



Canadian Environmental
Assessment Agency

Agence canadienne
d'évaluation environnementale

Tazi Twé Hydroelectric Project

Environmental Assessment Report



July 2015

Canada

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Projet hydroélectrique Tazi Twé

Executive Summary

Saskatchewan Power Corporation (the proponent) is proposing the construction, operation, decommissioning, and abandonment of a 50 megawatt water diversion type electrical generation station on the Black Lake Denesuline First Nation reserve land Chicken 224, approximately seven kilometers northeast of the community of Black Lake in northern Saskatchewan. The Tazi Twé Hydroelectric Project (the Project) would consist of an all-season gravel access road and a bridge over the Fond du Lac River; a powerhouse with a maximum capacity of 50 megawatts; a water intake and power tunnel that will divert water from Black Lake to the powerhouse; a tailrace channel to return diverted flows to the Fond du Lac River just upstream of Middle Lake; a submerged weir in the Fond du Lac River at the outlet of Black Lake; and associated site infrastructure. Black Lake Denesuline First Nation has agreed in principle to a limited partnership with the proponent at the operational phase of the Project, which would give it a 30 percent interest in the Project.

The Canadian Environmental Assessment Agency (the Agency) conducted a federal environmental assessment (EA) of the Project in accordance with the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). The Project is subject to CEAA 2012 because it is described in the *Regulations Designating Physical Activities* as follows:

The construction, operation, decommissioning and abandonment of a new structure for the diversion of 10 000 000 cubic meters per year of water from a natural water body into another natural water body.

The Project was also subject to a provincial EA under Saskatchewan's *Environmental Assessment Act*. The Agency and the Saskatchewan Ministry of Environment conducted the EAs in cooperation to the fullest extent possible pursuant to the Canada-Saskatchewan Agreement on Environmental Assessment Cooperation (2005). The Project may require authorizations under the *Fisheries Act*, *Navigation Protection Act*, *Explosives Act*, and a lease and project approval to occupy and use federal lands administered by Aboriginal Affairs and Northern Development Canada.

This EA Report provides a summary of the information presented and gathered during the EA and the main findings. The Agency prepared this report in consultation with Aboriginal Affairs and Northern Development Canada, Fisheries and Oceans Canada, Environment Canada, Health Canada, Natural Resources Canada, and Transport Canada following a technical review of the proponent's Environmental Impact Statement and an evaluation of the potential environmental effects of the Project.

The EA focused on the following valued components that are considered to be within federal jurisdiction as described in subsection 5(1) of CEAA 2012, or are related to the exercise of the federal authorizations noted above as described in subsection 5(2). The following is a list of valued components included in the evaluation:

- Fish and fish habitat.
- Migratory birds.

- Terrestrial wildlife and vegetation.
- Current use of lands and resources for traditional purposes.
- Health and socio economic conditions of Aboriginal communities.
- Physical and cultural heritage and any structure, site or thing that is of historical, archaeological, paleontological or architectural significance for Aboriginal communities.

The Agency assessed the potential for the Project to cause significant adverse effects on the valued components based on the proponent's information, federal department expertise, and comments provided by Aboriginal communities and the public. Issues raised include potential effects on terrestrial and aquatic environments (fish, wildlife, vegetation) and potential interference with fishing, hunting and gathering (including for traditional food, social, or ceremonial purposes by Aboriginal peoples).

For construction and operation, the Agency focused its analysis on the following adverse environmental effects in relation to section 5 of CEEA 2012:

- Effects on fish and fish habitat as a result of the direct loss or alteration of fish habitat from construction activities, hydrological changes and loss of habitat in the Fond du Lac River, entrainment and impingement of fish in the power tunnel and generating facility, and changes to surface water quality in the Fond du Lac River.
- Effects on wildlife habitat, including migratory birds and species at risk habitat, as a result of direct habitat loss, alteration, or fragmentation from construction activities and associated sensory disturbance.
- Effects on wildlife as a result of direct injury or mortality from vehicle collisions and construction activities.
- Effects on vegetation as a result of the loss and alteration of wetlands and plant communities with the potential to contain listed plants and traditional use plants.
- Effects on aboriginal peoples' health and socio-economic conditions as a result of the reduced ability to access traditional foods, and to undertake commercial fishing and commercial trapping due to effects from construction and operation on fish and fish habitat, wildlife, and vegetation.
- Effects on aboriginal peoples' current use of lands and resources as a result of impacts to fish and fish habitat, wildlife and vegetation, and loss or changes in access to lands used for traditional purposes; and effects on physical and cultural heritage from physical and sensory disturbances.

The proponent's project plan and design incorporates mitigation measures to prevent or reduce the adverse effects of the Project, and follow-up programs to verify the effectiveness of the mitigation measures. These include standard mitigation measures, compliance with regulatory standards, and best management practices for the construction and operation of a power generation facility, such as the use of a two-turbine Kaplan style generator to reduce mortality of entrained fish, and the implementation of a monitoring program to ensure that the mortality rates of entrained fish do not exceed those predicted in the environmental assessment.

The Project's potential effects on potential or established Aboriginal or Treaty rights were also examined. Aboriginal groups raised key concerns about the effects of the Project on the exercise of their rights and related interests, including hunting, fishing, trapping, plant gathering, as well as physical and cultural heritage aspects. The Agency believes that the recommended mitigation measures in relation to potential environmental effects on fish and fish habitat, wildlife, and vegetation are appropriate accommodation for potential impacts on rights.

The Minister of the Environment accepted the Agency's conclusion that the Tazi Twé Hydroelectric Project is not likely to cause significant adverse environmental effects, taking into account the implementation of key mitigation measures. The conditions she established in her decision statement take into account the key mitigation measures and follow-up program requirements identified by the Agency.

Table of Contents

Executive Summary	3
Table of Contents	vi
List of Tables	ix
List of Figures	x
List of Abbreviations and Acronyms	xi
Glossary	xii
1 Introduction	1
1.1 Purpose of the Environmental Assessment Report.....	1
1.2 Scope of Environmental Assessment	1
1.2.1 <i>Environmental assessment requirements</i>	1
1.2.2 <i>Factors considered in the environmental assessment</i>	2
1.2.3 <i>Selection of valued components</i>	3
1.2.4 <i>Spatial and temporal boundaries</i>	5
2 Project Overview	10
2.1 Project Location.....	10
2.2 Project Components.....	10
2.3 Project Activities.....	13
3 Purpose of Project and Alternative Means	15
3.1 Purpose of Project	15
3.2 Alternative Means of Carrying Out the Project.....	15
3.3 Agency analysis and conclusion.....	18
4 Consultation Activities and Advice Received	19
4.1 Public Participation.....	19
4.1.1 <i>Public participation led by the Agency</i>	19
4.1.2 <i>Public participation activities by the Proponent</i>	20
4.2 Aboriginal Consultation	20
4.2.1 <i>Aboriginal consultation led by the Agency</i>	20
4.2.2 <i>Aboriginal consultation and engagement activities organized by the proponent</i>	21
4.3 Participation of Federal and Other Experts.....	22
5 Geographical Setting	23
5.1 Biophysical Environment	23
5.2 Human Environment	25
6 Predicted Effects on Valued Components	27
6.1 Fish and Fish Habitat	27

6.1.1	<i>Proponent’s assessment of environmental effects</i>	27
6.1.2	<i>Views expressed</i>	34
6.1.3	<i>Agency analysis and conclusion</i>	35
6.2	Wildlife	38
6.2.1	<i>Proponent’s assessment of environmental effects</i>	38
6.2.2	<i>Views expressed</i>	45
6.2.3	<i>Agency analysis and conclusion</i>	46
6.3	Vegetation	49
6.3.1	<i>Proponent’s assessment of environmental effects</i>	49
6.3.2	<i>Views expressed</i>	53
6.3.3	<i>Agency analysis and conclusion</i>	53
6.4	Aboriginal Groups – Health and Socio-Economic Conditions	55
6.4.1	<i>Proponent’s assessment of environmental effects</i>	55
6.4.2	<i>Views expressed</i>	57
6.4.3	<i>Agency analysis and conclusion</i>	57
6.5	Aboriginal Groups – Effects to Current Use of Land and Resources and to Physical and Cultural Heritage	59
6.5.1	<i>Proponent’s assessment of environmental effects</i>	59
6.5.2	<i>Views expressed</i>	64
6.5.3	<i>Agency analysis and conclusion</i>	66
7	Other Effects Considered	68
7.1	Effects of Accidents and Malfunctions	68
7.1.1	<i>Proponent’s assessment of environmental effects</i>	69
7.1.2	<i>Views expressed</i>	71
7.1.3	<i>Agency analysis and conclusion</i>	72
7.2	Effects of the Environment on the Project	74
7.2.1	<i>Proponent’s assessment of environmental effects</i>	74
7.2.2	<i>Agency analysis and conclusion</i>	74
7.3	Cumulative Environmental Effects	76
7.3.1	<i>Approach and scope</i>	76
7.3.2	<i>Proponent’s assessment of cumulative environmental effects</i>	78
7.3.3	<i>Views expressed</i>	79
7.3.4	<i>Agency Analysis and conclusion</i>	79
8	Impacts on Potential or Established Aboriginal or Treaty Rights	80
8.1	Potential or Established Aboriginal or Treaty Rights in the Project Area	80
8.2	Potential Adverse Impacts of the Project on Potential or Established Aboriginal or Treaty Rights	80
8.3	Proposed Accommodation Measures	82
8.4	Issues Outside the Scope of the Environmental Assessment	83
8.5	Issues to be Addressed During the Regulatory Approval Phase	84
8.6	Agency Views Regarding Impacts to Aboriginal Rights	86

9	Conclusions and Recommendations of the Agency	87
10	References	88
11	Appendices	89
	Appendix A Proponent’s Environmental Effects Rating Criteria	89
	Appendix B Summary of Environmental Effects Assessment	93
	Appendix C List of Key Mitigation Measures, Monitoring and Follow-Up Considered by the Agency	95
	Appendix D Proponent Commitments as presented in the Environmental Impact Statement.....	101
	Appendix E Summary of Monitoring Programs and Other Follow-Up Activities proposed by the proponent	105
	Appendix F Summary of Aboriginal Consultations	107
	Appendix G Summary of Key Comments Received on the Draft Environmental Assessment Report	130

List of Tables

Table 1 Agency’s selection of valued components4

Table 2 Local and Regional Study Areas by Valued Component.....5

Table 3 Public and Aboriginal Comment Opportunities during the Federal EA19

Table 4 Predicted changes to Arctic grayling habitat in the Fond du Lac River between Black Lake and Middle Lake.....30

Table 5 Disturbance, during construction, to ungulate preferred habitat types within the regional study area.....39

Table 6 Disturbance, during construction, to furbearer preferred habitat types within the regional study area.....40

Table 7 Disturbance, during construction, to migratory bird preferred habitat types within the regional study area.....42

Table 8 Disturbance, during construction, to plant communities with listed plant potential within the local and regional study area.49

Table 9 Disturbance, during construction, to plant communities with traditional use plant potential within the local and regional study area.....50

Table 10 Disturbance, during operations and at closure, to plant communities with listed plant potential within the local and regional study area.....51

Table 11 Disturbance, during operations and at closure, to plant communities with traditional use plant potential within the local and regional study area.51

Table 12 Proponents Accidents and Malfunctions Risk Summary.....68

Table 13 Summary of past, existing, and reasonably foreseeable developments or activities identified by the proponent as having the potential to overlap or interact with project effects.....76

List of Figures

Figure 1 **Project Location8**

Figure 2 **Project site plan and components.....12**

Figure 3 **Bypassed Section of the Fond du Lac River28**

Figure 4 **Area between Fir Island and the North Shore of Black Lake32**

Figure 5 **Location of fur blocks N-24 and N-80 in relation to the Project Area56**

Figure 6 **Portage Routes between Middle Lake and Black Lake.....62**

List of Abbreviations and Acronyms

Abbreviation/Acronym	Definition
CEAA 2012	Canadian Environmental Assessment Act, 2012
the Agency	Canadian Environmental Assessment Agency
EA	environmental assessment
EIS	environmental impact statement
EA Report	environmental assessment report
the proponent	Saskatchewan Power Corporation
the Project	Tazi Twé Hydroelectric Project

Glossary

Term	Definition
pH	pH is the negative log of the activity of the hydrogen ion in an aqueous solution. Solutions with a pH less than 7 are said to be acidic and solutions with a pH greater than 7 are basic or alkaline. Pure water has a pH of 7.
Anchor Ice	Ice formed below the surface of a body of water (such as a stream or lake) and attached or anchored to the bottom or to submerged objects.
Frazil Ice	Soft or amorphous ice formed by the accumulation of ice crystals in water that is too turbulent to freeze solid.

1 Introduction

1.1 Purpose of the Environmental Assessment Report

Saskatchewan Power Corporation (the proponent) is proposing the construction, operation, decommissioning, and abandonment of a 50 megawatt water diversion type electrical generation station (the Project). The Project would be located on Black Lake Denesuline First Nation reserve land Chicken 224 adjacent to the Fond du Lac River between Black Lake and Middle Lake in northern Saskatchewan, approximately seven kilometers northeast of the community of Black Lake (Figure 1). A water intake structure and power tunnel will divert water from Black Lake through the powerhouse, and discharge it into the Fond du Lac River through a tailrace channel. The predicted cost for the proposed Project is approximately \$500 million. Black Lake Denesuline First Nation has agreed in principle to a limited partnership with the proponent at the operational phase of the Project, which would give it a 30 percent interest in the Project.

The purpose of the Environmental Assessment Report (EA Report) is to provide a summary of information and analysis considered by the Canadian Environmental Assessment Agency (the Agency) in reaching its conclusion on whether the Project is likely to cause significant adverse environmental effects, after taking into account the proposed mitigation measures.

1.2 Scope of Environmental Assessment

1.2.1 *Environmental assessment requirements*

Based on the Project Description submitted by the proponent, the Agency initiated a screening of the designated Project to determine if an environmental assessment (EA) was required under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012). On January 14, 2013, the Agency invited the public to provide comments on the designated Project and its potential effects on the environment. The Agency determined that an EA was required on February 28, 2013 and as a result, an EA was commenced on March 01, 2013.

Requirements of CEAA 2012

CEAA 2012 applies to projects described in the *Regulations Designating Physical Activities* (the Regulations) or to physical activities designated by the Minister of the Environment.

The Project is subject to a federal EA as it exceeds the following threshold of the Regulations under CEAA 2012:

- Section 6. The construction, operation, decommissioning and abandonment of a new structure for the diversion of 10 000 000 cubic meters per year of water from a natural water body into another natural water body.

Cooperative environmental assessment requirements

The Project is subject to a provincial EA under Saskatchewan's *Environmental Assessment Act*. The Agency and the Saskatchewan Ministry of Environment conducted the EAs in cooperation to the fullest extent possible pursuant to the Canada-Saskatchewan agreement on Environmental Assessment Cooperation (2005). This cooperative approach avoided unnecessary duplication of effort by all parties.

1.2.2 Factors considered in the environmental assessment

The following factors are required to be considered as part of the EA pursuant to subsection 19(1) of CEEA 2012:

- the environmental effects of the Project, including the environmental effects of malfunctions or accidents that may occur in connection with the Project and any cumulative environmental effects 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 effects;
- comments from the public;
- mitigation measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project;
- the requirements of the follow-up program in respect of the Project;
- the purpose of the Project;
- alternative means of carrying out the Project that are technically and economically feasible and the environmental effects of any such alternative means; and
- any change to the Project that may be caused by the environment.

In addition to public comments, the Agency considered comments from Aboriginal groups, as well as local and Aboriginal traditional knowledge during its assessment.

1.2.3 Selection of valued components

As required by section 5 of CEAA 2012, the EA considered the significance of the Project's potential adverse effects on the following components within federal jurisdiction:

- Fish and fish habitat.
- Migratory birds.
- Federal lands.
- Effects that impact Aboriginal communities – health and socio economic conditions, physical and cultural heritage, current use of lands and resources for traditional purposes, and any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

The following decisions under other federal legislation may also be required prior to the Project being able to proceed:

- An authorization under paragraph 35(2)(b) of the *Fisheries Act* for the serious harm to fish that are part of a commercial, recreational, or Aboriginal fishery, or to fish that support such a fishery;
- Approvals under the *Navigation Protection Act* for works that impact navigation;
- A license under paragraph 7(1)(a) of the *Explosives Act* for the storage of explosives; and
- A lease and Project approval to occupy and use federal lands administered by Aboriginal Affairs and Northern Development Canada.

Therefore, in accordance with subsection 5(2) of CEAA 2012, the EA considered changes to the environment that could result from these decisions as well as any associated effects on health, socio-economic conditions, matters of historical, archaeological, paleontological or architectural interest, or on physical or cultural heritage.

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

The proponent selected the valued components based on the key interactions between the Project and various components of the biophysical and socio-economic environments and their subsequent effect on the environment considering the temporal and spatial scope of the Project. The selection of valued components was also informed by the predicted Project-environmental interactions, data from environmental and socio-economic baseline studies, feedback received from the public and Aboriginal groups, and discussions with federal and provincial authorities.

The Agency considered the proponent's selected valued components and the significance of the Project's potential adverse environmental effects on components within federal jurisdiction and selected the valued components outlined in Table 1 for consideration in the EA Report.

Table 1 Agency's selection of valued components

Valued Component	Rationale
Effects identified pursuant to subsection 5(1) of CEAA 2012	
Fish and Fish Habitat	Changes to water quantity of Fond du Lac River may affect fish and fish habitat. Construction and operation of the water intake structure and turbines for the Project may affect fish by increasing fish mortality.
Migratory Birds	Project construction and operation may affect migratory bird mortality and behavior due to sensory disturbances and habitat loss.
Terrestrial Wildlife (including Species at Risk)	Project construction and operation may affect wildlife and wildlife habitat on federal lands including caribou, moose, and furbearers due to direct loss, alteration or fragmentation of vegetation and sensory disturbance.
Vegetation	Project construction and operation may affect vegetation on federal lands that are traditionally harvested by Aboriginal people and that provide food and habitat for wildlife that are traditionally hunted and trapped by Aboriginal people. Project construction and operation may affect rare plant communities on federal lands.
Health and socio-economic conditions of Aboriginal peoples	Project construction and operation may affect air, water, fish and country foods which may affect the health and wellbeing of local Aboriginal peoples.
Current use of lands and resources for traditional purposes by Aboriginal peoples	Project construction and operation may affect several fish, plant, and wildlife species used by local Aboriginal people for hunting, trapping, fishing, and gathering for domestic and commercial use. Project construction and operation will disturb lands and resources which are currently used by Aboriginal people for traditional purposes.
Physical and cultural heritage of Aboriginal peoples (including any structure, site or thing that is of historical, archaeological, paleontological or architectural significance for Aboriginal people)	Project construction and operation may affect heritage and cultural resources or sites that have historical, archaeological, paleontological or architectural significance to Aboriginal peoples.
Effects identified pursuant to subsection 5(2) of CEAA 2012	
No additional effects identified	
Effects identified pursuant to subsection 79(2) of the <i>Species at Risk Act</i>	
Species at risk	Effects on specific species listed under the <i>Species at Risk Act</i> .

1.2.4 Spatial and temporal boundaries

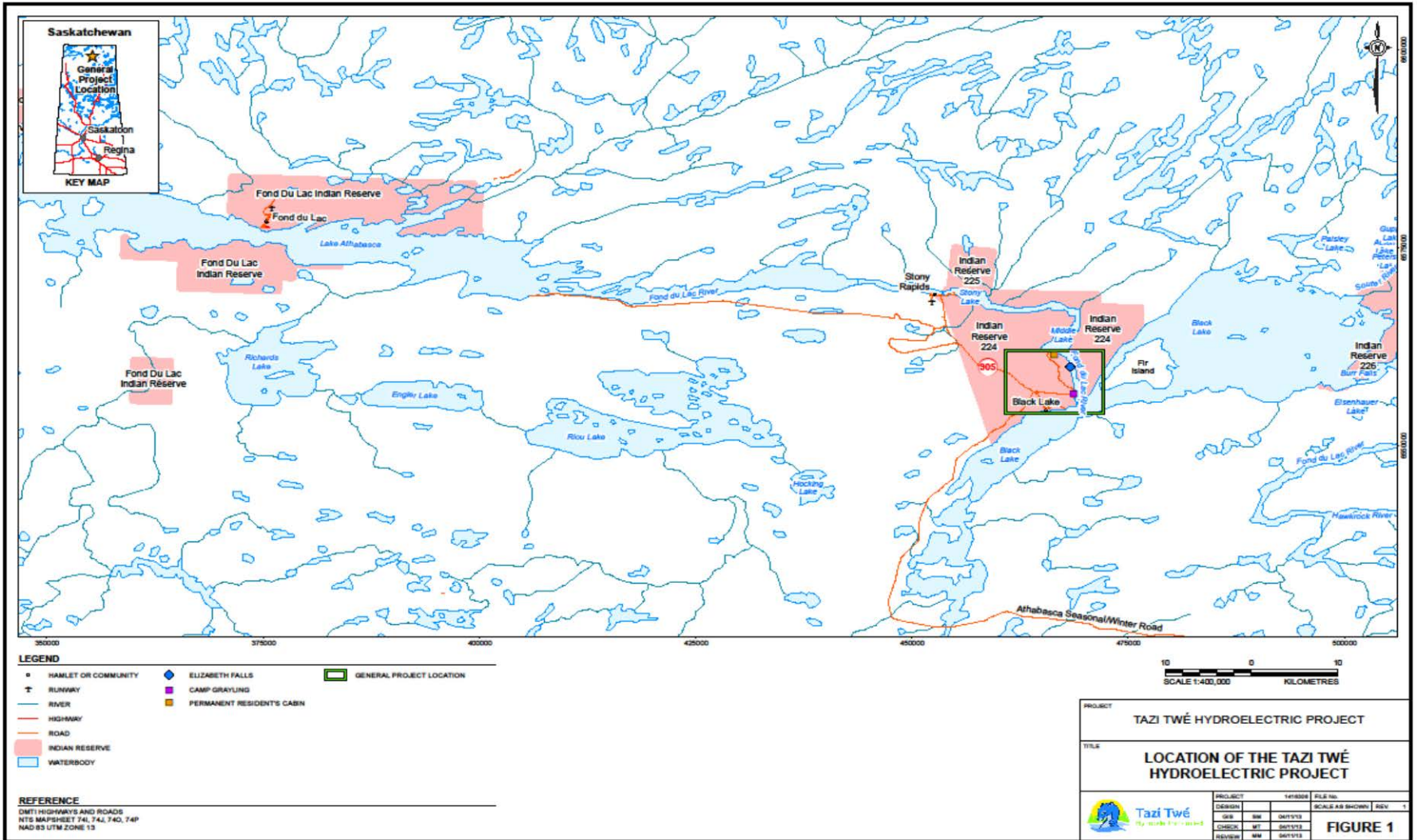
The proponent defined spatial boundaries as the geographical extent within which the environment can be reasonably predicted to be affected by the Project. The local study areas (spatial boundaries) were designed to measure baseline environmental conditions and to assess direct effects on each valued component. The regional study areas (spatial boundaries) were designed to measure the baseline conditions at a larger scale to assess the maximum predicted geographic extent of direct and indirect effects on each valued component. The Agency agreed with the proponent’s definition for spatial boundaries and used them in this EA Report. Table 2 summarizes the local study areas and the regional study areas identified by the proponent for each valued component.

Table 2 Local and Regional Study Areas by Valued Component

Valued Component	Local Study Area	Regional Study Area
Fish and Fish Habitat	Includes Black Lake, Fond du Lac River and Middle Lake Also includes project footprint and its associated downstream areas (approximately 9000 hectares)	Includes Black Lake, Fond du Lac River, Middle Lake, Stony Lake and narrower section of Lake Athabasca to the Community of Fond du Lac
Wildlife	8881 hectares - The LSA includes the project infrastructure and the main access road and was based on the predicted direct and small-scale indirect effects from the Project on the terrestrial environment.	115 600 hectares– the RSA was selected based on the predicted spatial extent of the combined direct and indirect effects on wildlife, and is predicted to be large enough to assess the ecologically relevant effects on wildlife populations from the Project.
Vegetation	8881 hectares - The LSA includes the project infrastructure and the main access road and was based on the predicted direct and small-scale indirect effects from the Project on the terrestrial environment.	115 600 hectares – the RSA was selected based on the predicted spatial extent of the combined direct and indirect effects on vegetation, and is expected to include most of the individuals that comprise local plant populations.
Aboriginal Peoples – Current Use of Lands and Resources and Physical and Cultural Heritage (including Any structure, site or thing that is of historical, archaeological, paleontological or architectural significance for Aboriginal people)	Communities of Black Lake and Stony Rapids, Black Lake, Fond du Lac River, Middle Lake, and Stony Lake	Athabasca region of northern Saskatchewan
Aboriginal Peoples – Health and Socio-Economic Conditions	Communities of Black Lake and Stony Rapids	Communities of Black Lake and Stony Rapids managed by Athabasca Health Authority

The proponent defined the temporal boundaries based on the timing and duration of project activities that could potentially 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 (2016 to 2019 - approximately 3 years), operation (2019 to approximately 2109 - 90 years), and decommissioning and abandonment (approximately 2 years) phases of the Project. The Agency has determined that the temporal boundaries applied by the proponent are adequate for the purposes of assessing the potential environmental effects of the Project.

Figure 1 Project Location



Source: Golder Associates: February 2014. Tazi Twe Hydroelectric Project Environmental Impact Statement (EIS)

The Agency reviewed the EIS, additional information requested, public and Aboriginal comments received, and considered the views of federal and other experts. To determine the significance of residual effects on valued components, the Agency adopted the assessment criteria proposed by the proponent for direction, magnitude, geographic extent, duration, reversibility, frequency, and likelihood. These assessment criteria are defined in the following manner:

- **Direction:** indicates whether the effect on a valued component is negative or positive.
- **Magnitude:** a quantitative or qualitative measure of the intensity of an effect or the degree of change caused by the Project. It is classified as negligible to low, moderate, and high.
- **Geographic Extent:** the spatial extent over which an effect will occur. It is categorized into three scales: local, regional, and beyond regional.
- **Duration:** the period of time over which an effect will occur and expressed in the amount of time from the beginning of the effect to when the effect is reversed. It is categorized into four scales: short-term, medium-term, long-term and permanent.
- **Reversibility:** the degree to which the effect can or will be reversed. It has two scales: reversible or irreversible.
- **Frequency:** how often an effect will occur within a given time period and has three scales: isolated, periodic and continuous.
- **Likelihood:** the probability of the effect occurring. It has four categories: unlikely, possible, likely, and highly likely.

Appendix B summarizes the Project's residual effects, using the proponent's assessment criteria, for valued components discussed in this Report. The proponent assessed the significance of residual effects based on whether the predicted effect had sufficient magnitude, duration, and geographic extent to cause fundamental changes to population and/or community processes and properties. The Agency accepted and used the proponents' methodology to determine the significance of each residual project-related environmental effect.

2 Project Overview

2.1 Project Location

The Project is to be located adjacent to the Fond du Lac River on the Black Lake Denesuline First Nation reserve land Chicken 224 between Black Lake and Middle Lake in northern Saskatchewan, approximately 7 kilometres northeast of the community of Black Lake, Figure 1.

2.2 Project Components

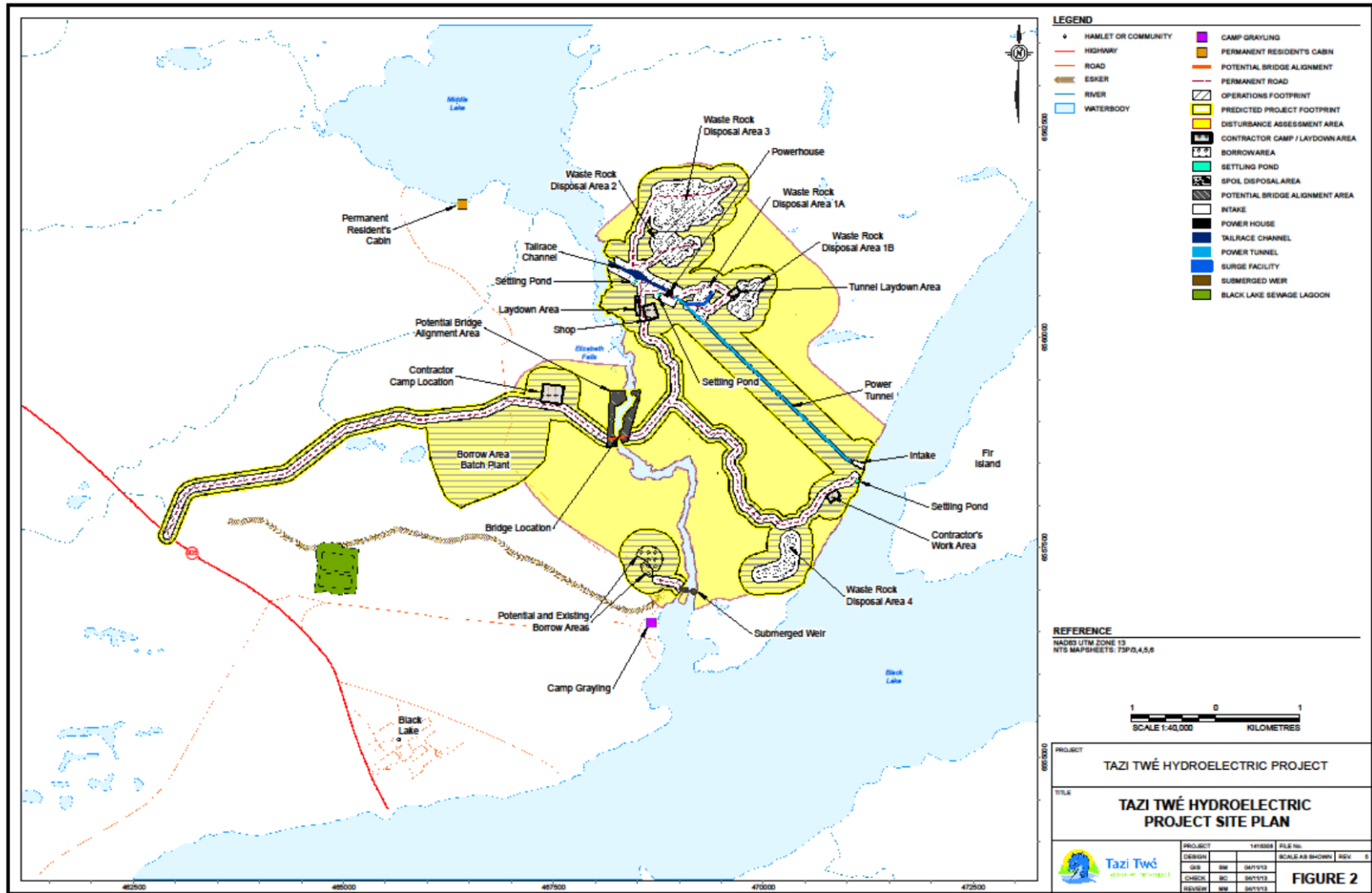
The Project is comprised of the following components (Figure 2):

- **All-season gravel access roads:** All-season gravel access roads (approximately 11.5 kilometers) will be constructed to provide access to the project area from Highway 905.
- **Bridge:** A bridge will be constructed over the Fond du Lac River located approximately two to three kilometers downstream of Grayling Island.
- **Powerhouse and associated infrastructure:** A powerhouse with a maximum capacity of 50 megawatt with two turbine generator units will be constructed at the end of the power tunnel.
- **Water intake and power tunnel:** The water intake and power tunnel will divert water from Black Lake to the powerhouse.
- **Tailrace channel:** The tailrace channel will extend from the powerhouse to a location on the Fond du Lac River that is upstream approximately 0.8 kilometers of Middle Lake.
- **Submerged weir:** A submerged weir will be placed in the Fond du Lac River at the outlet of Black Lake near Grayling Island to maintain flow and water levels in Black Lake during project operation.
- **Settling ponds:** Three settling ponds located near the water intake, powerhouse, and the downstream end of the tailrace channel, respectively, will be constructed to temporarily store and treat (if needed) waste rock runoff and groundwater collected during the construction of the power tunnel and tailrace channel. Each settling pond will have a volume of approximately 650 cubic metres and would be able to accommodate about 3300 cubic meters of wastewater per day. A surface water collection system (primarily berms and ditches) will direct the waste rock runoff to the settling ponds.
- **Waste rock disposal areas:** There are five waste rock disposal locations that will be designed to contain or dispose approximately 118 000 cubic meters of overburden and 1 074 000 cubic meters of waste rock (total 1 192 000 cubic meters).
- **Construction camp:** A temporary construction camp will be built approximately 0.75 kilometers northwest of the proposed bridge location to accommodate 250 workers during the project construction.
- **Granular borrow sources:** Two areas that are proposed as potential sources of concrete aggregates include an existing source 0.6 kilometers from Camp Grayling and a new source west of the project bridge.

- **All related physical works:** Related physical works will include: the associated cofferdams, laydown areas, borrow areas, concrete batch plant, fuel storage facility and fueling areas, explosives storage, and sewage treatment and potable water facilities.

In addition to the above project components, there will be new transmission lines to connect the power house to the northern Saskatchewan electrical grid. The new transmission lines are not included as a part of the Project as they will be proposed, designed, and constructed by a third party.

Figure 2 Project site plan and components



Source: Golder Associates: February 2014. Tazi Twé Hydroelectric Project EIS Report

2.3 Project Activities

Project Construction - 2016 to 2019 (Approximately 3 years)

- Procurement and delivery of construction materials to the site.
- Site clearing activities.
- Development of borrow areas.
- Construction of the camp and contractors' work areas.
- Construction of the access roads.
- Construction of a new bridge to provide access to the construction site on the east side of the Fond du Lac River.
- Construction of the water intake structure, the power tunnel from Black Lake, the powerhouse, and a tailrace channel leading into Fond du Lac River.
- Installation of turbines and generators.
- Construction of submerged weir.
- Construction of three settling ponds.
- Creation of five waste rock disposal areas for storing a volume of approximately 1 192 000 cubic meters of overburden and waste rock.

Procurement, off-site fabrication and manufacture, delivery, and installation of the turbines and generators will continue throughout the construction phase.

Soon after the completion of project construction, the camp and temporary work areas no longer required during operation will be decommissioned. Contaminated soil will be removed and disposed of in an approved landfill or waste management facility. Progressive reclamation of camp and borrow sources areas will be initiated.

Project Operation - 2019 to approximately 2109 (90 years)

- Operation of power house and generation station.
- Maintenance of generation station and operation in special or emergency mode.
- Removal, by licensed companies, of hazardous materials (such as waste hydrocarbons, chemicals, glycols, solvents, antifreeze, and batteries) generated during the construction and operation.
- Maintenance of site erosion and sediment controls.
- Operation and maintenance of main bridge and access roads.
- Use of borrow areas and quarries for maintenance.
- Management of fuel and materials.
- Treatment and disposal of domestic sewage.
- Management of site waste water.
- Management of waste rock.

Project Decommissioning and Abandonment - Approximately 2 years

- Clean up, remediation, and disposal of waste material.
- Demolishing of all the buildings to grade.
- Removal of all equipment and materials.
- Backfilling of powerhouse substructure to remain in place below the natural ground elevation.
- Removal of the submerged weir at the outlet of Black Lake.
- Closure and sealing of the two openings of the power tunnel using concrete.
- Backfilling of the tailrace channel and contouring to the natural terrain.
- Restoring of the disturbed landscape to approximately its original contour.

Waste rock disposal areas will remain in place without remediation. Site access roads and the bridge would be left in place unless Black Lake Denesuline First Nation requests their removal.

3 Purpose of Project and Alternative Means

3.1 Purpose of Project

The purpose of the 50 megawatt hydro power project is to supply electrical energy to northern Saskatchewan markets to meet the growing power demand and create economic development and employment opportunities for the Black Lake Denesuline First Nation and other surrounding communities.

3.2 Alternative Means of Carrying Out the Project

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 considering the relative importance of the individual performance objectives listed below:

- Cost-effectiveness
- Technical applicability
- Integrity and reliability of the selected alternative mean
- Effects to the selected valued components
- Feedback from local residents and Aboriginal groups

The EIS identifies alternative means of carrying out the Project with respect to the following project components:

- Water intake
- Power tunnel length
- Methods used and shape of tunnel
- Surge facility
- Power generating capacity
- Turbine selection
- Tailrace channel
- Submerged weir
- Access roads
- Bridge location
- Borrow areas

Water Intake

Two options were considered for the depth of the water intake: shallow water intake (surface to five meters in depth) and deep water intake (greater than five meters in depth). The shallow water intake near the surface of Black Lake was preferred as it will have the same temperature as the water in the Fond du Lac River reducing

water temperature effects on fish and fish habitat. In addition, the shallow water intake would reduce the potential entrainment and impingement of deep water fish species.

Power tunnel length

A number of power tunnel alignments ranging from 2.65 to 3.3 kilometers in length were considered for the Project. A 2.95 kilometers long power tunnel alignment was chosen based on its technical and economic feasibility, which will allow a minimum rock cover of 30 meters in thickness over the majority of the tunnel which is necessary for tunnel stability. The preferred power tunnel alignment of 2.95 kilometers will minimize the overall quantity of waste rock generation.

Methods used and shape of tunnel

Three options for construction methods and power tunnel shapes were considered including a) high horseshoe shaped cross-section (11 meters wide by 10 meters) excavated by drilling and blasting method, b) a circular tunnel excavated by a tunnel-boring machine, and c) an excavated tunnel with a concrete lining. The drill and blast horseshoe shaped power tunnel was selected as the most cost effective construction method and created the best shape for the power tunnel. All three options of construction methods are not predicted to result in significant adverse environmental effects.

Surge facility

Two different designs were considered for the surge facility, one as an inclined tunnel branching off the power tunnel with an opening at an elevation above the level of Black Lake. The alternate design included a raised bore vertical shaft excavated in the rock to the surface, above the level of Black Lake. The inclined tunnel was selected as it also provides access to the power tunnel during construction to remove the waste rock.

Power generating capacity

Single and multiple power generating units were considered for the Project. Although a multiple power generating unit is more costly, it was selected to increase operational flexibility, allow for maintenance of the power supply during planned maintenance outages, and provides better efficiency and control during the low flow conditions.

Turbine selection

Two turbine types including Kaplan (a propeller type turbine with adjustable blades) and Francis (an inward flow turbine with runner blades) were considered for the Project. Selection of the turbine type was based on the equipment performance, costs, and potential implications to fish species. Fish mortality rates reported for Kaplan turbines are generally lower as compared to Francis turbines due to the number of blades and blade spacing. Kaplan turbines were selected for the Project as they are considered more efficient and fish-friendly.

Tailrace channel length and location

Ranges of 600 to 1000 meters in length for the tailrace channel were considered. Preference was given to the tailrace channel length that will reduce the pressure loss, cause a minimal disturbance to the ground, and reduce the cost of excavation. The preferred length of the tailrace is approximately 800 meters based on these criteria.

The options for the location of the tailrace channel considered avoidance of fish spawning locations, limiting human access, and the smooth blending of water flow into the Fond du Lac River. The selection of the location for tailrace channel will be finalized at the time of power tunnel and powerhouse construction to optimize power tunnel and powerhouse arrangement, while considering these criteria.

Submerged weir

Two options were considered to maintain the historical water levels in Black Lake including a submerged weir or a gated concrete structure near the Grayling Island at the outlet of the Black Lake. A submerged weir structure was selected for the Project based on its reduced visual impact, less in-water works and the community of Black Lake's preference to avoid a concrete gated structure at the outlet of Black Lake.

Access roads

Five access road alignments (A, B, B1, B2, and C) were considered for the Project and were discussed with the community of Black Lake.

Alignment A (approximately 13.5 kilometers) is located near residential and cultural facilities, and crosses a fish-bearing stream. Alignment B (approximately 11.5 kilometers) passes through rough terrain which would increase construction costs and crosses a fish-bearing stream. Alignment B2 (approximately 10 kilometers) will possibly intersect the Black Lake sewage lagoon and was not supported by the community as it passes through the area with a high potential to have plant species of heritage importance. Alignment C (approximately 12.5 kilometers) is along an existing road and near a cemetery. Alignment B1 (approximately 11.5 kilometers) was selected as it is the most technically and economically feasible option and was the preferred option of the community of Black Lake as it avoids cultural facilities as well as sensitive habitats.

Bridge location

Two bridge locations were proposed, one in an area close to the location of the proposed weir at the downstream end of Grayling Island and another approximately two to three kilometers downstream of Grayling Island. Both locations were found to have similar technical and economic feasibility. However, based on the preference shown by the community of Black Lake, the location two to three kilometers downstream of Grayling Island was selected for the bridge construction.

Borrow areas

Two main sites were considered as the granular material sources. One is an existing borrow source located 0.6 kilometers from Camp Grayling and the other is a new borrow source located west of the preferred bridge location. Two additional locations will be considered pending further evaluation. These locations include a potential site northeast of the construction camp and at the project site, where granular material will be produced by crushing the excavated rock. However, this last option will be evaluated for cost and suitability after the excavated rock is characterized.

The borrow source selection criteria is based on the aggregate suitability, available volume of aggregate, and haul distance. The existing granular borrow pit 0.6 kilometers from Camp Grayling is the most likely source for concrete aggregates as it reduces the amount of new surface area disturbance.

3.3 Agency analysis and conclusion

The proponent's alternatives assessment considered the cost-effectiveness, technical applicability, integrity, and reliability of the selected alternative means, effects to the selected valued components, and feedback from local residents and Aboriginal groups. The Agency reviewed the assessment conducted by the proponent for selection of project preferred components and is satisfied with the proponent's assessment.

The Agency is also satisfied that the project design responds to concerns and preferences shown by the Aboriginal groups regarding the selection of the weir structure and locations for the access road and the bridge.

Overall, the Agency is satisfied that the proponent has sufficiently assessed alternative means of carrying out the Project for the purposes of assessing the environmental effects of the Project under CEAA 2012.

4 Consultation Activities and Advice Received

The Agency provided four opportunities for the public and Aboriginal groups to participate in the EA process, including an opportunity to comment on:

- The project description summary
- The draft EIS guidelines
- The summary of the proponent's EIS
- The draft EA Report

For the fourth public consultation opportunity, the Agency invited the public and Aboriginal groups to provide comments on the content, conclusions and recommendations set out the draft version of the EA report and on the potential recommended conditions. The Agency offered to meet with Aboriginal groups most affected by the Project. After taking into consideration the comments received from the public and Aboriginal groups, the Agency finalized and submitted the report to the Minister of the Environment.

4.1 Public Participation

4.1.1 *Public participation led by the Agency*

The dates and focus of each public consultation periods that have taken place to inform the Agency's analysis of the Project in reaching its conclusion on whether the Project is likely to cause significant adverse environmental effects, after taking into account the proposed mitigation measures, are outlined in Table 3.

Table 3 Public and Aboriginal Comment Opportunities during the Federal EA

Document or Subject of Consultation	Dates
Project description summary	January 14, 2013 to February 02, 2013
Draft EIS guidelines	March 01, 2013 to March 31, 2013
EIS summary	March 28, 2014 to April 27, 2014
Draft EA Report	May 19, 2015 to June 18, 2015

During these four opportunities, the Agency received 11 comments from the public (Camp Grayling, an individual, and the proponent) describing concerns about the Project and its effects on the environment. The views expressed by Camp Grayling on the project description summary can be found in section 6.1.2 of this Report. Comments on the draft EA Report are summarized in Appendix G.

Notices of these opportunities were posted on the Canadian Environmental Assessment Registry website, and individuals and groups who had expressed an interest in the Project during earlier phases were notified directly.

The Agency supports the public participation in the EA process through its Participant Funding Program. A total of 42 000 dollars were allocated for public (public member, group or organization) participation; however, no applications for public participation funding were received by the Agency.

4.1.2 Public participation activities by the Proponent

Various agencies, organizations, and groups who have an interest in the Project were identified by the proponent as stakeholders. These stakeholders included the Mayor and Council of Northern Hamlet of Stony Rapids, Camp Grayling; Athabasca Health Authority; New North; Northern Labour Market Committee; Athabasca Basin Development; Athabasca Keepers of the Water; Canadian Parks and Wilderness Society, Saskatchewan; Saskatchewan Environmental Society; regional suppliers; local outfitters and resource users; uranium industry; and regional educations and training institutes. Proponent public consultation activities included information sharing, presentations, and key stakeholder meetings.

In addition to community and leadership sessions described in section 4.22 of this Report that invited local residents to attend, the following key stakeholder meetings were held between 2010 and 2013: two community sessions in Stony Rapids, three sessions with the Northern Labour Market Committee, and a meeting with the Athabasca Basin Development Limited Partnership.

4.2 Aboriginal Consultation

4.2.1 Aboriginal consultation led by the Agency

The federal government has a duty to consult Aboriginal groups and where appropriate, to accommodate Aboriginal peoples when its proposed conduct might adversely affect established or potential Aboriginal or treaty rights. The federal government also believes that Aboriginal consultation is an important part of good governance for sound policy development and decision making. In addition to the federal government's broader obligations, CEAA 2012 requires that all EAs consider the effect of any project-related effects on Aboriginal people's 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.

For the purposes of the EA, the Agency served as the Crown Consultation Coordinator to facilitate a whole-of-government approach to consultation. The Saskatchewan Ministry of Environment, Environmental Assessment Branch, is responsible for Aboriginal consultation for the province and delegated the provincial Aboriginal consultation activities to the proponent.

In order to fulfill Crown consultation obligations, the Agency conducted Aboriginal consultation in an integrated manner with the EA process.

The Agency identified the following Aboriginal groups as having potential or established Aboriginal or Treaty rights that could be impacted by the Project:

- Black Lake Denesuline First Nation

- Fond du Lac Denesuline First Nation
- Hatchet Lake Denesuline First Nation
- Métis Local Camsell Portage #79
- Métis Local Stony Rapids # 80
- Métis Local Uranium City # 50

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. Only one identified Aboriginal group, the Hatchet Lake Denesuline First Nation, applied for funding and received 50 000 dollars through this program.

The Agency consulted all Aboriginal groups listed above throughout the EA process using a variety of methods including phone calls, emails, and letters. The Agency requested comments (written or verbal) from these Aboriginal groups on the Project Description summary, the draft EIS Guidelines, the EIS (Table 4.1), the draft EA Report and provided information updates. In addition, the Agency offered to meet with the Aboriginal groups most affected by the Project during the review of the EIS and after the release of the draft EA Report.

During Agency consultation only four identified groups provided comments regarding the Project. Hatchet Lake Denesuline First Nation submitted several written comments to the Agency that focused on the effects of the Project on fish and fish habitat, country foods, its Aboriginal use of lands and resources for traditional purposes, and its Aboriginal rights. The Agency met with Hatchet Lake Denesuline First Nation on September 05, 2014 in Prince Albert, Saskatchewan and discussed its concerns about the effects of the Project. These comments were included by the Agency in its additional information requests to the proponent. The Agency also offered to meet with Hatchet Lake Denesuline First Nation in June 2015 regarding the draft EA report; however, a planned meeting was cancelled by the Hatchet Lake Denesuline First Nation due to scheduled Band elections. Hatchet Lake Denesuline First Nation provided comments on the draft EA Report which are summarized in Appendix G.

Appendix F contains a summary of Aboriginal concerns that were brought to the Agency's attention.

Potential environmental effects on Aboriginal peoples are discussed in section 6.4 "Aboriginal Peoples – Health and Socioeconomic conditions" and section 6.5, "Aboriginal Peoples – Effects to Current Use of Land and Resources and to Physical and Cultural Heritage". Potential adverse impacts on potential or established Aboriginal and treaty rights are outlined in section 8- "Impacts on potential or established Aboriginal or treaty rights".

4.2.2 Aboriginal consultation and engagement activities organized by the proponent

The proponent indicates that it engaged all Aboriginal groups identified by the Agency through meetings, community sessions, and correspondence (letter and email). The proponent arranged several meetings with the leadership of various Aboriginal groups, including three meetings with Black Lake Denesuline First Nation, one meeting with Fond du Lac Denesuline First Nation, one meeting with Hatchet Lake Denesuline First Nation, one meeting with Prince Albert Grand Council, and one meeting with the Cabin owner of Middle Lake. During these

meetings the proponent presented the project details, discussed various issues, and recorded concerns regarding the Project's effects to the environment.

The proponent arranged twelve community sessions between 2010 to 2014; five with the Black Lake Denesuline First Nation, three with the Fond du Lac Denesuline First Nation, and four with the Stony Rapids Métis to reach as many community members as possible.

The community sessions were focused on the technical details of the Project, potential effects of the Project on the surrounding water bodies, waste rock management, and locations of various project components (water intake, submerged weir, access road, bridge, and construction camp). These community sessions included formal presentations, poster stations with subject matter experts, and formal and informal question periods.

The Agency attended two of the community sessions, arranged by the proponent in the communities of Black Lake and Stony Rapids in May 2014.

4.3 Participation of Federal and Other Experts

Federal authorities provided specialist or expert information or knowledge relevant to their mandates in accordance with section 20 of CEEA 2012. Federal authorities provided advice to support the Agency's determination that an EA was required, participated in the review of the draft EIS Guidelines, the EIS review, and provided input into the preparation of the draft version of the EA Report.

Fisheries and Oceans Canada has regulatory responsibilities under the *Fisheries Act* and provided advice and information related to fish and fish habitat, commercial, recreational, and Aboriginal fisheries, provisions for water flow and fish passage, and mitigation measures including fish habitat offsetting.

Environment Canada provided advice related to geochemistry, water quality, terrestrial species at risk, and migratory birds.

Health Canada provided advice on potential effects on Aboriginal health related to air quality.

Natural Resources Canada has regulatory responsibilities under the *Explosives Act*, and provided advice related to fluvial geomorphology¹ and groundwater quality and quantity.

Transport Canada likely has regulatory responsibilities under the *Navigation Protection Act*. This act has an opt-in provision that allows the project owners of work in non-scheduled navigable waters to be considered for a review. The proponent indicated that it may choose to opt-in for a review under the *Navigation Protection Act*. Transport Canada also provided advice related to changes to the environment that may impede navigation, and effects to Aboriginal people.

Aboriginal Affairs and Northern Development Canada manages and administers the land management component of the *Indian Act*. Aboriginal Affairs and Northern Development Canada provided advice on various permit and lease requirements for the Project.

¹ Fluvial geomorphology is the study of the processes responsible for the shape and form of watercourses.

5 Geographical Setting

This section provides a description of the existing biophysical and human environments as described by the proponent. It is intended to provide the reader with an understanding of what the existing environment is in the project area.

5.1 Biophysical Environment

Atmospheric Environment

The Black Lake area has a subarctic continental climate with short, cool summers with mean maximum daily air temperatures of 22.7 degrees Celsius and long, cold winters with mean minimum temperatures of -30 degrees Celsius. The communities of Stony Rapids and Black Lake experience extreme seasonal temperature variations with a mean annual temperature of -3.4 degrees Celsius. Mean annual precipitation at Stony Rapids is 424 millimetres with 66 percent of the precipitation occurring as rainfall during the spring, summer, and fall. Winds have the highest average speeds in spring of 28.6 kilometres per hour, and lowest speeds in summer of 6 kilometres per hour.

Daytime and nighttime noise levels at the project site ranged from 33 to 46 A-weighted decibels. These noise levels are consistent with natural noise sources such as the rustling of leaves, birds, and water sounds. The proponent defined the study area for noise as a 5 kilometre radius around the Project operation footprint.

Geology

The geological setting surrounding the Project area, east of the Fond du Lac River, is dominated by Precambrian bedrock that rises more than 100 meters above the surrounding terrain. The mineralogy of the bedrock indicates that it contains several metals, including aluminum, chromium, selenium, arsenic, cadmium, copper, nickel, silver, zinc, lead, and iron. In addition, bedrock leachate samples shows that it exceeds the Canadian Council of Ministers of the Environment's Canadian Environmental Quality Guidelines for the protection of freshwater aquatic life. The bedrock in the local study area is not likely to contain uranium.

Hydrology

The river systems in the northern boreal forest of Saskatchewan consist of networks of lakes connected by fast-flowing, short stretches of streams. The Project is located on the Fond du Lac River in the Athabasca River basin of Northern Saskatchewan, between Black Lake and Middle Lake.

Black Lake is upstream of the Project with outflows discharging from the lake down the Fond du Lac River to Middle Lake and eventually into Lake Athabasca, approximately 50 kilometres downstream of the Project. Black Lake has a total surface area of 418 square kilometres and has a maximum depth of 58 metres. Middle Lake is a widening of the Fond du Lac River before it continues toward Lake Athabasca. Middle Lake has a total surface area of 7.5 square kilometres and a maximum depth of 14 metres. The Fond du Lac River flows between Black Lake and Middle Lake for a total length of 6.1 kilometres with a change of elevation of 36 metres. The mean average daily flow rate of the Fond du Lac River is 304 cubic metres per second.

Baseline water quality in Black lake is characterized by low dissolved and suspended solids, hardness, alkalinity, nutrients, and metals. The pH is within the Canadian Council of Ministers of the Environment's Canadian

Environmental Quality Guidelines for the protection of freshwater aquatic life for most of the year except for the spring season in which it is below the typical pH range of 6.5 to 9.0. Nutrient levels are at concentrations near or below measureable quantities, indicative of low biological productivity.

Water quality parameters in the Fond du Lac River are similar to those in Black Lake. The pH of the water in Fond du Lac River is slightly acidic in spring as compared to other seasons. The nutrients and metals concentrations are below the Canadian Council of Ministers of the Environment's Canadian Environmental Quality Guidelines for the protection of freshwater aquatic life, indicative of low biological productivity.

Fish and Fish Habitat

Lake trout, Arctic grayling, Lake whitefish, Walleye, and Northern pike are most common in the cold waters of the region. Additionally, two different species of ciscoes are known to inhabit Black Lake, the common cisco and the Shortjaw cisco. Shortjaw ciscoes are identified as a threatened species by the committee on the Status of Endangered Wildlife in Canada. No Shortjaw ciscoes were captured during fish population sampling in Black Lake.

Shoreline substrate near the proposed water intake location in Black Lake is comprised primarily of cobble and boulder with some gravel. Emergent aquatic vegetation and low shrubs are the predominant vegetation along the shoreline near the proposed water intake. The shoreline near the proposed water intake provides habitat for small fish and juveniles of larger fish species.

Deep, fast-flowing runs, rapids, deep pools, and waterfalls are the most common type of habitat in the Fond du Lac River between the Black Lake outflow and the Middle Lake inflow. Arctic grayling use the Fond du Lac River habitats throughout their life cycles (spawning, rearing, and overwintering). Barriers or potential barriers to upstream fish migration include Elizabeth Falls and two additional waterfall-type habitats; the proponent has asserted that these barriers have contributed to the creation of three functionally distinct Arctic grayling populations. Grayling Island is at the inlet to Fond du Lac River, which is the proposed location of the Black Lake outfall submerged weir. The proposed tailrace outlet would be located in a bay upstream of Middle Lake. The bay is composed of a large calm water area on the east shore with a predominantly sand and silt substrate, and an area with faster flows along the downstream outlet of the bay with gravel, cobble, and boulder substrates. Large woody debris and emergent vegetation are found around the bay's perimeter.

Vegetation

The project area is in the northern boreal forest. The east side of the Fond du Lac River is characterized by forests of black spruce and jack pine. White spruce tends to occur along the margins of fens and marshes, and stands of trembling aspen typically occupy low sheltered areas. The west side of the Fond du Lac River is characterized by open jack pine forest. Stands of mixedwood containing species such as black spruce, jack pine, and white birch also occur. Areas at the interface of land and water typically contain black spruce, jack pine, white birch, alders, and willow. Wetlands are dominated with black spruce, tamarack, and dwarf birch. The region is dominated by slow-growing species due to the short growing seasons and as a result, natural succession processes are slow. Seventy-three percent of the local study area consists of jack pine, open water, wetland, and regenerating jack pine. Seventy-two percent of the regional study area consists of jack pine, recent burn, and open water. Sixty-seven provincially listed plant species have been historically or recently documented within the regional study area. Many traditional use plants such as black spruce, willow,

crowberry, bog cranberry, Labrador tea, and prickly rose are commonly found in the regional study area. A few traditional use species, such as acerbic bulrush and tamarack, are more restricted in their distribution.

Wildlife

The landscape provides habitat for a wide variety of animals, including ungulates (e.g., moose and caribou), furbearing animals (e.g., bears, wolves, Canada lynx, and marten), semi-aquatic animals (e.g., beaver, otter, mink, muskrat), amphibians, upland breeding birds (e.g., grouse, ptarmigan, woodpeckers, songbirds), waterbirds (e.g., ducks, terns, mergansers, gulls) and raptors (e.g., eagles, ospreys, hawks). There are eight species listed on the *Species at Risk Act* that have the potential to occur in the area but only one of these, the olive-sided flycatcher, was observed during project wildlife surveys.

Traditional use of wildlife in the area includes hunting of top level predators (wolf and black bear), ungulates (moose), and trapping of smaller mammals (martens, hares). Martens are the most important animal for trapping in the region and require denser forests for habitat and are intolerant of sparser vegetation covers.

5.2 Human Environment

The Project is located within the Black Lake Denesuline First Nation reserve land Chicken 224 and, consequently, members of the Black Lake Denesuline First Nation are the primary traditional users within the project area. The area outside the reserve is provincial Crown land and includes the asserted traditional territories of the Black Lake Denesuline First Nation, the Fond du Lac Denesuline First Nation, the Hatchet Lake Denesuline, the Stony Rapids Métis Local #80, the Uranium City Métis Local #50, and the Camsell Portage Métis Local #79.

The local study area for land and resource use includes: the communities of Black Lake Denesuline First Nation; the Northern Hamlet of Stony Rapids; Black Lake (the water body); the section of the Fond du Lac River from Black Lake to Stony Rapids; and associated shoreline areas including Stony Lake, Middle Lake, and Camp Grayling. The regional study area includes the Athabasca region of northern Saskatchewan. The Aboriginal people of the region have traditionally used the local and regional study areas for generations. Sixty-eight heritage resources were identified around Black Lake, Middle Lake, Stony Lake, and the Fond du Lac River during surveys conducted in the 1970s.

Barren-ground caribou is the most important traditional food source of the Aboriginal people of Athabasca; however, due to the absence of caribou in the region, they must travel into Northwest Territories, Nunavut, and northern Manitoba to hunt caribou. Moose, black bear, beaver, rabbit, geese, ducks, ptarmigan and grouse are also harvested in the Athabasca region.

The Black Lake Denesuline First Nation reserve land is designated as a trapping area for all members of Black Lake. However, trappers without active trapping licenses are not permitted to sell furs commercially and tend to trap on reserve for personal use. Some trapping occurs along the Fond du Lac River from Black Lake to Stony Lake. A variety of fur bearers were historically abundant in the area but because of fires and the resulting reduction in habitat for these furbearers, trapping now tends to be only for personal use in the area.

Fish have been a vital part of traditional life in the Athabasca region, and continue to be prepared for consumption using local cultural practices. Fish species harvested commercially or domestically in the project area include Whitefish, Lake trout, Cisco species, Northern pike, Walleye, Suckers, and Arctic grayling. Most

fishing for domestic use takes place on Stony Lake, with some fishing on Middle Lake and Black Lake. Lake trout fishing occurs near the junctions of the Fond du Lac River and local lakes, and Arctic grayling are prevalent in the Fond du Lac River near Elizabeth Falls. Residents of Black Lake and Stony Rapids participate in the commercial fishery on Lake Athabasca, Black Lake, Riou Lake, Pasfield Lake, and Wapata Lake. Black Lake is the only commercial fishery in the local study area. In 2012, there was only one active commercial fisher on Black Lake.

Traditional plants had historically been gathered for food, medicine and tools, as well as for local trade, sale or gifts. Berry picking spots include the Middle Lake area and on Fir Island on Black Lake. Firewood is also collected by local residents.

6 Predicted Effects on Valued Components

6.1 Fish and Fish Habitat

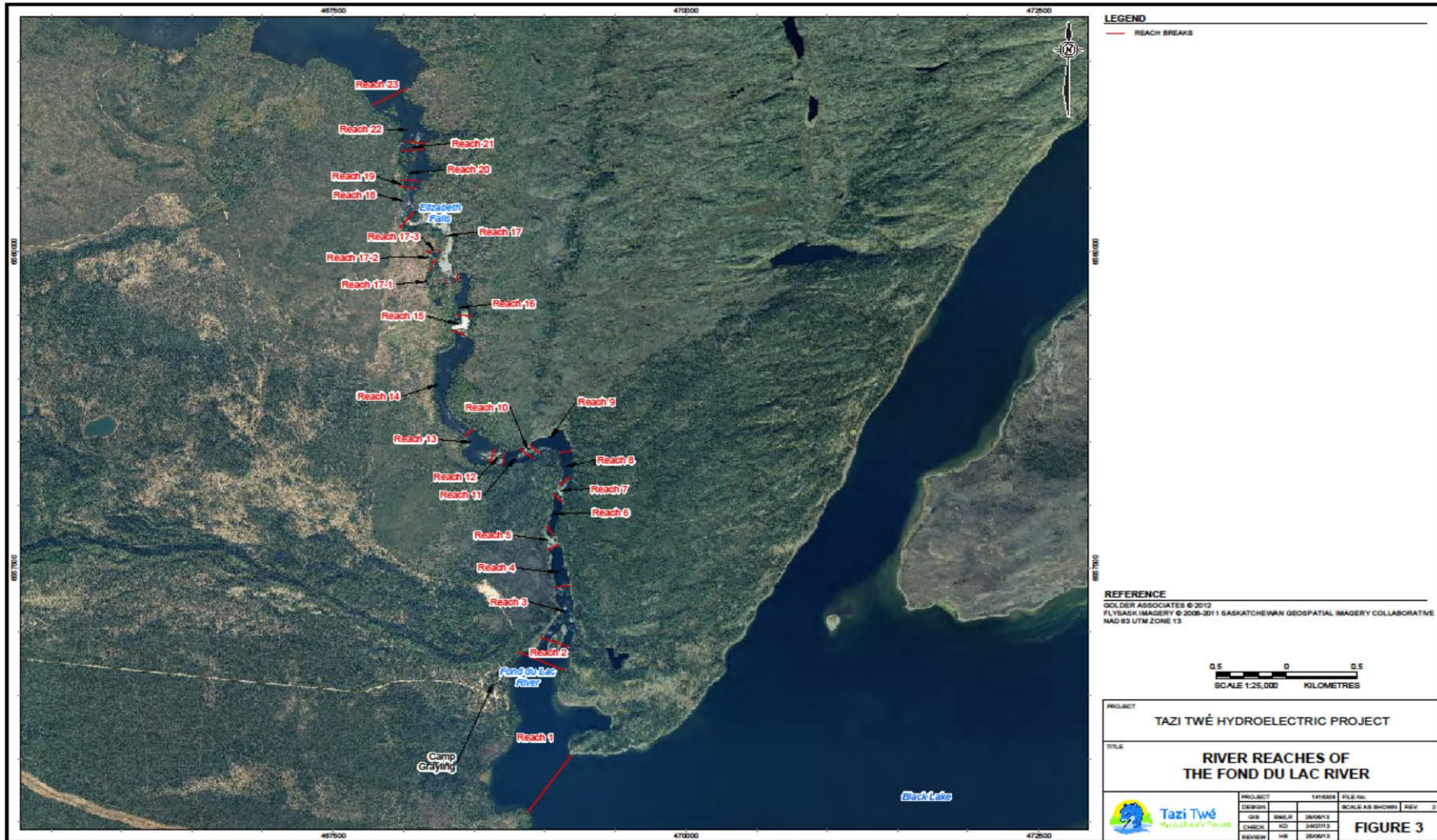
The Agency focused its assessment of fish and fish habitat on the following project interactions:

- Direct loss or alteration of fish habitat from construction activities
- Hydrological changes and loss of habitat in the Fond du Lac River
- Entrainment and impingement of fish at the water intake
- Changes to surface water quality in the Fond du Lac River

6.1.1 *Proponent's assessment of environmental effects*

The proponent's assessment looked at three main waterbodies impacted by the Project (Black Lake, the Fond du Lac River, and Middle Lake). These water bodies contain several fish species, including Arctic grayling, Burbot, Cisco, Lake chub, Lake trout, Lake whitefish, Longnose sucker, Ninespine stickleback, Northern pike, Round whitefish, Slimy sculpin, Spottail Shiner, Trout-perch, Walleye, White sucker and Yellow perch. The proponent indicates that the bypassed section of the Fond du Lac River supports three functionally distinct Arctic grayling populations located upstream (in reaches 2-5), middle (in reaches 6-14) and downstream (in reaches 19-22) (See Figure 3).

Figure 3 Bypassed Section of the Fond du Lac River



Source: Golder Associates: February 2014. Tazi Twe Hydroelectric Project EIS Report

Direct loss or alteration of fish habitat from construction activities

The Project's effects on fish and fish habitat include the direct loss or alteration of fish habitat caused by the construction of the submerged weir and water intake approach in Black Lake, the access bridge across the Fond du Lac River, and the tailrace outlet channel in the Fond du Lac River just upstream of Middle Lake. The proponent indicated that effects could include fish mortality from blasting activities as part of the construction of the Black Lake water intake and tailrace outlet channel.

During construction, 19 660 square meters of fish habitat would be altered, and 2531 square meters of fish habitat would be destroyed, as a result of the submerged weir; the Black Lake water intake; the tailrace outlet channel; and bridge piers. Construction activities could also lead to erosion and sedimentation into fish habitat in the area of project components being constructed.

The proponent stated that it would work with Fisheries and Oceans Canada to finalize a fisheries offsetting plan to offset the destruction and permanent alteration of habitat that supports a commercial, recreational, or aboriginal fishery. The proponent indicated that it would carry out fish salvage operations to relocate fish prior to commencing dewatering at construction sites to minimize any potential impacts to fish and would adhere to an operational overpressure upper limit of 50 kilopascals when blasting near water. In addition, the proponent stated that it would locate and construct the water intake on the north shore of Black Lake, based on aquatic habitat surveys and focussed spawning surveys, to avoid any sensitive or critical fish habitat, and would implement erosion and sedimentation control measures to avoid and mitigate potential effects. The proponent committed to the development and implementation of a monitoring program to verify the predictions and the effectiveness of mitigation and that it would work with Fisheries and Oceans Canada to ensure accordance with *Fisheries Act* authorization requirements.

The proponent predicted that, after mitigation, the effects of the alteration and destruction of fish habitat during construction would be negligible in magnitude, permanent, confined to the physical area of the project components, and not significant.

Hydrological changes and loss of habitat in the Fond du Lac River

The proponent indicated that the diversion of water through the powerhouse during project operation would result in the permanent alteration and direct loss of fish habitat in a 6 kilometer stretch of the Fond du Lac River between Black Lake and Middle Lake. Changes to hydrology are predicted to decrease average flows through the Fond du Lac River by 37 percent (high spring flows) to 80 percent (average winter low flows), and would have the greatest effect on fish habitat quality and quantity in reaches 3-21 (Figure 3). These flow changes would also increase the potential for ice formation (frazil, anchor and surface) in or on the Fond du Lac River, which may have implications for fish injury and mortality in the winter. The proponent's analysis of impacts to fish within the Fond du Lac River focused on the Arctic grayling species.

During project operation, flow changes in the Fond du Lac River would result in a predicted loss of 150 667 square meters of wetted area during average winter low flows. Due to the decrease in flows, the remaining habitat found throughout the Fond du Lac River will be permanently altered. The proponent's predicted changes to Arctic Grayling habitat during operations are summarized below in Table 4.

Table 4 Predicted changes to Arctic grayling habitat in the Fond du Lac River between Black Lake and Middle Lake

Habitat Type	Flow Scenario	Age Class	Population Location	Percent change in Suitable Habitat ^(b)
Overwintering	Average Winter Low Flow	0 / Juvenile	Upstream	-22.9
			Middle	-54.8
			Downstream	-80.6
		Adult	Upstream	-1.2
			Middle	+26.1
			Downstream	-27.9
Spawning	Low, Average and High Spring Flows	Adult	Upstream	-33.2
			Middle	-28.1
			Downstream	-1.9
Foraging	Q ₁₀ ^(a) low flows for June/July and September/October	0 / Juvenile	Upstream	+7.5
			Middle	-16.6
			Downstream	+6.6
		Adult	Upstream	+5.9
			Middle	-13.2
			Downstream	+4.3

^(a) lowest average flow that occurs once every ten years

^(b) difference between baseline habitat areas available and habitat areas available during operations

As previously indicated, the proponent committed to working with Fisheries and Oceans Canada to finalize a fisheries offsetting plan. The proponent indicated that, if Arctic grayling spawning habitat in the middle reaches of the Fond du Lac River are proven to be limiting during project operations, it would offset through the creation or enhancement of Arctic grayling habitat in the Fond du Lac River by spreading sorted rock over boulder substrates at an approximate depth of 0.30 metres. The proponent stated that it would maintain a minimum flow of 40 cubic meters per second at all times in the Fond du Lac River, and that it would increase flows in April to achieve a 70 cubic meters per second spawning incentive flow by May 1 of each year. The proponent committed to the development and implementation of a monitoring program to verify whether the predicted changes, including the loss of habitat in the Fond du Lac River and impacts of frazil ice under reduced project induced flows, require adaptive management or further offsetting. The monitoring program, in conjunction with the fisheries offsetting plan will include contingency offsetting and contingency offset monitoring in the event that impacts are greater than those predicted during the EA. The proponent committed to working with Fisheries and Oceans Canada to ensure that the monitoring program would be in accordance with *Fisheries Act* authorization requirements.

The proponent predicted that, after mitigation, the alteration and destruction of fish habitat from hydrological changes in the Fond du Lac River would be moderate in magnitude, long-term (greater than 90 years), confined

to reaches 3 - 21 of the Fond du Lac River, continuous, highly likely, but reversible (post decommissioning), and not significant.

Entrainment and impingement of fish at the water intake

The diversion of water through the powerhouse during project operations has the potential to result in the injury and mortality of fish from entrainment² or impingement³ at the water intake on the north shore of Black Lake. The proponent predicted that construction of the water intake at a shallow depth would reduce the entrainment of deep-water species such as Lake trout, Lake whitefish, and Ciscoes, which are preferred by aboriginal and commercial fishers. An exclusion bar rack with clear spacing of 125 millimeters would be installed at the water intake; however the proponent indicated that the exclusion bar rack is not predicted to physically or behaviorally deter fish from entering the water intake. The proponent predicted that impingement will not be a source of fish mortality for the Project. The proponent focused its analysis of entrainment impacts to fish on Walleye and White sucker.

The proponent estimated that a maximum population of 3418 Walleye and 4709 White suckers resides in the area between Fir Island and the northwest shore of Black Lake (Figure 5). The proponent predicted that up to 10 percent of Walleye and White suckers would be entrained and lost annually from Black Lake in this area. The proponent also predicted that the mortality rate for entrained fish that are less than 600 millimetres long would be up to 25 percent, based on the use of a two-unit, Kaplan style turbine. The proponent predicts that the death of fish from entrainment is not likely to impact the sustainability and productivity of commercial, recreational, or aboriginal fisheries in the regional study area. The proponent concluded that the death of fish from entrainment would not likely impact the sustainability and productivity of commercial, recreational or aboriginal fisheries in the area.

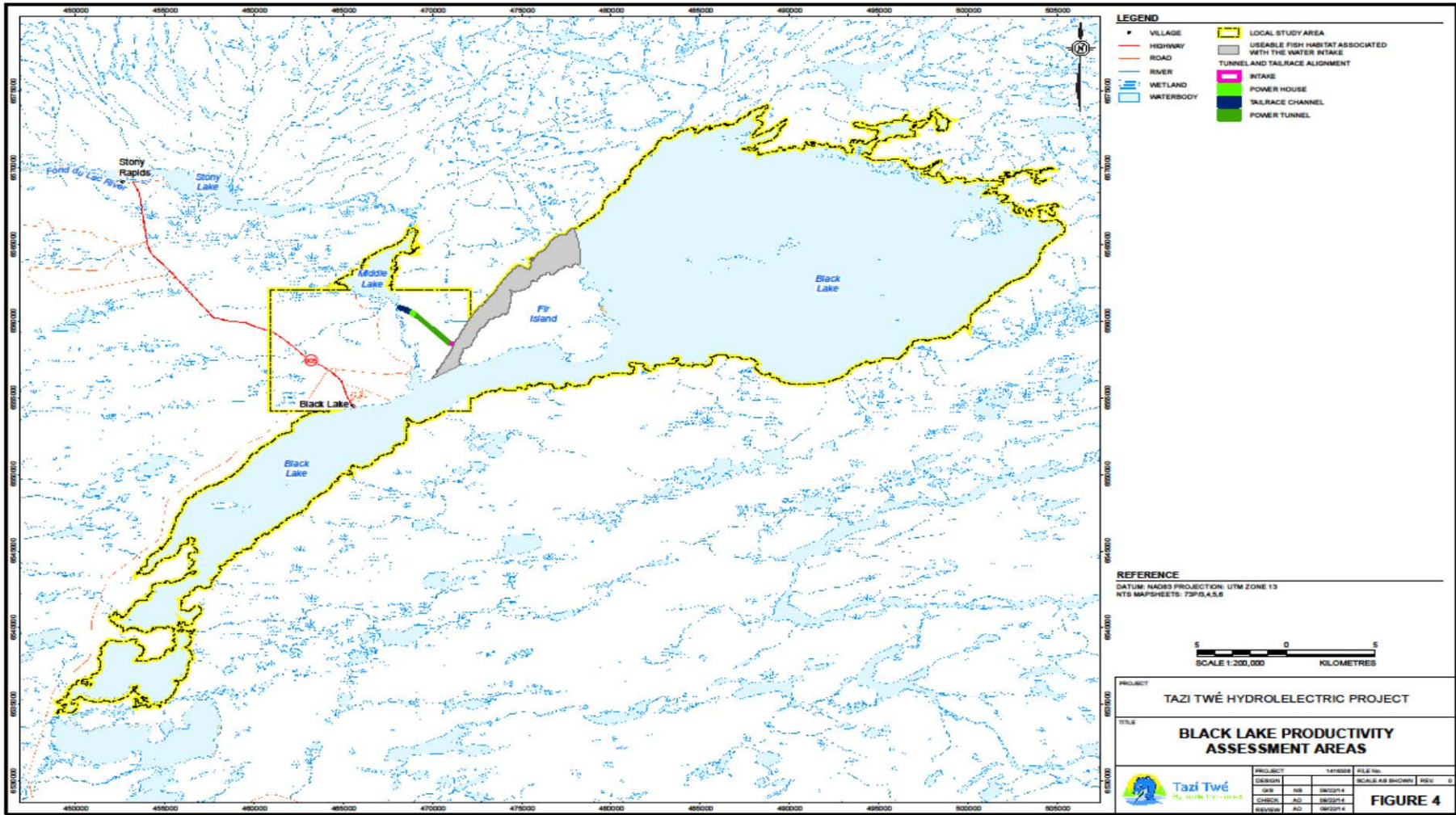
The proponent committed to the development and implementation of a monitoring program which would include measures to quantify the numbers, types, and mortality rates of fish passing through the power generation turbines. The monitoring program, in conjunction with the fisheries offsetting plan would include contingency offsetting and contingency offset monitoring in the event that impacts are greater than those predicted during the EA. The proponent committed to working with Fisheries and Oceans Canada to ensure that the monitoring program would be in accordance with *Fisheries Act* authorization requirements.

The proponent predicted that the effects of entrainment and impingement of fish, after mitigation, would be moderate in magnitude, permanent, confined to the project site, continuous, highly likely, and not significant.

² Drawn into and passing through the water intake, power generation turbines, and tailrace channel

³ Entrapped against a barrier such as the water intake screen

Figure 4 Area between Fir Island and the North Shore of Black Lake



Source: Golder Associates: February 2014. Tazi Twe Hydroelectric Project EIS Report

Changes to Surface water quality of Fond du Lac River

The proponent indicated that it would develop and implement a Site Water Management Program that would include the detailed design of the collection and storage facilities and components to retain and treat, if necessary, site generated wastewater from construction activities and surface run-off. The proponent indicated that it would be implementing a series of three settling ponds and that it would discharge wastewater from the settling ponds into the Fond du Lac River at two proposed locations both of which are upstream of waterfall features. Effects to fish and fish habitat could result from the discharge of this wastewater which could change surface water quality through the release of particulates or chemical constituents contained in the wastewater. The proponent predicted that wastewater generated during construction would be up to 6900 cubic meters per day and during operation up to 2200 cubic meters per day. The settling ponds would have a combined total capacity of 1950 cubic meters per day (650 cubic meters per day per pond). The proponent indicated that the settling ponds would be constructed in such a manner that they can be scaled up in terms of capacity once inflows are confirmed requiring greater retention capacity.

The proponent indicated that it would develop and implement a Water Quality Monitoring Program that would include the detailed sampling, testing and treatment options, as necessary, for the site generated wastewater. The proponent indicated that it would test all wastewater prior to discharge into the Fond du Lac River. Should wastewater test results indicate that the wastewater does not meet applicable water quality guidelines; the proponent would retain the wastewater, increase capacity of the storage ponds, and, if necessary, implement treatment technologies, such as aeration and/or addition of flocculants. The proponent indicated that wastewater would meet the discharge criteria contained in any Saskatchewan Ministry of Environments' Permit for Industrial Effluent Works issued for the Project. Water treatment technologies would be assessed and selected prior to the commencement of construction activities.

The proponent stated that it would develop a Waste Rock Management Plan that would include testing of waste rock generated during construction for leached metals, chemical constituents, acid rock drainage potential and uranium mineralization. The proponent indicated that should test results indicate that waste rock runoff and groundwater inflows contain leached metals and chemical constituents, acid rock drainage or uranium mineralization, it would be collected, and treated, if necessary, in separate storage ponds (separate from the three proposed settling ponds) prior to discharge to the Fond du Lac River.

The proponent predicted that after treatment the potential adverse effects to surface water quality would be negligible. The proponent predicted that, given the wastewater discharge rate (0.058 – 0.080 cubic meters per second) and the annual 7Q10⁴ flow rate in the Fond du Lac River at the discharge point (161 cubic meters per second), applicable water quality guidelines (Canadian Council of Ministers of the Environment for the protection of aquatic life, Saskatchewan Surface Water Quality Objectives for the protection of aquatic life, Canadian Drinking Water Guidelines, and the Saskatchewan Drinking Water Standards and Objectives) would be met within 30 meters of the discharge point. The proponent indicated that it could test the Fond du Lac River at a minimum of 100 meters downstream of the discharge point (due to safety reasons) to ensure that water quality objectives are being met within that mixing zone. Sampling would be conducted on a seasonal basis

⁴ 7Q10 = the lowest average discharge over a period of one week with a recurrence interval of 10 years.

during pre-construction, construction, and in years 1, 2, and 5 of operations. Should testing indicate that water quality objectives are not being met within the 100 meters; the proponent would install diffusers at the discharge locations to accelerate the dispersion rate.

The proponent predicted that the release of wastewater during construction and operations would result in minor and short term changes to the water quality of the Fond du Lac River and predicted that concentrations of various parameters under fully mixed conditions would be within the range of baseline concentrations in the river. The proponent predicted that the residual effects on fish and fish habitat as a result of changes to the surface water quality, after mitigation, would be negligible to low in magnitude, continuous, highly likely, and not significant.

6.1.2 *Views expressed*

Federal authorities

Environment Canada noted that a number of the potential environmental effects to surface water quality, sediment quality, and aquatic biota are mitigable if best practices and adaptive management practices are employed. Consequently, Environment Canada recommended that, throughout all stages of the project, the proponent's decisions and actions be informed by current best practices and the best available information. The advice provided by Environment Canada during the environmental assessment process identified numerous specific recommendations which would improve environmental protection and management of the Project. Environment Canada encouraged the proponent to demonstrate due diligence by incorporating best practices and an adaptive management response framework throughout the Project.

Environment Canada recommended development of the following programs/plans:

- Environmental Protection Plan referred to in Appendix C.
- Site Water Management Program referred to in section 6.1.1.
- Surface Water Quality Monitoring Program and that it include monitoring for and verification that uranium concentrations are not higher than predicted and do not exceed water quality objectives, use of the most recent cadmium guideline (Canadian Council of Ministers of the Environment, 2014), and thresholds for mitigative action based on monitoring results.
- Aquatic Monitoring Program to verify the proponent's predictions regarding project impacts on water quality, sediments, and biota in the aquatic receiving environment, including comparison against baseline data and reference sites.
- Erosion and Sediment Control Plan, and that it include action levels which trigger specific management actions.
- Ammonia Management Plan, and that it include measures to avoid surface water contact with ammonium nitrate, and monitor for ammonia on-site and in the receiving environment in order to mitigate effects of blasting agents on the aquatic environment.
- Waste Rock Management Plan as discussed in section 6.1.1.
- Adaptive Management Plan.

Fisheries and Oceans Canada considers there to be a high level of uncertainty regarding the proponent's conclusions on the predicted impacts to fish and fish habitat, particularly species in the Fond du Lac River. Fisheries and Oceans Canada indicated that this further extends to the mitigation of impacts proposed by the proponent to date, which may not be acceptable as measures to offset serious harm to fish. Fisheries and Oceans Canada indicated that if the Project proceeds it would require the development and implementation of a robust monitoring program, offsetting plan and contingency offsetting plan at the Regulatory (*Fisheries Act* Authorization) stage. The development of robust monitoring and offsetting may include requirements for the proponent to collect additional baseline information. It further stated that failure to meet these Regulatory requirements may result in a denial in the issuance of a *Fisheries Act* Authorization.

Aboriginal groups

Hatchet Lake Denesuline First Nation expressed concerns about the Project's effect of turbines on fish mortality and potential effects to downstream fish populations in Lake Athabasca and upstream fish populations in Wollaston Lake.

Public

Camp Grayling expressed serious concerns that the stated riparian minimum flow rate of 50 - 100 cubic meters per second applied for multiple months, and repeated annually, will drastically reduce or eliminate the grayling population in the Fond du Lac River. Camp Grayling stated that data in the proponent's report uses a 40 year history of flow rates, but ignores that flow rates have been much lower in recent years. Camp Grayling noted that water flow in 2011 and 2012 reached as low as 200 cubic meters per second and is presently 225 cubic meters per seconds and dropping. Camp Grayling stated that the proponent's report noted the lowest recorded flow at 122 cubic meters per second, and that the proven long time flow that sustains fish is 180 cubic meters per second.

Camp Grayling noted that their long history is based on one unique feature unavailable to competing camps; abundant trophy class fishing in five species: (Pike, Whitefish, Grayling, Walleye, and Lake Trout). Camp Grayling is concerned that this advantage will be lost, in either fact or perception, or both. It indicated that its camp offers scenic tours and a special atmosphere near the river and it is concerned that the solitude and the wildness experience will be affected by the Project, particularly the new bridge with local traffic. The necessary weir to be constructed at Grayling Island will alter a great fishing location and make it artificial.

Camp Grayling concluded that it was not opposed to progress, but wanted decision makers aware that they would be permitting the alteration of one of their nation's most majestic sections of river.

6.1.3 Agency analysis and conclusion

The Agency considers that with the implementation of an effective fisheries offsetting plan, developed in accordance with any *Fisheries Act* authorization, the residual effects from the permanent loss of fish habitat from the construction of project components would be localized and agrees with the proponent's assessment that the magnitude of effects is negligible to low.

The Agency considers that with the implementation of an effective monitoring and contingency offsetting plan, the residual effects of injury or mortality of fish as a result of entrainment or impingement would be localized and agrees with the proponent's assessment that the magnitude of effects is moderate. The Agency is of the

view that there is some uncertainty regarding the numbers and types of fish that will become entrained or impinged at the water intake. The Agency believes that with the implementation of appropriate monitoring for the numbers and types of fish entrained or impinged, and the implementation of corrective measures, as part of a fisheries offsetting plan, should the effects be determined to be greater than those predicted in the environmental impact statement, effects of entrainment or impingement would be addressed.

The Agency agrees with the proponent that the residual effects of hydrological changes to the Fond du Lac River on Arctic grayling populations may be localized to reaches 3-21 of the River and agrees with the proponent's assessment that the magnitude of effects is moderate. The Agency acknowledges that there is a high degree of uncertainty regarding the effects to Arctic grayling populations within the Fond du Lac River, particularly for the population residing in the central portion of the River, and how those potential effects may impact Arctic grayling populations in the surrounding area including Black Lake and its tributaries. The Agency agrees with Fisheries and Oceans Canada that the mitigation measures proposed by the proponent in the environmental impact statement may not be sufficient to mitigate the effects to Arctic grayling in the Fond du Lac River. The Agency is of the view that it is essential that the proponent develop a fisheries offsetting plan that meets the regulatory requirements of the *Fisheries Act* in order to mitigate effects to Arctic grayling. In addition, it is essential that the follow-up program provide verification of effects to the Arctic grayling populations and to determine whether there is a need for corrective measures, such as modifications to flow rates, to adaptively manage environmental effects beyond what are predicted in the environmental impact statement.

Appropriately designed settling ponds for both site generated wastewater and waste rock storage piles run-off; necessary treatment options; and a Surface Water Quality Monitoring Program are necessary to ensure that water quality objectives are met. The Agency considers that with the implementation of these measures, the residual effects to surface water quality from the discharge of wastewater on fish and fish habitat in the Fond du Lac River will be negligible.

The Agency has considered the mitigation measures proposed by the proponent, expert advice from federal authorities, and comments received from Aboriginal groups and the public in identifying the following key mitigation measures:

- Develop and implement a fisheries offsetting plan in accordance with any *Fisheries Act* authorization required for the Project with contingency offsetting measures as required to address effects to Arctic grayling in the Fond du Lac River.
- Locate and construct in-water works in areas that avoid sensitive or critical fish habitat.
- Construct and install the water intake structure to avoid entrainment or impingement of deep water fish species.
- Adhere to an operational overpressure upper limit of 50 kilopascals to avoid fish mortality from blasting activities as part of the construction of the Black Lake water intake and tailrace outlet channel.
- Maintain a minimum flow of 40 cubic meters per second at all times in the Fond du Lac River
- Implement a spring spawning trigger flow of 70 cubic metres per second timed to match the natural increase in flow in the Fond du Lac River between Black Lake and Middle Lake during spring fish spawning periods.

- Develop and implement a Site Water Management Plan including the design of settling ponds to collect and treat, if necessary, all construction and site generated run-off wastewater for the duration of the Project.
- Develop and implement a Waste Rock Management Plan which includes:
 - testing of waste rock seepage and contact water for leached metals, chemical constituents, acid rock drainage potential, and uranium mineralization; and
 - collect and treat, if necessary, wastewater run-off from waste rock storage piles that contain acid rock drainage or uranium mineralization separately in its own settling ponds prior to discharge.
- Ensure that wastewater released from settling ponds meets the most stringent thresholds for parameters out of the Canadian Council of Ministers of the Environment Water Quality Guidelines for the protection of aquatic life; the Saskatchewan Surface Water Quality Objectives for the protection of aquatic life; Canadian Drinking Water Guidelines; and the Saskatchewan Drinking Water Standards and Objectives within 100 meters of any discharge point.

The Agency has considered the follow up and monitoring programs proposed by the proponent, expert advice from federal authorities, and comments received from Aboriginal groups and the public in identifying the following follow up and monitoring programs as necessary to verify the predictions of effects to fish and fish habitat and to verify the effectiveness of mitigation measures:

- Monitor all potential adverse effects from the Project to fisheries productivity to confirm that avoidance and mitigation measures and standards, in addition to offsetting activities, are functioning as planned, including:
 - monitor the number of fish injured or killed from entrainment or impingement within the power tunnel and power generating facility;
 - monitor ice formation during project operation; and
 - monitor to confirm predictions made in the EIS are as planned.
- Develop and implement a Water Quality Monitoring Program to verify the quality of wastewater in settling ponds before it is released into the Fond du Lac River and to verify concentrations meet the most stringent of the Canadian Council of Ministers of the Environment or Saskatchewan Water quality guidelines criteria by 100 m of discharge.
- Monitoring Arctic grayling populations in the Fond du Lac River to determine the extent of adverse environmental effects to the species as a result of reduced flows and increased ice formation in the Fond du Lac River.

The Agency concludes that the Project is not likely to cause significant adverse environmental effects on fish and fish habitat taking into account the implementation of mitigation measures and follow-up as described above.

6.2 Wildlife

The Agency focused its assessment of wildlife on the following project interactions:

- Direct habitat loss, alteration, or fragmentation
- Decrease in habitat quality due to sensory disturbance
- Direct injury or mortality

6.2.1 Proponent's assessment of environmental effects

Direct habitat loss, alteration or fragmentation

The assessment of direct habitat loss, alteration or fragmentation focused on the following indicator groups:

- Ungulates – barren-ground and woodland caribou (woodland caribou are listed as threatened under the *Species at Risk Act*) and moose are important subsistence and cultural species for Aboriginal people.
- Furbearers – beaver and marten are important economic and cultural species to Aboriginal groups.
- Birds – upland, waterbirds, and raptors of which most species are migratory; some species are hunted by aboriginal groups; and some are listed under the *Species at Risk Act* or by the Committee on the Status of Endangered Wildlife in Canada.

Project activities such as site clearing, blasting, waste rock excavation, and access roads will result in direct habitat loss, alteration or fragmentation. The proponent predicted that the maximum amount of area disturbed by project activities (including construction and sensory disturbances) would be 1620 hectares (1.4 percent of the regional study area, 115 600 hectares). The physical area disturbed as a result of construction activities would be 869 hectares. The proponent indicated that progressive reclamation, immediately following construction, would reduce the 869 hectare construction footprint to 280 hectares, of which 180 hectares would be reclaimed at final closure. The proponent evaluated the effects of changes to habitat quantity based on the maximum disturbance area (1620 hectares) within the regional study area (115 600 hectares), which the proponent indicated provides for an overestimation of final project effects. The proponent predicted that the main effects to wildlife would take place during the construction phase of the Project. The proponent indicated that the project would not impact critical habitat for any species at risk.

Ungulates

The proponent identified two habitat types, mature coniferous forests and wetlands, in the regional study area as preferred habitat for woodland caribou⁵ and over-wintering habitat for barren-ground caribou in years of peak population. Lichens are a primary food source in winter and these are found as ground cover in spruce and jack pine forest and on bedrock. The proponent conducted baseline studies⁶ in the regional study area and did not observe caribou. The proponent indicated that a significant portion of the regional study area is burned and that the regenerating landscape (close to 40 percent) would not be preferred caribou habitat.

⁵ Woodland Caribou are listed under the *Species at Risk Act*. Recovery Strategy for the Woodland Caribou, Boreal population (*Rangifer tarandus caribou*) in Canada http://www.registrelep-sararegistry.gc.ca/document/default_e.cfm?documentID=2253

⁶ Aerial surveys and winter track count surveys conducted in January and February of 2012.

The proponent identified that moose prefer a mixture of mature and regenerating forest habitat types and wetlands in the regional study area, using coniferous boreal forest for cover and consuming deciduous browse in summer months. It also stated that moose are intolerant of high temperatures and seek refuge in summer in lowland areas, including wetlands, due to the cooler microclimate found there. The proponent indicated that moose are also dependant on riparian and aquatic plants as a source of sodium.

The habitat area disturbed during construction for ungulates is summarized in Table 5.

Table 5 Disturbance, during construction, to ungulate preferred habitat types within the regional study area.

Ungulate Indicator Species	Preferred Habitat Types	Baseline Area in RSA (hectares)	Project Disturbance Area (hectares)	Percent disturbed
Caribou	Bedrock	347	4	1.1%
	Mature Coniferous forest	30 496	549	1.8%
	Wetland	6 213	49	0.8%
Moose	Mature Coniferous forest	9 004*	314	3.5%
	Mature Mixedwood forest	3 658	16	0.4%
	Mature Deciduous forest	2 971	18	0.6%
	Wetland	6442	99	1.5%
	Riparian	76	17	22.4%
	Regenerating Mixedwood forest	2 002	158	7.9%
	Regenerating Deciduous forest	854	48	5.7%

*The proponent states that moose prefer different mature coniferous forest sub-types than caribou which is reflected in the different values for mature coniferous forest baseline areas between caribou and moose

Roads and other linear disturbances can act as barriers to caribou movement and as corridors that facilitate predator and alternate prey (moose) movement and thus increase caribou predation. The traffic volume is not predicted to present a barrier to ungulate movements.

The proponent estimated that the current density of linear features is 0.35 kilometres per square kilometre in the local study area (8881 hectares) and 0.07 kilometres per square kilometre in the regional study area (115 600 hectares). The proponent predicted that with the development of the project the linear density would increase by 0.26 kilometres per square kilometre to a total of 0.61 kilometres per square kilometre in the local study area. The proponent indicated that adverse effects on ungulate wildlife (for example increased predation) in forested environments can occur between 0.6 to 1.5 kilometres per square kilometer linear density values and these effects could occur in the local study area. However, within the regional study area, the proponent predicted that the development of the project would increase the linear density by 0.01 kilometres per square kilometre to a total of 0.08 kilometres per square kilometre and would have negligible effects to wildlife at the regional scale.

Furbearers

Beavers reside in aquatic habitats and require forest for food and as material for lodge building. The proponent indicated that beaver populations are currently stable, and are considered to be widespread, and abundant. In the 2008-2009 and 2009-2010 trapping seasons, beaver were the second most harvested animal in the Northern Fur Conservation Area of Saskatchewan.

The proponent stated that martens prefer forested areas and are concerned more with available structural components (i.e. dens) than with forest type. The proponent indicated that marten are the most important fur-bearing species in the regional study area for trapping.

The habitat area disturbed during construction for furbearers is summarized below in Table 6.

Table 6 Disturbance, during construction, to furbearer preferred habitat types within the regional study area.

Furbearer Indicator Species	Preferred Habitat Types	Baseline Area in RSA (hectares)	Project Disturbance Area (hectares)	Percent disturbed
Beaver	Mature Coniferous forest	30 496	549	1.8%
	Mature Mixedwood forest	3 658	16	0.4%
	Mature Deciduous forest	2 971	18	0.6%
	Wetland	6 442	99	1.5%
	Riparian	76	17	22.4%
	Open Water	26 275	12	<0.1%
Marten	Mature Coniferous forest	30 496	549	1.8%
	Mature Mixedwood forest	3 658	16	0.4%
	Mature Deciduous forest	2 971	18	0.6%
	Wetland	6442	99	1.5%
	Recent Burn	35 993	3	<0.1%
	Riparian	76	17	22.4%
	Regenerating Coniferous forest	5548	639	11.5%
	Regenerating Mixedwood forest	2 002	158	7.9%
	Regenerating Deciduous forest	854	48	5.7%

Migratory Birds

Due to the variety of upland breeding bird species considered, the proponent predicted that all landscape types (except for open water) may be used as nesting habitat. No upland breeding bird species is specific to regenerating habitat. Because most upland breeding birds have more general habitat requirements and are highly mobile, the proponent predicted they would not be impacted by habitat fragmentation.

Waterbirds found in the region are a diverse group and have diverse habitat requirements; however all are reliant on riparian and aquatic habitats for movement, foraging and nesting. The proponent predicted that changes to habitat abundance and connectivity would not be a limiting factor for waterbirds.

The primary species of raptor found in the regional study area is the bald eagle. Bald eagles prefer nesting in forested areas near fish-bearing open water. Fourteen bald eagle individuals and two nests were observed within 5 kilometers of the proposed powerhouse site.

The proponent stated that one olive-sided flycatcher, a species at risk, was observed in the regional study area during wildlife baseline surveys conducted in 2012.

The habitat area for birds disturbed during construction is summarized below in Table 7.

Table 7 Disturbance, during construction, to migratory bird preferred habitat types within the regional study area.

Migratory Bird Indicator Species	Preferred Habitat Types	Baseline Area in RSA (hectares)	Project Disturbance Area (hectares)	Percent disturbed
Upland Breeding Birds	Bedrock	347	4	1.1%
	Mature Coniferous forest	30 496	549	1.8%
	Mature Mixedwood forest	3 658	16	0.4%
	Mature Deciduous forest	2 971	18	0.6%
	Riparian	76	17	22.4%
	Recent Burn	35 993	3	<0.1%
	Wetland	6442	99	1.5%
	Regenerating Coniferous forest	5548	639	11.5%
	Regenerating Mixedwood forest	2 002	158	7.9%
	Regenerating Deciduous forest	854	48	5.7%
Waterbirds	Riparian	76	17	22.4%
	Wetland	6442	99	1.5%
	Open Water	26 275	12	<0.1%
Raptors	Mature Coniferous forest	30 496	549	1.8%
	Mature Mixedwood forest	3 658	16	0.4%
	Mature Deciduous forest	2 971	18	0.6%
	Riparian	76	17	22.4%
	Open Water	26 275	12	<0.1%

To minimize the loss, alteration or fragmentation of wildlife habitat, the proponent indicated that it would limit clearing of vegetation to the greatest extent possible and carry out progressive reclamation following construction, as soon as practical, including the removal of construction materials and infrastructure no longer needed. In addition, the proponent would develop and implement a community-based monitoring program to determine if and when caribou may be in the vicinity of the project. The proponent would also develop and implement, during construction, a Caribou Protection Plan that would outline monitoring and mitigation to be progressively applied as caribou approach the project area. For instance, if caribou are within 500 meters of a work location, work activities would be delayed, if possible, to prevent stress.

The proponent predicted that while the size of the direct habitat loss, alteration or fragmentation would be negligible to low, the effects to wildlife habitat could be either long term or permanent due to the high

uncertainty whether the future reclaimed landscape will have the same capacity to support equivalent habitats. The high uncertainty reflects an environment where natural succession processes are slow and where trajectories can be altered by a number of factors such as climate change, fire, or development. The proponent predicted that, after mitigation, the residual effects to wildlife would not be significant.

Decrease in habitat quality due to sensory disturbances

The proponent indicated that sensory disturbances that may cause a decrease in habitat quality include noise from construction, operation and blasting activities; lights from equipment, infrastructure and buildings; and smells from on-site waste that may attract, repel or otherwise disturb wildlife. The proponent stated that sources of sensory disturbance would be most prevalent during the construction phases.

Blasting will create noise and vibration that would disturb wildlife. The proponent planned to initiate clearing of the project footprint and begin blasting in the late summer of 2016, which would be outside of the nesting period (May 1 to August 15). Blasting of the power tunnel will take 1.5 to 2 years and would primarily occur underground, limiting sensory disturbance to migratory birds. Blasting of the tailrace channel, powerhouse and intake structure would be above ground and will take approximately 9 months. Given this blasting schedule, the proponent indicated that migratory birds may be affected during the key nesting periods (May 1 to August 15) of 2017, 2018, and 2019.

The proponent noted that most bird populations are adaptable, highly mobile and have high reproductive rates. These characteristics would allow individual birds to relocate to avoid blasting disturbance. Also, as blasting continues subsequent to the first year, migrating birds would begin avoiding the area as they seek more suitable nesting sites. The proponent predicted that blasting may result in a shift in population distribution and may have an impact on individuals, but the effects of the sensory disturbance at a population level would be minor and short-term.

The proponent indicated that sensory disturbance from vehicle traffic may also affect wildlife in the area. The noise from vehicles may cause wildlife to avoid available habitat adjacent to roads, or to flush wildlife and create stressful conditions as vehicles travel through the project area. The proponent predicted that low vehicle numbers and speed limits would reduce the effects of sensory disturbance caused by traffic.

To reduce the effects of sensory disturbance to wildlife the proponent would suspend surface blasting if wildlife is sighted in the blasting area; lighting would be covered and would face downwards to illuminate the ground and not the sky; low-glare fixtures or lighting with motion sensors will be used, where possible; lighting would be high cut-off fixtures that would limit light emissions beyond work areas; and a waste management plan would be created, which would include appropriate storage and handling policies for camp waste in order to avoid attracting wildlife to the project site.

The proponent predicted that the residual effects of sensory disturbance to wildlife, after mitigation, to be negligible to moderate (for migratory birds) in magnitude, local and regional (for migratory birds) in scale, long-term, reversible, continuous, highly likely, and not significant.

Direct injury or mortality

Injury or mortality of wildlife could result from wildlife-vehicle collisions from traffic or increasing harvesting pressures from increased access.

Traffic will be 42 vehicles per day during peak construction and ten vehicles per day during operations. While roads and associated traffic can be a deterrent for some animals, others can be attracted to roads. For example, moose may be attracted to salt-covered vegetation in roadside ditches and predators can prefer roads and other linear disturbances as predation corridors. The proponent noted that traffic will be relatively light, and concentrated into two periods each day. The proponent predicted that with additional mitigations, such as speed limits and mowing of the right-of-ways, the impact of wildlife-vehicle collisions will be minor.

The access road will be 11.5 kilometres long with a 40 metre right-of-way. It would provide all-year access to an area east of the Fond du Lac River that is currently accessible only by boat or snowmobile. Increased access may create increased harvesting pressures on wildlife populations to the east of the Fond du Lac River. The proponent would mitigate increased harvesting pressures through an Access Management Plan developed with Black Lake Denesuline First Nation.

Increased vehicle traffic could pose a hazard to upland breeding birds, but given the low volume of vehicles, the proponent did not predict any effects. The proponent would avoid vegetation clearing activities during breeding and nesting periods for migratory birds (May 1 through July 31) if possible, if clearing must occur during that period, monitors would be employed to conduct non-intrusive nest searches and should any active nests be found, buffer zones would be created and protected until the young have fledged.

To reduce the effects of direct injury or mortality to wildlife the proponent would enforce speed limits on the construction and access roads; clear vegetation along road right-of-ways; construct gaps in snow windrows to provide passageways for mid- to large-sized animals; fence or otherwise isolate infrastructure that may pose a hazard (open pits, trenches) to prevent access by wildlife. The proponent will also develop and implement an Access Management Plan, which would include a no hunting zone around the project footprint, no firearms policies and a “no harvesting” policy for employees. During construction, site access would be controlled and the proponent would develop and implement a Waste Management Plan, which would include appropriate storage and handling policies for camp waste.

The proponent predicted that there would be no residual effects of direct injury or mortality, after mitigation, to wildlife.

6.2.2 Views expressed

Federal authorities

Although the proponent has stated that no boreal woodland caribou occur in the project area, Environment Canada indicated that the project exists in close proximity to the Boreal Shield (SK1) boreal caribou range, as identified in the Recovery Strategy for Woodland Caribou, Boreal population, in Canada. The boundary of the SK1 range is uncertain and could overlap with the project area.

Environment Canada acknowledged that no caribou were observed during the proponent's 2012 surveys, however with only one season of caribou surveys, there was uncertainty in the proponent's conclusion that boreal woodland caribou are not currently using the project area. Also, given that boreal caribou alter their range use over time as habitat conditions change, Environment Canada noted it was possible that boreal caribou could also use the project area in the future. Because of uncertainties in the SK1 range boundary and occurrence of caribou in the project area, Environment Canada recommended that additional surveys be conducted for boreal caribou. In addition, following a precautionary approach, Environment Canada recommended that the proponent avoid or lessen potential project effects on boreal caribou and caribou habitat by: minimizing new linear disturbance (for example along access road corridors, transmission line right-of-ways and any other linear features), minimizing line-of-sight along access roads and other linear features to reduce predation, avoiding project areas while caribou are present, restoring habitat, and preventing potential harassment of caribou by mitigating sensory disturbances (noise, light, smells and vibrations).

Environment Canada also noted that one additional wildlife species listed under the *Species at Risk Act*, the Olive-sided Flycatcher, was observed in the Regional Study Area. Several other species listed under the *Species at Risk Act* may also occur in the Regional Study Area, including Common Nighthawk, Yellow Rail, Rusty Blackbird, Peregrine Falcon, Short-eared Owl, Northern Leopard Frog, Little Brown Myotis and Northern Myotis. In addition to these species, species listed by the Committee on the Status of Endangered Wildlife in Canada were observed (Horned Grebe and Wolverine) or could occur (Barn Swallow) in the Regional Study Area. These species may be listed under the *Species at Risk Act* in the future. Environment Canada recommended that project effects on all species at risk be avoided or lessened, consistent with the requirements of the *Species at Risk Act*.

Environment Canada recommended that the proponent develop comprehensive project-specific wildlife monitoring programs for wildlife, including all species at risk, to:

- determine and monitor use and change in use of the project area by wildlife throughout the life of the project (including boreal woodland caribou and their predators);
- determine the effectiveness of mitigation measures; and
- allow for adaptive management.

Migratory Birds

The *Migratory Birds Regulations* pursuant to the *Migratory Birds Convention Act* prohibits the disturbance, destruction or taking of a nest, egg or nest shelter of a migratory bird. The proponent has proposed nest searches to locate nests when work during the breeding season is necessary. Environment Canada indicated that

nest searches are not recommended, as they create more disturbances. Environment Canada indicated that the proponent should follow the advice provided on Environment Canada's web site (https://www.ec.gc.ca/paom-itmb/default.asp?lang=En&n=8D910CAC-1#_03_1) for determining the presence of nests.

Environment Canada expressed concern regarding the sensory effects of blasting activities beyond the specific area to be blasted and into the surrounding areas where migratory birds (including upland birds and water birds) would be nesting during the breeding season. Environment Canada did not agree with the proponent's conclusion that blasting activities would have a minor effect on migratory birds and species at risk and advised that blasting of surface areas during the breeding season carried high risks to birds in and surrounding the blasting sites. A year-round blasting schedule, as proposed by the proponent, would likely present a major sensory disturbance to birds in the project area. Although the proponent indicated that the effects of sensory disturbance will be minor and short-term at the population level, Environment Canada noted that the prohibitions in the *Migratory Birds Convention Act* apply to individuals and are not limited to populations, and that any disturbance during nesting periods may constitute a contravention of the *Migratory Birds Convention Act*, as well as the *Species at Risk Act*.

Environment Canada advised the proponent to avoid any habitat destruction activities (e.g., vegetation clearing, flooding, draining, etc.) and high disturbance activities (e.g., drilling, blasting) in areas attractive to migratory birds during the migratory bird breeding periods, and in areas used by species at risk during sensitive times for these species. The peak breeding period for migratory birds in the Project area is approximately, but not limited to, the period between May 1 and August 15. Environment Canada advised the proponent to protect active or indicated nest(s) (i.e. behaviour indicative of nesting such as aggression, distraction or territorial behaviour; carrying of fecal sacs, nesting material or food), at any time during the year, with a suitable species-appropriate buffer until the young have fledged.

Environment Canada recommended that the proponent engage in active reclamation of any disturbed areas as soon as they are no longer needed. This reclamation should include using native plant species to accelerate natural succession of native plant communities appropriate for the location.

Aboriginal groups

Hatchet Lake Denesuline First Nation indicated that barren-ground caribou do periodically occur in the area where the project is located and that the First Nation has conducted harvests of caribou at the site. It expressed concerns related to the proponent's assertion that caribou do not occur in the regional study area. Hatchet Lake Denesuline First Nation also expressed concern about project effects to black bear, wolf, and Canada lynx; and that it disagreed with the proponent's assertions that these species are not found in the project area.

6.2.3 *Agency analysis and conclusion*

Analysis of the effects

The Agency agrees with the proponent's view that there will be no residual effects from injury or mortality of wildlife due to vehicular collisions after implementation of the mitigation measures proposed by the proponent.

The Agency is of the view that residual effects of the project will be limited to direct loss, alteration and fragmentation of wildlife habitat, sensory disturbance to wildlife.

The direct loss, alteration, and fragmentation of available wildlife habitat in the regional study area will be less than 1.4 percent of the total regional study area. The project will not disturb any rare or uncommon habitat that is required by any species for survival, nor will it disturb critical habitat for any species at risk. The Agency acknowledges that one species at risk (Olive-sided Flycatcher) and two Committee on the Status of Endangered Wildlife in Canada listed species (Horned Grebe and Wolverine) were observed in the regional study area, and that others may occur in the regional study area. Given the availability of alternate habitat to support the life functions of wildlife species present in the regional study area the Agency agrees with the proponent's determination that the effect of the direct loss of habitat on wildlife will be negligible, and not significant. The Agency agrees with Environment Canada's observation that progressive, active reclamation of the project area will be a key mitigation measure to replace habitat destroyed by project activities. The Agency is also of the view that the Caribou Protection Plan should determine changes in use of the local study area by caribou; determine the effectiveness of imposed mitigation; and incorporate adaptive management. The Agency notes that any wildlife monitoring should include community-proposed observation techniques to detect wildlife.

The Agency agrees with the proponent's view that sensory disturbance will be greatest during the construction phase, which will last for three years, and will lessen during operations. The Agency also agrees with Environment Canada that this disturbance will present a major sensory disturbance to birds in the project area, along with other wildlife. The Agency determines that the proponent must institute appropriate mitigation measures to minimize the effect of this activity. The Agency concludes the residual effects, after mitigation, from sensory disturbances will be moderate in magnitude, short-term in duration, reversible and highly likely.

The Agency has considered the mitigation measures proposed by the proponent, expert advice from federal authorities, and comments received from Aboriginal groups and the public in identifying the following key mitigation measures:

- Carry out all phases of the Designated Project in a manner that protects and avoids harming, killing or disturbing migratory birds or destroying or taking their nests or eggs. In this regard, the proponent shall take into account the Avoidance Guidelines, the edition modified in 2014 by the Department of the Environment. The proponent's actions in applying the Avoidance Guidelines shall be in compliance with the *Migratory Birds Convention Act, 1994* and with the *Species at Risk Act*.
- Use community-proposed observation techniques, to detect and monitor wildlife.
- Route and construct the access road along existing trails to the greatest extent possible, to limit further linear disturbance.
- Carry out progressive reclamation following construction, as soon as practical, including the removal of construction materials and infrastructure no longer needed, using native plant species to accelerate natural succession of native plant communities appropriate for the location as recommended by Environment Canada.
- Enforce speed limits on the construction and access roads.
- Construct gaps in snow windrows to provide passageways for mid- to large-sized animals.
- Fence or otherwise isolate infrastructure that may pose a hazard (open pits, trenches) to prevent access by wildlife.

- Develop and implement a policy prohibiting any hunting, fishing, trapping and harvesting within the project area by the Proponent's employees and contractors, following consultation with Aboriginal groups and the Northern Hamlet of Stony Rapids.

The Agency has considered the views of the proponent, expert advice from federal authorities, and comments received from Aboriginal groups and the public in identifying the follow up and monitoring programs necessary to verify the predictions of effects to wildlife and to verify the effectiveness of mitigation measures:

- Develop and implement a community-based wildlife monitoring and surveillance program for caribou which:
 - determines changes in use of the project area by caribou and their predators; and
 - determines the effectiveness of imposed mitigation.
- Monitor reclamation to determine the success of restored or created vegetation communities and to ensure a functionally equivalent ecological structure is established.

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

6.3 Vegetation

The Agency focused its assessment of vegetation on the following:

- Plant communities with the potential to contain listed plants and traditional use plants
- Wetlands
- Listed rare plants

6.3.1 Proponent's assessment of environmental effects

Plant communities with the potential to contain listed plants and traditional use plants

The proponent classified plant communities within the regional and local study areas on a range of low to very high potential to contain provincially-listed plant or traditional use plant species' habitat. The proponent indicated that the Project's effects to plant communities with listed or traditional use plant potential included the direct effects to these plant communities and indirect effects to plant community growth and structure. These effects would be caused by construction and operational activities such as site clearing, blasting, waste rock excavation, power generation, and site water management. The proponent stated that these activities would adversely affect plant communities by the direct removal of these communities, introducing weeds, reducing seed dispersion or pollination from increased fragmentation, changing permafrost or ground thermal conditions, changing soil and water quality, changing soil moisture, and depositing dust or pollutant emissions.

The area disturbed during construction for each class of plant community with the potential to contain listed plants is summarized below in Table 8.

Table 8 Disturbance, during construction, to plant communities with listed plant potential within the local and regional study area.

Listed Plant Potential (Class)	Project Disturbance Area (hectares)	Local Study Area		Regional Study Area	
		Baseline Area (hectares)	Percent disturbed	Baseline Area (hectares)	Percent disturbed
Very High	3.6	5	72%	347	1%
High to High-Moderate	301	4325	7%	31532	0.9%
Moderate to Moderate-Low	550	2697	20%	40364	1%
Low	758	1839	41%	43307	1.7%
Total	1613*	8866*		115550*	

*Maximum project disturbance area is 1620 hectares, local study area is 8881 hectares, and regional study area is 115,600 hectares. The differences in totals are due to unclassified mapping units.

The area disturbed during construction for each class of plant community with the potential to contain traditional use plants is summarized below in Table 9.

Table 9 Disturbance, during construction, to plant communities with traditional use plant potential within the local and regional study area.

Traditional Use Plant Potential (Class)	Project Disturbance Area (hectares)	Local Study Area		Regional Study Area	
		Baseline Area (hectares)	Percent disturbed	Baseline Area (hectares)	Percent disturbed
High	553	1436	38.5%	18488	3%
High-Moderate	99	1057	9.3%	6442	1.5%
Moderate	557	3360	16.6%	22299	2.5%
Low – very low	403	3013	13.4%	68320	0.6%
Total	1612*	8866*		115550*	

*Maximum project disturbance area is 1620 hectares, local study area is 8881 hectares, and regional study area is 115,600 hectares. The differences in totals are due to unclassified mapping units.

The proponent indicated that it would site and construct project components to avoid environmentally sensitive areas (critical wildlife habitat, listed plant species, and wetlands) to the greatest extent possible. The proponent would salvage upper soil horizons and store them for later use during reclamation of disturbed areas. The proponent would prepare a Reclamation Plan to reduce or avoid effects to vegetation, including measures for progressive reclamation following construction and during operation. The proponent’s objective of final reclamation would be to return lands disturbed by Project activities to a condition that is physically stable, safe, and environmentally sustainable in keeping with the land use objectives and landscape. Reclamation goals included the successful re-establishment and long-term success of natural vegetation communities on the reclaimed landscape.

The proponent indicated that the physical area disturbed as a result of construction activities would be 869 hectares. The proponent proposed to progressively reclaim physically disturbed areas following construction and commencement of operations. The operational footprint would be reduced to 280 hectares, which the proponent would reclaim 180 hectares of upon final closure, as a result of progressive reclamation activities. The proponent predicted that the waste rock storage piles would occupy an area of 100 hectares which would not be reclaimed upon final closure as it would not be economically feasible to do so given the remote location of the project site. Despite its commitment to progressive reclamation activities, the proponent considered the Project’s effect on plant communities with the potential to contain listed or traditional use plant species to be a permanent loss of the entire 869 hectares because of the high uncertainty of the future reclaimed landscape having the same capacity to support these plant species. The high uncertainty reflects an environment where natural succession processes are slow and where trajectories can be altered by a number of factors such as climate change, fire, or development.

The area disturbed during operation and at closure for each class of plant community with the potential to contain listed plants is summarized below in Table 10.

Table 10 Disturbance, during operations and at closure, to plant communities with listed plant potential within the local and regional study area.

Listed Plant Potential (Class)	Project Disturbance Area (hectares)	Local Study Area		Regional Study Area	
		Baseline Area (hectares)	Percentage disturbed	Baseline Area (hectares)	Percentage disturbed
Very High	0	5	0%	347	0%
High to High-Moderate	243	4325	5.6%	31532	0.8%
Moderate to Moderate-Low	243	2697	9%	40364	0.6%
Low	379	1839	21%	43307	0.9%
Total	865*	8866*		115550*	

*Maximum project disturbance area is 869 hectares, local study area is 8881 hectares, and regional study area is 115,600 hectares. The differences in totals are due to unclassified mapping units.

The area disturbed during operation and at closure for each class of plant community with the potential to contain traditional use plant species is summarized below in Table 11.

Table 11 Disturbance, during operations and at closure, to plant communities with traditional use plant potential within the local and regional study area.

Traditional Use Plant Potential (Class)	Project Disturbance Area (hectares)	Local Study Area		Regional Study Area	
		Baseline Area (hectares)	Percent disturbed	Baseline Area (hectares)	Percent disturbed
High	275	1436	19%	18488	0.2%
High-Moderate	53	1057	5%	6442	0.8%
Moderate	266	3360	8%	22299	0.1%
Low – very low	271	3013	9%	68320	0.4%
Total	865*	8866*		11550*	

*Maximum project disturbance area is 869 hectares, local study area is 8881 hectares, and regional study area is 115,600 hectares. The differences in totals are due to unclassified mapping units.

The proponent indicated that plant communities with listed plant and traditional use plant potential affected by construction activities are not unique to the regional area and that the amount of area disturbed by project construction is small relative to the regional study area (as summarized in Tables 1 through 4).

The proponent has predicted that effects on plant communities with listed plant and traditional use plant potential, after mitigation, would be confined to the project area and would be negligible to low in magnitude given the small (less than 1) percent of disturbed areas within the regional study area. While effects are predicted to be permanent due to both the length of operations and the highly uncertain outcome of reclamation activities, they are not likely to be significant.

Wetlands

The project footprint would remove 41 hectares of wetlands and 12 hectares of regenerating wetlands or a 4 percent loss of wetlands and 12 percent loss of regenerating wetlands in the local study area. The proponent noted that wetlands within the local study area are not endemic to the region. At a regional scale, less than 0.1 percent of wetlands and 5 percent of regenerating wetlands would be lost. If avoidance of wetlands is not possible, the proponent would determine the need for a wetland compensation plan in consultation with Aboriginal Affairs and Northern Development Canada.

The Project could indirectly affect wetland function by acid and dust deposition and changes in soil and water quality and hydrology. The proponent did not anticipate changes to wetlands from acid and dust deposition after taking into account mitigation to reduce air emissions. Dust deposition, modeled by the proponent, was predicted to be less than 0.1 millimetres per year within a 2500 meter area of the Project and therefore deemed negligible. The proponent predicted that the co-emission of sulphur dioxide and nitrogen oxide with fugitive dust would reduce the acid generating potential as these acidic compounds react heterogeneously with conjugate bases found on the surface area of airborne dust particles. The proponent predicted that project effects to wetlands from changes in soil and water quality would be negligible after taking into account mitigation to reduce nitrogen loading from blasting, soil erosion, and seepage from waste rock disposal. The proponent predicted that changes to wetlands from changes in surface and groundwater levels would not be detectable.

The proponent predicted that residual effects from the direct loss and alteration of wetlands would not be significant because they would be negligible to low in magnitude, and confined to the project area. They may however, be permanent due to the length of operations and the highly uncertain outcome of reclamation activities, but not significant.

Rare Plants

The proponent indicated that fifty-one plant species within the local and regional study area are listed by the Saskatchewan Conservation Database Centre as extremely rare⁷, rare, or uncommon⁸. The proponent did not find any species within the local and regional study area that are listed under the *Species at Risk Act* or by the Committee on the Status of Endangered Wildlife in Canada.

The rare and uncommon plant species that could be disturbed by the project footprint include the russet sedge, Labrador lousewort, limestone oak fern, ground fir, hairy butterwort, and lichen species. The proponent predicted that the Project would not disturb any extremely rare plant species such as arctic eyebright, alternate-flowered water-milfoil, mountain woodsia, and lichen species.

The proponent indicated that it would conduct a pre-disturbance survey of rare plants, prior to construction, to ensure that none are in the project area. The proponent would fence or flag any observed rare plants to avoid disturbance during construction activities. The proponent noted it would also consult with the Saskatchewan

⁷ Extremely rare plant species are defined as having fewer than five occurrences in Saskatchewan or very few remaining individuals.

⁸ Rare and uncommon plant species are defined as having six to 100 occurrences in Saskatchewan, having few remaining individuals, or being rare and local throughout the province and occur within a restricted provincial range.

Ministry of Environment if disturbance to rare plants cannot be avoided to determine the significance of the population and identify feasible mitigation strategies.

Although the Project could affect plant species listed as rare to uncommon through construction activities, the proponent concluded that other suitable habitat would be present in the region for these species. The proponent has predicted that the effects of the Project on these rare plant species, after mitigation, would be moderate in magnitude, local in extent, continuous over the life of the Project, permanent, but not significant.

6.3.2 *Views expressed*

Federal authorities

Environment Canada advised that mitigation measures and conditions considering wetlands, including avoidance and compensation for any net loss in wetland function, should include all wetlands and wetland functions in the Project area, in accordance with the *Federal Policy on Wetland Conservation*. Environment Canada advised that an effort should be made to protect wetlands from habitat destruction, irrespective of whether they are wet or dry. Wetlands should be avoided with a 100 meter buffer where possible.

Environment Canada recommended all project areas no longer in use should be restored as quickly as possible, particularly roads and linear features in order to limit predator access. Environment Canada also recommended that the proponent commit to long-term monitoring and adaptive management of project areas to ensure successful restoration.

Aboriginal groups

Hatchet Lake Denesuline First Nation expressed concerns about project effects to traditional plants.

6.3.3 *Agency analysis and conclusion*

The Agency considers that the residual effects to vegetation would be localized and agrees with the proponent that the magnitude of effects to plant communities with listed and traditional use plant potential and wetlands is negligible or low (i.e. less than one percent at the regional scale after construction and following progressive reclamation) and moderate for rare plants.

The proponent considered the residual effect to be permanent because of the length of operations and because the outcome of reclamation activities with respect to the operation footprint is highly uncertain. Despite the uncertainties associated with the outcome of reclamation activities, the Agency is of the view that progressive reclamation using native plant species, as recommended by Environment Canada, will result in the overall impacts to vegetation, as a result of construction and operation of the project, being negligible to low in magnitude. Should reclamation activities be successful the effects will be reversed.

Ecosystems have varying critical loads which can tolerate acidic pollution or neutralize acids so that acidification of wetlands is unlikely due to the lack of emission sources from the Project and other industrial activities and fuel combustion in the area.

The Agency agrees with the proponent that, after taking mitigation into account, the residual effects to vegetation are not predicted to be large enough to alter the state of plant communities or populations or to significantly influence self-sustaining plant populations or communities.

The Agency has considered the mitigation measures proposed by the proponent, expert advice from federal authorities, and comments received from Aboriginal groups and the public in identifying the following key mitigation measures:

- Develop and implement a wetland compensation plan to achieve a no net loss of wetland function as defined in the *Federal Policy on Wetland Conservation*.
- Conduct a pre-disturbance survey for listed and traditional use plants, and avoid or transplant any observed listed or traditional use plants.
- Carry out progressive reclamation following construction, as soon as practical, including the removal of construction materials and infrastructure no longer needed, using native plant species to accelerate natural succession of native plant communities appropriate for the location as recommended by Environment Canada.
- Implement a minimum 50-meter buffer around the wetlands prior to construction for wetlands adjacent to the Project footprint.
- Collect and treat surface water run-off from construction activities, including access road construction, to maintain water quality in adjacent wetlands.

The Agency has considered the views of the proponent, expert advice from federal authorities, and comments received from Aboriginal groups and the public in identifying the follow-up and monitoring programs necessary to verify the predictions of effects to vegetation and to verify the effectiveness of mitigation measures:

- Monitor reclamation to determine the success of restored or created vegetation communities and to ensure a functionally equivalent ecological structure is established and that a no net loss of wetland function is achieved.

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

6.4 Aboriginal Groups – Health and Socio-Economic Conditions

The Agency focused its assessment of health and socioeconomic conditions of aboriginal people on changes to the environment caused by the Project that could affect:

- The ability to access traditional foods
- Commercial trapping
- Commercial fishing

6.4.1 *Proponent's assessment of environmental effects*

Ability to access traditional foods

The proponent predicted that the project would reduce the ability of some of the Aboriginal resource users (including the cabin owner near Middle Lake and members of the Black Lake Denesuline First Nation), who live and harvest within or near the local study area, to access traditional foods through traditional hunting, fishing, and gathering activities. This could result in a reduction of consumption of traditional foods and reduced participation in traditional activities associated with increased physical activity and health. Reduced access to traditional foods could also result in increased purchases of market foods and reduce access to fresh and healthy food choices at affordable prices, resulting in increased financial burden and negative effects on human health.

The proponent noted that only a small number of Aboriginal resource users would be affected by the Project and most of the Aboriginal resource users would have access to and be able to harvest in other nearby areas (for more information with regard to access to land and resources, refer to Section 6.4 Aboriginal Groups – Effects to Current Use of Lands and Resources for Traditional Purposes and to Physical and Cultural Heritage).

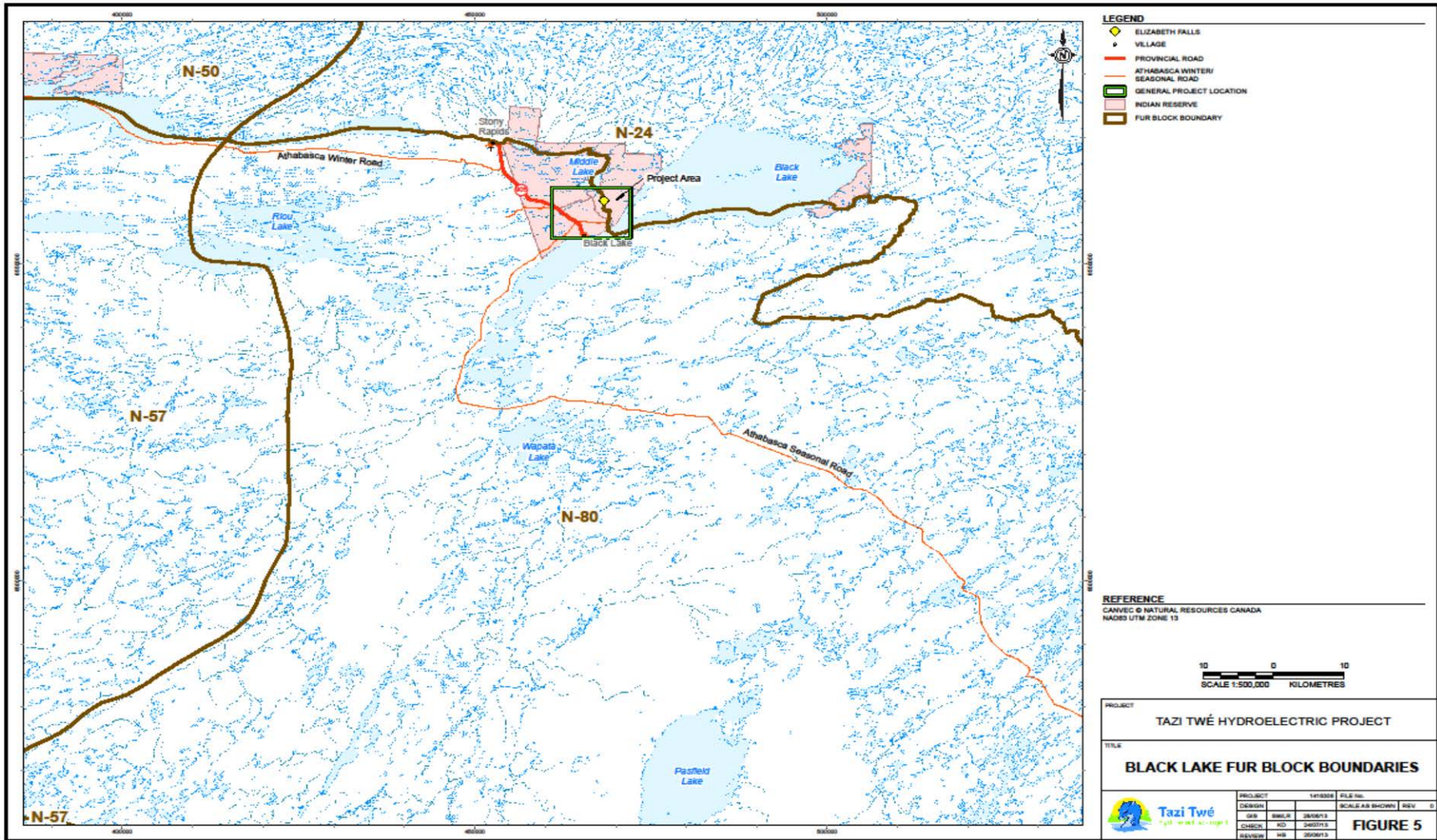
The proponent predicted that, although some of the Aboriginal resource users would not be able to access a portion of the traditional resource use areas for traditional foods during construction; other areas in the vicinity of the project would be available for traditional use. The proponent predicted that the effects on the local human population and health would be negligible and not significant.

Commercial Trapping

The proponent indicated that commercial trapping in the local study area is divided into two fur block areas, N-24 on the east side of the Fond du Lac River, and N-80 on the west side of the Fond du Lac River. The proponent stated that commercial trapping within these fur blocks is regulated by the provincial government, with only a few trappers currently registered in each block. The proponent noted that there are no specific allocations of fur blocks on reserve territory.

The proponent predicted, as is the case with traditional trapping, outlined in section 6.5 Aboriginal Peoples – Effects to Current Use of Lands and Resources for Traditional Purposes and to Physical and Cultural Heritage, that project effects to the primary resources used for commercial trapping would be negligible due to the abundance of available habitat in the local study area, and there would be no direct effects on fur blocks N-24 and N-80 themselves (see Figure 5).

Figure 5 Location of fur blocks N-24 and N-80 in relation to the Project Area



Source: Golder Associates: February 2014. Tazi Twe Hydroelectric Project EIS Report

Commercial Fishing

The proponent stated that while the Project's effects on fish and fish habitat are predicted to be moderate and would continue through operations, these effects are largely concentrated downstream of the current outlet of Black Lake and through the Fond du Lac River to Middle Lake where there are no commercial fishing operations. The proponent did not anticipate that commercial fishing in the local study area and regional study area would be affected by the construction or operations of the Project. While no effects are predicted, the proponent would carry out consultations with active licensed commercial fishers and, if necessary, implement measures to prevent or mitigate project related loss or damage sustained by commercial fishers.

6.4.2 *Views expressed*

Aboriginal groups

Hatchet Lake Denesuline First Nation expressed concern with regard to the food budgets of members on fixed incomes should the project interfere with their traditional harvesting activities, particularly the winter caribou hunt. As outlined in section 6.2 (wildlife), the proponent will develop and implement a community-based monitoring program to determine if and when caribou may be in the vicinity of the Project, and a caribou protection plan outlining monitoring and mitigation to be progressively applied should caribou approach the project area.

Hatchet Lake Denesuline First Nation expressed concerns about impacts to fish populations and the potential effects to its commercial fishing practices in Black Lake. As indicated above, the proponent did not anticipate commercial fishing in the local study area and regional study area to be affected by the construction or operations of the Project.

6.4.3 *Agency analysis and conclusion*

The Agency considers that effects on the ability of the local residents to access traditional foods during project construction will be negligible to low and localized as most of the Aboriginal resource users will be able to harvest in other nearby areas. After construction, the effects will further be reduced as access will be available to progressively reclaimed areas (589 hectares). The Agency agrees with the proponent that there will be negligible residual effects on local human health due to the changes in the ability of the local residents to access traditional resource use areas for traditional foods.

Mitigation measures related to effects on vegetation (see section 6.3) and on current use of lands and resources (see section 6.5) would address potential health effects from reduced access to traditional foods.

The Agency agrees that there will negligible effects of the Project on socio-economic conditions related to commercial fishing or trapping. Potential effects to fish and fish habitat are largely concentrated downstream of the current outlet of Black Lake and through the Fond du Lac River to Middle Lake where there are no commercial fishing operations. As such, commercial fishing in the local study area and regional study area is not predicted to be affected by the construction or operations of the Project. The Agency assessed the potential impact of the Project on commercial trapping and concluded that Project effects would be negligible because it

is unlikely that the Project will affect abundance and distribution of trapping resources and that there are no commercial fur blocks in the local study area or on the Chicken 224 reserve land.

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

6.5 Aboriginal Groups – Effects to Current Use of Land and Resources and to Physical and Cultural Heritage

The Agency focused its assessment of the current use of land and resources for traditional purposes (traditional land use) and of physical and cultural heritage on project interactions with:

- Resources used for traditional hunting, trapping, gathering, and fishing by Aboriginal peoples
- Access to land and resources
- Physical and cultural heritage, including sites or structures with historical, archeological, paleontological, or architectural significance to Aboriginal peoples

6.5.1 *Proponent's assessment of environmental effects*

The proponent analysed environmental effects to current use of lands and resources and to physical and cultural heritage based on Key Person Interviews, mapping, and land and resource use workshops conducted from 2011 to 2013 in the communities of Black Lake and Stony Rapids. Other sources of information include the Statistics Canada Aboriginal Peoples Survey 2001, ethnographic literature, as well as reports on historical and contemporary land and resource use in the Athabasca region of Northern Saskatchewan and the communities of Black Lake and Stony Rapids.

The local study area for land and resource use included the communities of Black Lake Denesuline First Nation and the Northern Hamlet of Stony Rapids. The local study area included the traditional territory of the Black Lake Denesuline First Nation. The proponent documented extensive use of lands and resources in the local study area by community members of both Black Lake and Stony Rapids. Métis Nation – Saskatchewan, Stony Rapids Local #80 is centred in Stony Rapids, 25 kilometers downstream from the proposed Project.

The regional study area included the asserted traditional territory for the Fond du Lac Denesuline First Nation, whose reserve lands are approximately 75 kilometers west of the Project area, and the asserted traditional territory of Hatchet Lake Denesuline First Nation.

Resources - Traditional Hunting

The proponent indicated that barren-ground caribou is the most important food source of the aboriginal people of the Athabasca region. However; declining populations require aboriginal people to travel into the Northwest Territories, Nunavut, and northern Manitoba to hunt caribou. Moose, black bear, beaver, rabbit, geese, ducks, ptarmigan and grouse are also harvested in the regional study area.

The proponent indicated that project environmental effects that could affect traditional hunting include: injury or mortality of wildlife, direct loss and alteration of wildlife habitat and sensory disturbance to wildlife. The analysis of these effects on wildlife is described in section 6.2 Wildlife and Wildlife Habitat and did include species of importance to Aboriginal peoples. In addition to the mitigation measures identified in section 6.2, the proponent would develop an access management plan that will include no hunting zones, no firearms policies and a “no harvesting” policy for employees.

The proponent predicted that the overall effects on traditional hunting would not be significant because the effects on wildlife and wildlife habitat, after mitigation, would not be significant, as described in section 6.2 and due to the access management plan.

Resources - Traditional Trapping

The proponent noted that local Aboriginal peoples identified beaver and marten as the main trapping resources in the regional study area. The proponent predicted that potential project effects would be on less than one percent of primary beaver and marten habitat (see Section 6.2 Wildlife). Given the abundance of available beaver and marten habitat in the local study area the proponent predicted that the Project would cause negligible changes to traditional trapping for personal use during construction and operations. Consequently, the proponent predicted that project effects to beaver and marten and their habitat would not significantly impact traditional trapping.

Resources - Traditional Gathering

The proponent indicated that traditional uses of forest plant species are numerous. The proponent noted that most traditional plants are used for food, medicine and tools, and that current gathering for domestic use is largely for berries, particularly blueberries, bog cranberries, moss berries and strawberries, as well as other edible vegetation like mushrooms, when available. Wood continues to be collected for heating. The proponent stated project effects on gathering would result from the direct loss or alteration of traditional use plants from the project footprint.

The analysis of project effects on traditional plants are described in section 6.3 Vegetation. The proponent predicted that the project disturbance area would reduce plant communities with high traditional use plant potential, after mitigation, by 19 percent in the local study area or less than one percent in the regional study area. Dust deposition caused by project emissions on traditional plants was deemed negligible.

The proponent stated that it would avoid environmentally sensitive areas (critical wildlife habitats, listed plants, wetlands) to the greatest extent possible and would implement progressive reclamation following construction and throughout operations.. Given the direct relationship between the impacts to vegetation and the impacts to traditional gathering, the proponent predicted that project effects to vegetation would not significantly impact traditional gathering.

Resources - Traditional Fishing

According to the proponent, fish species that are harvested in the regional study area include Lake Whitefish, Lake trout, cisco species, Northern pike, Walleye, suckers, and Artic grayling. The proponent indicated that most fishing for domestic use takes place on Stony Lake, with some fishing on Middle Lake and Black Lake. Lake trout fishing occurs near the junctions of the Fond du Lac River and local lakes, and Artic grayling are prevalent in the Fond du Lac River near Elizabeth Falls. Impacts to fish were a particular concern for Fond du Lac Denesuline First Nation.

Potential direct effects and small-scale indirect effects of the Project to fish and fish habitat are discussed in section 6.1 Fish and Fish Habitat. After implementation of mitigation measures for fish and fish habitat, including a fisheries offsetting plan to address the loss of fish habitat caused by the Project, the proponent predicted the effects of habitat loss and direct effects on fish would not significantly impact traditional fishing.

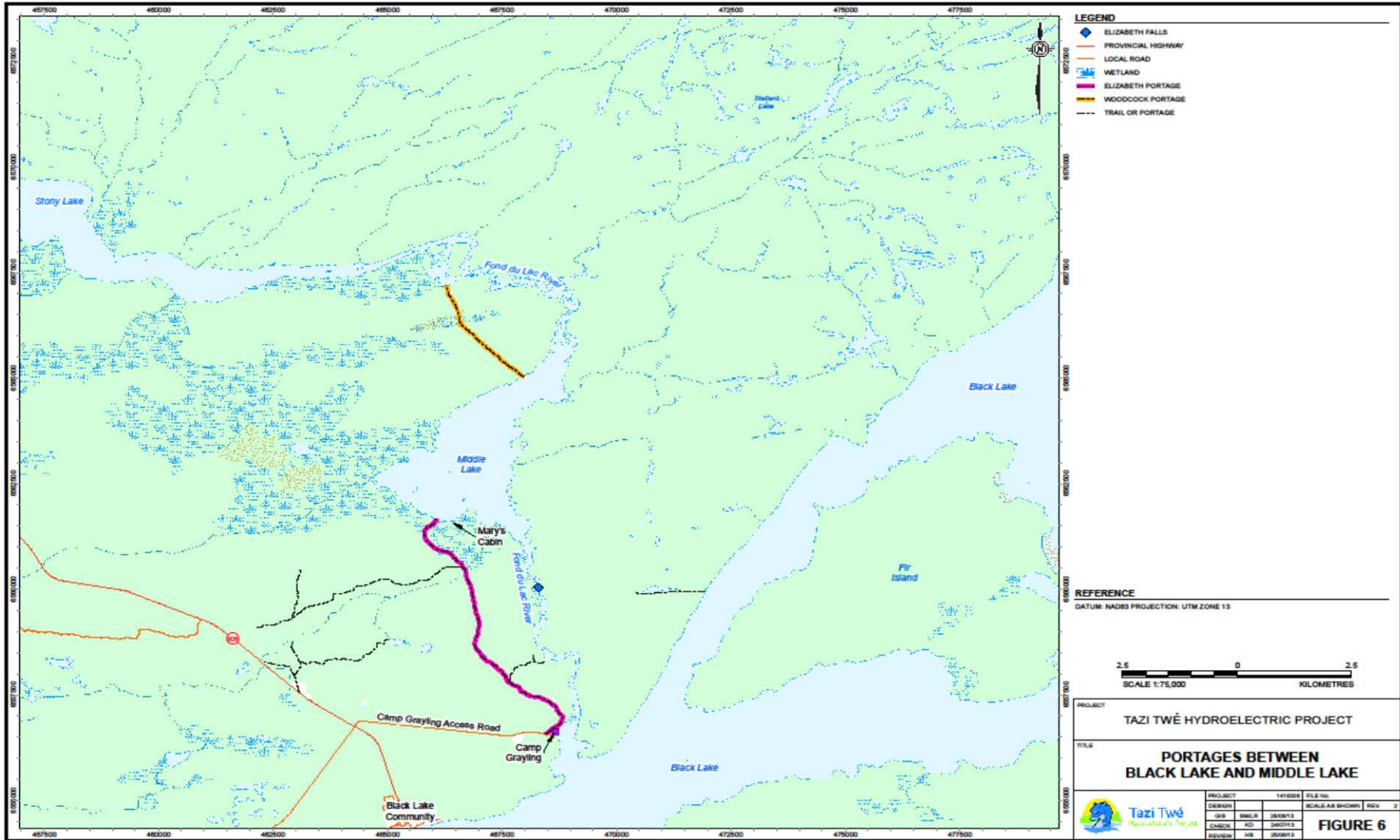
Access to land and resources

The proponent indicated that the Project may impact the ability of aboriginal people to access lands and waters used for traditional activities. The Project may also increase pressure on traditional resources from outside users because of the development of the all season access road.

The Project is located on the Chicken 224 reserve land of Black Lake Denesuline First Nation. The proponent predicted that the maximum extent of area lost for traditional uses that would occur during the construction phase would be 1620 hectares. Of this area, 869 hectares (3.3 percent of the Chicken 224 reserve land) would be the project footprint during construction. The remaining disturbance area during construction (751 hectares) represents the area in which traditional activities would be restricted to reduce public safety risk due to a 500 meter safety buffer around project facilities. Five hundred eighty nine hectares of the project footprint would be progressively reclaimed following construction. During operations, the project footprint would be 280 hectares and the 500 meter safety buffer would remain. The operational project footprint would be reclaimed and the safety buffer would be removed following project closure.

The proponent stated that the local study area has been used historically and currently as a travel corridor by Aboriginal groups in the region. There are two main portage routes in the area, one between Black Lake and Middle Lake and another between Middle Lake and Stony Lake (Figure 6). There are small trails throughout the region that are used to access cabins and campsites and to portage through the area. Trails are located off the road leading to Camp Grayling that provides access to a cabin (inhabited by an individual considered to be the principal resource user in the local study area) on Middle Lake, and to the East of Elizabeth Falls Portage along the Fond du Lac River. These trails also provide access to campsites used for community cultural camp activities. Access to some land-based trails including sections near the Fond du Lac River would be limited during construction to reduce public safety risk (temporary construction fencing would be installed in some areas). During construction of the water intake, 80 meters along the north Shore of Black Lake would not be accessible. Construction of the submerged weir would make the area around Grayling Island in the outlet of Black Lake not accessible. Based on information from local communities no one currently navigates or attempts to navigate the Fond du Lac River between Grayling Island and Middle Lake, therefore the proponent predicted that no impacts to navigation would occur during construction or operation of the submerged weir. During operations, ice-based travel near the water intake on Black Lake and tailrace channel outlet in the Fond du Lac River could be affected by changes in ice formation near these components.

Figure 6 Portage Routes between Middle Lake and Black Lake



Source: Golder Associates: February 2014. Tazi Twe Hydroelectric Project EIS Report

The proponent indicated that the all season access road would be connected to the all season road between the communities of Stony Rapids and Black Lake. The proponent stated that this connection would result in increased access to the Project area, an issue of particular concern to the Black Lake Denesuline First Nation. During construction, the Project would employ approximately 250 to 300 people and six to eight people during operations. These employees may also put increased pressure on the area and resources used for traditional activities.

The proponent would develop an Access Management Plan with the Black Lake Denesuline First Nation and the Northern Hamlet of Stony Rapids community to mitigate project effects on accessing traditional resources and cultural sites. The plan would include effective and timely communication with resource users about Project activities, public safety restrictions and provisions to limit pressures on traditional hunting, trapping and gathering resources such as no hunting zones, no firearms policies and a “no harvesting” policy for employees.

The proponent would install warning buoys and signage in front of the water intake and at the tailrace channel outlet to inform travelers of hazardous areas and sections of unsafe ice conditions during winter.

The proponent predicted that most of the effects to access of lands and waters used for traditional activities are predicted to accrue near the Project footprint and would affect a small number of resource users. Despite mitigation, some land and resources would be removed from current usage. Permanent negative project effects would be small, limited to the local study area, and not significant.

With the proposed mitigation policies and practices, the proponent predicted that traditional land and resource uses would persist in the area. The proponent predicted that project effects beyond the immediate area of the Project would be negligible as traditional resource users tend to be active outside the local study area and therefore suitable alternative locations for resource use would be available.

Physical and Cultural Heritage

The proponent carried out a database and literature search, Elder interviews, and a pre-construction field assessment as part of baseline studies to determine if heritage resources were present in Project footprint. Proponent research identified eight previously recorded heritage resources along the Fond du Lac River between Black Lake and Middle Lake. During its field assessment work, no new heritage resources were recorded but four of the eight previously recorded sites were successfully identified. The proponent did not locate any heritage, habitation, or permanent cultural sites within the local study area.

The Fond du Lac Denesuline First Nation expressed concern to the proponent about how the Project would impact heritage sites in the area. The proponent indicated that the Project’s effects to physical and cultural heritage sites due to construction activities could include physical disruption of the sites and sensory disturbance, leading to avoidance or reduced cultural experience at the sites. The historic Denesuline cemetery is outside the local study area but within 60 meters of an existing road extending north from Camp Grayling towards the proposed submerged weir location. The proponent may upgrade this access road as part of the construction of the submerged weir which could potentially result in physical disruption of the cemetery. There are a few community cultural camps located near Camp Grayling; these cultural camps are organized by Black Lake Denesuline First Nation Education and provide community members with opportunities to spend time on the land learning traditional skills. Sensory disturbance from the potential construction of an upgraded access

road would also affect the experience of Aboriginal peoples participating in the traditional learning activities. Cultural camps have historically been mobile and suitable alternative locations, in collaboration with Black Lake Denesuline First Nation, would be identified during construction when sensory disturbances occur. The proponent would also implement the following measures to mitigate effects to cultural and physical heritage:

- Flag or barricade the historic Denesuline cemetery so that it would be avoided if the adjacent road is upgraded.
- Consult with the Saskatchewan Heritage Conservation Branch on the need for a Heritage Resource Impact Assessment should new project components be proposed that are outside of the current project footprint or have not yet been assessed.
- Cease construction activity and develop appropriate management options should unanticipated heritage resources be discovered during construction.
- Consult with Black Lake Denesuline First Nation on suitable alternate locations for cultural camps during periods of construction.

The proponent predicted that with the implementation of proposed mitigation measures, the effects to cultural or physical heritage and historical, archeological, paleontological, or architectural sites or structures would be negligible.

6.5.2 Views expressed

Federal authorities

Aboriginal Affairs and Northern Development suggested that consideration be given to restricting use of the bridge over the Fond du Lac River to official use only. The bridge potentially opens up a new area to hunting, trapping, and gathering that was previously only accessible by boat and/or snowmobile and Aboriginal Affairs and Northern Development Canada suggested that the Access Management Plan address this.

Aboriginal Affairs and Northern Development Canada stated that the project is not likely to cause significant adverse environmental effects to the current use of the lands and resources for traditional purposes by Aboriginal people and to physical and cultural heritage taking into account the implementation of mitigation measures.

Transport Canada stated that under the *Navigable Waters Works Regulations* paragraph 7(2) (b), it has the authority to require the proponent to provide and maintain portages around the works “between the upper and lower reaches of the river”. Transport Canada indicated it would likely place a condition on an approval under the *Navigation Protection Act* that these portages:

- Be extended to allow for safe portage around existing obstacles, as well as all components of this work (weir, intake and tailrace channel).
- Be available for use to public at all times, including during the construction phase, safe alternative portages of reasonable length must be provided for the public, in addition to the permanent portages around the works.

Comments received with regard to environmental effects that would impact traditional land use can be found in sections: 6.1 Fish and Fish Habitat; 6.2 Wildlife and Wildlife Habitat; and, 6.3 Vegetation.

Aboriginal groups

The Hatchet Lake Denesuline First Nation, based on historic and present family relations with the Black Lake Denesuline First Nation, asserted traditional use in the project area. Hatchet Lake Denesuline First Nation did not feel that it has been properly consulted by the proponent and noted the lack of information and data regarding its traditional use of the area in the proponent's Environmental Impact Statement.

Hatchet Lake Denesuline First Nation asserted that its members currently fish, trap, travel, and hunt caribou between Wollaston Lake and Black Lake. It is concerned that the Project would make hunting of caribou even more difficult. Hatchet Lake Denesuline First Nation indicated that its members already have to travel further distances to hunt caribou because of the observed decline in herd numbers. Hatchet Lake Denesuline First Nation stated that the Project would have detrimental effects to its traditional hunt of caribou and its cultural way of life and primary source of traditional sustenance. Hatchet Lake Denesuline First Nation also expressed concern that the roads required by the Project would increase access to and competition for already scarce resources.

According to the proponent, effects on land and resource use activities (including traditional use) are not predicted to extend beyond the local study area, and, for the most part, will occur in close proximity to the Project footprint within the Chicken 224 reserve land. Any effects beyond the reserve within the local study area (e.g., on the water body of Black Lake, or in closer proximity to Stony Rapids) are predicted to be negligible. It was predicted that current land and resource uses would continue in the area and there would be no significant adverse effects to Hatchet Lake Denesuline First Nation traditional use of the area.

6.5.3 *Agency analysis and conclusion*

The Agency agrees with the proponent that the majority of effects to Aboriginal peoples' current use of land and resources for traditional purposes will be caused by project-induced changes to biophysical resources such as wildlife, vegetation, and fish and disturbance of land on the Black Lake Denesuline First Nation reserve land Chicken 224.

The Agency agrees with the proponent that the Project's effects to traditional hunting due to the loss of locally harvested species habitat, injury or mortality of traditional species, or impacts due to sensory disturbance will be negligible to low in magnitude, local in extent and short term in duration. The Agency agrees that the Project effects to traditional trapping will be negligible because the Project is unlikely to affect beaver and marten abundance and distribution during construction and operations.

The Agency is of the view that residual effects to traditional gathering due to construction activities will be negligible to low as they will be localized in extent and traditional gathering can continue outside the disturbance area during construction (869 hectares). Post-construction, gathering activities of traditional plant species can continue in the local study area, possibly in a modified context as it is uncertain whether the reclaimed landscape will have the same capacity to support traditional use plant species. The proponent's objective of final reclamation is to return lands disturbed by Project activities to a condition that is physically stable, safe, and environmentally sustainable in keeping with the land use objectives and landscape. Reclamation goals include the successful re-establishment and long-term success of natural vegetation communities on the reclaimed landscape. The Agency is of the view that progressive reclamation using native plant species, as recommended by Environment Canada, will result in the overall impacts to traditional gathering, as a result of construction and operation of the project, being negligible to low in magnitude, and should reclamation activities be successful the effects will be reversed.

The Agency acknowledges that there will be residual effects to traditional fishing, in terms of loss of fish and fish habitat as a result of hydrological changes to the Fond du Lac River due to project operation, and the construction of permanent project components (water intake, Access Bridge, tailrace channel, and submerged weir). With the implementation of mitigation measures, including the development and implementation of a fisheries offsetting plan, these effects to traditional fishing would be addressed.

The Agency agrees that the disturbance of land used for traditional purposes will be isolated to the project area on the Black Lake Denesuline First Nation reserve land Chicken 224. The region outside the immediate project area will be available and accessible for traditional practices. Other Aboriginal groups practicing traditional activities in the vicinity of the project area, outside of the Black Lake Denesuline First Nation reserve, are predicted to be less affected and able to continue traditional practices in the region.

The Agency acknowledges that during construction, there will be short term impacts to some of the traditional travel corridors used for accessing traditional use areas. Potential safety hazards can be mitigated through the appropriate use of warning signs. In addition, the Agency agrees that increased access to the project area from the construction of the new access road, and potential influx of non-resident workers, can result in increased pressures on resources important for traditional activities. However, these effects will be short term in duration and would be mitigated with the development and implementation of an Access Management Plan by the proponent, in consultation with potentially affected Aboriginal groups.

The Agency notes that identified heritage resources will not be affected and that mitigation is proposed to deal with unanticipated finds. The Agency is of the view that disturbance effects on cultural sites such as the cemetery and camps, if the access road is upgraded, will be short term (during construction) and negligible based on proposed mitigation, developed in collaboration with Black Lake Denesuline First Nation.

The Agency has identified the following mitigation measures, in addition to those described in Sections 6.1, 6.2 and 6.3 of this report:

- Choose an access road route to avoid sensory disturbance on any known community cultural camps.
- Consult with Black Lake Denesuline First Nation on suitable alternate locations for cultural camps during periods of construction.
- Flag or barricade the historic Denesuline cemetery so that it will be avoided if the adjacent road is upgraded.
- Consult with the Saskatchewan Heritage Conservation Branch on the need for a Heritage Resource Impact Assessment should new project components be proposed that are outside of the current project footprint or have not yet been assessed.
- Cease construction activity and develop appropriate management options should unanticipated heritage resources be discovered during construction.
- Develop and implement an Access Management Plan with the Black Lake Denesuline First Nation and the Northern Hamlet of Stony Rapids community with the following components:
 - Communication protocols;
 - Notification of public safety issues;
 - Prohibition of firearms, hunting, trapping, and fishing for all employees; and
 - Development of the no hunting zone.
- Install and maintain warning buoys and signage in front of the water intake and at the tailrace channel outlet into the Fond du Lac River to notify travelers of hazardous areas and sections of unsafe ice conditions during winter.
- Install and maintain a boat barrier safety boom in front of the submerged weir that meets or exceeds the Canadian Dam Association *Dam Safety Guidelines* and *Guidelines for Public Safety Around Dams*.
- Establish and mark unsafe travel routes during the ice-covered season.
- Establish and maintain alternate portage routes for any existing portage routes impacted by the Designated Project.

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

7 Other Effects Considered

7.1 Effects of Accidents and Malfunctions

Pursuant to paragraph 19(1) (a) of the Act, the proponent must take into account the environmental effects of accidents and malfunctions that may occur in connection with the designated project. Malfunctions and accidents have the potential to occur from project construction through to decommissioning and abandonment.

The proponent assessed each potential accident and malfunction according to frequency and consequence, to assign an associated risk ranking for the potential event. The results of this analysis are summarized below in Table 12.

Table 12 Proponents Accidents and Malfunctions Risk Summary

Accident or Malfunction	Issue of Concern	Frequency ^(a)	Consequence ^(b)	Risk ^(c)
Release or spills of hazardous substances	Change to surface water, soil, and vegetation quality, which can affect fish and wildlife habitat, and human health	Likely	Negligible	Negligible
Failure of embankment dykes around the settling ponds	Change to surface water, soil, and vegetation quality, which can affect fish and wildlife habitat, and human activities	Unlikely	Moderate	Low
Unplanned shutdowns of power generation activities	Change of surface hydrology, which can affect fish and fish habitat.	Highly Likely	Low	Low
Fire	Increased risk to the health and safety of employees, damage to site infrastructure and equipment, loss of wildlife habitat, wildlife mortality and loss of traditional and non-traditional land use	Unlikely	Moderate	Low
Traffic collisions	Increased potential for vehicle-to-vehicle and vehicle-wildlife collisions, which can cause injury or mortality to people and/or wildlife	Possible	High	Moderate
Physical hazards	Physical hazards (e.g., blasting activities, tailrace channel, buildings, waste rock disposal areas) can cause injury or mortality to people and/or wildlife	Unlikely	Moderate	Low

^(a)Frequency is organized into four categories: **Highly likely** – at least one chance of occurring within a year; **Likely** – at least one chance of occurring within 10 years, but less than once a year; **Possible** – at least one chance of occurring within 100 years, but less than once in 10 years; **Unlikely** – less than one chance of occurring in 100 years.; ^(b)Consequence is organized into four categories: **High** – a consequence that results in a negative effect of high magnitude (at the population level) over the medium- to long- term; **Moderate** – a consequence that is uncontained and results in localized reversible environmental damage (the loss of plant, wildlife, or aquatic communities within the local study area over the medium term); **Low** – a consequence that is contained, controlled, and cleaned up through normal environmental management in the short term, but could negatively affect organisms present at the location of the accident or malfunction; **Negligible** – a consequence that is contained, controlled, or cleaned up with no measureable impact to the environment.; ^(c) Risk is defined as the product of frequency and consequence (for example a highly likely accident and malfunction with a high consequence would result in a high risk ranking.

7.1.1 *Proponent's assessment of environmental effects*

Release or spill of hazardous substances

The proponent indicated that hazardous substances used during construction, operation, and decommissioning would include oil, gasoline, diesel, coolants and other reagents. An uncontrolled release or spill of these hazardous substances would have the potential to affect surface water (including runoff), sediment, and soil quality, which in turn could adversely affect fish and fish habitat (including fish food items); vegetation; wildlife and wildlife habitat, and human health. In addition, clean-up of spills could affect unidentified heritage resources.

The proponent stated that spills are generally preventable and local in nature. All equipment with significant quantities of fuel or oil would be surrounded by trenches or curbs that would have drains to direct small releases to the powerhouse oil separation system to prevent the release of petroleum-based wastes into waterways and would provide containment of larger spills. The proponent would develop and implement an Emergency Response and Contingency Plan that would describe spill response protocols and spill reporting procedures to meet the provincial *Environmental Spill Control Regulations* and specific procedures.

The proponent would make spill containment supplies available in designated areas throughout the project site and within Project vehicles. The proponent indicated that in the event of a large spill, disposal of all contaminated soil would be handled by a licensed contractor and be hauled off-site to an approved disposal facility. Alternative approaches for in-situ treatment of contaminated soils may also be considered (for example, phyto- or bio- remediation), depending on the substance spilled and capacity to treat the volume of material affected.

The proponent stated that vehicles would be regularly maintained and be equipped with fire extinguishers and standard emergency clean-up kits. The proponent would not store, refuel, or repair construction machinery, equipment, and vehicles. The proponent would locate vehicle fuelling stations on a constructed pad sloping toward a drain connected to a sump. The proponent indicated that any spills at the fueling stations would flow to the sump, which would be pumped out to a container for shipment offsite.

The proponent would design, construct, and manage (operate, maintain, inspect) all fuel storage tanks in accordance with the requirements of the Canadian Council of Ministers of the Environment Environmental Code of Practice for Above-Ground Storage Tanks Systems Containing Petroleum Products, the National Fire Code of Canada, and any other standards as required.

The proponent would develop options for responding to archaeological or heritage resources discovered during the clean-up of spills in consultation with the Saskatchewan Heritage Conservation Branch, and the Ministry of Parks, Culture and Sport.

The proponent concluded that the implementation of mitigation measures would reduce the likelihood and extent of the release of hazardous materials occurring on-site. The proponent predicted that the release of hazardous substances, after mitigation, would not result in residual environmental effects to fish and fish habitat, vegetation, wildlife, land and resource use, heritage resources, and human health.

Failure of the embankment dykes

The proponent stated that failure of embankment dykes around the settling ponds could result in the release of sediment laden water and potential contaminants to the surrounding surface water and terrestrial environments. To prevent or reduce the risk of an embankment dyke failure the proponent would engineer the settling ponds to provide adequate storage of construction and site run-off generated wastewater under both normal and extreme operating conditions (for example extreme precipitation events). In the event of increased precipitation (i.e., during a storm event), additional flow capacity from the collection ditch to the settling pond would be provided by the inclusion of an overflow spillway in the embankment. Based on concerns expressed by Aboriginal Affairs and Northern Development Canada, the proponent would include global stability measures of embankment dykes using a slope safety factor of 1.5.

The proponent would regularly inspect the settling pond for sediment accumulation and stability of embankments, outlet, and spillway to confirm that they are functioning properly. During the detailed design stage, additional mitigation would be identified and included as part of the Environmental Protection Plan and the Emergency Response and Contingency Plan.

The proponent concluded that the implementation of mitigation measures would reduce the likelihood and extent of a failure of the embankment dykes. The proponent predicted that the failure of the embankment dykes, after mitigation, would not result in residual environmental effects to fish and fish habitat, vegetation, wildlife, land and resource use, and heritage resources.

Unplanned shutdowns of power generation facility

The proponent estimated that the power plant would undergo between 10 and 50 unplanned shutdowns per year, with most of these occurring during the summer months because of adverse weather conditions on the electrical grid. The power plant would also be shut down without advance notice if there was a load rejection in the transmission system due to a transmission line failure. The proponent predicted that these unplanned shutdowns would be brief, ranging from a few minutes to up to five hours, and that most of the shutdowns would be for 10 to 60 minutes in length. The proponent indicated that unplanned shutdowns of the power generation facility could result in flow reductions in the Fond du Lac River downstream of the tailrace outlet which in turn could increase the annual Arctic Grayling spawning failure rate at this location to 23 percent (up from 13 percent).

To reduce or avoid the potential environmental effects from an unplanned shutdown the proponent would construct and operate a bypass conduit which can be activated, at a rate of 80 cubic meters per second (42 percent of plant capacity), to maintain flows near the tailrace channel outlet in the Fond du Lac River. The proponent would activate the bypass conduit during spring fish spawning and rearing periods (May 15 to July 15) and winter low flow periods (November through April) when unplanned shutdowns exceed 15 minutes.

The proponent would work with Fisheries and Oceans Canada to finalize a fisheries offsetting plan to offset the destruction and permanent alteration of habitat resulting in serious harm to fish caused by unplanned shutdowns of the power generation facility. Offsetting measures may include the construction of Arctic grayling spawning habitat near the tailrace channel outlet at an elevation where eggs and fry would not be lost at low riparian flows.

The proponent predicted that the residual environmental effects to fish and fish habitat as a result of emergency shutdowns of the power generation facility, after mitigation, would be negligible in magnitude, and not significant.

Fire

The proponent indicated that accidental fires at the project site have the potential to affect vegetation, wildlife and wildlife habitat by causing their direct loss and in turn affecting land and resource use and human health.

In order to reduce or avoid potential environmental effects as a result of fires, the proponent would develop and implement an Occupational Health and Safety Plan and the Emergency Response and Contingency Plan which would include site-specific response plans and mitigation measures for fire prevention, safety, and protection. The proponent would review the fire safety measures and proposed response with the communities of Black Lake and Stony Rapids. The proponent would also train on-site personnel in established fire prevention and response procedures. The proponent would provide appropriate firefighting equipment on-site so that trained personnel would be able to respond promptly, including a serviceable fire extinguisher on or within 5 meters of each piece of equipment or machinery at the project site. The proponent would also inspect all equipment and machinery daily for the accumulation of flammable debris, and park all equipment or machinery that is not in use on a non-combustible surface.

The proponent would design and construct a fire protection system that would access the water from the water treatment plant and water storage tanks with sufficient capacity to provide two hours of available water. The fire protection system would be distributed throughout the project site via pipes and electric pumps. In addition, the proponent would arrange to have water trucks or other firefighting equipment on standby during summer months with dry conditions and a high risk of fires.

The proponent predicted that the residual environmental effects to vegetation, wildlife and wildlife habitat, land and resource use, and human health as a result of fires at the project site, after mitigation, would be negligible in magnitude, and not significant.

Increased Traffic and Physical Hazards

The proponent stated that increased vehicle traffic in the regional study area and specific Project activities such as blasting could result in increased injury and mortality to wildlife and in turn affect land and resource use activities. A detailed discussion on injury and mortality of wildlife, including mitigation measures, is presented in section 6.2 (Wildlife) of this report.

The proponent predicted that increased traffic and physical hazards, after mitigation, would not result in residual environmental effects to wildlife and wildlife habitat, and land and resource use.

7.1.2 *Views expressed*

Federal authorities

Aboriginal Affairs and Northern Development Canada indicated that it was of the view that the Project would not likely cause significant adverse environmental effects related to accidents and malfunctions, taking into account the implementation of mitigation measures.

Fisheries and Oceans Canada indicated that the offsetting proposed by the proponent may not be acceptable for the mitigation of effects from the 10% increase in annual spawning failure. Fisheries and Oceans Canada indicated that if the Project proceeds it will require the development and implementation of a robust monitoring program, offsetting plan and contingency offsetting plan at the Regulatory stage (*Fisheries Act* Authorization).

7.1.3 Agency analysis and conclusion

The Agency is satisfied with the characterization of the risk from various accidents and malfunctions in the EIS. The structural failures, accidents and malfunctions that could result in residual effects, have a very low to negligible likelihood of occurrence (Table 12).

The Agency agrees with the proponent's assessment that, after mitigation, the residual effects of fires at the project site will be negligible in magnitude.

The Agency agrees that, with the implementation of a fisheries offsetting plan that meets the regulatory requirements of the *Fisheries Act* to be developed with Fisheries and Oceans Canada, the residual effects of hydrological changes to the Fond du Lac River on Arctic grayling populations, as a result of planned and unplanned shutdowns, would be localized to near the tailrace channel of the River and agrees with the proponent's assessment that the magnitude of effects is negligible. The Agency is of the view that the effective implementation of the bypass conduit to maintain flows in the Fond du Lac River is essential to reducing these effects. It is essential that the follow-up program provide verification of effects to the Arctic grayling populations and whether there is a need for corrective measures, such as modifications to flow rates, to address any further effects beyond what are predicted in the environmental impact statement.

The Agency has identified the following key mitigation measures including those presented in section 6.1 (Fish and Fish Habitat) and 6.2 (Wildlife):

- Develop an Emergency Response and Contingency Plan to reduce the likelihood and extent of the spills.
- Construct and manage (operate, maintain, inspect) all fuel storage tanks in accordance with the requirements of the Canadian Council of Ministers of the Environment Environmental Code of Practice for Above-Ground Storage Tanks Systems Containing Petroleum Products.
- Design the settling ponds to provide adequate storage capacity and retention time for wastewater both under normal and extreme operating conditions.
- Activate the bypass conduit during spring fish spawning and rearing periods (May 15 to July 15) and winter low flow periods (November through April) when planned and unplanned shutdowns exceed 15 minutes to maintain flows in the Fond du Lac River downstream of the tailrace outlet.
- Offset impacts from the 10 percent increase in spawning failure rates in accordance with any *Fisheries Act* authorization.
- Develop site-specific response and mitigation plans for fire safety and fire protection as part of the Emergency Response and Contingency Plan.

The Agency concludes that the Project is not likely to cause significant adverse environmental effects as a result of accidents and malfunctions taking into account the implementation of mitigation measures.

7.2 Effects of the Environment on the Project

7.2.1 *Proponent's assessment of environmental effects*

Effects of the environment on the project include: long term change to the hydrologic regime from climate change; mining induced seismicity; and the potential natural hazards of drought, extreme floods, high winds, natural fires and ice jams.

Long term changes to the hydrologic regime could result in reduced water levels in Black Lake and flows in the Fond du Lac River which could affect the facility's ability to operate and ensure minimum flows in the Fond du Lac River. The proponent concluded that project operations are designed in such a manner to withstand any long term changes to the hydrological regime in Black Lake. The proponent committed to designing and implementing a Water Management Plan for the Project that would include a detailed water management strategy to address low flow conditions including retrieving its domestic water supply from local groundwater wells or directly from Black Lake.

The proponent indicated that extreme flood events, long term or seasonal increases in water levels could cause damage to site infrastructure or excessive erosion. The proponent would design drainage structures, road crossings and culverts for a 1 in 100 year flood. Culverts would be monitored particularly for ice jams prior to spring break up. The site would be graded to create stable slopes and landscaped to include armouring or vegetation where necessary. Site buildings would comply with National Building code standards and be located above high water levels.

The proponent stated that mining induced seismicity in northern Saskatchewan, known to range from 1.9 to 2.7 in magnitude on the Richter scale, poses a minimal amount of risk of slight damage to well-constructed buildings. Site infrastructure would comply with National Building Code standards which would be sufficient to protect the project facilities from such events.

Forest fires are part of the natural regeneration cycle at the project site. Natural fires would not result in any additional environmental effects and would be mitigated by the design and implementation of an emergency response plan to prevent and respond to fires.

7.2.2 *Agency analysis and conclusion*

The Agency is of the view that the proponent has adequately designed the Project to account for water supply availability and natural hazards. Mitigation measures to reduce the potential effects include:

- Develop and implement an erosion and sediment control plan to ensure site stability including:
 - prevention of surface run-off water from entering active work areas where it can come in contact with exposed or erodible soils; and
 - the prompt removal of excavated material and placement in designed containment areas, prompt installation of silt fences and other containment devices to prevent erosion of stockpiled soil and overburden.
- Develop and implement a site water management plan to account for changes in precipitation including redirection of surface runoff from areas unaffected by the project into natural drainage courses and energy dissipating structures into areas of site ditching to reduce sediment and erosion potential.
- Develop and implement an emergency response plan to prevent and respond to natural fires.

- Use of National Building Codes to construct site infrastructure to withstand mining induced seismicity.

The Agency determines that the proponent has adequately considered the effects of the environment on the Project and is satisfied with the mitigation measures that the proponent has put forward to account for potential effects of the environment on the Project.

7.3 Cumulative Environmental Effects

Consistent with the Agency’s operational policy statement *Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012*, 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.

7.3.1 Approach and scope

The proponent selected the valued components for the cumulative effects assessment based on the potential for the Project to have residual effects which overlap or interact temporally or spatially with one or more past, existing or reasonably foreseeable future developments or activities within the regional study area (115 600 hectares). The past, existing, or reasonably foreseeable developments or activities with the potential to overlap or interact with project effects are summarized below in Table 13.

The proponent indicated that historically, the regional study area surrounding the Project has experienced little industrial human development and activity.

Table 13 Summary of past, existing, and reasonably foreseeable developments or activities identified by the proponent as having the potential to overlap or interact with project effects

Project / Activity	Distance from the Project	Project / Activity Status
Past Projects		
Nisto uranium deposit	Located on the west shore of Black Lake, approximately 5 km north of the Project	Exploration work and mining from 1950 - 1959 and the mine was subsequently abandoned. Site rehabilitation was completed in 1999.
Existing Projects		
Black Lake sewage lagoon	Approximately 1.5 km southwest of the project	Constructed and commenced operation in 2009
Several cabins, trails, roads, and the communities of Black Lake and Stony Rapids	Located within the Project regional study area	Several of these features have existed for more than 50 years
Reasonably Foreseeable Projects		
Extension to Highway 905 all-weather road	The highway is approximately 3 to 4 km from the project and does not overlap with the regional study area.	Project is on hold and timing of construction is unknown.
Transmission lines to connect Project to the existing Stony Rapids Switching Station	The final route of the transmission line has not been determined. The transmission line will connect the proposed power house to the existing Stony Rapids Switching Station. A portion of the transmission line will be with in the local study area.	Project is identified

The proponent predicted that the terrestrial and aquatic populations in the regional study area have adapted to the historical and existing human industrial activities, therefore, no cumulative effects are predicted to result from the project’s interactions with past and existing disturbances.

The Highway 905 extension is an 88.5 kilometer road from the community of Stony Rapids to the community of Fond du Lac outside of the Project regional study area. The proposed highway would originate from the existing Highway 905 from approximately 3.5 kilometers south of the Stony Rapids airport and will follow the 31.9 kilometers existing winter road towards the community of Fond du Lac. The remaining 56.6 kilometers will be new highway and extend to the south shore of Lake Athabasca near the community of Fond du Lac. Because the Highway 905 extension project is on hold, the proponent did not predict a temporal overlap with the Project. Based on concerns expressed by Environment Canada that the ranges for ungulate wildlife species, in particular caribou, were large enough to warrant a cumulative environmental effects assessment, the proponent carried out the analysis for wildlife despite the Highway 905 extension project being outside the Project regional study area and the unlikelihood of both projects being constructed at the same time.

A transmission line will connect the Project to the northern Saskatchewan electrical grid through the existing Stony Rapids Switching Station (located approximately 15 kilometers northwest of the Project). Although the final route for the transmission line is not yet finalized, it has a spatial and temporal overlap with the Project local and regional study areas.

The proponent predicted that the residual effects from carrying out the Project did not have the potential to cause significant adverse cumulative environmental effects to fish and fish habitat; vegetation; current use of lands and resources; and human population and health as these effects do not overlap with the spatial or temporal boundaries for any of the past, existing or reasonably foreseeable future developments and activities. Wildlife was the only valued component assessed as some of the indicator species (caribou and moose) have large ranges and therefore could be adversely affected due to cumulative environmental effects from direct mortality, habitat loss and fragmentation.

The Agency accepts and agrees with the proponent's approach and scope of assessment for cumulative environmental effects.

7.3.2 *Proponent's assessment of cumulative environmental effects*

Wildlife mortality due to increase in traffic volume

During both construction and operation, the proponent predicted that the Project related truck traffic volume on Highway 905 between Points North Landing and the community of Black Lake will increase by 8.5 percent (approximately 2 trucks per day). Small vehicle traffic volume on Highway 905 between Black Lake and Stony Rapids would increase by 30.3 percent (approximately 40 small vehicles per day) during construction and 7.6 percent (approximately 10 small vehicles per day) during operations.

Cumulative environmental effects on direct mortality of wildlife from increased traffic in the regional study area could occur if construction of the Project and the construction of the Highway 905 expansion were to occur at the same time. The proponent assumed, for the purposes of the cumulative environmental effects assessment, that the construction of the Highway 905 extension project would require the same amount of truck and small vehicle traffic as the Tazi Twé Hydroelectric Project. Based on this assumption, the proponent predicted that if both the project and the Highway 905 extension were constructed at the same time, truck traffic volume on Highway 905 between Points North Landing and the community of Black Lake would increase by 17 percent (approximately 4 trucks per day) and small vehicle traffic volume on Highway 905 between Black Lake and Stony Rapids would increase by 60.6 percent (approximately 80 small vehicles per day).

The proponent stated that with the implementation of mitigation measures such as enforcing speed limits and giving wildlife the right-of-way, the effects of direct mortality to wildlife from collisions on the highway would be limited. The proponent concluded that the cumulative effects from the increase in traffic volumes during concurrent Project construction and Highway 905 extension project construction on direct mortality of wildlife will be moderate in magnitude, short-term in duration, unlikely to occur as the Highway 905 project is on hold, and not significant.

Wildlife habitat loss and fragmentation

The proponent indicated that the construction of the Project in conjunction with the construction of the power transmission line could contribute to the cumulative environment effects of habitat loss and fragmentation on wildlife. The proponent stated that past and existing developments have disturbed approximately 1 percent of wildlife habitat in the regional study area, and that the project will remove an additional 1.4 percent (1620 hectares out of 115 600 hectares) of wildlife habitat in the regional study area. The proponent indicated that the baseline density of linear features in the regional study area is 0.07 kilometers per square kilometer. The proponent predicted that the Project would increase this to a total of 0.08 kilometers per square kilometer which is much lower than a linear density of 0.6 to 1.5 kilometers per square kilometer which has been observed to have a negative effect on wildlife in a forested environment. The proponent predicted that habitat loss and fragmentation would not be increased due to the construction of the transmission line as the transmission line would follow existing right-of-ways from linear features already in the regional study area to the greatest extent possible, and those established by the construction of the Project's access road to the power house.

Following construction, the effects of the transmission line would be restricted to the local study area due to cleared vegetation, but would not increase the effects beyond those that may already be caused by the Project. The Proponent stated that certain wildlife (wolves in particular) prefer power line corridors as travel routes during winter, however, caribou and moose normally avoid linear disturbances because of increased predation risk.

The proponent indicated that past and existing human developments currently cover approximately 0.22 percent (36 428 hectares) of the Bathurst herd of barren-ground caribou winter range, (15 950 900 hectares) which includes the regional study area. The proponent predicted that the project would increase the total amount of human disturbance in the Bathurst herd winter range by 0.02 percent to a total of 0.24 percent. The proponent predicted that the project will not remove any habitat from the boreal shield woodland caribou range. The proponent would develop and implement a Community-Based Monitoring Program to determine if and when caribou may be in the vicinity of the project. The proponent would also develop and implement a Caribou Protection Plan that would outline monitoring and mitigation to be progressively applied as caribou approach the project area. For instance, during construction if caribou are within 500 meters of a work location, work activities would be delayed, if possible, to prevent stress.

The Proponent predicted that the Project would have limited cumulative environmental effects on wildlife due to the small area of disturbance (1.4 percent of the regional study area) caused by the Project, the low number of reasonably foreseeable developments or activities in the regional study area, and that it is unlikely that there would be temporal or spatial overlap with any of these developments. The proponent predicted that the cumulative environmental effects caused by the Project on wildlife to be negligible in magnitude, unlikely, and not significant.

7.3.3 *Views expressed*

Aboriginal groups

Hatchet Lake Denesuline First Nation expressed concern about the cumulative effects of northern development projects to caribou.

7.3.4 *Agency Analysis and conclusion*

The Agency agrees with the proponent that the cumulative effects due to the increase in traffic volumes on wildlife during Project construction and Highway 905 extension project construction will be moderate in magnitude. However, these effects will be short term in duration, decrease substantially following construction, and are not significant.

The Agency is of the view that the adverse residual effects of the Project on wildlife could act in combination with the reasonably foreseeable developments (Highway 905 expansion and transmission lines) over spatial and temporal boundaries to further fragment wildlife habitat, and disrupt wildlife or displace the movement of certain animals that inhabit small territories or home ranges in mature forest stands. However, the Agency agrees with the proponent that the effects will be restricted to the construction phase of these projects and will be substantially reduced following construction. In addition, the area disturbed from the Project with the past and existing disturbance of wildlife habitat (2.4 percent total of the regional study area) is relatively minor, given the availability of alternate habitat available to support the life functions of wildlife species present in the regional study area. The Agency agrees with the proponents' determination that the effect of habitat loss and fragmentation on wildlife will be negligible, unlikely, and not significant.

The Agency considers the mitigation is appropriate to address any cumulative environmental effects to wildlife identified in section 6.2 (Wildlife) of this report and the follow up and monitoring programs will verify the predictions regarding those cumulative effects, and the effectiveness of the mitigation measures that will be implemented.

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

8 Impacts on Potential or Established Aboriginal or Treaty Rights

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

The Agency considered whether the Project had the potential to impact the potential or established Aboriginal or Treaty rights of Black Lake Denesuline First Nation, Fond du Lac Denesuline First Nation, Hatchet Lake Denesuline First Nation, and Métis Nation-Saskatchewan (represented by Locals #80, #79 and #50).

Black Lake Denesuline First Nation and the Fond du Lac Denesuline First Nation are signatories to Treaty 8. Under the terms of Treaty 8, they have an established right to hunt and fish. Black Lake Denesuline First Nation has agreed in principle to a 30 percent interest in a limited partnership with the proponent at the operational phase of the Project. The Project is located on Black Lake Denesuline First Nation reserve land Chicken 224. Fond du Lac Denesuline First Nation reserve land is approximately 75 kilometers west of the Project. Hatchet Lake Denesuline First Nation is a signatory to Treaty 10. Under the terms of Treaty 10, they have an established right to hunt, trap and fish. Hatchet Lake's reserve land is approximately 150 kilometers east of the Project. Hatchet Lake Denesuline First Nation claim historic and present family relations with the Black Lake Denesuline First Nation, thus they have indicated that they use the project area.

Black Lake Denesuline First Nation, Fond du Lac Denesuline First Nation and Hatchet Lake Denesuline First Nation assert traditional territory extending into both Treaty 8 and Treaty 10 territory, which includes the Project area. They assert their traditional harvesting rights throughout this traditional territory. Under the *Natural Resources Transfer Act* of 1930, Treaty First Nations have the right to hunt, fish, and trap on unoccupied Crown lands.

The Project lies within the Northern Administrative District of Saskatchewan. The province of Saskatchewan recognizes that Métis who have a long-standing connection to the area, identify as Métis, live a traditional lifestyle, and live within the Northern Administrative District, have an established right to hunt and fish without a licence. The province of Saskatchewan recognizes that these Métis rights extend to the following groups potentially impacted by the Project: Métis Nation- Saskatchewan Local #80 Stony Rapids, centred in Stony Rapids, 25 kilometers downstream from the Project; Métis Nation- Saskatchewan Local #79 Camsell Portage, centred in Camsell Portage, 216 kilometers downstream from the Project; and Métis Nation- Saskatchewan Local #50 Uranium City, centred in Uranium City, 179 kilometers downstream from the Project.

The federal government consulted with Aboriginal groups to understand potential project impacts on potential or established Aboriginal or Treaty rights and to take any potential adverse effects into consideration before reaching an EA decision on the Project.

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

Aboriginal groups raised key concerns about the effects of the Project on the exercise of their rights and related interests, including hunting, fishing, trapping, plant gathering as well as physical and cultural heritage aspects.

The Agency concludes that the disturbance of land used for the exercise of potential or established Aboriginal or Treaty rights will be isolated to the project area on the Black Lake Denesuline First Nation reserve land Chicken 224. As noted in Section 6.5 (current use), the operational project footprint would cover 280 hectares of reserve lands plus a safety buffer on a permanent basis. An additional 589 hectares of reserve land will be used during construction but will be

progressively reclaimed after the three year construction period. Cultural and community camps may be affected by sensory disturbance during the construction period.

The region outside the immediate project area is expected to be available, accessible and have sufficient resources for the exercise of rights, based on the analysis reflected for the valued components of fish and fish habitat (section 6.1), wildlife (section 6.2), vegetation (section 6.3), health and socio-economic conditions (section 6.4) and current use (section 6.5). Other Aboriginal groups exercising their rights in the vicinity of the project area, outside of the Black Lake Denesuline First Nation reserve land Chicken 224, are predicted to be less affected and able to continue traditional practices in the region.

As detailed in section 6.4 (health and socio-economic conditions) and section 6.5 (current use) , the Agency assessed the potential for the Project to impact the ability to access lands and waters for traditional activities and the ability to access traditional foods. The Agency considered lack of access to the Project footprint and increased pressure on resources from outside users and concludes that project effects to access will be negative, small in magnitude, limited to the local study area, permanent and not significant. Consequently, the Agency concludes that project effects to access are not likely to cause significant adverse effects to the ability to exercise Aboriginal or Treaty rights.

The Project may interact with Aboriginal hunters' ability to exercise their right to hunt traditionally, as detailed in section 6.5 (current use). The Agency assessed the potential impact of the Project on the right to hunt, considering: injury or mortality of wildlife; direct loss, alteration, and fragmentation of traditional wildlife habitat; and, sensory disturbance to wildlife. A discussion of potential effects on wildlife is presented in section 6.2 of this report, along with the Agency's conclusion that the Project is not likely to cause significant adverse environmental effects to wildlife taking into account the implementation of mitigation measures. Consequently, the Agency concludes that the project is not likely to cause significant adverse effects to Aboriginal hunters' ability to exercise their right to hunt.

The Project may interact with Aboriginal fishers' ability to exercise their right to fish traditionally or commercially, as detailed in sections 6.4 (health and socio-economic conditions) and 6.5 (current use). The Agency assessed the potential impact of the Project on the right to fish, considering both access to preferred areas and any potential effects on fish and fish habitat that could potentially reduce the availability and quality of fish. A discussion of potential effects on fish and fish habitat is presented in section 6.1 of this report. The Agency's concluded that the Project is not likely to cause significant adverse effects on this valued component, taking into account the implementation of appropriate mitigation and follow-up measures. Consequently, the Project is not likely to cause significant adverse effects to the Aboriginal right to fish. A discussion of the potential effects to commercial fishing is presented in section 6.4 (health and socio-economic conditions). Potential effects to fish and fish habitat are largely concentrated downstream of the current outlet of Black Lake and through the Fond du Lac River to Middle Lake where there are no commercial fishing operations. As such, commercial fishing in the local study area and regional study area is not predicted to be affected by the construction or operation of the Project.

The Project may interact with Aboriginal trappers' ability to exercise their right to trap traditionally or commercially, as detailed in sections 6.4 (health and socio-economic conditions) and 6.5 (current use). The Agency assessed the potential impact of the Project on the right to trap, considering abundance and distribution of the main trapping resources and concluded that Project effects would be negligible.

The Project may interact with Aboriginal peoples' ability to gather plants as detailed in section 6.5 (current use). The Agency assessed the potential impact of the Project on plant gathering, considering direct loss or alteration of traditional

use plants from the Project footprint. The analysis of project effects on traditional plants is found in section 6.3 (vegetation), along with the Agency's conclusion that the Project is not likely to cause significant adverse environmental effects to vegetation taking into account the implementation of mitigation measures. Consequently, the Project is not likely to cause significant adverse effects to the Aboriginal right to gather.

The Project may interact with Aboriginal physical and cultural heritage resources as detailed in section 6.5 (current use). The Agency assessed the potential impact of the Project on physical and cultural heritage resources, considering physical disruption of the sites and sensory disturbance. The Agency agrees that identified physical and cultural heritage sites are not likely to be affected and that mitigation is proposed to deal with unanticipated finds. Disturbance effects on physical and cultural heritage resources will be short term (during construction) and negligible based on proposed mitigation developed in collaboration with Black Lake Denesuline First Nation.

The Agency also considered effects of accidents and malfunctions, which are discussed in depth in Section 7.1 (accidents and malfunctions), on potential or established Aboriginal or Treaty rights. The Agency considered: the release or spill of hazardous substances; failure of the embankment dykes; unplanned shutdowns of the power generation facility; fire; increased traffic; and physical hazards. The Agency concludes that the Project is not likely to result in significant adverse environmental effects as a result of accidents and malfunctions, taking into account the likelihood and consequence of occurrence, the proposed project design, environmental controls and implementation of the mitigation measures. Consequently, accidents and malfunctions are not likely to cause significant adverse effect to the ability to exercise potential or established Aboriginal or Treaty rights.

Aboriginal groups submitted comments regarding the potential impacts of the Project on potential or established Aboriginal or Treaty rights. The comments communicated to the Agency and to the proponent are summarized in Appendix E.

8.3 Proposed Accommodation Measures

Sections 6.1 to 6.5 set out the proponent's mitigation measures and follow-up and monitoring programs for fish and fish habitat, wildlife, vegetation, current use of lands and resources for traditional purposes, physical and cultural heritage, and commercial, recreational, and aboriginal fisheries. These serve as accommodation measures to minimize or avoid potential adverse impacts on potential or established Aboriginal or Treaty rights, and address concerns of Aboriginal groups.

The Agency has identified the following key mitigation measures related to effects to potential or established Aboriginal or Treaty rights:

- Measures related to the avoidance, mitigation, and offsetting of effects on fisheries resources and access to preferred fishing areas, including the development and implementation of a fisheries monitoring, offsetting, and contingency offsetting plan in accordance with any *Fisheries Act* authorization required for the project.
- Measures to reduce injury, mortality or disturbance of wildlife and effects on wildlife habitat such as routing and construction of the access road along existing trails to reduce increased linear disturbance.
- Measures to support reclamation of the site to support traditional uses and habitat for species important to Aboriginal peoples.

- Control site access during construction and operations to minimize increased pressure on the area and resources used for traditional activities.
- Measures to reduce effects to vegetation and wetlands including development and implementation of a wetland compensation plan to achieve a no net loss of wetlands and to avoid disturbance of or transplant any traditional use plants.
- Measures to reduce effects on access to traditional resource use areas including, development and implementation of an Access Management Plan with the Black Lake Denesuline First Nation and the Northern Hamlet of Stony Rapids community and measures to reduce navigation hazards including warning buoys, signs for hazardous areas, and marking of unsafe travel routes.
- Avoidance of physical disruption and sensory disruption to culturally important sites including cemeteries and cultural camps.
- Identify in consultation with Black Lake Denesuline First Nation suitable alternate locations for cultural camps during periods of construction.

The Agency has identified the following follow up and monitoring programs as necessary to verify the predictions of effects to potential or established Aboriginal or Treaty rights and to verify the effectiveness of mitigation measures:

- Develop and implement a Community-Based Wildlife Monitoring and Surveillance Program.
- Develop and implement of a Caribou Protection Plan which:
 - determines changes in use of the project area by caribou and their predators; and
 - determines the effectiveness of imposed mitigation.
- Monitor reclamation to determine the success of restored or created vegetation communities and to ensure a functionally equivalent ecological structure is established.

In addition, Black Lake Denesuline First Nation has agreed in principle to a 30 percent interest in a limited partnership with the proponent at the operational phase of the Project. The proponent has also committed to compensate resource users for any demonstrated losses; the Agency considers that these would contribute to accommodation to potential impacts to established or asserted Aboriginal or Treaty Rights.

8.4 Issues Outside the Scope of the Environmental Assessment

Aboriginal groups raised concerns about effects to health and socio-economic conditions due to the influx of non-resident workers and changes to traffic volumes predicted as a result of project activity. The influx of non-local workers could create a potential for negative interactions between the residents and the non-local work force. To minimize this potential, the proponent committed to house non-local workers in a camp, away from the communities of Black Lake and Stony Rapids and would encourage workers to stay in camp by providing them with various recreational facilities. The camp would be fenced with restricted access and casual visitors would not be allowed. The proponent would implement adaptive management as required and Aboriginal residents and local service providers would be involved in developing responses to specific situations as they arise. The construction camp would be designated a drug and alcohol free area and a drug-testing program would be implemented. An increase in traffic volumes could increase the potential for traffic collisions. The proponent committed to post speed limits on all project roads, regularly grade and maintain all

unpaved roads, and remove vegetation along the roadsides for increased visibility of wildlife. A shuttle service would be employed to transport workers between the project site and the Stony Rapids airport to reduce traffic volumes. Aboriginal Affairs and Northern Development Canada considered that the interaction of non-local construction workers and local residents, along with the exposure of a traditionally very remote community to an influx of potentially negative influences, to have some negative residual effects. However, given a number of the proposed mitigation measures (dry camp, no visitors, and bussing system) Aboriginal Affairs and Northern Development Canada agreed that the predicted effects will be short in duration.

8.5 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). The following decisions under other federal legislation may also be required prior to the Project being able to proceed:

- An authorization under paragraph 35(2)(b) of the *Fisheries Act* for the serious harm to fish that are part of a commercial, recreational, or Aboriginal fishery, or to fish that support such a fishery.
- Approvals under the *Navigation Protection Act* for works that impact navigation.
- A license under paragraph 7(1) (a) of the *Explosives Act* for the storage of explosives.
- A lease and Project approval to occupy and use federal lands administered by Aboriginal Affairs and Northern Development Canada.

In these cases, the federal government 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. Coordination of Crown consultation for the regulatory phase would be the responsibility of federal government departments or agencies with a regulatory decision for the Project.

Aboriginal Affairs and Northern Development Canada

Aboriginal Affairs and Northern Development Canada indicated that it would be conducting its own consultation decision making during the regulatory approval process for the Project.

Fisheries and Oceans Canada

Fisheries and Oceans Canada indicated that once the proponent submits an application for authorization, it would notify Aboriginal groups that it is considering authorizing the project and would invite them to contact Fisheries and Oceans Canada to discuss concerns under the scope of the *Fisheries Act* Authorization. Fisheries and Oceans Canada would proceed with a level of engagement based on the concerns expressed. Fisheries and Oceans Canada noted that with the potential for offsite offsetting, other groups not included in the EA review may have to be consulted with, but that this would be a Fisheries and Oceans Canada responsibility to be addressed at the regulatory stage.

Natural Resources Canada

Natural Resources Canada is responsible for conducting Aboriginal engagement and consultation activities with respect to explosives factory and magazine licence applications under the *Explosives Act*. Natural Resources Canada follows the federal *Aboriginal Consultation and Accommodation Guidelines for Federal Officials* and as such, consults with Aboriginal groups, as appropriate, prior to making regulatory decisions. Natural Resources Canada will contact the potentially affected Aboriginal groups to provide information about the regulatory decision to be taken and would provide

consultation opportunities and consider any concerns raised prior to the issuance of a licence under 7(1)(a) of the *Explosives Act*.

Transport Canada

Transport Canada indicated that the potential impacts of the project on potential or established Aboriginal/Treaty rights, related to *Navigation Protection Act* approvals, have been adequately identified and accommodated as part of the EA process. During the regulatory phase, Transport Canada may include conditions in the *Navigation Protection Act* approvals to minimize risks to navigation around all works.

8.6 Agency Views Regarding Impacts to Aboriginal Rights

In assessing impacts to potential or established Aboriginal or Treaty rights, the Agency considered the analysis of environmental effects of the Project on Aboriginal peoples and the related mitigation measures outlined in section 6.1 (fish and fish habitat), section 6.2 (wildlife), section 6.3 (vegetation), section 6.4 (health and socio-economic conditions), section 6.5 (current use), and section 7.1 (accidents and malfunctions). It also considered the potential impacts and accommodation measures proposed by the proponent. The Agency took into account that Black Lake Denesuline First Nation has agreed in principle to a 30 percent interest in a limited partnership with the proponent at the operational phase of the Project. The Agency has concluded that the potential impacts of the Project on potential or established Aboriginal or Treaty rights have been adequately identified and will be appropriately accommodated. Consultation with potentially impacted Aboriginal groups was carried out and any comments received on the draft report and draft conditions assisted the Agency in finalizing its conclusion with respect to the potential impacts on Aboriginal or Treaty rights.

The environmental assessment decision statement issued by the Minister of the Environment also established conditions requiring the proponent to implement mitigation measures that address environmental effects on current Aboriginal use of lands and resources for traditional purposes, fish and fish habitat, vegetation, wildlife, and accidents and malfunctions which also constitute accommodation of potential impacts on potential or established Aboriginal or Treaty rights.

9 Conclusions and Recommendations of the Agency

In preparing this EA report, the Agency took into account the proponent's EIS, its responses to information requests, and the views of the public, government agencies, and Aboriginal groups.

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

The Agency concludes that the Tazi Twé Hydroelectric Project is not likely to cause significant adverse environmental effects, taking into account the implementation of the mitigation measures described in this EA Report. It has also proposed the requirements of a follow-up monitoring plan to be implemented by the proponent.

Following the comment period on the draft EA Report, the Agency provided the final report to the Minister of Environment to support her environmental assessment decision. She issued an environmental assessment decision statement indicating that the Project is not likely to cause significant adverse environmental effects⁹, and established conditions that the proponent must meet with respect to mitigation and follow-up programs.

⁹ Or, where applicable, Cabinet's determination that any significant adverse environmental effects are justified in the circumstances.

10 References

Black Lake Denesuline First Nation and Saskatchewan Power Corporation 2014. *Tazi Twé Hydroelectric Project Environmental Impact Statement*. Prepared by Golder Associates Ltd. in association with InterGroup Consultants.

Canadian Environmental Assessment Agency. 2014. *Operational Policy Statement: “Assessing Cumulative Environmental Effects” under the Canadian Environmental Assessment Act, 2012*. Available from: <https://www.ceaa-acee.gc.ca/default.asp?lang=En&n=1DA9E048-1>

Canadian Environmental Assessment Agency. 2013d. *Operational Policy Statement: Addressing “Purpose of” and “Alternative Means” under the Canadian Environmental Assessment Act, 2012*. Available from: <https://www.ceaa-acee.gc.ca/default.asp?lang=En&n=1B095C22-1>.

Environment Canada 1991. *Federal Policy on Wetland Conservation*. Available from: <http://publications.gc.ca/pub?id=100725&sl=0>.

11 Appendices

Appendix A Proponent’s Environmental Effects Rating Criteria

VEC	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Likelihood of Occurrence
Fish and Fish Habitat	<p>Negative: There is a less favourable change relative to baseline values or conditions.</p> <p>Positive: There is an improvement over baseline values or conditions.</p>	<p>Negligible to Low: There is no measureable residual effect on fish and fish habitat, or the change is expected to be less than the applicable guidelines or objectives.</p> <p>Moderate: The residual effect on fish and fish habitat is measureable, but within the anticipated resilience limits of the fish population, or within applicable guidelines/objectives and less than two standard deviations from baseline conditions.</p> <p>High: The residual effect on fish and fish habitat is near or exceeding the anticipated resilience limits of the population, or is predicted to be above applicable guidelines/objectives and greater than two standard deviations from baseline conditions.</p>	<p>Local: The residual effect is limited to the local study area.</p> <p>Regional: The residual effect is limited to the Project area, and can include cumulative environmental effects from the Project and other developments.</p> <p>Beyond Regional: The residual effect will extend beyond the Project area and includes cumulative effects from the Project and other developments.</p>	<p>Short-term: The residual effect is reversible at the end of construction.</p> <p>Medium-term: The residual effect is reversible at closure, during initial decommissioning and reclamation activities.</p> <p>Long-term: The residual effect is reversible within a defined length of time beyond closure and early decommissioning and reclamation activities.</p> <p>Permanent: The residual effect is irreversible.</p>	<p>Isolated: The residual effect is confined to a specific discrete period (i.e., the construction phase) or Project activity.</p> <p>Periodic: The residual effect occurs intermittently, but repeatedly over the temporal boundary of the assessment (95 years).</p> <p>Continuous: The residual environmental effect will occur continually over the temporal boundary of the assessment (95 years).</p>	<p>Reversible: The time (i.e., duration) required for the Project to no longer influence fish and fish habitat.</p> <p>Irreversible: The residual environmental effect is not reversible within the temporal boundary of the assessment (95 years) or the duration of the residual effect is undefined or permanent.</p>	<p>Unlikely: The residual effect is possible, but unlikely, within the temporal boundary of the assessment (95 years; < 10% chance of occurring).</p> <p>Possible: The residual effect is possible within a year, or has a chance of occurring within the temporal boundary of the assessment (95 years).</p> <p>Likely: The residual effect is probable within a year, or has a chance of occurring at least within the next 10 years (> 80% chance of occurring).</p> <p>Highly Likely: The residual effect is certain.</p>
Wildlife	<p>Negative: There is a less favourable</p>	<p>Negligible to Low: There is no measurable residual effect on wildlife</p>	<p>Local: Predicted maximum spatial</p>	<p>Short-term: The residual effect is reversible at end of</p>	<p>Isolated: The residual effect is confined to a</p>	<p>Reversible: The residual effect is reversible within a</p>	<p>Unlikely: The residual effect is possible but unlikely within</p>

VEC	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Likelihood of Occurrence
	change relative to baseline values or conditions Positive: There is an improvement over baseline values or conditions	Moderate: The residual effect on wildlife is measurable, but within the anticipated resilience limits of the wildlife population High: The residual effect is near or exceeding the anticipated resilience limits of the wildlife population	extent of direct and indirect effects from the Project Regional: Project-specific effects exceed the local scale and can include cumulative effects from other developments in the RSA Beyond Regional: Effects from the Project and other developments extend beyond the RSA	construction Medium-term: The residual effect is reversible at a defined length of time beyond construction following initial decommissioning and reclamation activities Long-term: The residual effect is reversible within a defined length of time beyond closure and final decommissioning and reclamation activities Permanent: The residual effect is irreversible	specific discrete period (i.e., construction) or Project activity Periodic: The residual effect occurs intermittently, but repeatedly over the temporal boundary of the assessment (95 years) Continuous: The residual effect will occur continually over the temporal boundary of the assessment (95 years)	time period that can be identified when the Project no longer influences wildlife populations processes (e.g., survival and reproduction) and properties (e.g., stability and resilience) Irreversible: The residual effect is predicted to influence wildlife populations indefinitely (duration is permanent or unknown)	the temporal boundary of the assessment (95 years; <10% chance of occurring) Possible: The residual effect is possible within a year, or a chance of occurring within the temporal boundary of the assessment (95 years) Likely: The residual effect is probable within a year, or at least a chance of occurring in the next 10 years (>80% chance of occurring) Highly Likely: The residual effect is certain
Vegetation	Negative: There is a less Favourable change relative to baseline values or conditions Positive: There is an improvement over baseline values or	Negligible to Low: There is no measurable residual effect on vegetation Moderate: The residual effect on vegetation is measurable, but is not predicted to alter the state of a self-sustaining plant population or community High: The residual effect is near or predicted to alter the state of a	Local: Predicted maximum spatial extent of direct and indirect effects from the Project Regional: Project-specific effects exceed the local scale and can include cumulative effects from other developments in	Short-term: The residual effect is reversible at end of construction Medium-term: The residual effect is reversible at a defined length of time beyond construction following initial decommissioning and reclamation activities	Isolated: The residual effect is confined to a specific discrete period (i.e., construction) or Project activity Periodic: The residual effect occurs intermittently, but repeatedly over the temporal boundary	Reversible: The residual effect is reversible within a time period that can be identified when the Project no longer influences plant population or community processes (e.g., forest succession) and properties, stability and resilience)	Unlikely: The residual effect is possible but unlikely within the temporal boundary of the assessment (95 years; <10% chance of occurring) Possible: The residual effect is possible within a year, or a chance of occurring within the temporal boundary of the assessment (95 years)

VEC	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Likelihood of Occurrence
	conditions	self-sustaining plant population or community	the RSA Beyond Regional: Effects from the Project and other developments extend beyond the RSA	Long-term: The residual effect is reversible within a defined length of time beyond closure and final decommissioning and reclamation activities Permanent: The residual effect is irreversible	of the assessment (95 years) Continuous: The residual effect will occur continually over the temporal boundary of the assessment (95 years)	Irreversible: The residual effect is predicted to affect plant populations and communities indefinitely (duration is permanent or unknown)	Likely: The residual effect is predicted to occur within a year, or at least a chance of occurring in the next 10 years (>80% chance of occurring) Highly Likely: The residual effect is certain
Human Population and Health	Negative: An adverse effect relative to the existing environment. Positive: A beneficial effect relative to the existing environment.	Low: Effects are likely to result in a small, hardly discernible change relative to the existing environment. Moderate: Effects are likely to result in a noticeable or detectable change relative to the existing environment. High: Effects are likely to result in a large, meaningful, and readily detectable change relative to the existing environment.	Local: Changes would affect communities in the local study area including the communities of Black Lake and Stony Rapids. Regional: Changes would extend to the Athabasca region and to Saskatchewan as a whole.	Short-term: Changes will only occur during the construction phase. Medium-term: Changes will extend to the first 10 years of operation of the Project, or for one generation relative to human population and health. Long-term: Changes will last for more than 10 years, or for more than one generation relative to human population and health.	Frequency was not considered in evaluating the significance of residual socio-economic effects on human population and health. For socio-economic changes, the residual effects are generally continuous; therefore, the criterion frequency is typically not used.	Reversibility was not used in determining effects on the socioeconomic environment as effects associated with a project are typically part of an ongoing process of interdependent economic and social change extending into the future. In general, these processes cannot be reversed to return to pre-project development conditions.	Unlikely: The residual effect is possible but unlikely within the temporal boundary of the assessment (95 years; <10% chance of occurring) Possible: The residual effect is possible within a year, or a chance of occurring within the temporal boundary of the assessment (95 years) Likely: The residual effect is probable within a year, or at least a chance of occurring in the next 10 years (>80% chance of occurring) Highly Likely: The residual effect is certain

VEC	Direction	Magnitude	Geographic Extent	Duration	Frequency	Reversibility	Likelihood of Occurrence
Current Use of Lands and Resources	<p>Negative: An adverse effect relative to the existing environment</p> <p>Positive: A beneficial effect relative to the existing environment</p>	<p>Low: Effects are likely to result in a small, hardly discernible change relative to the existing environment</p> <p>Moderate: Effects are likely to result in a noticeable or detectable change relative to the existing environment</p> <p>High: Effects would be likely to result in a large, meaningful and readily detectable change relative to the existing environment</p>	<p>Site: Effects will be limited to the Project footprint</p> <p>Local: Effects may affect resource use activities in relative proximity to the communities of Black Lake and Stony Rapids, including Black Lake (the waterbody), the section of the Fond du Lac River from Black Lake to Stony Rapids (including Middle Lake), and associated shoreline areas</p> <p>Regional: Effects extend to the Athabasca region</p>	<p>Short-term: Effects will only occur during the construction phase</p> <p>Medium-term: Effects will extend to the first 10 years of operation of the Project, or for one human generation relative to land and resource use</p> <p>Long-term: Effects will last for more than 10 years, or for more than one human generation relative to land and resource use</p>	Frequency was not considered in evaluating the significance of residual effects on land and resource use. For socio-economic changes, the residual effects are generally continuous; therefore, the criterion frequency is typically not used.	Reversibility was not used in determining effects on the socio-economic environment as effects associated with a project are typically part of an ongoing process of interdependent economic and social change extending into the future; it cannot be reversed.	<p>Unlikely: The residual effect is possible but unlikely within the temporal boundary of the assessment (95 years; <10% chance of occurring)</p> <p>Possible: the residual effect is possible within a year, or a chance of occurring within the temporal boundary of the assessment (95 years)</p> <p>Likely: The residual effect is probable within a year, or at least a chance of occurring in the next 10 years (>80% chance of occurring)</p> <p>Highly Likely: The residual effect is certain</p>

Appendix B

Summary of Environmental Effects Assessment

Residual effect	Predicted degree of effect after mitigation						Significance of residual adverse environmental effects
	Magnitude	Extent	Duration	Frequency	Reversibility	Likelihood	
VC – Fish & Fish Habitat							
Direct loss or alteration of fish habitat from the Project footprint or activities can affect fish.	<i>Negligible</i>	<i>Local</i>	<i>Long-term</i>	<i>Continuous</i>	<i>Reversible</i>	<i>Highly Likely</i>	Not significant
Withdrawal, diversion, and discharge of water for power generation may change hydrology, which can affect fish habitat (in reaches 3 through 22 of the Fond du Lac River).	<i>Moderate</i>	<i>Local</i>	<i>Long-term</i>	<i>Continuous</i>	<i>Reversible</i>	<i>Highly Likely</i>	Not significant
Water withdrawal from Black Lake for power generation may impinge or entrain fish, resulting in fish injury or mortality, which can affect fish populations.	<i>Moderate</i>	<i>Local</i>	<i>Permanent</i>	<i>Continuous</i>	<i>Irreversible</i>	<i>Highly Likely</i>	Not significant
Effects to water quality due to discharge of wastewater from settling ponds on fish & fish habitat	<i>Negligible</i>	<i>Local</i>	<i>Long-Term</i>	<i>Continuous</i>	<i>Reversible</i>	<i>Highly Likely</i>	Not significant
VC – Wildlife							
<i>Direct loss and fragmentation of habitat can affect wildlife abundance</i>	<i>Negligible to low</i>	<i>Regional</i>	<i>Permanent</i>	<i>Continuous</i>	<i>Irreversible</i>	<i>Highly Likely</i>	Not significant
<i>Decrease in habitat quality due to sensory disturbances</i>	<i>Moderate</i>	<i>Local and Regional (for migratory birds)</i>	<i>Short-term</i>	<i>Continuous</i>	<i>Reversible</i>	<i>Highly Likely</i>	Not significant
VC – Vegetation							
<i>Destruction of plant communities with listed plant and traditional use plant potential</i>	<i>Negligible to Low</i>	<i>Local</i>	<i>Long-term</i>	<i>Continuous</i>	<i>Reversible</i>	<i>Highly Likely</i>	Not significant
<i>Direct loss and alteration of wetlands</i>	<i>Negligible to low</i>	<i>Local</i>	<i>Long-term</i>	<i>Continuous</i>	<i>Reversible</i>	<i>Highly Likely</i>	Not significant
<i>Effects to plant species listed as rare to uncommon</i>	<i>Moderate</i>	<i>Local</i>	<i>Long-Term</i>	<i>Continuous</i>	<i>Reversible</i>	<i>Highly Likely</i>	Not significant
VC – Aboriginal Groups – Health and Socio-Economic Conditions							
<i>Reduction in the ability to access traditional foods</i>	<i>Negligible to low</i>	<i>Local</i>	<i>Long-Term</i>	<i>n/a</i>	<i>n/a</i>	<i>Somewhat likely</i>	Not significant

Residual effect	Predicted degree of effect after mitigation						Significance of residual adverse environmental effects
	Magnitude	Extent	Duration	Frequency	Reversibility	Likelihood	
<i>Loss of income from a reduction in commercial trapping and fishing</i>	<i>Negligible</i>	<i>Local</i>	<i>Long-Term</i>	<i>n/a</i>	<i>n/a</i>	<i>Unlikely</i>	Not significant
VC – Aboriginal Groups – Effects to Current Use of Land and Resources and to Physical & Cultural Heritage*							
<i>Changes to traditional hunting ability resulting from of project-induced changes to the biophysical environment</i>	<i>Negligible to low</i>	<i>Local</i>	<i>Short-term</i>	<i>n/a</i>	<i>n/a</i>	<i>Highly Likely</i>	Not significant
<i>Changes to traditional trapping ability resulting from of project-induced changes to the biophysical environment</i>	<i>Negligible</i>	<i>Local</i>	<i>Short-term</i>	<i>n/a</i>	<i>n/a</i>	<i>Highly Likely</i>	Not significant
<i>Changes to traditional gathering ability resulting from of project-induced changes to the biophysical environment</i>	<i>Negligible to low</i>	<i>Local</i>	<i>Short-term</i>	<i>n/a</i>	<i>n/a</i>	<i>Highly Likely</i>	Not significant
<i>Changes to traditional fishing ability resulting from of project-induced changes to the biophysical environment</i>	<i>Negligible to low</i>	<i>Local</i>	<i>Short-term</i>	<i>n/a</i>	<i>n/a</i>	<i>Highly Likely</i>	Not significant
<i>Changes to access of land and resources</i>	<i>Negligible</i>	<i>Local</i>	<i>Short-Term</i>	<i>n/a</i>	<i>n/a</i>	<i>Likely</i>	Not significant
<i>Cultural or physical heritage & historical, archaeological, paleontological or architectural sites or structures</i>	<i>Negligible</i>	<i>Local</i>	<i>Short-term</i>	<i>n/a</i>	<i>n/a</i>	<i>Unlikely</i>	Not significant
Other Effects – Accidents and Malfunctions							
<i>Unplanned shutdowns of the power generation facility</i>	<i>Negligible</i>	<i>Local</i>	<i>Short-Term</i>	<i>Periodic</i>	<i>Reversible</i>	<i>Possible</i>	Not significant
<i>Fire</i>	<i>Negligible</i>	<i>Local/Regional</i>	<i>Short-Term</i>	<i>Periodic</i>	<i>Reversible</i>	<i>Possible</i>	Not significant
Other Effects – Cumulative Effects							
<i>Accumulative effects of direct loss and fragmentation of habitat can affect wildlife abundance</i>	<i>Negligible</i>	<i>Regional</i>	<i>Long-Term</i>	<i>Continuous</i>	<i>Reversible</i>	<i>Highly Likely</i>	Not Significant

*Frequency is not considered in evaluating the significance of residual effects on land and resource use. For socio-economic changes, the residual effects are generally continuous; therefore, criterion frequency is typically not used. Similarly, reversibility is not used in determining effects on the socio-economic environment as effects associated with a project are typically part of an ongoing process of interdependent economic and social change extending into the future; it cannot be reversed. Source:

Golder Associates: February 2014. Tazi Twe Hydroelectric Project Environmental Impact Statement (EIS)

Valued Component	Mitigation Measures	Monitoring and Follow-up
Effects identified under subsection 5(1) of the Act		
Fish and fish habitat	<p>Mitigation measures</p> <ul style="list-style-type: none"> • Develop and implement a fisheries offsetting plan in accordance with any <i>Fisheries Act</i> authorization required for the Project, with contingency offsetting measures as required to address effects to Arctic grayling in the Fond du Lac River. • Locate and construct in-water works in areas that avoid sensitive or critical fish habitat. • Adhere to an operational overpressure upper limit of 50 kilopascals to avoid fish mortality from blasting activities as part of the construction of the Black Lake water intake and tailrace outlet channel. • Construct and install the water intake structure to avoid entrainment or impingement of deep water fish species.. • Maintain a minimum flow of 40 cubic meters per second at all times in the Fond du Lac River. • Implement a spring spawning trigger flow of 70 cubic metres per second timed to match the natural increase in flow in the Fond du Lac River between Black Lake and Middle Lake during spring fish spawning periods. • Develop and implement a Site Water Management Plan including the design of settling ponds to collect and treat, if necessary, all construction and site generated run-off wastewater for the duration of the Project. • Develop and implement a Waste Rock Management Plan which includes: <ul style="list-style-type: none"> ○ Testing of waste rock seepage and contact water for leached metals, chemical constituents, acid rock drainage potential, and uranium mineralization. 	<p>Monitoring and Follow-up</p> <ul style="list-style-type: none"> • Monitor all potential adverse effects from the Project to fisheries productivity to confirm that avoidance and mitigation measures and standards, in addition to offsetting activities, are functioning as planned, including: <ul style="list-style-type: none"> ○ monitor the number of fish injured or killed from entrainment or impingement within the power tunnel and power generating facility; ○ monitor ice formation during project operation ; and ○ monitor to confirm predictions made in the EIS are as planned and that proposed offsets are appropriate. • Develop and implement a Water Quality Monitoring Program to verify the quality of wastewater in settling ponds before it is released into the Fond du Lac River and to verify that concentrations meet the most stringent of the Canadian Council of Ministers of the Environment or Saskatchewan Water quality guidelines criteria by 100 m of discharge. • Monitoring Arctic grayling populations in the Fond du Lac River to determine the extent of adverse environmental effects to the species as a result of reduced flows and increased ice formation in the Fond du Lac River.

Valued Component	Mitigation Measures	Monitoring and Follow-up
	<ul style="list-style-type: none"> ○ Collection and treatment, if necessary, wastewater run-off from waste rock storage piles that contain acid rock drainage or uranium mineralization separately in its own settling ponds prior to discharge. ● Ensure that wastewater released from settling ponds meets the most stringent thresholds for parameters out of the Canadian Council of Ministers of the Environment Water Quality Guidelines for the protection of aquatic life; the Saskatchewan Surface Water Quality Objectives for the protection of aquatic life; Canadian Drinking Water Guidelines; and the Saskatchewan Drinking Water Standards and Objectives within 100 meters of any discharge point. 	
Wildlife	<p>Mitigation measures</p> <ul style="list-style-type: none"> ● Carry out all phases of the Designated Project in a manner that protects and avoids harming, killing or disturbing migratory birds or destroying or taking their nests or eggs. In this regard, the proponent shall take into account the Avoidance Guidelines, the edition modified in 2014 by the Department of the Environment. The proponent’s actions in applying the Avoidance Guidelines shall be in compliance with the <i>Migratory Birds Convention Act, 1994</i> and with the <i>Species at Risk Act</i>. ● Use community-proposed observation techniques, to detect and monitor wildlife. ● Route and construct the access road along existing trails to the greatest extent possible, to limit further linear disturbance. ● Carry out progressive reclamation following construction, as soon as practical, including the removal of construction materials and infrastructure no longer needed, using native plant species to accelerate natural succession of native plant communities appropriate for the location as recommended by Environment Canada. 	<p>Monitoring and Follow-up</p> <ul style="list-style-type: none"> ● Develop and implement a community-based wildlife monitoring and surveillance program for caribou which: <ul style="list-style-type: none"> ○ determines changes in use of the project area by caribou; and ○ determines the effectiveness of imposed mitigation. ● Monitor reclamation to determine the success of restored or created vegetation communities and to ensure a functionally equivalent ecological structure is established.

Valued Component	Mitigation Measures	Monitoring and Follow-up
	<ul style="list-style-type: none"> • Enforce speed limits on the construction and access roads. • Construct gaps in snow windrows to provide passageways for mid- to large-sized animals. • Fence or otherwise isolate infrastructure that may pose a hazard (open pits, trenches) to prevent access by wildlife. • Develop and implement a policy prohibiting any hunting, fishing, trapping and harvesting within the project area by the Proponent’s employees and contractors, following consultation with Aboriginal groups and the Northern Hamlet of Stony Rapids. 	
Vegetation	<p>Mitigation measures</p> <ul style="list-style-type: none"> • Develop and implement a wetland compensation plan to achieve a no net loss of wetland function as defined in the <i>Federal Policy on Wetland Conservation</i>. • Conduct a pre-disturbance survey for listed and traditional use plants, and avoid or transplant any observed listed or traditional use plants. • Carry out progressive reclamation following construction, as soon as practical, including the removal of construction materials and infrastructure no longer needed, using native plant species to accelerate natural succession of native plant communities appropriate for the location as recommended by Environment Canada. • Implement a minimum 50-metre buffer around wetlands prior to construction for the wetlands adjacent to the Project footprint; • Collect and treat surface water run-off from construction activities, including access road construction, to maintain water quality in adjacent wetlands. 	<p>Monitoring and Follow-up</p> <ul style="list-style-type: none"> • Monitor reclamation to determine the success of restored or created vegetation communities and to ensure a functionally equivalent ecological structure is established.
Aboriginal Groups – Health and Socio-Economic	<p>Mitigation measures</p> <p>Mitigation measures related to effects on vegetation and on current</p>	<p>Monitoring and Follow-up</p> <p>No additional follow-up measures identified in relation to Aboriginal</p>

Valued Component	Mitigation Measures	Monitoring and Follow-up
Conditions	use of lands and resources would address potential health effects from reduced access to traditional foods.	Groups – Health and Socio-Economic Conditions.
Aboriginal Groups – Effects Current Use of Land and Resources and to Physical and Cultural Heritage	<p>Mitigation measures</p> <ul style="list-style-type: none"> • Choose an access road route to avoid sensory disturbance on any known community cultural camps. • Consult with Black Lake Denesuline First Nation on suitable alternate locations for cultural camps during periods of construction. • Flag or barricade the historic Denesuline cemetery so that it will be avoided if the adjacent road is upgraded. • Consult with the Saskatchewan Heritage Conservation Branch on the need for a Heritage Resource Impact Assessment should new project components be proposed that are outside of the current project footprint or have not yet been assessed. • Cease construction activity and develop appropriate management options should unanticipated heritage resources be discovered during construction. • Develop and implement an Access Management Plan with the Black Lake Denesuline First Nation and the Northern Hamlet of Stony Rapids community with the following components: <ul style="list-style-type: none"> ○ Communication protocols; ○ Notification of public safety issues; ○ Prohibition of firearms, hunting, trapping, and fishing for all employees; and ○ Development of the no hunting zone. • Install and maintain warning buoys and signage in front of the water intake and at the tailrace channel outlet into the Fond du Lac River to notify travelers of hazardous areas and sections of unsafe ice conditions during winter. • Install and maintain a boat barrier safety boom in front of the submerged weir that meets or exceeds the Canadian Dam Association <i>Dam Safety Guidelines</i> and <i>Guidelines for Public</i> 	<p>Monitoring and Follow-up</p> <p>No additional follow-up measures identified in relation to Aboriginal Groups – Effects Current Use of Land and Resources and to Physical and Cultural Heritage.</p>

Valued Component	Mitigation Measures	Monitoring and Follow-up
	<p><i>Safety Around Dams.</i></p> <ul style="list-style-type: none"> • Establish and mark unsafe travel routes during the ice-covered season. • Establish and maintain alternate portage routes for any existing portage routes impacted by the Designated Project. 	
Other measures		
Accidents and malfunctions	<p>Mitigation measures</p> <ul style="list-style-type: none"> • Develop an Emergency Response and Contingency Plan to reduce the likelihood and extent of the spills. • Construct and manage (operate, maintain, inspect) all fuel storage tanks in accordance with the requirements of the Canadian Council of Ministers of the Environment Environmental Code of Practice for Above-Ground Storage Tanks Systems Containing Petroleum Products. • Design the settling ponds to provide adequate storage capacity and retention time for wastewater both under normal and extreme operating conditions. • Activate the bypass conduit during spring fish spawning and rearing periods (May 15 to July 15) and winter low flow periods (November through April) when planned and unplanned shutdowns exceed 15 minutes to maintain flows in the Fond du Lac River downstream of the tailrace outlet. • Offset impacts from the 10 percent increase in spawning failure rates in accordance with any <i>Fisheries Act</i> authorization. • Develop site-specific response and mitigation plans for fire safety and fire protection as part of the Emergency Response and Contingency Plan. 	<p>Monitoring and Follow-up</p> <p>No additional follow-up measures identified in relation to the effects of accidents and malfunctions.</p>
Effects of the Environment on the Project	<p>Mitigation measures</p> <ul style="list-style-type: none"> • Develop and implement an erosion and sediment control plan to ensure site stability including: 	<p>Monitoring and Follow-up</p> <p>No additional follow-up measures identified in relation to the effects of the environment on the Project.</p>

Valued Component	Mitigation Measures	Monitoring and Follow-up
	<ul style="list-style-type: none"> ○ Prompt removal of excavated material and placement in designed containment areas, prompt installation of silt fences and other containment devices to prevent erosion of stockpiled soil and overburden. ● Use National Building Codes to construct site infrastructure to withstand mining induced seismicity. 	
Cumulative Environmental Effects	<p>Mitigation measures</p> <p>The Agency considers the mitigation, follow up, and monitoring programs identified in section 6.2 (Wildlife) of this report to be appropriate for effects to wildlife, to verify the predictions of cumulative effects to wildlife, and to verify the effectiveness of mitigation measures.</p>	<p>Monitoring and Follow-up</p> <p>No additional follow-up measures identified in relation to cumulative effects.</p>
Impacts on Potential or Established Aboriginal or Treaty Rights	<p>Mitigation measures</p> <p>Measures to mitigate impacts on fish and fish habitat, current use by Aboriginal peoples for traditional purposes, and accidents and malfunctions are appropriate. The list of mitigation measures is included above.</p>	<p>Monitoring and Follow-up</p> <p>Follow-up measures related to fish and fish habitat, current use by Aboriginal peoples for traditional purposes, and accidents and malfunctions are appropriate. The list of follow-up is included above.</p>

Appendix D Proponent Commitments as presented in the Environmental Impact Statement

Valued Component	Mitigation and Follow-up Commitments
Fish & Fish Habitat, Wildlife, Vegetation, Aboriginal Groups – Health and Socio-Economic Conditions, Aboriginal Groups – Effects on Current Use of Land and Resources and to Physical and Cultural Heritage	Develop and implement an Environmental Protection Plan for the Project.
Fish & Fish Habitat, Wildlife, Vegetation	Develop and implement an Erosion and Sediment Control Plan for the Project.
Fish & Fish Habitat, Vegetation	Develop and implement a detailed Weed Management Plan for the Project.
Effects on Current Use of Land and Resources and to Physical and Cultural Heritage	Stop construction activities and contact the Heritage Conservation Branch should unanticipated archaeological materials or features be discovered during construction activities.
Fish & Fish Habitat, Wildlife, Vegetation, Aboriginal Groups – Effects on Current Use of Land and Resources and to Physical and Cultural Heritage	Develop and implement a Blasting Plan for the Project.
Fish & Fish Habitat, Wildlife, Vegetation, Aboriginal Groups – Health and Socio-Economic Conditions, Aboriginal Groups – Effects on Current Use of Land and Resources and to Physical and Cultural Heritage	Develop and implement a Site Water Management Plan for the Project; this will include site drainage settling ponds and water treatment areas.
Fish & Fish Habitat, Wildlife, Vegetation	Dewatering activities for the water intake power tunnel and tailrace channel will be directed to settling ponds prior to discharge to watercourses.
Wildlife	Develop and implement a Caribou Protection Plan
Fish & Fish Habitat, Wildlife, Vegetation	Develop a Waste Rock Management Plan for the Project to assess and manage various waste rock types (including rock with ARD potential, elevated concentrations of various metals, or containing uranium mineralization).
Wildlife, Aboriginal Groups – Health and Socio-Economic Conditions	Develop a Waste Management Plan for the construction camp and worksite for construction and operations.
Fish & Fish Habitat, Wildlife, Aboriginal Groups – Health and Socio-Economic Conditions, Aboriginal Groups – Effects on Current Use of Land and Resources and to Physical and Cultural Heritage	Construct, maintain and monitor appropriate storage areas for all hazardous substances and waste dangerous goods.
Fish & Fish Habitat, Vegetation, Wildlife, Aboriginal Groups – Health and Socio-Economic Conditions, Aboriginal Groups – Effects on Current Use of Land and Resources and to Physical and Cultural Heritage	Procedures to handle spills of hazardous substances. Maintain spill response materials at locations where hazardous materials are stored and will be located around the Project site.

Valued Component	Mitigation and Follow-up Commitments
Fish & Fish Habitat, Vegetation, Wildlife, Aboriginal Groups – Effects on Current Use of Land and Resources and to Physical and Cultural Heritage	All hazardous materials and waste will be transported, stored, handled and disposed of in accordance with all regulatory requirements.
N/A	<i>Permanent roads will be designed to meet current provincial road design standards. Site drainage, erosion, and sedimentation management will be in accordance with the applicable provincial and federal regulations and guidelines</i>
Fish & Fish Habitat, Vegetation, Wildlife, Aboriginal Groups – Health and Socio-Economic Conditions, Aboriginal Groups – Effects on Current Use of Land and Resources and to Physical and Cultural Heritage	Develop an Emergency Response Plan for the Project.
Vegetation, Wildlife	Clearing of vegetation will be limited to the extent possible and only removed in areas that may pose a hazard or interfere with construction activities. Merchantable timber will be available to the local community.
Vegetation	Complete a site-specific assessment prior to soil salvage to identify surficial stripping depths and develop a site-specific soil salvage plan.
Vegetation, Wildlife	Complete an appropriate pre-construction survey and if federal or provincial tracked species are discovered apply activity setback guidelines if construction occurs during sensitive nesting, breeding, and rearing periods for wildlife species.
Fish & Fish Habitat, Aboriginal Groups – Effects on Current Use of Land and Resources and to Physical and Cultural Heritage	Construct and operate in-water works (e.g., water intake, submerged weir, and tailrace channel) in accordance with conditions outlined in the Fisheries Act Authorization.
Fish & Fish Habitat	Implement a Turbidity Monitoring Program during construction of the bridge piers, submerged weir, and water intake and tailrace outlet connections to Black Lake and the Fond du Lac River, respectively.
Fish & Fish Habitat	Screen water pump intakes as per Fisheries and Oceans’ “Freshwater Intake End-of-Pipe Fish Screen Guideline” to prevent entrainment of fish (DFO 1995).
Fish & Fish Habitat, Aboriginal Groups – Effects on Current Use of Land and Resources and to Physical and Cultural Heritage	Develop a Fish Habitat Offsetting Plan for the Project.
Aboriginal Groups – Health and Socio-Economic Conditions	Obtain the appropriate water rights licence prior to diverting water from Black Lake through the power tunnel or pumping water from the Fond du Lac River to use for potable and industrial purposes (operations).
Fish & Fish Habitat, Wildlife, Aboriginal Groups – Effects on Current Use of Land and Resources and to Physical and Cultural Heritage	Use DFO guidelines for the Use of Explosives in or Near Canadian Fisheries Waters, and adhere to an operational overpressure upper limit of 50 kPa when blasting near water.

Valued Component	Mitigation and Follow-up Commitments
N/A	<i>The underground works will be performed in accordance with requirements of the Occupational Health and Safety Act of the Province of Saskatchewan.</i>
Fish & Fish Habitat, Vegetation, Wildlife, Aboriginal Groups – Health and Socio-Economic Conditions	Implement a Water Quality Monitoring Program.
Fish & Fish Habitat, Wildlife, Aboriginal Groups – Effects on Current Use of Land and Resources and to Physical and Cultural Heritage	Develop an Access Management Plan for the construction camp and worksite.
Fish & Fish Habitat, Vegetation	Test excavated rock and aggregate materials to confirm whether this material requires special management (ARD potential radioactivity). Dispose of any waste rock that is found to be ARD generating or radioactive as per provincial and federal guidelines.
Vegetation, Aboriginal Groups – Health and Socio-Economic Conditions	Potable water for the construction camp is anticipated to be sourced from one or more new wells located near the camp and will be treated on-site.
Fish & Fish Habitat, Vegetation, Wildlife, Aboriginal Groups – Health and Socio-Economic Conditions	Transport sewage and grey water from the Project to the Black Lake Lagoon for disposal.
Fish & Fish Habitat, Vegetation, Wildlife, Aboriginal Groups – Health and Socio-Economic Conditions	Develop a Site Water Management Plan for the site during operations.
Fish & Fish Habitat, Wildlife, Vegetation, Aboriginal Groups – Health and Socio-Economic Conditions, Aboriginal Groups – Effects on Current Use of Land and Resources and to Physical and Cultural Heritage	Water required for fire protection will be provided for the site to meet requirements.
Fish & Fish Habitat, Vegetation	Develop a Decommissioning and Reclamation Plan for the Project.
Fish & Fish Habitat, Wildlife, Vegetation, Aboriginal Groups – Health and Socio-Economic Conditions, Aboriginal Groups – Effects on Current Use of Land and Resources and to Physical and Cultural Heritage	Regularly maintain equipment for compliance with provincial and federal air emission standards. Comply with provincial and federal air emission standards for facilities generating air emissions.
Fish & Fish Habitat	Construction of the water intake in Black Lake will comply with conditions outlined in the Aquatic Habitat Protection Permit.
Aboriginal Groups – Effects on Current Use of Land and Resources and to Physical and Cultural Heritage	Construction of the water intake in Black Lake will comply with conditions of the <i>Navigable Waters Protection Act Approval</i> and marker buoys will be used during open water season. In winter unsafe ice conditions marked by other means.
Fish & Fish Habitat, Vegetation	On-site storage of explosives will be performed in accordance with requirements of the federal <i>Explosives Act</i> .

Valued Component	Mitigation and Follow-up Commitments
Aboriginal Groups – Health and Socio-Economic Conditions, Aboriginal Groups – Effects on Current Use of Land and Resources and to Physical and Cultural Heritage	A Project Advisory Committee, including equal representation from the Elizabeth Falls Hydroelectric Limited Partnership (EFHLP) and SaskPower will meet at least monthly or as otherwise agreed to by the Committee, and will review the status of the Project including environmental, engineering and construction activities including community matters that relate to the completion of the Project. It is anticipated that this committee will discuss on-going concerns about socio-economic effects, and that the EFHLP and SaskPower will work together collaboratively on measures to address any community concerns.
Aboriginal Groups – Effects on Current Use of Land and Resources and to Physical and Cultural Heritage	Work with the contractor to limit Project-related disruption to the principle resource user and Camp Grayling. Provide effective and timely communication about Project activities and whether any restrictions to activities will be applied (e.g., for safety concerns). Consider compensation for demonstrated losses resulting from the Project.
Aboriginal Groups – Effects on Current Use of Land and Resources and to Physical and Cultural Heritage	In addition to road alignment that avoids cultural campsites and protects public safety, provide timely and effective communication with local resource users about construction and operation activities, including providing information about any restrictions that may be put in place to limit risks to public safety.
Aboriginal Groups – Health and Socio-Economic Conditions	Contractors will be required to support apprenticeship-training programs and implement a craft-mentoring program that pairs trainees and apprentices with experienced craftsmen and foremen.
Aboriginal Groups – Health and Socio-Economic Conditions	SaskPower will advertise several operations positions through SaskPower Human Resources and hire the most qualified individuals, with a preference for BLFN and Athabasca Region applicants.

Appendix E

Summary of Monitoring Programs and Other Follow-Up Activities proposed by the proponent

Valued Component	Monitoring and Follow-up
Fish and fish habitat	<ul style="list-style-type: none"> • Monitor fisheries offsetting activities, as defined in the Fisheries Offsetting Plan, during operation. The objectives and methods used to offset serious harm to fish within the local study area will be determined with input from regulators and local communities. • Install continuous water level sensors on Black Lake to monitor predicted effects on these waterbodies. • Maintain continuous flow records in the bypassed section of the Fond du Lac River to verify environmental effects predictions. • Collect streamflow and water level data to verify hydrological models applied in the assessment and verify the hydrologic function of the weir at the outflow of Black Lake. • Implement a water quality monitoring program in the Fond du Lac River to verify predicted changes in water quality from discharges from the settling ponds. • Implement a water quality monitoring program to detect potential changes in water quality in Black Lake, Middle Lake, and several small lakes near the Project to verify the prediction of no effects on water quality due to acid deposition from the Project. Implement adaptive management if monitoring detects effects that are different from predicted effects, or there is a demonstrated need for improved or modified design features.
Wildlife	<ul style="list-style-type: none"> • Prior to construction, complete detailed site assessments to identify listed wildlife species that may be present in the areas to be disturbed, which were not identified during previous surveys. • Complete additional wildlife surveys prior to construction if construction activities are to take place during the breeding season.
Vegetation	<ul style="list-style-type: none"> • Monitor re-vegetation techniques and success. • Environmental monitoring for weed species during construction and operation and the implementation of a Weed Management Plan.
Aboriginal Groups – Health and Socio-Economic Conditions	<ul style="list-style-type: none"> • A Project Advisory Committee, including equal representation from the EFHLP and SaskPower, will monitor and manage community concerns on the economy. • With respect to the longer-term effects associated with Project operation, BLFN may want to consider monitoring how their equity is invested and what the associated outcomes for the community would be. • A Project Advisory Committee, including equal representation from the EFHLP and SaskPower, will monitor and manage community concerns on infrastructure and community services. • A Project Advisory Committee, including equal representation from the EFHLP and SaskPower, will monitor and manage community concerns on population and health.
Aboriginal Groups – Effects	<ul style="list-style-type: none"> • Monitoring and follow-up programs associated with fish and fish habitat, vegetation, and wildlife also relevant to land and resource

Valued Component	Monitoring and Follow-up
on Current Use of Land and Resources and to Physical and Cultural Heritage	<p>use.</p> <ul style="list-style-type: none"> • A Project Advisory Committee, including equal representation from the EFHLP and SaskPower, monitor and manage community concerns on resource use. • An additional Heritage Resource Impact Assessment will be conducted for portions of the access road that traverse native boreal forest located 250 metres from unnamed creeks that drain into Middle Lake prior to construction activities.

Group	Comment or Concern	Summary of Proponent’s Response	Agency Response
Fish and Fish Habitat			
<p>Black Lake Denesuline First Nation</p> <p>Hatchet Lake Denesuline First Nation</p>	<p>Concern about effects of turbines on fish mortality.</p>	<p>The proponent predicted that a maximum of 25 percent of fish less than 600 millimeters long (based on a 2-turbine power generation facility) passing through the power tunnel and power generation turbines would be injured and killed from entrainment or impingement. Walleye and White suckers are most likely to interact with the water intake where approximately 10 percent of their abundance is predicted to be entrained and lost annually from Black Lake.</p> <p>A fisheries offsetting plan will mitigate the loss of fish as a result of entrainment or impingement caused by the power tunnel and power generation turbines.</p> <p>The water intake will be located on the north shore of Black Lake in an area that does not support spawning or large fish populations. To reduce the entrainment of deep-water fish, the water intake will be constructed at a shallow depth and a trashrack will be installed to act as a visual and physical fish deterrent.</p> <p>A monitoring program, which includes measures to quantify the numbers, types, and mortality rates of fish passing through the power generation turbines, will be developed. Contingency offsetting measures will be implemented if effects are greater than those predicted.</p> <p>Studies on predicted fish injury and mortality caused by the Project are described in the EIS, section 12.5.1.</p>	<p>The Agency notes that there is some uncertainty regarding the numbers and types of fish that will become entrained or impinged in the power tunnel. However, the Agency is satisfied that the proponent will manage and address the effects after taking into consideration the implementation of an appropriate follow-up program to monitor fish becoming entrained or impinged in the power tunnel and the implementation of corrective measures.</p> <p>The Agency is satisfied that the Project’s effect of turbines on fish injury and mortality will be mitigated by the proponent and therefore concludes that the corresponding effects to the Aboriginal use of fish resources will not be significantly affected by the Project.</p> <p>The Agency considers that certain key mitigations serve to address concerns raised by Aboriginal groups related to fish mortality. The Agency is recommending the following key measures that the proponent should meet with respect to mitigation and follow-up programs in the event that the project is permitted to proceed:</p> <p>Develop and implement a fisheries offsetting plan in accordance with any <i>Fisheries Act</i> authorization required for the Project with contingency offsetting measures as required to address effects to Arctic grayling in the Fond du Lac River.</p> <p>Monitor all potential adverse effects from the Project to fisheries productivity to confirm that avoidance and mitigation measures and standards, in addition to offsetting</p>

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
			<p>activities, are functioning as planned, including:</p> <ul style="list-style-type: none"> • monitor the number of fish injured or killed from entrainment or impingement within the power tunnel and power generating facility; • monitor ice formation during project operation; and • monitor to confirm predictions made in the EIS are as planned and that proposed offsets are appropriate. <p>Monitoring Arctic grayling populations in the Fond du Lac River to determine the extent of adverse environmental effects to the species as a result of reduced flows and increased ice formation in the Fond du Lac River.</p>
Fond du Lac Denesuline First Nation	Concern about effects of the submerged weir on fish movement.	<p>The proponent predicted that the weir would create a small set of rapids but would be designed to allow fish passage and not exceed flow velocity swimming thresholds of fish species identified as valued components.</p> <p>In-water works will be completed in accordance with conditions outlined in the authorization issued by Fisheries and Oceans Canada. Other mitigation measures such as cofferdams and constructing in-water works outside of sensitive periods will also be implemented.</p> <p>Studies on the effects of the weir on fish movement are described in the EIS, section 12.5.2.</p>	<p>The Agency is satisfied that the effect of the weir on fish movement will be mitigated by the proponent and therefore concludes that the corresponding effects to the Aboriginal use of fish resources will not be significantly affected by the Project.</p> <p>The Agency considers that certain key mitigations serve to address Aboriginal groups' concerns about the effects of the Project on fish movement. The Agency is recommending the following key measures that the proponent should meet with respect to mitigation and follow-up programs in the event that the project is permitted to proceed:</p> <p>Locate and construct in-water works in areas that avoid sensitive or critical fish habitat.</p> <p>Develop and implement a fisheries offsetting plan in accordance with any <i>Fisheries Act</i> authorization required for</p>

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
			<p>the Project with contingency offsetting measures as required to address effects to Arctic grayling in the Fond du Lac River.</p>
<p>Fond du Lac Denesuline First Nation</p> <p>Hatchet Lake Denesuline First Nation</p>	<p>Concern about effects to downstream fish populations in Lake Athabasca and upstream fish populations in Wollaston Lake.</p>	<p>The proponent stated that the Project is wholly within Black Lake Denesuline First Nation reserve Chicken 224 and will have minimal off-reserve impacts to fish or fish habitat in Wollaston Lake and Lake Athabasca after taking into account the implementation of mitigation measures and follow-up.</p> <p>The proponent predicted that residual project effects off-reserve would not be large enough to alter the state of fish health, abundance, distribution or habitat, and therefore influence the maintenance of self-sustaining fish populations in the regional and local area, both upstream and downstream.</p>	<p>The Agency is satisfied that the upstream and downstream effects to fish and fish habitat will be mitigated by the proponent. The Agency therefore concludes that the corresponding effects to the Aboriginal use of fish resources upstream and downstream of the Project will not be significantly affected by the Project.</p> <p>The Agency considers that certain key mitigations serve to address Aboriginal groups' concerns about effects of the Project on specific fish populations in Lake Athabasca and Wollaston lake. The Agency is recommending the following key measures that the proponent should meet with respect to mitigation and follow-up programs in the event that the project is permitted to proceed:</p> <p>Maintain a minimum flow of 40 cubic meters per second at all times in the Fond du Lac River.</p> <p>Implement a spring spawning trigger flow of 70 cubic metres per second timed to match the natural increase in flow in the Fond du Lac River between Black Lake and Middle Lake during spring fish spawning periods.</p> <p>Activate the bypass conduit during spring fish spawning and rearing periods (May 15 to July 15) and winter low flow periods (November through April) when planned and unplanned shutdowns exceed 15 minutes to maintain flows in the Fond du Lac River downstream of the tailrace outlet.</p> <p>Locate and construct in-water works in areas that avoid sensitive or critical fish habitat.</p> <p>Develop and implement a fisheries offsetting plan in accordance with any <i>Fisheries Act</i> authorization required for the Project with contingency offsetting measures as required to address effects to Arctic grayling in the Fond du Lac River.</p>

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Black Lake Denesuline First Nation	Concern about effects on water levels, flow, and temperature.	<p>The proponent predicted that water levels and total daily flows on Black Lake and Middle Lake during operation will remain within natural range conditions. Controlling water flow through the tunnel and the design of the weir at the outlet of Black Lake will ensure water levels in Black Lake and Middle Lake are kept within natural conditions.</p> <p>The proponent predicted that the mean monthly flow rate in the Fond du Lac River will decrease from 302 cubic meters per second to 112 cubic meters per second during project operations; ice formation is not expected to increase as a result of this decrease in flow (frazil ice, anchor ice, and surface ice). The flow changes in the Fond du Lac River will result in a maximum predicted loss of 150 667 square meters of wetted areas during average winter low flows.</p> <p>A fisheries offsetting plan, in conjunction with other contingency offsetting measures determined with Fisheries and Oceans Canada, will offset the loss of fish habitat from the hydrological changes in the Fond du Lac River by enhancing existing Arctic grayling habitat in the river by spreading sorted rock over boulder substrates, creating approximately 21 150 square meters of suitable habitat.</p> <p>Studies on the hydrological effects to fish populations are described in the EIS, section 12.5.3.</p>	<p>The Agency acknowledges that there is a high degree of uncertainty regarding the effects to Arctic grayling populations within the Fond du Lac River. However, the Agency finds that the implementation of a fisheries offsetting plan and a follow-up program will mitigate the predicted effects to Arctic grayling habitat and will provide verification of effects to the Arctic grayling populations and whether there is a need for corrective measures, such as additional modifications to flow rates, to address any further effects beyond what are predicted in the environmental impact statement.</p> <p>The Agency is satisfied that the Project's effects to hydrology and temperature of waterbodies within the study region will be mitigated by the proponent and therefore concludes that the corresponding effects to the Aboriginal use of fish resources will not be significantly affected.</p> <p>The Agency considers that certain key mitigations serve to address the concerns of Aboriginal groups' with respect to water levels, flow and temperature that could then affect Arctic grayling. The Agency is recommending the following key measures that the proponent should meet with respect to mitigation and follow-up programs in the event that the project is permitted to proceed:</p> <p>Maintain a minimum flow of 40 cubic meters per second at all times in the Fond du Lac River.</p> <p>Implement a spring spawning trigger flow of 70 cubic metres per second timed to match the natural increase in flow in the Fond du Lac River between Black Lake and Middle Lake during spring fish spawning periods. Activate the bypass conduit during spring fish spawning and rearing periods (May 15 to July 15) and winter low flow periods (November through April) when planned and unplanned shutdowns exceed 15 minutes to maintain flows in the Fond</p>

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
			<p>du Lac River downstream of the tailrace outlet.</p> <p>Monitor all potential adverse effects from the Project to fisheries productivity to confirm that avoidance and mitigation measures and standards, in addition to offsetting activities, are functioning as planned, including:</p> <ul style="list-style-type: none"> • monitor the number of fish injured or killed from entrainment or impingement within the power tunnel and power generating facility; • monitor ice formation during project operation; and • monitor to confirm predictions made in the EIS are as planned and that proposed offsets are appropriate. <p>Monitoring Arctic grayling populations in the Fond du Lac River to determine the extent of adverse environmental effects to the species as a result of reduced flows and increased ice formation in the Fond du Lac River.</p>
Fond du Lac Denesuline First Nation	<p>Concern about the Project's effects of blasting residue and recovery water from the tunnel and tail race channel excavation on water quality.</p> <p>Concern about the Project's effects to downstream water quality.</p>	<p>The proponent will collect water from the excavation and surface run-off into settling ponds. Wastewater in the settling ponds will be tested prior to release to the environment and, if required, it will be treated prior to its release to meet applicable provincial effluent discharge regulations. The proponent will develop a blasting plan to reduce potential for nitrogen loading from blasting activities. Setback distances will be included in this plan.</p> <p>The proponent predicted that wastewater released from the settling ponds will meet applicable water quality guidelines at the end of the mixing zone in the Fond du Lac River (100 meters from the final point of discharge).</p>	<p>The Agency is satisfied that the Project's effect to water quality and its consequent effect to fish and fish habitat will be mitigated by the proponent. The Agency therefore concludes that the corresponding effects to the Aboriginal use of fish resources, including fish populations downstream, will not be significantly affected by the Project.</p> <p>The Agency considers that certain key mitigations address concerns of Aboriginal groups related to water quality and consequent effects to fish and fish habitat. The Agency is recommending the following key measures that the proponent should meet with respect to mitigation and follow-up programs in the event that the project is</p>

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
		<p>The proponent will develop and implement a water quality monitoring program to ensure that water quality objectives and requirements of the <i>Fisheries Act</i> and other applicable regulations are met.</p> <p>Studies on the predicted effects of site wastewater on water quality are described in the EIS, section 11.5.2.</p>	<p>permitted to proceed:</p> <p>Ensure that wastewater released from settling ponds meets the most stringent thresholds for parameters out of the Canadian Council of Ministers of the Environment Water Quality Guidelines for the protection of aquatic life; the Saskatchewan Surface Water Quality Objectives for the protection of aquatic life; Canadian Drinking Water Guidelines; and the Saskatchewan Drinking Water Standards and Objectives within 100 meters of any discharge point.</p> <p>Develop and implement a Site Water Management Plan including the design of settling ponds to collect and treat, if necessary, all construction and site generated run-off wastewater for the duration of the Project.</p> <p>Develop and implement a Waste Rock Management Plan which includes:</p> <ul style="list-style-type: none"> • testing of waste rock seepage and contact water for leached metals, chemical constituents, acid rock drainage potential, and uranium mineralization; and • collect and treat, if necessary, wastewater run-off from waste rock storage piles that contain acid rock drainage or uranium mineralization separately in its own settling ponds prior to discharge. <p>Develop and implement a Water Quality Monitoring Program to verify the quality of wastewater in settling ponds before it is released into the Fond du Lac River and to verify concentrations meet the most stringent of the Canadian Council of Ministers of the Environment or Saskatchewan Water quality guidelines criteria by 100 m of</p>

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
			discharge.
Wildlife			
Hatchet Lake Denesuline First Nation	Concern about project effects to caribou populations, movement, and habitat. Disagrees with the proponent's assertions that caribou is not found in the project area.	<p>The proponent acknowledged that woodland and barren-ground caribou may use areas near the Project, as supported by government survey reports, local and traditional knowledge, and range maps. These data and information support the proponent's view that the frequency and likelihood of caribou interacting with the Project is low and that the residual effects of the Project would not be large enough to alter the state of caribou populations.</p> <p>The proponent predicted that the Project would have negligible effects to the barren-ground caribou winter range (Bathurst herd), as it would contribute 0.02 percent to the existing human disturbance area of 36 428 hectares or 0.22 percent of its range. The Project is predicted to remove 602 hectares or 1.6 percent of preferred caribou habitat within the regional study area.</p> <p>The proponent will mitigate the loss of caribou habitat by limiting vegetation clearing to the greatest extent possible, progressively reclaiming disturbed areas following construction, and developing and implementing a community-based monitoring and surveillance program and caribou protection plan.</p> <p>The proponent predicted that linear disturbances from the Project would be negligible as the proposed access route will follow existing trails to the greatest extent possible to limit further linear disturbance and that sensory disturbance and mortality caused by the Project would be mitigated through measures such as suspending blasting if caribou is found in the project</p>	<p>The Agency agrees with the overall assessment of the Project's effects to caribou. It also agrees with Environment Canada's observation that progressive, active reclamation of the project area will be a key mitigation measure to replace caribou habitat destroyed by project activities. The Agency notes that the caribou monitoring program should determine changes in use of the project area by caribou and the effectiveness of imposed mitigation, as well as allow for adaptive management.</p> <p>The Agency is therefore satisfied that the Project's effects to caribou will be mitigated by the proponent and concludes that the corresponding effects on Aboriginal use of caribou will not be significantly affected by the Project.</p> <p>The Agency considers that certain key mitigations address concerns of Aboriginal groups related to caribou. The Agency is recommending the following key measures that the proponent should meet with respect to mitigation and follow-up programs in the event that the project is permitted to proceed:</p> <p>Route and construct the access road along existing trails to the greatest extent possible, to reduce increased linear disturbance.</p> <p>Enforce speed limits on the construction and access roads.</p> <p>Construct gaps in snow windrows to provide passageways for mid- to large-sized animals.</p> <p>Develop and implement a community-based wildlife monitoring and surveillance program for caribou which:</p> <ul style="list-style-type: none"> • determines changes in use of the project area by

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
		<p>area, enforcing speed limits, and prohibiting the use of firearms, harvesting, and access in the project area.</p> <p>Effects of the Project to caribou and corresponding mitigations are described in the EIS, January 19, 2015 Information Request Response, comment 22 and 24.</p>	<p>caribou and their predators; and</p> <ul style="list-style-type: none"> determines the effectiveness of imposed mitigation. <p>Carry out progressive reclamation following construction, as soon as practical, including the removal of construction materials and infrastructure no longer needed, using native plant species to accelerate natural succession of native plant communities appropriate for the location as recommended by Environment Canada.</p>
<p>Hatchet Lake Denesuline First Nation</p>	<p>Concern about project effects to black bear, wolf, and Canada lynx. Disagrees with the proponent's assertions that these species are not found in the project area.</p>	<p>The proponent stated that the population densities and sizes for black bear, wolf, and Canada lynx in Saskatchewan are unknown and that its wildlife baseline studies reported the absence of these species.</p> <p>The proponent provided population densities for these species from the nearest geographic location or most similar ecoregion: 1 bear per 1.6 to 5 square kilometres, 1 lynx per 3 to 43 square kilometres, and 1 wolf per 40 to 167 square kilometres.</p> <p>The proponent did not conduct an assessment of Project effects on these species. However, the proponent stated that, since the Project is wholly within Black Lake Denesuline First Nation reserve land Chicken 224, it will have minimal off-reserve impacts and that incremental and cumulative effects from the Project and previous and existing developments would not be large enough to alter the state of wildlife populations.</p>	<p>The Agency acknowledges that the local and regional study area supports the traditional hunting of wildlife, including black bear, wolf, and Canada lynx. The Agency however notes that population densities for these species are low and therefore project interaction with these species would be unlikely.</p> <p>The Agency confirmed with provincial wildlife experts that there is other available undisturbed habitat surrounding the Project for black bear and wolves to adapt to environmental changes caused by the Project. Provincial experts state however that lynx could be affected locally if water level fluctuations affect their prey base along waterbodies in the local and regional study area. The Agency finds that the community-based wildlife monitoring and surveillance program proposed by the proponent should detect and address project effects to black bear, wolf, and Canada lynx if encountered.</p> <p>The Agency concludes that the residual adverse effects to black bear, wolf, and Canada lynx would not be significant and that the corresponding effects to the Aboriginal use of wildlife resources will not be significantly affected by the Project.</p>

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
			<p>The Agency considers that certain key mitigations address concerns of Aboriginal groups related to wildlife. The Agency is recommending the following key measures that the proponent should meet with respect to mitigation and follow-up programs in the event that the project is permitted to proceed:</p> <p>Construct gaps in snow windrows to provide passageways for mid- to large-sized animals.</p> <p>Develop and implement a community-based wildlife monitoring and surveillance program for caribou which:</p> <ul style="list-style-type: none"> • determines changes in use of the project area by caribou and their predators; and • determines the effectiveness of imposed mitigation.
Vegetation			
Hatchet Lake Denesuline First Nation	Concern about project effects to traditional plants.	<p>The proponent predicted that 553 hectares of plants with high traditional use plant potential (38.5 percent of the local study area or 3 percent of the regional study area) would be disturbed by the Project. The proponent estimated that 275 hectares of plants with high traditional use potential (19 percent of the local study area or 0.2 percent of the regional study area) would be permanently lost during operations and at closure due to the high uncertainty of the future reclaimed landscape having the same plant potential to support traditional use.</p> <p>The proponent is of the view that the residual effects caused by the Project are localized and therefore not</p>	<p>The Agency finds that the residual effects to traditional plants would not be significantly adverse after taking mitigation into account and therefore concludes that the corresponding effects on Aboriginal use of plant resources will not be significantly affected by the Project.</p> <p>The Agency considers that certain key mitigations address concerns of Aboriginal groups related to traditional plants. The Agency is recommending the following key measures that the proponent should meet with respect to mitigation and follow-up programs in the event that the project is permitted to proceed:</p> <p>Conduct a pre-disturbance survey for listed and traditional</p>

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
		<p>large enough to alter the state of plant communities and significantly influence self-sustaining plant populations and communities.</p> <p>Effects of the Project to vegetation and corresponding mitigations are described in the EIS, section 14.4.</p>	<p>use plants, and avoid or transplant any observed listed or traditional use plants.</p> <p>Carry out progressive reclamation following construction, as soon as practical, including the removal of construction materials and infrastructure no longer needed, using native plant species to accelerate natural succession of native plant communities appropriate for the location as recommended by Environment Canada.</p>
Aboriginal Groups – Health and Socio-Economic Conditions			
<p>Black Lake Denesuline First Nation Fond du Lac Denesuline First Nation Hatchet Lake Denesuline First Nation</p>	<p>Concern about the Project's acoustic and visual effects to community members, from construction noise and visual obstructions caused by the waste rock piles and the weir.</p>	<p>The proponent predicted that noise levels at the permanent resident's cabin on Middle Lake, at Camp Grayling, and at the bridge location on Fond du Lac River will be below Health Canada's guidelines for noise, taking into consideration measures to reduce noise emissions (e.g. well maintained internal combustion engines with muffler systems) and that noise emission from the powerhouse will be insulated in a deep cut in the bedrock. A Blasting Plan to mitigate sleep disturbance will be developed and implemented.</p> <p>The proponent considered two options to maintain the historical water levels in Black Lake including a submerged weir or a gated concrete structure near the Grayling Island at the outlet of the Black Lake. A submerged weir structure was selected for the Project based on its reduced visual impact, less in-water works and the community of Black Lake's preference to avoid a concrete gated structure at the outlet of Black Lake. The proponent predicted that the submerged weir will have limited visibility and will not alter the appearance of the natural environment at the lake outlet.</p> <p>The proponent predicted that the chosen tailrace design and alignment will reduce the excavated volume and</p>	<p>The Agency is satisfied that the Project's acoustic and visual effects will be mitigated by the proponent and therefore concludes that the Project will not have significant adverse effects to the ability of Aboriginal groups to benefit from the aesthetics provided by the local and regional landscape.</p> <p>The Agency considers that certain key mitigations address concerns of Aboriginal groups related to noise and visual disturbance. The Agency is recommending the following key measures that the proponent should meet with respect to mitigation and follow-up programs in the event that the project is permitted to proceed:</p> <p>Install and maintain warning buoys and signage in front of the water intake and at the tailrace channel outlet into the Fond du Lac River to notify travelers of hazardous areas and sections of unsafe ice conditions during winter.</p> <p>Install and maintain a boat barrier safety boom in front of the submerged weir that meets or exceeds the Canadian Dam Association <i>Dam Safety Guidelines</i> and <i>Guidelines for Public Safety Around Dams</i>.</p> <p>Establish and mark unsafe travel routes during the ice-</p>

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
		<p>footprint of the waste rock piles compared with other alternatives. The waste rock disposal areas will have a lower profile spread over a greater area to limit the visibility of the piles and will be located away from watercourses or lakes and north of project facilities on the east side of the river, as this area is not widely used for resource use.</p> <p>A Project Advisory Committee consisting of the project proponents will be formed to discuss concerns raised by local Aboriginal resource users about socio-economic effects related to the Project.</p> <p>Effects of the Project to acoustic and visual aesthetics are described in the EIS, section 20.4.1 and March 26, 2014 Addendum I, section 8.0.</p>	<p>covered season.</p> <p>Choose an access road route to avoid sensory disturbance on any known community cultural camps.</p> <p>Consult with Black Lake Denesuline First Nation on suitable alternate locations for cultural camps during periods of construction.</p>
<p>Black Lake Denesuline First Nation Hatchet Lake Denesuline First Nation</p>	<p>Concern about local economic benefits to their community and building community capacity to be qualified for contracts and employment opportunities arising from the Project.</p> <p>Concern that these benefits will only be short-term during the 3-year construction phase.</p>	<p>The proponent stated that it will have hiring preferences for residents, businesses, and contractors from the Athabasca region. It will also increase local education and training opportunities through its pre-employment and on-the-job training programs and provide business opportunities, such as contracting associated with construction and operation of the Project.</p> <p>The proponent predicted that between 65-120 of the estimated 250 employees required for construction of the Project would be from Saskatchewan's north and that 20-50 percent of these employees would potentially be from the local study area (24-60 people). The proponent committed to hiring the six to eight employees that are required during operations from the local community.</p> <p>The proponent stated that, while construction jobs are short-term, they will provide education and</p>	<p>The Project's effects to employment, contracting, education, and vocational training are outside the scope of this environmental assessment. In order to support the objective of sustainable employment for Aboriginal peoples, the Agency encourages Aboriginal groups to explore relevant federal employment and training programs through Employment and Social Development Canada or Aboriginal Affairs and Northern Development Canada.</p>

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
		<p>employment experience to enhance future employability.</p> <p>Effects of the Project to the local economy are described in the EIS, section 18.4.</p>	
Hatchet Lake Denesuline First Nation	<p>Concern about the Project's effects to the food budgets of members on fixed incomes resulting from reduced access to traditional foods, particularly caribou.</p>	<p>Mitigation measures related to effects on wildlife, vegetation, and current use of lands and resources will address potential health effects of reduced access to traditional foods and are described in the fish and fish habitat, vegetation, and wildlife sections of the EIS.</p> <p>The proponent predicted that, although some of the Aboriginal resource users would not be able to access a portion of the traditional resource use areas for traditional foods during construction, other areas in the vicinity of the Project would be available for traditional use and that effects on the local human population and health would be negligible and not significant.</p> <p>Effects of the Project to health resulting from reduced access to traditional foods are described in the EIS, section 20.4.</p>	<p>The Agency is satisfied that the Project's effects to Aboriginal health resulting from reduced access to traditional foods will be mitigated by the proponent and therefore concludes that the Project will not have significant adverse health effects related to the ability of Aboriginal groups to access traditional foods in the local and regional study areas.</p> <p>The Agency considers that certain key mitigations address concerns of Aboriginal groups related to health and traditional foods. The Agency is recommending the following key measures that the proponent should meet with respect to mitigation and follow-up programs in the event that the project is permitted to proceed:</p> <p>Develop and implement an Access Management Plan with the Black Lake Denesuline First Nation and the Northern Hamlet of Stony Rapids community.</p>
Hatchet Lake Denesuline First Nation	<p>Concern about the Project's effects to commercial fishing practices on Black Lake.</p>	<p>The proponent predicted that the Project's effects to fish and fish habitat will be unlikely because the Project's effects will be largely concentrated downstream of the current outlet of Black Lake and through the Fond du Lac River to Middle Lake where there are no commercial fishing operations.</p> <p>Commercial resource users will be compensated for demonstrated losses as a result of changes to traditional resource use caused by project-induced changes to the environment. There will be timely and effective communication of Project activities and any applied</p>	<p>The Agency is satisfied that the Project's effects to commercial fishing will be mitigated by the proponent and therefore concludes that the Project will not have significant adverse effects to Aboriginal economic conditions in the local and regional study areas.</p> <p>The Agency considers that certain key mitigations that mitigate effects on fish and fish habitat address concerns of Aboriginal groups related to commercial fishing. The Agency is recommending the following key measures that the proponent should meet with respect to mitigation and follow-up programs in the event that the project is</p>

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
		<p>restrictions to activities (such as for safety concerns) affecting resource users.</p> <p>The proponent concluded that commercial fishing in the local and regional study areas will not be affected by the construction or operations of the Project after taking into account mitigation.</p> <p>Effects of the Project to commercial fishing from project-induced changes to the environment are described in the EIS, section 17.4.1.</p>	<p>permitted to proceed:</p> <p>Locate and construct in-water works in areas that avoid sensitive or critical fish habitat.</p> <p>Construct and install the water intake structure to avoid entrainment or impingement of deep water fish species.</p>
<p>Black Lake Denesuline First Nation</p>	<p>Concern about the Project's impact to the health and wellness of its community, including environmental health, communicable disease, alcohol and drug abuse, and housing conditions resulting from the influx of non-local workers.</p>	<p>The proponent predicted that there will be no human health effects caused by project-induced changes to air quality, ambient sound levels, and drinking water quality as there are no predicted violations to human health guidelines.</p> <p>The proponent will limit interaction between local residents and non-local workers to mitigate adverse effects to community well-being such as providing a shuttle service for non-local workers to return home for their days off rather than remaining on-site and providing an on-site construction camp separated from the community. A dry construction camp policy will be implemented along with a drug testing program. The proponent will also coordinate with local health service providers to determine appropriate education strategies on communicable disease such tuberculosis, and if applicable, implement medical screening for workers.</p> <p>The proponent predicted that there will be no project impacts related to housing during the construction phase as the majority of the workforce will be drawn from the local communities where feasible and temporary accommodations (construction camp) will be</p>	<p>The Agency is satisfied that the Project's effects to human health resulting from project-induced changes in the environment will be mitigated by the proponent and therefore concludes that the Project will not have significant adverse effects to Aboriginal health conditions.</p> <p>The Project's effects to Aboriginal health and wellness resulting from the influx of non-local workers are outside the scope of this environmental assessment. The Agency will refer this concern to the Athabasca Health Authority for its consideration.</p> <p>Aboriginal Affairs and Northern Development Canada considers the interaction of non-local construction workers and local residents, along with the exposure of a traditionally very remote community to an influx of potentially negative influences, to have some negative residual effects. However, given a number of the proposed mitigation measures (dry camp, no visitors, and busing system) Aboriginal Affairs and Northern Development Canada agrees that the anticipated effects will be short in duration and have no significant adverse environmental effect.</p>

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
		<p>provided to accommodate the workforce.</p> <p>The proponent predicted a positive effect to local Aboriginal community health and wellness through increased personal and community income as it will empower the Aboriginal communities with resources to address their needs.</p> <p>Effects of the Project to community health and wellness are described in the EIS, section 20.4.2 and 20.5.1.</p>	<p>The Agency considers that certain key mitigations address concerns of Aboriginal groups related to health effects based on environmental change. The Agency is recommending the following key measures that the proponent should meet with respect to mitigation and follow-up programs in the event that the project is permitted to proceed:</p> <p>Install and maintain warning buoys and signage in front of the water intake and at the tailrace channel outlet into the Fond du Lac River to notify travelers of hazardous areas and sections of unsafe ice conditions during winter.</p> <p>Install and maintain a boat barrier safety boom in front of the submerged weir that meets or exceeds the Canadian Dam Association <i>Dam Safety Guidelines</i> and <i>Guidelines for Public Safety Around Dams</i>.</p> <p>Establish and mark unsafe travel routes during the ice-covered season.</p> <p>Establish and maintain alternate portage routes for any existing portage routes impacted by the Designated Project.</p>
Aboriginal Groups – Effects to Current Use of Land and Resources and to Physical and Cultural Heritage			
<p>Black Lake Denesuline First Nation</p> <p>Hatchet Lake Denesuline First Nation</p>	<p>Concern about effects on their traditional use of resources within the local and regional study area.</p>	<p>The proponent acknowledged that Hatchet Lake Denesuline First Nation members may travel to the study region and practice traditional activities within provincial Crown land surrounding the Black Lake Denesuline First Nation reserve land Chicken 224. However, it asserted that the First Nation does not practice traditional activities on the reserve itself, which comprises the majority of the land base within the local study area.</p> <p>The proponent predicted that the Project, which is wholly on Black Lake Denesuline First Nation reserve land Chicken 224, will have potential adverse effects to</p>	<p>The Agency is satisfied that the Project's effects to traditional resource use will be mitigated by the proponent and therefore concludes that the Project will not have significant adverse effects to the ability of Aboriginal groups to access and effectively use traditional resources within the local and regional study areas.</p> <p>The Agency considers that certain key mitigations address concerns of Aboriginal groups related to traditional resource use. The Agency is recommending the following key measures that the proponent should meet with respect to mitigation and follow-up programs in the event that the project is permitted to proceed:</p>

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
		<p>traditional resource use by the Black Lake Denesuline First Nation as traditional lands will be removed due to the project footprint and safety buffer. Any effects beyond the reserve are predicted to be negligible after taking into account mitigation.</p> <p>Mitigation measures for valued components that relate to traditional resources are described in the fish and fish habitat, vegetation, and wildlife sections of the EIS. The proponent will also compensate resource users for demonstrated losses as a result of changes to traditional resource use caused by project-induced changes to the environment.</p> <p>Taking into account mitigation, the proponent is of the view that traditional resource use in the area will be able to continue and that the Project will not have significant adverse effects to traditional resource use.</p> <p>Effects of the Project to traditional resource use are described in the EIS, section 17.4.</p>	<p>Install and maintain warning buoys and signage in front of the water intake and at the tailrace channel outlet into the Fond du Lac River to notify travelers of hazardous areas and sections of unsafe ice conditions during winter.</p> <p>Install and maintain a boat barrier safety boom in front of the submerged weir that meets or exceeds the Canadian Dam Association <i>Dam Safety Guidelines</i> and <i>Guidelines for Public Safety Around Dams</i>.</p> <p>Establish and mark unsafe travel routes during the ice-covered season.</p> <p>Develop and implement a community-based wildlife monitoring and surveillance program for caribou which:</p> <ul style="list-style-type: none"> • determines changes in use of the project area by caribou and their predators; and • determines the effectiveness of imposed mitigation. <p>Conduct a pre-disturbance survey for listed and traditional use plants, and avoid or transplant any observed listed or traditional use plants.</p> <p>Choose an access road route to avoid sensory disturbance on any known community cultural camps.</p> <p>Consult with Black Lake Denesuline First Nation on suitable alternate locations for cultural camps during periods of construction.</p> <p>Develop and implement a policy prohibiting any hunting, fishing, trapping and harvesting within the project area by the Proponent's employees and contractors, following consultation with Aboriginal groups and the Northern Hamlet of Stony Rapids.</p> <p>Develop and implement an Access Management Plan with the Black Lake Denesuline First Nation and the Northern Hamlet of Stony Rapids community</p>

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
Fond du Lac Denesuline First Nation	Concern about the Project's effects to cultural heritage sites.	<p>The proponent stated that there were no physical or cultural heritage resource sites in direct conflict with the project footprint. Project effects to cultural heritage sites are limited to unanticipated finds during construction and construction activities causing sensory disturbance to neighboring sites.</p> <p>Construction activities will cease and Saskatchewan Heritage Conservation Branch will be notified if unanticipated finds are encountered. Black Lake Denesuline First Nation will also be consulted on alternative suitable cultural camps during construction.</p> <p>The proponent predicted that the Project's effects to cultural or physical heritage and historical, archeological, paleontological, or architectural sites or structures will be negligible, taking into account the implementation of mitigation.</p> <p>Effect of the Project to cultural heritage sites and corresponding mitigation measures are described in the EIS, section 16.0.</p>	<p>The Agency is satisfied that the proponent will mitigate the Project's effects to cultural heritage resources and therefore concludes that the Project will not have significant adverse effects to the ability of Aboriginal groups to access and benefit from cultural heritage resources in the local and regional study areas.</p> <p>The Agency considers that certain key mitigations address concerns of Aboriginal groups related to cultural heritage sites. The Agency is recommending the following key measures that the proponent should meet with respect to mitigation and follow-up programs in the event that the project is permitted to proceed:</p> <p>Flag or barricade the historic Denesuline cemetery so that it will be avoided if the adjacent road is upgraded.</p> <p>Consult with the Saskatchewan Heritage Conservation Branch on the need for a Heritage Resource Impact Assessment should new project components be proposed that are outside of the current project footprint or have not yet been assessed.</p>
Black Lake Denesuline First Nation Hatchet Lake Denesuline First Nation	Concern about increased public access to traditional lands.	<p>The proponent predicted that the Project may increase pressure on traditional resources by outside users from the development of the all season access road.</p> <p>An Access Management Plan will be developed and implemented, which includes communicating with resource users about Project activities, establishing no hunting zones, and implementing a "no harvesting" policy for employees.</p> <p>With the implementation of the plan, the proponent predicted that the Project will cause minor changes to</p>	<p>The Agency is satisfied that the proponent will mitigate the Project's effects to public access to traditional lands and therefore concludes that the Project will not have significant adverse effects to the ability of Aboriginal groups to access and effectively use traditional resources in the local and regional study areas.</p> <p>Aboriginal Affairs and Northern Development suggested that consideration be given to restricting use of the bridge over the Fond du Lac River for official use only. The bridge potentially opens up a new area to hunting, trapping, and gathering that was previously only accessible by boat and/or</p>

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
		<p>the environment and a negligible effect to traditional resource use relative to existing baseline conditions. Effects of the Project to access are described in the EIS, section 17.4.2.</p>	<p>snowmobile. Aboriginal Affairs and Northern Development Canada suggests that the Access Management Plan address this.</p> <p>The Agency considers that certain key mitigations address concerns of Aboriginal groups related to increased public access to traditional lands. The Agency is recommending the following key measures that the proponent should meet with respect to mitigation and follow-up programs in the event that the project is permitted to proceed:</p> <p>Install and maintain warning buoys and signage in front of the water intake and at the tailrace channel outlet into the Fond du Lac River to notify travelers of hazardous areas and sections of unsafe ice conditions during winter.</p> <p>Install and maintain a boat barrier safety boom in front of the submerged weir that meets or exceeds the Canadian Dam Association <i>Dam Safety Guidelines</i> and <i>Guidelines for Public Safety Around Dams</i>.</p> <p>Establish and mark unsafe travel routes during the ice-covered season.</p> <p>Establish and maintain alternate portage routes for any existing portage routes impacted by the Designated Project.</p> <p>Develop and implement an Access Management Plan with the Black Lake Denesuline First Nation and the Northern Hamlet of Stony Rapids community.</p> <p>Develop and implement a policy prohibiting any hunting, fishing, trapping and harvesting within the project area by the Proponent's employees and contractors, following consultation with Aboriginal groups and the Northern Hamlet of Stony Rapids.</p>
Accidents and Malfunctions			
Black Lake Denesuline First	Concern about the Project's risk to cause	The proponent stated that project malfunctions and accidents will not cause flooding in the study region	The Agency is satisfied that the proponent will mitigate the Project's effects to hydrology caused by accidents and

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
<p>Nation</p> <p>Fond du Lac Denesuline First Nation</p>	<p>flooding or drastic drawdown of Black Lake and other waterbodies within the study region.</p>	<p>because Black Lake will not be dammed. A submerged weir will be constructed on the Fond du Lac River at the outlet of Black Lake and be designed to maintain the historical range of water levels in Black Lake and in the upper reaches of the Fond du Lac River for all powerhouse operating flow conditions.</p> <p>The proponent stated that unplanned shutdowns of the power generation facility could result in significant flow reductions in the Fond du Lac River which in turn could cause adverse environmental effects to fish and fish habitat. The proponent predicted that the power plant will undergo between 10-50 unplanned shutdowns per year, which could last between 10-60 minutes, with most of these occurring during the summer months because of adverse weather conditions affecting the electrical grid.</p> <p>To mitigate potential effects of unplanned shutdowns, a bypass conduit will be constructed to maintain flows near the tailrace channel outlet in the Fond du Lac River to minimize loss of fish habitat. The proponent would activate the bypass conduit during spring fish spawning and rearing periods (May 15 to July 15) and winter low flow periods (November through April) when planned and unplanned shutdowns exceed 15 minutes.</p> <p>The proponent predicted that the effects to hydrology during emergency shutdown will be negligible, taking into account environmental design features such as the weir, which will maintain water levels in Black Lake and allow flow to continue into the Fond du Lac River during shutdowns, and the bypass conduit.</p> <p>Effect of project malfunctions and accidents related to water flows and corresponding mitigation are described</p>	<p>malfunctions and therefore concludes that the corresponding effects to the Aboriginal use of traditional resources will not be significantly affected by the Project.</p> <p>The Agency considers that certain key mitigations address concerns of Aboriginal groups related to flooding or drastic drawdown. The Agency is recommending the following key measures that the proponent should meet with respect to mitigation and follow-up programs in the event that the project is permitted to proceed:</p> <p>Maintain a minimum flow of 40 cubic meters per second at all times in the Fond du Lac River</p> <p>Implement a spring spawning trigger flow of 70 cubic metres per second timed to match the natural increase in flow in the Fond du Lac River between Black Lake and Middle Lake during spring fish spawning periods</p> <p>Activate the bypass conduit during spring fish spawning and rearing periods (May 15 to July 15) and winter low flow periods (November through April) when planned and unplanned shutdowns exceed 15 minutes to maintain flows in the Fond du Lac River downstream of the tailrace outlet.</p>

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
Black Lake Denesuline First Nation	Concern about the safety of project infrastructure, including ice-travel on Black Lake.	<p>The proponent predicted that physical hazards caused by project infrastructure are unlikely and there is low risk to local resource users after taking into account mitigation, such as restricting access to the project site, tailrace channel, and surge facility and installing warning signs and buoys near the intake. An Access Management Plan and Emergency Response Plan will be developed and communicated to local resource users and proponents will establish a Project Advisory Committee to discuss and address any community concerns about socio-economic effects resulting from the Project.</p> <p>Effects of the Project to the local economy are described in the EIS, section 17.4.3.</p>	<p>The Agency is satisfied that the Project's effects to the safety of local Aboriginal resource users resulting from physical hazards will be mitigated by the proponent and therefore concludes that the Project will not have significant adverse effects to the ability of Aboriginal groups to safely access traditional foods in the local and regional study areas.</p> <p>Transport Canada stated that under the <i>Navigable Waters Works Regulations</i> paragraph 7(2) (b), it has the authority to require the proponent to provide and maintain portages around the works "between the upper and lower reaches of the river". Transport Canada indicated it would likely place a condition on an approval under the <i>Navigation Protection Act</i> that these portages:</p> <ul style="list-style-type: none"> • Be extended to allow for safe portage around existing obstacles, as well as all components of this work (weir, intake and tailrace channel) • Be available for use to public at all times, including during the construction phase, safe alternative portages of reasonable length must be provided for the public, in addition to the permanent portages around the works. <p>The Agency considers that certain key mitigations address concerns of Aboriginal groups related to safety of the project, particularly ice-travel. The Agency is recommending the following key measures that the proponent should meet with respect to mitigation and follow-up programs in the event that the project is permitted to proceed:</p> <p>Install and maintain warning buoys and signage in front of the water intake and at the tailrace channel outlet into the Fond du Lac River to notify travelers of hazardous areas and</p>

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
			<p>sections of unsafe ice conditions during winter.</p> <p>Install and maintain a boat barrier safety boom in front of the submerged weir that meets or exceeds the Canadian Dam Association <i>Dam Safety Guidelines</i> and <i>Guidelines for Public Safety Around Dams</i>.</p> <p>Establish and mark unsafe travel routes during the ice-covered season.</p> <p>Establish and maintain alternate portage routes for any existing portage routes impacted by the Designated Project.</p>
Cumulative Environmental Effects			
Hatchet Lake Denesuline First Nation	Concern about the cumulative effects of northern development projects to caribou.	<p>The proponent predicted that the Project would increase the total amount of human disturbance in the 15 950 900 hectare Bathurst herd winter range from 0.22 percent to 0.24 percent. The proponent stated that the Project will not remove any habitat from the boreal shield woodland caribou range. The proponent predicted that habitat loss and fragmentation will not increase due to the construction of the transmission line as the transmission line will follow existing right-of-ways from linear features, to the greatest extent possible, and those established by the construction of the Project's access road to the power house.</p> <p>Proposed mitigation, follow up, and monitoring programs for caribou are identified in section 6.2.3 of this report.</p> <p>The proponent concluded that the Project will not have significant adverse cumulative environmental effects to caribou, taking into account the Project's negligible contribution to the total disturbance of caribou habitat</p>	<p>The Agency is satisfied with the proponent's assessment of cumulative effects to caribou and concludes that significant adverse cumulative environmental effects to caribou are unlikely to occur, taking into account mitigation, follow up, and monitoring programs. Accordingly, the Agency concludes that any corresponding cumulative effects to the Aboriginal use of caribou will not be significantly affected by the Project.</p> <p>The Agency considers that certain key mitigations address concerns of Aboriginal groups related to caribou, including cumulative effects. The Agency is recommending the following key measures that the proponent should meet with respect to mitigation and follow-up programs in the event that the project is permitted to proceed:</p> <p>Develop and implement a community-based wildlife monitoring and surveillance program for caribou which:</p> <ul style="list-style-type: none"> determines changes in use of the project area by caribou and their predators; and

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
		<p>and the availability of alternate caribou habitat available within the regional study area. Furthermore, the Project's effects will be restricted to the construction phase and be substantially reduced following construction due to progressive reclamation.</p> <p>Cumulative effects to caribou are described in the EIS, January 19, 2015 Information Request Response, comment 25.</p>	<ul style="list-style-type: none"> determines the effectiveness of imposed mitigation.
Impacts on Potential or Established Aboriginal or Treaty Rights			
<p>Black Lake Denesuline First Nation</p> <p>Hatchet Lake Denesuline First Nation</p>	<p>Concern about the Project's impact to the exercise of their potential or established Aboriginal and treaty rights and related interests, including hunting, fishing, trapping, plant gathering, and physical and cultural heritage aspects.</p> <p>Hatchet Lake Denesuline First Nation asserts that the proponent did not recognize and therefore did not assess the Project's impact to its Aboriginal and treaty rights in the area.</p>	<p>The proponent acknowledged in its EIS that Aboriginal groups, including the Hatchet Lake Denesuline First Nation, may travel to the study region and practice traditional activities within provincial Crown land surrounding the Black Lake Denesuline First Nation reserve land Chicken 224. However, it asserted that the First Nation would not practice traditional activities on the reserve itself, which comprises the majority of the land base within local study area.</p> <p>The proponent predicted that the Project's impacts to the exercise of potential or established Aboriginal or treaty rights will be isolated to the project area on the reserve and that the region outside the immediate project area is expected to be available, accessible, and have sufficient resources for the exercise of rights after taking into account mitigation that serve to minimize or avoid impacts to potential or established Aboriginal or treaty rights for both the Black Lake Denesuline First Nation and Hatchet Lake Denesuline First Nation. These mitigation measures include those described in the fish and fish habitat, vegetation, and wildlife sections of the EIS. Black Lake Denesuline First Nation, as co-proponent with Saskatchewan Power Corporation, will hold a 30 percent interest in the Project.</p>	<p>The Agency is satisfied that the Project's impact to Aboriginal or treaty rights and interests will be accommodated by the proponent and that the proponent's follow up and monitoring programs will serve to address concerns of Aboriginal groups.</p> <p>The Agency therefore concludes that the Project is not likely to cause significant adverse effects to the ability to exercise the Aboriginal and Treaty rights in the vicinity of the project area and outside of the Black Lake Denesuline First Nation reserve land Chicken 224 and that the potential impacts of the Project on potential and established Aboriginal and treaty rights have been adequately identified and appropriately accommodated.</p> <p>The Agency considers that some key mitigations can also serve as accommodation for potential impacts to potential or established Aboriginal or Treaty rights and related interests. In particular, conditions related to plants used for traditional purposes, current use of lands and resources for traditional purposes, health and socio-economic conditions and physical and cultural heritage serve to address concerns raised by Aboriginal groups related to the exercise of their Aboriginal or Treaty rights. Specifically, the Agency is recommending the following key measures that the proponent should meet with respect to mitigation and follow-up programs in the event that the project is</p>

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
		<p>Impacts of the Project to Aboriginal and treaty rights are described in the EIS, March 26, 2014 Addendum I, section 9.2.</p>	<p>permitted to proceed:</p> <p>Conduct a pre-disturbance survey for listed and traditional use plants, and avoid or transplant any observed listed or traditional use plants.</p> <p>Choose an access road route to avoid sensory disturbance on any known community cultural camps.</p> <p>Consult with Black Lake Denesuline First Nation on suitable alternate locations for cultural camps during periods of construction.</p> <p>Flag or barricade the historic Denesuline cemetery so that it will be avoided if the adjacent road is upgraded.</p> <p>Consult with the Saskatchewan Heritage Conservation Branch on the need for a Heritage Resource Impact Assessment should new project components be proposed that are outside of the current project footprint or have not yet been assessed.</p> <p>Cease construction activity and develop appropriate management options should unanticipated heritage resources be discovered during construction.</p> <p>Develop and implement an Access Management Plan with the Black Lake Denesuline First Nation and the Northern Hamlet of Stony Rapids community with the following components:</p> <ul style="list-style-type: none"> • Communication protocols; • Notification of public safety issues; • Prohibition of firearms, hunting, trapping, and fishing for all employees; and • Development of the no hunting zone. <p>Install and maintain warning buoys and signage in front of the water intake and at the tailrace channel outlet into the Fond du Lac River to notify travelers of hazardous areas and</p>

Group	Comment or Concern	Summary of Proponent's Response	Agency Response
			<p>sections of unsafe ice conditions during winter.</p> <p>Install and maintain a boat barrier safety boom in front of the submerged weir that meets or exceeds the Canadian Dam Association <i>Dam Safety Guidelines</i> and <i>Guidelines for Public Safety Around Dams</i>.</p> <p>Establish and mark unsafe travel routes during the ice-covered season.</p> <p>Establish and maintain alternate portage routes for any existing portage routes impacted by the Designated Project.</p>
Hatchet Lake Denesuline First Nation	Asserts that funding provided by the Agency was not adequate to cover the cost of consulting its members who are located in remote areas in northern Saskatchewan.	Not applicable.	Funding under the Agency's Participant Funding Program is limited and is not intended to fund an Aboriginal group's full participation in the environmental assessment process.
Fond du Lac Denesuline First Nation	Requests to be consulted should the powerline traverse through Fond du Lac Denesuline First Nation reserve.	The proponent stated that the scope of the environmental assessment does not include the 20 kilometre transmission line because a different proponent, the SaskPower Transmission Group, is proposing the project. This proponent will seek separate government approvals for this project.	The 20 kilometre transmission line is outside the scope of this environmental assessment as it is considered a separate project that does not require an environmental assessment under the <i>Canadian Environmental Assessment Act, 2012</i> . The Agency will refer this concern to Aboriginal Affairs and Northern Development for its consideration.

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

Key comments received on the draft EA Report are summarized in the table below.

Comment Source	Comment	Agency Response	Changes to EA Report (v)
Benefits to Canadians			
Individual	Thank you for the extra efforts needed to go through such an important process.	The Agency will continue to deliver timely, efficient, and high quality environmental assessments for Canadians.	No change.
General			
Hatchet Lake Denesuline First Nation	Inquired whether the Minister's decision would be affected by a potential federal election.	<p>Under subsection 27(2) of CEEA 2012 <i>The Minister's decisions must be made no later than 365 days after the day on which the notice of the commencement of the environmental assessment of the designated project is posted on the Internet site.</i></p> <p>The notice of commencement for the Project was posted on the Internet site on March 1, 2013, and the Minister has 365 days of federal time to make the environmental assessment decision.</p>	No change.
Proponent	The proponent requested that the list of project activities to be carried out during decommissioning be revised to indicate that the tailrace channel will be contoured so it is safe for humans and wildlife and not completely backfilled, and that disturbed areas will be recontoured and reclaimed to be compatible with end land uses.	<p>On page 5-36 of the EIS the proponent states that <i>"The tailrace channel will be decommissioned by contouring it so it is safe for wildlife. If there are concerns about leaving the tailrace channel open once the plant is decommissioned, the waste rock and overburden could be used to fill in the channel.</i></p> <p><i>...The disturbed landscape will be restored to approximately its original contour..."</i></p> <p>The Agency is of the view that the listed</p>	Changed to "Restoring of the disturbed landscape to approximately its original contour."

Comment Source	Comment	Agency Response	Changes to EA Report (v)
		<p>components do not differ substantially from the information contained in the EIS. The Agency does acknowledge that the Proponent committed to engaging with the community of Black Lake Denesuline First Nation to determine whether there are concerns with leaving the tailrace channel open (and contoured so it is safe for humans and wildlife) post decommissioning.</p>	
Proponent	<p>The proponent requested that references to the provision of safe ice travel routes be changed to a commitment to mark instead those unsafe areas affected by the Designated Project on Black Lake due to potential liability issues and the lack of control regarding where community members may travel on Black Lake and Middle Lake.</p>	<p>The Agency considers that certain key mitigations address concerns of Aboriginal groups related to safety of the project, particularly ice-travel. The Agency is of the view that proponent commitment to mark unsafe areas of Black Lake during the ice-covered season is sufficient to ensure safe travel. The Agency recommended the inclusion of Middle Lake as the EIS describes use during the ice-covered season of both Black Lake and Middle Lake.</p>	<p>Changed 'safe' to 'unsafe' in "Establish and mark unsafe travel routes during the ice-covered season".</p>
Fish and fish habitat			
Camp Grayling	<p>Concern about lack of information on the location of arctic grayling fry and fingerlings and the potential effect on this fish species from alteration of river access and sedimentation in Middle Lake.</p>	<p>In the EIS the Proponent states that Arctic grayling young of year (YOY) can occur in Lakes and Rivers (Black Lake, Fond du Lac River, and Middle Lake).</p> <p>The Proponent designed the submerged weir with a v slope to allow fish passage between Black Lake and the Fond du Lac River.</p> <p>There are no residual adverse environmental effects predicted for fish or fish habitat in Middle Lake.</p> <p>The Agency recommended that the proponent be required to retain and treat all wastewater generated from the project footprint in settling</p>	<p>No change.</p>

Comment Source	Comment	Agency Response	Changes to EA Report (v)
		<p>ponds to ensure that water quality guidelines are not exceeded as a result of carrying out the project.</p> <p>The Agency is of the view that its conclusion that there are no likely significant adverse environmental effects to fish and fish habitat is valid.</p>	
Camp Grayling	Concern that alternatives to the Project exist, and that the Project will impact the viability of Camp Grayling without any compensation for this loss.	<p>Under section 19 (g) the Proponent was required to assess “<i>alternative means of carrying out the designated project that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the designated project</i>”. The Proponent determined that the current proposal was the preferred option (section 3.2 of this Report).</p> <p>In addition the Proponent committed to compensating any demonstrated loss to land users resulting from the carrying out of the project (pages 17-15, 17-21, 17-23, 17-31, 17-33, 20-14, 22-12, and 23-11 of the EIS). Note that page 17-33 of the EIS specifically discusses this topic with respect to Camp Grayling.</p> <p>The Agency reflected this commitment in the EA Report.</p>	No change.
Camp Grayling	Concern that this is not a financially sound project and that the Fond du Lac River will be severely impacted.	<p>Under CEAA 2012 the Agency assessed the potential for significant adverse environmental effects of the project on areas of federal jurisdiction.</p> <p>The Proponent is responsible to determine the economic viability of its proposal.</p> <p>The Agency recommended that the Proponent be required to maintain minimum flows in the Fond du Lac River throughout the year and maintain spring</p>	No change.

Comment Source	Comment	Agency Response	Changes to EA Report (v)
		spawning incentive/trigger flows in the Fond Du Lac River between Black Lake and Middle Lake.	
Proponent	The proponent requested that the second statement in the last paragraph on page 28 be revised to say: “...(0.058 - 0.080 cubic meters per second) and the annual mean 7Q10 flow rate at the discharge point (124 161 cubic meters per second), applicable...”	The Agency accepts the comment.	Changed the second sentence of the last paragraph to state “...the annual mean 7Q10 flow rate in the Fond du Lac River at the discharge point (161 cubic meters per second)...”
Proponent	The Proponent requested that any reference in the EA report to “April 1” in relation to the spawning incentive flow be revised to “May 1”.	The Agency is of the view that the spring spawning incentive flow should be in effect by May 1 st . The initiation of this spring spawning flow rate may have a temporal delay from the time the flows are reduced through the power tunnel and flows increase in the Fond du Lac River. It is important that the Proponent account for this temporal delay. The Agency accepts the comment with the understanding that the spring spawning incentive flow will be in effect <u>no later than</u> May 1 st of each year.	Changed April 1 st to May 1 st .
Wildlife			
Proponent	The Proponent requested that “where practically possible” is added to any reference to <i>route and construct the access road along existing trails</i> in the EA report and draft Potential EA Conditions.	The Agency is of the view that the routing and construction of the access road should be carried out along existing trails to the greatest extent possible to minimize the increase of linear disturbance on the landscape, but accepts that this may not be practically possible for the entire route.	Added “to the greatest extent possible” to the routing and construction of the access road.
Hatchet Lake Denesuline First Nation	Indicated that the group’s comments and information from provincial natural resource officers about the presence of caribou in the area were not included in the draft EA report. Emphasized that caribou are an important food source for the members of the First Nation and that they depend upon this food source	The Agency notes that Hatchet Lake Denesuline First Nation indicated that barren-ground caribou do periodically occur in the area where the project is located and that the First Nation has conducted harvests of caribou at the site. The Agency accepted this assertion and reflected it in the analysis.	Added Proponent commitment (development and implementation of a Caribou Protection Plan)

Comment Source	Comment	Agency Response	Changes to EA Report (v)
	throughout the year to supplement low incomes.	<p>The concerns related to caribou being present in and around the project area and the Agency's responses were discussed in further detail.</p> <p>The Proponent did commit to developing and implementing a Caribou Protection Plan during the technical review of the EIS.</p> <p>As discussed in the EA Report, the Agency assessed the potential for significant adverse environmental effects to caribou and concluded that those effects were not likely. The Agency considers that certain federal EA conditions address concerns of Aboriginal groups related to caribou (see Appendix F for further detail).</p>	
Vegetation			
Proponent	The Proponent requested that to align with Environment Canada's recommendation "where possible" is added to the buffer reference in the EA report and potential draft EA conditions. In addition, the Proponent requests a reduction in the buffer distance from 100 metres to 30 metres.	The Agency is of the view that avoidance of effects to wetlands is the primary goal. If avoidance is not possible, the Agency still recommends that a 100 meter buffer be implemented. If a 100 meter buffer is not possible no less than a 50 meter buffer should be implemented as even with a 50 meter buffer there is a potential for indirect effects to wetlands through dust deposition, siltation, erosion, etc... Adjacent wetlands should be monitored for indirect effects and mitigation measures applied in accordance with the Federal Policy on Wetland Conservation.	Changed 100 meter buffer to a "minimum 50 meter buffer".
Aboriginal peoples – Health and socio-Economic conditions			
Hatchet Lake Denesuline First	Requested federal capacity funding to offset the loss of these lands to development. Indicated that there is precedence being set by	The Agency supports Aboriginal participation in the environmental assessment process through its Participant Funding Program. Funds were provided	No change.

Comment Source	Comment	Agency Response	Changes to EA Report (v)
Nation	the mining industry whereby the loss of traditional lands is being settled via collaborative agreement that include funding and a large economic development component. These funds will increase the employability of the membership via training opportunities, distance education, post-secondary education, technical training, and other similar certificate and training opportunities.	<p>to reimburse eligible expenses of Aboriginal groups that participated in the EA. The Hatchet Lake Denesuline First Nation applied for funding, and received \$50 000 through this program.</p> <p>As indicated in the EA report, the Agency is of the view that the effects of changes to the environment as a result of carrying out the project on current use of lands and resources for traditional purposes will be localized to the project area on Black Lake Denesuline First Nation reserve land Chicken 224. The Agency has concluded that these effects will not significantly affect the traditional land use of other aboriginal groups in the region.</p>	
Aboriginal peoples – Current use of lands and resources			
Hatchet Lake Denesuline First Nation	Requested compensation for the loss of a food source from the caribou herd being affected and/or displaced if this project does get approved	<p>The Proponent committed to compensating any demonstrated loss to land users resulting from the carrying out of the project. (pages 17-15, 17-21, 17-23, 17-31, 17-33, 20-14, 22-12, and 23-11 of the EIS) The Agency reflected this commitment on pages 72 and 101 of the EA Report.</p> <p>As discussed in the EA Report, the Agency assessed the potential for significant adverse environmental effects to caribou and traditional land use and concluded that those effects were not likely.</p> <p>As indicated in the EA report, the Agency is of the view that the effects of changes to the environment as a result of carrying out the project on current use of lands and resources for traditional purposes will be localized to the project area on Black Lake Denesuline First Nation reserve land Chicken 224. The Agency has concluded that these effects will not</p>	No change.

Comment Source	Comment	Agency Response	Changes to EA Report (v)
		significantly affect the traditional land use of other aboriginal groups in the region.	
Hatchet Lake Denesuline First Nation	Indicated that the EA draft report should have included more emphasis on the loss of traditional lands by the members of HLDFN and reflected the importance of the loss to HLDFN. This loss will affect their fishing, trapping, caribou hunting, medicinal plants, traditional gathering places, berry picking, and other cultural practices.	The Agency included three sections of the report specifically discussing the potential effects of changes to the environment on Aboriginal peoples as a result of carrying out the project and the potential impacts to Aboriginal and Treaty rights . These potential effects were carefully considered by the Agency in reaching its conclusion that the Project is not likely to cause significant adverse environmental effects.	No change.
Consultation			
Hatchet Lake Denesuline First Nation	Requested that some conditions be included for this project as have been included for other similar projects throughout Canada in recent history, specifically focused on effects to First Nations peoples.	The Minister of the Environment will issue an Environmental Assessment Decision Statement identifying the conditions that the proponent must meet with respect to mitigation and follow-up programs in the event that the project is permitted to proceed. The Agency considers that certain federal EA conditions, which are developed to mitigate key environmental effects from the designated project, address concerns of and effects on Aboriginal groups.	No change.
Hatchet Lake Denesuline First Nation	Requested increased consultation and accommodation efforts for future developments on their traditional lands. For this project, meetings could not be concluded due to conflicting schedules and the remote location of Athabasca communities. Expressed concern that consultation records give the incorrect impression that HLDFN were not cooperating fully with the meeting date(s) as arranged by Black Lake and/or members of the proponent community.	The Agency consulted with Hatchet Lake Denesuline First Nation at the high end of the consultation spectrum consistent with the Government of Canada’s whole of government approach to consultation. The Agency’s consultation activities are summarized in the EA Report. The Agency appreciates Hatchet Lake Denesuline First Nation’s participation throughout the EA process. The Agency consider that mitigation and accommodation measures have been appropriately identified based on the nature and extent of impacts.	No change.

Comment Source	Comment	Agency Response	Changes to EA Report (v)
		The proponent's information on its consultation activities was presented as received by the Agency.	