WAASIGAN
TRANSMISSION LINE

FINAL ENVIRONMENTAL ASSESSMENT

Section 5.0 Environmental Assessment Approach

November 2023

Acknowledgements

We wish to acknowledge that the Waasigan Transmission Line Project is located within lands that represent the traditional territories and homelands of the Robinson-Superior Treaty (1850) and Treaty #3 (1873) First Nations, and traverse the Red Sky Métis Independent Nation, Northwestern Ontario Métis Community and Northern Lake Superior Métis Community.

Hydro One also wishes to acknowledge Indigenous artist, Storm Angeconeb, for developing the covering page and wildlife designs throughout the Final Environmental Assessment. Storm is a highly recognized visual artist from Lac Seul First Nation in Treaty #3 and currently resides in Red Lake. Many of her works include animals and birds as representations of herself or those close to her. The artist's description of the covering page is presented below.

Hydro One Environmental Study Art:

What stands out in this art piece is the symbolic representation of solar rays as "Bringing Power"; we can see the environment represented through the wildlife and Ojibwe floral visuals. This artwork is an excellent representation of Hope, Life, and Opportunity, visually portrayed through the Black Bear and her two cubs. The colour theme of this artwork comes from the Waasigan Transmission Line Project brand identity.

Artist: Storm Angeconeb

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Ezhinaagwak Aki Waa-dazhindamang

The Waasigan Transmission Line (the Project) is subject to a Comprehensive Environmental Assessment (EA) under the Ontario *Environmental Assessment Act* (EAA). The EAA requires an assessment of the potential environmental effects, description of mitigation measures, description of net effects, and identification of the advantages/disadvantages of the alternatives and the Project on the environment.

This section describes the general approach used to carry out the assessment of environmental effects predicted to occur as a result of the Project.

The approach for the assessment has been developed to satisfy regulatory requirements under paragraph 6(2)(c) and subsection 6.1(3) of the EAA, and is based on the *Code of Practice: Preparing and Reviewing Environmental Assessments in Ontario* (MOECC 2014) and the approved Amended Terms of Reference (ToR) for the Project approved by the Ministry of the Environment, Conservation and Parks in February 2022 (Hydro One 2021). The approach also takes into consideration the Ministry of Natural Resources and Forestry (MNRF) *Class Environmental Assessment for Provincial Parks and Conservation Reserves* (MNRF 2005), the *Class Environmental Assessment for Resource Stewardship and Facility Development Projects* (MNRF 2002), and the Ontario climate change guide for *Considering climate change in the environmental assessment process* (Ontario Climate Change Guide; MECP 2017).

A list of the studies and reports undertaken in connection with the Project are provided in Appendix 5.0-A.

The EA approach is shown on Figure 5.0-1 and involves the following steps:

- **Describe the Project**, including the purpose of and need for the Project, the rationale for the undertaking and alternative methods of carrying out the Project (Section 2.0 and Section 4.0). Impacts of climate change on the Project were considered in Appendix 3.0-C.
- **Identify preliminary environment** during the development of the ToR to provide a general understanding of the environmental, socio-economic and cultural context of the region in which the Project is being proposed.
- **Identify criteria** that may interact with the Project, **and indicators** to characterize changes to those criteria. The criteria and indicators were confirmed through engagement with Indigenous communities, government officials and agencies, and interested persons and organizations (Section 5.2).
- **Define the assessment boundaries** (i.e., the spatial and temporal boundaries) for the criteria (Section 5.3).

- **Describe the existing environment** that may be affected by the Project, specific to each criterion identified (Section 5.4).
- **Identify potential Project-environment interactions** (Section 5.5).
- **Assess net effects (Section 5.6):**
  - Identify potential environmental effects (positive and negative) (Section 5.6.1);
  - Identify mitigation measures (Section 5.6.2);
  - Predict the net effects (i.e., the likely residual effects after mitigation measures are applied) (Section 5.6.3);
  - Characterize the net effects of the Project on environmental criteria (Section 5.6.4); and
  - Determine the significance of the net effects (positive and adverse) (Section 5.6.5).
- **Assess cumulative effects** of the net effects in combination with other past, present, and reasonably foreseeable future developments and activities, and determine their significance (Section 5.7).
- **Identify a monitoring framework** that will be completed during construction and operation and maintenance stages to evaluate the effectiveness of mitigation measures, verify predictions made in the EA Report, address environmental issues identified during Project operation, and provide feedback for adaptive management (Section 5.8).
- **Determine confidence in effects predictions**, record the key factors influencing that determination, and how uncertainty will be managed so Project effects are not underestimated (Section 5.9).
- **Evaluate the advantages and disadvantages** of the alternative to the Project (i.e., do nothing), and the alternative methods of carrying out the Project (Section 5.10).

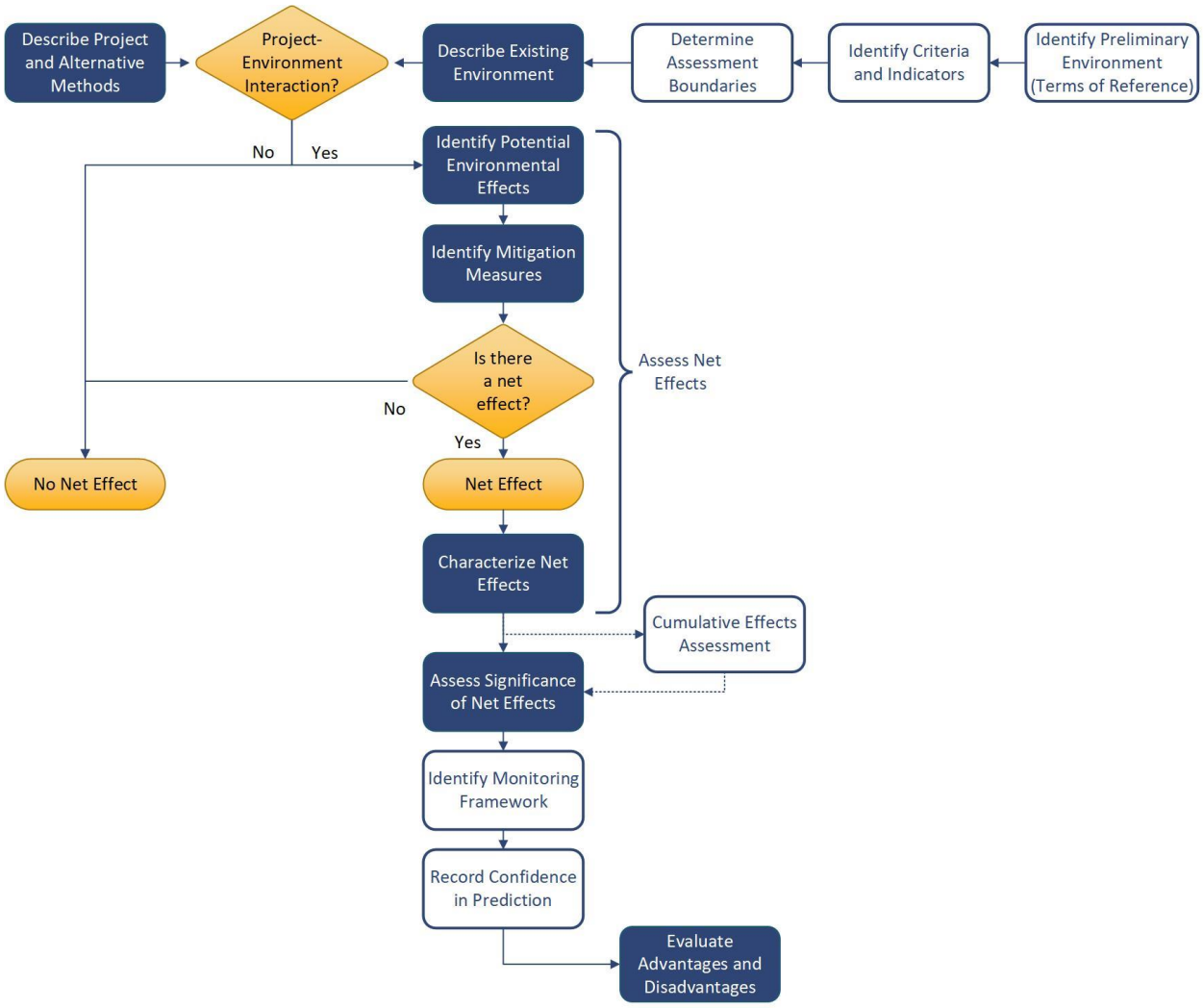

Figure 5.0-1: Environmental Assessment Approach

Environmental Assessment Report Structure

Each natural environment, socio-economic or Indigenous component for which criteria have been identified has a dedicated subsection in the EA document, within Sections 6.0 and 7.0. Each subsection describes the details of each assessment step as it relates to a specific criterion to allow for differences in the nature of potential effects of the Project on that criterion.

The following sections are included in the EA document:

- Section 6.0 Natural Environment
  - Section 6.1 Physiography, Geology, Surficial Geology and Soils;
  - Section 6.2 Surface Water;
  - Section 6.3 Groundwater;
  - Section 6.4 Vegetation and Wetlands;
  - Section 6.5 Wildlife and Wildlife Habitat;
  - Section 6.6 Fish and Fish Habitat;
  - Section 6.7 Air Quality;
  - Section 6.8 Greenhouse Gas (GHG) Emissions;
  - Section 6.9 Acoustic Environment;
- Section 7.0 Socio-economic
  - Section 7.1 Land and Resource Use;
  - Section 7.2 Community Well-Being;
  - Section 7.3 Economy;
  - Section 7.4 Aesthetics;
  - Section 7.5 Archaeological Resources;
  - Section 7.6 Built Heritage Resources and Cultural Heritage Landscapes;
  - Section 7.7 First Nations Rights, Interests, and Use of Land and Resources; and
  - Section 7.8 Métis Rights, Interests, and Use of Land and Resources.

5.1 Consideration of Indigenous Teachings

The Project is located in the traditional territories of Robinson-Superior Treaty (1850) First Nations and Treaty #3 (1873) and traverses the traditional territories of the Red Sky Métis Independent Nation, Northwestern Ontario Métis Community, which is represented by the Kenora Métis Council, the Sunset Country Métis Council, the Northwest Métis Council and

Atikokan Métis Council, and Region 2, which is represented by the Greenstone Métis Council, Superior Northshore Métis Council, and Thunder Bay Métis Council. The Amended ToR recognizes the commitment by Hydro One to incorporate Indigenous knowledge received from Indigenous communities into the EA.

Current land and resource use by Indigenous peoples is influenced by traditional knowledge systems, which are cumulative, dynamic, and continually building on experience and adapting to change (Usher 2000). Knowledge of the land - traditional knowledge/traditional ecological knowledge (TK/TEK) and how the land is used - traditional land and resource use (TLRU) are both are considered. The collection and documentation of information that describes these activities, areas and features is collectively in this report referred to as Indigenous Knowledge (IK). IK is considered to be a holistic body of knowledge containing information and records collected by Indigenous communities that is of social, economic, cultural, spiritual, and/or historical significance to its members. Much of this knowledge may have been passed on from generation to generation. Each Indigenous community will have its own approach to collecting, recording, sharing and using this knowledge. In terms of EA processes, IK may include "specific, direct observation or experience of the biophysical world that can be complementary to scientific data (e.g., fisheries data collected over many years) or may be embedded in a governance context including information regarding community practices, language, teachings, laws, relationships, and rituals" (BC EAO 2022). This unique lens or way of knowing may bring a different perspective by which members of the Indigenous communities engage with the structure and content of the EA process.

The Amended ToR recognizes that western science and IK approach environmental evaluation differently. Where western science often relies on deduction and inference to reach conclusions, information from IK adds an experiential understanding of the land that has been passed down through generations of teachings since time immemorial. Where western science relies on gauges and modelling, it is often based on limited historical data. Indigenous community members have generations of historical knowledge that may be shared. Hydro One is committed to working with Indigenous communities to understand their values and teachings, acknowledging and respecting community protocols.

Some examples of cultural training or teachings shared by Indigenous communities that have influenced the content of this report and the EA process for the Project include:

- Consultation protocols shared by Indigenous communities reflecting the role of cultural practices in engagement, participation and decision making; and
- Manito Aki Inakonigaawin (MAI; Great Earth Law) of the Anishinaabe Nations in Treaty #3 (shared through training sessions and comments shared on EA documents by Grand Council Treaty #3).

MAI is understood to be based on sacred law and represents the Anishinaabe legal framework for relating with all of creation (Grand Council Treaty #3 2022). MAI represents a manner of thought, a way of feeling and a way of living, rooted in the principles of respect, rights,

responsibility and reciprocity (Grand Council Treaty #3 2022). Grand Council Treaty #3 shared through comment on the Amended ToR, that the people of Treaty #3 have a sacred connection to the land and the water and carry an inherent role to protect and preserve the environment for future generations, and who collectively use the land that is being considered for the Project.

Varying Indigenous worldviews shared specific to this EA process include highlighting the following:

- Respect for cultural protocols and ceremony in effective engagement and decision making.
- Protection of the ability to exercise rights and interests for future generations.
- The sacred role of nibi (water) and interconnectedness of all beings.
- Importance of considering how effects of one Project may act cumulatively with other activities.
- Wabigoon Lake Ojibway Nation cultural awareness training (completed by all Hydro One team members and contractors including engagement and field staff prior to completing work within the traditional territory).
- Respect for cultural protocols and ceremony in effective engagement and decision making.
- Observation of cultural protocols and ceremonial practices to prepare for activities on the land.
- Métis Nation of Ontario (MNO) 101 training sessions and through comments from the MNO submitted on behalf of the Northwestern Ontario Métis Community and Region 2:
  - Respect for cultural protocols in effective engagement and decision making.
  - Protection of the ability to exercise rights and interests for future generations.
  - Importance of considering how effects of one Project may act cumulatively with other activities.

The intension of this section is to reflect the understanding gained through working with Indigenous communities that ‘Indigenous Knowledge’ is more than areas of current or traditional practice of Section 35 Aboriginal and Treaty Rights and Interests, and can also include ways of knowing, being and deciding. Within this EA report, efforts have been made to make space to recognize places where this definition of IK may work in concert with (e.g., selection of criteria and indicators) or in conflict with the EA process (e.g., representation of the interconnectedness of the environment) where this has been shared or identified through feedback from Indigenous communities.

5.2 Identify Criteria and Indicators

The Amended ToR proposed alternative route evaluation criteria and indicators (Appendix C of the Amended ToR), as well as a draft list of net effects assessment criteria and indicators (Appendix D of the Amended ToR), noting that additions or deletions may happen during the assessment process as new information is obtained. The criteria and indicators first identified in the Amended ToR were refined through the assessment process.

Criteria are components of the environment that have economic, social, biological, conservation, aesthetic or cultural value (Beanlands and Duinker 1983). This assessment is focused on criteria that are based on the key natural and socio-economic environment considerations identified in the Amended ToR. The criteria have physical, biological, socio-economic or Indigenous importance, and have the potential to change as a result of the Project. The criteria first identified in the Amended ToR and refined through the assessment process were based upon:

- Engagement with Indigenous communities;
- Stakeholder engagement, including discussions with property owners, interest holders, and regulators;
- Presence, abundance and distribution of a criterion within, or relevant to, the area associated with the Project;
- Potential for interaction of the criterion with the Project, and sensitivity to effects;
- Species conservation status or concern;
- Umbrella or keystone species with potential to represent a broad range of potential effects;
- Uniqueness or rarity of a criterion;
- Likelihood of an indirect effect on an associated criterion (i.e., if a link exists between the affected criterion and another criterion, such as water quality affecting fish habitat);
- Ecological and socio-economic value to Indigenous communities, government officials and agencies, and interested persons and organizations; and
- Traditional, cultural, and heritage importance to Indigenous peoples.

An **indicator** is an aspect or characteristic of a criterion that, if changed as a result of the Project, may demonstrate an effect to Indigenous, physical, biological or socio-economic features. This is explained in the *Code of Practice: Preparing and Reviewing Environmental Assessments in Ontario*, which requires consideration of “indicators that will identify how the potential environment effects will be measured for each criterion” (MOECC 2014). Indicators may be characterized quantitatively or qualitatively. For example, ambient concentrations of particulate matter is an indicator for air quality that can be measured quantitatively. In contrast,

changes in the movement and behaviour of individuals or populations are indicators for wildlife and fish, and are often expressed through qualitative assessment of alterations in habitat distribution and connectivity. Employment, training opportunities, business revenue, service, and infrastructure demand and capacity are some of the indicators of various socio-economic criteria, which can be measured quantitatively where information is available, and qualitatively when it is not available. Changes in preferred harvested species and changes in, or restrictions to, preferred identified harvesting methods are some of the indicators that may be relevant to Indigenous rights or interests, which may be measured quantitatively or qualitatively, respectively.

The criteria selected to address the issues identified in relation to this Project, the rationale for their selection, their associated indicators and how they are used to measure potential effects are presented in Table 5.2-1. A description of the alternative route evaluation and associated criteria and indicators for that process is presented in Section 2.0.

Table 5.2-1: Criteria and Indicators for Net Effects Assessment

Valued Component	Criterion	Rationale for Selection	Indicators	Measurement of Potential Effects
Physiography, Geology, Surficial Geology and Soils (Section 6.1)	Geology and Soil Distribution	• IK and Indigenous community feedback regarding the importance of rock as the foundation of life. • Indigenous community feedback that changes to the landscape can impact the connection Indigenous community members have with the land, even after restoration is complete. • Commitment to avoid or minimize loss of, and adverse effects to, productive soils given the importance to ecosystem diversity and interrelation with other components (e.g., groundwater, vegetation), as well as concern about impacts to existing agricultural operations.	• Change to the extent or properties of geologic features. • Change to areal extent of productive soil within the Project footprint.	• Potential effects are measured qualitatively as changes to the extents or properties of geologic features in the study area • Potential effects are measured quantitatively as a change in area of disturbance of productive soils in the study area.
Physiography, Geology, Surficial Geology and Soils (Section 6.1)	Soil Productivity and Quality	• Commitment to avoid or minimize loss of, and adverse effects to, productive soils given the importance to ecosystem diversity and interrelation with other components (e.g., groundwater, vegetation), as well as concern about impacts to existing agricultural operations. • Commitment to avoid or minimize potential to encounter or disperse contaminated soils.	• Change in soil productivity and soil quality.	• Potential effects are measured qualitatively in terms of changes to soil productivity or quality in the study area.

Surface Water (Section 6.2)	Surface Water Quality and Quantity	• IK and Indigenous community feedback regarding the importance of water, which has spiritual, social, cultural and ecological value.
		• Represents the freshwater habitat for fish, aquatic organisms, and aquatic vegetation;
		• Important for recreational use and aesthetics;
		• Important to fauna and flora abundance and diversity; and
		  ◦ Important to human use (drinking water or other consumption, travel).
			• Change to surface water quantity with consideration of:
			  ◦ stream flows;
			  ◦ water levels;
			  ◦ cross-section hydraulics;
			  ◦ erosion and sedimentation processes; and
			  ◦ drainage patterns.
			• Change to surface water quality with consideration of:
			  ◦ turbidity and Total Suspended Solids;
			  ◦ water chemistry; and
			  ◦ water temperature.
				• Potential effects are measured quantitatively and/or qualitatively as a possible change in streamflows, water levels, cross-section hydraulics, erosion, and sedimentation processes in water bodies, as well as overall drainage patterns within the study areas.
				• Potential effects are measured quantitatively and/or qualitatively as an increase to concentrations of suspended solids or chemical constituents in receiving waters within the study areas.

Valued Component	Criterion	Rationale for Selection	Indicators	Measurement of Potential Effects

Groundwater (Section 6.3)	Groundwater Quality and Quantity	• IK and Indigenous community feedback regarding the importance of water.
		• Indigenous community feedback on the importance of spring water.
		• Commitment to avoid or minimize impacts to groundwater quality and quantity, which has social or cultural value and may:
		  ◦ be a source of potable and non-potable water supply; or
		  ◦ provide baseflow to surface water features.
			• Change in groundwater quality, levels and flow considering:
			  ◦ numbers, depths, and proximity of water wells in the study area; and
			  ◦ anticipated groundwater withdrawal and discharge during construction.
				• The amount or abundance and spatial configuration of groundwater and groundwater receptors. This is measured qualitatively and quantitatively as changes in abundance and distribution of the indicators in the assessment area.
				• Qualitative assessment of the physical and chemical characteristics of groundwater.

Vegetation and Wetland Ecosystems (Section 6.4)	• Upland ecosystems
	• Riparian ecosystems
	• Wetland ecosystems
		• IK and Indigenous community feedback regarding the importance of vegetation and wetlands, including but not limited to the protection of traditionally used plants important to Indigenous peoples for cultural, spiritual and medicinal values.
		• Commitment to avoid or minimize adverse effects to vegetation communities, and specifically to:
		  ◦ under-represented; landform/vegetation values
		  ◦ vegetation significant wildlife habitat;
		  ◦ sensitive vegetation features; and
		  ◦ provincially significant wetlands.
			• Ecosystem quantity considering:
			  ◦ change to area (ha) of vegetation communities in the Project footprint, by type as appropriate (e.g., bog, fen, swamp wetlands).
			• Ecosystem distribution considering:
			  ◦ change to spatial configuration of vegetation communities (e.g., fragmentation) in the study area.
			• Ecosystem condition considering:
			  ◦ change to the integrity or naturalness of vegetation communities in the study area, including their ability to support the communities of organisms naturally associated with them.
				• The potential effect to ecosystem availability (for each type) is measured quantitatively by calculating the amount of each ecosystem unit and significant feature available at the baseline characterization compared to the Project net effects assessment.
				• The potential effect to ecosystem distribution and associated harvesting areas, is measured qualitatively using mapping to visually analyze the spatial configuration (or arrangement) and connectivity of ecosystems. Linear feature density (e.g., roads) is measured quantitatively to help inform changes in ecosystem distribution and connectivity.

Vegetation and Wetlands – Species at Risk (Section 6.4)	• Plant Species at Risk (SAR)
	• Plant Species of Conservation Concern (SOCC)[(a)]
	• Plants of Traditional Use (see Section 6.4.5.2.6)
		• IK and Indigenous community feedback regarding the importance of protecting plants, including but not limited to traditionally used plants important to Indigenous peoples for cultural, spiritual and medicinal values.
		• Commitment to avoid or minimize adverse effects to plant SAR or plant SOCC, and traditional use plants and/or habitat.
		• Need to comply with legal protections for plant SAR (e.g., *Endangered Species Act*).
			• Habitat quantity considering:
			  ◦ change to amount (ha) of mapped suitable habitat with high potential to support plant SAR, plant SOCC, traditional use plants in the study area.
			• Habitat distribution considering:
			  ◦ change to spatial configuration of habitat in the study area, including the effects on plant dispersal and population distribution.
			• Survival and reproduction considering:
			  ◦ change to plant SAR, plant SOCC populations or traditional plant populations through changes in survival and recruitment, as well as changes in the number of documented occurrences of plant SAR, plant SOCC or traditional use plants in the study area.
				• The potential effect to habitat quantity is measured by calculating the amount of suitable habitat available for various plant SAR, plant SOCC, or traditional use plants.
				• The potential effect to habitat distribution is measured qualitatively using mapping to visually analyze the spatial configuration (or arrangement) and connectivity of required habitats (including critical habitat).
				• Survival and reproduction are measured qualitatively and assessed based on persistence in the study area and their recruitment characteristics, as well as the estimated size of existing populations.

Valued Component	Criterion	Rationale for Selection	Indicators	Measurement of Potential Effects

Wildlife and Wildlife Habitat (Section 6.5)	• Ungulates (moose)
	• Furbearers (American marten, beaver, gray wolf)
	• Herpetofauna (snapping turtle, spring peeper)
	• Marsh birds (trumpeter swan)
	• Raptors (bald eagle)
	• Songbirds (Canada warbler, eastern wood-pewee, olive-sided flycatcher)
	• Wildlife SOCC (bald eagle, barn swallow, Canada warbler, common nighthawk, eastern wood-pewee, olive-sided flycatcher, snapping turtle)
		• IK and Indigenous community feedback regarding the importance of wildlife and wildlife habitat, including but not limited to the protection of species of wildlife that represent sustenance, cultural or spiritual importance to Indigenous peoples (e.g., moose, turtles).
		• Commitment to avoid or minimize adverse effects to wildlife and wildlife habitat.
		• Need to comply with legal protections for wildlife and wildlife habitat (e.g., *Migratory Birds Convention Act Fish and Wildlife Conservation Act*).
		• Hydro One corporate commitment to identify critical habitats and species that need protection.
			• Habitat availability considering:
			  • change to amount (ha) of wildlife habitat in the study area and animal use of available habitat.
			• Habitat distribution considering:
			  • change to spatial configuration of habitat in the study area, including the effects on wildlife movement and habitat connectivity.
			• Survival and recruitment considering:
			  • change to animal abundance/wildlife populations through changes in survival and recruitment.
				• Changes in habitat availability and animal use are estimated quantitatively by calculating the amount of different types of suitable habitat for each criterion, and qualitatively considering potential changes in habitat use (e.g., avoidance due to sensory disturbance).
				• Changes in habitat distribution, including the effects on wildlife movement and habitat connectivity, are estimated qualitatively by examining changes to the distribution of habitat patches within the relevant criterion-specific study areas, and considering potential barriers to movement.
				• Changes in survival and recruitment are identified qualitatively and quantitatively using the results from changes in habitat, and specialist knowledge of potential changes from similar projects (e.g., bald eagle strikes with conductors). Predictions of change are made using data collected in the relevant criterion-specific study areas, where possible, and supported by scientific literature.

Wildlife and Wildlife Habitat - Species at Risk[(b)] (Section 6.5)	• Little brown myotis and northern myotis
	• Eastern whip-poor-will
	• Bank swallow
	• Bobolink
	• Chimney swift
	• Gray fox
		• IK and Indigenous community feedback regarding the importance of wildlife and wildlife habitat.
		• Commitment to avoid or minimize adverse effects to wildlife SAR and/or habitat.
		• Need to comply with legal protections for SAR (e.g., *Endangered Species Act, Species at Risk Act*).
			• Habitat quantity considering:
			  • change to amount (ha) of SAR critical habitat in the study area.
			• Habitat distribution considering:
			  • change to spatial configuration of critical habitat in the study area, including the effects on movement corridors and habitat connectivity.
			• Survival and recruitment considering:
			  • change to SAR populations through changes in survival and recruitment.
				• Changes in habitat availability and animal use are estimated quantitatively by calculating the amount of different types of suitable habitat for each criterion, and qualitatively considering potential changes in habitat use (e.g., avoidance due to sensory disturbance).
				• Changes in habitat distribution, including the effects on wildlife movement and habitat connectivity, are estimated qualitatively by examining changes to the distribution of habitat patches within the relevant criterion-specific study areas, and considering potential barriers to movement.
				• Changes in survival and recruitment are identified qualitatively and quantitatively using the results from changes in habitat, and specialist knowledge of potential changes from similar projects (e.g., bald eagle strikes with conductors). Predictions of change are made using data collected in the relevant criterion-specific study areas, where possible, and supported by scientific literature.

Valued Component	Criterion	Rationale for Selection	Indicators	Measurement of Potential Effects

Fish and Fish Habitat (Section 6.6)	• Species at Risk (Lake Sturgeon)
	• Species of Conservation Concern (Northern Brook Lamprey, Coaster Brook Trout, and Deepwater Sculpin)
	• Criteria Species including Species of Indigenous Concern[(d)] (Lake Trout, Brook Trout, Northern Pike, and Walleye)
		• IK and Indigenous community feedback regarding the importance of fish and fish habitat, including but not limited to the protection of species of fish that represent cultural or spiritual importance to Indigenous peoples (e.g., Lake Sturgeon, Eel).
		• Commitment to avoid or minimize adverse effects to fish and fish habitat.
		• Need to comply with legal protections for fish and fish habitat (e.g., *Fisheries Act, Species at Risk Act*).
			• Habitat quantity considering:
			  ◦ change to the amount (m^2) of fish habitat identified in the study area.
			• Habitat quality considering:
			  ◦ change (qualitative) to the type and condition of habitat available for various life history stages of fish.
			• Survival and reproduction considering:
			  ◦ change (qualitative) to a fish population as a result of altering survival and reproduction.
			• Distribution and connectivity considering:
			  ◦ change (qualitative) to habitat availability, including the effects on fish movement and habitat connectivity.
				• Quantitative assessment of potential changes to total area of habitat present, calculated and presented as absolute (i.e., area) and relative (e.g., percentage change), as appropriate.
				• Qualitative assessment of the quality of habitat available for aquatic organisms and various life history stages of fish.
				• Qualitative assessment of changes to abundance of fish in the population based on: direct changes to the population (i.e., mortality of individuals resulting from physical activities or Project infrastructure); or indirect changes to the population (i.e., changes to habitat availability and distribution).
				• Distribution and connectivity assessed through a qualitative assessment of changes to distribution via direct and indirect changes in aquatic habitat or fish abundance.

Air Quality (Section 6.7)	Air Quality	• IK and Indigenous community feedback regarding the importance of air quality.
		• Commitment to avoid or minimize adverse effects to nearby residents and/or other sensitive land uses.
		• Sensitivity of human health and the environment (e.g., soils, plants, animals) to air quality changes.
			• Change to ambient criteria air contaminants (CAC) and fugitive dust in the study area, including:
			  ◦ suspended particulate matter (SPM);
			  ◦ particulate matter (PM_{10} and $PM_{2.5}$);
			  ◦ carbon monoxide (CO);
			  ◦ nitrogen dioxide (NO_2); and
			  ◦ sulfur dioxide (SO_2).
				• Quantitative assessment of predicted changes in ambient concentrations of SPM, PM_{10} and $PM_{2.5}$, CO, NO_2 and SO_2.

Greenhouse Gas (GHG) Emissions (Section 6.8)	GHG Emissions	• Commitment to avoid or minimize emissions of GHGs, which contribute to climate change.
		• Hydro One corporate commitment to achieve net-zero GHG emissions by 2050, with a target to achieve a 30% GHG emissions reduction by 2030.
			• Change to greenhouse gas emissions of:
			  ◦ carbon dioxide (CO_2);
			  ◦ nitrous oxide (N2O); and
			  ◦ methane (CH_4).
				• Quantitative assessment of predicted emissions of CO_2, N_2O and CH_4 expressed in units of equivalent CO_2 (CO_2eq).

Acoustic and Vibration Environment (Section 6.9)	Noise	• IK and Indigenous community feedback regarding concerns about increased noise. • May affect nearby noise sensitive fish/wildlife, human occupancy and land use	• Change to noise levels in the study area. • Compliance with applicable guidance documents.	• Qualitative assessment of the construction and maintenance activities to describe the potential for change to the existing noise levels.
Acoustic and Vibration Environment (Section 6.9)	Vibration	• Indigenous community feedback regarding concerns about increased vibration. • May affect nearby noise sensitive fish/wildlife, human occupancy and land use	• Change to air and/or ground vibration levels in the study area. • Compliance with applicable guidance documents.	• Qualitative assessment of the construction activities, which will describe the potential for change to the existing vibration levels.

Valued Component	Criterion	Rationale for Selection	Indicators	Measurement of Potential Effects

Land and Resource Use (Section 7.1)	• Provincial Parks
	• Conservation Reserves
	• Areas of Natural and Scientific Interest
	• Enhanced Management Areas
		• Commitment to avoid or minimize adverse effects to:
		  ◦ provincially designated areas;
		  ◦ critical landform/vegetation within designated areas;
		  ◦ existing park values and activities,
		  ◦ existing conservation reserve values and activities; and
		  ◦ other related existing values and activities.
		• Need to conform with the policy direction and maintain the objectives of the provincial parks crossed by the Project footprint, or seek amendments.
			• Change to protected areas including:
			  ◦ provincial parks and provincial nature reserves in the Project footprint;
			  ◦ conservation reserves in the Project footprint;
			  ◦ areas of natural and scientific interest (earth and life science), including candidate areas, in the Project footprint; and
			  ◦ other ecologically sensitive areas in the Project footprint.
			• Ability to conform with the policy direction and maintain the objectives of the provincial parks crossed by the Project footprint.
				• The potential effects to protected areas are measured quantitatively by calculating the area affected by the Project footprint, through the use of land use mapping.
				• The potential effects are also assessed qualitatively through assessment of change in environmental conditions (e.g., air quality, noise, water quality, visual aesthetics) and cultural and recreational values that might change users' experience, along with protected areas users' access.
				• For provincial parks, a qualitative assessment of the combined above effects is conducted to determine if the above combined effects could compromise the policy direction and objectives of the parks.

Land and Resource Use (Section 7.1)	Land Use Planning	• Commitment to avoid or minimize land use conflicts and incompatibilities with existing and planned land uses. • Need to conform with provincial policy and official plans or seek amendments.	• Change and conformance with land use planning. • Change to current land use.	• Qualitative assessment of current and planned future land uses. • Qualitative assessment of changes potentially required in land use policy and planning.

Land and Resource Use (Section 7.1)	Mining Resource Use	• Commitment to maintain access for significant exploration and mining activities.
		• Abandoned mines could pose human health and/or constructability issues, as well as wildlife habitat.
			• Change in access to mining resources considering:
			  ◦ proximity to mining claims in the study area;
			  ◦ proximity to active and planned mines, and associated infrastructure (i.e., mine access roads), in the study area; and
			  ◦ proximity of inactive (abandoned) mines in the study area.
				• Quantitative assessment of change in area and access to mining resources. The potential effects are measured by calculating the area of mining claims, active and planned mines, and inactive mines affected by the Project footprint, using land use mapping.

Land and Resource Use (Section 7.1)	Aggregate Resources	• Commitment to avoid or minimize adverse effects, and enhance positive effects, by identifying active aggregate sources local to the Project.
		• Commitment to maintain access to significant aggregate activities.
			• Change in availability of aggregate resources in the study area considering:
			  ◦ proximity to aggregate pits and associated infrastructure (e.g., access roads) in the study area;
			  ◦ area (ha) of high potential for aggregate resources in the Project footprint; and
			  ◦ anticipated volume and sources of aggregate required for the Project.
				• Quantitative assessment of change in area and access to aggregate resources. The potential effects are measured by calculating the area of aggregate pits and associated infrastructure and known areas of high potential for aggregate resources affected by the Project footprint, using land use mapping.
				• The potential effects of aggregate required for the Project on aggregate resources in the study area will also be assessed quantitatively using land use mapping if volume and sources of aggregate required for the Project are available.

Land and Resource Use (Section 7.1)	Hunting, Trapping and Fishing	• IK and Indigenous community feedback regarding the importance of hunting, trapping and fishing.
		• Commitment to avoid or minimize adverse effects to resource harvesting, which is a common practice for Indigenous and non-Indigenous peoples in the region.
			• Changes to hunting, trapping and fishing in the study area considering:
			  ◦ Wildlife Management Units crossed by the Project footprint;
			  ◦ proximity to traplines in the study area;
			  ◦ number and types of hunting licences in the study area; and
			  ◦ waterbody features used for recreational fishing in the Project footprint.
				• Quantitative assessment of change in area and access to Wildlife Management Units, traplines, hunting areas and waterbody features by calculating their respective area affected by the Project footprint, using land use mapping.
				• Qualitative assessment of change in area and access to traplines, hunting areas and waterbody features for recreational fishing.

Valued Component	Criterion	Rationale for Selection	Indicators	Measurement of Potential Effects

Land and Resource Use (Section 7.1)	Recreation and Commercial Tourism	• Commitment to avoid or minimize adverse effects and disturbances to:
		  ◦ tourism-related businesses and activities;
		  ◦ recreational and tourism-related areas of concern and related activities;
		  ◦ recreational cabins and cottages, and related activities/land uses;
		  ◦ recreational trails and related activities, including access points for recreational activities (e.g., trail heads, fishing access points, etc.);
		  ◦ campgrounds and/or users;
		  ◦ golf courses and users; and
		  ◦ other recreational features.
			• Change to recreation and commercial tourism considering:
			  ◦ proximity to outpost camps in the study area;
			  ◦ proximity to areas of concern associated with tourism and recreation in the study area;
			  ◦ proximity to cabins and cottages in the study area;
			  ◦ proximity to recreational trails and access points in the study area;
			  ◦ proximity to other recreational features, including canoe routes, backcountry campsites, shore launch sites, boat launches in the study area;
			  ◦ proximity to campgrounds in the study area; and
			  ◦ proximity to golf courses in the study area.
				• Quantitative assessment of change in area and access to recreational and commercial outdoor tourism features (e.g., outpost camps, cabins and cottages, recreational trails, canoe routes, etc.) by calculating the area affected by the Project footprint and, if possible, the number of affected features, using land use mapping.
				• Qualitative assessment of change to recreational and commercial outdoor tourism values within the area (e.g., outpost camps, cabins and cottages, recreational trails, canoe routes, etc.).

Land and Resource Use (Section 7.1)	Navigation	• Commitment to avoid or minimize interference with navigation and navigation safety.	• Change to navigation considering:
			  ◦ navigable watercourses crossed by the Project footprint; and
			  ◦ types and timing of watercourse crossings to be used or constructed.
				• Quantitative assessment of change in area and access to navigable watercourses. The potential effects are measured by calculating the area of navigable watercourses and watercourse crossings affected by the Project footprint, using land use mapping.
				• Qualitative assessment of changes in navigation.

Community Well-Being and Infrastructure (Section 7.2)	Population and Demographics	• Commitment to avoid or minimize adverse effects to populated areas.	• Change to population and demographics considering:
			  ◦ population and demographics of the settlements in the study area;
			  ◦ size, location, and duration of anticipated workforce; and
			  ◦ location and availability of accommodation for the workforce.
				• Quantitative assessment of the change in population and demographics in the study area.

Community Well-Being and Infrastructure (Section 7.2)	Quality of Life	• IK and Indigenous community feedback regarding concerns about changes to quality of life.
		• Commitment to enhance positive effects by identifying potential opportunities for local populations.
		• Commitment to avoid or minimize adverse effects to populated areas, dwellings and sensitive points of reception (e.g., residents or recreational users).
			• Change to quality of life considering:
			  ◦ proximity to settlements and built-up areas within the study area;
			  ◦ location of nearby points of reception to the Project footprint; and
			  ◦ nature of anticipated nuisance-related concerns (e.g., noise, vibration, traffic, access) from activities in the Project footprint,
			  ◦ potential for undesirable interactions between Project workforce and communities.
			  ◦ risks to public safety
				• Qualitative assessment of nuisance effects resulting from changes in noise and air quality.
				• Qualitative assessment of change in public safety due to potential hazards associated with the Project.
				• Qualitative assessment of potential negative interactions.

Valued Component	Criterion	Rationale for Selection	Indicators	Measurement of Potential Effects

Community Well-Being and Infrastructure
(Section 7.2)
	Transportation and Energy Infrastructure	• Commitment to avoid or minimize adverse effects to existing infrastructure (e.g., roads) and facilities.
		• Commitment to maximize benefits of providing new energy infrastructure.
			• Change in transportation and energy infrastructure considering:
			  ◦ proximity to transmission lines, pipelines and other utilities in the study area;
			  ◦ proximity to roads, highways, rail lines and airports in the study area;
			  ◦ distance and condition of existing access roads available for use; and
			  ◦ capacity of local infrastructure.
				• Qualitative assessment of changes in demand for transportation and energy infrastructure.
				• Qualitative change in transportation and energy infrastructure capacity.

Community Well-Being and Infrastructure
(Section 7.2)
	Community Services and Facilities	• Commitment to enhance positive effects by identifying existing services potentially available for the Project.
		• Commitment to avoid or minimize adverse effects to access and operations of community services and facilities.
			• Change to community services and facilities considering:
			  ◦ proximity to active, inactive (closed), and proposed (new) waste management facilities in the study area;
			  ◦ proximity to healthcare facilities in the study area (e.g., hospitals, clinics, etc.);
			  ◦ proximity to educational facilities in the study area (e.g., schools, colleges, universities, etc.);
			  ◦ proximity to community-based recreational facilities in the study area (e.g., community centres, libraries, etc.);
			  ◦ proximity to places of worship in the study area; and
			  ◦ capacity of the community services identified in the study area.
				• Qualitative assessment of changes in demand for community services and facilities.
				• Qualitative change in capacity of community services and facilities.

Economy (Section 7.3)	Labour Force and Local Economy	• Commitment to maximize positive economic effects. • Commitment to avoid or minimize adverse effects to employment and the economy.	• Change to local and regional employment opportunities. • Change to procurement of Project materials and services from local businesses and contractors.	• Qualitative assessment of changes in employment and income. • Qualitative assessment of business contracting opportunities. • Qualitative assessment of changes to business goods and services supply revenues.
Economy (Section 7.3)	Local Government Finances	• Commitment to maximize positive economic effects. • Commitment to avoid or minimize adverse effects relating to local government revenue, taxes and expenditures.	• Change to local government revenues. • Change to local government expenditures.	• Qualitative assessment of changes to local/regional government expenditures on the Project. • Qualitative assessment of changes to taxation revenues.

Visual Aesthetics
(Section 7.4)
	Visual Landscape (Aesthetics)	• IK and Indigenous community feedback regarding places and landscapes of special significance.
		• Commitment to avoid or minimize adverse effects to existing scenic views and visual aesthetics.
			• Change to the visual landscape considering:
			  ◦ visibility of the Project; and
			  ◦ visual contrast of the Project relative to the existing landscape.
				• Qualitative assessment of the change to the visual landscape during construction.
				• Qualitative and quantitative assessment of the change to the visual landscape during operations and maintenance.

Valued Component	Criterion	Rationale for Selection	Indicators	Measurement of Potential Effects

Cultural Heritage Resources (Sections 7.5 and 7.6)	Archaeological Resources	• IK and Indigenous community feedback regarding the importance of protecting archaeological resources.
		• Archaeological resources are a non-renewable resource that could be affected by Project activities.
		• Archaeological resources may have spiritual and cultural importance to Indigenous peoples and Canadians.
		• Archaeological sites are protected under the *Ontario Heritage Act*.
		• Commitment to the identification and protection of significant archaeological resources.
			• Change to archaeological resources considering:
			  ◦ number of archaeological sites in the Project footprint;
			  ◦ area (ha) of Project footprint with archaeological potential;
			  ◦ number of archaeological sites where archaeological assessment is completed prior to Project construction; and
			  ◦ areas of marine archaeological potential.
				• Quantitative and qualitative assessment of known archaeological sites, objects, material, or physical features that may have cultural heritage value or interest, that are protected under the *Ontario Heritage Act*.
				• Quantitative and qualitative assessment of areas with archaeological potential.

Cultural Heritage Resources (Sections 7.5 and 7.6)	Built Heritage Resources and Cultural Heritage Landscapes	• IK and Indigenous community feedback regarding the importance of protecting Indigenous cultural heritage sites.
		• Commitment to the identification and protection of significant built heritage resources and cultural heritage landscapes.
			• Change to built heritage resources and cultural heritage landscapes considering:
			  ◦ proximity of built heritage resources and cultural heritage landscapes identified in the study area; and
			  ◦ proximity of known historical cemeteries in the Project footprint.
				• Quantitative and qualitative assessment of known and potential built heritage resources and cultural heritage landscapes.

First Nations Rights, Interests and Use of Land and Resources (Section 7.7)	Use of Land and Resources for the current and traditional exercise of Indigenous rights	• IK and Indigenous community feedback regarding the importance of protecting Indigenous rights, interests, and use of land and resources.
		• Commitment to avoid or minimize adverse effects to the exercise of Indigenous rights and interests, including land availability and harvesting practices and/or culturally sensitive sites.
			• Changes to use of land and resources for the current and traditional exercise of Indigenous rights considering:
			  ◦ area (ha) of unoccupied Crown land being converted to occupied Crown land;
			  ◦ availability of harvested resources (considering outcomes of assessments for wildlife, vegetation, fish); and
			  ◦ access (increased or decreased) to preferred harvesting areas (hunting, trapping, fishing and plant harvest).
			  ◦ Quality of experience/sense of place in areas of use for traditional purposes, including sensory disturbance through Project-related changes to air quality, acoustics, and visual landscape (aesthetics).
				• Quantitative assessment of change in Crown land.
				• Quantitative assessment of change to availability of natural resources for harvesting by Indigenous peoples (including preferred species for hunting, trapping, fishing, or harvesting) through change in habitat availability, distribution, and composition or survival/recruitment through the assessment of wildlife, habitat and vegetation.
				• Qualitative assessment of changes from the Project that may result in changes or restrictions in harvesting practices identified by First Nation communities.

First Nations Rights, Interests and Use of Land and Resources (Section 7.7)	Cultural Landscapes and Intangible Cultural Heritage	• Avoid or minimize effects to the exercise of Indigenous rights and expression of cultural practices and values.	• Changes to cultural practices considering:
			  ◦ access to culturally sensitive, sacred or spiritual landscapes and sites; and
			  ◦ quality of experience/sense of place in areas of use for traditional purposes, including sensory disturbance through Project-related changes to air quality, acoustics and visual landscape (aesthetics).
				• Quantitative changes to cultural use locations that may be potentially removed or altered by the Project.

Valued Component	Criterion	Rationale for Selection	Indicators	Measurement of Potential Effects

Métis Rights, Interests and Use of Land and Resources (Section 7.8)	Loss of Land/Change in Priority Rights	• Avoid or minimize effects to the exercise of Métis rights and expression of cultural practices and values	• Changes in land available for Métis use considering:
			  ◦ conversion of unoccupied Crown land to occupied Crown land; and
			  ◦ increased physical disturbance.
				• Quantitative assessment of change in crown land.

Métis Rights, Interests and Use of Land and Resources (Section 7.8)[c]	Harvesting/Sites	• Avoid or minimize effects to the exercise of Métis rights and expression of cultural practices and values	• Changes in physical attributes considering:
			  ◦ decrease in air quality;
			  ◦ increase in noise;
			  ◦ decrease in visual quality;
			  ◦ perception of changes in air quality, noise or visual quality; and
			  ◦ increased avoidance behaviours.
			• Changes to harvesting of culturally critical species considering:
			  ◦ displacement of wildlife resulting in reductions to hunting, fishing and trapping; and
			  ◦ reduction or change in vegetation resulting in reductions of gathering activities.
			• Changes to harvesting practices considering:
			  ◦ disruption to harvesting timing windows.
			• Changes to access to harvesting areas considering:
			  ◦ increased non-Métis access; and
			  ◦ decreased Métis access.
			• Change in teaching/ transmittal of knowledge considering:
			  ◦ removal of resources for teaching/ transmittal to the next generation; and
			  ◦ removal of sites for teaching/transmittal to the next generation.
			• Changes in perception of ‘place’ considering:
			  ◦ changes in perception of harvesting experience;
			  ◦ changes in perception of species; and
			  ◦ changes in perception of Métis sites.
				• Quantitative assessment of changes in air quality, acoustics, and aesthetics.
				• Qualitative assessment of changes in perception of air quality, noise, and visual quality and avoidance behaviour.
				• Quantitative assessment of change in wildlife and wildlife habitat, fish and fish habitat, vegetation, and wetlands.
				• Qualitative assessment of changes to hunting, trapping, and fishing.
				• Quantitative assessment of seasonal changes in wildlife and wildlife habitat, fish and fish habitat, and vegetation.
				• Qualitative assessment of seasonal changes to hunting, trapping, and fishing.
				• Quantitative and qualitative assessment of change in access to known harvesting areas.
				• Qualitative assessment of change in access to known harvesting areas by Métis and non- Métis land users.
				• Quantitative and qualitative assessment of change in lands available for harvesting.
				• Qualitative assessment removal of resources and sites for teaching/transmittal to the next generation.

Valued Component	Criterion	Rationale for Selection	Indicators	Measurement of Potential Effects

Métis Rights, Interests and Use of Land and Resources (Section 7.8)[c]	Cultural Identity	• Avoid or minimize effects to the exercise of Métis rights and expression of cultural practices and values	• Disruption of “sense of place” considering:
			  ◦ removal of required conditions for territorial connection for the Métis.
			• Reduction in cultural practices considering:
			  ◦ changes in traditional practices specifically linked to cultural identity.
			• Change in teaching/ transmittal to the next generation considering:
			  ◦ removal of cultural connection required for teaching/ transmittal to the next generation.
				• Quantitative assessment of change to archaeological sites.
				• Qualitative assessment of change in “sense of place” and territorial connection.
				• Quantitative assessment of change in wildlife and wildlife habitat, fish and fish habitat, vegetation, and wetlands.
				• Quantitative and qualitative assessment of change cultural practices and cultural connection.
				•

a) Species of Conservation Concern (SOCC) are defined as:
   - Any species listed under Schedule 1 of SARA as Special Concern;
   - Any species designated Threatened, Endangered, or Extirpated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (unless otherwise listed as SAR under SARA or the ESA);
   - Any species listed under the ESA as Special Concern (unless otherwise listed as SAR under SARA); and/or
   - Any species with a subnational rank (SRank) of SH, S1 – S3 as designated by the Natural Heritage Information Centre (NHIC).

b) There are a few Wildlife and Wildlife Habitat criteria outlined in the Terms of Reference that will not be considered in the effects assessment. These are SAR species for which there are no data to determine that they inhabit the study areas (American badger), the population status of the species in Ontario is unknown (cougar), or their known, regular, breeding distribution is far from the study areas (least bittern, king rail and wolverine). Reference to the field work and background data that corresponds to these conclusions can be found in the Baseline Terrestrial Report (WSP Golder, in prep.) and in the 2022 Field Work Plan (Golder 2022).

c) The indicators included for Métis Rights, Interests and Use of Land and Resources were included at the request of MNO (NWOMC and Region 2) during the ToR phase. The use and quantitative analysis of these Métis specific indicators is dependent on the receipt of applicable Indigenous knowledge.

d) Note that Species of Indigenous Concern (see Section 6.6.3 and 6.6.5.2.4.4) and all other fish species that may be present in the LSA are discussed in the description of the existing environment (Section 6.2.5.2) and were considered in the effects assessment including the application of the proposed restricted activity periods/in water work timing windows.

e) Potential effects, mitigation measures and net effects of blasting within fish habitats is discussed in detail in Section 6.6.7.2. Mitigation measures include creation of a blasting plan that respects fish and fish habitat, following the DFO guidelines for the use of explosives in or near fish-bearing waters (Wright and Hopky 1998) and permitting approval requirements.

5.3 Define Assessment Boundaries

The scope of the assessment is based on spatial boundaries and temporal boundaries that set parameters for the net effects and cumulative effects assessments. These boundaries provide a meaningful and manageable focus for the EA, and aid in directing the most effective use of available study resources.

5.3.1 Spatial Boundaries

Spatial boundaries define the geographic extent within which the potential environmental effects of the Project are expected to occur. This EA has adopted a multi-scale approach for describing baseline (i.e., existing environment) conditions and predicting effects from the Project. This approach accommodates the responses of different criteria to natural and human-induced disturbance, which will occur across different scales.

The spatial boundaries define the study areas for the effects assessment. These study areas are selected to characterize existing environmental conditions and predict the direct and indirect changes from the Project on criteria on a continuum of increasing spatial scales from the Project footprint to local and regional levels. The selection of study areas also considers the physical and biological properties of each criterion. Study areas are designed to capture the maximum spatial extent of potential effects from the Project, including cumulative effects.

The following study areas are used to capture the potential direct and indirect effects of the Project on each criterion, as well as to understand the context within which the effects could occur:

- **Project footprint** – This is established to identify the physical area required for Project construction and operation, which represents the area of direct disturbance. The Project footprint includes the following Project components, which are described in more detail in Section 3.3:
  - transmission line right-of-way (ROW);
  - expansion of the existing Lakehead, Mackenzie and Dryden transformer stations within Hydro One property;
  - separation of approximately 1 km of the existing 230 kV transmission circuits out of Mackenzie TS;
  - temporary and permanent access roads;
  - water crossings;
  - equipment and material laydown areas;
  - temporary construction camps and offices;

- temporary land rights area such as pull sites;
- aggregate pits; and
- helicopter pads.

- **Local study area (LSA)** – This encompasses the area within which most effects of the Project are expected to occur and are likely to be measurable. This study area is the primary focus of data collection to characterize the existing environment. The LSA for most criteria includes lands within approximately 1 km of the Project footprint.
- **Regional study area (RSA)** – This includes areas beyond the LSA (generally up to approximately 5 km or more from the Project footprint) used to measure broader-scale existing environment conditions and provide regional context for the maximum predicted geographic extent of direct and indirect effects from the Project (e.g., changes to downstream water quality, migratory ranges, or changes to the economy, including regional employment and incomes). Cumulative effects from the Project in combination with past, present, and reasonably foreseeable future developments are typically assessed at this larger spatial scale.

Based on baseline field studies and desktop data collection, some study areas have been adjusted on a criterion-specific basis. Where study areas have been adjusted to accommodate the assessment of a specific criterion (e.g., local environmentally sensitive features), the refined study areas are described in the criteria-specific assessments (Sections 6.0 and 7.0).

5.3.2 Temporal Boundaries

The temporal boundaries encompass the time periods during which the criteria are likely to interact with, or be influenced by, the Project. The EA was designed to evaluate the short- and long-term changes from the Project and associated effects on the environment, as well as potential cumulative effects.

Development of the Project is planned to occur in three stages:

- **Construction stage**: the period from the start of construction to the start of operation (in-service date).
- **Operation and maintenance stage**: the period from the start of operation and maintenance activities through to the end of the Project life.
- **Retirement stage**: the period from the start of retirement activities through to the end of final reclamation of the Project.

The construction stage is scheduled to begin in Q1 2024, after receipt of required permits and approvals. The Project in-service date is planned for Q4 2027.

The Project will be operated for an indeterminate period. The new transmission line and related facilities would undergo regular maintenance in adherence with Hydro One's maintenance

standards and regulatory requirements to maintain a safe and reliable electricity transmission system. It is anticipated that upgrades to reinforce or rebuild portions or all of the Project may occur over its lifetime to maintain its longevity, and these projects would be subject to their own environmental regulatory requirements. Therefore, the timing of retirement, or decommissioning, is not known at this time.

When transmission facilities become obsolete or unserviceable and/or deemed to be at end-of-life, the equipment would be retired from service. Transmission facilities that are retired from service are often left in place (idle) for potential future use. The facilities may eventually be removed, and the site made suitable for other purposes. The foundations are typically cut back 1.0 m below-ground surface when transmission structures are removed.

Activities that would typically be completed to facilitate the decommissioning of a project of this type would include removing towers and transmission line cables, insulators and other hardware, and ground reclamation. The potential effects and mitigation measures to be identified during the EA for the construction of the Project will likely equally apply to the potential removal of the Project at a future point in time, should it ever be required. Further, decommissioning of the Project is expected to have a positive net effect on most criteria and indicators (e.g., returning the ROW to a natural state and no maintenance activities that generate noise and air emissions). Therefore, the construction scenario assessed as part of the EA is considered bounding and potential effects and mitigation measures for retirement are not identified separately in this EA.

Although generally based on the planned stages described above, the final selection of temporal boundaries is criterion-specific and further detail can be found in Sections 6.0 and 7.0. For some criteria, the assessment is focussed on those stages of the Project where predicted effects are expected to occur (e.g., noise effects will primarily occur during construction stage). Temporal variation in potential effects associated with different criteria (e.g., annual or seasonal changes in water flow or habitat use, or trends over time in populations and employment) is also considered.

In some cases, the assessment considers that Project components and activities may overlap in time. For example, following construction, temporary laydown areas and some access roads will be decommissioned, and reclamation and revegetation (human-facilitated and natural) will occur during the operation and maintenance stage. Likewise, the effects from Project activities may overlap in time. For example, effects from vegetation clearing for permanent infrastructure will start during construction and persist for the duration of the Project's operational life.

Similarly, the temporal boundaries identified for cumulative effects assessments are specific to the criteria being assessed. Temporal boundaries include the duration of net effects from previous and existing developments that overlap with net effects of the Project, and the period during which the net effects from reasonably foreseeable developments will overlap with net effects from the Project.

5.4 Describe the Existing Environment

The existing environment represents baseline conditions, including cumulative changes associated with past and present developments (e.g., forestry, transportation, municipal, residential and recreational development) and natural factors (e.g., fire, disease and insects), for each criterion. For assessment purposes, the baseline characterization represents conditions from 2020-2022.

A description of the existing environment is completed for each environmental criterion to provide the baseline for determining the potential effects resulting from the Project. Documentation of existing baseline conditions also provides a benchmark for the post-construction monitoring program.

The study methods, specific data sources, and the existing environment in which the Project will be constructed, and operated and maintained, are described in detail in Sections 6.0 and 7.0, along with the results of field surveys completed in support of the effects assessment. Field surveys, where undertaken, are generally focused on characterizing existing conditions within the LSA. The rationale and management of uncertainty related to baseline field data gaps and limitations is provided in criteria-specific sections. The EA also uses new secondary information sources (e.g., published data sources, electronic databases, aerial photographs, published literature and journals, map interpretation, etc.), as well as primary sources, as necessary. Indigenous knowledge received from Indigenous communities is also incorporated into the description of the existing environment.

The baseline information used to describe the existing environment was compiled using the following sources:

- Available topographic and resource maps, aerial imagery, databases, scientific papers, technical reports, publicly available government documents and websites, information letters, and fact sheets;
- Data and information provided by regulatory agencies, such as the MNRF;
- Criteria-specific field surveys;
- EA reports and regulatory applications prepared for other projects in the area;
- IK, including traditional knowledge, traditional land and resource use, and information about rights and interests. Any information received from Indigenous communities is incorporated into aspects of the EA in consultation with Indigenous communities; and
- Engagement with Indigenous communities and groups, local land users, community members, representatives from local and regional governments, provincial and federal regulatory agencies, non-governmental organizations, general public, and other stakeholders that provided input.

5.5 Identify Project-Environment Interactions

Potential Project-environment interactions are identified by reviewing the Project description and existing environmental conditions, and identifying possible interactions between criteria and the Project, within the identified spatial and temporal boundaries. Relevant Project components and activities are analyzed individually to determine if there is a likely mechanism for an effect on each criterion during Project construction, and operation and maintenance. The analyses are informed by professional judgement and experience with regard to the physical and operational features of the Project and their potential for interaction with the environment. The results are summarized in a matrix illustrating the potential for the Project to interact with each criterion and result in environmental effects. The interactions identified are used to focus the description of the existing environment and the assessment and mitigation measures of potential Project effects in Sections 6.0 to 9.0.

5.6 Assess Net Effects

A step-wise process was used to assess the environmental effects of the Project in a systematic and transparent manner once the relevant Project works and activities and their interactions, assessment boundaries, and relevant environmental criteria and indicators were identified. The net effects assessment method included the following steps:

- Identification of potential environmental effects;
- Identification of technically and economically feasible mitigation measures;
- Prediction of net effects following implementation of mitigation measures;
- Characterization of the predicted net effects (i.e., describe and determine the magnitude, duration, extent, frequency); and
- Determine the significance of the predicted net effects.

Each step is described in the following sections.

5.6.1 Identifying Potential Effects

The net effects assessment considers the potential interactions between the Project components and activities and the criteria within the identified spatial and temporal boundaries. These Project-environment interactions can result in environmental effects that are defined as “the effect that a proposed undertaking or its alternatives has or could potentially have on the environment, either positive or negative, direct or indirect, short- or long-term” (MOECC 2014).

Potential effects of the Project on criteria were determined by comparing baseline conditions to those expected to result from the construction, and operation and maintenance, of the Project. Potential effects were described for each criterion, including an indication of whether they are expected to be direct (i.e., as a result of a Project component or activity affecting a criterion), or indirect (i.e., as a result of a change to one criterion affecting another criterion).

5.6.2 Identify Technically and Economically Feasible Mitigation Measures

Once potential effects have been identified, technically and economically feasible mitigation measures to avoid and minimize potential adverse effects are identified for both Project stages. Refinements to these measures may be made as potential effects are identified, as the cumulative effects assessment is conducted, and as the Project proceeds. Mitigation measures are described in detail in Sections 6.0 and 7.0, with reference to monitoring (Section 10.0), commitments, other regulatory requirements, and industry standard practices to be implemented. These measures were developed for the Project based on:

- Expertise of the Project team;
- Best management practices;
- Applicable agency requirements and guidance;
- Hydro One environmental and social management plans, and
- Feedback received during engagement with Indigenous communities, government officials and agencies, and interested persons and organizations.

Hydro One will have an adaptive management strategy to mitigation, based on the results of the compliance and effects monitoring for the Project (see Section 10.0). Mitigation and compliance measures will be provided in contract specifications to be adhered to by Hydro One staff and contractors.

5.6.3 Predict the Net Effects

A net effect is a natural environment or socio-economic effect of a project and related activities that is predicted to remain after the application of mitigation measures (MOECC 2014). A potential effect is considered to occur where anticipated future conditions resulting from the Project differ from the conditions otherwise expected from natural change. In some situations, the recommended mitigation measures will eliminate a potential negative effect, while in other situations mitigation measures will lessen, but not eliminate the effect. Mitigation measures may also enhance positive effects. A potential effect that will be eliminated, or considered unlikely after mitigation measures, is identified as not resulting in a net effect (i.e., no net effect) and is not considered further in the net effects assessment. An effect that may remain after the application of feasible mitigation measures is identified as a net effect and is further considered in the effects assessment. Positive effects are also considered further in the effects assessment.

Neutral changes are not carried forward for the characterization of net effects. Where effects are identified as neutral, they are characterized in terms of the confidence in the predictions and the likelihood of the effect.

5.6.4 Characterize the Net Effects

Predicted net effects, where identified, are described in terms of the following significance factors (MNRF 2002, MNRF 2005):

- Direct/indirect
- Direction;
- Magnitude;
- Geographic extent;
- Duration/reversibility;
- Frequency;
- Likelihood of occurrence; and
- Context (where applicable).

General definitions of these factors are provided in Table 5.6-1; however, the definition of effect levels may vary from one criterion to another, recognizing that the units and range of measurement are distinct for each. For some criteria, specific significance factors may apply (e.g., criteria-specific definitions for magnitude). In such cases, the specific significance factors definitions are provided within the criteria-specific assessments in Sections 6.0 and 7.0.

Table 5.6-1: Definitions of Significance Factors Used to Characterize Net Effects

Effects Characteristic	Definition	Description
Direct / indirect	• Identifies if the effect is caused directly by a project activity or if it is caused by another environmental effect.	• **Direct** – effect is caused directly by a project activity • **Indirect** – effect is caused by another environmental effect (direct or indirect) due to project
Direction	• The direction of change in the effect relative to the current value or state.	• **Positive** – net gain or positive effect • **Neutral** – no change • **Negative** – net loss or adverse effect
Magnitude	• Magnitude is the intensity of the effect or a measure of the degree of change from existing (baseline) conditions expected to occur in the criterion.	• To be defined by each criteria-specific assessment.

Effects Characteristic	Definition	Description
Geographic extent	• Geographic extent refers to the spatial area over which an effect will occur/can be detected (distance covered or range).	• **Project footprint** – effect is limited to the direct physical disturbance from the Project • **Local** – the effect is confined to the LSA, but outside of the Project footprint • **Regional** – the effect extends beyond the LSA boundary, but is confined within the RSA • **Beyond regional** – the effect extends beyond the RSA
Duration/ reversibility	• Duration is the period of time over which the environmental effect will be present. The amount of time between the start and end of an activity or stressor, plus the time required for the effect to be reversed. • Reversibility is an indicator of the potential for recovery of the criterion from an effect. Reversible implies that the effect will not influence the criterion at a future predicted period in time. For effects that are permanent, the effect is determined to be irreversible.	• **Short-term** – the effect occurs during construction and/or operation and maintenance, and persists for the duration of the activity, but is reversible • **Medium-term** – the effect occurs during construction and/or operation and maintenance, and persists after the activity is complete, but is reversible • **Long-term** – the effect occurs during construction and/or operation and maintenance, and persists for the life of the Project, but is reversible • **Permanent** – the effect occurs during construction and/or operation and maintenance and is irreversible
Frequency	• Frequency refers to the repeated occurrence of the environmental effect over time, whether it is because an activity occurs repeatedly over time, or because time periods change (e.g., seasonal effects may occur annually).	• **Infrequent** – the effect is expected to occur rarely • **Frequent (or periodic)** – the effect is expected to occur intermittently • **Continual** – the effect is expected to occur continually

Effects Characteristic	Definition	Description
Likelihood of occurrence	• Likelihood of occurrence is a measure of the probability that an activity will result in an environmental effect.	• **Unlikely** – the effect is not likely to occur • **Possible** – the effect may occur, but is not likely • **Probable** – the effect is likely to occur • **Certain** – the effect will occur

Context may also be relevant when describing a net effect on biological and socio-economic criteria. The concept of "ecological context" is similar to MNRF's significance factor of "Value of the Feature or Situation Affected" (MNRF 2002). Ecological and socio-economic principles (i.e., ecological or socio-economic context), such as natural cycles, interdependence and networks, and diversity and resilience, are considered throughout the effects assessment and specifically in assessing the significance of an identified effect on a biological or socio-economic resource. Definitions of ecological and socio-economic context are provided below.

- Ecological context relates to the potential for environmental effects to cause disruption of ecological functions in relation to the receiving environment, which may be ecologically fragile with little resilience to imposed stresses or may be already adversely affected by human activities.
- Socio-economic context is helpful in understanding the ability of the environment to absorb and adapt to further stresses from the Project.

Where relevant, ecological or socio-economic context is discussed in the description of net effects.

An effort is made to express expected changes quantitatively. For example, the magnitude (intensity) of the effect may be expressed in absolute or percentage values above (or below) baseline conditions or a guideline value. The duration (which includes reversibility) of the effect may be described in years relative to the stages of the Project, and the spatial extent of effects is typically expressed in area or distance from the Project. In addition, the direction, frequency, reversibility, and prediction confidence of effects are characterized. Due to the amount and type of data available, some assessment is necessarily qualitative, and includes professional judgement or experienced opinion.

5.6.5 Assess the Significance of Net Effects

The significance factors are considered in combination to assess the importance of an adverse net effect on a criterion. If the effects assessment indicates that the Project may contribute to significant effects, then additional mitigation measures may be identified and implemented.

The *Class Environmental Assessment for Provincial Parks and Conservation Reserves* (MNRF 2005), and the *Class Environmental Assessment for Resource Stewardship and Facility*

Development Projects (MNRF 2002) require the assessment of significance of environmental effects. They provide guidance for assessing the significance of potential environmental effects for individual criteria, for the Project, and for alternatives. They include factors that may be applied in assessing the significance of effects, as presented in Section 5.6.4, and a series of considerations that should be taken into account in applying them (e.g., concerns of interested agencies, groups and individuals).

In addition to the Class EA guidance, the determination of significance of net effects and cumulative effects from the Project and other previous, existing, and reasonably foreseeable future developments generally follows the guidelines and principles of the *Operational Policy Statement: Determining Whether a Designated Project is Likely to Cause Significant Adverse Environmental Effects under the Canadian Environmental Assessment Act, 2012* (*Canadian Environmental Assessment* Agency 2015) and *Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012, Interim Technical Guidance* (*Canadian Environmental Assessment* Agency 2018). These documents identify several possible methods for the determination of whether residual or net effects are significant, including the use of established environmental standards, guidelines, or objectives in relation to likely residual effects, as well as quantitative and qualitative assessment of the effects.

The assessment of significance of negative and positive net effects applies to each criterion and is classified as significant or not significant (i.e., binary response). Maintaining the integrity of ecological and socio-economic criteria is based on an understanding of the functioning of natural or socio-economic systems.

The assessment of significance involves the professional judgment of experienced specialists. The extent to which the professional experience of the EA team was used in the assessment of significance is described in Sections 6.0 and 7.0. The EA team is comprised of technical specialists with experience collecting data and assessing natural environmental and socio-economic effects for numerous projects in Ontario, and across Canada. The EA team understands the Project scope, landscape, environmental sensitivities, communities and types of natural environment and socio-economic issues commonly encountered across northern Ontario, and those specific to this Project during construction, and operation and maintenance.

Based on the application of significance criteria, a significance conclusion is made for each criterion. A description of how significance was determined for each criterion is presented in Table 5.6-2. Additional details about the approach and methods for characterizing net effects and determining significance for criteria and criteria-specific definitions of significance are provided in Sections 6.0 and 7.0.

Table 5.6-2: Definitions of Significant Net Effects for Each Criterion Criteria

Environmental, Cultural or Social Component	Criteria	Definition of Significance

Physiography, Geology, Surficial Geology and Soils (Section 6.1)	• Soil Productivity and Quality	• A predicted net effect would be considered significant if it is assessed as:
		  ◦ high magnitude;
		  ◦ long-term or permanent in duration;
		  ◦ occurring at any geographic extent; and
		  ◦ representing a management concern.

Surface Water (Section 6.2)	• Surface Water Quality and Quantity	• A predicted net effect would be considered significant if it is assessed as:
		  ◦ moderate to high magnitude;
		  ◦ long-term (for high magnitude effects) or permanent (for moderate effects) in duration;
		  ◦ occurring at any geographic extent; and
		  ◦ representing a management concern.

Groundwater (Section 6.3)	• Groundwater Quality and Quantity	• A predicted net effect would be considered significant if it is assessed as:
		  ◦ moderate to high magnitude;
		  ◦ long-term or permanent in duration;
		  ◦ occurring at any geographic extent; and
		  ◦ representing a management concern.

Vegetation and Wetland Ecosystems (Section 6.4)	• Upland ecosystems
	• Riparian ecosystems
	• Wetland ecosystems
		• A predicted net effect would be considered significant if it is assessed as:
		  ◦ high magnitude;
		  ◦ long-term or permanent in duration;
		  ◦ occurring at any geographic extent; and
		  ◦ representing a management concern.
		• Predicted net effects would be high magnitude if a criterion is expected to no longer be: (1) self-sustaining, or (2) ecologically effective. Self-sustaining communities are healthy, functioning, and robust entities that are capable of withstanding environmental change and accommodating stochastic processes. Ecologically effective communities are those that can support the range of native species and ecological and evolutionary processes normally provided by the ecosystem.

Vegetation and Wetlands – Species at Risk (Section 6.4)	• Plant Species at Risk, Species of Conservation Concern, Traditional Use Plants and Related Habitat	• A predicted net effect would be considered significant if it is assessed as:
		  ◦ high magnitude;
		  ◦ long-term or permanent in duration;
		  ◦ occurring at any geographic extent; and
		  ◦ representing a management concern.
		• Predicted net effects would be high magnitude if a criterion population is expected to no longer be: (1) self-sustaining, or (2) ecologically effective. Self-sustaining communities are healthy, functioning, and robust entities that are capable of withstanding environmental change and accommodating stochastic processes. Ecologically effective communities are those that can support the range of native species and ecological and evolutionary processes normally provided by the ecosystem.

Environmental, Cultural or Social Component	Criteria	Definition of Significance

Wildlife and Wildlife Habitat
(Section 6.5)
	• Ungulates (moose)
	• Furbearers (pine marten, beaver, gray wolf, black bear)
	• Raptors (bald eagle)
	• Songbirds (Nashville warbler, white-throated sparrow, red-eyed vireo)
	• Herpetofauna (snapping turtle, spring peeper)
	• Wildlife Species of Conservation Concern (olive-sided flycatcher, Canada warbler)
		• A predicted net effect would be considered significant if it is assessed as:
		  ◦ high magnitude;
		  ◦ long-term or permanent in duration;
		  ◦ occurring at any geographic extent; and
		  ◦ representing a management concern.
		• Predicted net effects would be high magnitude if a criterion population is expected to no longer be: (1) self-sustaining, or (2) ecologically effective. Self-sustaining populations are healthy and viable populations, which are capable of withstanding environmental change and accommodating stochastic population processes. Loss of ecological effectiveness (i.e., function) occurs when a population can no longer perform its ecological role, such that it might trigger ecological changes that result in degraded or simplified ecosystems. Ecologically effective communities are those that can support the range of native species and ecological and evolutionary processes normally provided by the ecosystem.

Wildlife and Wildlife Habitat - Species at Risk
(Section 6.5)
	• Little Brown Myotis and Northern Myotis
	• Eastern Whip-poor-will
	• Barn Swallow
	• Bank Swallow
	• Bobolink
	• Chimney Swift
	• American White Pelican
	• Gray Fox
		• A predicted net effect would be considered significant if it is assessed as:
		  ◦ high magnitude;
		  ◦ long-term or permanent in duration;
		  ◦ occurring at any geographic extent; and
		  ◦ representing a management concern.
		• Predicted net effects would be high magnitude if a criterion population is expected to no longer be: (1) self-sustaining, or (2) ecologically effective. Self-sustaining populations are persistent and viable populations, which are capable of withstanding environmental change and accommodating stochastic population processes. Loss of ecological effectiveness (i.e., function) occurs when a population can no longer perform its ecological role, such that it might trigger ecological changes that result in degraded or simplified ecosystems. Ecologically effective communities are those that can support the range of native species and ecological and evolutionary processes normally provided by the ecosystem.
		• Maintaining viable populations is a conservation target frequently applied by conservation biologists and resource managers (Fahrig 2001, Nicholson et al. 2006, Ruggiero et al. 1994, With and Crist 1995).

Fish and Fish Habitat
(Section 6.6)
	Fish and Fish Habitat
	
	Specific example criteria:
	• Northern Pike
	• Walleye
	• Lake Trout
	• Brook Trout
		• A predicted net effect would be considered significant if it is assessed as:
		  ◦ high magnitude;
		  ◦ long-term or permanent in duration;
		  ◦ occurring at any geographic extent; and
		  ◦ representing a management concern.
		• Significant effects to fish and fish habitat would cause permanent adverse changes to survival or reproduction at a population level such that self-sustaining and ecologically effective populations of criterion species cannot be maintained.

Fish and Fish Habitat - Species at Risk
(Section 6.6)
	• Lake Sturgeon (Great Lakes - Upper St. Lawrence River population)
	• Lake Sturgeon (Nelson River population)
	• American Eel
		• A predicted net effect would be considered significant if it is assessed as:
		  ◦ moderate to high magnitude;
		  ◦ long-term or permanent in duration;
		  ◦ occurring at any geographic extent; and
		  ◦ representing a management concern.
		• Significant effects to aquatic SAR and their habitat would cause permanent adverse changes to survival or reproduction at a population level such that self-sustaining and ecologically effective populations of criterion species cannot be maintained.

Air Quality (Section 6.7)	• Air quality	• A predicted net effect would be considered significant if it is assessed as:
		  ◦ moderate or high magnitude over a regional geographic extent or beyond, or a high magnitude occurring continuously at a local extent;
		  ◦ occurring for any duration; and
		  ◦ representing a management concern.
		• Significant effects to the criterion would likely result in regional concentrations of the indicator compound above levels considered to be representative of good air quality.

Environmental, Cultural or Social Component	Criteria	Definition of Significance

Climate Change – Greenhouse Gas (GHG) Emissions (Section 6.8)	• GHG Emissions	• A predicted net effect would be considered significant if it is assessed as:
		  ◦ high magnitude beyond a regional geographic extent;
		  ◦ occurring for any duration; and
		  ◦ representing a management concern.
		• Significant effects result in meaningful changes to the provincial and federal inventories (>5% of provincial totals and >2% of federal totals).

Acoustic and Vibration Environment (Section 6.9)	• Noise	• A predicted net effect would be considered significant if it is assessed as:
		  ◦ high magnitude;
		  ◦ long-term to permanent in duration; and
		  ◦ occurring at any geographic extent.

Acoustic and Vibration Environment (Section 6.9)	• Vibration	• A predicted net effect would be considered significant if it is assessed as:
		  ◦ high magnitude;
		  ◦ long-term to permanent in duration; and
		  ◦ occurring at any geographic extent.

Land and Resource Use (Section 7.1)	• Provincial Parks
	• Conservation Reserves
	• Areas of Natural Scientific Interest
	• Enhanced Management Areas
		• A predicted net effect would be considered significant if it is assessed as:
		  ◦ high magnitude;
		  ◦ medium to long-term in duration; and
		  ◦ occurring at any geographic extent.
		• The significant effect would cause the capacity of a land and resource use system to be exceeded on an ongoing and consistent basis, with the land and resource use system (and its users and operations, at the community level) being unlikely to be able to respond in a timely manner.

Land and Resource Use (Section 7.1)	• Mining Resource Use
	• Aggregate Resources
	• Hunting, Trapping and Fishing
	• Recreation and Commercial Tourism
	• Navigation
		• A predicted net effect would be considered significant if it is assessed as:
		  ◦ high magnitude;
		  ◦ medium to long-term in duration; and
		  ◦ occurring at any geographic extent.
		• The significant effect would cause the capacity of a land and resource use system to be exceeded on an ongoing and consistent basis, with the land and resource use system (and its users and operations, at the community level) being unlikely to be able to respond in a timely manner.

Community Well-Being (Section 7.2)	• Population and Demographics
	• Quality of Life
		• A predicted net effect would be considered significant if it is assessed as:
		  ◦ moderate to high magnitude;
		  ◦ occurring for any duration; and
		  ◦ occurring at any geographical extent.
		• The significant effect could require management and represents an impact on the quality of life for those affected by the Project. Adverse net effects may be considered significant even with a low likelihood of occurrence.

Community Well-Being (Section 7.2)	• Transportation and Energy Infrastructure
	• Community Services and Facilities
		• A predicted net effect would be considered significant if it is assessed as:
		  ◦ high magnitude;
		  ◦ occurring for any duration; and
		  ◦ occurring at any geographical extent.
		• Adverse net effects may be considered significant even with a low likelihood of occurrence.

Economy (Section 7.3)	• Labour Force and Local Economy
	• Local Government Finances
		• A predicted net effect would be considered significant if it is assessed as:
		  ◦ high magnitude;
		  ◦ occurring for any duration; and
		  ◦ occurring at any geographical extent.
		• Adverse net effects may be considered significant even with a low likelihood of occurrence.

Environmental, Cultural or Social Component	Criteria	Definition of Significance

Aesthetics
(Section 7.4)
	• Visual Landscape (Aesthetics)	• A predicted net effect would be considered significant if it is assessed as:
		  ◦ high magnitude;
		  ◦ long-term to permanent in duration; and
		  ◦ at any geographic extent.
		• The net negative effects would be defined as a change in visual quality whereby the overall level of visual impact from the Project to viewing opportunities substantially changes the existing landscape character.

Cultural Heritage Resources
(Section 7.5)
	• Archaeological Resources
	• Built Heritage Resources and Cultural Heritage Landscapes
		• A predicted net effect would be considered significant if it is assessed as:
		  ◦ high magnitude;
		  ◦ long-term or permanent duration;
		  ◦ at any geographic extent; and
		  ◦ represent a management concern.

First Nations Rights, Interests and Use of Land and Resources
(Section 7.7)
	• Use of Land and Resources for the current and traditional exercise of Indigenous rights
	• Cultural Landscapes and Intangible Cultural Heritage
		• A predicted net effect would be considered significant if it is assessed as:
		  ◦ high magnitude;
		  ◦ medium-term to permanent in duration;
		  ◦ occurring at any geographic extent; and
		  ◦ representing a management concern.
		• The effects would represent a substantial interference in the continued opportunity for First Nations communities to be able to undertake use of land and resources for the current and traditional exercise of Indigenous rights.

Métis Rights, Interests and Use of Land and Resources
(Section 7.8)
	• Loss of Land/ Change in Priority Rights
	• Harvesting/Sites
		• A predicted net effect would be considered significant if it is assessed as:
		  ◦ high magnitude;
		  ◦ medium-term to permanent in duration;
		  ◦ occurring at any geographic extent; and
		  ◦ representing a management concern.
		• The effects would represent a substantial interference in the continued opportunity for Métis communities to be able to undertake use of land and resources for the current and traditional exercise of Indigenous rights.

5.7 Assess Cumulative Effects

In addition to assessing the net environmental effects of the Project, which considered past and present developments, this assessment also evaluates and assesses the significance of net effects from the Project that overlap temporally and spatially with effects from other reasonably foreseeable future developments (RFDs) and activities (i.e., cumulative effects).

Cumulative effects can be defined as the sum of net effects from all past, current and reasonably foreseeable future developments or activities on the physical, biological, cultural and socio-economic components of the environment (Hegmann et. al. 1999). The MNRF Class EAs (MNRF 2002, 2005) describe cumulative environmental effects as "the total effect on the environment within the defined study area from two or more projects." These Class EAs indicate that consideration should be given to whether the environment affected by the project is undergoing change because of other projects or activities, and likewise, where there is potential for significant cumulative effects, this should be considered in defining study areas for a project evaluation. Therefore, the cumulative effects assessment recognizes that, while each single land use change may result in a relatively small effect or change, the accumulation of these changes over time and space could cause a significant effect. The aim is to assess the interaction of these individual developments to determine how a given project will influence not only the Project footprint or area, but the entire region over time.

In addition to the guidance provided in the Class EAs, the steps used to assess cumulative effects also consider *Assessing Cumulative Environmental Effects under the Canadian Environmental Assessment Act, 2012, Interim Technical Guidance* (Canadian Environmental Assessment Agency 2018) and include the following:

- identify and characterize net effects of the Project;
- define spatial and temporal boundaries for each criterion where net effects have been identified;
- identify other past, current, and reasonably foreseeable projects with effects likely to overlap both temporally and spatially with the predicted net effects of the Project;
- identify the potential for cumulative effects;
- develop additional mitigation measures, if warranted, and predict likelihood of net cumulative effects; and
- evaluate and determine the significance of the likely net cumulative effects.

For a criterion that has identified net effects, it is necessary to determine if the effects from the Project interact both temporally and spatially with the effects from one or more past, present, or reasonably foreseeable developments or activities, since the combined effects may differ in nature or extent from the effects of individual Project activities. Cumulative effects also include natural influences on the physical, biological, and socio-economic environment prior to, during

and after development of the Project (e.g., extreme rainfall events, periodic harsh and mild winters, economic changes that are independent of the Project). Where information is available, the cumulative effects assessment estimates or predicts the contribution of effects from the Project and other developments on criteria, in the context of natural changes in the environment.

In this EA report, cumulative effects are identified, analyzed and assessed under the cumulative effects assessment for each criterion in Sections 6.0 and 7.0, with a summary provided in Section 9.0.

Net effects carried forward in the cumulative effects assessment analysis include net effects with a magnitude greater than negligible and with a likelihood of occurrence of 'probable' or 'certain' as described below:

- **Level of change compared to baseline conditions or values**. Criterion-specific definitions of the magnitude of net effects are provided in Sections 6.0 and 7.0. The level of change compared to baseline conditions for a net effect is characterized by the magnitude of the effect. Net effects that are assessed as a negligible magnitude are not likely to additively or synergistically contribute to effects of other past, present, or reasonably foreseeable developments. Therefore, net effects with a higher magnitude or intensity of change compared to baseline conditions may be carried forward, while net effects assessed as unlikely to additively or synergistically contribute to effects of other past, present, or reasonably foreseeable developments may not be carried forward to the cumulative effects assessment.
- **Likelihood of occurrence.** The cumulative effects assessment focuses on net effects that are likely to occur unless they are negligible magnitude. Net effects assessed as having a likelihood of occurrence of 'probable' or 'certain' are carried forward while net effects assessed as 'unlikely' and 'possible' are not carried forward to the cumulative effects assessment.

The rationale for selection of net effects to carry forward to the cumulative effects assessment is also provided for each criterion in Sections 6.0, 7.0, and 8.0.

5.8 Identify a Monitoring Framework

The monitoring framework presented in Section 10.0 identifies recommended effects monitoring to verify the prediction of the effects assessment and to verify the effectiveness of the mitigation measures, and compliance monitoring to evaluate whether the Project has been constructed, implemented, and operated in accordance with the commitments made in the EA Report.

The roles and responsibilities of the workers on the Project (including any Hydro One contractors and consultants) are identified, as well as the mitigation measures to be implemented to avoid and minimize the potential adverse environmental effects of the Project. The monitoring framework includes mitigation measures, including management plans, as well

as other industry standard practices and regulatory requirements. Contingency plans are included in case of unforeseen circumstances (e.g., accidental spills or discovery of unknown heritage resources). Monitoring and commitments will be carried out throughout the duration of the Project to guide the implementation of mitigation measures, and to monitor their effectiveness.

The monitoring framework will:

- Evaluate the effectiveness of mitigation measures and modify or enhance measures as necessary through adaptive management;
- Identify unanticipated potentially adverse effects, including possible accidents and malfunctions;
- Contribute to continual improvement; and
- Include active involvement of Indigenous communities.

A compliance monitoring plan is also presented in Section 10.0, which outlines the process used to complete an assessment of whether the undertaking has been constructed and implemented in accordance with the commitments made in the EA and the conditions of EA approval. Details will also be provided to outline how and when the commitments made in the EA will be fulfilled and how Hydro One will report to the MECP about compliance.

While Hydro One always strives to avoid and mitigate potential effects to the natural and socio-economic environments, and restore areas that are affected by the Project, Hydro One acknowledges that there may be adverse effects that cannot be avoided, or that occur even when appropriate mitigation and restoration measures are employed. Natural environment examples include the long-term transition of incompatible vegetation, such as forest communities to compatible vegetation communities including meadows or shrub thickets. Because these net effects cannot be further avoided or mitigated, they are typically compensated for by undertaking positive environmental activities.

Hydro One has committed to undertaking a biodiversity initiative specific to this project to offset habitat loss or transition (long-term change) that may occur as a result of the Project. The scope of the biodiversity initiative is expected to be determined post-EA completion; however, typically such initiatives involve the funding of third-party opportunities or projects, such as wetland and wildlife habitat creation and enhancement, aquatic habitat restoration and enhancement activities, or invasive species inventory or removal, among others. As well, in an effort to offset socio-economic net effects, Hydro One is also committed to working with local communities in the Project area to identify opportunities that could enhance and contribute to the broader landscape, recognizing that community benefits can be varied and diverse in nature. Following completion of the EA process, Hydro One will engage with Indigenous communities, local communities and interested parties to discuss the implementation of the biodiversity and community benefits initiatives for the Project.

5.9 Determine Prediction Confidence in the Assessment

Prediction confidence refers to the degree of certainty in the net effects predictions and associated determinations of significance. The EA deals with predictions of future circumstances, and predicts interactions of the Project and other developments or activities within complex physical, biological, and socio-economic environments. Therefore, the effects predictions vary in their level of certainty, which is influenced by factors such as:

- Availability of data relevant to the environment in the study area;
- Understanding of the Project components and activities;
- Natural variability and resiliency of the environment and society;
- Degree of scientific understanding of Project criteria interactions, and criteria inter relationships;
- Use of standardized assessment methods to estimate, calculate or model predicted effects;
- Understanding of the likely effectiveness of the proposed mitigation measures; and
- Other factors beyond the control of the assessment team (e.g., future technologies, climate change).

The level of certainty is considered during the effects assessment and is described as low, moderate or high certainty. Discussion is provided on how uncertainty was addressed to increase the level of confidence so that net effects will not be worse than predicted, such as building conservatism into the analysis and assessment.

5.10 Evaluate the Advantages and Disadvantages

The EA planning process consists of a systematic evaluation of the potential environmental effects of alternatives, and weighting the advantages and disadvantages of alternatives. Under paragraph 6(2)(d) of the EAA, an evaluation of the advantages and disadvantages to the environment of the undertaking and alternatives must be included in the assessment. As identified in the approved Amended ToR, this EA includes an assessment of the “alternative methods” appropriate for the Project; it does not include an assessment of “alternatives to” the Project, with the exception of the “do nothing” or null alternative.

In accordance with the EAA, “alternative methods” (e.g., alternative routes and footprint refinements) have been evaluated through the EA process. In accordance with the approved Amended ToR, Hydro One completed an alternative route evaluation to select a preferred route. The alternative route evaluation was based on Indigenous community values criteria and indicators, natural environment, socio-economic environment and technical (including cost and constructability). Appendix 2.0-A provides the method and results of the alternative route evaluation and a comparison of advantages and disadvantages of each option. A summary of

advantages and disadvantages is also completed for the Project versus the “do nothing” alternative in Section 11.0.

As described in the Amended ToR, local refinements to the preliminary Project footprint will be considered as new information becomes available (e.g., from IK studies, field studies, etc.) to avoid sensitive Indigenous, natural and/or socio-economic features and for technical reasons (e.g., SAR habitat identified during field surveys, terrain issues identified during geotechnical surveys, site-specific landowner concerns, results of IK studies, etc.).

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