END	<ul style="list-style-type: none"> Requires cavity trees of large diameter to use as maternity roosts and foraging habitat such as wetlands and open woodlands. Bat hibernacula generally consist of caves, abandoned mine shafts, and underground foundations. 	<ul style="list-style-type: none"> The study area provides an abundance of forest edge interface as well as low-lying swamplands which provide ample foraging habitat. Woodlands consisting of large diameter Trembling Aspen likely provide suitable cavities for maternal roosts. Passes were identified twice at one detector location. 	<ul style="list-style-type: none"> Vehicular collisions may pose a mortality threat. Will remove six percent of hardwood that is a high quality habitat for cavity-nesting bats.

Appendix I Excerpts from Proponent’s List of Monitoring Commitments

In addition to the follow-up program highlighted in section 10 and summarized in Appendix A: Part 1, the proponent made the following list of monitoring commitments.

Note: The numbers in the last column correspond to the commitments made by the proponent in their document entitled, “New Gold Rainy River Project – Commitments Registry” dated July 2014.

Factor/Effect	Report Elements	Proponent Commitment Reference No.
<p>Section (5)(1)(a)(i) Fish and Fish Habitat Loss of fish habitat for Aboriginal, recreational and commercial fisheries in the Minor Creek Systems and Pinewood River</p> <p>Potential contamination of fish tissue</p> <p>Potential effects to fish and fish habitat caused by increases or decreases in flows</p> <p>Potential decrease in water quality from contaminants in effluent, seepage and site runoff</p>	<p>The follow-up monitoring plan will include:</p> <p>(A) Provisions to detect and report impacts to fish and fish habitat:</p> <ul style="list-style-type: none"> • Assessing the character and quality of aquatic resources during construction, operation, and decommissioning at the West Creek Diversion Channel, Pinewood River, and upstream and downstream of the project site in accordance with the <i>Metal Mining Guidance Document for Aquatic Environmental Effects Monitoring</i> (Environment Canada 2012); • Monitoring the contaminants of potential concern by collecting and analyzing fish dorsal muscle and liver tissue samples from fish in the Pinewood River, including Northern Pike and Walleye, and by working with fishermen to reflect any applied methods of food preparation and increased fishing in Pinewood River; and • Conducting fish habitat and fisheries assessments starting one year after the date of commercial production of the mine and at three year intervals thereafter, including: <ul style="list-style-type: none"> ○ Sediment and benthos investigations of West Creek Diversion Channel, Clark Creek Diversion Channel (upstream of the east mine rock stockpile), Clark Creek Pond, Teeple Road Pond, Stockpile Diversion Channel, Stockpile Pond, and Pinewood River; and ○ Fish life cycle stability in the Modified Minor Creek Systems and stability of diversion channels and ponds for habitat and structural function until completion of construction. 	<p>24, 28, 32, 43, 47, 51, 52, 63, 64, 67, 69, 76, 77, 80, 81</p>

Factor/Effect	Report Elements	Proponent Commitment Reference No.
	<p>(B) Provisions to monitor water flows and levels, including:</p> <ul style="list-style-type: none"> • Monitoring surface water flows, including in Pinewood River, during construction, operation and decommissioning, with monitoring expected to continue for a decade (or more) at reduced frequencies pending ongoing analysis of data; • Monitoring, on a continuous basis, West Creek Pond and West Creek Diversion Channel flows using water level transducers and on a monthly basis, by taking manual measurements, during the winter period, when transducer results experience interference caused by ice pressure; • Monitoring flow rates upon completion of construction on the West Creek pond and the West Creek Diversion Channel at: <ul style="list-style-type: none"> ○ West Creek at the West Creek pond outflow; ○ West Creek Diversion Channel; and ○ Pinewood River at Highway 617; • Determining the effects of effluent discharges and runoff on the flow rates of West Creek Diversion Channel and the Pinewood River; • Collecting and analyzing samples to measure rates of flow from site discharges, runoff and seepage collection facilities, at the start of their respective operations, including: <ul style="list-style-type: none"> ○ tailings management area discharges to the Pinewood River; ○ Sedimentation Pond #1 and #2 discharges to West Creek; ○ Aggregate operation(s) discharges; ○ Rock stockpiles; ○ Sewage effluent discharge; and ○ Runoff and seepage collected from site operations areas in accordance with <i>Metal Mining Effluent Regulations</i> and Environmental Compliance Approval requirements; ○ Sampling sediments to evaluate soil quality parameters prior to undertaking any further closure activities for any contact water ponds and drainage works (including stockpile sediment ponds) where breaching is proposed; and ○ Developing annual statistical flow estimates for local watercourses based on flow data derived through monitoring for each waterway, including monthly averages, annual averages, and extreme low and 	

Factor/Effect	Report Elements	Proponent Commitment Reference No.
	<p>high flow statistics corresponding to 2, 5, 10, and 20 year return period conditions.</p> <p>(C) Provisions to monitor water quality downstream and at the project site, including:</p> <ul style="list-style-type: none"> • Using sulphur dioxide and air treatment of tailings slurry for cyanide destruction and associated heavy metals precipitation before discharge to the tailings management area; • Installing and maintaining monitoring stations, specifically the three stations on West Creek, the five stations on Pinewood River and the two current baseline monitoring stations on the Rainy River for monthly monitoring; • Determining the effects of effluent discharges and runoff on the water quality and biota of West Creek, Loslo Creek and the Pinewood River; • Monitoring runoff and seepage related to tailings and stockpiles and the ability of water treatment and water management facilities to produce effluents and runoff that meet <i>Provincial Water Quality Objectives</i>, <i>Canadian Environmental Quality Guidelines</i>, and other regulatory requirements, including Ministry of the Environment and Climate Change site-specific criteria and <i>Metal Mining Effluent Regulations</i>; • Carrying out field trials to confirm modelling results during all or a portion of the mine construction and operation phases; • Analyzing select quarterly water samples from sampling stations for total mercury and methylmercury; • Monitoring the water quality upstream and downstream of the same discharge locations identified above for water flow monitoring, monthly; • Monitoring water pipelines twice per 12 hours to prevent large volumes of water and resulting sediment plumes impacting fish and fish habitat; • Monitoring and evaluating the integrity of the tailings management area cover system (e.g. low permeability overburden zone) and the continuous saturation of the tailings; • Undertaking further studies to optimize final pit overflow water quality; and • Conducting confirmatory sampling and analyses prior to any direct discharge 	

Factor/Effect	Report Elements	Proponent Commitment Reference No.
	<p>from the pit lake into Pinewood River during decommissioning and abandonment, so that appropriate treatment (if necessary) can be implemented.</p> <ul style="list-style-type: none"> • <p>(D) Provisions to monitor groundwater quality and quantity and the integrity of containment structures:</p> <ul style="list-style-type: none"> • Establishing a groundwater well (piezometer) network around the open pit area to monitor groundwater levels throughout the area on a continuous basis using water level transducers, with transducer downloads to be completed twice per year, commencing at least six months prior to the start of pumping; • Monitoring groundwater quality and quantity during construction, operation and decommissioning phases, with abandonment monitoring expected to continue for a decade (or more); • Measuring water levels, continuously, in the monitoring wells with data downloaded semi-annually; • Installing groundwater monitoring wells around the tailings management area and east mine rock stockpile and pond areas, with any amendments or expansion of the network approved through the Ministry of the Environment and Climate Change approvals process; • Implementing a water management plan that will include regular sampling and dipping of dedicated monitoring wells to identify any impacts to any wells in the vicinity of the zone of influence from the open pit and tailings management area and rectify any impacts to water availability for well owners; and • Monitoring kinetic cells to demonstrate and continuously evaluate the robustness of the geochemical results. <ul style="list-style-type: none"> • <p>(E) Provisions to comply with monitoring and reporting obligations to the relevant government agencies and Aboriginal communities:</p> <ul style="list-style-type: none"> • Sharing with and engaging Aboriginal communities on the development of the water management plan prior to construction and the development and implementation of monitoring plans; • Providing assistance and opportunities for ongoing consultation to Aboriginal 	

Factor/Effect	Report Elements	Proponent Commitment Reference No.
	<p>communities on environmental approvals, the mine closure plan, the contingency and response plan, and the follow-up monitoring plan;</p> <ul style="list-style-type: none"> • Providing timely notification to Aboriginal communities on spills and accidents if any, and on the details of any investigation and response to these events; • Requesting local well owners to participate in well water quality monitoring as part of the water management plan; and • Notifying potential consumers of fish and the applicable provincial departments (Ministry of the Environment and Climate Change and Ministry of Natural Resources and Forestry), if contaminant concentrations in fish increase over time, provide information related to increased health risks (if any) and facilitate provincial issuance of fish consumption advisories. <p>(F) Provisions to establish adaptive management techniques:</p> <ul style="list-style-type: none"> • Developing an adaptive management plan as a condition of the Fisheries Act authorization that will define monitoring criteria and ecological targets to ensure that the Pinewood River continues to provide for all life functions for all resident fish species during operation and decommissioning, and will include contingency mitigation or offset provisions in the event that unanticipated effects beyond the ecological targets are detected; • Monitoring water levels and flow discharges to address any unforeseen flow reductions through adaptive management techniques. Water flow management can be optimized during mine operations should the need to accommodate unexpected concerns arise; • Assessing whether additional mitigation measures may be required as part of an adaptive management plan; and • Taking any corrective action necessary to ensure compliance with all applicable laws, regulations and instruments. 	
Section (5)(1)(a)(ii) Migratory Birds	<p>The follow-up monitoring plan will include:</p> <ul style="list-style-type: none"> • Monitoring species at risk during the construction, operation and decommissioning phases, with post closure habitat development and utilization by wildlife to continue at reduced frequencies consistent with Species at Risk 	82, 85, 99, 105, 109, 110, 111, 112

Factor/Effect	Report Elements	Proponent Commitment Reference No.
<p>Disturbance to migratory birds</p> <p>Loss of migratory bird habitat</p>	<p>Permit requirements;</p> <ul style="list-style-type: none"> • Implementing a wildlife follow-up monitoring plan for Eastern Whip-poor-will, Bobolink, Common Nighthawk, and Barn Swallow populations and for nesting in proximity to the proposed mine and transmission line sites, within compensatory habitat areas; • Conducting post-construction monitoring surveys in the first year following completion of construction and at three year intervals thereafter until decommissioning is complete; • Conducting targeted point-count surveys for woodland area-sensitive breeding birds and diurnal species at risk, including Golden-winged Warbler, Barn Swallow, Bobolink, using survey protocols described in the <i>Ontario Breeding Bird Atlas Guide for Participants</i> (OBBA 2001); • Conducting targeted twilight surveys for Eastern Whip-poor-will in suitable habitat using survey protocols as outlined in the Whip-poor-will Roadside Survey Participant's Guide (BSC 2012); • Collecting observation data regarding the Common Nighthawk during targeted Eastern Whip-poor-will surveys; • Collecting incidental data collection for species at risk, including Canada Warbler, and Olive-sided Flycatcher; • Maintaining a wildlife log of breeding bird observations at the project site focusing on species at risk (including vehicle collisions); and • Sharing with and engaging Aboriginal communities on the development and implementation of the monitoring plans. 	
<p>Section (5)(1)(c)(iii)</p> <p>Current use of lands and resources for traditional purposes by Aboriginal peoples</p> <p>Potential changes to</p>	<p>The follow-up monitoring plan will include:</p> <ul style="list-style-type: none"> • Updating Traditional Knowledge and Traditional Land Use studies conducted for the Project beginning five years after the commencement of operation, to determine if there have been any changes to resource harvesting patterns by local Aboriginal peoples as a result of the Project, and the reasons for any such changes; • Determining any changes in the availability of fisheries and wildlife resources for local harvesters, based on data derived from biological follow-up monitoring 	<p>117, 121</p>

Factor/Effect	Report Elements	Proponent Commitment Reference No.
fishing, hunting, and plant harvesting practices	<p>plans;</p> <ul style="list-style-type: none"> • Monitoring terrestrial landscapes after decommissioning, including restoration of habitat and use by wildlife; and • Sharing with and engaging Aboriginal communities on the development and implementation of monitoring plans. • <p>Implementation of the follow-up monitoring plan is subject to any terms of agreement with the local First Nations and Métis. The reporting of any results relating to traditional pursuits would be subject to confidentiality and other considerations expressed by the Aboriginal peoples involved, and if deemed appropriate, would be reported in summary form as part of the follow-up monitoring plan annual report.</p>	
<p>Section (5)(1)(c)(i) Health and socio-economic conditions of Aboriginal peoples</p> <p>Potential decreases in air quality</p> <p>Potential changes to Aboriginal health from contamination of country foods and potential changes to commercial fishing practices</p>	<p>During construction, operation, and decommissioning, the follow-up monitoring plan for potential contamination of country foods will include :</p> <ul style="list-style-type: none"> • Monitoring metal concentrations in country foods including fish muscle and liver tissue, White-tailed Deer liver tissue, and other wildlife tissues. Providing any new information regarding the Project's effects that could impact health, to Aboriginal people; and • Sharing with and engaging Aboriginal communities on the development and implementation of monitoring plans. <p>The follow-up monitoring plan for air quality will include (during construction, operation, and decommissioning):</p> <ul style="list-style-type: none"> • Monitoring air quality for dust and metals (total suspended particulate, particulate matter, fine particulate matter, nitrogen oxides; full metal scan for mercury, arsenic, cadmium, and lead; and passive monitoring for nitrogen dioxide and sulphur dioxide); • Collecting and analyzing late-winter snow pack samples for pH and metals to help determine the effects of dust fall accumulated within the snow pack during spring melt; • Annual monitoring of dust deposition on vegetation adjacent to mine roads; 	4, 8, 164, 168

Factor/Effect	Report Elements	Proponent Commitment Reference No.
	<ul style="list-style-type: none"> • Assessing whether additional mitigation measures may be required as part of an adaptive management plan for the fugitive dust best management practices plan, to accommodate results of site inspections and monitoring; and • Sharing with and engaging Aboriginal communities on the development and implementation of monitoring plans. 	
<p>Section (5)(1)(c)(ii) and Section (5)(1)(c)(iv)</p> <p>Physical or cultural heritage and effects on historical, archaeological, paleontological or architectural sites or structures of Aboriginal peoples</p> <p>Potential changes to cultural heritage resources</p>	<p>The follow-up monitoring plan will include:</p> <p>(A) Provisions to monitor cultural heritage and archaeological findings:</p> <ul style="list-style-type: none"> • Conducting a post-construction assessment of the state of known cultural heritage sites and structures in the vicinity of project activities to confirm the integrity of such resources; • Maintaining a record of all known cultural heritage resources in the vicinity of planned developments, such that intrusion on or damage to such resources can be avoided during construction, recognizing and respecting confidentiality limitations; and • Monitoring for archaeological findings during the construction phase, including employing a trained archaeologist during the construction of major project works to reduce impacts to undocumented cultural heritage sites, and to supervise transmission line construction at identified areas of high archaeological potential. <p>(B) Provisions to comply with monitoring and reporting obligations to Aboriginal communities:</p> <ul style="list-style-type: none"> • Holding regular and ongoing discussions with Aboriginal people to help monitor any effects to the socio-cultural environment; • Maintaining an active dialogue with Aboriginal peoples with cultural heritage knowledge to encourage sharing of knowledge regarding undocumented cultural heritage sites; and • Enlisting the services of elders or other cultural advisors in the event that cultural heritage resources are encountered. <p>Any notable cultural heritage finds will be reported according to regulatory requirements</p>	174, 176

Factor/Effect	Report Elements	Proponent Commitment Reference No.
	at the time, with reporting as required when and if further information becomes available.	
<p>Section (5)(2) Recreation and Commercial Use</p> <p>Potential changes to the enjoyment of the Richardson Trail</p>	<ul style="list-style-type: none"> • No follow-up monitoring was identified. 	
<p>Section (5)(2) Furbearers, and Amphibians and Reptiles, including Snapping Turtle</p> <p>Loss of habitat and increased disturbance to amphibians, reptiles and furbearers</p>	<p>The follow-up monitoring plan will include:</p> <ul style="list-style-type: none"> • Maintaining a log of furbearer, amphibian and reptile observations (including vehicle collisions) during construction, operation, and decommissioning; • Reporting on timing of vegetation clearing during construction and vegetation restoration progress during decommissioning in relation to furbearers, amphibians and reptiles; • Detailed wildlife monitoring strategies developed through consultation with the Ministry of Natural Resources and Forestry and Environment Canada. Additional control sites around the periphery of the mine footprint may be developed and monitored following mine construction, and periodically throughout mine operations; and • Sharing with and engaging Aboriginal communities on the development and implementation of monitoring plans. 	91, 92
<p>Section 79(2) of the Species at Risk Act Federal Species at Risk</p> <p>Loss of habitat and increased disturbance to federal species at risk</p>	<p>Follow-up monitoring for Snapping Turtles is described with reptiles in section (5)(2) above.</p> <p>Follow-up monitoring for Eastern Whip-poor-will, Canada Warbler, Olive-sided Flycatcher, Golden-winged Warbler, and Red-headed Woodpecker is described with other migratory birds, in section (5)(1)(a)(ii), above.</p> <p>The follow-up monitoring plan for Short-eared Owl will include:</p> <ul style="list-style-type: none"> ○ Collecting incidental data. 	

Appendix J Summary of Key Comments Received on the Draft Environmental Assessment Report

Comments received on the draft EA report have been summarized in the table below. All editorial comments and comments that identify basic errors in the draft EA report have been addressed in this EA report and are not included in this table.

Group	Comment	Agency Response (all section listings refer to the EA Report unless otherwise noted)
Fish and Fish Habitat [Section 5(1) a) i) of the Act]		
<p>Nootkamegwanning First Nation, Anishinaabeg of Naongashiing First Nation, Ojibways of Onigaming First Nation</p> <p>Environment Canada</p> <p>Nootkamegwanning First Nation</p>	<ul style="list-style-type: none"> • Questions about timeline for potential impacts from acid rock drainage and metal leaching and how they will be mitigated. • The Draft EA report did not identify all mitigation measures committed by the proponent related to the sorting of waste rock into potentially acid generating and non-potentially acid generating rock stockpiles. Also recommended that commitment be made to monitor tailings management area for permanent saturation. • Approval of the EA should be conditional upon receipt of complete and satisfactory information from the proponent regarding acid rock drainage and 	<ul style="list-style-type: none"> • The amount of time for mine rock to become acidic can vary and is dependent on the scenario. The proponent has committed to ongoing kinetic testing to verify the potential metal leaching from mine rock and tailings. The measures that will be implemented to mitigate potential impacts from acid rock drainage and metal leaching include lining the former Clark Creek channel (under the east mine rock stockpile), sorting waste rock, covering stockpiles at decommissioning, covering the tailings beach with overburden and the tailings with water, and controlling water quality in the open pit lake. Additional information is provided in section 7.1.5 and Appendix A: Part 1. • The following additional mitigation measures were integrated in section 7.1.5 and Appendix A: Part 1: filling the former Clark Creek channel (under the east mine rock stockpile) with non-potentially acid generating material to provide drainage of effluent; and, ongoing kinetic cell testing to ensure the robustness of the geochemical results. The following monitoring measure was integrated into section 10 and Appendix A: Part 1: monitoring the maintenance of a perpetually saturated state of the tailings. • Section 7.1 states the acid generating material will be used in a controlled manner, where saturated conditions can be maintained. For the purposes of the EA, the Agency is satisfied with the mitigation measures for acid rock drainage and metal leaching identified in the report and

Group	Comment	Agency Response (all section listings refer to the EA Report unless otherwise noted)
Couchiching First Nation	<p>metal leaching mitigation measures.</p> <ul style="list-style-type: none"> Clarify the term “assimilative capacity” by explaining whether it differs for different watersheds and the expectations required for the Project. 	<p>noted in the responses above.</p> <ul style="list-style-type: none"> The assimilative capacity differs for different waterbodies. The proponent is expected to minimize the impact to assimilative capacity by protecting water quality and quantity through mitigation, including measures described in sections 7.1.5, 8.2.2, and Appendix A.
Member of the Public	<ul style="list-style-type: none"> Comment about dust deposition into the nearby lake. 	<ul style="list-style-type: none"> As discussed in sections 6.1, 7.4 and Appendix A, to minimize the likelihood of off-site deposition of dust, the proponent commits to using dust control equipment such as bag houses, water cannons and spray trucks, as approved by the Ministry of the Environment and Climate Change.
Naothamegwanning First Nation	<ul style="list-style-type: none"> Comment about flow levels in the Pinewood River. Conditions should be imposed for all environmental approvals and permits with respect to taking water and effluent discharge into the water table. 	<ul style="list-style-type: none"> Section 7.1.5 and Appendix A: Part 1 include requirements to establish water flow and level thresholds in consultation with the appropriate government authorities and to ensure compliance with the Ministry of the Environment and Climate Change Environmental Compliance Approval and federal <i>Metal Mining Effluent Regulations</i> Schedule 4 limits at all times.
Member of the Public, Naothamegwanning First Nation	<ul style="list-style-type: none"> Comment about potential impacts to Rainy River, including potential impacts from Pinewood River during flood conditions. 	<ul style="list-style-type: none"> Potential impacts to the Project from maximum flood conditions (100-year flood) were considered; and the tailings management area and open pit have been designed to withstand extreme flooding. Additional information is provided in section 8.2.
Environment Canada	<ul style="list-style-type: none"> Clarify that the proponent committed to meeting federal and provincial guidelines on effluent criteria. 	<ul style="list-style-type: none"> The following text was integrated into section 3.2.1: the proponent committed to meeting “applicable federal and provincial guidelines for the protection of aquatic life”.
Anishinaabeg of Naongashiing First Nation, Naothamegwanning First Nation, Naicatchewenin	<ul style="list-style-type: none"> Comments about fish and fish habitat and proposed compensation measures. 	<ul style="list-style-type: none"> Section 7.1 provides a description of baseline fish and fish habitat conditions, residual effects and mitigation measures. The proponent has committed to implement fish habitat compensation and offsetting plans to mitigate the loss of fish habitat. Further details about the plans will be

Group	Comment	Agency Response (all section listings refer to the EA Report unless otherwise noted)
<p>Environment Canada</p> <p>Anishinaabeg of Naongashiing First Nation, Naicatchewenin First Nation, Ojibways of Onigaming First Nation</p> <p>Environment Canada</p> <p>Environment Canada</p> <p>Ministry of the Environment and Climate Change</p>	<p>area.</p> <ul style="list-style-type: none"> • Comment that not all mitigation measures committed by the proponent, related to migratory birds were included. Specifically, there is no mention of the fencing of the tailings management area and its abiotic conditions and the commitment to carry out a wildlife monitoring program. • Comment that migratory birds and other wildlife may be attracted to the tailings management area. • Mitigation measures for the Eastern Whip-poor-will also apply to the Common Nighthawk. • The date range restriction regarding habitat clearing provided in the EA report is not consistent with Canadian Wildlife Service policy. When implementing mitigation, the proponent should reference the Canadian Wildlife Service's compiled information on core nesting periods for all regions in Canada. • Ministry of the Environment and Climate Change clarified that Ministry of the Environment and Climate Change NPC-300 Guideline applies to human 	<p>the tailings management area.</p> <ul style="list-style-type: none"> • A follow-up monitoring program for migratory birds is described in section 10. The following text was integrated into sections 7.3.5 and Appendix A: Part 1: maintain a fence around the tailings management area to prevent access by wildlife; and deter migratory birds from the tailings management area.” • As described above, the proponent has committed to deter migratory birds that may be attracted to the tailings management area, and to fence the tailings management area to prevent wildlife access. • Modifications were integrated in Appendix A: Part 2 to clarify and add mitigation measures to reduce potential adverse effects to Eastern Whip-poor-will and Common Nighthawk. • The following text was integrated in section 7.2.5 and Appendix A: Part 1: carry out project activities in a manner that avoids harming or killing migratory birds, or disturbing, destroying, or taking nests or eggs, in accordance with Environment Canada’s policy on <i>Incidental Take of Migratory Birds in Canada</i>, and avoidance guidelines on <i>General Nesting Periods of Migratory Birds in Canada</i>. • The following modifications were integrated in section 7.2.3, 7.2.5, and 7.2.6: reference to the Ministry of the Environment and Climate Change NPC-300 Guideline and Ministry of the Environment and Climate Change comments relating to noise impacts on migratory birds were removed.

Group	Comment	Agency Response (all section listings refer to the EA Report unless otherwise noted)
	receptors only.	
Aboriginal People – Health and Socio-Economic Conditions [Section 5(1) c) i) of the Act]		
Rainy River First Nation, Naothamegwaning First Nation, Ojibways of Onigaming First Nation	<ul style="list-style-type: none"> Comments were made regarding monitoring of contaminants in country foods, their links to health risks, and consumer alerts regarding health risks. 	<ul style="list-style-type: none"> Section 10.1 identified that the proponent will work with local Aboriginal peoples to monitor metal concentrations in country foods. The following modification was integrated into section 10 and Appendix A: Part 1: notifying Aboriginal groups in cases of exceedances of provincial, federal or international health-based criteria in fish tissue.
Rainy River First Nation	<ul style="list-style-type: none"> Request that human health monitoring begin earlier than 1-2 years prior to mine closure. 	<ul style="list-style-type: none"> Comment noted. Health Canada is satisfied with the approach identified by the proponent. The Agency has reflected this information in sections 7.4 and 10.
Anishinaabeg of Naongashiing First Nation	<ul style="list-style-type: none"> Comment about potential health effects from chemicals in tailings. 	<ul style="list-style-type: none"> As described in section 10, the proponent has committed to monitor water quality, as well as contaminant levels in fish and to notify Aboriginal groups of any possible exceedances which may affect human health.
Anishinaabeg of Naongashiing First Nation, Naothamegwaning First Nation, Ojibways of Onigaming First Nation	<ul style="list-style-type: none"> Comment about the long term environmental effects of air quality contamination, including potential evaporation of chemicals from the tailings management area, and interest in participating in monitoring. 	<ul style="list-style-type: none"> Air emissions for health considerations are expected to be below <i>Ambient Air Quality Criteria</i> limits for emissions during all phases of the Project, with only infrequent potential exceedances of limits for particulate matter at the project site boundary during operation. Air emissions are expected to be considerably lower at the nearest permanent receptors. Additional information is provided in sections 6.1 and 7.4. As described in section 10, the follow-up monitoring plan will be implemented in consultation with the local Aboriginal communities.
Aboriginal People – Physical and Cultural Heritage [Section 5(1) c) ii) of the Act]		
Naothamegwaning First Nation	<ul style="list-style-type: none"> Were the culture, religion, practices, or beliefs of Treaty 3 First Nations considered? 	<ul style="list-style-type: none"> Potential effects to physical and cultural heritage are discussed in section 7.5. The assessment included archaeological sites, artifacts, and sites of cultural importance. The report includes a description of mitigation measures identified by the proponent, including honouring

Group	Comment	Agency Response (all section listings refer to the EA Report unless otherwise noted)
Naotkamegwanning First Nation	<ul style="list-style-type: none"> Identified the need to conduct appropriate cultural ceremonial procedures to confirm impacts and mitigation measures in advance of approval of the EA report. 	<p>requests for ceremonies in advance of construction, and allowing limited and controlled access to culturally significant sites (Also see Appendix A).</p> <ul style="list-style-type: none"> The proponent has committed to provide access to the site for cultural and ceremonial purposes to Aboriginal communities. This commitment is identified in section 7.5 and Appendix A: Part 1.
Aboriginal People – Current Use of Land and Resources [Section 5(1) c) iii) of CEEA 2012]		
<p>Naotkamegwanning First Nation, Rainy River First Nation</p> <p>Naotkamegwanning First Nation</p> <p>Naotkamegwanning First Nation, Anishinaabeg of Naongashiing First Nation</p> <p>Couchiching First Nation</p> <p>Ministry of Natural</p>	<ul style="list-style-type: none"> Comments were made about access to traditional lands for current and future hunting on. Comment was also made about medicinal plants in beaver ponds. Clarification requested on location of compensatory habitat. Comments regarding plant species, including rare plants, medicinal plants and blueberries. What are ungulates? Specific edit clarifying Ministry of Natural Resources and Forestry 	<ul style="list-style-type: none"> Section 7.3 states that access to the project site for hunting will be lost for most of the project life. The proponent has committed to restoring access to the project site following mine closure to the extent that such access is safe and possible. This commitment is included in section 7.3 and Appendix A: Part 1. Furthermore, as an accommodation measure, section 7.3 states that Aboriginal groups will be given restricted access to private lands for traditional uses such as hunting and plant gathering. The private land that will be provided for access for Aboriginal groups. The location has yet to be finalized. The proponent has committed to provide access to private lands for traditional plant harvesting activities and to use native plant species to revegetate the project site during reclamation, to offset direct losses of traditional plants harvested for food and medicinal purposes. The following definition has been integrated into the glossary: Ungulates are animals that have hooves, such as moose and deer. The following modification was integrated in section 10.1: The Ministry of Natural Resources and Forestry was

Group	Comment	Agency Response (all section listings refer to the EA Report unless otherwise noted)
Resources and Forestry	comment regarding lack of follow-up monitoring plan for rare plants.	concerned by the lack of a follow-up monitoring plan for rare plants.
Aboriginal People – Structure, Site or Things of Historical, Archeological, Paleontological or Architectural Significance [Section 5(1) c iv) of the Act]		
Naotkamegwaning First Nation	<ul style="list-style-type: none"> What would happen if archaeological sites were found? 	<ul style="list-style-type: none"> If an archaeological site is found during construction, the proponent has committed to stop construction, assess the significance of the site, preserve any discovered burial sites, and preserve and manage artifacts by transferring them to a third party facility. The proponent will also ensure that a ceremony is conducted by Aboriginal groups once the artifacts are physically returned. Additional information is provided in section 7.5.5. The Agency is aware that Aboriginal groups have expressed interest in the development of a protocol for the preservation of artifacts. Further discussions between the proponent and potentially affected Aboriginal groups is proposed to occur.
Amphibians and Reptiles – [Section 5(2) of the Act]		
Naotkamegwaning First Nation	<ul style="list-style-type: none"> A condition of EA approval should be provision of clarity and certainty by the proponent regarding mitigation plans and strategies to prevent wildlife mortality and access to the site and the tailings management area. 	<ul style="list-style-type: none"> Appendix A: Parts 1 and 2 detail the proponent's mitigation measures with regards to potential impacts to wildlife. The Agency has identified key mitigation measures and follow-up program requirements for consideration by the Minister of the Environment in preparing conditions as part of the decision statement.
Recreation and Commercial Use – [Section 5(2) of the Act]		
Member of the Public	<ul style="list-style-type: none"> Comment that access to hunting lands (non-Aboriginal) will be limited by the compensatory habitat for Eastern Whip-poor-will. 	<ul style="list-style-type: none"> Comment noted. The Agency has passed this comment to the proponent and Ministry of Natural Resources and Forestry for their consideration.

Group	Comment	Agency Response (all section listings refer to the EA Report unless otherwise noted)
<p>Member of the Public</p> <p>Member of the Public</p>	<ul style="list-style-type: none"> • Comment about the results of the alternatives analysis for the tailings management area pond. • Additional information requested about the materials that will be used to construct the tailings pond. 	<ul style="list-style-type: none"> • The Agency is satisfied with the proponent's alternatives assessment for mine waste disposal because it was undertaken according to Environment Canada's Guidelines for the Assessment of Alternatives for Mine Waste Disposal. Additional information is provided in section 3.2 and Appendix D. • Section 8.1.1 summarizes the proponent's design safeguards for constructing the tailings management area. The tailings management area will include dams constructed using mainly selective permeability clay till (overburden) and mine rock from pit development. Internal drainage zones will consist of locally acquired sand and gravel or processed mine rock that do not have acid generating potential. The tailings dams will be comprised of four zones designed to retain water, provide stability and support, safely control seepage, and ensure integrity. Additional information about the construction of the tailings management area is provided in section 4.8 of the EIS.
EA Methodology		
<p>Couchiching First Nation</p> <p>Ministry of Natural Resources and Forestry</p>	<ul style="list-style-type: none"> • How are the Natural Environment Regional Study Area and borders of the mining site defined? • Ministry of Natural Resources and Forestry had comments on the significance analysis completed by the proponent for terrestrial habitat and wildlife, including species at risk. 	<ul style="list-style-type: none"> • The Natural Environment Regional Study Area includes the entire Pinewood River watershed with the corridor extension to the northeast to accommodate transmission line routing alternatives. Additional information about the spatial boundaries of the assessment can be found in section 1.2.5. The borders of the mine site reflect the land parcels forming the Project that the proponent has interest through direct ownership or option agreement. • The Agency considered Ministry of Natural Resources and Forestry's comments, the proponent's responses, as well as Environment Canada's comments, in relation to related valued components in drawing its significance conclusions.

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Effects of the Environment on the Project		
Couchiching First Nation	<ul style="list-style-type: none"> How was it determined that the area is in a low risk seismic zone? 	<ul style="list-style-type: none"> Potential effects of the environment on the Project are described in section 8.2. The proponent determined the area was in a low risk seismic zone using seismic hazard maps produced by the Geological Society of Canada.
Follow-up Program		
<p>Nootkamegwanning First Nation</p> <p>Nootkamegwanning First Nation</p> <p>Environment Canada, Nootkamegwanning First Nation</p> <p>Environment Canada</p>	<ul style="list-style-type: none"> Did the Agency design the mitigation measures and follow-up plans? Ensure all commitments that incorporate consultation and follow-up activities, including commitments 167, 175, 194 and 195, are extended to include all affected Aboriginal Groups. It should be identified that monitoring of Aboriginal health includes the proponent working with the local Aboriginal peoples on an ongoing basis to monitor metal concentrations in country foods, as appropriate. All approvals for the Project should be conditional upon First Nation participation in any joint water monitoring, or other environmental monitoring programs, and should be funded on an ongoing basis. No mention of monitoring plan for Common Nighthawk and Eastern 	<ul style="list-style-type: none"> The proponent developed mitigation measures and a follow-up monitoring program to meet EA requirements. The Agency has reviewed these mitigation measures and the follow-up monitoring program. Additional information can be found in section 10 and Appendices A: Part 1 and Appendix I. Appendix A has been modified to include Nootkamegwanning First Nation, Anishinaabeg of Naongashiing First Nation and Ojibways of Onigaming First Nation in commitments 167,175, 194 and 195. Section 10 and Appendix A: Part 1 include a general statement to engage Aboriginal groups on the development and implementation of all monitoring plans, which includes monitoring contaminant levels in country foods, and water monitoring programs. This information is included in section 10 and Appendix A:

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Naothamegwaning First Nation, Ojibways of Onigaming First Nation, Member of the public	<p>Whip-poor-will in the Agency's analysis and conclusions for species at risk.</p> <ul style="list-style-type: none"> • Comment regarding ongoing water quality monitoring. 	<p>Part 1.</p> <ul style="list-style-type: none"> • The proponent has committed to implement a water management plan that will include regular sampling and dipping of dedicated monitoring wells to identify any impacts to groundwater in the vicinity of the zone of influence from the open pit and rectify any impacts to water availability for well owners. The proponent will also monitor water quality downstream and at the project site, including installing and maintaining monitoring stations, monitoring runoff and seepage related to tailings and stockpiles, to confirm that effluent meets Ministry of the Environment and Climate Change site-specific criteria and <i>Metal Mining Effluent Regulations</i>. Additional information is provided in Appendices A: Part 2 and Appendix I.
Traditional Knowledge		
Rainy River First Nation, Naothamegwaning First Nation	<ul style="list-style-type: none"> • How was traditional knowledge collected and incorporated into the EA? Did the Agency receive the comments from Dillon Consulting and the joint technical review? 	<ul style="list-style-type: none"> • As described in section 4.1.2, Dillon Consulting completed a technical review on behalf of several Aboriginal groups, including collection of knowledge. Big Grassy River First Nation and the Métis Nation of Ontario Region 1 completed their own Traditional Knowledge and Traditional Land Use studies. The results from both the technical review and the Traditional Knowledge and Traditional Land Use studies were considered by the Agency during preparation of the EA report.
Consultation		
Naothamegwaning First Nation	<ul style="list-style-type: none"> • Were proponent Aboriginal engagement activities monitored? • 	<ul style="list-style-type: none"> • During the EA process, the Agency, on behalf of the Crown, is responsible for fulfilling the duty to consult and conducts its own consultations with potentially impacted Aboriginal groups. As part of the EA, the Agency instructed the proponent to record engagement activities and information on potential impacts of the Project on potential or

Group	Comment	Agency Response (all section listings refer to the EA Report unless otherwise noted)
<p>Naotkamegwanning First Nation</p> <p>Anishinaabeg of Naongashiing First Nation</p>	<ul style="list-style-type: none"> • Comment about Aboriginal consultation completed on the Mine Closure Plan, and level of detail previously provided to elders regarding water quality by the proponent and Ministry of Northern Development and Mines . Identify that the proponent and Ontario must ensure that responses provided to all parties, including First Nations, are complete and consistent. • Comment about involvement of Aboriginal communities throughout all phases of the Project implementation. 	<p>established Aboriginal and Treaty rights. The Agency reviewed the information collected by the proponent as part of the preparation of the EA report. If the Project proceeds, the Agency will monitor that the proponent follows any commitments they have made to engage Aboriginal groups that are identified in the conditions.</p> <ul style="list-style-type: none"> • The comment is noted and forwarded to the provincial Crown and the proponent to consider and respond appropriately. • The proponent has committed to continue Aboriginal consultation through the follow-up monitoring program, including all phases of the Project implementation (construction, operation, decommissioning, and abandonment). Further information about consultation commitments is detailed in section 10 and Appendix A: Part 1 and Part 2.
Impacts on Potential and Established Aboriginal and Treaty Rights		
<p>Naotkamegwanning First Nation</p>	<ul style="list-style-type: none"> • Comment about language in section 9 stating there are no impacts on Aboriginal rights. 	<ul style="list-style-type: none"> • Section 9 details the impacts to potential or established Aboriginal or Treaty rights in the project area. In its analysis, the Agency considered general project concerns and impacts to valued components, including, impacts to potential or established Aboriginal or Treaty rights; areas used and resources important to exercise rights, cultural sites and heritage resources, cultural, spiritual and

Group	Comment	Agency Response (all section listings refer to the EA Report unless otherwise noted)
Naotkamegwanning First Nation	<ul style="list-style-type: none"> The EA report and the relevant permit applications and authorizations should be sensitive to the terms of Treaty 3 and <i>Manito Aki Inakoniagaawin</i>. Permit approvals must acknowledge that consultation and accommodation of Aboriginal and Treaty rights will be ongoing throughout the permitting stages. No conclusion should state that potential impacts of the Project have already been accommodated unless consultation with First Nations about the Project and the technical details that will be delivered in the various permitting processes have been completed. 	<p>archeological sites, artifacts, and exercise of traditional cultural practices. Access to traditional areas for hunting, trapping, fishing, and harvesting; impacts to plant and animal species for hunting, trapping, fishing, harvesting; and impacts to the health of Aboriginal peoples, including, dust, noise, air and water quality, and contamination of country foods were considered. The Agency also considered post-EA activities, mine closure plans, land restoration, and consultation during the regulatory phase. The accommodation measures that are expected to mitigate and avoid impacts are identified throughout the EA report and are summarized in Appendix A. In consideration of these measures, the Agency is satisfied that the potential impacts to potential or established Aboriginal or Treaty rights have been adequately identified and appropriately accommodated.</p> <ul style="list-style-type: none"> The Agency has consulted and considered impacts and accommodation for Aboriginal groups, with respect to Treaty 3. The Agency has considered <i>Manito Aki Inakoniagaawin</i> to the extent possible. The Agency has concluded that the Project as a whole is not likely to cause significant adverse environmental effects, taking into account the implementation of the key mitigation measures described in the EA report. The Agency notes that consultation will continue post-EA with regulatory authorities and has passed the comment on to relevant departments and ministries.
Federal Species at Risk – [Effects identified under Section 79(2) of the <i>Species at Risk Act</i>]		

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<p>Environment Canada</p> <p>Naotkamegwanning First Nation</p>	<ul style="list-style-type: none"> Identified that section 7.9.5 should include all species at risk mitigation measures, not just those relating to the Snapping Turtle. The proponent made several errors in the identification and categorization of species at risk potentially affected by the Project, including Snapping Turtle, Lake Sturgeon, and Silver Haired Bat. Monitoring plans should be developed in consultation with Naotkamegwanning First Nation. 	<ul style="list-style-type: none"> The following modification has been integrated into section 7.9.5: The Agency has identified the following key mitigation measures as required to prevent significant adverse effects on species at risk: Consider species at risk habitat needs when restoring habitat. Additional mitigation measures for species at risk that are migratory birds are described in section 7.2. Additional mitigation measures for species at risk that are reptiles are described in section 7.7. The assessment of potential effects to federal species at risk completed by the Agency is provided in section 7.9. It includes the Snapping Turtle and Lake Sturgeon. Silver Haired Bat is not listed under the <i>Species at Risk Act</i>. Section 7.3.6 states the proponent has committed to continue engagement with Aboriginal groups throughout the Project, including with respect to Traditional Knowledge and Traditional Land Use studies and the development and implementation of a follow-up monitoring program.
Other comments		
<p>Naotkamegwanning First Nation</p> <p>Couchiching First Nation</p>	<ul style="list-style-type: none"> Aboriginal communities are also dealing with other issues (e.g., addiction issues, lack of capital to implement training programs). Could the different federal and provincial authorities be grouped based on jurisdiction? 	<ul style="list-style-type: none"> The Agency acknowledges the comment and has forwarded this comment to the Ministry of the Environment and Climate Change. The provincial EA considers socio-economic conditions that are not directly linked to a change to the environment. The federal EA only considers socio-economic issues that are directly linked to a change to the environment. The federal authorities mentioned are Environment Canada, Fisheries and Oceans Canada, Health Canada, Natural Resources Canada, Transport Canada and Foreign Affairs and Development Canada. The provincial authorities included in the report are the Ministry of the Environment and Climate Change, Ministry of Northern Development and Mines, Ministry of Natural Resources and Forestry, Ministry of Transportation and the Ministry of Tourism, Culture, and Sport. Involvement of other agencies is

Group	Comment	Agency Response (all section listings refer to the EA Report unless otherwise noted)
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